South Dakota

An Annual Report on Cancer Incidence and Mortality Among South Dakotans, 2011

South Dakota Cancer Registry
May 2014

Cancer In South Dakota 2011

South Dakota Cancer Registry, South Dakota Department of Health

Preface

"Cancer in South Dakota, 2011," is the 19th annual report from the South Dakota Cancer Registry (SDCR) in the Office of Chronic Disease Prevention and Health Promotion in the Division of Health and Medical Services within the South Dakota Department of Health (DOH). The report contains 2011 cancer incidence and mortality data of South Dakota residents.

Acknowledgements

The South Dakota Cancer Registry acknowledges all the Certified Tumor Registrars in hospital cancer registries who work diligently to maintain quality data, hospitals, clinics, physicians, pathology laboratories and other providers and health entities that submit data to the SDCR, and co-workers in the Department of Health.

Funding Source

This publication was funded by the South Dakota Cancer Registry with a grant from the Centers for Disease Control and Prevention – grant number U58/DP003943.

Changes in Report

Age-adjusted rates were calculated using the 2000 US standard million and the US Census Bureau 2001 - 2011 population estimates for South Dakota. Reports published before 2012 used the 2000 South Dakota census population for age-adjusted calculations. Any comparison to reports published before 2012 with this report would not be compatible.

Requests for Information

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Suggested Citation

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WEB Access: This report is available on the internet at the following URL:
http://getscreened.sd.gov/documents/Cancer2011.pdf

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I. EXECUTIVE SUMMARY

This report summarizes the state of cancer in South Dakota and includes cancer incidence and mortality data. The data will enable the many organizations working with cancer prevention and control to identify public health problems, target goals for cancer control, and to inform citizens and health care professionals about risks, early detection, and treatment.

Incidence 2011

- 4,320 South Dakotans were diagnosed with invasive, reportable cases of cancer, which excludes the less life-threatening cancers such as *in situ* cancers (except *in situ* bladder cases) and the common skin cancers.
- Each day 12 cases of cancer are diagnosed in residents of South Dakota; this includes only cases of invasive cancer and *in situ* bladder.
- The five most diagnosed cancer sites (female breast, prostate, lung, colorectal, bladder) accounted for 55% of all cancer cases.
- Female breast cancer was the most common reportable malignancy with 624 cases among women, accounting for 14.4% of all cases and 29.1% of cases for women.
- Prostate cancer was the second most common reportable cancer with 596 cases, 13.8% of all cases and 27.4% of cases for men.
- Lung cancer was the third most common reportable malignancy with 528 cases, 12.2% of all cases.
- Colon and rectal cancers were the fourth most common malignancy with 421 cases, 9.7% of all cases.
- Bladder cancers were the fifth most common malignancy with 221 cases, 5.1% of all reported cases.
- 50% of all new cancers were diagnosed in males and 50% were in females.
- Males had an age-adjusted incidence rate of 488.9 per 100,000, which was higher than females who had an age-adjusted rate of 433.8 per 100,000.
- Whites accounted for 93.8% of cancer cases with 4,054 cases whereas American Indians were 5.3% with 230 cases.
- The American Indian age-adjusted incidence rate was 556.3, which is higher than the age-adjusted rate among whites of 456.1.
- The South Dakota age-adjusted incidence rate for 2011 was 455.4, higher than the US SEER 2011 age-adjusted incidence rate of 438.1 per 100,000 persons.

Mortality 2011

- Overall, cancer was the leading cause of death in South Dakota.
- In 2011, 1,656 South Dakotans died from cancer, accounting for one in every four deaths.
- Each day five South Dakotans died from cancer.
- The five cancers sites (lung, colorectal, female breast, pancreas, prostate) caused 54.2% of all cancer deaths.
- Lung and bronchus cancers were the leading cause of cancer deaths at 457 deaths or 27.6% of all cancer deaths. Lung and bronchus cancers caused one in four deaths due to cancer.
- Colorectal cancer was the second leading cause of cancer deaths with 136 deaths, 8.2% of all cancer deaths.
- Female breast cancer was the third leading cause of cancer deaths with 122 deaths, 7.4% of all cancer deaths and 14.9% of all female cancer deaths.
- Pancreatic cancer was the fourth leading cause of death with 95 deaths, 5.7% of all cancer deaths.
- Prostate cancer was the fifth leading cause of death with 88 deaths, 5.3% of all cancer deaths, and 10.5% of all male cancer deaths.
- Over half, 51%, of all cancer deaths were males and 49% were females.
- Males had an age-adjusted death rate of 192.5 per 100,000 males, 28.8% higher than females with an age-adjusted rate of 149.5 deaths per 100,000 females.
- Whites accounted for 94.3% of deaths with 1,561 deaths, whereas American Indians were 4.9% with 81 deaths.
- The American Indian age-adjusted death rate was 240.5 which is 45.2% higher than the rate among whites at the age-adjusted death rate of 165.6.
- South Dakota's age-adjusted death rate for 2011 was 167.3, lower than the US SEER 2010* rate of 171.8.

Trends

- Incidence rates for female breast cancer are decreasing, from an age-adjusted rate of 141.5 in 2002 to 129.8 in 2011.
- Ovarian cancer deaths have declined over the past decade.
- Colorectal cancer deaths have declined since a high of 180 deaths in 2003 to 136 deaths in 2011.

*2010 was the lastest available national mortality rate at the time of publication.

II. INTRODUCTION

A limited cancer data collection system was established in 1992 under South Dakota Codified Laws, SDCL 1-43-1 to 1-43-18, and Administrative Rules ARSD 44:22:01. The South Dakota Cancer Registry (SDCR) was established in 2001 to develop a statewide, population-based cancer surveillance system. However, the state legislature amended the law to expand reporting to reflect statewide surveillance. SDCL 1-43-14 has been in effect since July 1, 2005:

> *Any hospital licensed pursuant to chapter 34-12, physician licensed pursuant to chapter 36-4, physician assistant licensed pursuant to chapter 36-4A, nurse practitioner or nurse midwife licensed pursuant to chapter 36-9A, pathology laboratory, or free-standing radiology center that detects, diagnoses, or treats a cancer case in South Dakota shall submit a report to the Department of Health as required by § 1-43-11 to 1-43-17, inclusive*.

Reportable cancers for 2011 include benign brain, benign central nervous system and all malignant neoplasms except basal and squamous cell carcinomas of the skin and *in situ* cervical cancers. In addition to receiving cases from hospital cancer registries the SDCR actively follows back pathology reports and abstracts cases from facilities without tumor registries.

The SDCR performs many quality assurance procedures to assure that the data are valid. The data are run through numerous edits and consolidated if received from more than one reporting source. In addition, the SDCR links the 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 the incidence file with the Indian Health Service database to identify any American Indian South Dakotan who was misclassified as another race.

The SDCR uses the cancer incidence data reported as well as the mortality data and health behavior surveys collected by the department's Health Statistics Office and Vital Records to provide useful information for cancer control and prevention programs, researchers, clinicians, and policy makers. The SDCR is able to answer several epidemiological questions such as:

- How many South Dakotans are diagnosed or die from cancer each year?
- What are the most common cancers?
- When are cancers being diagnosed, i.e. at what stage?
- Which cancers are the deadliest?
- Who is most affected by cancer?
- What are the trends in cancer incidence and mortality?
- Where are cancers occurring?
- Where and what are the disparities?
- Are screening efforts working?

Every life is touched by cancer in some way whether one is diagnosed with the disease or has a family member or friend with the disease. Although cancer is primarily a disease of people over 50 years old, the younger a person dies from cancer, the greater the impact on societal and economic costs. Cancer concerns voiced by South Dakotans are a priority for the SDCR.

As the SDCR continues to collect population based data and as more health care entities and providers report cases, more questions can be answered with the data. For example, SDCR can look at modifiable risk factors such as obesity and exercise. The Harvard Report on Cancer Prevention in 1996 researched the risk factors for cancer. The estimated percent of total cancer deaths attributed to established causes of cancer were:

Risk Factor	Percentage
Tobacco	30%
Adult diet/obesity	30%
Sedentary lifestyle	5%
Occupational factors	5%
Family history of cancer	5%
Viruses/biological agents	5%
Perinatal factors/growth	5%
Reproductive factors	3%
Alcohol	3%
Socioeconomic status	3%
Environmental pollution	2%
Ionizing /UV radiation	2%
Prescription drugs/medical	1%
Salt/food additives/contaminants	1%

The most successful way to prevent cancer is to limit the number of modifiable risk factors by following these guidelines:

- Do not smoke
- Maintain a healthy weight
- Get at least 30 minutes of physical activity every day
- Eat a healthy diet
- Limit alcohol intake to less than one drink a day
- Protect yourself from the sun

Studies suggest that quitting smoking and leading a healthy lifestyle could prevent two-thirds of the approximately 1,600 cancer deaths that occur each year in South Dakota

The SDCR continuously expands data collection. This will help 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.

III. TECHNICAL NOTES

Age-adjusted death rates: Death rates are calculated for total cases and separately for males and females. The death rates are age-adjusted to the 2000 US standard population using five-year groups and are per 100,000 persons. Rates are presented for 2011 and for the five-year period, 2007-2011.

Age-adjusted incidence rate: Age-adjusted incidence rates were calculated using the 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. Reports prior to 1999 used the 1970 US standard population. In conformity with the National Cancer Institute's (NCI) Surveillance, Epidemiology, and End Results (SEER) Program guidelines, the incidence rates for cancer sites exclude the following:

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

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

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

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

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

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

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

Data source: All data, tables, and figures come from the South Dakota Department of Health, *American Cancer Society Facts and Figures 2011* or *SEER Cancer Statistics Review 1975-2011* and should be cited as such if taken out of this report in part. SEER data represents approximately 10% of the U.S population.

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

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

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

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

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

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

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

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

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

- ***In Situ:*** Malignant cells are within the cell group from which they arose, without penetration of the basement membrane of the tissue and no stromal invasion. *In situ* is "in place".

- ***Localized:*** The malignant cells are limited to the organ of origin and have spread no farther than the organ in which they started.

- ***Regional:*** The tumor is beyond the limits of the organ of origin by direct extension to adjacent areas with or without lymph node involvement.

- ***Distant:*** The primary tumor has broken away and has traveled, growing secondary tumors in other parts of the body. It has metastasized

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

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

Statistical significance: This determines whether an event happens by chance alone. The null hypothesis states that in a given place and a period of time, all events occur randomly by chance. If not, then there is statistical significance. Confidence intervals are used to test statistical significance in this report. If the confidence intervals of two different rates intersect each other, then there is no statistical difference between the two rates.[3] However, if the confidence intervals do not intersect one another, there is statistical significance. This report looks at the South Dakota rates as compared to the 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 2001, cervical cancer rates were 10 per 100,000 American Indian women, a cervical cancer age-adjusted rate six times higher than white women in South Dakota. However, the case counts were two for American Indians and 10 whites. Small numbers result in wider confidence intervals, thus less confidence in the data.

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

[1] http://epi.grants.cancer.gov/ResPort/HDoverview.html
[2] http://www.omni.org/docs/CMHFProceedings.pdf
[3] BIOSTATISTICS *The Bare Essentials, 2nd edition Norman and Shreiner Page 512*

IV. CANCER INCIDENCE

South Dakota collected 4,320 new reportable cancer cases in 2011. Data at the county level ranged from a low incidence rate of 215.5 in Ziebach County to a high of 1001.9 in Buffalo County. There were three counties with rates significantly lower than the state incidence rate of 455.4. In 2001, (the South Dakota Cancer Registry's reference year) there were 10 counties with significantly lower rates. In the 2011 reporting year, no counties had a significantly higher rate, compared to three counties in 2010.

The United States incidence rate for 2011 was 438.1 and the South Dakota incidence rate was 455.4 per 100,000 persons, making South Dakota's significantly higher.

On page 14 of this report a map displaying the 2011 incidence rates by county can be located. On page 15 is a map displaying the mortality rates by county.

Table 1 : Cancer Cases and Incidence Rates by County
South Dakota, 2011 and 2007-2011 Average

County	2011			2007-2011^		
	Cases	Rate		Cases	Rate	
South Dakota	4,320	455.4		4,063	441.5	
Aurora	18	451.9		17	408.1	
Beadle	109	470.0		99	440.3	
Bennett	16	507.0		14	437.0	
Bon Homme	41	438.8		39	408.6	
Brookings	112	425.8		110	426.0	
Brown	181	401.6		184	420.2	▼
Brule	41	636.2		32	474.7	
Buffalo	11	1001.9		8	573.1	
Butte	69	537.8		57	466.1	
Campbell	9	305.8		7	279.7	▼
Charles Mix	50	416.3		54	485.1	
Clark	30	483.5		23	403.8	
Clay	51	478.8		44	399.5	
Codington	131	412.7		130	424.2	
Corson	19	549.9		14	387.6	
Custer	55	404.1		49	388.6	▼
Davison	109	437.0		110	467.1	
Day	40	449.5		40	463.4	
Deuel	18	285.4	▼	26	428.0	
Dewey	27	603.7		20	448.8	
Douglas	32	664.1		25	539.3	
Edmunds	33	492.3		26	427.0	
Fall River	70	553.7		62	517.3	▲
Faulk	19	481.1		15	401.1	
Grant	49	514.8		46	432.2	
Gregory	38	569.8		34	486.0	
Haakon	15	565.7		14	489.6	
Hamlin	24	351.1		29	429.3	
Hand	21	394.4		21	388.9	
Hanson	19	564.6		17	449.8	
Harding	4	252.1		5	383.2	
Hughes	99	479.7		96	491.9	▲
Hutchinson	49	435.5		49	419.9	
Hyde	8	361.3		8	385.6	
Jackson	13	385.7		10	323.6	▼
Jerauld	21	688.9		16	485.7	
Jones	5	372.0		7	497.5	
Kingsbury	47	629.9		46	574.3	▲
Lake	74	502.9		69	467.0	
Lawrence	147	475.4		115	389.1	▼
Lincoln	162	406.2		155	472.2	
Lyman	20	431.8		22	514.4	
McCook	32	434.6		32	435.4	
McPherson	13	263.4	▼	13	271.2	▼
Marshall	22	329.8		26	403.1	
Meade	105	386.1		107	421.1	
Mellette	13	626.0		10	457.8	
Miner	15	425.4		17	457.2	
Minnehaha	842	493.5		820	467.1	▲
Moody	28	325.7		29	383.4	▼
Pennington	536	458.8		500	455.1	
Perkins	25	464.1		21	411.4	
Potter	25	573.7		19	417.0	
Roberts	56	414.6		44	349.7	▼
Sanborn	22	719.9		18	537.0	
Shannon	31	363.0		31	413.3	
Spink	51	522.7		40	409.2	
Stanley	19	504.3		20	580.0	▲
Sully	7	405.1		7	400.3	
Todd	26	402.0		23	378.0	▼
Tripp	39	433.2		35	408.8	
Turner	58	521.5		51	442.9	
Union	85	470.9		73	445.1	
Walworth	40	417.0		35	402.3	
Yankton	116	402.0		114	411.6	▼
Ziebach	4	215.5	▼	5	292.5	▼

* Counts less than three are suppressed. Incidence rates with counts less than 20 are generally considered unstable.
^ Number of the cases and rates are averaged over the five-year period.
▲ Rate significantly higher; ▼ Rate significantly lower
Rates per 100,000 age-adjusted to 2000 US standard population and SD 2011 estimated population. Source: South Dakota Department of Health.

Table 2: Age-adjusted Incidence Rates by County for Selected Sites, 2011

	Colorectal		Lung & Bronchus		Female Breast		Prostate		Bladder		NHL	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
South Dakota	**421**	**43.8**	**528**	**55.1**	**624**	**129.3**	**596**	**127.1**	**221**	**22.9**	**183**	**19.3**
Aurora	*	52.5	7	183.5	3	120.0	*	59.9	0	0.0	*	25.4
Beadle	9	43.6	6	21.9	14	118.8	19	164.6	3	10.8	5	20.0
Bennett	3	95.2	*	66.8	0	0.0	*	75.7	*	35.0	*	38.3
Bon Homme	*	11.6	4	39.8	8	174.2	6	137.2	4	47.2	4	39.4
Brookings	14	54.5	8	31.9	15	113.9	13	100.1	5	17.8	6	27.9
Brown	25	54.9	23	48.2	23	100.4	17	75.5	12	23.5	10	20.2
Brule	*	25.6	8	97.1	8	273.4	3	97.2	*	8.5	0	0.0
Buffalo	*	128.5	*	181.8	*	232.2	*	244.4	*	129.2	0	0.0
Butte	3	24.2	11	81.7	10	145.4	7	103.1	*	16.6	*	14.2
Campbell	*	61.2	3	103.6	0	0.0	*	135.7	0	0.0	*	37.5
Charles Mix	5	42.0	6	48.0	5	87.1	4	64.5	0	0.0	*	16.6
Clark	5	74.8	5	81.6	3	78.6	6	218.7	*	10.3	*	30.2
Clay	3	23.3	8	82.7	9	153.5	8	151.8	5	45.8	4	35.4
Codington	9	26.4	16	49.7	22	126.7	16	97.0	9	25.8	5	16.8
Corson	4	110.1	*	70.1	*	86.5	4	257.3	0	0.0	*	23.0
Custer	7	54.5	7	48.3	6	112.8	5	67.7	*	15.7	3	22.7
Davison	10	44.5	8	31.8	13	106.8	23	192.0	5	17.6	6	28.4
Day	*	8.8	*	21.1	7	132.0	5	96.4	3	28.3	0	0.0
Deuel	*	31.0	*	16.1	*	23.8	3	96.0	*	16.1	0	0.0
Dewey	*	48.9	5	132.6	*	76.7	3	146.2	*	22.0	*	17.9
Douglas	4	94.3	8	145.2	3	149.1	8	328.5	*	22.3	*	9.3
Edmunds	4	54.7	*	29.2	5	147.8	6	190.4	4	47.3	0	0.0
Fall River	8	58.4	8	57.6	12	198.2	5	71.2	*	16.8	3	16.8
Faulk	3	66.9	*	51.7	*	85.9	*	58.8	*	51.7	*	27.4
Grant	4	38.9	6	56.9	6	140.3	7	143.4	*	18.4	3	22.4
Gregory	3	37.6	6	83.5	3	138.6	13	374.5	*	32.6	*	14.8
Haakon	*	28.5	*	28.8	*	252.5	3	197.2	*	28.8	*	38.0
Hamlin	*	40.8	3	39.3	3	86.3	3	79.4	*	15.3	0	0.0
Hand	4	50.9	0	0.0	*	61.5	*	66.4	*	26.9	*	69.6
Hanson	5	145.3	3	81.3	*	56.5	3	150.4	*	54.7	*	34.2
Harding	0	0.0	0	0.0	*	153.4	*	114.2	0	0.0	*	64.6
Hughes	10	47.3	9	48.1	17	150.5	21	193.5	8	40.9	4	17.1
Hutchinson	7	69.5	4	34.9	7	155.1	8	145.5	*	17.0	*	12.7
Hyde	*	79.3	*	47.4	0	0.0	0	0.0	3	109.4	0	0.0
Jackson	0	0.0	*	57.8	5	290.8	*	55.7	*	28.9	0	0.0
Jerauld	*	56.8	*	49.2	4	321.9	5	328.8	0	0.0	*	13.6
Jones	0	0.0	0	0.0	*	225.4	0	0.0	*	57.0	0	0.0
Kingsbury	*	46.2	3	34.9	8	224.9	10	255.0	3	29.9	*	22.0
Lake	4	22.8	7	43.6	9	122.5	15	200.8	3	19.4	6	43.9
Lawrence	14	49.8	17	56.4	19	119.2	15	91.4	7	19.3	10	31.6
Lincoln	9	23.8	16	43.8	27	124.4	35	176.2	7	19.1	5	15.0
Lyman	3	58.7	6	120.8	3	166.5	3	154.4	0	0.0	0	0.0
McCook	5	71.4	11	135.2	3	78.9	0	0.0	*	25.7	*	11.6
McPherson	3	62.0	0	0.0	*	125.5	*	32.4	*	11.3	*	27.8
Marshall	*	23.6	*	13.3	3	82.1	0	0.0	3	44.9	*	17.4
Meade	14	48.2	15	60.8	13	87.2	7	53.2	3	9.0	*	6.7
Mellette	*	54.0	*	88.3	*	114.5	*	138.3	*	116.3	*	53.0
Miner	*	14.2	3	92.9	*	87.0	5	314.3	0	0.0	0	0.0
Minnehaha	69	39.0	93	54.8	139	155.6	130	157.2	43	25.1	44	25.6
Moody	*	19.6	0	0.0	3	60.9	3	77.9	*	18.7	0	0.0
Pennington	53	43.6	91	75.7	76	129.3	50	86.7	24	21.5	15	12.3
Perkins	5	91.7	3	55.7	*	82.6	3	141.2	*	10.5	3	51.9
Potter	4	109.5	4	63.2	4	245.8	4	282.9	0	0.0	*	17.4
Roberts	7	48.9	5	34.3	8	132.0	9	120.5	3	21.8	*	12.7
Sanborn	3	74.5	*	30.3	*	107.5	3	187.2	*	30.1	*	28.6
Shannon	7	75.9	4	56.8	6	114.7	3	57.9	*	14.6	*	9.9
Spink	4	30.9	*	10.9	10	191.9	9	203.3	6	50.4	*	10.9
Stanley	*	54.8	*	67.8	3	180.7	6	245.8	*	33.7	0	0.0
Sully	*	53.9	0	0.0	*	384.0	*	83.6	0	0.0	0	0.0
Todd	4	51.5	5	95.3	3	81.0	4	158.8	0	0.0	0	0.0
Tripp	5	41.3	3	31.0	*	43.8	5	128.6	0	0.0	*	15.5
Turner	3	25.4	7	69.9	11	208.9	9	138.4	3	27.6	*	13.4
Union	8	44.7	15	76.7	16	176.8	10	112.8	*	3.9	0	0.0
Walworth	*	18.4	7	72.9	3	52.4	3	69.0	6	60.5	*	9.7
Yankton	15	51.4	15	53.6	18	124.5	16	104.6	5	18.9	7	24.6
Ziebach	*	32.2	0	0.0	0	0.0	*	117.7	0	0.0	*	32.2

Note: * Counts less than 3 are suppressed. Incidence rates with counts less than 20 are generally considered unstable.
Rates per 100,000 age-adjusted to the 2000 US standard population and 2011 SD estimated population.
Source: South Dakota Department of Health.

Table 3: Age-adjusted Incidence Rates by Site, Gender and Race, South Dakota, 2011

2011	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	**4,320**	**455.4**	**2,178**	**488.9**	**2,142**	**433.8**	**4,054**	**456.1**	**230**	**556.3**
Oral Cavity	**116**	**12.4**	**74**	**16.2**	**42**	**8.3**	**110**	**12.4**	**6**	**10.2**
Lip	26	2.7	13	2.9	13	2.4	25	2.7	1	1.7
Tongue	30	3.2	17	3.5	13	2.9	28	3.2	2	3.4
Salviary Gland	12	1.3	8	1.8	4	0.9	12	1.3	0	0.0
Floor of Mouth	5	0.5	3	0.6	2	0.3	5	0.5	0	0.0
Gum and Other Mouth	12	1.2	8	1.8	4	0.7	11	1.2	1	1.7
Nasopharynx	3	0.4	3	0.9	0	0.0	3	0.5	0	0.0
Tonsil	19	1.9	14	2.9	5	1.0	18	2.0	1	1.7
Oropharynx	3	0.3	2	0.4	1	0.2	2	0.2	1	1.7
Hypopharynx	4	0.4	4	0.8	0	0.0	4	0.4	0	0.0
Other Oral Cavity and Pharynx	2	0.2	2	0.5	0	0.0	2	0.3	0	0.0
Digestive System	**760**	**80.2**	**415**	**93.8**	**345**	**65.0**	**696**	**76.1**	**53**	**131.0**
Esophagus	56	5.5	44	9.8	12	2.1	50	5.1	6	20.0
Stomach	51	5.4	34	8.1	17	3.3	45	5.1	3	9.5
Small Intestine	24	2.6	10	2.3	14	2.8	23	2.6	0	0.0
Colorectal	421	44.6	230	52.1	191	35.5	386	42.4	31	69.0
Colon Excluding Rectum	297	30.7	154	35.3	143	26.3	277	30.2	17	40.6
Rectum and Rectosigmoid	124	13.1	76	16.8	48	9.3	109	12.2	14	28.4
Anus, Anal Canal and Anorectum	13	1.4	5	1.1	8	1.8	13	1.5	0	0.0
Liver and Intrahepatic Bile Duct	51	5.5	29	6.5	22	4.5	39	4.4	9	19.6
Gallbladder	6	0.6	3	0.8	3	0.5	6	0.6	0	0.0
Other Biliary	18	1.9	8	1.8	10	2.0	18	2.0	0	0.0
Pancreas	107	10.9	46	10.1	61	11.3	104	11.0	3	10.5
Retroperitoneum	2	0.2	2	0.4	0	0.0	2	0.2	0	0.0
Peritoneum, Omentum and Mesentery	11	1.1	4	0.9	7	1.3	10	1.1	1	2.3
Respiratory	**572**	**60.7**	**302**	**69.2**	**270**	**53.2**	**529**	**58.3**	**40**	**120.3**
Nose, Nasal Cavity and Middle Ear	7	0.8	6	1.4	1	0.2	6	0.7	1	1.7
Larynx	37	3.8	30	7.0	7	1.4	35	3.9	2	4.0
Lung and Bronchus	528	55.1	266	60.8	262	51.6	488	53.7	37	114.6
Pleura	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mediastinum and Other Resp Organs	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bones and Joints	**3**	**0.3**	**1**	**0.2**	**2**	**0.5**	**2**	**0.2**	**1**	**1.0**
Soft Tissue (Including Heart)	**33**	**3.6**	**21**	**5.1**	**12**	**2.4**	**31**	**3.7**	**2**	**4.0**
Skin	**201**	**21.9**	**101**	**23.1**	**100**	**21.0**	**200**	**23.2**	**1**	**1.5**
Melanomas of the Skin	186	20.1	95	21.8	91	19.6	185	21.7	1	1.5
Other Skin	15	1.4	6	1.3	9	1.4	15	1.4	0	0.0
Breast	**631**	**69.0**	**7**	**1.5**	**624**	**129.3**	**588**	**68.2**	**38**	**80.2**
Breast, Female	624	129.3			624	129.3	582	130.3	37	142.6
Breast, Male	7	1.5	7	1.5			6	1.4	1	5.4
Female	**242**	**50.1**			**242**	**50.1**	**227**	**50.3**	**14**	**48.9**
Vulva	13	2.4			13	2.4	13	2.5	0	0.0
Vagina	5	1.1			5	1.1	5	1.2	0	0.0
Cervix Uteri	32	8.0			32	8.0	24	7.0	8	26.8
Corpus and Uterus, NOS	139	28.2			139	28.2	133	28.7	5	18.2
Corpus Uteri	136	27.7			136	27.7	131	28.4	4	14.9
Uterus, NOS	3	0.5			3	0.5	2	0.3	1	3.3
Ovary	50	9.9			50	9.9	49	10.3	1	4.0
Other Female Genital Organs	3	0.6			3	0.6	3	0.6	0	0.0

Table 3: Age-adjusted Incidence Rates by Site, Gender and Race, South Dakota, 2011 (continued)

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Male	**617**	**132.3**	**617**	**132.3**			**588**	**133.5**	**28**	**156.6**
Penis	2	0.5	2	0.5			2	0.5	0	0.0
Prostate	596	127.1	596	127.1			569	127.9	26	151.3
Testis	19	4.7	19	4.7			17	5.0	2	5.3
Other Male Genital Organs	0	0.0	0	0.0			0	0.0	0	0.0
Urinary	**356**	**38.2**	**236**	**55.1**	**120**	**23.5**	**342**	**38.2**	**10**	**23.4**
Bladder	221	23.3	162	38.2	59	10.8	217	23.7	2	5.5
Kidney and Renal Pelvis	129	14.2	70	16.0	59	12.3	119	13.8	8	18.0
Ureter	4	0.4	2	0.5	2	0.3	4	0.4	0	0.0
Other Urinary Organs	2	0.2	2	0.4	0	0.0	2	0.2	0	0.0
Eye and Orbit	**1**	**0.1**	**0**	**0.0**	**1**	**0.3**	**1**	**0.1**	**0**	**0.0**
Brain and CNS	**76**	**8.5**	**41**	**9.2**	**35**	**7.8**	**73**	**8.9**	**3**	**5.7**
Brain	73	8.2	40	9.0	33	7.4	71	8.6	2	4.0
Meninges and CNS	3	0.3	1	0.2	2	0.4	2	0.2	1	1.6
Endocrine	**113**	**13.3**	**26**	**5.9**	**87**	**20.6**	**105**	**13.5**	**3**	**4.9**
Thyroid	108	12.8	24	5.4	84	20.0	102	13.3	2	2.9
Other Endocrine	5	0.6	2	0.6	3	0.5	3	0.3	1	2.1
Lymphomas	**201**	**21.9**	**110**	**25.4**	**91**	**18.8**	**191**	**22.0**	**6**	**14.9**
Hodgkin's Lymphoma	18	2.3	10	2.4	8	2.0	17	2.4	1	2.1
Non-Hodgkin's Lymphoma	183	19.7	100	23.0	83	16.7	174	19.6	5	12.9
Multiple Myeloma	**70**	**7.4**	**43**	**10.0**	**27**	**4.9**	**69**	**7.5**	**1**	**3.1**
Leukemia	**150**	**16.6**	**84**	**19.2**	**66**	**13.8**	**140**	**16.5**	**8**	**14.4**
Acute Lymphocytic	12	1.4	5	1.3	7	1.5	9	1.2	2	2.9
Chronic Lymphocytic	61	6.4	31	6.6	30	6.1	59	6.4	2	3.5
Other Lymphocytic	4	0.4	3	0.6	1	0.2	4	0.5	0	0.0
Acute Myeloid	45	5.2	26	6.4	19	4.1	40	4.8	4	8.0
Acute Monocytic	1	0.1	1	0.2	0	0.0	1	0.2	0	0.0
Chronic Myeloid	18	2.0	12	2.7	6	1.2	18	2.1	0	0.0
Other Myeloid/Monocytic	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other Acute Leukemia	8	1.0	5	1.2	3	0.7	8	1.2	0	0.0
Other Leukemia	1	0.1	1	0.2	0	0.0	1	0.1	0	0.0
Myeloproliferative and Myelodysplastic	**62**	**6.5**	**35**	**8.1**	**27**	**4.9**	**58**	**6.3**	**4**	**11.9**
Mesothelioma	**6**	**0.7**	**4**	**0.9**	**2**	**0.4**	**5**	**0.6**	**1**	**1.7**
Other Sites	**110**	**11.4**	**61**	**13.7**	**49**	**9.2**	**99**	**10.6**	**11**	**35.9**

Rates per 100,000 age-adjusted to the 2000 US standard population and 2011 SD estimated population.
Source: South Dakota Department of Health

Table 3 above shows incidence and age-adjusted incidence rates for South Dakota in 2011 by primary sites, gender, and race according to SEER site category recodes (Appendix C).

Table 4: Percentage of Selected Cancers by Age Groups in South Dakota, 2011

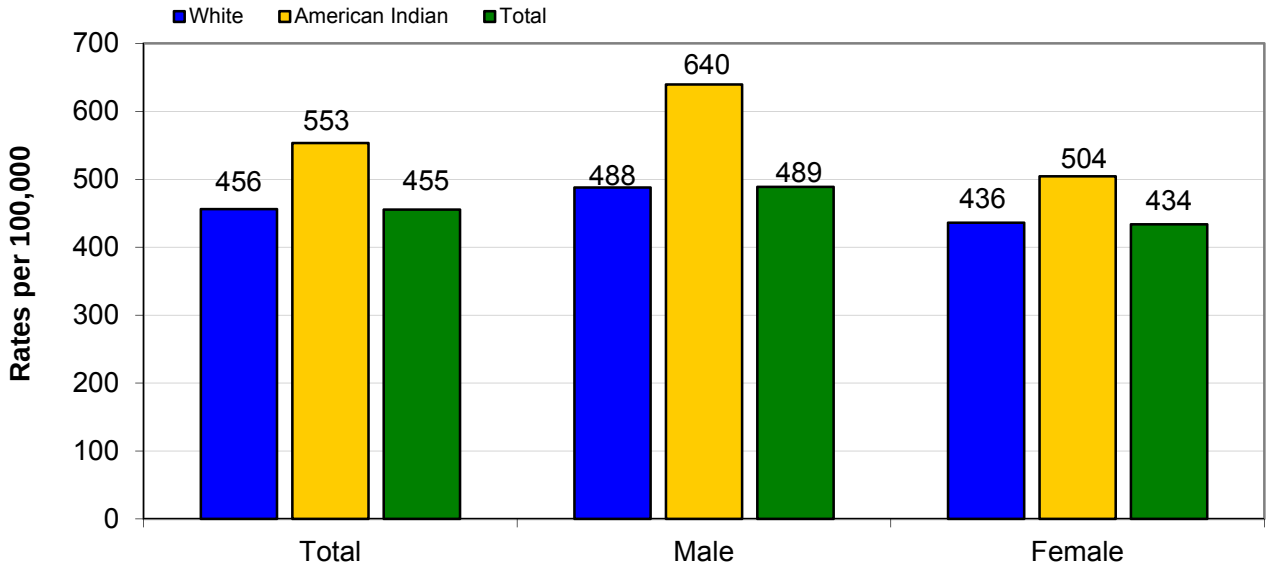
	0-19	20-34	35-49	50-64	65-74	75-84	85+
All Sites	1%	2%	8%	31%	25%	22%	10%
Bladder	0%	1%	5%	23%	21%	35%	15%
Breast, Female	0%	2%	16%	35%	21%	17%	9%
Colorectal	0%	0%	8%	30%	24%	22%	16%
Corpus and Uterus, NOS	0%	0%	14%	40%	23%	15%	7%
Hodgkin's Lymphoma	6%	44%	22%	11%	11%	0%	6%
Kidney and Renal Pelvis	1%	2%	11%	32%	29%	19%	7%
Leukemia	12%	5%	9%	28%	22%	16%	9%
Lung and Bronchus	0%	1%	2%	25%	29%	34%	9%
Melanomas of the Skin	0%	9%	14%	33%	22%	11%	12%
Non-Hodgkin's Lymphoma	1%	1%	12%	26%	23%	23%	14%
Pancreas	0%	0%	4%	23%	31%	25%	17%
Prostate	0%	0%	2%	44%	32%	17%	4%
Thyroid	1%	19%	19%	33%	14%	12%	3%

Source: South Dakota Department of Health

In 2011, 56% of all cancers were diagnosed between ages 50 to 74 (Table 4). Notable were the 16% of female breast cancers and 19% of thyroid cancers diagnosed between the ages of 35 to 49. In 2011, 50% of the Hodgkin's lymphoma cases were diagnosed in persons under 35 years old, compared to 35% in 2011.

Figure 1 below shows that incidence rates for American Indians in South Dakota were higher than those for whites in 2011. Of the 4,320 newly diagnosed cases in 2011, 230 or 5% were American Indians, 111 males and 119 females.

Figure 1: All Sites Cancer Incidence Rates by Race and Gender, South Dakota, 2011

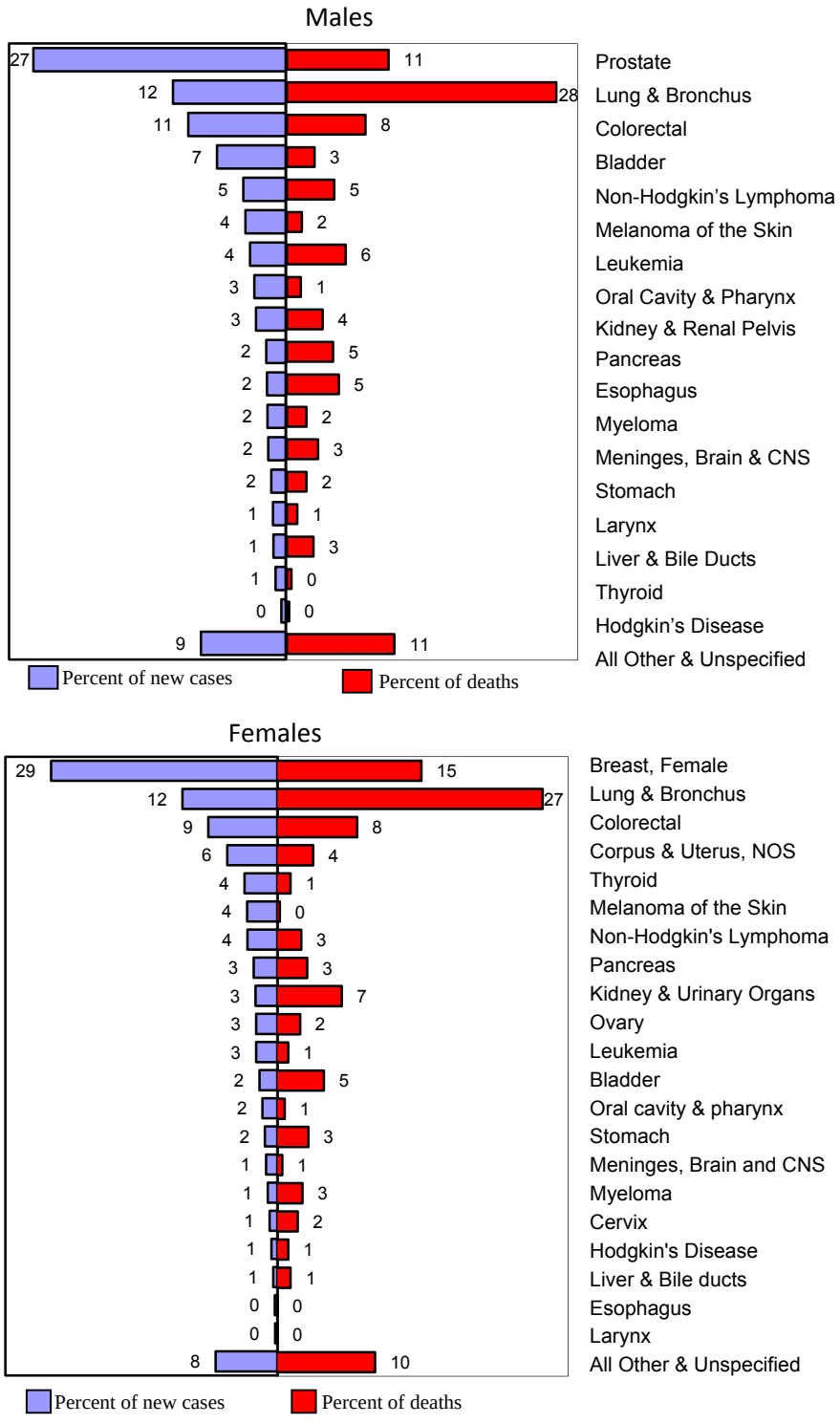


Note: Rates per 100,000 age-adjusted to the 2000 US standard population and 2011 SD estimated population.
Source: South Dakota Department of Health

V. CANCER CASES AND DEATHS BY RANK

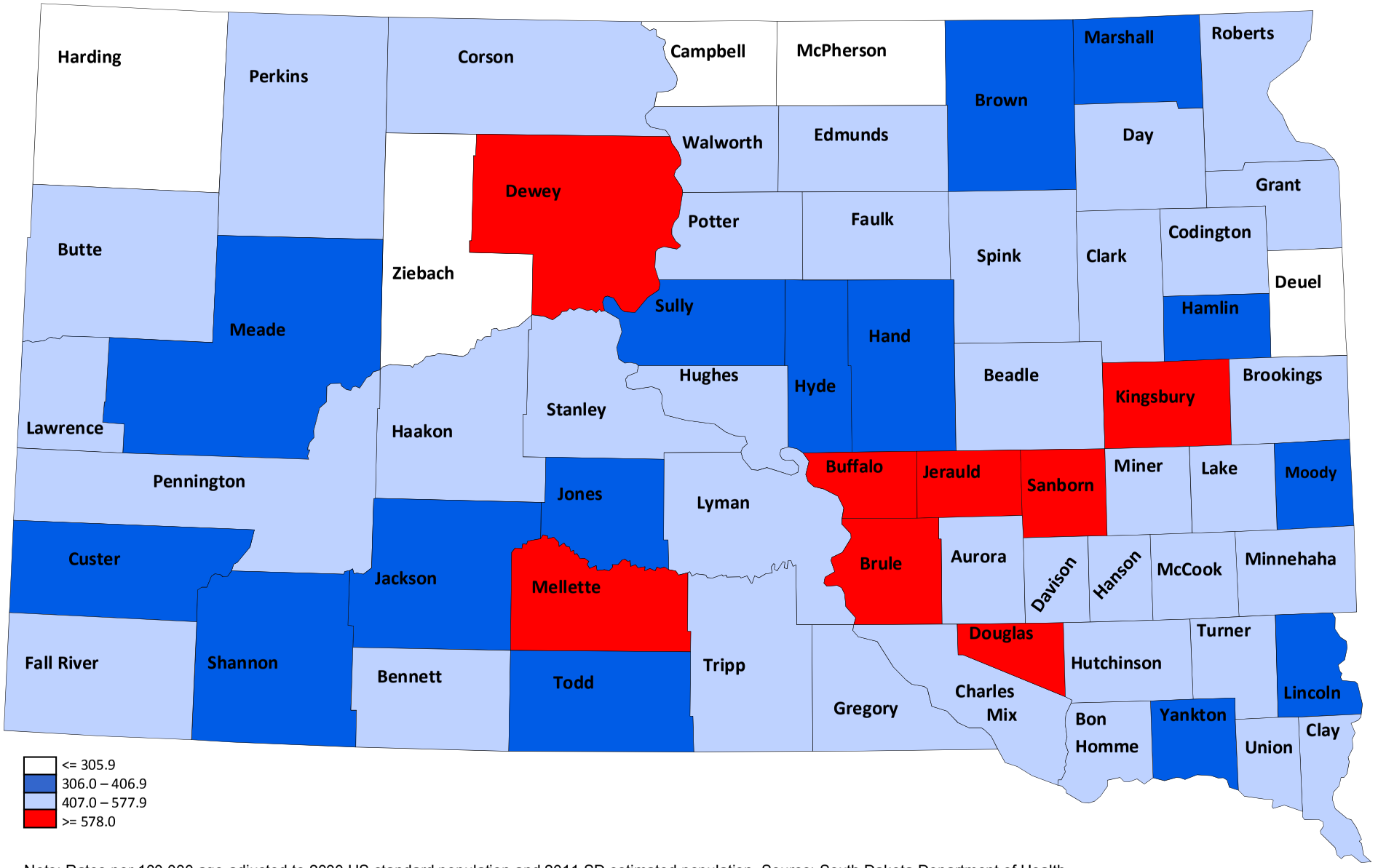
Female breast cancer was the most common cancer diagnosed during 2011. The four most diagnosed cancers were female breast, prostate, lung and bronchus, and colorectal which accounted for 50.2% of the new cases diagnosed and 48.5% of cancer deaths. Figure 2 shows the percent of new cancer cases and deaths by rank and gender.

Figure 2: Percent Distribution of Cancer Cases and Deaths by Rank and Gender, South Dakota, 2011



Source: South Dakota Department of Health

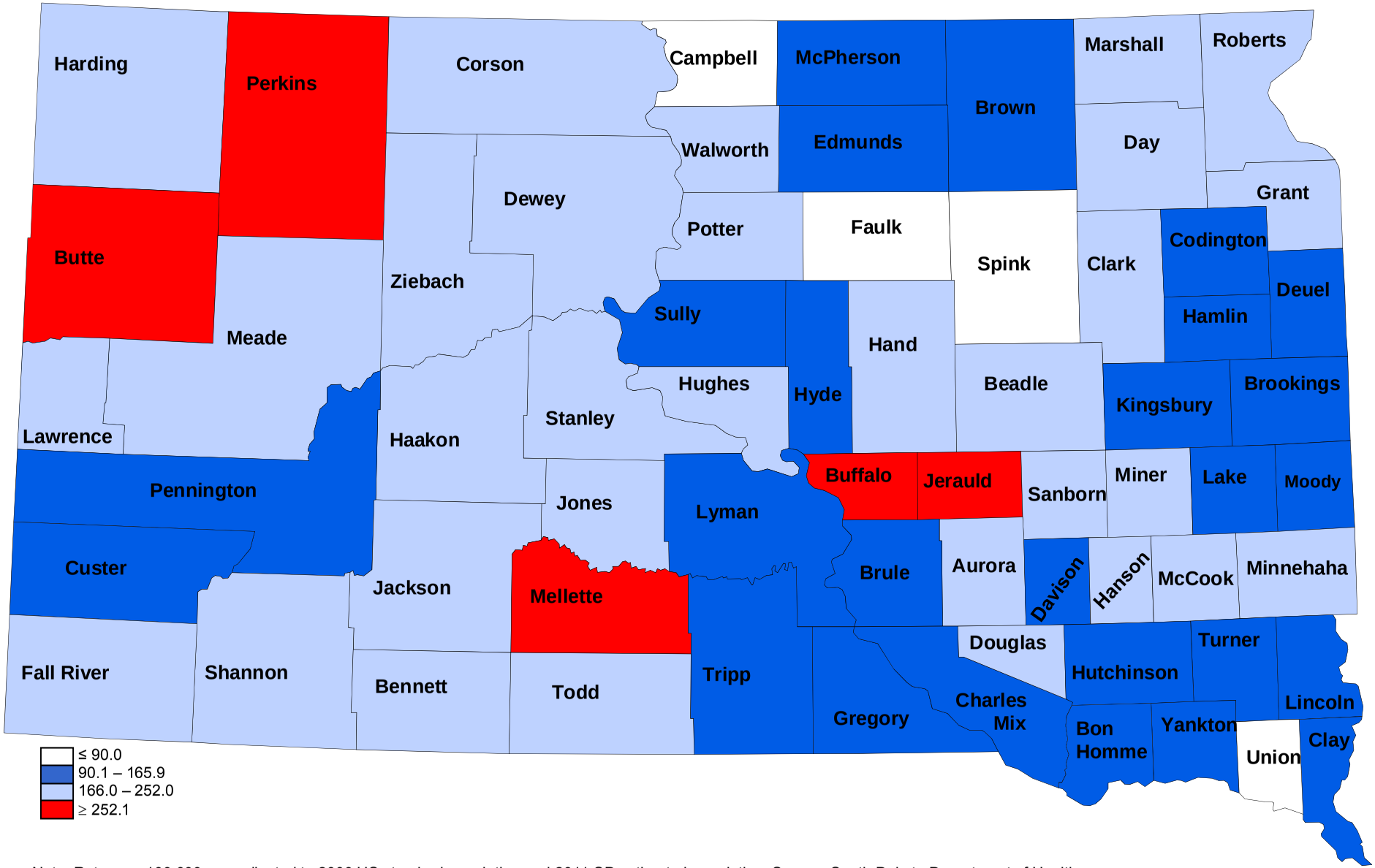
Figure 3: Cancer Incidence Rates by County, South Dakota, 2011



Note: Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population. Source: South Dakota Department of Health

South Dakota has an area of 77,121 square miles with a 2011 estimated population of 824,082 persons resulting in a population density of 10.7 persons per square mile. Population densities range from a low of 0.5 in Harding County to a high of 210.0 persons per square mile in Minnehaha County.

Figure 4: Cancer Mortality Rates by County, South Dakota, 2011



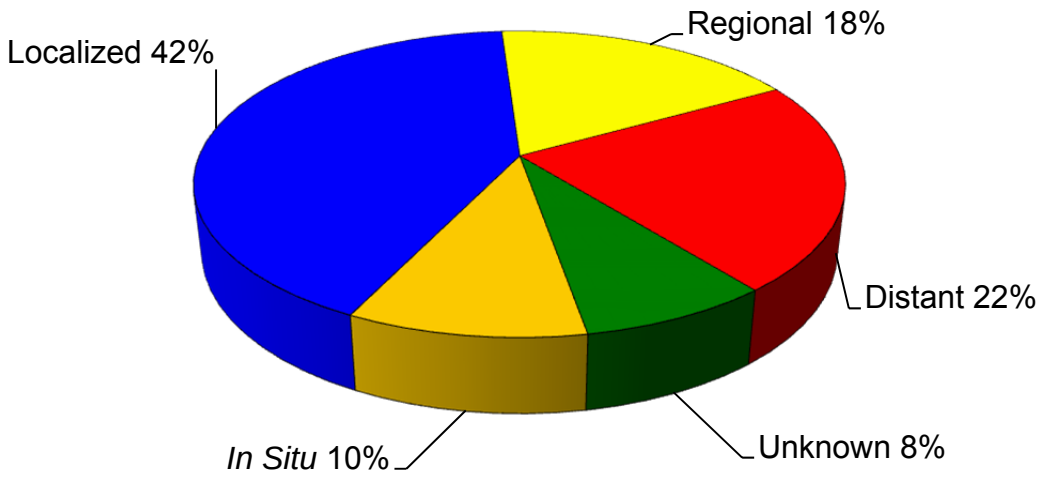
Note: Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population. Source: South Dakota Department of Health

South Dakota has an area of 77,121 square miles with a 2011 estimated population of 824,082 persons resulting in a population density of 10.7 persons per square mile. Population densities range from a low of 0.5 in Harding County to a high of 210.0 persons per square mile in Minnehaha County.

SEER Summary Staging:

- ***In Situ*** - Malignant cells are within the cell groups from which they arose, without penetration of the basement membrane of the tissue and stromal invasion.
- **Localized** - The malignant cells are limited to the organ of origin and have spread no farther than the organ where they began.
- **Regional** - The tumor is beyond the limits of the organ of origin by direct extension to adjacent areas such as the regional lymph nodes, adjacent organs, or 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, 2011



Source: South Dakota Department of Health

The figure above demonstrates the number of cases diagnosed at each stage of disease. For 2011, there were a total of 4,685 cases reported to the South Dakota State Cancer Registry, which includes *in situ* cases.

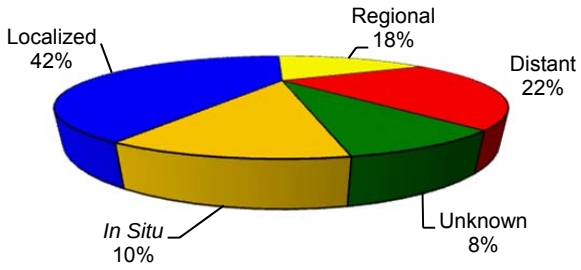
Table 5: South Dakota Stage at Diagnosis, All Cases, 2011

Stage	Number of Cases	Percent of Total
In Situ	470	10.0
Localized	1,953	41.7
Regional	841	18.0
Distant	1045	22.3
Unknown	376	8.0

In 2011, 42% of all cancer cases diagnosed in South Dakota were diagnosed at localized stage. Another 40% were diagnosed at the regional and distant stages combined. Stage at diagnosis by race was as follows:

Figure 6: Stage at Diagnosis in South Dakota, White, 2011

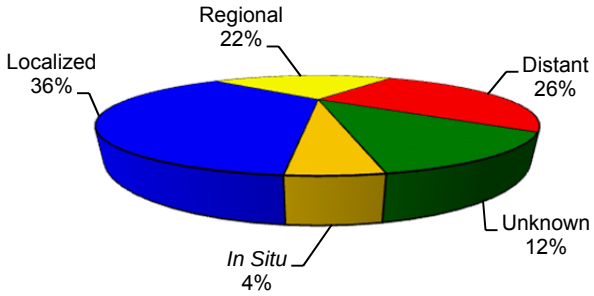
Number of cases = 4,409



Source: South Dakota Department of Health

Figure 7: Stage at Diagnosis in South Dakota, American Indians, 2011

Number of cases = 239



Source: South Dakota Department of Health

Cases of non-Hodgkin's lymphoma, myeloma and leukemias are usually 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 in Table 6.

Table 6: Stage at Diagnosis for Selected Sites by Race, South Dakota, 2011

	White						American Indian					
	Localized		Regional		Distant		Localized		Regional		Distant	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Female Breast	402	21.7%	146	18.7%	29	3.0%	18	21.2%	13	24.5%	5	7.9%
Prostate	445	24.1%	83	10.6%	25	2.6%	20	23.5%	5	9.4%	1	1.6%
Lung and Bronchus	96	5.2%	95	12.1%	257	26.4%	5	5.9%	6	11.3%	19	30.2%
Colorectal	145	7.8%	139	17.8%	71	7.3%	9	10.6%	11	20.8%	8	12.7%
Melanoma of the Skin	143	7.7%	11	1.4%	9	0.9%	0	0.0%	0	0.0%	1	1.6%
Bladder	81	4.4%	13	1.7%	10	1.0%	1	1.2%	0	0.0%	0	0.0%
Non-Hodgkin's Lymphoma	41	2.2%	28	3.6%	83	8.5%	2	2.4%	1	1.9%	1	1.6%
Corpus and Uterus, NOS	83	4.5%	30	3.8%	13	1.3%	4	4.7%	0	0.0%	1	1.6%
Kidney and Renal Pelvis	65	3.5%	22	2.8%	19	2.0%	4	4.7%	1	1.9%	2	3.2%
Pancreas	11	0.6%	21	2.7%	56	5.7%	0	0.0%	1	1.9%	1	1.6%
Thyroid	64	3.5%	33	4.2%	3	0.3%	1	1.2%	1	1.9%	0	0.0%
Leukemia	1	0.1%	0	0.0%	139	14.3%	0	0.0%	0	0.0%	8	12.7%

Source: South Dakota Department of Health

VII. CANCER MORTALITY

Cancer age-adjusted death rates for 2011 ranged from a low of 83.0 in Faulk County to a high of 723.3 in Buffalo County. South Dakota's age adjusted death rate was 167.3 in 2011 compared to a 5-year death rate of 165.5.

In 2011, only three counties had a significantly lower rate than that of the entire state and one had a significantly higher rate. The five-year rates show nine counties having significantly lower rates and three counties with significantly higher rates. South Dakota's mortality rate for 2007-2011 was 165.5 per 100,000 persons.

The United States mortality rate for 2011 is not available. The United States mortality rate was 171.8 and the South Dakota mortality rate was 169.7 per 100,000 persons in 2010. South Dakota's mortality rate for 2011 is 167.3 per 100,000 persons.

The South Dakota 2011 mortality rates are displayed in a state map on page 15 of this report.

Table 7 : Cancer Deaths and Mortality Rates by County
South Dakota, 2011 and 2007-2011 Average

County	2011			2007-2011^		
	Deaths	Rate		Deaths	Rate	
South Dakota	1,656	167.3		1,596	165.5	
Aurora	7	176.3		6	132.2	
Beadle	45	188.9		44	178.3	
Bennett	6	177.4		6	195.1	
Bon Homme	15	149.7		18	162.5	
Brookings	39	141.2		41	150.5	
Brown	68	141.3		78	164.6	
Brule	11	135.2		11	147.5	
Buffalo	3	723.3		3	273.6	
Butte	38	296.6	▲	28	225.1	▲
Campbell	3	88.6		3	95.0	▼
Charles Mix	22	156.5		23	180.7	
Clark	15	222.4		10	148.2	
Clay	16	130.3		18	147.6	
Codington	47	136.4		57	174.8	
Corson	7	232.9		7	213.1	
Custer	20	153.0		23	186.3	
Davison	36	128.5		43	162.7	
Day	21	181.0		17	169.0	
Deuel	9	127.9		9	128.3	▼
Dewey	7	171.3		9	206.4	
Douglas	11	183.9		9	177.6	
Edmunds	12	159.7		9	139.3	
Fall River	27	195.9		27	198.6	
Faulk	4	83.1		6	120.1	▼
Grant	21	185.8		17	145.8	
Gregory	9	147.4		15	182.5	
Haakon	6	186.5		6	154.9	
Hamlin	13	157.9		12	159.6	
Hand	9	177.1		8	130.3	
Hanson	7	198.9		6	177.8	
Harding	3	169.6		*	92.9	▼
Hughes	39	196.7		32	159.5	
Hutchinson	19	146.3		22	161.3	
Hyde	2	126.6		4	153.0	
Jackson	6	186.3		5	174.2	
Jerauld	9	287.5		8	226.3	
Jones	4	211.7		3	159.8	
Kingsbury	12	126.9		16	175.6	
Lake	25	161.4		25	152.8	
Lawrence	66	194.5		53	163.3	
Lincoln	51	135.0		45	151.0	
Lyman	6	124.2		6	132.8	
McCook	16	185.5		18	214.9	▲
McPherson	7	150.8		4	68.8	▼
Marshall	17	245.9		13	178.7	
Meade	46	183.9		44	179.2	
Mellette	8	377.2		5	223.9	
Miner	9	177.8		9	195.7	
Minnehaha	326	190.5		300	170.5	
Moody	11	129.4		13	160.8	
Pennington	196	164.7		181	162.9	
Perkins	18	320.7		11	190.2	
Potter	12	184.0		10	193.3	
Roberts	29	203.7		26	196.6	
Sanborn	6	167.3		4	115.6	▼
Shannon	16	224.8		14	224.2	▲
Spink	11	94.7	▼	15	138.1	
Stanley	7	169.7		6	172.2	
Sully	3	143.5		*	126.5	
Todd	9	186.7		11	211.4	
Tripp	14	144.2		13	132.5	▼
Turner	20	161.1		20	143.3	
Union	18	99.8	▼	31	185.2	
Walworth	23	192.4		14	133.7	▼
Yankton	35	112.4	▼	42	143.1	▼
Ziebach	3	189.2		3	188.5	

* Counts less than three are suppressed. Mortality rates with counts less than 20 are generally considered unstable. ▲ Rate significantly higher; ▼ Rate significantly lower
^ Number of the cases and rates are averaged over the five-year period.
Rates per 100,000 age-adjusted to 2000 US standard population and SD 2011 estimated population. Source: South Dakota Department of Health

Table 8: Age-adjusted Mortality Rates by County for Selected Sites, 2011

	Colorectal		Lung and Bronchus		Female Breast		Prostate		Bladder		NHL	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
South Dakota	**136**	**13.7**	**457**	**47.0**	**122**	**23.3**	**88**	**20.8**	**34**	**3.2**	**62**	**6.0**
Aurora	0	0.0	4	103.2	0	0.0	0	0.0	0	0.0	0	0.0
Beadle	3	11.2	11	40.2	6	45.7	*	17.2	0	0.0	*	6.3
Bennett	*	55.5	*	28.9	0	0.0	*	70.5	0	0.0	0	0.0
Bon Homme	0	0.0	8	82.6	*	32.1	*	33.8	*	9.3	0	0.0
Brookings	*	8.6	7	25.1	4	29.3	*	16.6	*	3.6	*	3.7
Brown	6	12.5	16	32.4	5	14.1	4	20.9	0	0.0	3	5.6
Brule	*	35.5	4	44.8	*	22.0	0	0.0	0	0.0	*	8.5
Buffalo	0	0.0	*	128.6	0	0.0	0	0.0	0	0.0	0	0.0
Butte	4	33.4	14	117.2	4	53.1	3	52.0	0	0.0	3	24.4
Campbell	*	27.4	0	0.0	0	0.0	*	79.4	0	0.0	0	0.0
Charles Mix	4	28.1	4	31.4	0	0.0	*	31.7	*	5.9	3	20.9
Clark	*	13.9	4	71.6	0	0.0	0	0.0	0	0.0	*	13.9
Clay	0	0.0	3	25.3	*	31.4	*	22.5	0	0.0	*	8.2
Codington	*	5.0	13	37.7	4	22.6	*	13.7	*	5.0	*	3.5
Corson	*	23.6	*	70.9	0	0.0	0	0.0	0	0.0	0	0.0
Custer	4	31.5	6	49.4	*	20.0	0	0.0	0	0.0	0	0.0
Davison	3	8.4	14	53.7	*	7.6	*	16.9	0	0.0	*	7.6
Day	3	27.3	*	8.9	3	34.0	*	42.9	*	6.5	0	0.0
Deuel	*	29.3	4	58.2	*	46.6	0	0.0	0	0.0	0	0.0
Dewey	0	0.0	3	80.8	0	0.0	0	0.0	0	0.0	0	0.0
Douglas	0	0.0	*	22.3	0	0.0	0	0.0	0	0.0	0	0.0
Edmunds	*	27.4	*	14.6	*	23.5	0	0.0	0	0.0	*	14.6
Fall River	0	0.0	10	72.7	*	31.0	3	46.1	*	7.6	*	5.6
Faulk	*	14.1	*	30.6	0	0.0	0	0.0	0	0.0	0	0.0
Grant	*	18.9	3	27.6	*	39.9	3	55.4	0	0.0	*	6.7
Gregory	*	14.8	3	67.9	0	0.0	0	0.0	0	0.0	0	0.0
Haakon	0	0.0	*	31.5	*	124.4	*	81.6	0	0.0	0	0.0
Hamlin	0	0.0	*	11.7	*	18.0	*	24.2	0	0.0	0	0.0
Hand	*	8.8	*	34.9	0	0.0	0	0.0	0	0.0	*	8.8
Hanson	0	0.0	3	84.0	0	0.0	*	63.7	0	0.0	0	0.0
Harding	*	84.4	*	42.6	0	0.0	*	77.6	0	0.0	0	0.0
Hughes	5	24.7	7	36.3	*	21.4	*	14.8	*	11.5	*	8.8
Hutchinson	0	0.0	4	24.0	*	70.0	*	10.5	*	3.5	*	25.5
Hyde	0	0.0	*	47.4	0	0.0	0	0.0	0	0.0	0	0.0
Jackson	*	30.8	3	90.6	0	0.0	0	0.0	0	0.0	*	36.0
Jerauld	0	0.0	*	17.8	*	58.1	*	58.1	0	0.0	*	13.6
Jones	*	48.2	*	60.9	*	167.1	0	0.0	*	45.6	0	0.0
Kingsbury	0	0.0	5	57.1	0	0.0	0	0.0	0	0.0	*	7.8
Lake	*	14.0	5	28.3	*	25.4	0	0.0	0	0.0	*	4.7
Lawrence	4	10.7	17	53.9	4	21.0	7	46.9	4	11.3	*	3.7
Lincoln	7	20.3	18	48.8	5	21.5	3	19.6	*	2.2	0	0.0
Lyman	0	0.0	3	58.3	0	0.0	0	0.0	0	0.0	0	0.0
McCook	*	13.0	7	82.1	*	26.0	*	22.6	0	0.0	0	0.0
McPherson	*	39.2	*	55.7	0	0.0	*	56.3	0	0.0	0	0.0
Marshall	*	27.0	*	23.4	*	14.6	*	26.6	*	12.8	0	0.0
Meade	*	4.5	15	61.8	0	0.0	4	34.6	0	0.0	*	4.2
Mellette	*	54.0	5	220.5	0	0.0	*	96.4	0	0.0	0	0.0
Miner	*	28.5	*	60.3	0	0.0	*	57.4	0	0.0	0	0.0
Minnehaha	22	11.9	93	55.7	29	31.5	11	17.2	12	6.9	17	10.1
Moody	*	19.9	*	14.4	*	27.9	*	20.7	0	0.0	0	0.0
Pennington	11	9.3	60	50.2	15	24.4	9	18.2	*	1.5	8	6.1
Perkins	4	70.8	3	60.1	*	30.8	0	0.0	0	0.0	*	10.5
Potter	*	17.0	4	69.3	0	0.0	0	0.0	0	0.0	*	17.0
Roberts	*	11.4	6	41.1	*	21.9	*	33.7	*	7.5	*	6.8
Sanborn	*	60.8	0	0.0	*	68.5	0	0.0	0	0.0	0	0.0
Shannon	3	37.6	3	46.8	*	30.8	3	99.6	0	0.0	0	0.0
Spink	0	0.0	3	31.2	*	14.3	0	0.0	0	0.0	0	0.0
Stanley	*	17.4	3	77.7	*	52.1	0	0.0	0	0.0	0	0.0
Sully	0	0.0	*	47.5	0	0.0	*	108.0	0	0.0	0	0.0
Todd	0	0.0	4	79.6	*	48.9	*	59.6	*	27.0	0	0.0
Tripp	*	13.3	3	29.4	0	0.0	0	0.0	0	0.0	*	6.5
Turner	*	14.3	7	58.4	*	16.0	0	0.0	*	9.0	0	0.0
Union	*	7.3	7	40.3	*	22.4	*	20.5	0	0.0	*	4.9
Walworth	3	29.1	4	36.0	*	12.6	0	0.0	0	0.0	0	0.0
Yankton	4	15.1	10	33.6	*	10.8	*	12.9	0	0.0	*	3.2
Ziebach	0	0.0	0	0.0	*	63.3	0	0.0	0	0.0	0	0.0

Note: * Counts less than 3 are suppressed. Mortality rates with counts less than 20 are generally considered unstable.
Rates per 100,000 age-adjusted to the 2000 US standard population and 2011 SD estimated population.
Source: South Dakota Department of Health

Table 9: Age-adjusted Mortality Rates by Site, Gender, and Race, South Dakota, 2011

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Total	**1,656**	**167.3**	**838**	**192.5**	**818**	**149.5**	**1,561**	**165.6**	**81**	**240.5**
Oral Cavity	**19**	**1.9**	**12**	**2.7**	**7**	**1.3**	**17**	**1.8**	**2**	**4.0**
Lip	1	0.1	1	0.2	0	0.0	1	0.1	0	0.0
Tongue	3	0.4	2	0.5	1	0.2	3	0.4	0	0.0
Salivary Gland	2	0.2	1	0.2	1	0.2	2	0.2	0	0.0
Floor of Mouth	1	0.1	0	0.0	1	0.2	0	0.0	1	1.7
Gum and Other Mouth	6	0.6	4	1.1	2	0.2	6	0.6	0	0.0
Nasopharynx	1	0.1	1	0.2	0	0.0	1	0.1	0	0.0
Hypopharynx	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tonsil	4	0.4	2	0.3	2	0.4	3	0.3	1	2.3
Oropharynx	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other Oral Cavity and Pharynx	1	0.1	1	0.2	0	0.0	1	0.1	0	0.0
Digestive System	**377**	**38.2**	**205**	**46.2**	**172**	**29.9**	**348**	**36.1**	**23**	**65.2**
Esophagus	57	5.5	45	10.1	12	1.9	54	5.5	2	5.5
Stomach	27	2.7	17	3.9	10	1.9	26	2.7	0	0.0
Small Intestine	6	0.6	5	1.1	1	0.2	6	0.6	0	0.0
Colorectal	136	13.9	68	15.9	68	11.2	124	13.0	11	33.6
Colon Excluding Rectum	105	10.5	46	10.8	59	9.6	97	10.1	7	21.8
Rectum and Rectosigmoid	31	3.2	22	5.1	9	1.6	27	2.9	4	11.8
Anus, Anal Canal and Anorectum	2	0.2	1	0.3	1	0.2	1	0.1	1	1.8
Liver and Intrahepatic Bile Duct	41	4.0	23	4.9	18	3.3	37	3.9	2	4.0
Gallbladder	5	0.6	3	0.7	2	0.5	4	0.5	1	3.1
Other Biliary	8	0.8	3	0.6	5	0.9	8	0.8	0	0.0
Pancreas	95	9.4	40	8.7	55	9.8	88	9.1	6	17.2
Retroperitoneum	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Peritoneum, Omentum and Mesentery	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Respiratory	**467**	**48.8**	**242**	**55.4**	**225**	**42.6**	**437**	**47.1**	**27**	**83.6**
Nose, Nasal Cavity and Middle Ear	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Larynx	10	1.0	9	2.0	1	0.1	10	1.0	0	0.0
Lung and Bronchus	457	47.0	233	53.4	224	42.5	427	46.1	27	83.6
Pleura	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Mediastinum and Other Resp Organs	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Bones and Joints	**2**	**0.2**	**1**	**0.3**	**1**	**0.2**	**2**	**0.2**	**0**	**0.0**
Soft Tissue	**10**	**1.2**	**4**	**1.0**	**6**	**1.4**	**10**	**1.3**	**0**	**0.0**
Skin	**32**	**3.4**	**17**	**3.9**	**15**	**2.7**	**30**	**3.4**	**2**	**6.3**
Melanomas Skin	25	2.7	13	2.9	12	2.4	25	2.9	0	0.0
Other Nonepithelial Skin	7	0.7	4	1.0	3	0.3	5	0.5	2	6.3
Breast	**124**	**13.0**	**2**	**0.4**	**122**	**23.3**	**116**	**12.7**	**6**	**16.6**
Breast, Female	122	23.3			122	23.3	114	23.2	6	29.8
Breast, Male	2	0.4	2	0.4			2	0.5	0	0.0
Female	**83**	**14.8**			**83**	**14.8**	**80**	**15.0**	**3**	**10.1**
Vulva	5	0.8			5	0.8	5	0.8	0	0.0
Vagina	2	0.3			2	0.3	2	0.3	0	0.0
Cervix Uteri	5	0.9			5	0.9	3	0.6	2	7.1
Corpus and Uterus, NOS	31	5.7			31	5.7	30	5.9	1	3.0
Corpus Uteri	19	3.5			19	3.5	19	3.7	0	0.0
Uterus, NOS	12	2.2			12	2.2	11	2.2	1	3.0
Ovary	40	7.0			40	7.0	40	7.3	0	0.0
Other Female Genital Organs	0	0.0			0	0.0	0	0.0	0	0.0

Table 9: Age-adjusted Mortality Rates by Site, Gender, and Race, South Dakota, 2011 (continued)

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
Male	**88**	**20.8**	**88**	**20.8**			**82**	**20.1**	**6**	**53.6**
Penis	0	0.0	0	0.0			0	0.0	0	0.0
Prostate	88	20.8	88	20.8			82	20.1	6	53.6
Testis	0	0.0	0	0.0			0	0.0	0	0.0
Other Male Genital Organs	0	0.0	0	0.0			0	0.0	0	0.0
Urinary	**89**	**9.0**	**58**	**13.3**	**31**	**5.6**	**87**	**9.0**	**2**	**7.0**
Bladder	34	3.3	24	5.6	10	1.7	33	3.2	1	3.9
Kidney and Renal Pelvis	51	5.3	31	7.0	20	3.7	50	5.4	1	3.1
Ureter	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other Urinary Organs	4	0.4	3	0.7	1	0.2	4	0.4	0	0.0
Eye and Orbit	**2**	**0.2**	**2**	**0.4**	**0**	**0.0**	**2**	**0.2**	**0**	**0.0**
Brain and CNS	**54**	**5.8**	**27**	**6.1**	**27**	**5.5**	**53**	**5.9**	**1**	**0.9**
Brain	52	5.5	26	5.9	26	5.3	51	5.7	1	0.9
Meninges and CNS	2	0.2	1	0.2	1	0.2	2	0.2	0	0.0
Endocrine	**7**	**0.7**	**4**	**0.9**	**3**	**0.6**	**6**	**0.6**	**0**	**0.0**
Thyroid	7	0.7	4	0.9	3	0.6	6	0.6	0	0.0
Other Endocrine	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Lymphomas	**65**	**6.5**	**43**	**9.8**	**22**	**3.4**	**62**	**6.4**	**2**	**6.3**
Hodgkin's Disease	3	0.4	2	0.6	1	0.2	3	0.4	0	0.0
Non-Hodgkin's Lymphomas	62	6.1	41	9.3	21	3.3	59	6.0	2	6.3
Multiple Myeloma	**39**	**3.8**	**17**	**3.9**	**22**	**3.6**	**39**	**3.8**	**0**	**0.0**
Leukemia	**77**	**7.9**	**51**	**11.6**	**26**	**4.6**	**75**	**8.0**	**2**	**5.6**
Acute Lymphocytic	3	0.3	2	0.4	1	0.1	3	0.3	0	0.0
Chronic Lymphocytic	23	2.3	13	3.0	10	1.6	23	2.3	0	0.0
Other Lymphocytic	1	0.1	1	0.3	0	0.0	1	0.1	0	0.0
Acute Myeloid	25	2.7	16	3.6	9	1.7	24	2.7	1	1.7
Acute Monocytic	1	0.1	0	0.0	1	0.2	1	0.1	0	0.0
Chronic Myeloid	4	0.4	4	0.9	0	0.0	4	0.4	0	0.0
Other Myeloid/Monocytic	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other Acute Leukemia	12	1.2	9	2.1	3	0.5	12	1.2	0	0.0
Other Leukemia	8	0.8	6	1.4	2	0.4	7	0.8	1	3.9
Mesothelioma	**6**	**0.6**	**5**	**1.2**	**1**	**0.2**	**6**	**0.7**	**0**	**0.0**
Immunoproliferative Diseases	**1**	**0.1**	**0**	**0.0**	**1**	**0.2**	**1**	**0.1**	**0**	**0.0**
Ill-Defined and Unspecified Sites	**114**	**11.8**	**60**	**14.4**	**54**	**9.8**	**108**	**11.5**	**5**	**19.5**

Rates per 100,000 age-adjusted to the 2000 US standard population and 2011 SD estimated population.
Source: South Dakota Department of Health

Table 9 shows death and age-adjusted death rates by SEER recode primary sites (Appendix D), gender and race. Approximately 1,600 persons die from cancer in South Dakota each year with little or no change in counts. Overall more males than females die from cancer, but that is starting to change as recent years of data have started to show.

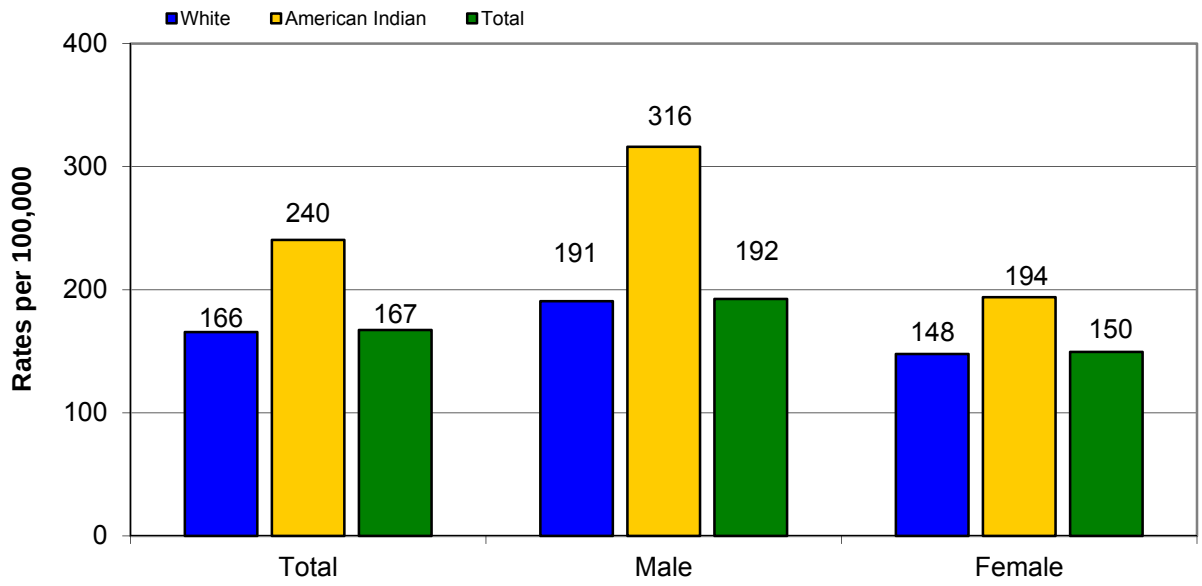
Table 10: Percentage of Cancer Deaths by Age Groups and Selected Primary Sites, South Dakota, 2011

Age Group	0-19	20-34	35-49	50-64	65-74	75-84	85+
All Sites	0%	0%	4%	20%	22%	31%	22%
Bladder	0%	0%	0%	15%	15%	29%	41%
Female Breast	0%	0%	7%	25%	25%	25%	17%
Colorectal	0%	0%	4%	13%	24%	33%	27%
Corpus and Uterus, NOS	0%	0%	10%	19%	19%	19%	32%
Meninges, Brain and CNS	4%	0%	7%	31%	19%	28%	11%
Kidney and Renal Pelvis	0%	0%	2%	20%	33%	25%	20%
Leukemia	4%	0%	3%	22%	16%	34%	22%
Lung and Bronchus	0%	0%	2%	22%	26%	36%	14%
Melanoma of the Skin	0%	0%	20%	20%	20%	20%	20%
Non-Hodgkin's Lymphoma	2%	2%	2%	16%	23%	24%	32%
Pancreas	0%	0%	3%	20%	21%	28%	27%
Prostate	0%	0%	1%	13%	17%	40%	30%

Source: South Dakota Department of Health

Overall, in 2011 more persons 75 to 84 years of age died from cancer in South Dakota than any other age group (Table 10). However, there would be cause for concern if too many people die from cancer at a young age.

Figure 8: All Sites Cancer Mortality Rates by Race, and Gender, South Dakota, 2011



Note: Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
Source: South Dakota Department of Health

Figure 8 illustrates that males had higher death rates than females. American Indian males and females had higher death rates than whites.

VIII. YEARS OF POTENTIAL LIFE LOST

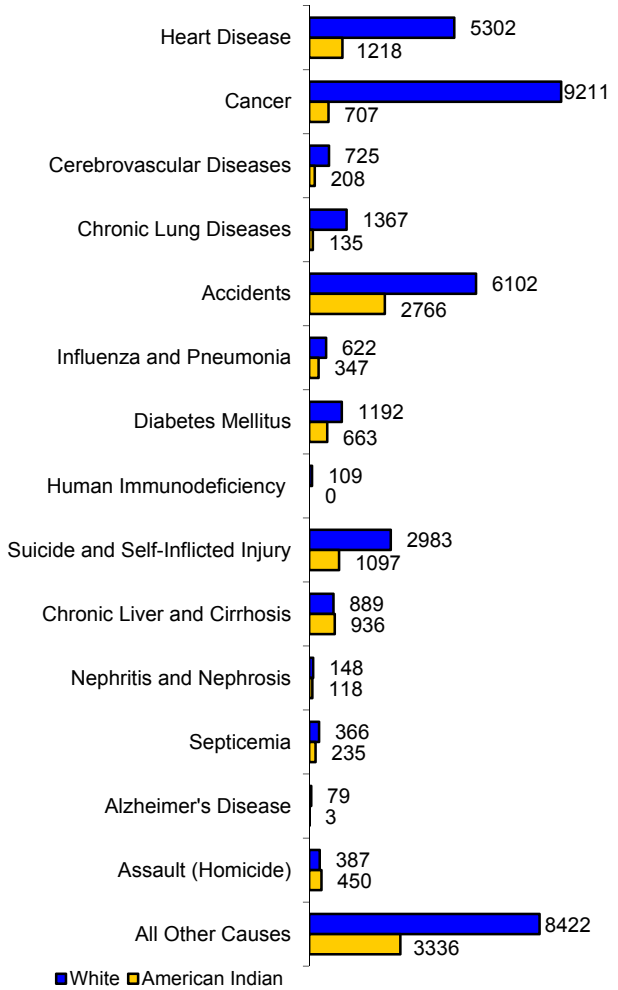
In both 2011 and the five-year period 2007 to 2011, cancer ranked number one in years of potential years lost (YPLL). The number of years lost are shown in Figures 9 and 10 by race. There were 10,116 years of potential years lost due to cancer in 2011, compared to 9,904 years in 2008.

Table 11: Leading Causes of Years of Potential Life Lost (to 75 years of age), South Dakota, 2011

Cancer	10,116
Accidents	8,895
Heart Disease	6,537
Suicide and Self-Inflicted Injury	4,147
Chronic Liver and Cirrhosis	1,910
Diabetes Mellitus	1,825
Chronic Lung Diseases	1,519
Cerebrovascular Disease	1,065
Homicide	1,022
Influenza and Pneumonia	965
Septicemia	601
All Other Causes	12,681

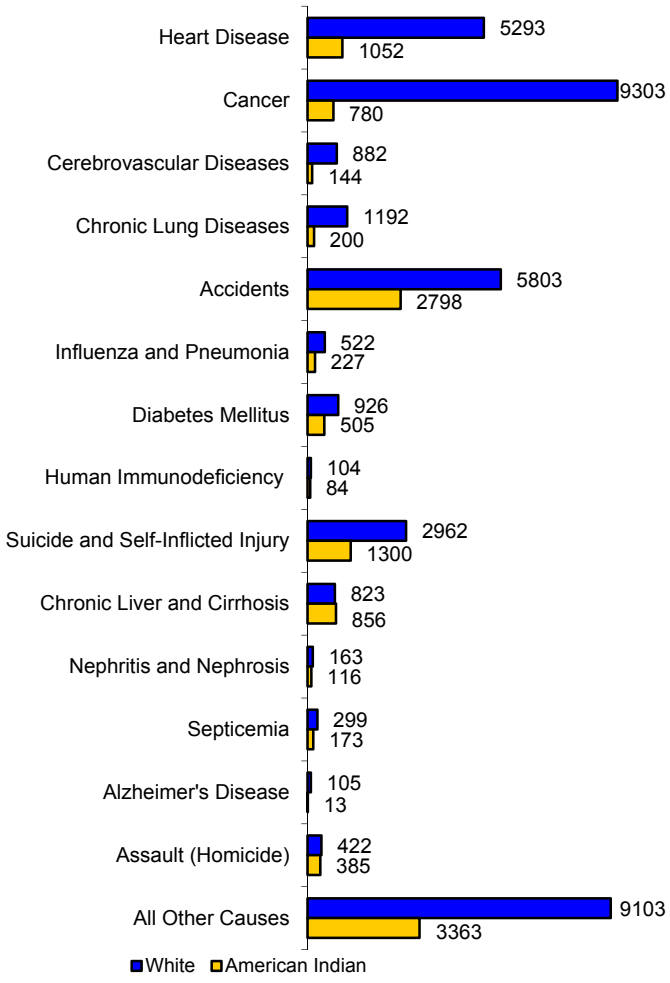
Source: South Dakota Department of Health

Figure 9: Years of Potential Life Lost (YPLL) Before Age 75 for the Leading Causes of Death by Race, South Dakota, 2011



Source: South Dakota Department of Health

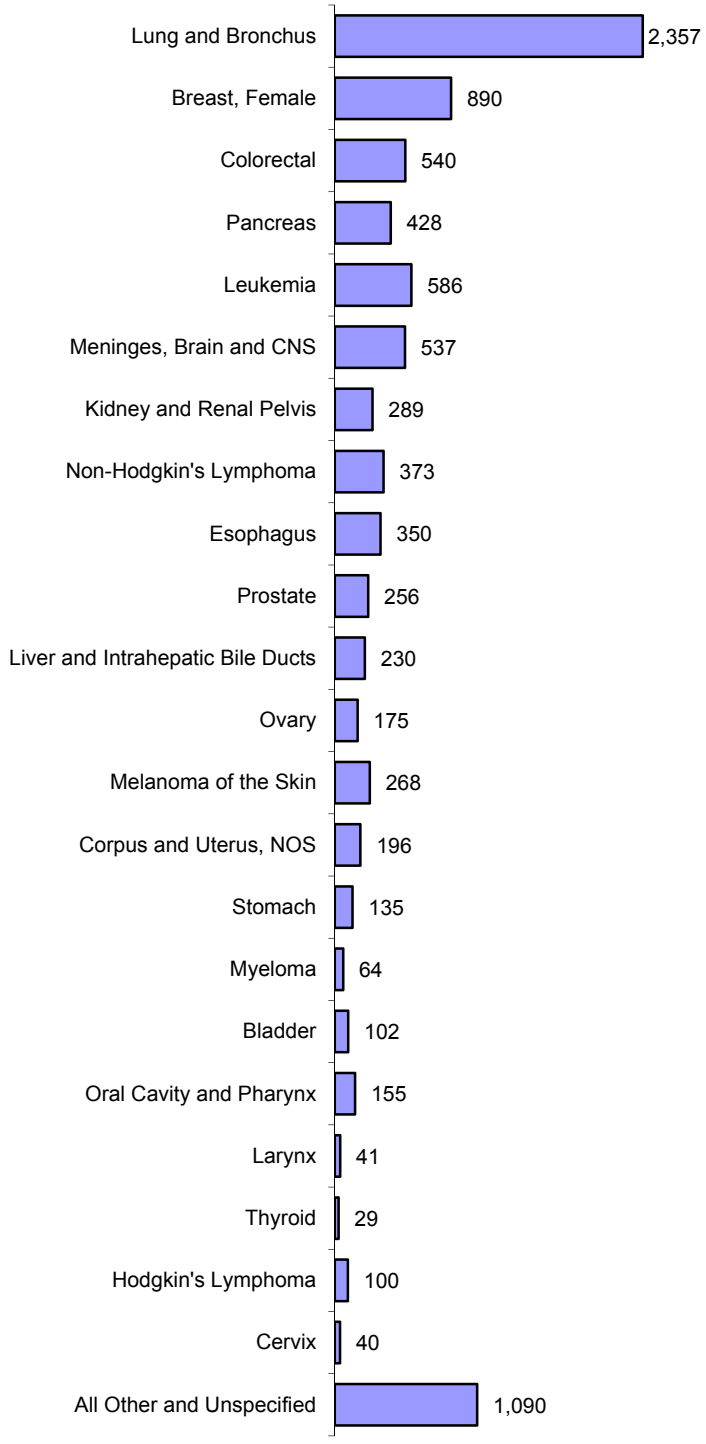
Figure 10: Years of Potential Life Lost (YPLL) Before Age 75 for the Leading Causes of Death by Race, South Dakota 2007-2011 Average*



* Number of years are averaged over the five-year period.
Source: South Dakota Department of Health

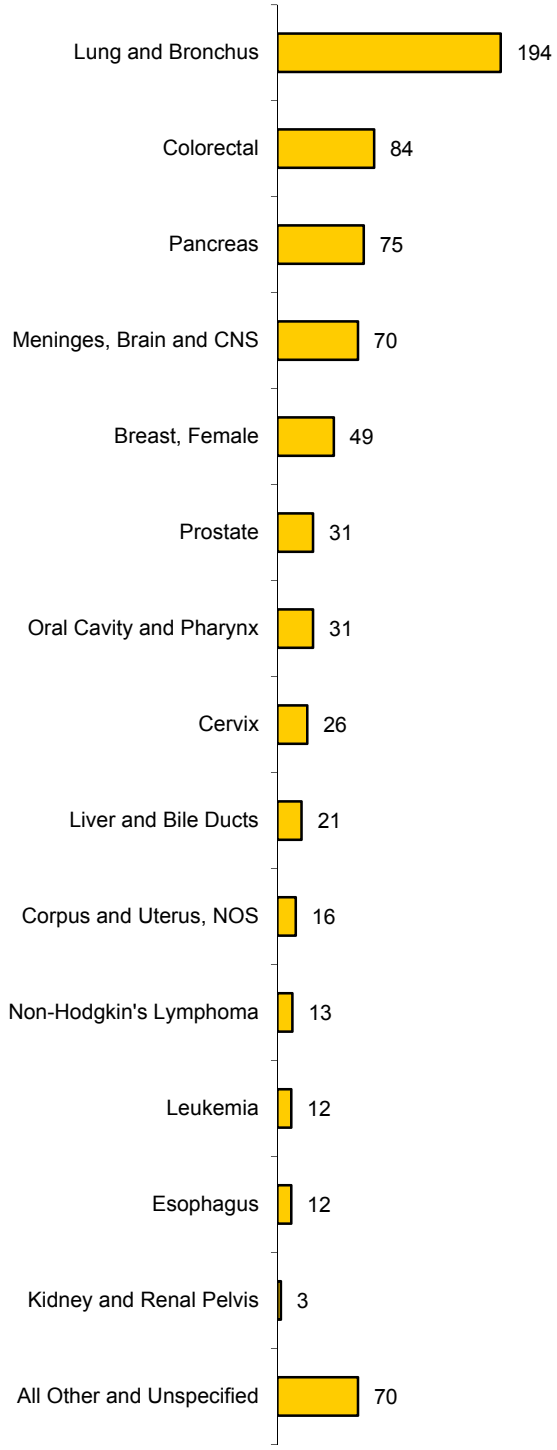
The differences in YPLL in Figures 11 and 12 reflect the number of cancer cases by primary sites by race. For example, the YPLL for lung and bronchus for whites was 2,357 for 210 deaths whereas the YPLL for American Indians was 194 years for 15 deaths which occurred during 2011. Not all cancers were present among the American Indian population during 2011, hence the differences in the cancer sites presented.

Figure 11: Years of Potential Life Lost for Selected Cancers Among Whites, South Dakota, 2011



Source: South Dakota Department of Health

Figure 12: Years of Potential Life Lost for Selected Cancers Among American Indians, South Dakota, 2011

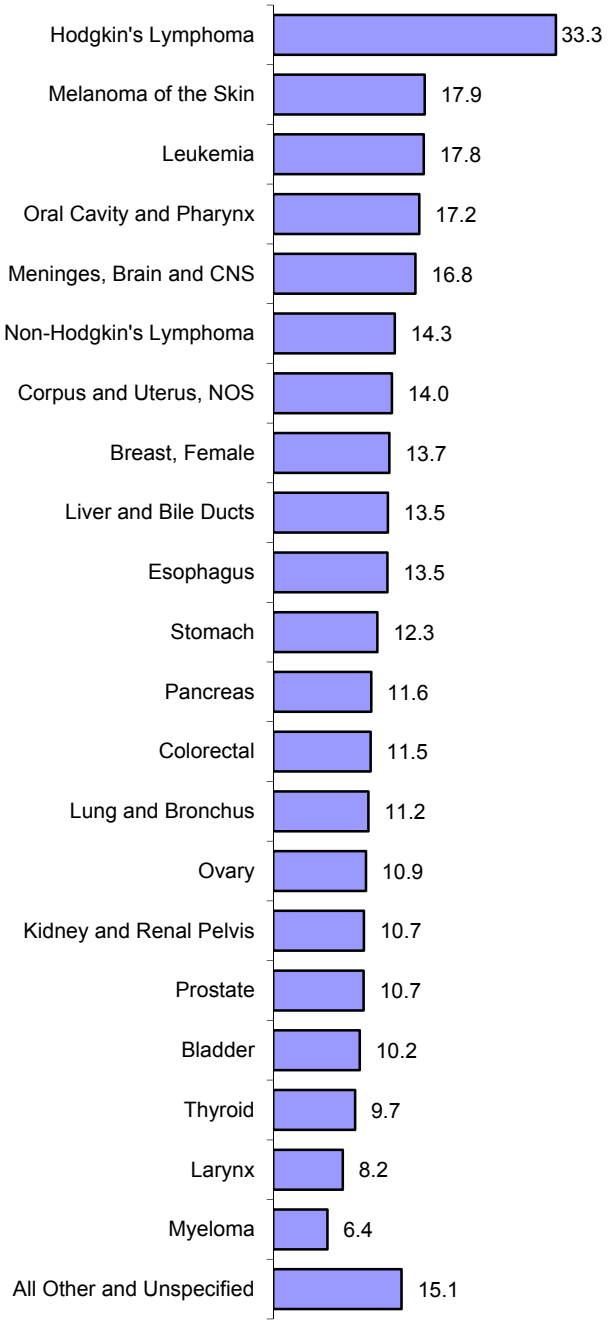


Source: South Dakota Department of Health

IX. AVERAGE YEARS OF LIFE LOST

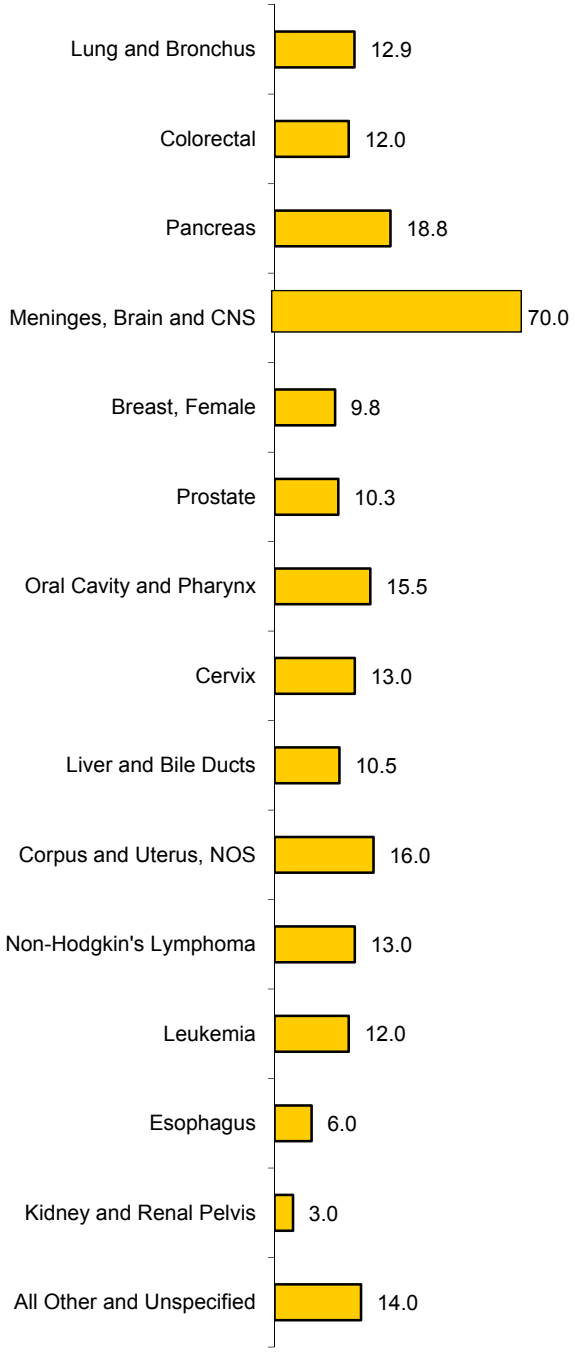
South Dakota's average years of life lost (AYLL) due to cancer in 2011 was 12.9 years, a decrease from 13.9 years in 2009. Pancreatic cancer ranked second among cancer sites for American Indians at 18.8 years compared to whites where it ranked 12th with an average of 11.6 years.

Figure 13: Average Years of Life Lost for Selected Cancers Among Whites, South Dakota, 2011



Source: South Dakota Department of Health

Figure 14: Average Years of Life Lost for Selected Cancers Among American Indians, South Dakota, 2011



Source: South Dakota Department of Health

X. SELECTED CANCER SITES INCIDENCE AND MORTALITY

This section covers the following cancers: bladder, female breast, cervix uteri, colorectal cancer, corpus uterus, kidney and renal pelvis, lung and bronchus, leukemia, melanoma (skin), myeloma, ovary, non-Hodgkin's lymphoma, pancreas, prostate, stomach, and thyroid.

These cancers were selected because of the ranking in the cancer sites reported as well as the importance and impact to society.

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

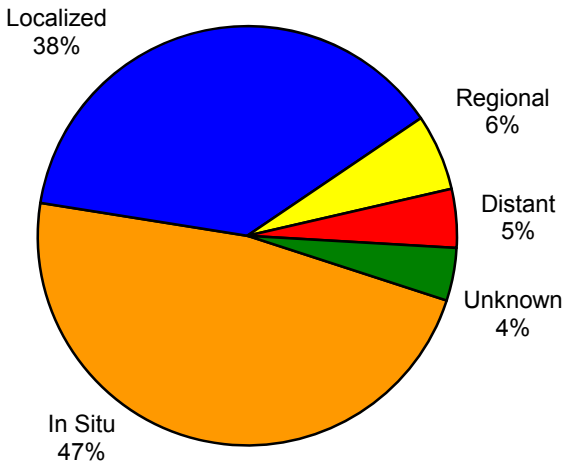
BLADDER

Table 12: Bladder Incidence and Mortality Summary, 2011

Bladder Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**221**	162	59	**34**	24	10
		Age Adjusted Rate	**22.9**	38.2	10.8	**3.2**	5.6	1.7
	White	# Cases / Deaths	**217**	159	58	**33**	23	10
		Age Adjusted Rate	**23.7**	39.3	11.3	**3.2**	5.5	1.8
	American Indian	# Cases / Deaths	**2**	2	0	**1**	1	0
		Age Adjusted Rate	**5.5**	12.5	0.0	**3.9**	9.6	0.0
United States	**Total**	Age Adjusted Rate	**19.7**	34.6	8.4	*** 4.4**	* 7.7	* 2.2
	White	Age Adjusted Rate	**21.5**	37.7	9.0	*** 4.6**	* 8.1	* 2.2
	American Indian	Age Adjusted Rate	**8.3**	17.0	2.6	*** 2.4**	* 4.1	* 1.4

[1]Includes *in situ* bladder; Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 15: Bladder Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Cancer is categorized as noninvasive and invasive. There were 105 noninvasive bladder cancers reported in 2011. There were 116 invasive. Forty-seven percent of all bladder cancer cases were diagnosed at noninvasive, *in situ* stage. Nationally 50% of the cases of urinary bladder cancer are diagnosed at the *in situ* stage. In South Dakota, 5% of the cases were not diagnosed until the disease had spread to distant sites. In the United States, distant stage accounted for 4% of the bladder cancers reported.

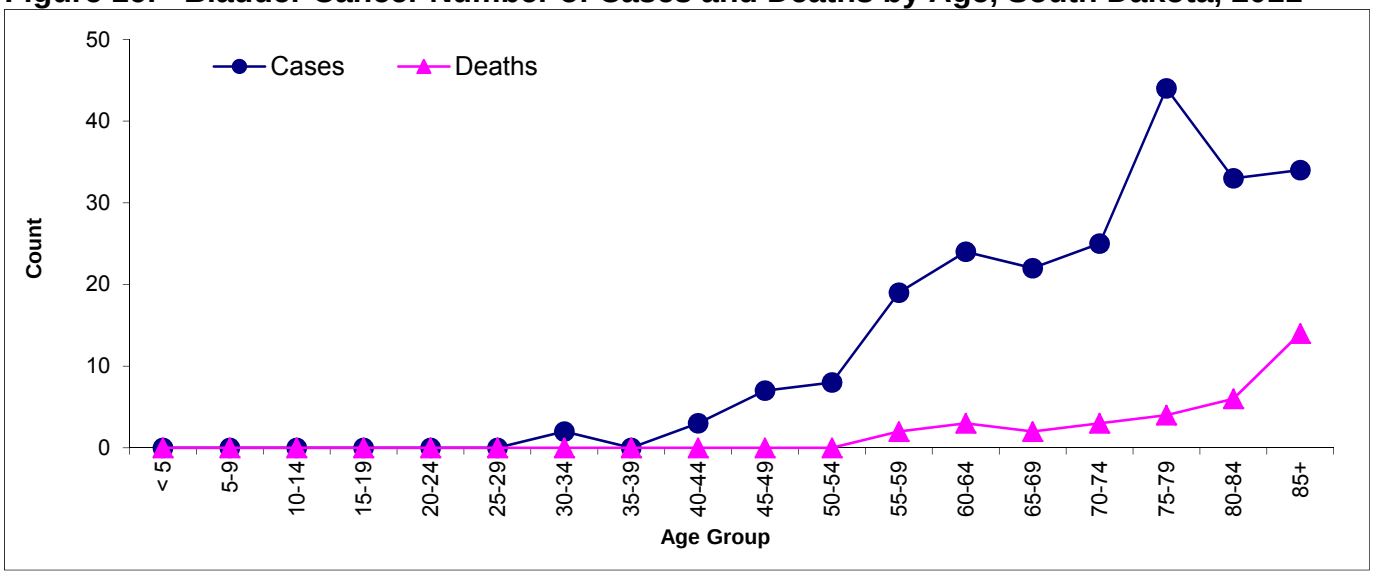
Incidence: In 2011, it was estimated that over 69,250 cases of bladder cancer would be diagnosed in the United States. There were 221 cases of bladder cancer reported in South Dakota. There were 162 men and 59 women diagnosed with bladder cancer in 2011. Statistically, men are diagnosed four times more frequently than women. There were only two American Indian cases diagnosed in 2011. In the United States it is the fifth most frequent cancer. In South Dakota it was also the fifth most frequent cancer diagnosed.

Mortality: Almost half (47%) of all bladder cancer cases reported in South Dakota were noninvasive. Advances in intravesical therapy and in the treatment of advanced disease with chemotherapy have reduced the percentage of mortality from bladder cancer. In South Dakota, ages from 70 and above have the highest mortality. In 2011, the South Dakota mortality rate was 3.2 compared to the US (2010) rate which was 4.4.

Risk and Associated Factors: Bladder cancer was one of the first malignancies associated with industrialization. Not surprisingly, the incidence continues to rise. Cigarette smoking increases the risk for bladder cancer by two times that of a nonsmoker. Work exposure to certain chemicals also increases risk. Some of those with the highest risk are makers of rubber, leather, textiles, paint products, and printing compounds.

Prevention and Early Detection: Avoiding exposure to chemicals and cigarette smoking are two of the most common suggestions for prevention.

Figure 16: Bladder Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

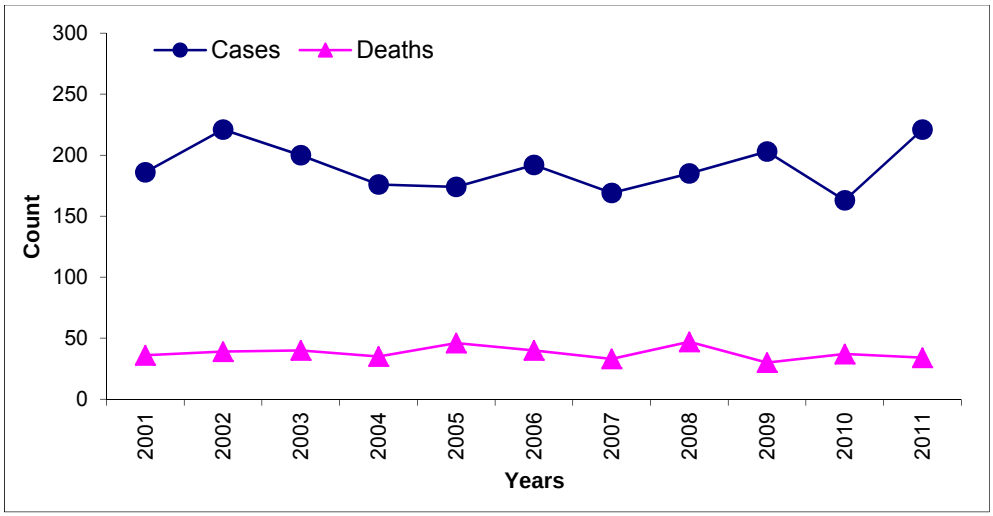


Figure 17: Bladder Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

Bladder cancer cases in 2011 tied an all-time high of 221 cases, the same as in 2002, after an all-time low in 2010 of 163 cases.

Source: South Dakota Department of Health

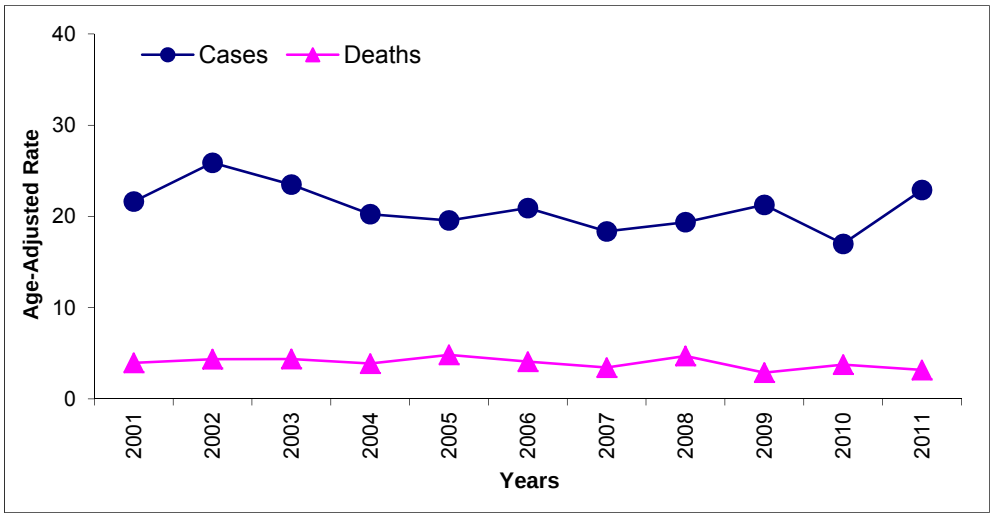


Figure 18: Bladder Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

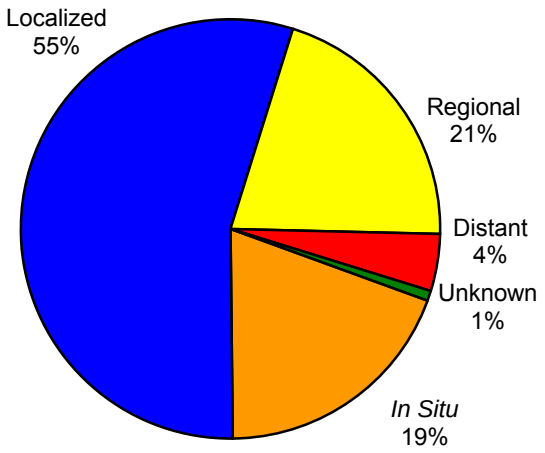
BREAST (FEMALE)

Table 13: Female Breast Incidence and Mortality Summary, 2011

Female Breast Cancer			Incidence	Mortality
South Dakota	Total	# Cases / Deaths	624	122
		Age Adjusted Rate	129.3	23.3
	White	# Cases / Deaths	582	114
		Age Adjusted Rate	130.3	23.2
	American Indian	# Cases / Deaths	37	6
		Age Adjusted Rate	142.6	29.8
United States	Total	Age Adjusted Rate	124.3	* 21.9
	White	Age Adjusted Rate	127.2	* 21.3
	American Indian	Age Adjusted Rate	81.3	* 14.1

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 19: Female Breast Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Health Department

Descriptive Epidemiology

Stage at Diagnosis: Including *in situ* female breast cancer cases there were 773 cases diagnosed in 2011, of which 425 cases were diagnosed at localized stage. This represents 55% of all reported breast cancer cases. There were 159 cases that had progressed beyond the breast. There were 34 that were diagnosed as a distant stage and 6 that were staged as unknown. The 149 *in situ* female breast cancer cases are reported but are not used in calculating incidence rates.

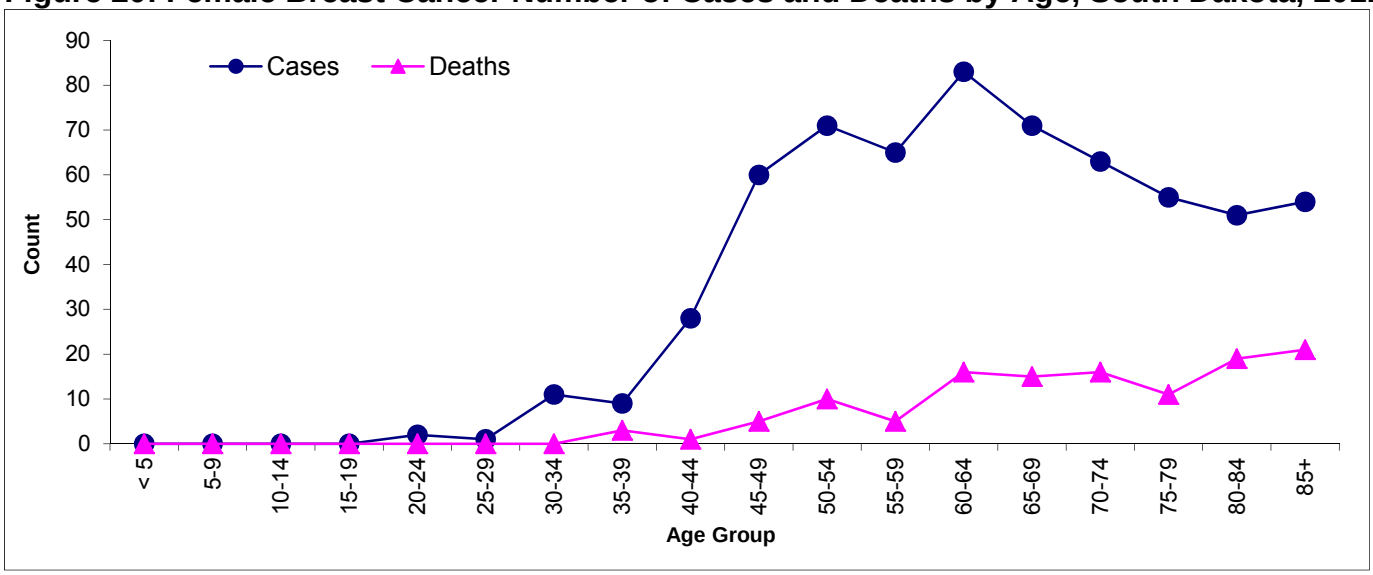
Incidence: Female breast cancer is the most common malignant tumor among women. The incidence rate increased from 1947-1990. The rates fell 3.5% per year from 2001-2005. This decrease may be in part due to the lower number of women using hormone replacement therapy. There were 624 cases of invasive female breast cancer reported in 2011. In South Dakota, 14.4% of all invasive cancer cases reported in 2011 were female breast. Nationally, 14% of all cancer cases are female breast cancer. Breast cancer represented 29% of the cancer cases diagnosed for South Dakota women in 2011.

Mortality: Breast cancer is the third leading cause of death attributed to cancer in South Dakota. Nationwide, breast cancer mortality has been relatively stable overall since 1950. In cancers only of women, it is the second leading cause of cancer deaths. Although mortality has increased among women older than 55 years, it has decreased among women younger than 55 years of age. In 2011, there were 122 deaths. Of those deaths, 114 were white and six were American Indian.

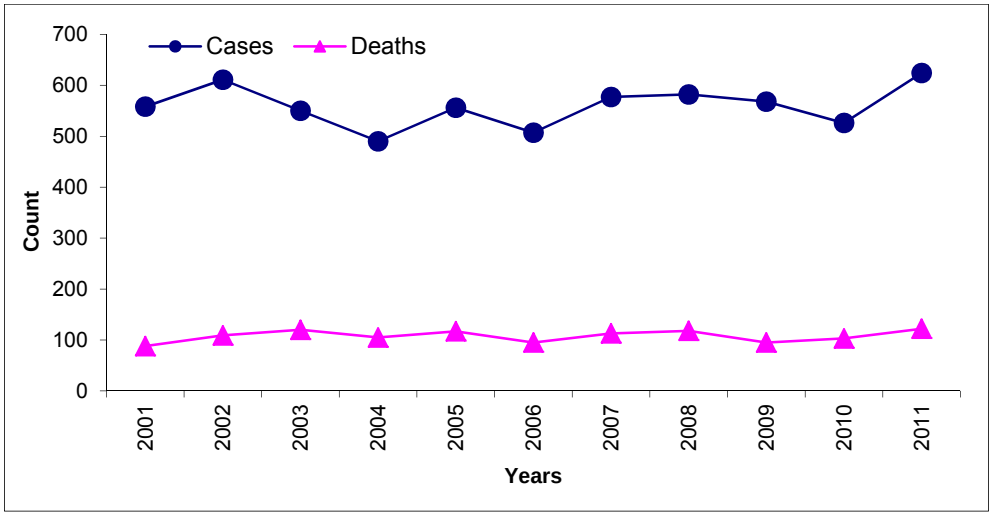
Risk and Associated Factors: Among the known risk factors for breast cancer are early onset of menarche, late onset of menopause, never having been pregnant, first full term pregnancy after age 30 and fewer number of children. These factors increase the risk because of cumulative exposure of breast tissue to estrogen. Other risk factors include high fat diets, obesity, alcohol consumption, history of fibrocystic disease, having a mother or sister with breast cancer, a personal history of ovarian or endometrial cancer and specific tumor suppressor genes such as BRCA1 and BRCA2.

Prevention and Early Detection: Prevention and early detection is the key to survival of breast cancer. Monthly self-examination and annual examination by a health professional are the mainstays of early detection. Women should talk to their doctor for individualized screening recommendations.

Figure 20: Female Breast Cancer Number of Cases and Deaths by Age, South Dakota, 2011



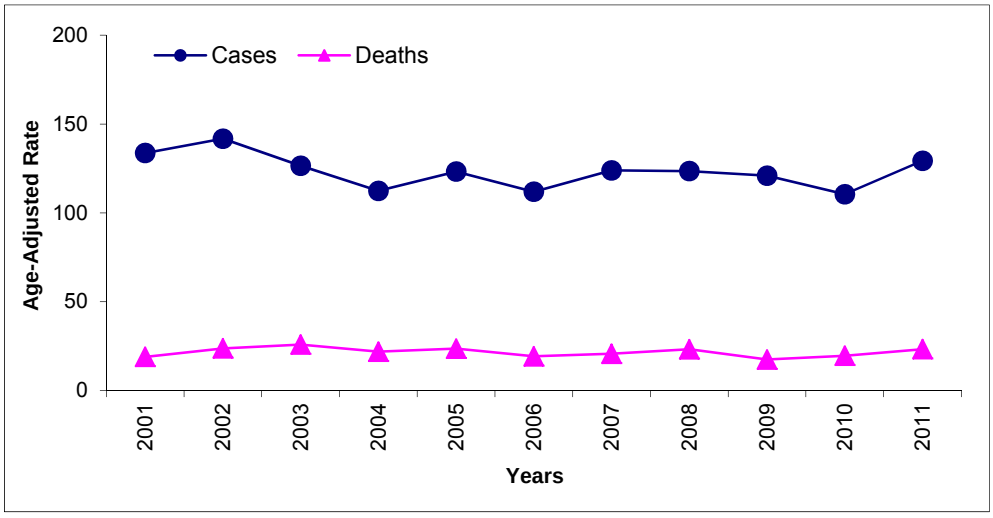
Source: South Dakota Department of Health



Source: South Dakota Department of Health

Figure 21: Female Breast Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence for female breast cancer was at an all-time high in 2011.



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

Figure 22: Female Breast Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

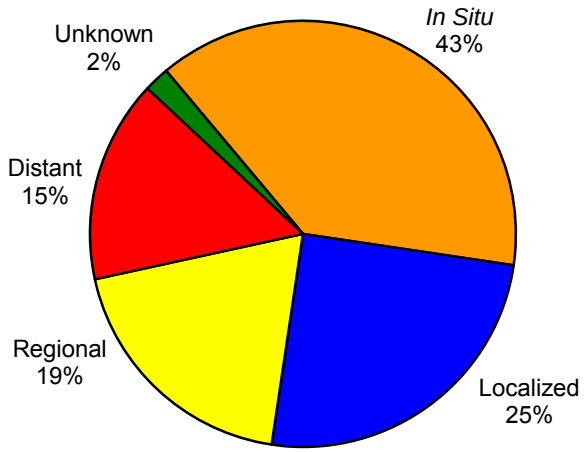
CERVIX UTERI

Table 14: Cervix Uteri Incidence and Mortality Summary, 2011

Cervix Uteri Cancer			Incidence	Mortality
South Dakota	Total	# Cases / Deaths	32	5
		Age Adjusted Rate	8.0	0.9
	White	# Cases / Deaths	24	3
		Age Adjusted Rate	7.0	0.6
	American Indian	# Cases / Deaths	8	2
		Age Adjusted Rate	26.8	7.1
United States	Total	Age Adjusted Rate	7.4	* 2.3
	White	Age Adjusted Rate	7.5	* 2.1
	American Indian	Age Adjusted Rate	7.4	* 3.4

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 23: Cervix Uteri Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Health Department

Descriptive Epidemiology

Stage at Diagnosis: Early stage of diagnosis clearly provides the best opportunity for cure. In South Dakota, 25% of the cases reported were diagnosed at localized stage. SEER reports that 46% of the cases diagnosed nationally were at the localized stage.

Incidence: The incidence rate in South Dakota was 8.0 and in the United States it was 7.4. Both nationally and in South Dakota cervical cancer was the third most common female genital tract malignancy. Invasive cervical cancer accounted for .7% of all cases reported and 1.5% of all females diagnosed with cancer in South Dakota in 2011. SEER incidence reports that .2% of cases were younger than 20 years of age.

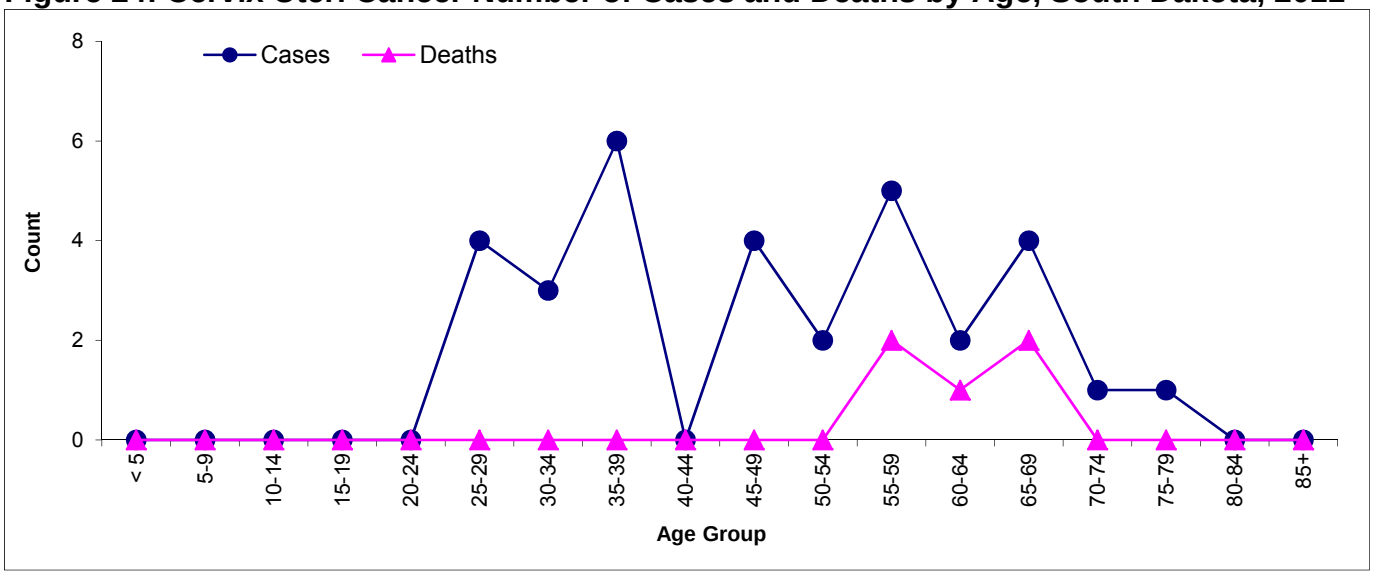
Mortality: The death rate in South Dakota was .9 for cancer of the cervix uteri. In the United States, the rate was 2.3 in 2010. The stage of disease at diagnosis affects the mortality rate. Cases diagnosed at a localized stage have a 92% survival rate according to the American Cancer Society. Nationally, when diagnosed at distant stage, the percentage of survival drops to 15% at five years. In South Dakota, there were eight cases in 2011 diagnosed at distant stage.

Risk and Associated Factors: Risk factors associated with cervical cancer suggest that a sexually transmitted agent is involved in the pathogenesis of the disease. Although Herpes Simplex Virus appeared to be a likely candidate in early studies, during the last decade the Human Papilloma virus (HPV) has been identified as the most likely. Other risk factors are nutritional deficiencies (Vitamin C and Vitamin B), low socioeconomic status, beginning sexual activity at a young age, high-risk male partner, tobacco use as well as the use of oral contraceptives.

Prevention and Early Detection: Cervical cancer represents the final step in a continuum that begins with cervical intraepithelial neoplasia (CIN). This is a preinvasive process, detectable by cervical cytological screening (Pap smear). The American Cancer Society recommends that all women at the age of 18 or earlier, if sexually active, should have annual Pap smears. Invasive cervical malignancies could be eradicated almost completely with regular screening programs available to all.

For more information on cervical cancer visit
http://www.cancer.gov/cancertopics/types/cervical/

Figure 24: Cervix Uteri Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

More than half of the incidence of cervical cancer occurred in women under the age of 50 .

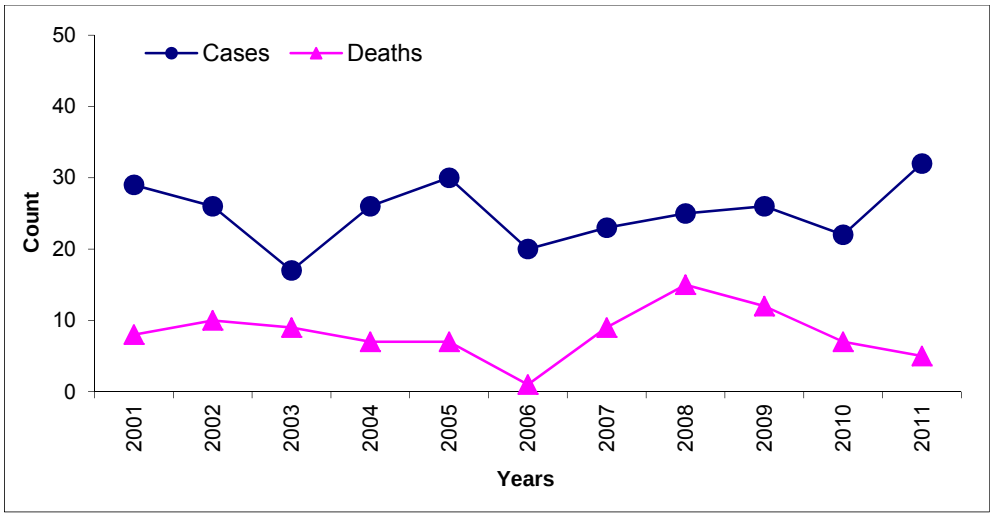


Figure 25: Cervix Uteri Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence peak for female cervix uteri cancer was in 2011.

Source: South Dakota Department of Health

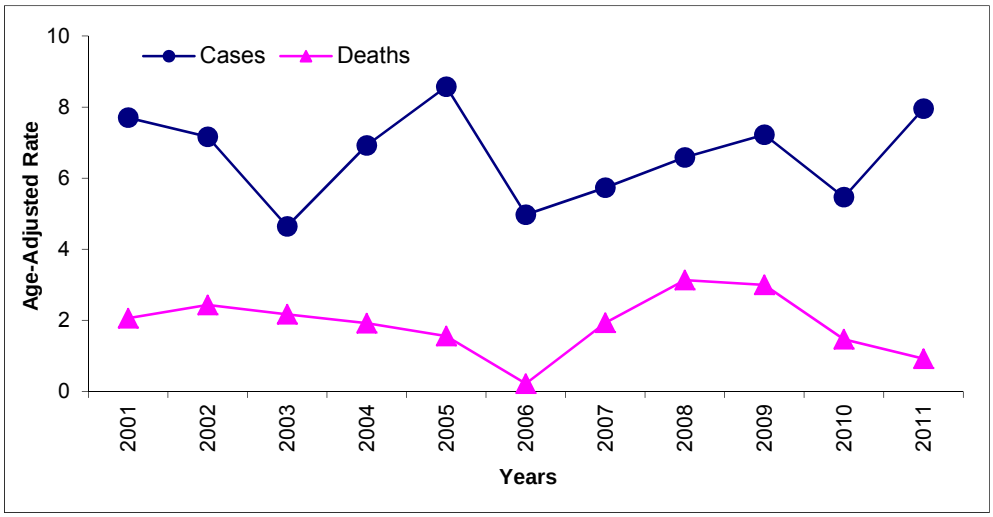


Figure 26: Cervix Uteri Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

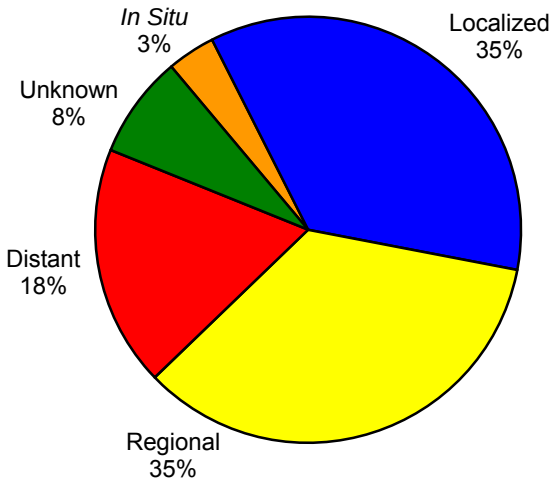
COLORECTAL

Table 15: Colorectal Incidence and Mortality Summary, 2011

Colorectal Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**421**	230	191	**136**	68	68
		Age Adjusted Rate	**43.8**	52.1	35.5	**13.7**	15.9	11.2
	White	# Cases / Deaths	**386**	207	179	**124**	62	62
		Age Adjusted Rate	**42.4**	49.8	35.1	**13.0**	15.2	10.6
	American Indian	# Cases / Deaths	**31**	21	10	**11**	6	5
		Age Adjusted Rate	**69.0**	96.1	44.7	**33.6**	36.3	30.9
United States	**Total**	Age Adjusted Rate	**40.3**	46.5	35.3	*** 15.5**	* 18.7	* 13.0
	White	Age Adjusted Rate	**39.3**	45.2	34.3	*** 15.0**	* 18.1	* 12.6
	American Indian	Age Adjusted Rate	**41.1**	47.9	35.1	*** 16.6**	* 19.2	* 14.7

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 27: Colorectal Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: The prognosis of the patient is greatly influenced by the stage of disease at diagnosis. In 2011, 35% (155) of the cases of colorectal cancer were diagnosed at localized stage. Localized is defined as when the disease is still confined to the colon. The remaining 232 invasive cases (53%) were diagnosed after the disease had spread beyond the colon. Of those 232 cases, 80 were diagnosed at distant stage when the disease had spread further involving other organs. The SEER National Cancer Institute website states that the 5-year survival rate for those who have distant stage at diagnosis is 12.9% for the 2004-2010 time period.

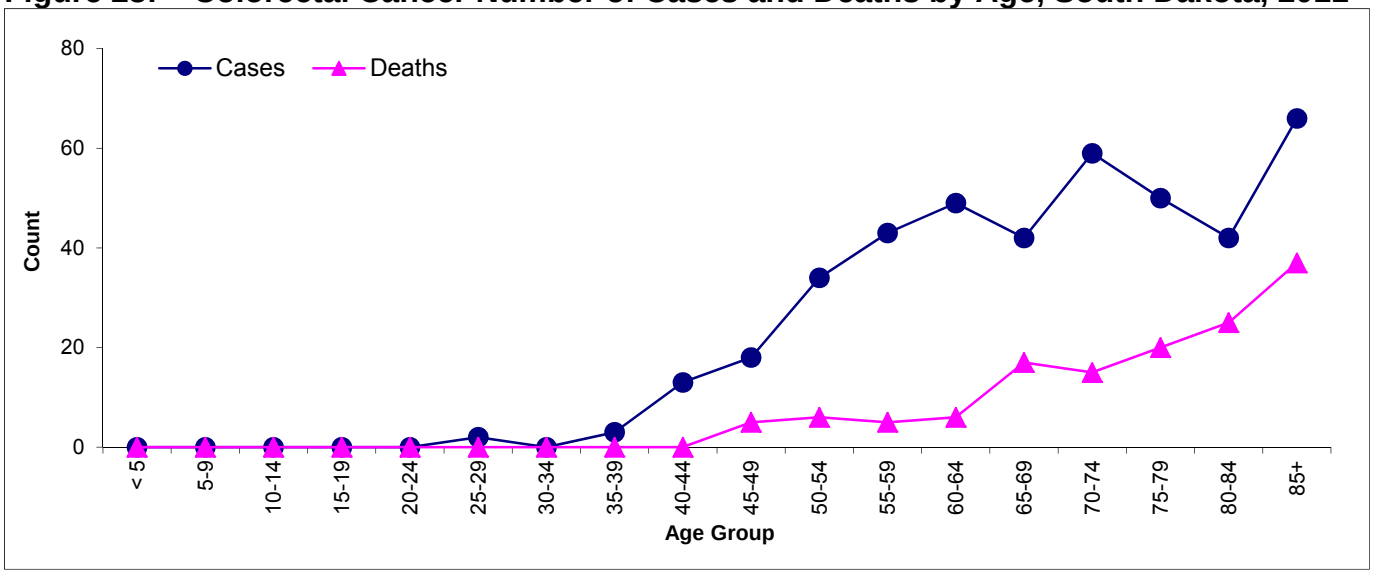
Incidence: Colorectal cancer accounted for 9.7% of all cases reported in South Dakota in 2011. The median age at diagnosis was 70. There were 230 men and 191 women diagnosed with colorectal cancer in 2011 in South Dakota. Overall, colorectal cancer was the fourth most diagnosed cancer. When reviewed by gender, it was the third most diagnosed cancer with 10.6% of the cancers reported in males and 8.9% of the cancers reported in females.

Mortality: Overall incidence and mortality rates for colorectal cancer are decreasing. The overall 5-year survival rate for 2004-2010 from SEER was 64.7% for men and women. In 2011, there were a total of 136 deaths that were attributed to colorectal cancer in South Dakota; half were men and half were women. Of that number, 124 were white and 11 were American Indian. The median age at death was 78. The SEER National Cancer Institute website states that the United States mortality rate in 2010 was 15.5.

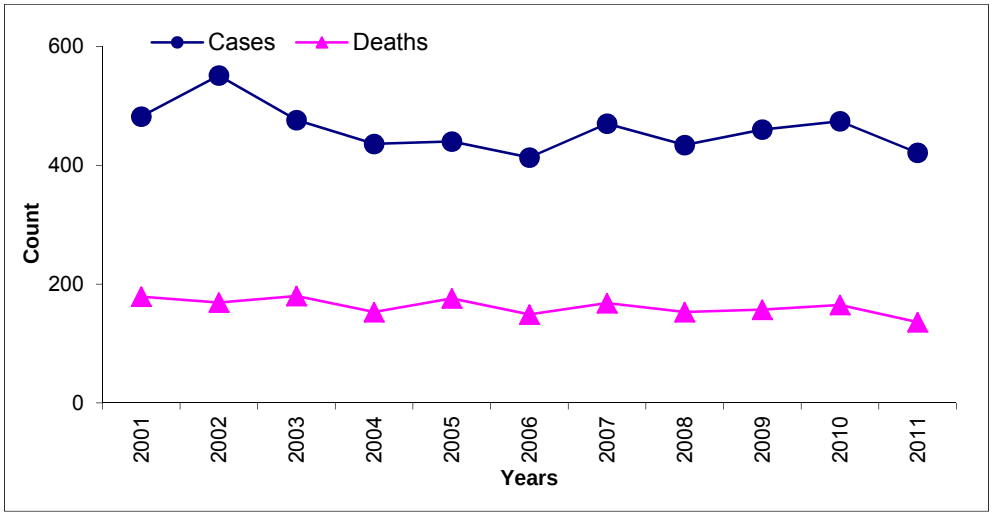
Risk and Associated Factors: Studies have shown that diets high in fat and low in fiber result in an increased risk for colon cancer. Diets also that are low in fresh fruit and vegetables increase the risk. Obesity is also listed as a risk factor.

Prevention and Early Detection: Doctors believe that most colon cancers develop in colon polyps. Therefore, removing benign colon polyps can prevent colorectal cancer. Colon polyps are initially benign but over years can become cancerous. Screening guidelines suggest having a colonoscopy every ten years beginning at the age of 50.

Figure 28: Colorectal Cancer Number of Cases and Deaths by Age, South Dakota, 2011



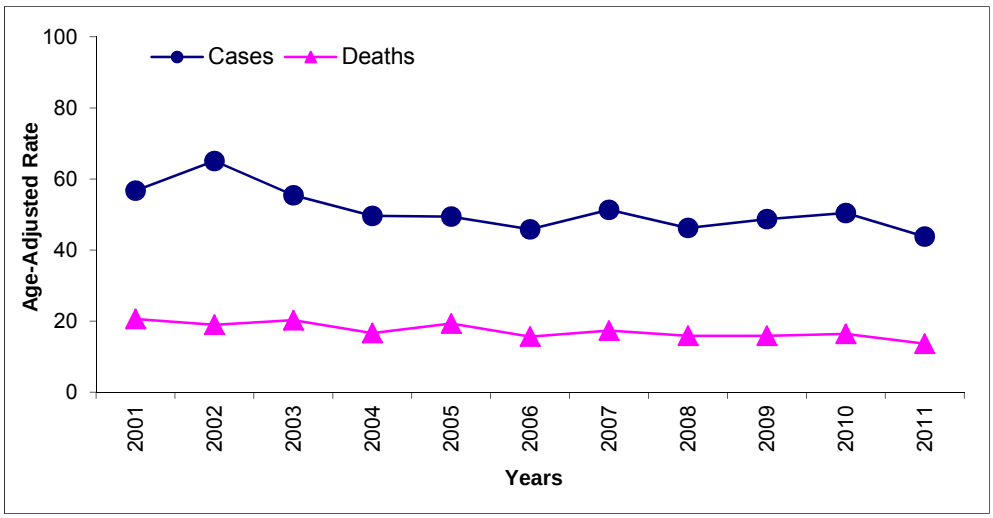
Source: South Dakota Department of Health



Source: South Dakota Department of Health

Figure 29: Colorectal Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence peak for colorectal cancer occurred in 2002. Incidences of colorectal cancer appear to escalate after age 50.



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

Figure 30: Colorectal Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

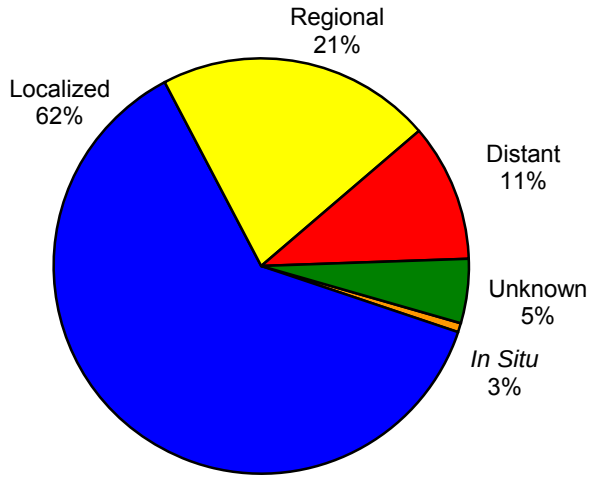
CORPUS and UTERUS, NOS

Table 16: Corpus and Uterus, NOS Incidence and Mortality Summary, 2011

Corpus & Uterus, NOS Cancer			Incidence	Mortality
South Dakota	Total	# Cases / Deaths	139	31
		Age Adjusted Rate	28.2	5.7
	White	# Cases / Deaths	133	30
		Age Adjusted Rate	28.7	5.9
	American Indian	# Cases / Deaths	5	1
		Age Adjusted Rate	18.2	3.0
United States	Total	Age Adjusted Rate	24.9	* 4.5
	White	Age Adjusted Rate	25.5	* 4.2
	American Indian	Age Adjusted Rate	17.4	* 3.9

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 31: Corpus and Uterus, NOS Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Health Department

Descriptive Epidemiology

***Stage at Diagnosis**:* Cancer in the uterus is treated surgically. Staging for these diseases is done following surgery, unless it is obvious that the disease has progressed and advanced. Cases with obvious advanced disease do not benefit from surgical procedures and are staged by physical examination. These cases are treated without operative staging. In South Dakota, during 2011, 62% of corpus uteri cases were diagnosed at localized stage. Fifteen cases were diagnosed at distant stage, a large increase from 2010 with only five cases.

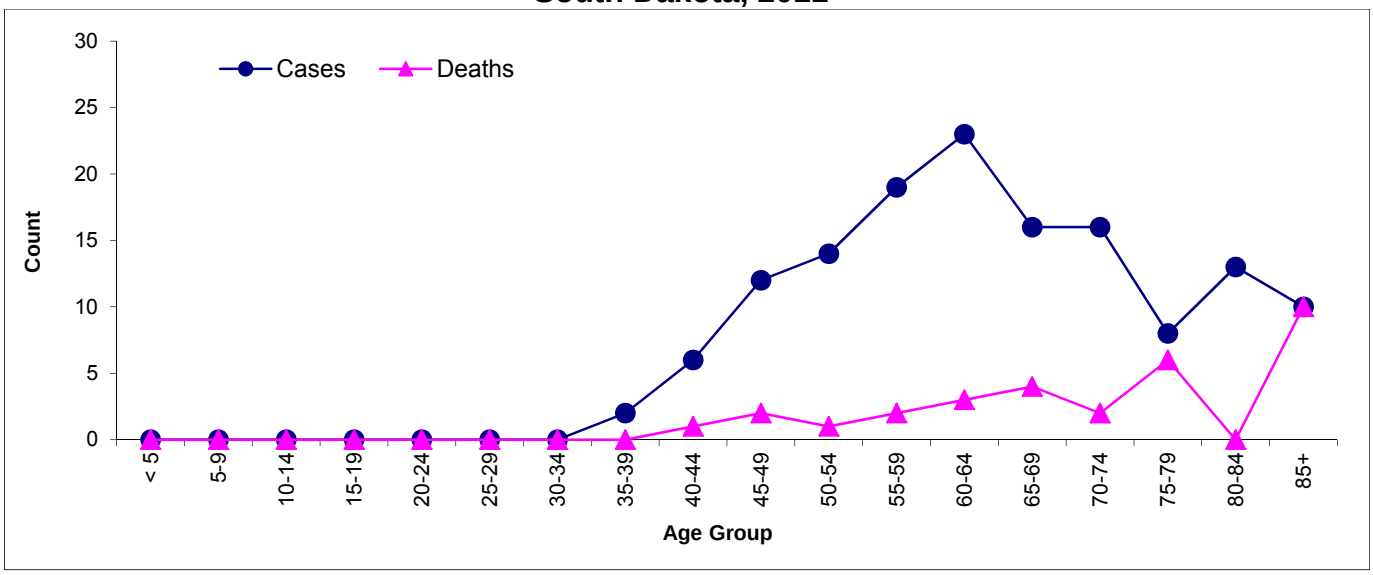
Incidence: The uterine cervix is the small cylindrical neck that leads from the uterus, or womb, into the vagina. A knob of the cervix protrudes into the vagina and can be visualized on physical examination. It is lined with epithelial and stromal cells creating a site for epithelial, stromal and mixed cell malignancies. Endometrial carcinoma is one of the female genital cancers. It is ranked fourth among females reported with cancer in South Dakota in 2011. Cancer of the corpus uteri represents 6.5% of all of the cancers diagnosed in South Dakota females in 2011. Endometrial cancer affects primarily postmenopausal women. The median age at diagnosis in the United States is 60. In South Dakota, the median age is 63 years of age.

Mortality: The death rate in South Dakota for the reporting period was 5.7 for deaths attributed to uterine cancer. In the United States, the 2010 rate was 4.5. Only 31 South Dakota female deaths were attributed to cancer of the uterus in 2011. The stage of disease at diagnosis affects the mortality rate. Overall (all stages included), the five-year relative survival rate was 83.2% in the United States.

Risk and Associated Factors: Risk factors associated with corpus uteri cancer suggest that exposure to estrogen for long periods of time plays a critical role. The use of exogenous estrogen replacement therapy accounted for a dramatic rise in the incidence of endometrial cancer in the United States in the 1970s. The use of combination estrogen-progesterone oral contraceptive pills confers protection against endometrial hyperplasia and subsequent development of cancer.

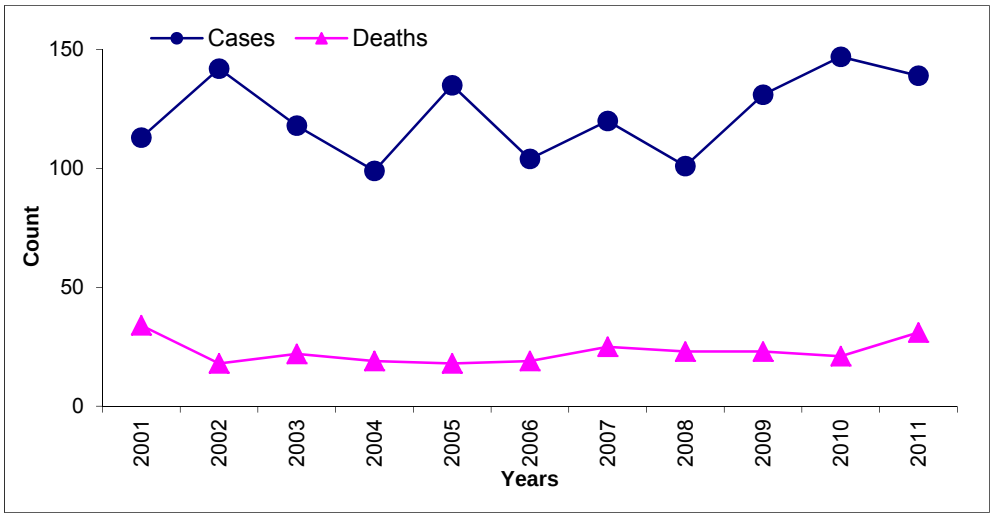
Prevention and Early Detection: Other factors associated with an increased risk of developing uterine cancer include obesity, a high-fat diet and a prolonged exposure to the female hormone, estrogen. One pregnancy appears to lower the risk of uterine cancer by 50%.

Figure 32: Corpus and Uterus, NOS Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

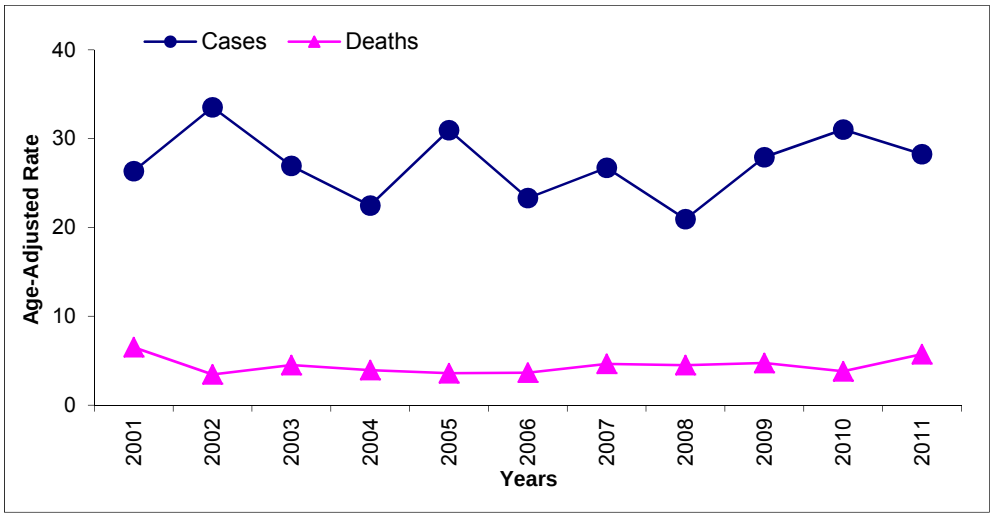
In South Dakota, in 2011 the incidence peaked in the 60-64 age group.



Source: South Dakota Department of Health

Figure 33: Corpus and Uterus, NOS Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence peak for female corpus and uterus, NOS cancer was in 2010.



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

Figure 34: Corpus and Uterus, NOS Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

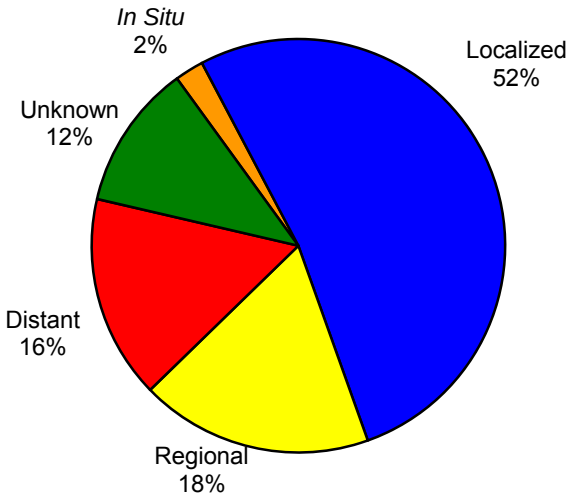
KIDNEY AND RENAL PELVIS

Table 17: Kidney and Renal Pelvis Incidence and Mortality Summary, 2011

Kidney & Renal Pelvis Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**129**	70	59	**51**	31	20
		Age Adjusted Rate	**14.0**	16.0	12.3	**5.2**	7.0	3.7
	White	# Cases / Deaths	**119**	64	55	**50**	30	20
		Age Adjusted Rate	**13.8**	15.6	12.4	**5.4**	7.1	3.9
	American Indian	# Cases / Deaths	**8**	6	2	**1**	1	0
		Age Adjusted Rate	**18.0**	28.2	8.9	**3.1**	7.1	0.0
United States	**Total**	Age Adjusted Rate	**15.2**	20.7	10.5	*** 3.9**	* 5.7	* 2.5
	White	Age Adjusted Rate	**15.6**	21.1	10.9	*** 4**	* 5.9	* 2.6
	American Indian	Age Adjusted Rate	**19.2**	27.3	12.7	*** 7.5**	* 11.2	* 4.4

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 35: Kidney and Renal Pelvis Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Health Department

Descriptive Epidemiology

Stage at Diagnosis: As with all malignancies, early diagnosis is the key to better prognosis and possible cure. Fifty-two percent of the cases in 2011 were diagnosed at localized stage, with another 16% diagnosed at distant stage. Unfortunately, symptoms do not always reflect the stage of disease. Blood in the urine is one of the symptoms that frequently presents at diagnosis. As with other cancers, renal cancer can spread through the blood stream and/or lymphatic system. Survival rates associated with kidney cancer depend on how far the disease has progressed, the size of tumor, and whether or not it has metastasized. The five-year survival rate for localized stage kidney cancer is 91.8%. The survival rate for distant stage is 12.1%.

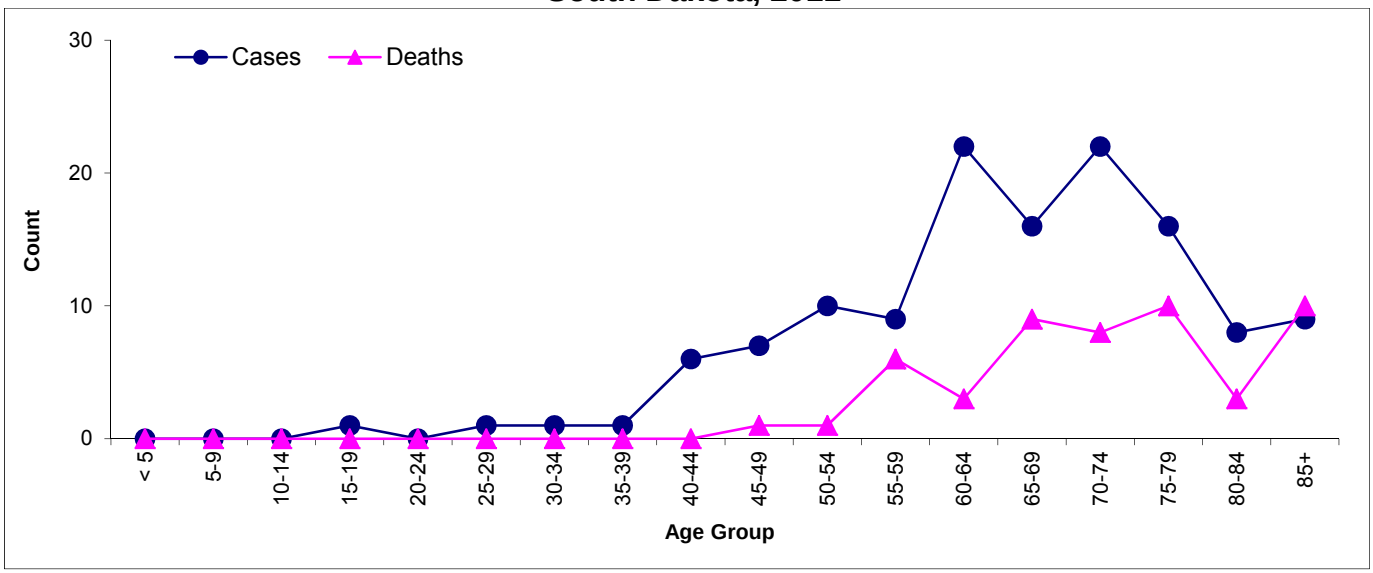
Incidence: In 2011 the American Cancer Society estimated there would be 60,920 new cases of kidney cancer in the United States. This accounts for 3.8% of all reported malignancies in the United States. In South Dakota there were 129 reported cases of kidney cancer in 2011 representing 3% of all cancer cases. Kidney cancer develops most often in people over 40. There is no known cause of this disease. Doctors can seldom explain why one person develops kidney cancer and another does not. The median age at diagnosis is 66 in South Dakota and 64 in the United States.

Mortality: This cancer was the eighth leading cause of cancer death for South Dakota in 2011. In the United States for 2006-2010 it is the thirteenth leading cause of death with a median age of death of 71 years. Death rates have been falling on average 0.6% each year since 2001.

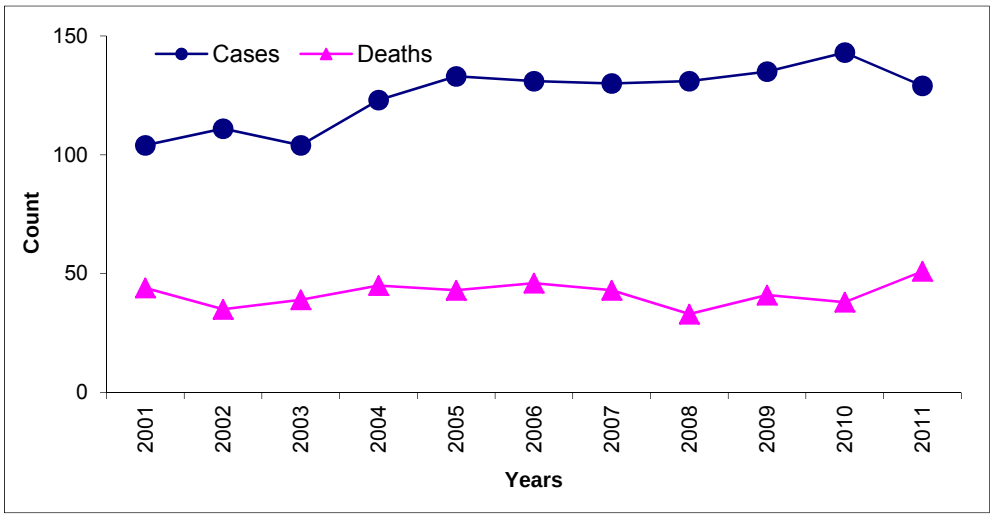
Risk and Associated Factors: Cigarette smoking increases the risk of developing kidney cancer. The risk seems to increase by the amount one smokes. Obesity is associated with risk, as are exposures to occupational substances such as aniline dyes, benzene, and naphthalene.

Prevention and Early Detection: The main preventive measure is to stop smoking and maintain a healthy weight. It is difficult to diagnose kidney cancer until it becomes symptomatic. There are no known screenings recommended at this time.

Figure 36: Kidney and Renal Pelvis Cancer Number of Cases and Deaths by Age, South Dakota, 2011



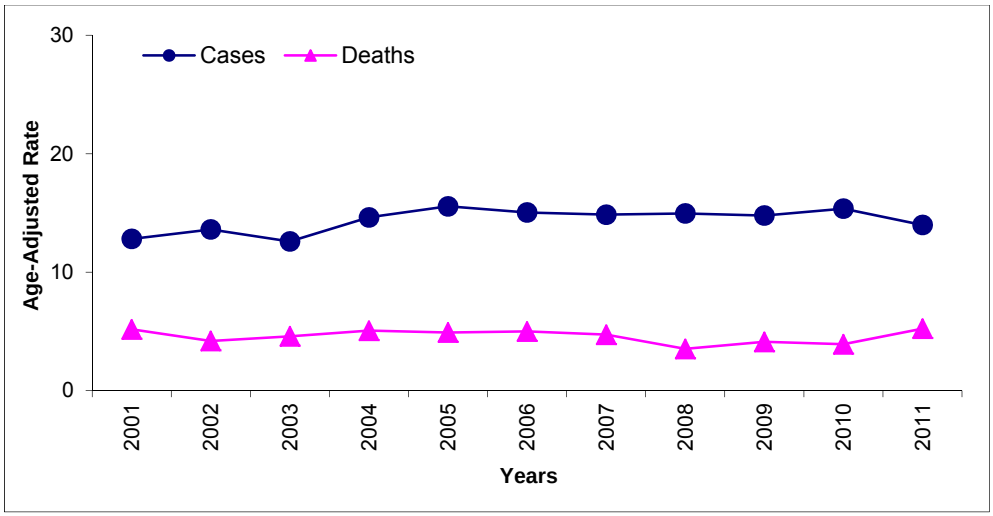
Source: South Dakota Department of Health



Source: South Dakota Department of Health

Figure 37: Kidney and Renal Pelvis Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence peak for kidney and renal pelvis cancer occurred in 2010.



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

Figure 38: Kidney and Renal Pelvis Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

LEUKEMIA

Table 18: Leukemia Incidence and Mortality Summary, 2011

Leukemia			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**150**	84	66	**77**	51	26
		Age Adjusted Rate	**16.4**	19.2	13.8	**7.8**	11.6	4.6
	White	# Cases / Deaths	**140**	78	62	**75**	49	26
		Age Adjusted Rate	**16.5**	19.3	14.1	**8.0**	11.9	4.8
	American Indian	# Cases / Deaths	**8**	5	3	**2**	2	0
		Age Adjusted Rate	**14.4**	19.1	9.5	**5.6**	13.3	0.0
United States	**Total**	Age Adjusted Rate	**13.0**	16.5	10.3	*** 6.9**	* 9.3	* 5.2
	White	Age Adjusted Rate	**13.6**	17.2	10.7	*** 7.2**	* 9.6	* 5.4
	American Indian	Age Adjusted Rate	**7.1**	8.2	6.3	*** 5.5**	* 8.4	* 3.8

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Leukemias are not staged because they may involve bone marrow throughout the body. Doctors classify them by type and subtype in an attempt to determine the prognosis and a recommended level of treatment. Chronic myelogenous leukemia is grouped by phases and chronic lymphocytic leukemia (CLL) uses a Rai classification. Leukemia is a type of cancer of the blood. 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 histology. Subtypes have different etiology, treatment, and prognosis. Leukemias accounted for 3.5% of the cancers reported in 2011 for South Dakota. The American Cancer Society estimated that there would be 140 new cases of leukemia in South Dakota during 2011 and 44,600 cases nationwide.

Mortality: Leukemia accounted for almost 5% of the cancer deaths in South Dakota in 2011. The subtype of acute myeloid leukemia was the most frequent cause of leukemia death. Almost 72% of the deaths associated with leukemia occurred at the age of 65 or older.

Leukemia is clinically and pathologically subdivided into a variety of large groups. The first division is between the acute and chronic forms.

Chronic Leukemia: Early in the disease process, the abnormal blood cells still have normal processes. Slowly, chronic leukemia does get worse. It causes symptoms as the number of abnormal cells in the blood rises. In South Dakota in 2011, there were 79 new cases of chronic leukemia.

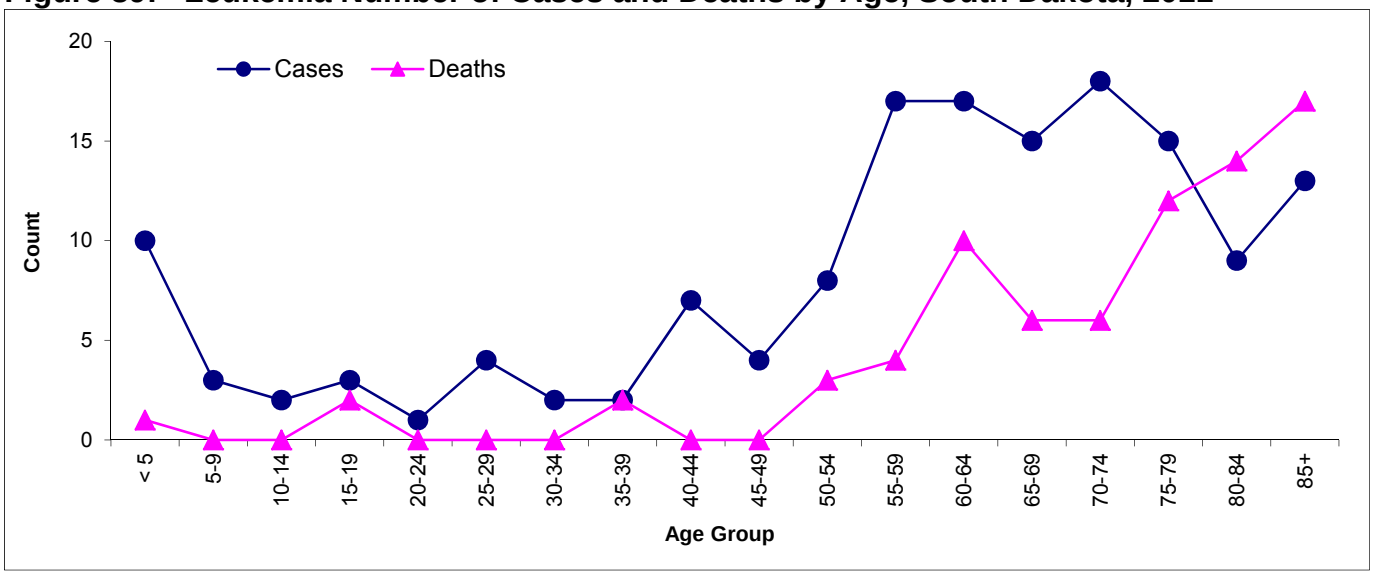
Acute Leukemia: The blood cells are very abnormal. The blood cells cannot carry out their normal processes. The number of abnormal cells increases rapidly. Acute leukemia worsens quickly as do the symptoms. There were 66 new cases of acute leukemia in South Dakota in 2011.

These types of leukemia are further divided by the type of white blood cell that is affected.

Risk and Associated Factors: People who are exposed to very high levels of radiation are more likely to develop leukemia. Working with certain chemicals and exposure to high levels of benzene in the workplace can cause leukemia. Benzene is used widely in the chemical industry. Workers exposed to formaldehyde may also be at greater risk of leukemia. Chromosomal abnormalities, such as Down's syndrome and certain other genetic diseases may increase the risk of leukemia.

Prevention and Early Detection: There are no early detection or prevention strategies. Often symptoms are the same as for many other health problems, thus early detection is difficult. Diagnosis is made using blood tests and bone marrow biopsies.

Figure 39: Leukemia Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

Leukemia is frequently diagnosed in children, but as with all malignancies it is a disease of the elderly. Deaths from leukemia steadily increase after the age of 74.

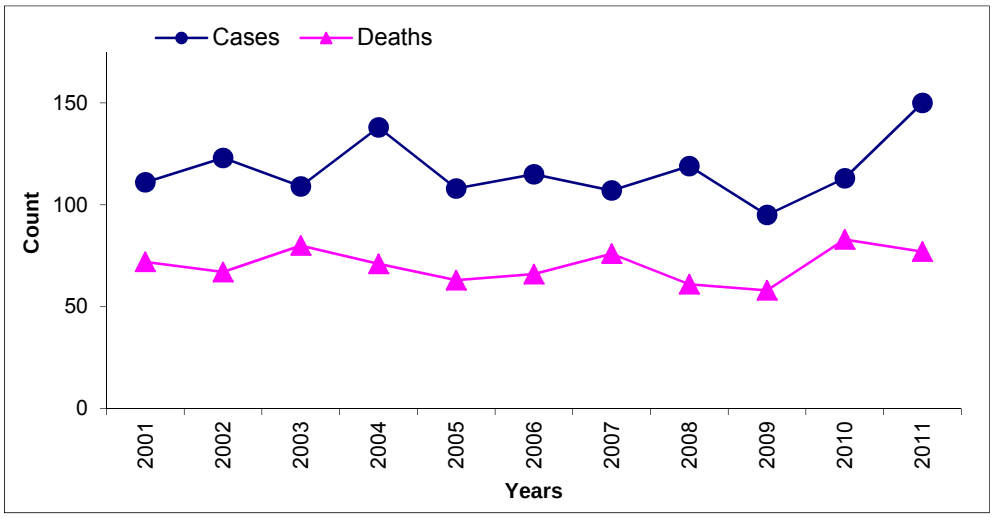


Figure 40: Leukemia Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence peak for leukemia occurred in 2011.

Source: South Dakota Department of Health

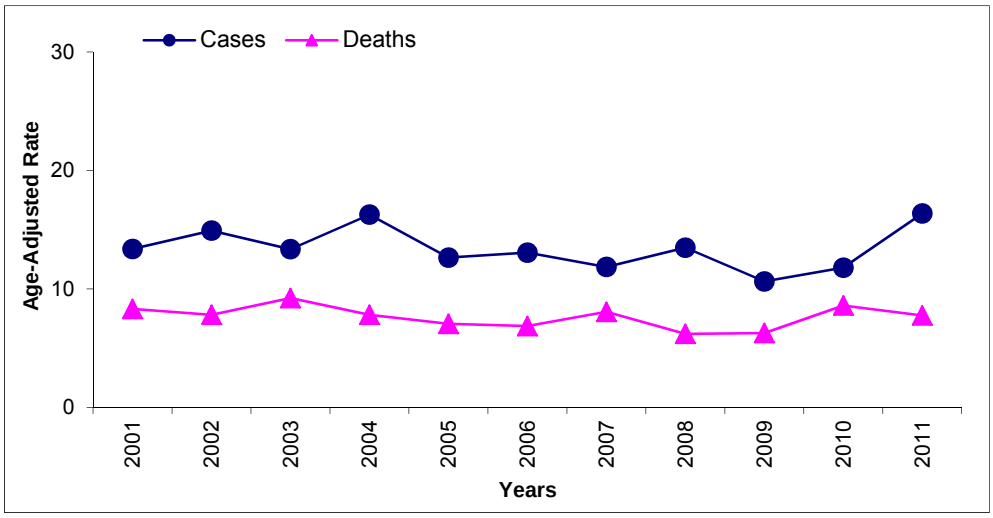


Figure 41: Leukemia Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

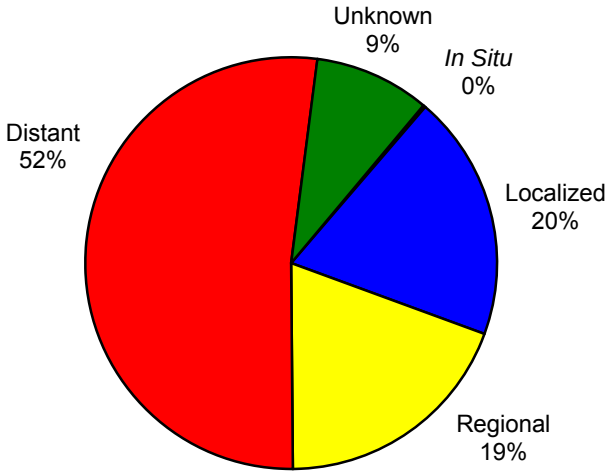
LUNG AND BRONCHUS

Table 19: Lung and Bronchus Incidence and Mortality Summary, 2011

Lung & Bronchus Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**528**	266	262	**457**	233	224
		Age Adjusted Rate	**55.1**	60.8	51.6	**47.0**	53.4	42.5
	White	# Cases / Deaths	**488**	246	242	**427**	217	210
		Age Adjusted Rate	**53.7**	58.9	50.7	**46.1**	52.1	42.1
	American Indian	# Cases / Deaths	**37**	18	19	**27**	16	11
		Age Adjusted Rate	**114.6**	135.1	102.6	**83.6**	112.8	63.0
United States	**Total**	Age Adjusted Rate	**55.9**	66.2	48.2	*** 47.4**	* 60.1	* 37.9
	White	Age Adjusted Rate	**57.5**	66.4	50.8	*** 48.1**	* 59.9	* 39.2
	American Indian	Age Adjusted Rate	**37.3**	40.4	34.9	*** 38.9**	* 48.7	* 31.0

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 42: Lung and Bronchus Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

***Stage at Diagnosis*:** The presentation of lung cancer is extremely variable and depends on local manifestations of the tumor, distant metastases or associated paraneoplastic syndromes. In 2011, 20% of lung cancer patients were diagnosed at localized stage. The more advanced the stage, the poorer the prognosis is for the patient. In 2011, 378 (52%) cases were diagnosed when disease had progressed beyond the lung and metastasized to a distant location. Approximately 73% of cases in 2011 were diagnosed after the disease had progressed beyond the lung to lymph nodes, regional areas, or distant sites, such as brain or bone.

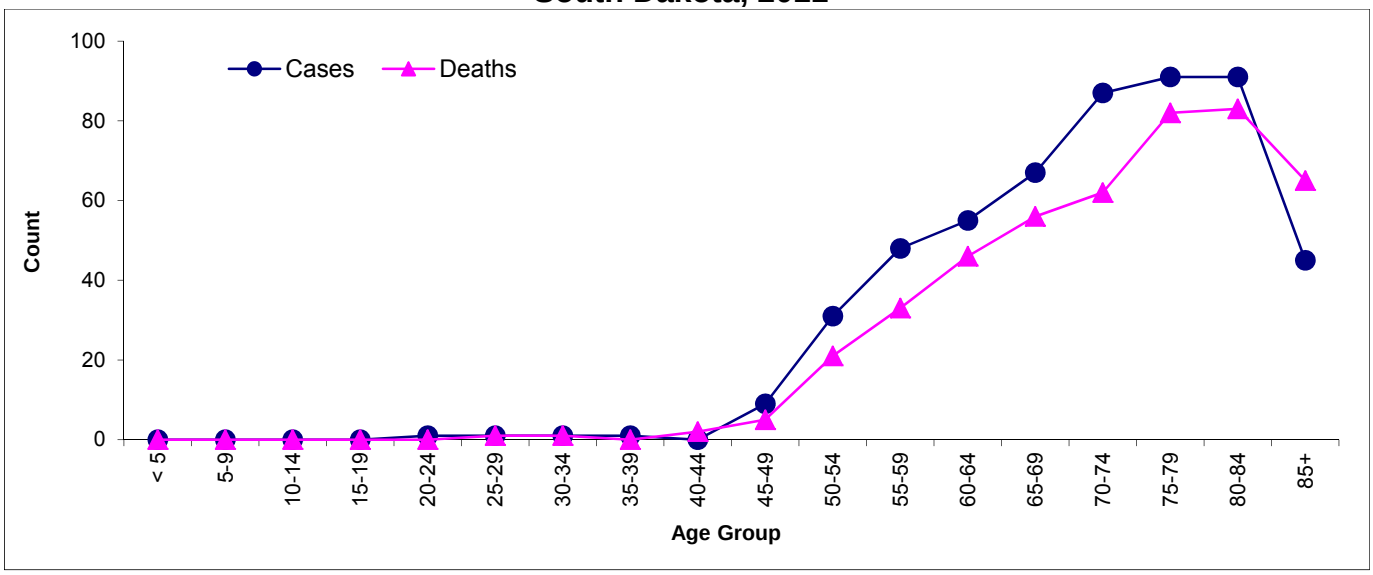
Incidence: Lung cancer is a major public health concern, with an estimated 221,130 new cases in the United States in 2011. Despite the well documented link between tobacco product use and respiratory diseases, including cancer, the outcomes of such efforts to curb the use of tobacco products have been mixed. In South Dakota, there were 528 new invasive lung cancer cases diagnosed in 2011.

Mortality: There were 457 lung cancer deaths in South Dakota in 2011. Incidence and mortality rates have significantly increased during the last century. Lung cancer accounts for approximately 27.5% of all United States deaths attributed to cancer. In South Dakota, lung cancer accounts for 27.6% of deaths from cancer. Lung cancer is the leading cause of cancer deaths in both men and women.

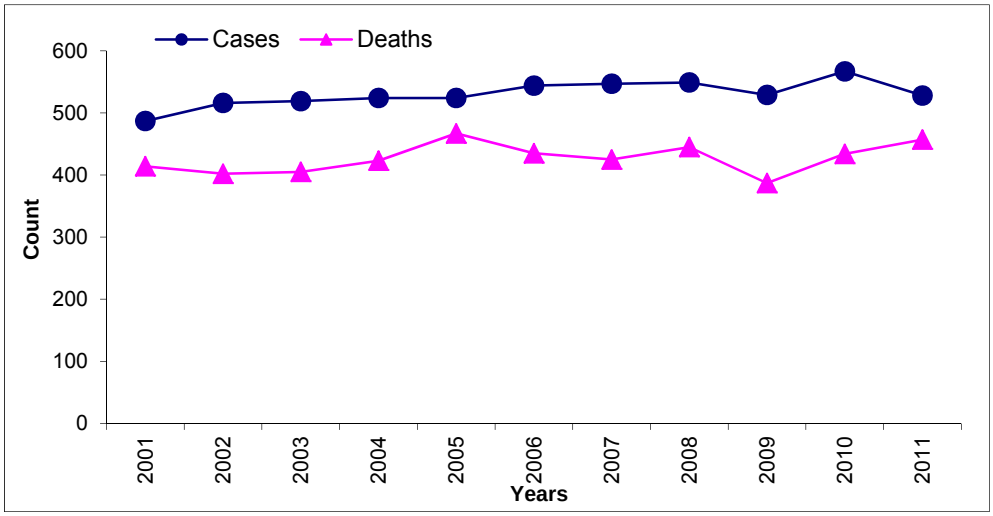
Risk and Associated Factors: Cigarette smoking is by far the most important risk factor for lung cancer. Approximately 90% of lung cancers in men and 80% in women are attributed to cigarette smoking. The lifetime risk of lung cancer in nonsmokers is estimated to be less than 1%. Other risk factors include second hand smoke, and occupational or environmental exposures to substances such as arsenic, benzene, and asbestos.

Prevention and Early Detection: Efforts at early detection by screening have not been effective in reducing mortality rates significantly. Chest x-ray, analysis of cells in sputum and bronchial fiber optic examination are methods used in early diagnosis and detection. The best prevention of lung cancer is to stop smoking or never smoke.

Figure 43: Lung and Bronchus Cancer Number of Cases and Deaths by Age, South Dakota, 2011



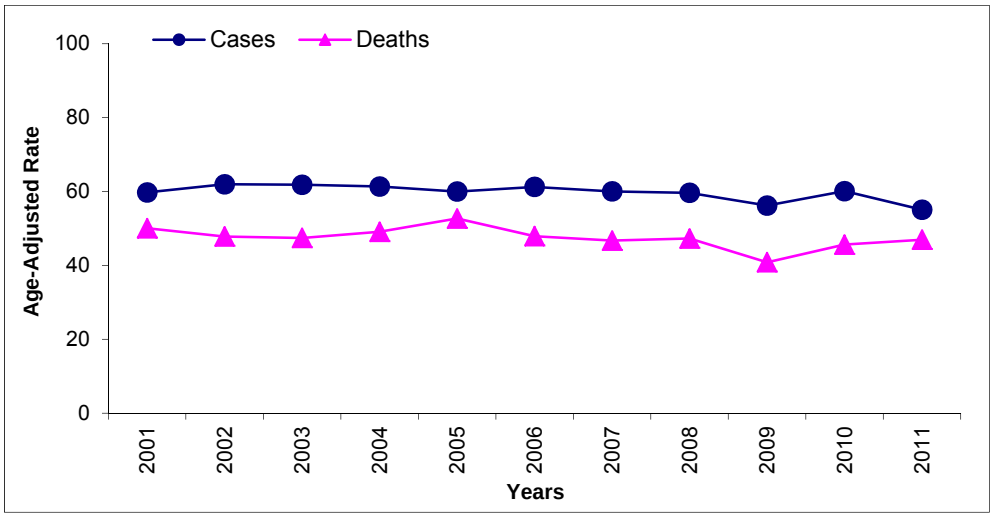
Source: South Dakota Department of Health



Source: South Dakota Department of Health

Figure 44: Lung and Bronchus Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The number of cases and deaths associated with lung and bronchus cancer remain constant.



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

Figure 45: Lung and Bronchus Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

MELANOMA OF THE SKIN

Table 20: Melanoma of the Skin Incidence and Mortality Summary, 2011

Melanoma of the Skin			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**186**	95	91	**25**	13	12
		Age Adjusted Rate	**20.1**	21.8	19.6	**2.7**	2.9	2.4
	White	# Cases / Deaths	**185**	95	90	**25**	13	12
		Age Adjusted Rate	**21.7**	23.2	21.4	**2.9**	3.1	2.6
	American Indian	# Cases / Deaths	**1**	0	1	**0**	0	0
		Age Adjusted Rate	**1.5**	0.0	2.9	**0.0**	0.0	0.0
United States	**Total**	Age Adjusted Rate	**21.1**	27.7	16.2	*** 2.7**	* 4.1	* 1.7
	White	Age Adjusted Rate	**24.8**	32.1	19.3	*** 3.2**	* 4.7	* 2.0
	American Indian	Age Adjusted Rate	**3.9**	3.2	4.7	*** 1.0**	*	*

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

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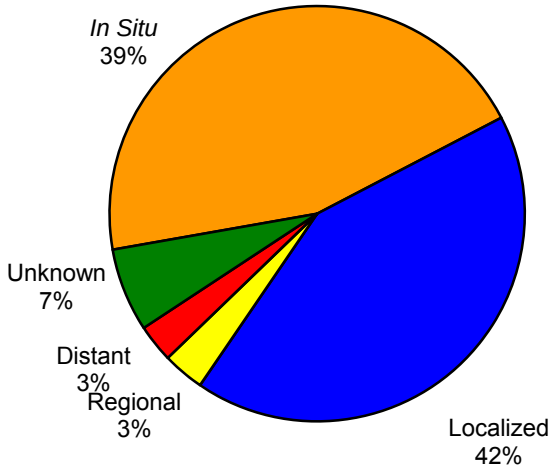
Figure 46: Melanoma of the Skin Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

***Stage at Diagnosis*:** Melanoma is staged by the depth of invasion and the extension of the lesion. In 2011, there were 186 cases of melanoma of the skin reported for South Dakota. Of this number, 143 were staged as localized disease. The survival rate for localized melanoma is 98.1%. For distant disease, the survival rate is 16.1% at 5 years.

Incidence: In the United States in 2011, the American Cancer Society estimated that there would be 70,230 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. Melanoma is primarily a cancer of the white populations. In South Dakota, the incidence rate is 20.1 and the United States has an incidence rate of 21.1.

***Mortality*:** There were 25 deaths attributed to melanoma of the skin in South Dakota in 2011 with a mortality rate of 2.7. The last reported mortality rate for the United States (2010) was 2.7. The median age for death in South Dakota for this cancer was 67 in 2011. Nationwide, the median age at death was 69 for melanoma of the skin.

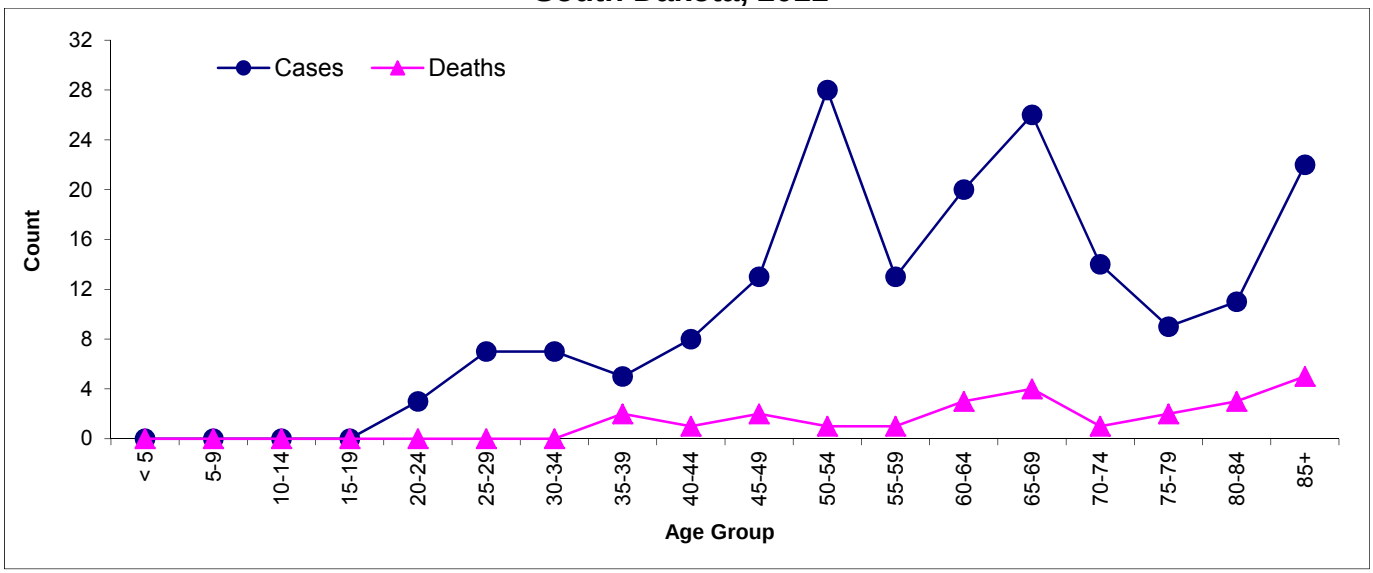
Risk and Associated Factors: Certain factors are more likely to contribute to a higher risk. These are:

- Lighter natural skin color
- Family history of skin cancer
- Personal history of skin cancer
- Exposure to the sun
- History of sunburns early in life
- Skin that burns, freckles, reddens easily
- Blue or green eyes, blond or red hair
- Large number of moles

Early Detection and Prevention: The best way to prevent skin cancer is to protect the skin from the sun. The CDC recommends five easy options for protection from sunburn:

- use sun glasses
- use sunscreen regularly
- stay in the shade
- cover skin
- wear a hat

Figure 47: Melanoma of the Skin Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

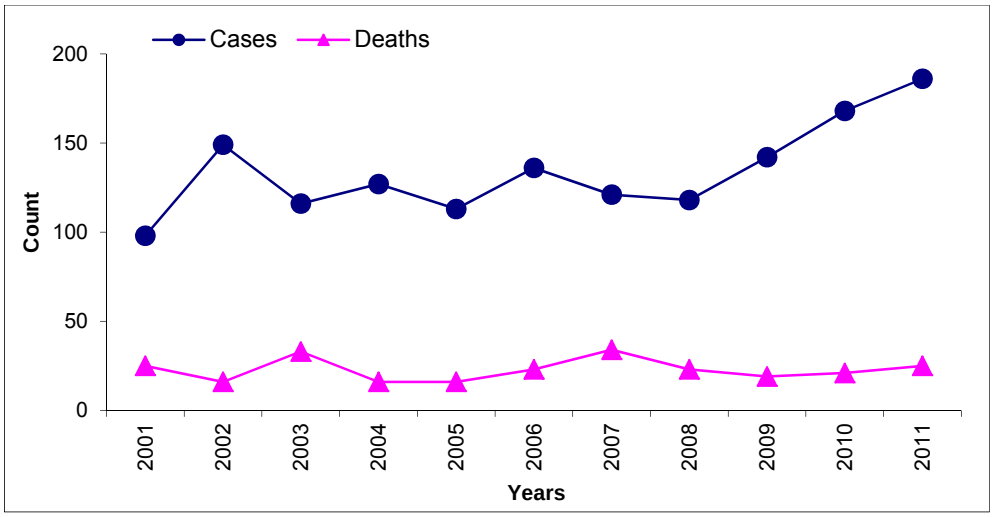


Figure 48: Melanoma of the Skin Cases and Deaths by Year, South Dakota, 2001 - 2011

Source: South Dakota Department of Health

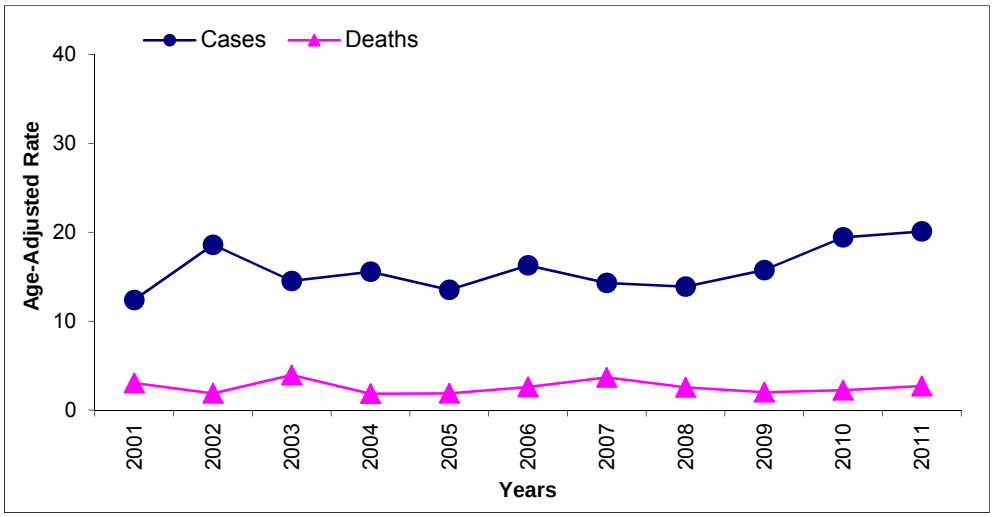


Figure 49: Melanoma of the Skin Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

MYELOMA §

Table 21: Myeloma Incidence and Mortality Summary, 2011

Myeloma §			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**70**	43	27	**39**	17	22
		Age Adjusted Rate	**7.2**	10.0	4.9	**3.7**	3.9	3.6
	White	# Cases / Deaths	**69**	42	27	**39**	17	22
		Age Adjusted Rate	**7.5**	10.2	5.1	**3.8**	4.1	3.7
	American Indian	# Cases / Deaths	**1**	1	0	**0**	0	0
		Age Adjusted Rate	**3.1**	7.1	0.0	**0.0**	0.0	0.0
United States	**Total**	Age Adjusted Rate	**6.2**	7.7	5.0	*** 3.3**	* 4.2	* 2.7
	White	Age Adjusted Rate	**5.6**	7.2	4.3	*** 3.1**	* 3.9	* 2.4
	American Indian	Age Adjusted Rate	**4.2**	5.9	3.0	*** 2.6**	* 3.4	* 2.0

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
§ can include NOS, multiple, plasma cell and solitary. * US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Stage of disease for myeloma is always distant per the SEER Summary Staging Manual.

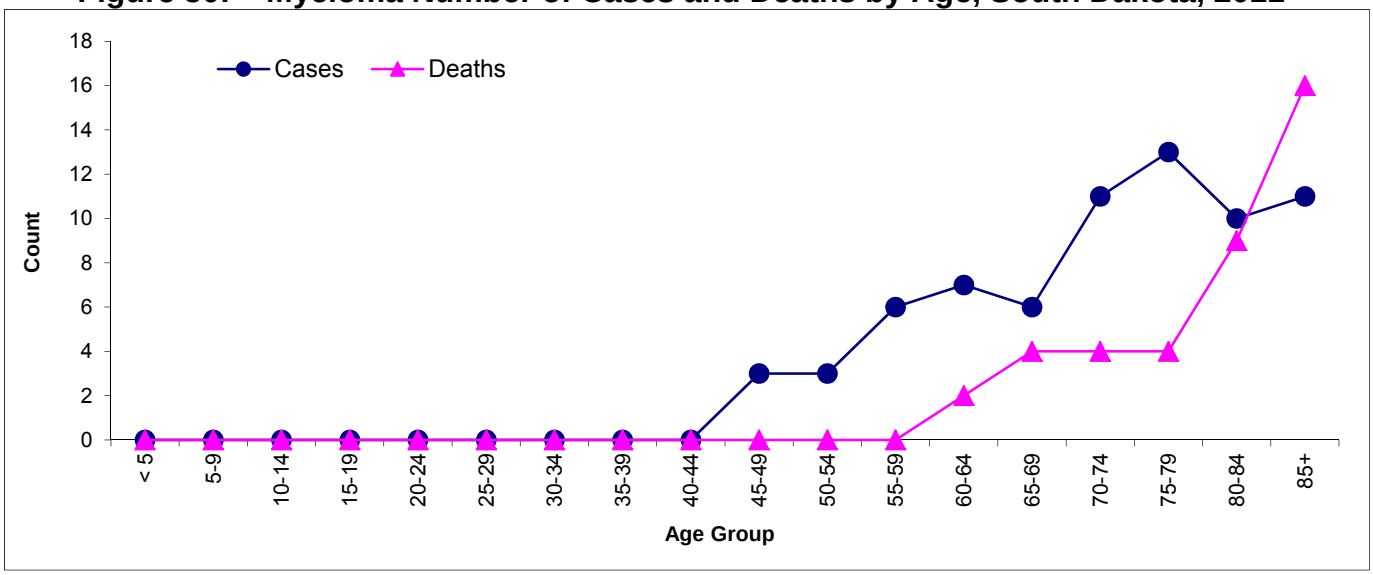
Incidence: Myeloma is a systemic malignancy of plasma cells that is highly treatable, but rarely curable. It is potentially curable when it presents as a solitary plasmacytoma of the bone or as an extramedullary plasmacytoma. In South Dakota during 2011, myeloma accounted for 1.6% of total cancer cases reported. Median age at diagnosis in South Dakota was 74 and the United States was 69. The national incidence rate is higher in men (7.7) than women (4.9). In South Dakota the incidence rate is also higher in men (10.0) than women (4.9). Myeloma is more common among the elderly. African Americans have approximately twice the incidence and mortality rates of whites.

***Mortality*:** The median survival prior to the common use of chemotherapy was about seven months. After the introduction of chemotherapy, prognosis improved significantly with a median survival of 24 to 30 months and a 10-year survival of 3%. During 2011, there were 39 deaths attributed to myeloma in South Dakota. Seventeen were male and 22 were female. The mortality rate for South Dakota is 3.7. For men the rate is 3.9 and for women it is 3.6. These rates compare to United States mortality rates in 2010 of 3.4 overall, 4.3 for men and 2.7 for women.

Risk and Associated Factors: The etiology of myeloma is relatively unknown. There are many research studies evaluating the exposure of individuals with myeloma to various substances.

Early Detection and Prevention: There is no known test for screening for early detection. Some cases of myeloma progress very slowly, and they are referred to as smoldering or indolent myeloma. The presence of plasma cells and proteinuria do not automatically lead to myeloma, but it can be an early symptom. This disease is often asymptomatic in early stages of the disease. Myeloma is most often diagnosed clinically by radiological procedures and through cytology.

Figure 50: Myeloma Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

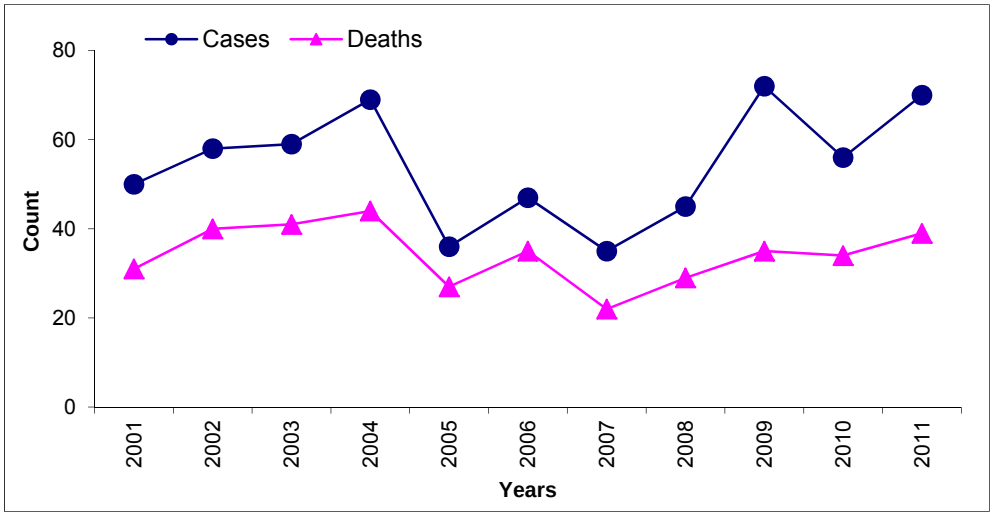


Figure 51: Myeloma Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence count for myeloma cancers took a sharp drop from 2004 to 2005.

Source: South Dakota Department of Health

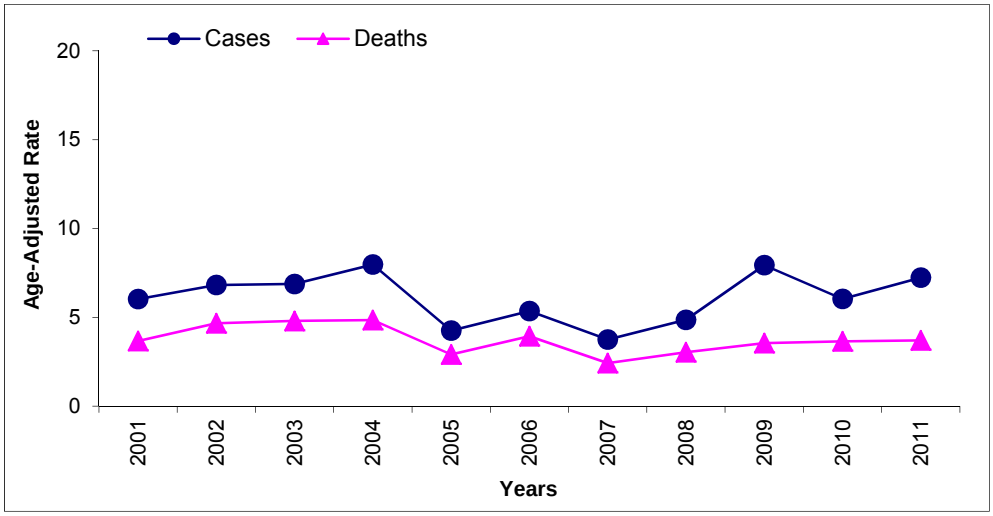


Figure 52: Myeloma Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

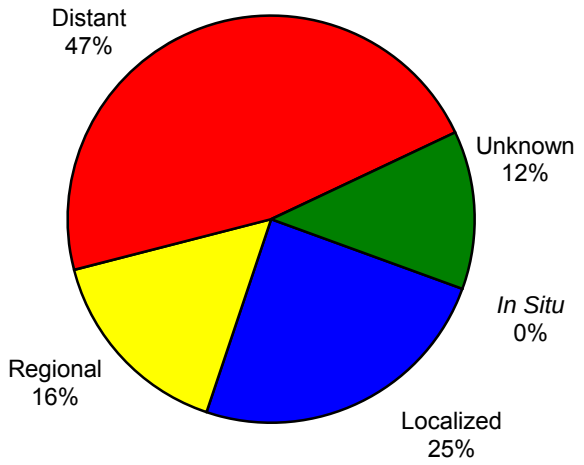
NON-HODGKIN'S LYMPHOMA

Table 22: Non-Hodgkin's Lymphoma Incidence and Mortality Summary, 2011

Non-Hodgkin's Lymphoma			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**183**	100	83	**62**	41	21
		Age Adjusted Rate	**19.3**	23.0	16.7	**6.0**	9.3	3.3
	White	# Cases / Deaths	**174**	93	81	**59**	39	20
		Age Adjusted Rate	**19.6**	22.7	17.6	**6.0**	9.4	3.2
	American Indian	# Cases / Deaths	**5**	3	2	**2**	2	0
		Age Adjusted Rate	**12.9**	18.0	8.7	**6.3**	14.5	0.0
United States	**Total**	Age Adjusted Rate	**19.0**	23.0	15.8	*** 6.1**	* 7.8	* 4.9
	White	Age Adjusted Rate	**19.8**	23.9	16.5	*** 6.4**	* 8.1	* 5.0
	American Indian	Age Adjusted Rate	**12.7**	12.9	12.3	*** 4.4**	* 5.7	* 3.3

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 53: Non-Hodgkin's Lymphoma Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Stage is based on where lymphoma cells are found (in the lymph or in other organs or tissues). The stage also depends on how many areas are involved. Localized stage only involves a single lymph node region or single extralymphatic organ. When two or more lymph node regions are involved and the regions are on both sides of the diaphragm the cancer will be staged as distant. In 2011, 47% of the cases were diagnosed at distant stage, a decrease from 2010 when 50% were diagnosed at distant stage.

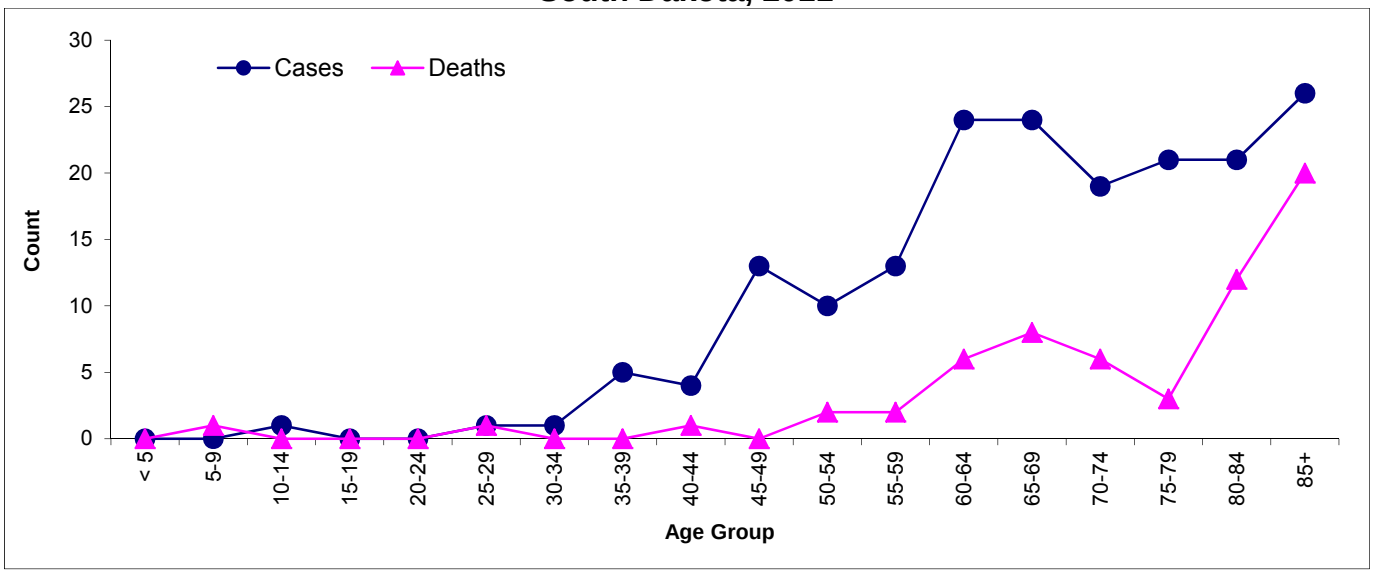
Incidence: Non-Hodgkin's lymphoma is a cancer that originates in the lymphatic system, the disease-fighting network that spreads throughout the body. It develops in lymphocytes, a type of white blood cell. Non-Hodgkin's lymphoma is more than five times as common as the other general type of lymphoma, Hodgkin's disease. The incidence rate has been increasing in the United States since the 1970s. The incidence of non-Hodgkin's disease in South Dakota was 183 cases in 2011. The median age at diagnosis in South Dakota in 2011 was 68.

Mortality: There were 62 deaths reported in South Dakota that were attributed to non-Hodgkin's lymphoma. The median age at death for those whose death was attributed to non-Hodgkin's lymphoma in South Dakota was 81 years of age. Nationally, the five-year survival rate is 69.3% for non-Hodgkin's lymphoma.

Risk and Associated Factors: Getting older is a strong risk factor for this disease, with most cases occurring from age 60 and older. Some studies suggest that 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. The risk is higher for those having been treated with both. Certain infections increase the risk, such as HIV, Epstein - Barr virus, H. pylori bacteria, and Hepatitis C virus.

Early Detection and Prevention: Non-Hodgkin's lymphoma may present with various symptoms. Symptoms may include signs resulting from local effects of cancer growth. Non-Hodgkin's lymphoma can also produce generalized symptoms, such as unexplained weight loss, fever, drenching night sweats, and severe itching.

Figure 54: Non-Hodgkin's Lymphoma Number of Cases and Death by Age, South Dakota, 2011



Source: South Dakota Health Department

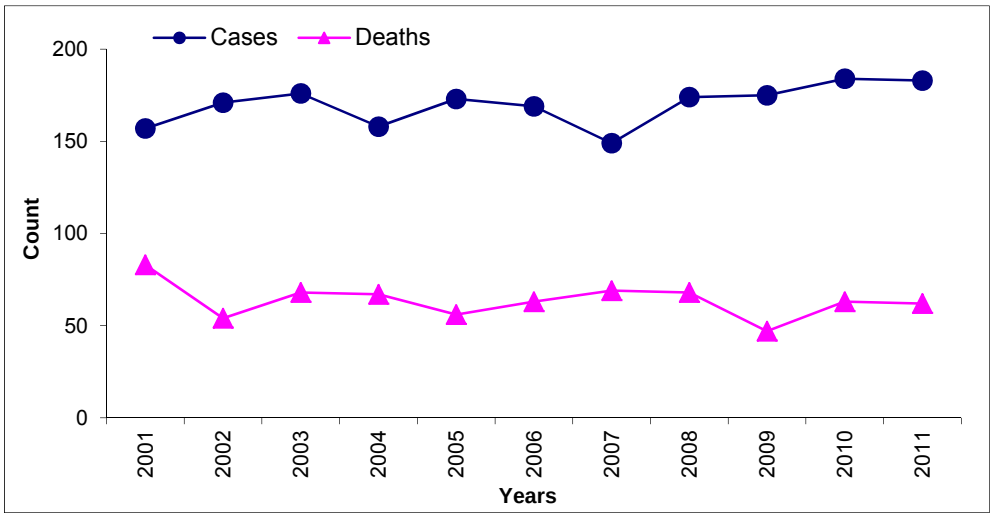


Figure 55: Non-Hodgkin's Lymphoma Cases and Deaths by Year, South Dakota, 2001 - 2011

Source: South Dakota Health Department

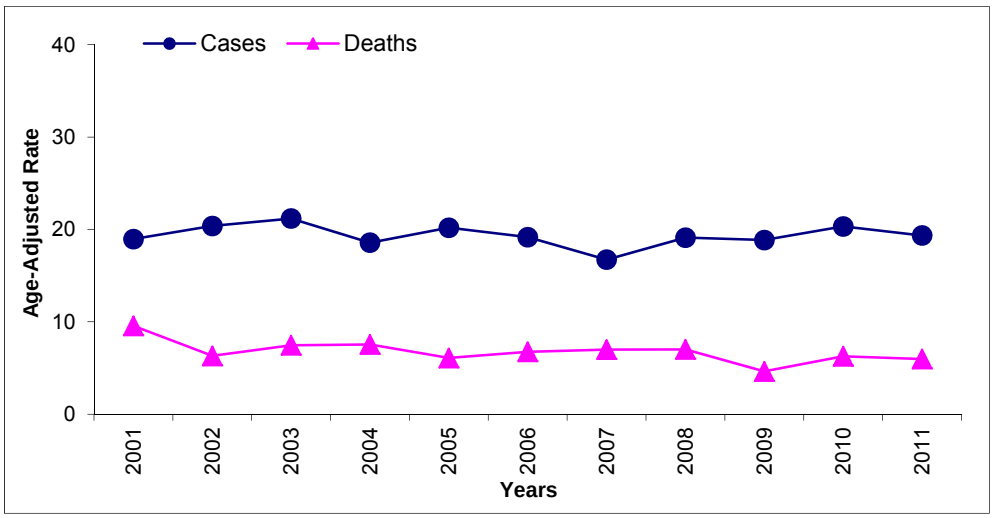


Figure 56: Non-Hodgkin's Lymphoma Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

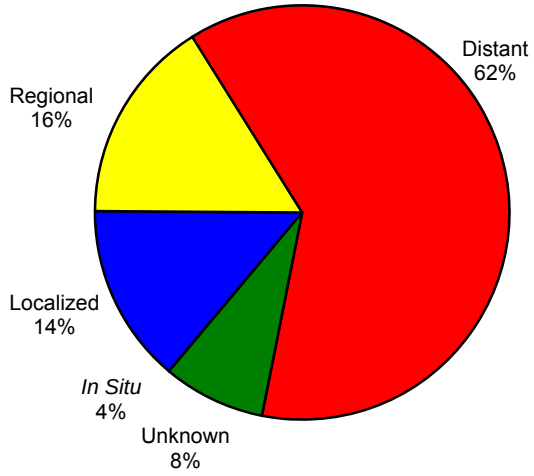
OVARY

Table 23: Ovarian Incidence and Mortality Summary, 2011

Ovarian Cancer			Incidence	Mortality
South Dakota	Total	# Cases / Deaths	50	40
		Age Adjusted Rate	9.9	7.0
	White	# Cases / Deaths	49	40
		Age Adjusted Rate	10.3	7.3
	American Indian	# Cases / Deaths	1	0
		Age Adjusted Rate	4.0	0.0
United States	Total	Age Adjusted Rate	11.5	* 7.8
	White	Age Adjusted Rate	12.1	* 8.1
	American Indian	Age Adjusted Rate	8.3	* 7.1

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 57: Ovarian Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

***Stage at Diagnosis*:** Staging of ovarian cancer is done by a surgical procedure to remove as much of the cancer as possible. Surgical staging is of critical importance in management of this disease. The morbidity associated with ovarian carcinoma is partially attributable to the fact that in the United States two-thirds of the patients present with advanced-stage disease at the time of diagnosis. In 2011, in South Dakota 31 (60%) of the 50 cases were diagnosed at distant stage.

Incidence: The incidence of ovarian cancer varies greatly. There were 50 cases of ovarian cancer reported in 2011 in South Dakota. This accounted for 2.3% of the cancer cases diagnosed in 2011 for South Dakota women. The lifetime risk of a woman developing ovarian cancer is 1.4%. Eight cases were diagnosed at younger than 49 years of age. There were 13 cases diagnosed in the 60-69 age group. The median age at diagnosis in South Dakota was 64.5; nationally it was 63.

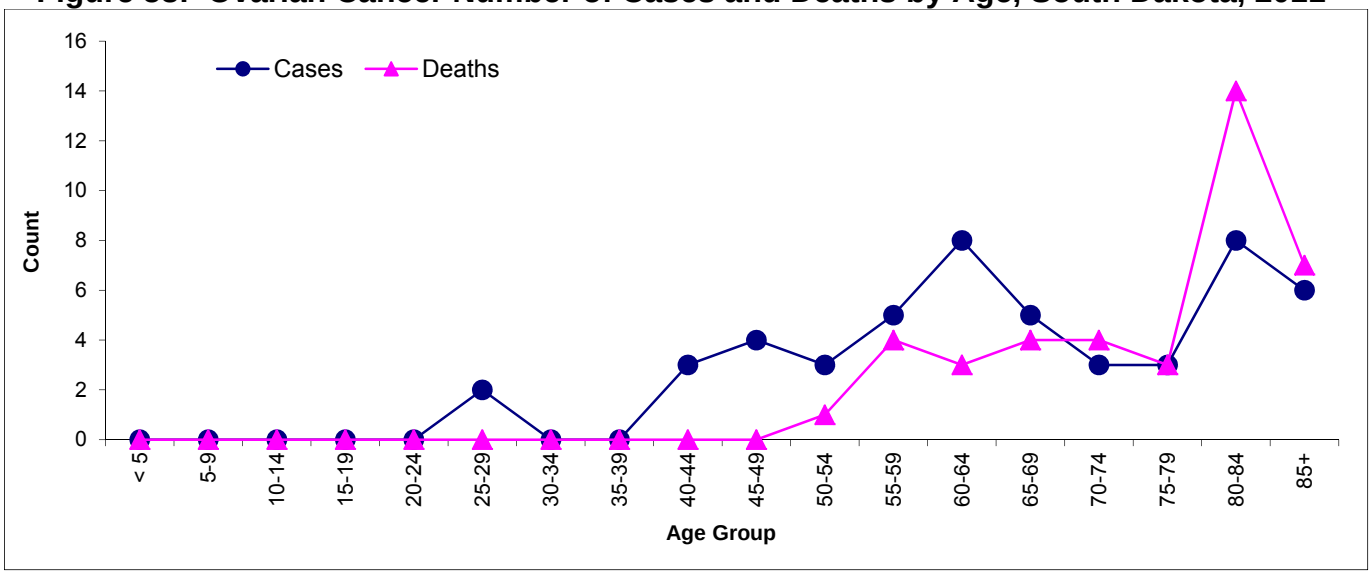
Mortality: Doctors are using dramatic new therapies to fight ovarian cancer, extending the lives of women who five or 10 years ago would have died from the disease. Survival rates for the last several decades are only about 25% for those with advanced disease. Most ovarian cancer presents at advanced disease. Only 27.4% of those diagnosed at late stage survive five years. For those who are diagnosed early, before the disease spreads beyond the ovaries, the disease is 92.3% curable. In South Dakota, 40 patients died in 2011. The mortality rate was 7.0 for women in South Dakota.

Risk and Associated Factors: Women who have a higher risk for developing ovarian cancer are those with a family history of the disease, those who have used fertility drugs, those who had their first baby after age 30 and those over the age of 65.

Prevention and Early Detection: Factors that may reduce the risk of ovarian cancer are pregnancy lasting full term, use of oral contraceptives, breastfeeding, tubal ligation, hysterectomy, or removal of ovaries in women with inherited risks.

No early stage screening tests have been proven for ovarian cancer and it can be difficult to detect until it has advanced. A combination of imaging and lab tests are the most useful diagnostic tools.

Figure 58: Ovarian Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

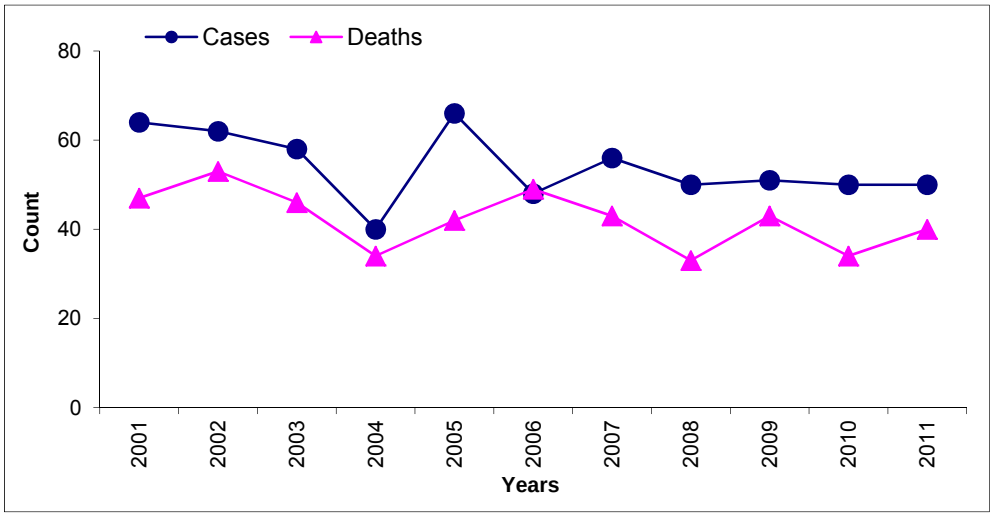


Figure 59: Ovarian Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

Source: South Dakota Department of Health

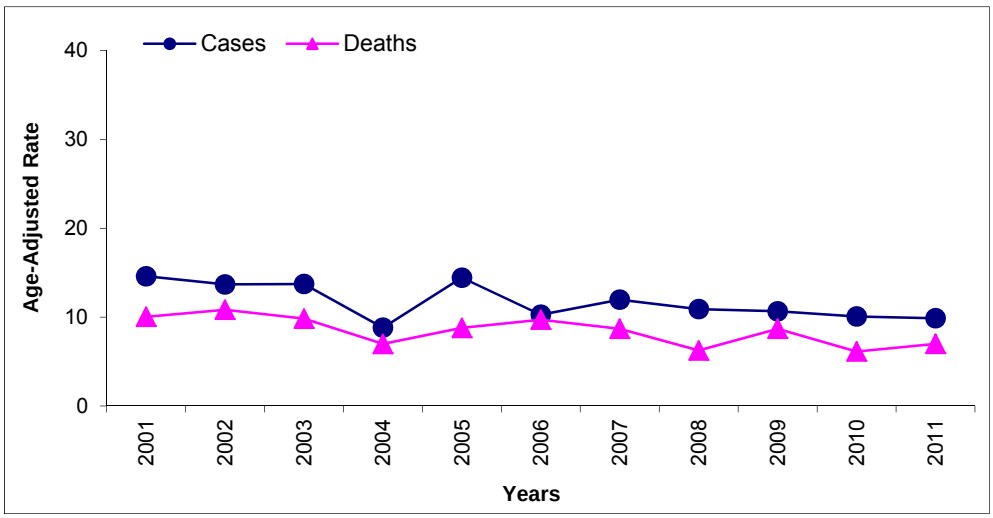


Figure 60: Ovarian Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

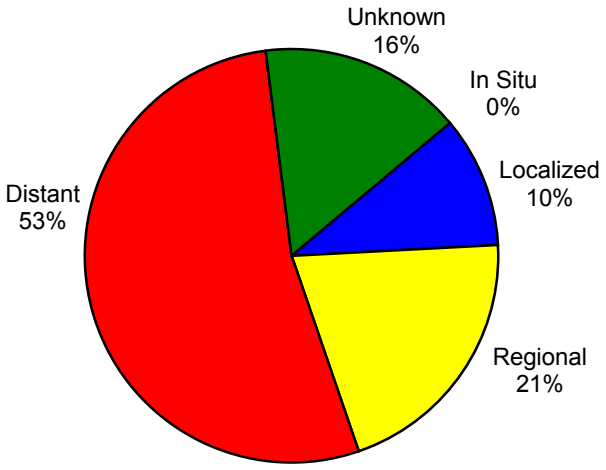
PANCREAS

Table 24: Pancreas Incidence and Mortality Summary, 2011

Pancreas Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**107**	46	61	**95**	40	55
		Age Adjusted Rate	**10.9**	10.1	11.3	**9.4**	8.7	9.8
	White	# Cases / Deaths	**104**	45	59	**88**	39	49
		Age Adjusted Rate	**11.0**	10.3	11.4	**9.1**	8.9	8.9
	American Indian	# Cases / Deaths	**3**	1	2	**6**	1	5
		Age Adjusted Rate	**10.5**	9.6	11.9	**17.2**	5.4	25.0
United States	**Total**	Age Adjusted Rate	**12.2**	14.0	10.7	*** 11.0**	* 12.7	* 9.6
	White	Age Adjusted Rate	**12.1**	14.1	10.5	*** 10.9**	* 12.6	* 9.4
	American Indian	Age Adjusted Rate	**9.5**	12.5	6.9	*** 9.5**	* 10.6	* 8.4

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 61: Pancreatic Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Often pancreatic cancer is diagnosed late in the disease process. Patients who have local stage disease may be acceptable for resection. Only 10 to 20% of patients with pancreatic cancer are candidates for surgical resection. In South Dakota, 74% of new cases were diagnosed at late stage (regional and distant) in 2011.

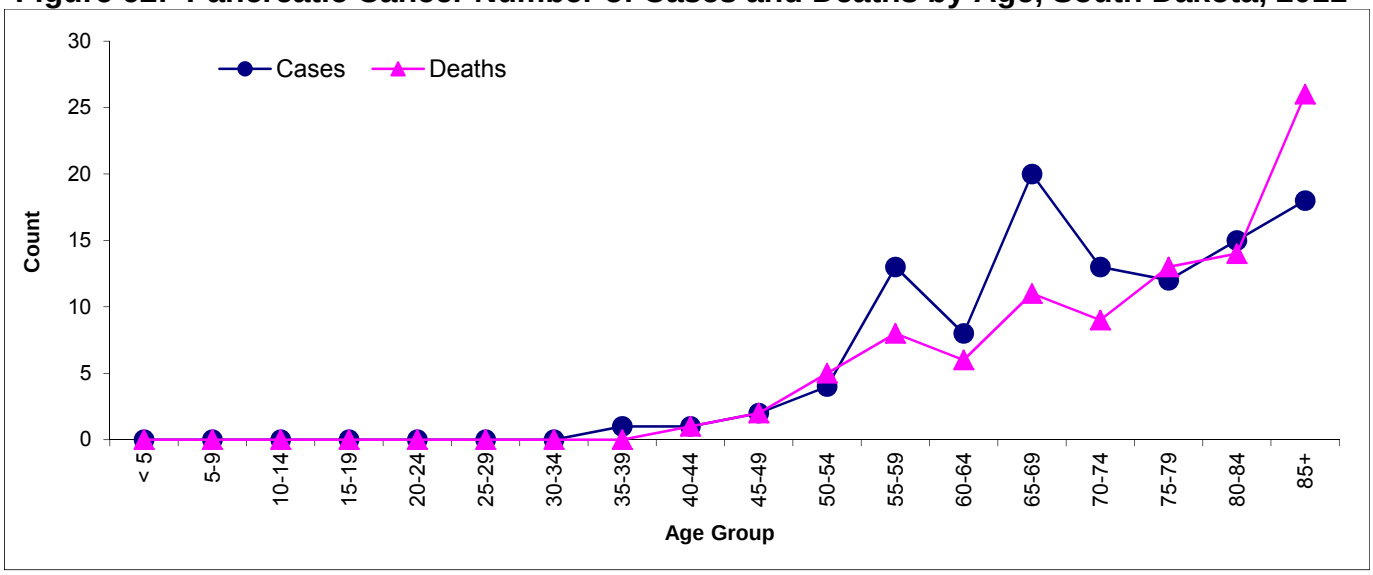
Incidence: The incidence of pancreatic cancer increases steadily with age. An estimated 44,030 new cases of pancreatic cancer were expected to be diagnosed in 2011 in the United States. The majority of the cases occured in South Dakotans 65 years old or older. Seventy-eight cases (72.9%) were diagnosed in 2011 in that age group. In the United States and South Dakota this cancer occured more in females than in males. Nationally, there was a higher incidence rate in blacks of both genders. The median age at diagnosis was 73 in South Dakota and 71 years in the United States.

Mortality: The overall survival for cancer of the pancreas is poor. Studies reveal that the 5-year survival rate is approximately 6.7%. More recently, prospective studies show survival improvement with postoperative chemotherapy. In 2011, there were 95 deaths and the median age at death was 77 in South Dakota.

Risk and Associated Factors: The exact causes of pancreatic cancer are unknown. Studies have found that certain factors increase a person's risk for developing pancreatic cancer. As one ages, the incidence of pancreatic cancer increases, especially after the age of 60. Cigarette smokers are two to three times more likely than nonsmokers to develop this cancer. Pancreatic cancer occurs frequently in those with diabetes. Also, African Americans are more likely than Asians, Hispanics, American Indians, or whites to have pancreatic cancer. The risk triples if the person's mother, father, sister, or brother had the disease. Also, a history of colon or ovarian cancer increases the risk. Some evidence shows that chronic pancreatitis may increase the risk.

Prevention and Early Detection: Currently, there are no known screenings for pancreatic cancer. Also, there is no specific prevention except to avoid smoking.

Figure 62: Pancreatic Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

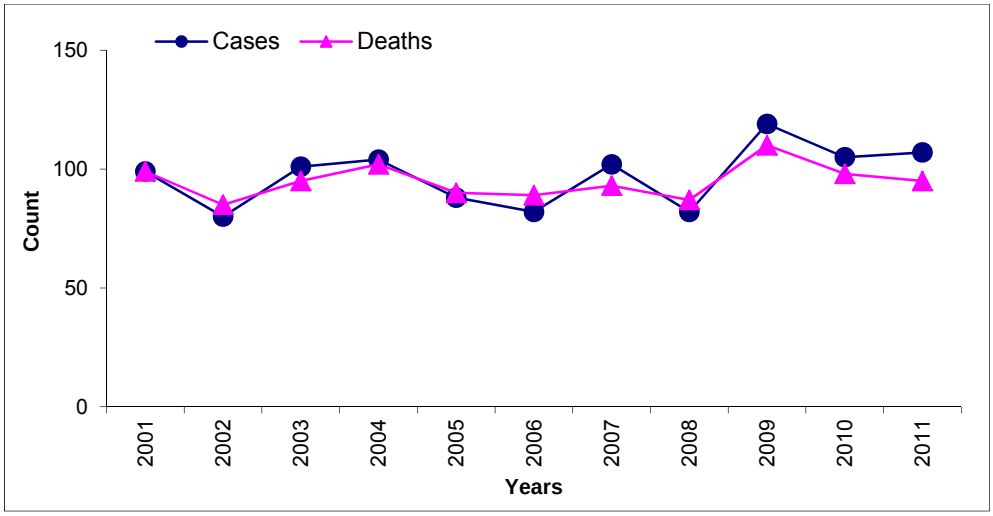


Figure 63: Pancreatic Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

Source: South Dakota Department of Health

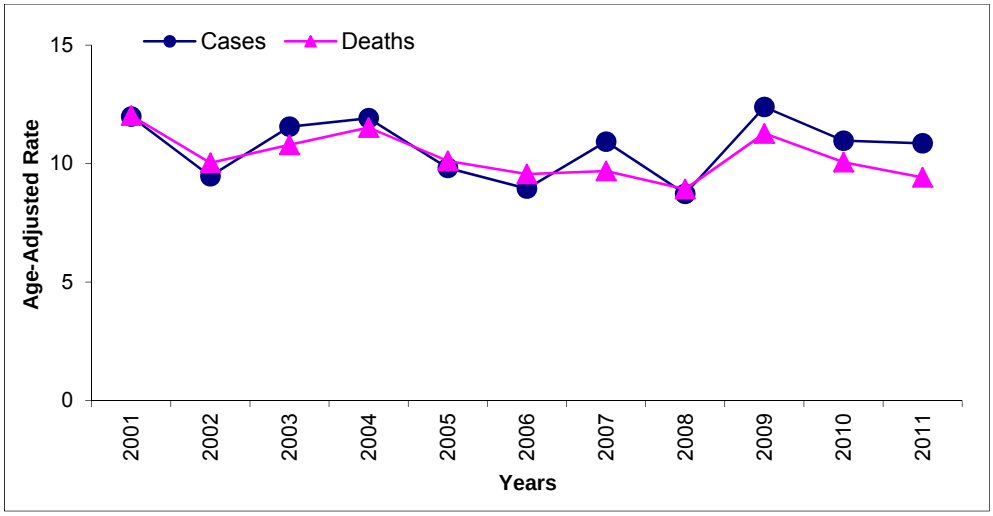


Figure 64: Pancreatic Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

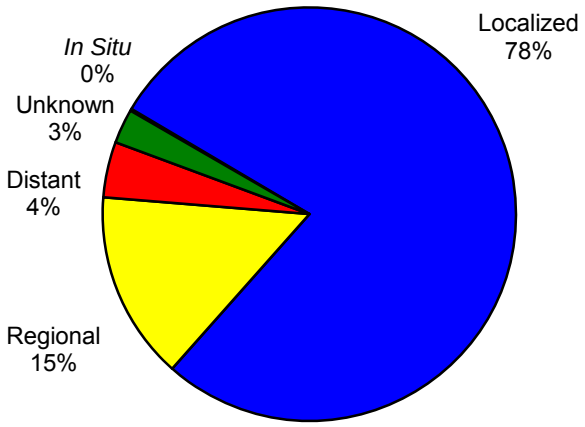
PROSTATE

Table 25: Prostate Incidence and Mortality Summary, 2011

Prostate Cancer			Incidence	Mortality
South Dakota	Total	# Cases / Deaths	596	88
		Age Adjusted Rate	127.1	20.8
	White	# Cases / Deaths	569	82
		Age Adjusted Rate	127.9	20.1
	American Indian	# Cases / Deaths	26	6
		Age Adjusted Rate	151.3	53.6
United States	Total	Age Adjusted Rate	135.7	* 21.8
	White	Age Adjusted Rate	125.9	* 20.1
	American Indian	Age Adjusted Rate	53.2	* 19.6

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 65: Prostate Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: The greatest number of cases was diagnosed at an early stage. In 2011, 78% of the cases were diagnosed as localized (not extending outside the prostate). Frequently older cases may simply be monitored (watchful waiting) by their physician to assess the rate of growth; others may be given hormonal therapy. New treatments for prostate cancer include the de Vinci Robotic assisted prostatectomy, proton therapy, and brachytherapy radiation.

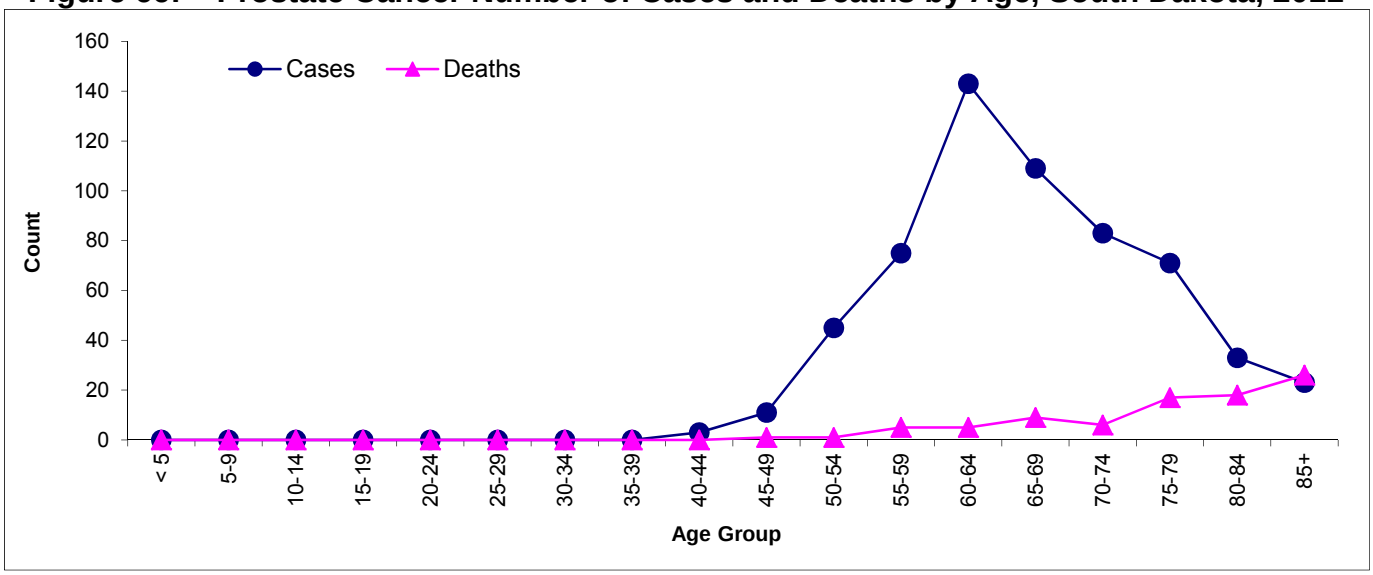
Incidence: Carcinoma of the prostate is predominately a tumor of older men. The median age at diagnosis in South Dakota is 65.5. Also, in South Dakota the incidence of prostate cancer begins to increase in the 60's age group. Nationwide, eight out of 10 men diagnosed with prostate cancer are over the age of 65. Prostate cancer is the second most diagnosed site of all cancers reported in the state.

Mortality: Prostate cancer was the second leading cancer death in men in South Dakota in 2011. 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 2011 was 79.5 years old and six were American Indians. Many patients have co-morbid conditions and will die of other causes rather than prostate cancer.

Risk and Associated Factors: A number of risk factors for prostate cancer have been identified. Studies suggest that prostate cancer risk is increased two to five-fold in relatives of men with prostate cancer. Environmental factors, including exposure to heavy metals may increase risk. Smoking has also been indicated as a risk. Diets high in saturated fat intake may also contribute.

Early Detection and Prevention: The availability of the Prostate Specific Antigen (PSA) test as a diagnostic test coupled with increased awareness by the public of the disease has produced an increase in the number of new cases diagnosed each year in the United States. Disease detected by elevated PSA in the presence of a palpable normal gland is the most common presentation of prostate cancer. The American Cancer Society recommends the PSA and digital rectal exam should be offered annually beginning at the age of 50.

Figure 66: Prostate Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

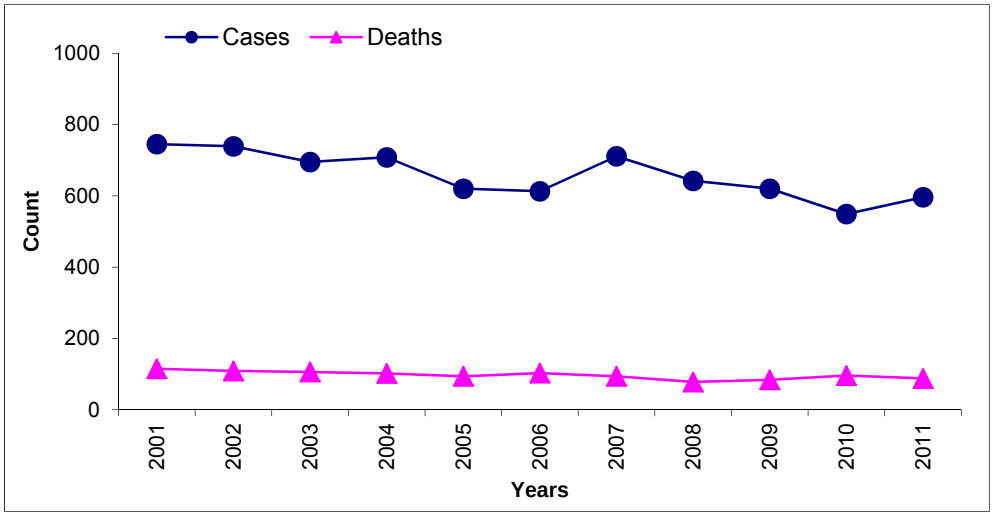


Figure 67: Prostate Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

Source: South Dakota Department of Health

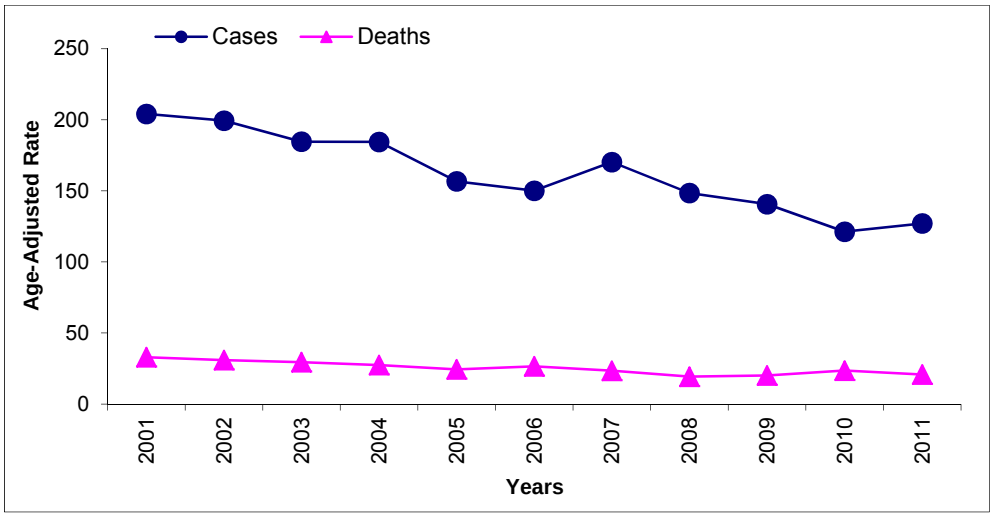


Figure 68: Prostate Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota 2001 - 2011

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

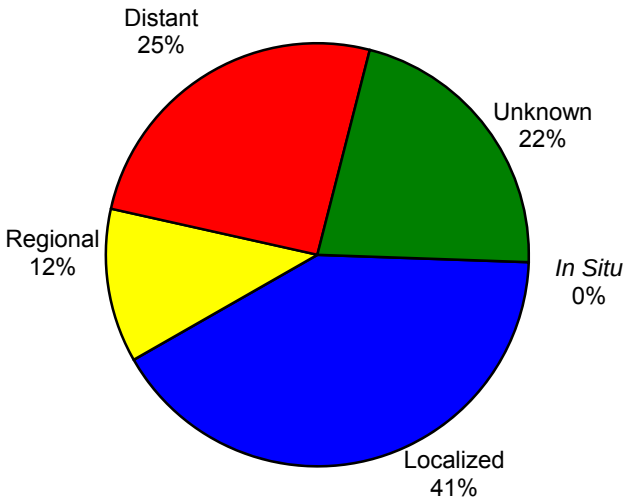
STOMACH

Table 26: Stomach Incidence and Mortality Summary, 2011

Stomach Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**51**	34	17	**27**	17	10
		Age Adjusted Rate	**5.4**	8.1	3.3	**2.7**	3.9	1.9
	White	# Cases / Deaths	**45**	32	13	**26**	16	10
		Age Adjusted Rate	**5.1**	8.1	2.6	**2.7**	3.9	2.0
	American Indian	# Cases / Deaths	**3**	1	2	**0**	0	0
		Age Adjusted Rate	**9.5**	9.6	9.8	**0.0**	0.0	0.0
United States	**Total**	Age Adjusted Rate	**7.2**	9.8	5.1	*** 3.4**	* 4.6	* 2.5
	White	Age Adjusted Rate	**6.5**	9.0	4.4	*** 3.0**	* 4.0	* 2.2
	American Indian	Age Adjusted Rate	**8.7**	13.7	5.2	*** 5.2**	* 7.1	* 3.7

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 69: Stomach Cancer Stage of Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: In 2011 data demonstrates that 21 (41%) cases were diagnosed at localized stage. When a patient is diagnosed at an early stage prognosis is much better. Six cases (12%) were diagnosed at regional stage. There were 13 (25%) of the cases in South Dakota diagnosed at distant stage. Prognosis for distant stage is very poor. The stage is based on whether the tumor has invaded nearby tissues, where the cancer has spread, and if so, to what extent.

Incidence: Stomach cancer continues to account for approximately 1.2% of all cancers in South Dakota. Of the 51 cases diagnosed in 2011, 34 were male and 17 were female. It is predominately a disease of men. Gastric (stomach) cancer is found more commonly in people between the ages of 50 and 70 years of age. The median age at diagnosis was 69 in the United States and 72 in South Dakota.

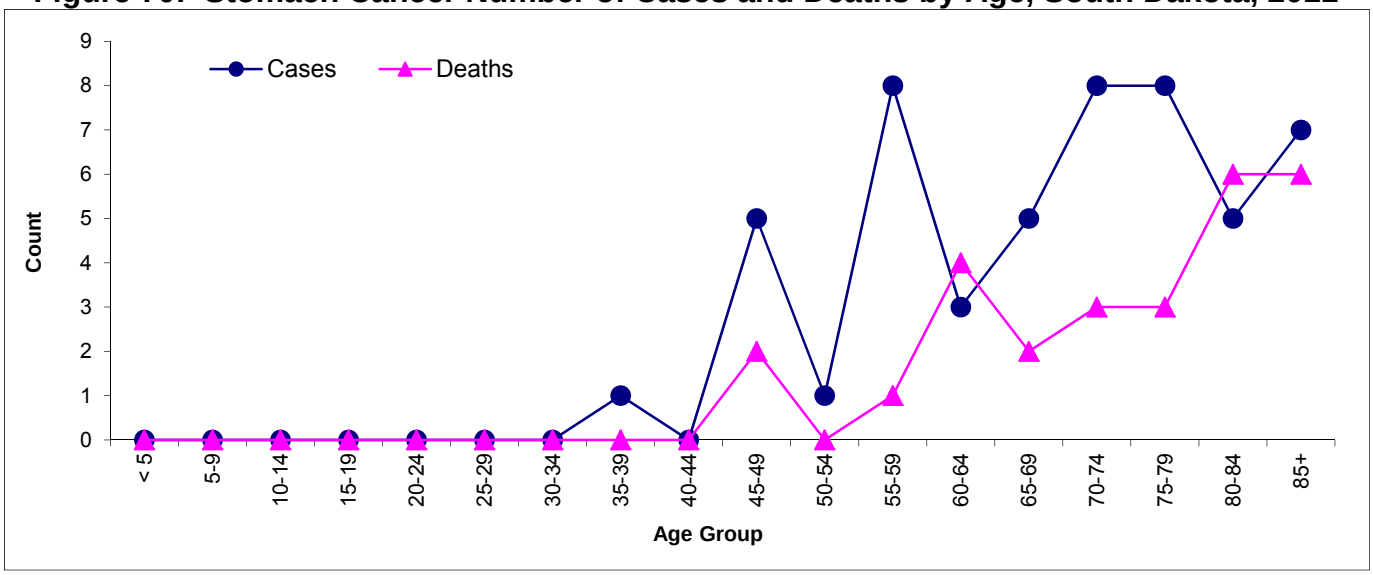
Mortality: Stomach cancer accounted for 1.6% of cancer deaths in South Dakota in 2011. The median age at death was 75 in South Dakota and 72 in the United States. The age-adjusted death rate was 3.3 for men and 1.9 in women in South Dakota. These rates are based on patients who died in 2011 in South Dakota. There were no American Indian stomach cancer deaths.

Risk and Associated Factors: Men have twice the risk of women for developing stomach cancer. In recent years, Helicobacter pylori bacteria have received considerable attention as a potential factor. Some researchers suspect this bacterium, which causes stomach inflammation and ulcers, may be an important stomach cancer risk factor. Individuals with pernicious anemia (a vitamin B-12-related disorder) and achlorhydria or gastric atrophy, both of which result in lower than normal amounts of gastric juices, may be at higher risk.

Prevention and Early Detection: Excessive salt intake has been identified as a possible risk factor for stomach cancer. Having a high intake of fresh fruits and vegetables may be associated with a decreased risk of stomach cancer. Studies have suggested that eating foods that contain **beta-carotene**[1] and **vitamin C**[2] may decrease the risk of stomach cancer.

[1]http://www.cancer.gov/Common/PopUps/popDefinition.aspx?id=45328&version=Patient&language=English
[2]http://www.cancer.gov/Common/PopUps/popDefinition.aspx?id=439435&version=Patient&language=English

Figure 70: Stomach Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

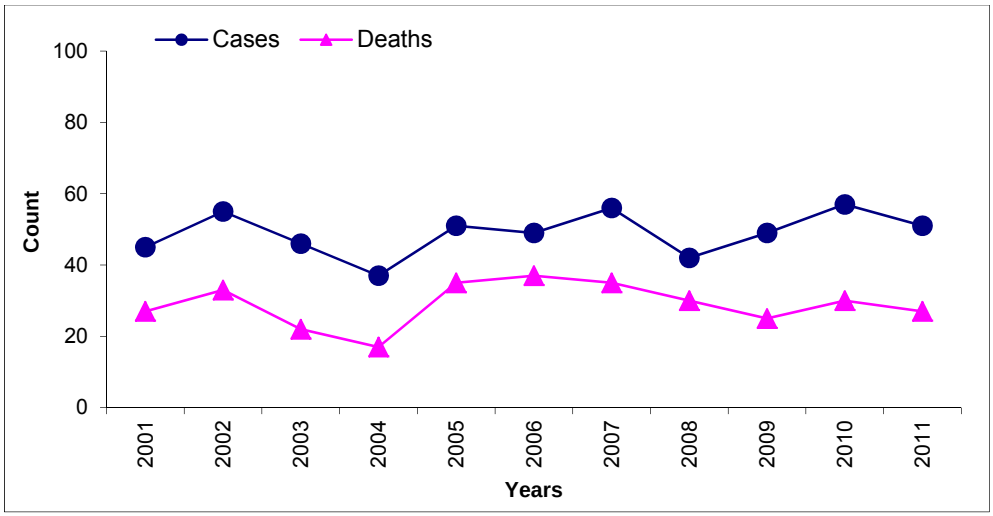


Figure 71: Stomach Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

Source: South Dakota Department of Health

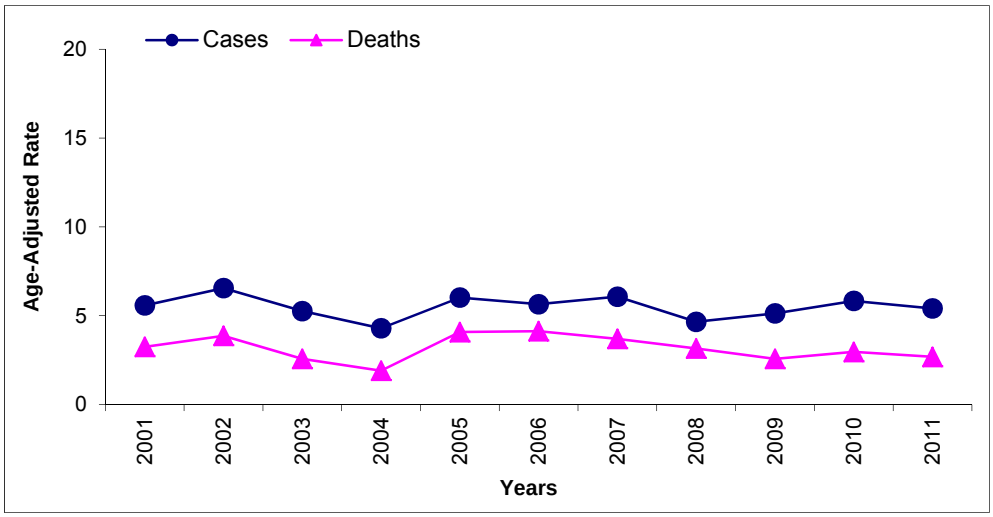


Figure 72: Stomach Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

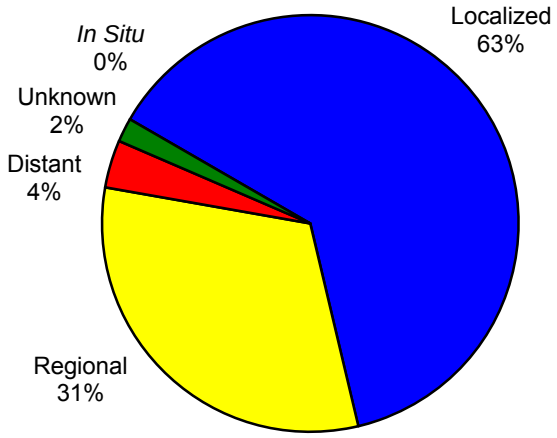
THYROID

Table 27: Thyroid Incidence and Mortality Summary, 2011

Thyroid Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**108**	24	84	**7**	4	3
		Age Adjusted Rate	**12.6**	5.4	20.0	**0.7**	0.9	0.6
	White	# Cases / Deaths	**102**	23	79	**6**	4	2
		Age Adjusted Rate	**13.3**	5.6	21.2	**0.6**	1.0	0.4
	American Indian	# Cases / Deaths	**2**	0	2	**0**	0	0
		Age Adjusted Rate	**2.9**	0.0	5.8	**0.0**	0.0	0.0
United States	**Total**	Age Adjusted Rate	**13.8**	6.9	20.5	*** 0.5**	* 0.5	* 0.5
	White	Age Adjusted Rate	**14.5**	7.4	21.7	*** 0.5**	* 0.5	* 0.5
	American Indian	Age Adjusted Rate	**8.0**	4.3	11.5	*****	* 0	*

Rates per 100,000 age-adjusted to 2000 US standard population and 2011 SD estimated population.
* US Mortality rates are from 2010, the 2011 rate is not available at this time. US rates www.seer.cancer.gov
Source: South Dakota Department of Health

Figure 73: Thyroid Cancer Stage at Diagnosis, South Dakota, 2011



Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: In 2011 data demonstrates that 68 (63%) of cases were diagnosed at localized stage. When a patient is diagnosed at an early stage, prognosis is much better for a cure. There were 31 (28%) cases diagnosed at regional stage. Only two cases (2%) were diagnosed at a distant stage.

Incidence: The American Cancer Society estimated 48,020 thyroid cancer cases would be diagnosed in the United States in 2011. Thyroid cancer continues to account for approximately 2.5% of all cancers in South Dakota. Of the 108 cases diagnosed in 2011, 24 were male and 84 were female. The median age at diagnosis was 54. In the United States the median age was 50. Thyroid cancer is found more commonly in people between the ages of 45 and 70 years of age, with 71% diagnosed before age 65. It is predominately a disease of females as the statistics of South Dakota confirm.

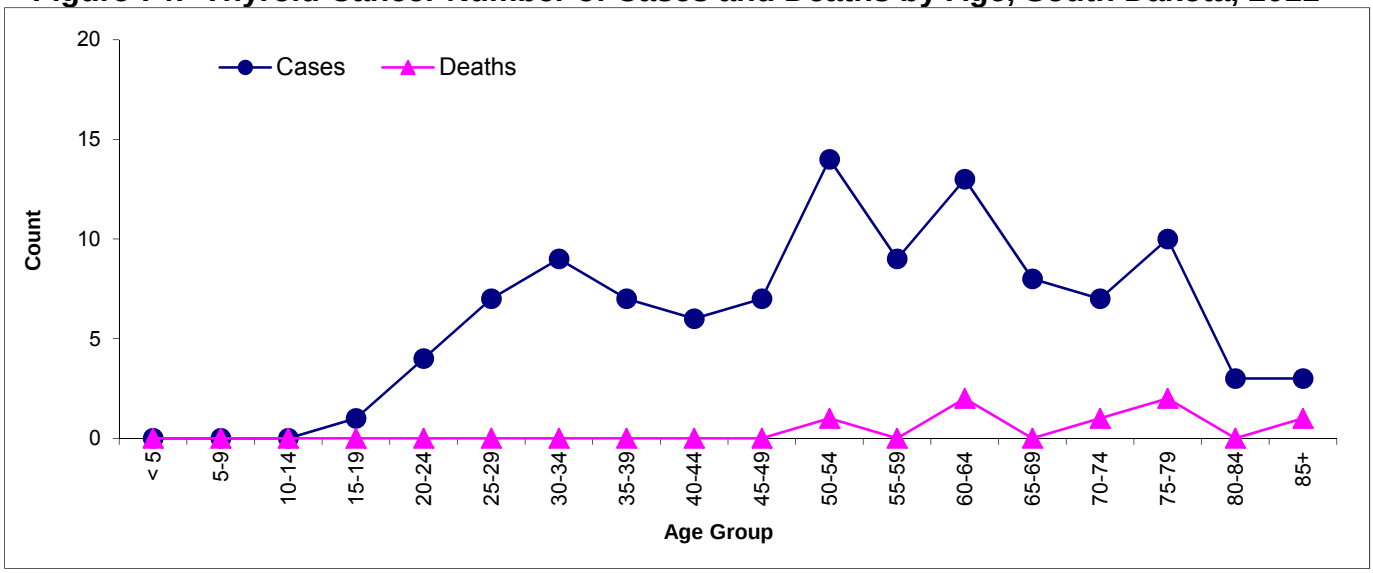
Mortality: There were seven deaths attributed to thyroid cancer in 2011. Nationally, the 5-year relative survival rates were 99.9% for localized, 98.1% for regional, and 89.6% for unknown stage.

Risk and Associated Factors: Thyroid cancer accounted for only 2.5% of the cancer cases in South Dakota in 2011. Risk factors include being exposed to radiation to the head and neck in childhood. Other risk factors for the development of thyroid cancer include a history of goiter, family history of thyroid disease, and Asian race.

Early Detection and Prevention: Early detection of cancer of the thyroid is extremely important. There are currently no tests or screenings for early detection of thyroid cancer. Physical examinations may reveal a lump on the side of neck, hoarseness of the voice, and difficulty swallowing. Most cancerous thyroid tumors are slow growing and curable. Prompt attention to signs and symptoms is the best approach to early diagnosis of most thyroid cancers. Signs or symptoms include:

- A lump in the neck, sometimes growing rapidly
- A pain in the neck, sometimes going up to the ears
- Hoarseness
- Trouble swallowing
- Breathing problems (feeling as if one were breathing through a straw)
- A cough that persists and is not due to a cold

Figure 74: Thyroid Cancer Number of Cases and Deaths by Age, South Dakota, 2011



Source: South Dakota Department of Health

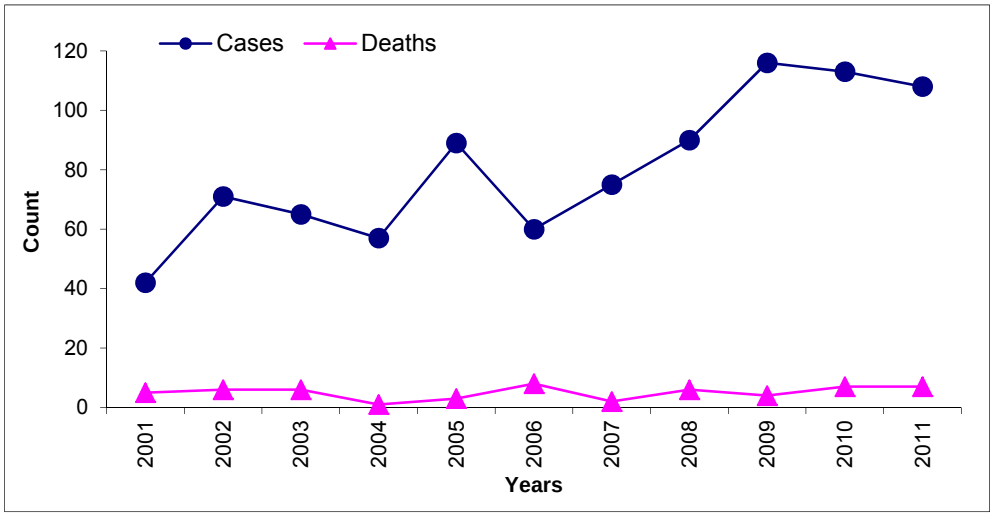


Figure 75: Thyroid Cancer Cases and Deaths by Year, South Dakota, 2001 - 2011

The incidence count for thyroid cancers peaked in 2011.

Source: South Dakota Department of Health

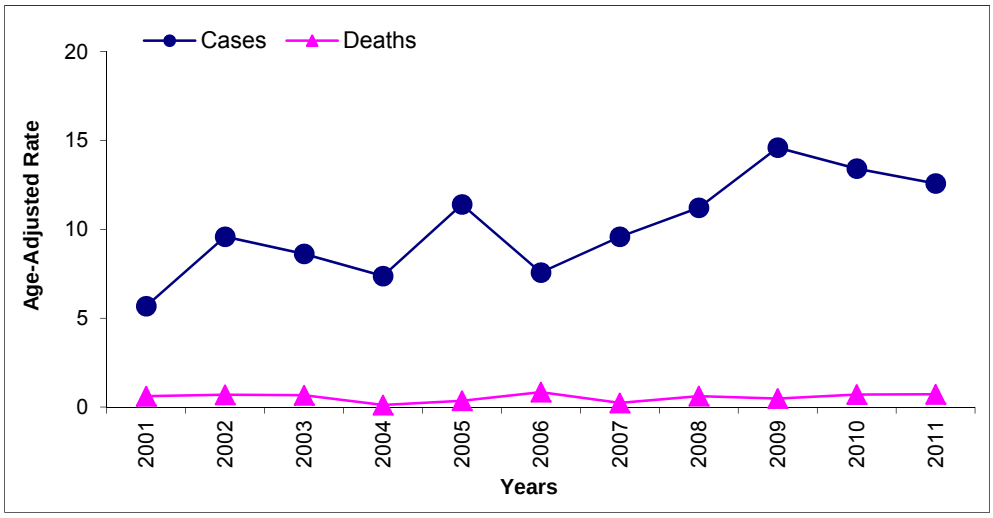


Figure 76: Thyroid Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2011

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

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. 2002-2011 South Dakota Estimated Population

Year	2002	2003	2004	2005	2007	2007	2008	2009	2010	2011
Total	762,107	766,975	774,283	780,084	788,519	797,035	804,532	812,383	814,180	824,082
<5	51,187	51,908	53,062	54,334	55,640	57,448	58,582	59,640	59,621	59,591
5-9	52,492	51,598	51,359	51,478	51,545	51,944	52,692	53,496	55,531	56,389
10-14	57,916	57,154	56,171	54,880	54,450	53,630	52,954	52,576	53,960	54,096
15-19	62,533	62,195	61,741	60,843	60,084	59,858	59,184	58,571	57,628	57,916
20-24	56,935	59,591	61,852	62,742	63,756	62,601	62,764	62,919	57,596	58,178
25-29	43,925	44,685	45,983	47,482	48,972	51,977	53,851	56,270	55,570	56,020
30-34	45,671	45,078	44,686	44,406	43,985	44,439	45,387	46,540	49,859	52,216
35-39	51,472	48,792	47,126	46,103	46,184	46,287	46,003	45,707	45,766	45,524
40-44	58,693	58,394	57,759	56,131	54,090	51,639	49,163	47,626	47,346	47,375
45-49	56,603	57,427	57,749	58,361	58,701	58,653	58,526	57,845	57,519	54,849
50-54	48,573	50,266	52,259	53,782	55,507	56,682	57,673	57,850	59,399	59,960
55-59	37,468	39,282	41,733	44,626	47,667	49,558	51,199	52,996	54,231	56,261
60-64	29,984	31,499	33,056	34,232	35,504	38,305	40,441	42,615	43,573	47,054
65-69	26,627	26,771	27,201	27,699	28,381	29,312	30,956	32,303	31,944	33,144
70-74	25,647	25,272	24,845	24,567	24,588	24,670	24,879	25,236	25,683	25,882
75-79	22,487	22,518	22,412	22,441	22,634	22,574	22,287	21,866	21,724	21,660
80-84	17,146	17,356	17,707	17,826	18,043	18,162	18,253	18,122	18,004	18,102
85+	16,748	17,189	17,582	18,151	18,788	19,296	19,738	20,205	19,226	19,865

Appendix C: Race in South Dakota by County, 2011 Estimated Population

	Total	White		Black		American Indian		Asian		Other	
South Dakota	824,082	713,633	87%	11,523	1%	73,285	9%	8,318	1%	17,323	2%
Aurora	2,694	2,598	96%	12	0%	43	2%	18	1%	23	1%
Beadle	17,550	16,032	91%	222	1%	227	1%	767	4%	302	2%
Bennett	3,441	1,199	35%	6	0%	2,072	60%	18	1%	146	4%
Bon Homme	6,983	6,283	90%	68	1%	519	7%	12	0%	101	1%
Brookings	32,226	30,216	94%	288	1%	342	1%	912	3%	468	1%
Brown	36,822	34,483	94%	234	1%	1,134	3%	364	1%	607	2%
Brule	5,283	4,671	88%	15	0%	448	8%	11	0%	138	3%
Buffalo	1,988	349	18%	5	0%	1,601	81%	3	0%	30	2%
Butte	10,259	9,712	95%	39	0%	211	2%	27	0%	270	3%
Campbell	1,427	1,406	99%	2	0%	5	0%	7	0%	7	0%
Charles Mix	9,208	5,996	65%	21	0%	2,897	31%	21	0%	273	3%
Clark	3,628	3,579	99%	13	0%	5	0%	2	0%	29	1%
Clay	14,051	12,795	91%	202	1%	468	3%	265	2%	321	2%
Codington	27,442	26,231	96%	131	0%	590	2%	145	1%	345	1%
Corson	4,022	1,237	31%	10	0%	2,654	66%	16	0%	105	3%
Custer	8,338	7,842	94%	40	0%	261	3%	31	0%	164	2%
Davison	19,651	18,599	95%	128	1%	505	3%	100	1%	319	2%
Day	5,741	5,071	88%	15	0%	540	9%	14	0%	101	2%
Deuel	4,359	4,286	98%	18	0%	21	0%	4	0%	30	1%
Dewey	5,421	1,239	23%	10	0%	3,963	73%	11	0%	198	4%
Douglas	2,972	2,874	97%	15	1%	59	2%	3	0%	21	1%
Edmunds	4,056	3,971	98%	6	0%	23	1%	6	0%	50	1%
Fall River	6,981	6,201	89%	61	1%	491	7%	29	0%	199	3%
Faulk	2,367	2,336	99%	3	0%	4	0%	3	0%	21	1%
Grant	7,250	7,114	98%	11	0%	44	1%	25	0%	56	1%
Gregory	4,216	3,793	90%	7	0%	312	7%	14	0%	90	2%
Haakon	1,907	1,800	94%	3	0%	39	2%	11	1%	54	3%
Hamlin	5,978	5,887	98%	14	0%	24	0%	17	0%	36	1%
Hand	3,423	3,370	98%	3	0%	10	0%	11	0%	29	1%
Hanson	3,376	3,323	98%	3	0%	20	1%	12	0%	18	1%
Harding	1,269	1,227	97%	1	0%	20	2%	1	0%	20	2%
Hughes	17,292	14,777	85%	156	1%	1,850	11%	99	1%	410	2%
Hutchinson	7,257	7,082	98%	35	0%	69	1%	12	0%	59	1%
Hyde	1,394	1,252	90%	2	0%	108	8%	3	0%	29	2%
Jackson	3,169	1,358	43%	15	0%	1,630	51%	2	0%	164	5%
Jerauld	2,085	2,047	98%	4	0%	9	0%	5	0%	20	1%
Jones	1,003	949	95%	2	0%	24	2%	1	0%	27	3%
Kingsbury	5,179	5,071	98%	11	0%	29	1%	17	0%	51	1%
Lake	11,567	11,166	97%	78	1%	88	1%	83	1%	152	1%
Lawrence	24,312	22,911	94%	166	1%	555	2%	177	1%	503	2%
Lincoln	46,793	44,937	96%	382	1%	317	1%	513	1%	644	1%
Lyman	3,806	2,252	59%	8	0%	1,426	37%	11	0%	109	3%
Marshall	5,556	5,456	98%	15	0%	32	1%	11	0%	42	1%
McCook	2,452	2,420	99%	1	0%	3	0%	6	0%	22	1%
McPherson	4,597	4,066	88%	20	0%	438	10%	14	0%	59	1%
Meade	25,546	23,549	92%	435	2%	643	3%	193	1%	726	3%
Mellette	2,067	820	40%	4	0%	1,110	54%	6	0%	127	6%
Miner	2,359	2,320	98%	3	0%	4	0%	9	0%	23	1%
Minnehaha	171,752	154,024	90%	6,493	4%	4,757	3%	2,606	2%	3,872	2%
Moody	6,475	5,306	82%	40	1%	897	14%	70	1%	162	3%
Pennington	102,815	86,724	84%	1,332	1%	9,965	10%	1,129	1%	3,665	4%
Perkins	3,001	2,905	97%	9	0%	46	2%	6	0%	35	1%
Potter	2,364	2,303	97%	4	0%	21	1%	9	0%	27	1%
Roberts	10,286	6,349	62%	29	0%	3,556	35%	31	0%	321	3%
Sanborn	2,392	2,343	98%	1	0%	12	1%	6	0%	30	1%
Shannon	13,928	750	5%	45	0%	12,876	92%	50	0%	207	1%
Spink	6,470	6,304	97%	22	0%	90	1%	7	0%	47	1%
Stanley	3,002	2,706	90%	10	0%	198	7%	4	0%	84	3%
Sully	1,375	1,329	97%	3	0%	17	1%	0	0%	26	2%
Todd	9,822	1076	11%	31	0%	8,502	87%	26	0%	187	2%
Tripp	5,615	4,684	83%	12	0%	780	14%	12	0%	127	2%
Turner	8,332	8,121	97%	23	0%	89	1%	18	0%	81	1%
Union	14,651	14,091	96%	117	1%	109	1%	144	1%	190	1%
Walworth	5,575	4,622	83%	9	0%	775	14%	17	0%	152	3%
Yankton	22,612	21,171	94%	392	2%	622	3%	133	1%	294	1%
Ziebach	2,852	672	24%	8	0%	2,086	73%	8	0%	78	3%

U.S. Census Bureau Estimated Race Population

Appendix D: SEER Incidence Site Analysis Categories

Site Group	ICD-O-3 Site	ICD-O-3 Histology (Type)	Recode
Oral Cavity and Pharynx			
Lip	C000-C009	excluding 9050-9055, 9140, 9590-9992	20010
Tongue	C019-C029		20020
Salivary Gland	C079-C089		20030
Floor of Mouth	C040-C049		20040
Gum and Other Mouth	C030-C039, C050-C059, C060-C069		20050
Nasopharynx	C110-C119		20060
Tonsil	C090-C099		20070
Oropharynx	C100-C109		20080
Hypopharynx	C129, C130-C139		20090
Other Oral Cavity and Pharynx	C140, C142-C148		20100
Digestive System			
Esophagus	C150-C159	excluding 9050-9055, 9140, 9590-9992	21010
Stomach	C160-C169		21020
Small Intestine	C170-C179		21030
Colon and Rectum			
Colon Excluding Rectum			
Cecum	C180	excluding 9050-9055, 9140, 9590-9992	21041
Appendix	C181		21042
Ascending Colon	C182		21043
Hepatic Flexure	C183		21044
Transverse Colon	C184		21045
Splenic Flexure	C185		21046
Descending Colon	C186		21047
Sigmoid Colon	C187		21048
Large Intestine, NOS	C188-C189, C260		21049
Rectum and Rectosigmoid Junction			
Rectosigmoid Junction	C199	excluding 9050-9055, 9140, 9590-9992	21051
Rectum	C209		21052
Anus, Anal Canal and Anorectum	C210-C212, C218		21060
Liver and Intrahepatic Bile Duct			
Liver	C220	excluding 9050-9055, 9140, 9590-9992	21071
Intrahepatic Bile Duct	C221		21072
Gallbladder	C239		21080
Other Biliary	C240-C249		21090
Pancreas	C250-C259		21100
Retroperitoneum	C480		21110
Peritoneum, Omentum and Mesentery	C481-C482		21120
Other Digestive Organs	C268-C269, C488		21130
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

Appendix D: SEER Incidence Site Analysis Categories (continued)

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		
Other Non-Epithelial Skin	C440-C449		
Breast	**C500-C509**	8720-8790	25010
Female Genital System		excluding 8000-8005, 8010-8046, 8050-8084, 8090-8110, 8720-8790, 9050-9055, 9140, 9590-9992	25020
Cervix Uteri	C530-C539	**excluding 9050-9055, 9140, 9590-9992**	**26000**
Corpus and Uterus, NOS			
Corpus Uteri	C540-C549	excluding 9050-9055, 9140, 9590-9992	27010
Uterus, NOS	C559		
Ovary	C569	excluding 9050-9055, 9140, 9590-9992	27020
Vagina	C529		27030
Vulva	C510-C519		27040
Other Female Genital Organs	C570-C589		27050
Male Genital System			27060
Prostate	C619	excluding 9050-9055, 9140, 9590-9992	27070
Testis	C620-C629		
Penis	C600-C609		28010
Other Male Genital Organs	C630-C639		28020
Urinary System			28030
Urinary Bladder	C670-C679	excluding 9050-9055, 9140, 9590-9992	28040
Kidney and Renal Pelvis	C649, C659		
Ureter	C669		29010
Other Urinary Organs	C680-C689		29020
Eye and Orbit	**C690-C699**		29030
Brain and Other Nervous System			29040
Brain	C710-C719	**excluding 9050-9055, 9140, 9590-9992**	**30000**
Cranial Nerves Other Nervous System	C710-C719		
	C700-C709, C720-C729	excluding 9590-9989, and sometimes 9050-9055, 9140+	
Endocrine System		excluding 9050-9055, 9140, 9530-9539, 9590-9992	31010
Thyroid	C739	9530-9539	31040
Other Endocrine Including Thymus	C379, C740-C749, C750-C759	excluding 9050-9055, 9140, 9590-9992	32020

Appendix D: SEER Incidence Site Analysis Categories (continued)

Lymphoma			
Hodgkin's Lymphoma			
Hodgkin's - Nodal	C024, C098-C099, C111, C142, C379, C422, C770-C779	9650-9667	33011
Hodgkin's - Extranodal	All other sites		33012
Non-Hodgkin's Lymphoma			
NHL - Nodal	C024, C098,C099, C111,C142, C379,C422, C770-C779	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687-9691, 9695, 9698-9702, 9705, 9708-9709, 9712, 9714-9719, 9724-9729, 9735, 9737-9738, 9811-9818, 9823, 9827, 9837	33041
NHL - Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9597, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9688, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9712, 9714-9719, 9724-9729, 9735, 9737, 9738	33042
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9811-9818, 9823, 9827, 9837	
Myeloma		**9731-9732, 9734**	**34000**
Leukemia			
Lymphocytic Leukemia			
Acute Lymphocytic Leukemia		9826, 9835-9836	35011
Chronic Lymphocytic Leukemia	C420, C421, C424	9811-9818, 9837	
Other Lymphocytic Leukemia		9823	35012
Myeloid and Monocytic Leukemia		9820, 9832-9834, 9940	35013
Acute Myeloid Leukemia			
Acute Monocytic Leukemia		9840, 9861, 9865-9867, 9869, 9871-9874, 9895-9897, 9898, 9910-9911, 9920	35021
Chronic Myeloid Leukemia		9891	35031
Other Myeloid/Monocytic Leukemia		9863, 9875-9876, 9945-9946	35022
Other Leukemia		9860, 9930	35023
Other Acute Leukemia		9801, 9805-9809, 9931	35041
Aleukemic, Subleukemic and NOS		9733, 9742, 9800, 9831, 9870, 9948, 9963-9964	35043
	C420, C421, C424	9827	
Mesothelioma +		**9050-9055**	**36010**
Kaposi Sarcoma +		**9140**	**36020**
Miscellaneous		**9740-9741, 9750-9769, 9950, 9960-9962, 9965-9967, 9970-9971, 9975, 9980, 9982-9987, 9989, 9991-9992**	**37000**
	C760-C768, C809	**excluding 9590-9989, and sometimes 9050-9055, 9140+**	
	C420-C424		
	C770-C779		
Invalid	**Site or histology code not within valid range or site code not found in this table.**		**99999**

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

+ The Site Recode variable can be created with or without Mesothelioma (9050-9055) and Kaposi Sarcoma (9140) as separate groupings. The table above documents both possibilities.

Appendix E: SEER Cancer Cause of Death Analysis Categories

Cancer Causes of Death	*ICD-10*
All Malignant Cancers	*C00-C97*
Oral Cavity and Pharynx	
Lip	*C00*
Tongue	*C01-C02*
Salivary Gland	*C07-C08*
Floor of Mouth	*C04*
Gum and Other Mouth	*C03, C05-C06*
Nasopharynx	*C11*
Tonsil	*C09*
Oropharynx	*C10*
Hypopharynx	*C12-C13*
Other Oral Cavity and Pharynx	*C14*
Digestive System	
Esophagus	*C15*
Stomach	*C16*
Small Intestine	*C17*
Colon and Rectum	
Colon Excluding Rectum	*C18, C26.0*
Rectum and Rectosigmoid Junction	*C19-C20*
Anus, Anal Canal and Anorectum	*C21*
Liver and Intrahepatic Bile Duct	
Liver	*C22.0, C22.2-C22.4, C22.7, C22.9*
Intrahepatic Bile Duct	*C22.1*
Gallbladder	*C23*
Other Biliary	*C24*
Pancreas	*C25*
Retroperitoneum	*C48.0*
Peritoneum, Omentum and Mesentery	*C45.1+, C48.1-C48.2*
Other Digestive Organs	*C26.8-C26.9, C48.8*
Respiratory System	
Nose, Nasal Cavity and Middle Ear	*C30-C31*
Larynx	*C32*
Lung and Bronchus	*C34*
Pleura	*C38.4, C45.0+*
Trachea, Mediastinum and Other Respiratory Organs	*C33, C38.1-C38.3, C38.8, C39*
Bones and Joints	*C40-C41*
Soft Tissue including Heart	*C47, C49, C38.0, C45.2+*
Skin excluding Basal and Squamous	
Melanoma of the Skin	*C43*
Other Non-Epithelial Skin	*C44, C46+*
Breast	*C50*
Female Genital System	
Cervix Uteri	*C53*
Corpus and Uterus, NOS	
Corpus Uteri	*C54*
Uterus, NOS	*C55*
Ovary	*C56*
Vagina	*C52*
Vulva	*C51*
Other Female Genital Organs	*C57-C58*

Appendix E: SEER Cancer Cause of Death Analysis Categories (Continued)

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

Source: http://seer.cancer.gov/codrecode

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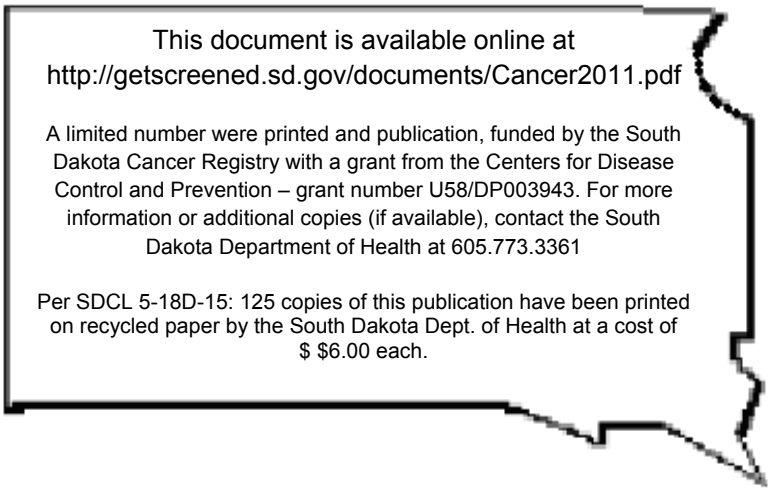

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A limited number were printed and publication, funded by the South Dakota Cancer Registry with a grant from the Centers for Disease Control and Prevention – grant number U58/DP003943. For more information or additional copies (if available), contact the South Dakota Department of Health at 605.773.3361

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