

Cancer in South Dakota 2006



South Dakota Cancer Registry
Department of Health

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Cancer
In
South Dakota
2006

Preface

“Cancer in South Dakota, 2006,” is the fourteenth annual report from the South Dakota Cancer Registry (SDCR) in the Office of Health Promotion in the Division of Health and Medical Services within the South Dakota Department of Health (DOH). The report contains 2006 incidence and mortality data of South Dakota residents.

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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 2006

- 3,571 South Dakotans were diagnosed with invasive, reportable cases of cancer, which excludes the less life-threatening cancers such as *in situ* cancers (except *in situ* bladders) and the common skin cancers.
- Each day 9 cases of cancer are diagnosed in residents of South Dakota; this includes only those cases of invasive cancer and *in situ* bladder.
- The top five cancer sites accounted for 60.3% of all cancer cases.
- Prostate cancer was the most common reportable malignancy reported with 590 cases, 16.5% of all cases.
- Lung cancer was the second most common reportable malignancy with 523 cases among women and men, accounting for 14.6% of all cases.
- Female breast cancers were the third most common reportable cancer with 473 cases, 13.3% of all cases.
- Colon and rectal cancers were the fourth most common malignancy with 384 cases, 10.8% of all cases.
- Urinary bladder cancers were the fifth most common malignancy with 182 cases, 5.1% of all reported cases. Of the 182 cases, 105 were *in situ*.
- More than half, 54.2%, of all new cancers were diagnosed in males and 45.8% were in females.
- Males had an age-adjusted incidence rate of 541.1 per 100,000, which was higher than females with an age-adjusted rate of 381.8 per 100,000 females.
- Whites accounted for 94% of cancer cases with 3,359 cases whereas American Indians were 4.7% with 168 cases.
- The American Indian age-adjusted incidence rate was 544.1, which is higher than the age-adjusted rate among whites of 442.7.
- The South Dakota age-adjusted incidence rate for 2006 was 447.8, slightly lower than the U.S. SEER age-adjusted incidence rate of 462.9 per 100,000 persons.

Mortality 2006

- Overall, cancer was the second leading cause of death in South Dakota.
- Cancer surpassed heart disease as the leading cause of death for persons under 85 years old.
- 1,561 South Dakotans died from cancer, accounting for one in every five deaths.
- Each day 4 South Dakotans died from cancer.
- The top five cancers sites causing death accounted for 55.8% of all cancer deaths.
- Lung and bronchus cancers were the first leading cause of cancer deaths with 435 deaths, 27.9% of all cancer deaths making it the cause of 1 in 4 deaths due to cancer.
- Colorectal cancer was the second leading cause of cancer deaths with 149 deaths, 9.5% of all cancer deaths.
- Prostate cancer was the third leading cause of death with 103 deaths, 6.6% of all cancer deaths and 12% of all male cancer deaths.
- Female breast cancer was the fourth leading cause of death with 95 deaths, 6% of all cancer deaths and 13.6% of all female cancer deaths.
- Over half, 55%, of all cancer deaths were males and 45% were females.
- Males had an age-adjusted death rate of 244.1 per 100,000 males, 59.1% higher than females with an age-adjusted rate of 145.9 deaths per 100,000 females.
- Whites accounted for 94.6% of deaths with 1,477 deaths, whereas American Indians were 4.8% with 76 deaths.
- The American Indian age-adjusted death rate is 287.0 which is 63% higher than the rate among whites at the age-adjusted death rate of 182.6.
- South Dakota's age-adjusted death rate for 2006 was 185.4, lower than the U.S. SEER rate of 189.8.

Trends

- South Dakota's all sites combined cancer death rates fell by -1.4% change (PC) from 2001-2005 with a PC of -2.0 for males and -1.5 for females.
- The death rate fell by an annual percent change (APC) of -1.5% during 1998-2002 with an APC of 1.2 for males and 0.0 for females.
- The APC was -1.2 for whites and 2.8 for American Indians.

II. INTRODUCTION

A limited cancer data collection system was established in 1992 under South Dakota Codified Laws, SDCL 1-43-11- 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 1 July 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 § 1-43-1 1 to 1-43-1 7, inclusive.

Reportable cancers for 2006 include all malignant neoplasms except basal and squamous cell carcinomas of the skin and *in situ* cervical cancers. Many stakeholders such as hospital tumor registries and pathologists submitted data to the central registry. In addition, the SDCR actively followed back pathology reports and abstracted cases from facilities without tumor registries when possible.

The SDCR performs many quality assurance procedures to assure that the data is valid. The data is 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 vital statistics to provide useful information for cancer control and prevention programs, researchers, clinicians and policy makers. The SDCR is able to answer various 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 affected by cancer the most?
- 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 stricken 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 healthcare entities and providers report cases, there will be more questions that could be answered with the data. For example with more data the SDCR could look at some modifiable risk factors such as obesity and exercise with incidence. 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	5%
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

As the SDCR expands data collection, it should become more useful to help prevention and control programs to target at risk populations as well as support epidemiologic studies such as pattern of care studies. The end goal is to produce valid and accurate data reflecting the complete evaluation 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 U.S. Standard Population using five-year groups, and are per 100,000 persons. Rates are presented for 2006 and for the five-year period, 2002-2006.

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

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

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

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

positive APC describes an increasing trend. In this report, a five-year period 2001-2005 was used and the calculations were made using *SEER STAT*

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

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

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

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

Data source: All data, tables and figures come from the South Dakota Department of Health, *American Cancer Society Facts and Figures 2004* or *SEER Cancer Statistics Review 2001-2005* and should be cited as such if taken out of this report in part. SEER data represents approximately 10% of the U.S population.

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

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

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

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

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

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

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

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

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

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

In situ and localized stages are the **early stages** of diagnosis. Regional and distant stages are **late stage** diagnoses. An **invasive cancer** refers to a cancer that has spread into surrounding tissues.

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

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

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

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

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

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

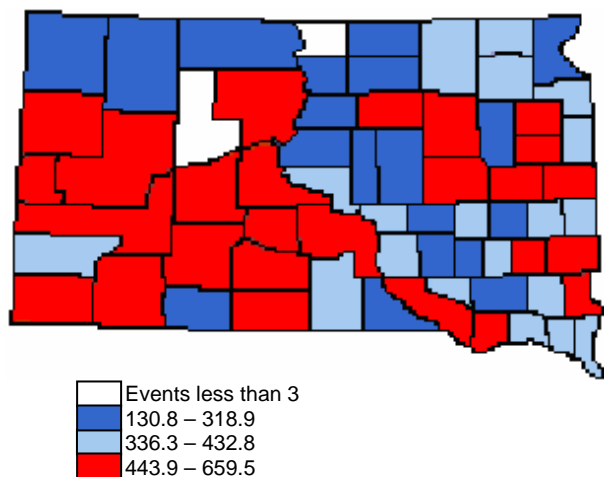
³BIostatistics *The Bare Essentials*, 2nd edition Norman and Shreiner Page 512

IV. CANCER INCIDENCE

South Dakota collected 3,571 new reportable cancer cases in 2006. Data at the county level range from a low incidence rate of 130.8 in McPherson County to a high of 659.5 in Lincoln County. There were 16 counties with rates significantly lower than the state incidence rate of 447.8. In 2001, (the South Dakota Cancer Registry's reference year) there were only 10 counties with significantly lower rates. Pennington County was one of the counties in 2001 that had a significantly higher rate than the state rate but is not significant in 2006. In the 2006 reporting year, the two counties with significantly higher rates are Lincoln and Minnehaha counties.

South Dakota's rate in 2006 was almost equal to the United State incidence rate. The United State incidence rate is 450.5 and the South Dakota incidence rate is 447.8 per 100,000 persons.

Figure 1: Cancer Incidence Rates by County, South Dakota, 2006



Note: Rates are per 100,000 persons and age-adjusted to the 2000 U.S. standard population. Source: South Dakota Department of Health

South Dakota has an area of 77,121 square miles with a 2000 Census population of 754,844 persons resulting in a population density of 10.2 persons per square mile. Population densities range from a low of 1.3 in Ziebach County to a high of 183.1 persons per square mile in Minnehaha County.

Table 1 : Cancer Cases and Incidence Rates by County South Dakota, 2001 and 2006

County	2001		2006			
	Cases	Rate	Cases	Rate		
South Dakota	3,466	433.0	3,571	447.8		
Aurora	18	491.2	9	277.2		
Beadle	116	516.6	105	474.9		
Bennett	15	482.7	9	281.7		
Bon Homme	43	439.2	43	443.9		
Brookings	103	437.0	104	445.8		
Brown	180	440.2	178	432.8		
Brule	40	658.4	▲	21	355.7	
Buffalo	8	636.0	▲	5	351.7	
Butte	59	559.2	49	477.4		
Campbell	6	266.0	*	*	▼	
Charles Mix	53	478.3	57	535.9		
Clark	22	435.8	20	298.2	▼	
Clay	40	388.5	35	342.8		
Codington	121	443.8	119	450.1		
Corson	6	182.4	▼	4	141.9	▼
Custer	36	377.8	36	378.1		
Davison	114	522.5	63	296.8	▼	
Day	35	336.0	38	432.3		
Deuel	28	455.1	25	404.9		
Dewey	16	342.8	18	461.7		
Douglas	13	240.7	▼	16	382.6	
Edmunds	19	313.3	16	254.3	▼	
Fall River	56	482.2	58	479.7		
Faulk	17	448.8	20	505.3		
Grant	35	351.2	41	395.3		
Gregory	16	231.2	▼	23	247.2	▼
Haakon	8	283.2	15	448.4		
Hamlin	19	303.0	36	502.9		
Hand	26	436.7	17	318.9		
Hanson	9	249.6	▼	15	425.0	
Harding	4	270.4	3	215.6		
Hughes	72	408.5	69	398.7		
Hutchinson	48	380.0	38	315.6	▼	
Hyde	5	172.0	▼	8	292.9	
Jackson	13	499.6	13	496.1		
Jerauld	17	410.5	7	194.5	▼	
Jones	7	427.7	8	594.3		
Kingsbury	26	262.4	45	551.1		
Lake	53	389.9	58	422.8		
Lawrence	95	402.0	120	516.6		
Lincoln	75	358.8	133	659.5	▲	
Lyman	22	561.0	26	648.0		
McCook	45	582.9	37	476.2		
McPherson	19	381.8	9	130.8	▼	
Marshall	25	384.6	22	354.1		
Meade	82	388.8	117	552.8		
Mellette	4	177.9	▼	12	545.5	
Miner	17	400.2	11	197.3	▼	
Minnehaha	673	515.1	▲	755	573.6	▲
Moody	19	270.6	▼	26	370.2	
Pennington	430	512.9	▲	415	496.2	
Perkins	7	121.9	▼	13	213.1	▼
Potter	12	249.7	▼	14	291.4	
Roberts	39	329.8	35	294.3	▼	
Sanborn	11	295.2	13	352.5		
Shannon	20	324.0	37	649.9		
Spink	32	324.6	42	466.8		
Stanley	9	354.0	13	493.3		
Sully	8	407.2	3	131.5	▼	
Todd	18	374.8	24	599.6		
Tripp	30	330.1	28	336.3		
Turner	54	418.0	42	361.5		
Union	67	502.4	55	410.5		
Walworth	26	259.9	▼	22	256.4	▼
Yankton	102	428.3	81	348.1	▼	
Ziebach	3	303.8	*	*	▼	

*DOH policy prohibits publishing vital events in cells with less than three events at county level. Incidence rates with counts less than 20 are generally considered unstable.

▲ Rate significantly higher; ▼ Rate significantly lower
Rates are per 100,000 age-adjusted to US 2000 standard.

Source: South Dakota Department of Health.

Table 2: Age-adjusted Incidence Rates by County for Selected Sites, 2006

	Colorectal		Lung & Bronchus		Female Breast		Prostate		Bladder		NHL	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
South Dakota	384	46.6	523	64.3	473	115.0	590	163.8	182	21.9	147	18.5
Aurora	*	39.8	*	19.3	*	87.1	3	217.0	0	0.0	0	0.0
Beadle	11	48.6	18	77.1	13	130.6	18	187.5	6	25.9	4	20.2
Bennett	*	67.4	0	0.0	*	75.6	*	62.3	0	0.0	0	0.0
Bon Homme	3	24.2	9	87.8	4	92.2	4	83.4	5	44.0	3	30.8
Brookings	12	50.1	14	59.8	12	99.6	22	212.4	6	23.6	5	20.0
Brown	20	44.8	26	61.8	34	158.2	27	150.4	11	24.0	12	29.0
Brule	3	35.9	*	36.8	*	46.8	3	115.9	*	32.6	*	36.9
Buffalo	0	0.0	*	78.4	0	0.0	*	163.9	0	0.0	0	0.0
Butte	4	39.5	10	92.8	8	146.3	6	147.2	3	29.4	0	0.0
Campbell	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Charles Mix	11	98.0	*	21.8	12	218.7	7	135.0	3	32.2	*	18.4
Clark	3	53.5	6	90.8	3	83.7	4	132.5	0	0.0	0	0.0
Clay	3	28.0	6	56.9	5	95.5	9	196.9	*	7.7	0	0.0
Codington	11	41.9	13	50.5	13	93.3	31	260.9	4	12.6	7	26.0
Corson	*	74.5	*	31.0	0	0.0	0	0.0	0	0.0	0	0.0
Custer	7	73.9	*	26.1	5	99.2	9	179.4	0	0.0	*	8.1
Davison	5	20.3	12	57.0	5	48.6	8	94.2	5	23.2	5	23.4
Day	5	48.0	4	46.2	4	88.4	7	164.4	3	32.7	*	24.3
Deuel	5	97.1	*	32.0	3	127.2	4	118.9	*	28.0	*	14.0
Dewey	*	44.1	7	191.7	0	0.0	*	94.7	0	0.0	0	0.0
Douglas	0	0.0	0	0.0	4	252.8	0	0.0	*	53.5	0	0.0
Edmunds	0	0.0	*	29.4	3	105.0	4	133.6	0	0.0	0	0.0
Fall River	6	51.0	16	130.9	5	84.0	4	70.2	4	30.9	0	0.0
Faulk	*	38.2	3	76.3	3	170.5	4	174.3	*	19.6	*	21.8
Grant	5	33.5	9	82.5	5	104.3	4	86.4	3	31.2	*	16.3
Gregory	5	46.8	5	54.9	0	0.0	*	46.6	*	9.7	*	15.3
Haakon	*	41.4	*	56.9	*	47.0	4	364.8	*	36.5	0	0.0
Hamlin	5	59.7	6	89.0	*	71.4	8	247.6	*	14.8	0	0.0
Hand	3	45.3	*	37.1	*	19.1	*	96.7	*	38.9	*	28.9
Hanson	3	91.1	*	55.5	0	0.0	4	255.3	*	27.5	0	0.0
Harding	*	71.8	0	0.0	*	135.0	0	0.0	*	74.6	0	0.0
Hughes	5	28.5	10	59.2	13	146.2	11	141.4	*	6.3	4	24.9
Hutchinson	*	3.8	5	34.4	6	127.3	6	95.8	3	14.7	0	0.0
Hyde	0	0.0	*	51.0	0	0.0	4	359.1	0	0.0	0	0.0
Jackson	*	34.9	0	0.0	*	79.3	4	308.9	0	0.0	0	0.0
Jerauld	0	0.0	*	30.1	*	55.3	*	108.7	*	30.1	0	0.0
Jones	3	238.1	*	125.0	0	0.0	*	198.2	0	0.0	0	0.0
Kingsbury	8	99.9	7	68.6	*	46.0	10	292.0	3	26.5	*	9.5
Lake	7	51.3	8	56.4	6	79.4	10	164.3	7	50.0	3	24.7
Lawrence	12	49.1	13	55.1	13	106.8	26	237.9	5	20.0	5	22.3
Lincoln	17	87.6	18	93.8	21	183.7	25	277.1	*	4.5	7	33.9
Lyman	5	133.3	9	224.8	5	228.9	3	143.2	*	21.5	0	0.0
McCook	4	46.8	7	91.8	3	71.8	6	172.6	*	36.4	*	18.3
McPherson	0	0.0	3	45.8	*	18.5	*	68.3	0	0.0	0	0.0
Marshall	0	0.0	*	27.2	*	87.6	10	324.3	*	24.9	0	0.0
Meade	13	63.6	21	104.5	11	99.5	18	181.6	4	18.5	6	25.6
Mellette	*	93.9	*	84.0	*	112.0	*	110.8	0	0.0	*	98.3
Miner	*	18.2	3	52.0	*	32.5	*	71.3	*	33.8	0	0.0
Minnehaha	65	50.0	105	81.4	107	150.2	112	203.5	36	27.1	36	27.7
Moody	5	68.6	3	50.3	3	81.2	6	177.4	*	9.5	0	0.0
Pennington	43	51.8	58	69.9	61	131.2	59	154.5	22	26.6	16	19.0
Perkins	0	0.0	*	29.4	*	23.1	*	70.1	0	0.0	*	33.2
Potter	*	12.9	*	19.7	3	146.6	3	123.5	*	12.9	0	0.0
Roberts	*	17.2	5	40.9	7	116.4	3	49.2	*	15.0	*	8.9
Sanborn	*	56.4	3	77.9	0	0.0	*	102.5	*	31.9	*	21.2
Shannon	7	129.1	*	20.0	5	143.0	4	179.7	*	20.0	0	0.0
Spink	7	72.8	*	9.8	6	116.5	10	227.4	3	31.4	*	8.5
Stanley	*	92.7	3	124.1	*	68.8	4	298.6	*	30.3	0	0.0
Sully	0	0.0	0	0.0	*	77.9	0	0.0	0	0.0	0	0.0
Todd	*	39.5	7	239.4	0	0.0	3	130.9	0	0.0	0	0.0
Tripp	3	39.4	7	76.9	5	137.2	4	109.4	*	26.2	0	0.0
Turner	*	11.9	9	70.7	7	113.4	7	129.2	*	15.8	3	21.1
Union	8	58.3	10	75.2	8	110.1	11	193.0	3	21.9	0	0.0
Walworth	*	23.7	5	56.9	*	20.5	7	161.0	*	9.0	*	28.2
Yankton	9	37.8	7	28.4	16	128.2	9	92.1	5	19.9	5	21.4
Ziebach	0	0.0	0	0.0	0	0.0	0	0.0	*	48.0	0	0.0

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

Rates are per 100,000 persons and age-adjusted to the 2000 U. S. standard population.

Source: South Dakota Department of Health.

Table 3: Age-adjusted Incidence Rates by Site, Gender and Race, South Dakota, 2006

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	3571	447.8	1936	541.1	1635	381.8	3359	442.7	168	544.1
Oral Cavity	71	8.9	46	13.0	25	5.4	65	8.5	3	8.3
Lip	8	1.0	6	1.8	2	0.4	6	0.7	0	0.0
Tongue	23	3.0	13	3.6	10	2.1	23	3.1	0	0.0
Salivary Gland	10	1.1	5	1.4	5	0.9	10	1.2	0	0.0
Floor of Mouth	4	0.5	3	0.8	1	0.3	4	0.6	0	0.0
Gum and Other Mouth	11	1.3	8	2.4	3	0.7	10	1.2	1	2.5
Nasopharynx	2	0.3	1	0.3	1	0.2	1	0.1	0	0.0
Tonsil	8	1.1	6	1.7	2	0.6	7	1.1	1	3.1
Oropharynx	2	0.3	2	0.6	0	0.0	1	0.1	1	2.8
Hypopharynx	3	0.3	2	0.6	1	0.1	3	0.3	0	0.0
Other Oral Cavity & Pharynx	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Digestive System	631	77.1	341	96.1	290	62.4	589	75.1	34	119.1
Esophagus	41	5.2	30	8.5	11	2.5	41	5.4	0	0.0
Stomach	45	5.6	34	9.4	11	2.4	38	5.0	5	21.5
Small Intestine	21	2.7	11	3.1	10	2.4	19	2.6	1	5.3
Colorectal	384	46.6	196	55.4	188	40.0	363	45.9	17	53.6
Colon Excluding Rectum	284	34.0	136	38.8	148	30.9	269	33.4	11	35.9
Rectum and Rectosigmoid	100	12.7	60	16.6	40	9.1	94	12.5	6	17.7
Anus, Anal Canal and Anorectum	9	1.2	4	1.1	5	1.4	7	1.0	2	4.5
Liver & Intrahepatic Bile Duct	26	3.3	18	5.1	8	2.1	21	2.9	4	14.9
Gallbladder	8	1.0	3	0.8	5	1.0	6	0.8	2	11.1
Other Biliary	12	1.4	6	1.7	6	1.0	11	1.3	1	2.3
Pancreas	75	9.0	37	10.5	38	8.1	73	9.1	2	5.8
Retroperitoneum	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Peritoneum, Omentum and Mesentery	10	1.1	2	0.6	8	1.5	10	1.2	0	0.0
Respiratory	547	67.4	314	87.8	233	53.2	512	65.9	31	116.1
Nose, Nasal Cavity and Middle Ear	4	0.5	1	0.3	3	0.9	4	0.6	0	0.0
Larynx	16	2.1	9	2.5	7	1.8	15	2.1	1	3.1
Lung and Bronchus	523	64.3	300	83.9	223	50.6	489	62.8	30	113.0
Pleura	4	0.5	4	1.1	0	0.0	4	0.5	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	6	0.8	1	0.2	5	1.3	6	0.9	0	0.0
Soft Tissue (Including Heart)	26	3.3	16	4.3	10	2.1	23	3.0	0	0.0
Skin	135	17.6	81	22.8	54	13.1	131	18.2	1	4.0
Melanomas of the Skin	125	16.3	74	20.8	51	12.4	121	16.9	1	4.0
Other Skin	10	1.3	7	1.9	3	0.7	10	1.4	0	0.0
Breast	476	61.2	3	0.8	473	115.0	446	60.5	24	71.7
Breast, Female	473	115.0			473	115.0	443	114.1	24	128.9
Breast, Male	3	0.8	3	0.8			3	0.9	0	0.0
Female	185	45.8			185	45.8	169	44.2	15	73.8
Vulva	13	3.0			13	3.0	10	2.4	2	12.9
Vagina	5	1.0			5	1.0	5	1.1	0	0.0
Cervix Uteri	17	4.6			17	4.6	14	4.1	3	13.1
Corpus and Uterus, NOS	100	25.6			100	25.6	92	24.9	8	36.8
Corpus Uteri	99	25.4			99	25.4	91	24.8	8	36.8
Uterus, NOS	1	0.2			1	0.2	1	0.2	0	0.0
Ovary	47	10.7			47	10.7	45	10.8	2	11.1
Other Female Genital Organs	3	0.8			3	0.8	3	0.9	0	0.0

Table 3: Age-adjusted Incidence Rates by Site, Gender and Race, South Dakota, 2006 (continued)

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Male	613	170.1	613	170.1			583	169.4	22	170.3
Penis	4	1.1	4	1.1			2	0.6	2	16.4
Prostate	590	163.8	590	163.8			565	164.0	18	147.0
Testis	18	5.0	18	5.0			15	4.5	2	6.9
Other Male Genital Organs	1	0.3	1	0.3			1	0.3	0	0.0
Urinary	321	39.3	226	63.4	95	21.2	306	39.1	13	42.3
Bladder	182	21.9	141	39.8	41	8.8	179	22.4	3	9.3
Kidney and Renal Pelvis	128	16.2	80	22.2	48	11.2	117	15.5	9	29.0
Ureter	9	1.1	4	1.1	5	1.1	8	1.0	1	4.0
Other Urinary Organs	2	0.2	1	0.3	1	0.1	2	0.2	0	0.0
Eye and Orbit	1	0.1	0	0.0	1	0.3	0	0.0	1	0.8
Brian & CNS	42	5.4	18	4.9	24	5.7	42	5.8	0	0.0
Brain	42	5.4	18	4.9	24	5.7	42	5.8	0	0.0
Meninges& CNS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Endocrine	59	7.9	13	3.6	46	12.3	58	8.5	1	1.6
Thyroid	58	7.8	13	3.6	45	12.0	57	8.3	1	1.6
Other Endocrine	1	0.1	0	0.0	1	0.3	1	0.2	0	0.0
Lymphomas	162	20.5	87	24.1	75	17.3	157	21.1	4	8.2
Hodgkins Lymphoma	15	2.1	10	2.7	5	1.4	15	2.3	0	0.0
Non-Hodgkins Lymphoma'	147	18.5	77	21.4	70	15.9	142	18.8	4	8.2
Myeloma	44	5.7	28	7.8	16	3.8	42	5.7	2	6.7
Leukemia	102	12.7	61	17.1	41	9.1	94	12.3	6	16.0
Acute Lymphocytic	8	1.1	4	1.1	4	1.1	7	1.1	1	0.8
Chronic Lymphocytic	44	5.4	27	7.6	17	3.8	42	5.3	1	2.0
Other Lymphocytic	8	1.0	3	0.8	5	1.0	8	1.0	0	0.0
Acute Myeloid	28	3.5	19	5.3	9	2.1	24	3.1	3	10.7
Acute Monocytic	2	0.2	1	0.2	1	0.1	2	0.2	0	0.0
Chronic Myeloid	9	1.2	6	1.7	3	0.6	8	1.1	1	2.5
Other Myeloid/Monocytic Leukemia	1	0.1	0	0.0	1	0.1	1	0.1	0	0.0
Other Acute Leukemia	2	0.2	1	0.2	1	0.2	2	0.3	0	0.0
Aleukemic, subleukemic and NOS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Miscellaneous	150	18.3	88	24.9	62	13.6	136	17.3	11	34.3
Myeloproliferative & Myelodysplastic	52	6.2	30	8.7	22	4.9	47	5.8	2	4.6

Rates are per 100,000 persons and age-adjusted to the 2000 U.S. standard population.

Source: South Dakota Department of Health

Table 3 above shows incidence and age-adjusted incidence rates for South Dakota in 2006 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, 2006

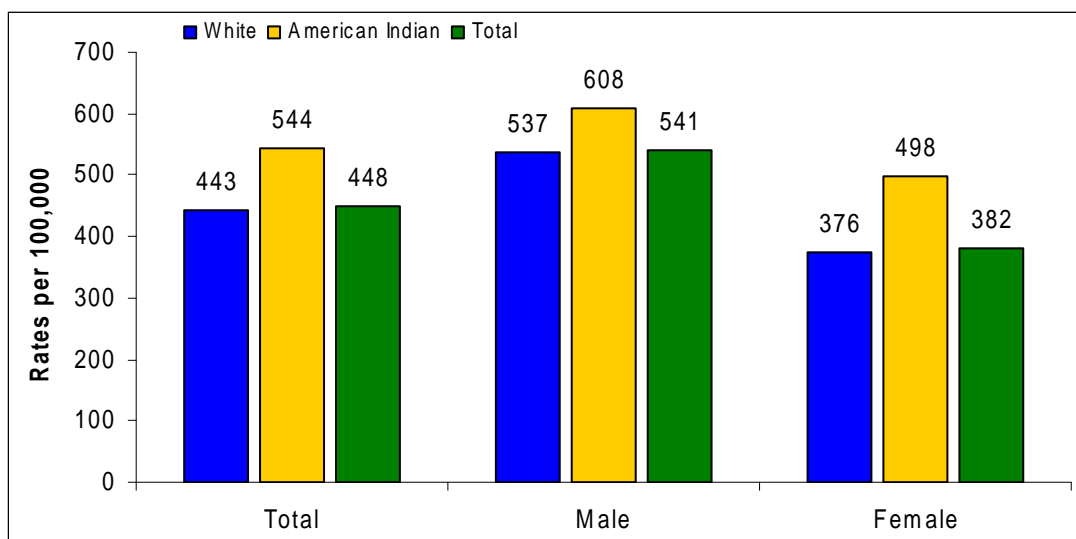
	0-19	20-34	35-49	50-64	65-74	75-84	85+
All Sites	1%	2%	9%	28%	25%	25%	10%
Bladder	0%	0%	5%	21%	23%	35%	16%
Breast, Female	0%	2%	17%	34%	21%	18%	9%
Colorectal	0%	0%	6%	21%	26%	32%	15%
Corpus & Uterus, NOS	0%	2%	15%	48%	19%	13%	3%
Hodgkin Lymphoma	13%	53%	7%	13%	7%	7%	0%
Kidney and Renal Pelvis	1%	2%	12%	27%	26%	25%	7%
Leukemia	5%	7%	6%	23%	21%	25%	14%
Lung & Bronchus	0%	0%	4%	25%	31%	30%	10%
Melanomas of the Skin	1%	8%	20%	30%	20%	14%	8%
Non-Hodgkin Lymphoma	0%	7%	7%	26%	27%	25%	8%
Pancreas	0%	0%	9%	17%	21%	33%	19%
Prostate	0%	0%	2%	35%	33%	26%	4%

Source: South Dakota Department of Health

In 2006, 53% of all cancers were diagnosed between ages 50 to 74 (Table 4). Notable are the 17% of female breast cancers and 20% of melanomas of the skin cancer diagnosed between the ages of 35 to 49. Sixty-six percent of the 15 Hodgkin lymphoma cases were diagnosed in persons under 35 years old.

Figure 2 below shows that incidence rates for American Indians in South Dakota were higher than those for whites in 2006. Of the 3,571 newly diagnosed cases in 2006, 168 or 4.7% were American Indians, 79 males and 89 females.

Figure 2: All sites cancer incidence rates by race in South Dakota, 2006



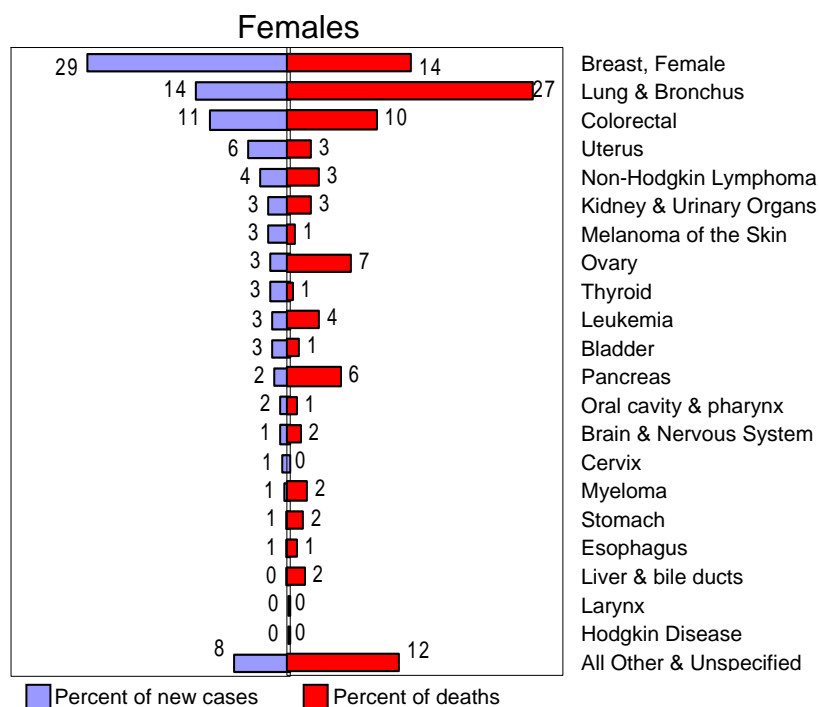
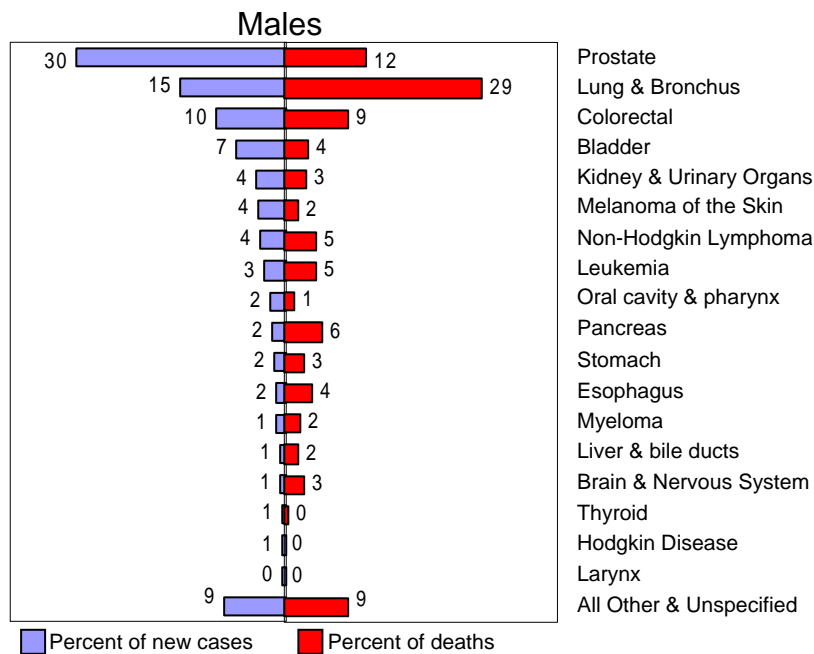
Note: Rates are per 100,000 persons age-adjusted to the 2000 U.S. standard population.

Source: South Dakota Department of Health

V. CANCER CASES AND DEATHS BY RANK

Prostate cancer was the most common cancer diagnosed during 2006. The top four cancers are prostate, breast, colorectal, and lung and bronchus which accounted for 55% of the new cases diagnosed and 50% of cancer deaths. Figure 3 shows percent of new cancer cases and deaths by rank and gender.

Figure 3: Percent distribution of cancer cases and deaths by rank and gender, South Dakota, 2006

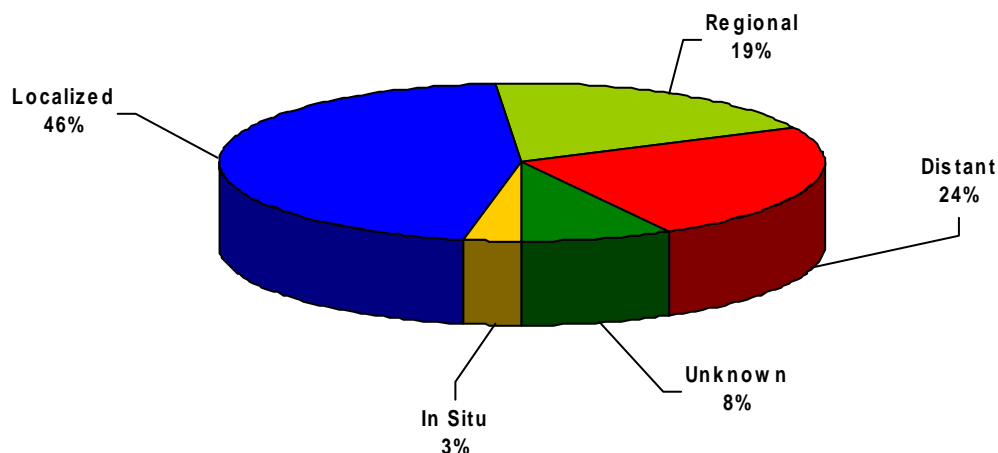


VI. STAGE AT DIAGNOSIS

SEER Summary Staging 2000:

- **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 or 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 the regional lymph nodes
- **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 4: South Dakota 2006 All Sites by SEER Summary Staging 2000



Source: South Dakota Department of Health

The figure above demonstrates the number of cases diagnosed at each stage of disease. For 2006, there were a total of 3,571 reportable cases reported to the South Dakota State Cancer Registry.

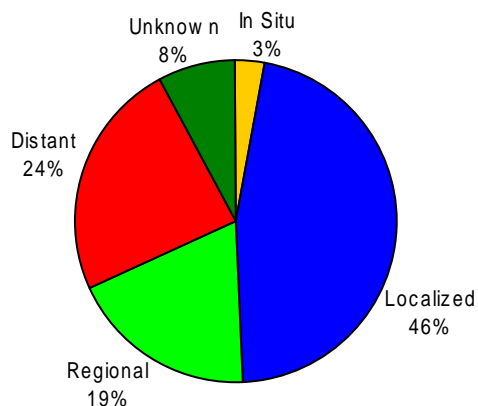
Table 5: South Dakota Stage at Diagnosis-all cases 2006

Stage	Number of Cases	Percent of Total
In Situ (Bladder)	105	2.9
Localized	1,633	45.7
Regional	678	19.0
Distant	871	24.4
Unknown	284	8.0

Over 45% of all cancer cases diagnosed in South Dakota in 2006 were diagnosed at localized stage. Almost another 45% were diagnosed at the regional and distant stages combined. Stage at diagnosis by race was as follows:

Figure 5: Stage at Diagnosis in South Dakota, White, 2006

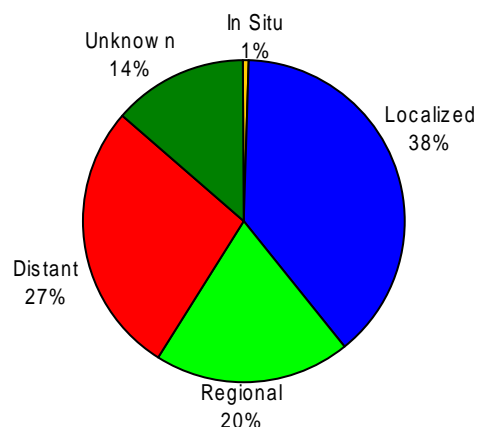
Number of cases = 3,359



Source: South Dakota Department of Health

Figure 6: Stage at Diagnosis in South Dakota, American Indians, 2006

Number of cases = 168



Source: South Dakota Department of Health

Cases of non-Hodgkin 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 Common Selected Sites by Race, South Dakota, 2006

	White						American Indian					
	Localized		Regional		Distant		Localized		Regional		Distant	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Bronchus & Lungs	89	17.0%	111	21.2%	266	50.9%	8	1.5%	2	0.4%	16	3.1%
Colorectal	161	41.9%	126	32.8%	57	14.8%	6	1.6%	5	1.3%	4	1.0%
Melanoma of the Skin	87	64.4%	21	15.6%	10	7.4%	1	0.7%	0	0.0%	0	0.0%
Female Breast	283	59.8%	130	27.5%	22	4.7%	11	2.3%	8	1.7%	5	1.1%
Cervix	10	58.8%	3	17.6%	1	5.9%	2	11.8%	1	5.9%	0	0.0%
Uterus	70	70.0%	11	11.0%	8	8.0%	7	7.0%	0	0.0%	0	0.0%
Ovary	6	12.8%	8	17.0%	27	57.4%	0	0.0%	2	4.3%	0	0.0%
Prostate	480	81.4%	44	7.5%	20	3.4%	11	1.9%	4	0.7%	0	0.0%
Bladder	49	26.9%	6	3.3%	11	6.0%	1	0.5%	1	0.5%	0	0.0%
Non-Hodgkins Lymphoma	36	24.5%	25	17.0%	73	49.7%	2	1.4%	1	0.7%	1	0.7%
Leukemia	0	0.0%	0	0.0%	94	92.2%	0	0.0%	0	0.0%	6	5.9%

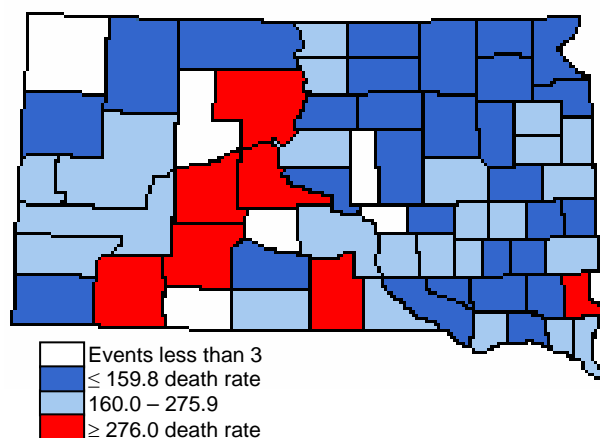
Source: South Dakota Department of Health

VII. CANCER MORTALITY

Cancer age-adjusted death rates for 2006 ranged from a low of zero in Hyde County to a high of 417.0 in Stanley County. South Dakota's death rate was 185.4 in 2006 compared to a death rate of 190.7 in 2001.

In 2001, only two counties had a significantly lower rate than that of the entire state. In 2006, five counties were significantly lower; they were Bennett, Edmunds, Hutchinson, McPherson, and Perkins. Also in 2006, two counties had a significantly higher death rate than the entire state and they were Lincoln and Minnehaha counties.

Figure 7: Cancer Death Rates by County, South Dakota, 2006



Note: Rates are per 100,000 persons and age-adjusted to the 2000 U.S. standard population. Source: South Dakota Department of Health

Table 7 : Cancer Cases and Incidence Rates by County, South Dakota, 2001 and 2006

County	2001		2006	
	Cases	Rate	Cases	Rate
South Dakota	1,598	190.7	1561	185.4
Aurora	14	314.3	7	174.7
Beadle	36	157.8	47	187.0
Bennett	9	288.5	*	65.2 ▼
Bon Homme	25	197.5	20	169.4
Brookings	43	174.5	46	187.7
Brown	80	185.1	69	159.8
Brule	14	209.8	14	226.6
Buffalo	4	432.6	*	140.7
Butte	38	355.3	14	127.6
Campbell	6	209.1	5	171.7
Charles Mix	10	70.0 ▼	17	129.7
Clark	6	93.5	10	137.2
Clay	26	243.4	23	226.6
Codington	51	181.1	52	185.7
Corson	4	134.2	5	159.5
Custer	19	203.7	20	214.6
Davison	45	193.8	44	185.6
Day	18	172.0	14	132.8
Deuel	8	111.8	16	211.8
Dewey	8	217.0	11	280.2
Douglas	11	178.6	9	143.9
Edmunds	9	153.1	5	69.4 ▼
Fall River	26	208.6	18	137.5
Faulk	7	177.2	5	120.4
Grant	24	207.7	16	143.7
Gregory	15	175.2	17	182.4
Haakon	3	105.7	11	369.6
Hamlin	14	167.1	16	208.7
Hand	9	158.1	8	110.5
Hanson	6	156.5	5	143.5
Harding	*	55.8	*	69.2
Hughes	30	171.5	24	127.0
Hutchinson	33	208.6	21	106.7 ▼
Hyde	6	240.9	0	0.0
Jackson	4	135.3	10	371.3
Jerauld	4	90.8	6	145.4
Jones	4	243.2	*	110.8
Kingsbury	20	176.3	15	155.5
Lake	34	238.0	23	159.7
Lawrence	39	157.1	58	230.1
Lincoln	45	211.4	58	276.8 ▲
Lyman	6	141.3	8	180.7
McCook	16	168.5	13	129.9
McPherson	10	144.2	4	76.3 ▼
Marshall	11	149.5	9	125.5
Meade	34	164.0	51	246.4
Mellette	5	257.0	3	145.9
Miner	4	64.2 ▼	12	216.8
Minnehaha	266	202.3	292	221.6 ▲
Moody	11	148.5	10	141.5
Pennington	182	220.1	170	206.4
Perkins	12	193.2	6	96.5 ▼
Potter	10	283.6	9	148.1
Roberts	32	234.2	15	118.6
Sanborn	4	115.6	8	232.9
Shannon	21	362.2	16	294.6
Spink	14	137.6	16	151.9
Stanley	7	303.9	11	417.0
Sully	*	44.1	4	243.2
Todd	10	224.6	9	215.0
Tripp	24	252.3	27	286.6
Turner	28	218.2	19	128.0
Union	27	197.9	29	218.6
Walworth	20	228.3	19	206.6
Yankton	35	143.3	34	139.9
Ziebach	0	0.0	*	63.5

*DOH policy prohibits publishing vital events in cells with less than three events at county level. Death rates with counts less than 20 are generally considered unstable.
▲ Rate significantly higher; ▼ Rate significantly lower
Rates are per 100,000 age-adjusted to US 2000 standard.
Source: South Dakota Department of Health.

Table 8: Age-adjusted Death Rates by County for Selected Sites, 2006

	Colorectal		Lung & Bronchus		Female Breast		Prostate		Bladder		NHL	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
South Dakota	149	17.3	435	52.6	95	21.2	103	30.1	40	4.5	63	7.3
Aurora	3	71.7	0	0.0	*	17.2	0	0.0	0	0.0	0	0.0
Beadle	*	6.6	7	27.6	3	27.3	5	48.0	4	13.4	6	23.3
Bennett	0	0.0	*	30.9	0	0.0	0	0.0	0	0.0	0	0.0
Bon Homme	4	29.4	7	65.2	0	0.0	*	18.0	*	7.1	0	0.0
Brookings	*	8.7	12	48.8	7	52.9	3	29.1	*	3.7	*	3.7
Brown	5	11.3	15	37.4	6	22.3	4	23.7	4	7.4	3	6.6
Brule	3	40.1	3	49.0	*	27.0	*	36.1	*	20.4	*	16.5
Buffalo	0	0.0	*	69.7	0	0.0	0	0.0	0	0.0	0	0.0
Butte	*	9.1	5	45.0	*	16.7	*	49.3	0	0.0	0	0.0
Campbell	0	0.0	*	71.4	0	0.0	0	0.0	0	0.0	0	0.0
Charles Mix	*	9.5	4	30.5	0	0.0	*	36.5	0	0.0	0	0.0
Clark	*	25.1	3	39.4	0	0.0	*	54.4	0	0.0	0	0.0
Clay	0	0.0	5	52.3	*	31.4	*	21.8	*	7.0	*	9.9
Codington	8	28.2	11	40.7	*	7.7	3	28.1	*	6.4	*	3.2
Corson	0	0.0	*	52.5	*	53.9	0	0.0	0	0.0	0	0.0
Custer	5	50.9	4	44.2	0	0.0	0	0.0	*	11.8	4	39.0
Davison	9	37.6	8	39.8	4	33.1	4	45.1	*	3.6	*	4.2
Day	0	0.0	3	24.8	*	12.5	*	21.8	*	6.7	0	0.0
Deuel	*	14.0	4	59.4	*	30.7	0	0.0	0	0.0	*	14.0
Dewey	*	42.4	4	111.5	0	0.0	0	0.0	0	0.0	0	0.0
Douglas	*	29.0	*	16.0	*	13.8	0	0.0	0	0.0	0	0.0
Edmunds	*	11.2	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Fall River	*	7.1	8	62.2	0	0.0	*	36.9	*	7.1	0	0.0
Faulk	0	0.0	*	30.5	0	0.0	*	68.6	0	0.0	0	0.0
Grant	3	25.0	6	57.0	*	15.3	0	0.0	0	0.0	*	9.4
Gregory	3	26.6	5	66.7	*	17.6	*	49.2	0	0.0	*	15.3
Haakon	0	0.0	*	56.9	0	0.0	0	0.0	0	0.0	0	0.0
Hamlin	0	0.0	6	81.4	0	0.0	*	31.7	0	0.0	0	0.0
Hand	3	43.9	*	24.3	0	0.0	0	0.0	0	0.0	0	0.0
Hanson	*	32.3	*	23.9	0	0.0	*	96.9	0	0.0	0	0.0
Harding	0	0.0	*	69.2	0	0.0	0	0.0	0	0.0	0	0.0
Hughes	*	8.0	7	40.3	*	11.9	0	0.0	*	4.0	*	6.4
Hutchinson	*	3.8	4	20.5	*	8.0	*	29.5	0	0.0	*	7.2
Hyde	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Jackson	0	0.0	*	78.6	*	51.7	*	208.4	0	0.0	0	0.0
Jerauld	*	30.1	*	36.7	0	0.0	*	42.5	0	0.0	0	0.0
Jones	*	52.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Kingsbury	*	9.5	*	13.9	*	36.4	*	25.4	*	7.5	0	0.0
Lake	*	18.2	8	53.2	*	18.4	*	30.8	0	0.0	*	12.6
Lawrence	11	40.5	13	52.4	*	13.9	5	51.5	*	3.3	*	7.9
Lincoln	3	14.5	20	98.1	8	75.5	4	44.7	0	0.0	*	3.8
Lyman	*	21.5	4	89.0	*	38.5	0	0.0	0	0.0	0	0.0
McCook	*	7.1	*	18.3	0	0.0	0	0.0	*	11.7	*	9.1
McPherson	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Marshall	*	14.7	*	29.1	0	0.0	*	33.3	0	0.0	0	0.0
Meade	3	14.2	14	69.9	5	42.3	4	49.4	*	5.6	4	19.9
Mellette	0	0.0	*	89.1	0	0.0	0	0.0	0	0.0	0	0.0
Miner	*	27.7	6	117.3	*	80.1	0	0.0	*	15.5	*	12.2
Minnehaha	25	19.1	91	70.2	18	24.0	11	22.9	5	3.8	12	8.9
Moody	*	21.4	6	95.4	0	0.0	0	0.0	0	0.0	0	0.0
Pennington	12	14.7	50	60.5	13	27.5	15	51.3	8	9.6	7	8.6
Perkins	*	27.4	*	14.4	0	0.0	0	0.0	0	0.0	0	0.0
Potter	*	26.2	3	51.4	0	0.0	*	54.1	0	0.0	0	0.0
Roberts	0	0.0	6	47.3	*	17.9	3	52.3	0	0.0	0	0.0
Sanborn	0	0.0	3	81.5	0	0.0	*	102.5	0	0.0	*	23.0
Shannon	0	0.0	3	70.4	*	14.2	*	84.5	0	0.0	0	0.0
Spink	5	44.2	0	0.0	0	0.0	*	19.6	0	0.0	0	0.0
Stanley	0	0.0	5	192.3	3	154.8	0	0.0	0	0.0	0	0.0
Sully	0	0.0	3	189.9	0	0.0	0	0.0	0	0.0	0	0.0
Todd	*	17.4	3	81.9	0	0.0	*	49.6	0	0.0	0	0.0
Tripp	*	8.4	8	86.7	0	0.0	4	97.6	0	0.0	*	25.4
Turner	*	5.6	7	45.6	*	20.3	*	32.2	0	0.0	3	21.1
Union	*	7.1	7	53.7	*	13.8	0	0.0	*	8.0	0	0.0
Walworth	*	17.3	7	83.4	*	10.5	*	41.6	*	19.1	*	19.1
Yankton	5	19.1	10	43.0	0	0.0	*	10.9	0	0.0	*	9.2
Ziebach	0	0.0	*	63.5	0	0.0	0	0.0	0	0.0	0	0.0

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

Rates are per 100,000 persons and age-adjusted to the 2000 U. S. standard population.

Source: South Dakota Department of Health.

Table 9 Age-adjusted Death Rates by Site, Gender and Race, South Dakota, 2006

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total	1561	185.4	860	244.1	701	145.9	1477	182.6	76	287.0
Oral Cavity	20	2.3	12	3.3	8	1.4	18	2.2	1	4.0
Lip	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Tongue	7	0.8	4	1.2	3	0.6	7	0.9	0	0.0
Salivary Gland	5	0.6	2	0.5	3	0.5	4	0.5	1	4.0
Floor of Mouth	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Gum and Other Mouth	2	0.2	1	0.3	1	0.1	2	0.2	0	0.0
Nasopharynx	2	0.3	2	0.6	0	0.0	1	0.2	0	0.0
Tonsil	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Oropharynx	0	0.0	0	0.0	0	0.0	1	0.1	0	0.0
Hypopharynx	1	0.1	1	0.3	0	0.0	0	0.0	0	0.0
Other Oral Cavity & Pharynx	3	0.3	2	0.6	1	0.2	3	0.4	0	0.0
Digestive System	374	44.1	218	61.7	156	30.0	352	43.1	19	73.4
Esophagus	44	5.3	36	10.0	8	1.4	44	5.6	0	0.0
Stomach	37	4.4	25	7.0	12	2.4	32	4.0	4	17.3
Small Intestine	4	0.5	2	0.6	2	0.6	4	0.5	0	0.0
Colorectal	149	17.3	81	23.2	68	12.9	142	17.0	5	14.6
Colon Excluding Rectum	122	14.1	67	19.2	55	10.5	118	14.2	2	6.1
Rectum and Rectosigmoid	27	3.1	14	4.0	13	2.4	24	2.8	3	8.4
Anus, Anal Canal and Anorectum	1	0.1	0	0.0	1	0.2	1	0.1	0	0.0
Liver & Intrahepatic Bile Duct	32	3.9	18	5.0	14	2.8	27	3.5	5	18.9
Gallbladder	5	0.5	2	0.6	3	0.5	4	0.5	1	5.7
Other Biliary	6	0.7	2	0.5	4	0.7	6	0.7	0	0.0
Pancreas	89	10.5	48	13.7	41	8.1	85	10.4	4	16.9
Retroperitoneum	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Peritoneum, Omentum and Mesentery	7	0.8	4	1.1	3	0.5	7	0.9	0	0.0
Respiratory	443	53.6	252	70.9	191	41.9	415	52.3	26	103.0
Nose, Nasal Cavity and Middle Ear	4	0.5	2	0.5	2	0.4	4	0.5	0	0.0
Larynx	3	0.4	2	0.6	1	0.2	3	0.4	0	0.0
Lung and Bronchus	435	52.6	248	69.8	187	41.1	407	51.3	26	103.0
Pleura	1	0.1	0	0.0	1	0.2	1	0.1	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	4	0.5	3	0.9	1	0.2	4	0.5	0	0.0
Soft Tissue (Including Heart)	13	1.5	5	1.4	8	1.8	12	1.5	1	1.3
Skin	31	3.8	21	6.1	10	2.2	31	4.0	0	0.0
Melanomas of the Skin	23	2.9	17	4.9	6	1.5	23	3.1	0	0.0
Other Skin	8	0.9	4	1.2	4	0.7	8	0.9	0	0.0
Breast	95	11.7	0	0.0	95	21.2	90	11.6	5	17.0
Breast, Female	95	21.2			95	21.2	90	21.1	5	28.3
Breast, Male	0	0.0	0	0.0			1	0.3	0	0.0
Female	75	15.8			75	15.8	71	15.5	4	25.0
Vulva	5	0.8			5	0.8	5	0.8	0	0.0
Vagina	1	0.1			1	0.1	1	0.1	0	0.0
Cervix Uteri	1	0.3			1	0.3	1	0.3	0	0.0
Corpus and Uterus, NOS	19	4.0			19	4.0	0	0.0	3	12.6
Corpus Uteri	14	2.9			14	2.9	12	2.6	2	15.1
Uterus, NOS	5	1.1			5	1.1	4	0.9	1	5.0
Ovary	49	10.6			49	10.6	48	10.8	1	4.8
Other Female Genital Organs	0	0.0			0	0.0	0	0.0	0	0.0

Table 9: Age-adjusted Death Rates by Site, Gender and Race, South Dakota, 2006 (continued)

	TOTAL		MALE		FEMALE		WHITE		AMERICAN INDIAN	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Male	104	30.4	104	30.4			99	29.8	4	41.3
Penis	1	0.3	1	0.3			1	0.3	0	0.0
Prostate	103	30.1	103	30.1			98	29.5	4	41.3
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	91	10.6	61	17.6	30	5.9	89	10.8	2	7.6
Bladder	40	4.5	31	9.0	9	1.6	40	4.6	0	0.0
Kidney and Renal Pelvis	46	5.6	28	8.0	18	3.8	44	5.6	2	7.6
Ureter	1	0.1	0	0.0	1	0.2	1	0.1	0	0.0
Other Urinary Organs	4	0.4	2	0.6	2	0.3	4	0.4	0	0.0
Eye and Orbit	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Brian & CNS	36	4.6	25	6.9	11	2.5	35	4.8	1	1.6
Brain	36	4.6	25	6.9	11	2.5	35	4.8	1	1.6
Meninges& CNS	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Endocrine	11	1.3	5	1.4	6	1.2	11	1.4	0	0.0
Thyroid	8	1.0	4	1.1	4	0.8	8	1.0	0	0.0
Other Endocrine	3	0.4	1	0.3	2	0.4	3	0.4	0	0.0
Lymphomas	65	7.6	40	11.4	25	4.9	64	7.7	1	2.0
Hodgkins Lymphoma	2	0.3	1	0.3	1	0.2	1	0.1	1	2.0
Non-Hodgkins Lymphoma'	63	7.3	39	11.2	24	4.7	63	7.6	0	0.0
Myeloma	35	4.2	20	5.6	15	3.2	34	4.2	1	5.0
Leukemia	66	7.6	41	11.6	25	4.6	63	7.6	2	6.6
Acute Lymphocytic Leukemia	3	0.3	3	0.8	0	0.0	2	0.2	1	1.3
Chronic Lymphocytic Leukemia	18	2.1	12	3.5	6	1.2	18	2.2	0	0.0
Other Lymphocytic Leukemia	3	0.3	1	0.3	2	0.3	3	0.4	0	0.0
Acute Myeloid Leukemia	14	1.6	8	2.2	6	1.2	13	1.6	1	5.3
Chronic Myeloid Leukemia	4	0.4	2	0.6	2	0.3	4	0.5	0	0.0
Other Myeloid Leukemia	7	0.8	4	1.2	3	0.6	7	0.8	0	0.0
Acute Monocytic Leukemia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Chronic Monocytic Leukemia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Other Monocytic Leukemia	1	0.1	0	0.0	1	0.1	1	0.1	0	0.0
Other Acute Leukemia	8	1.0	5	1.4	3	0.6	7	0.9	0	0.0
Other Chronic Leukemia	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Aleukemic, Subleukemic, and NOS	8	0.9	6	1.6	2	0.3	0	0.0	0	0.0
Mesothelioma	3	0.4	3	0.8	0	0.0	3	0.4	0	0.0
Ill-Defined and Unspecified Sites	95	11.2	50	14.0	45	8.9	0	0.0	9	33.3

Rates are per 100,000 persons and age-adjusted to the 2000 U.S. standard population.
 Source: South Dakota Department of Health

Table 9 shows death and age-adjusted death rates by SEER recode primary sites (Appendix E), 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.

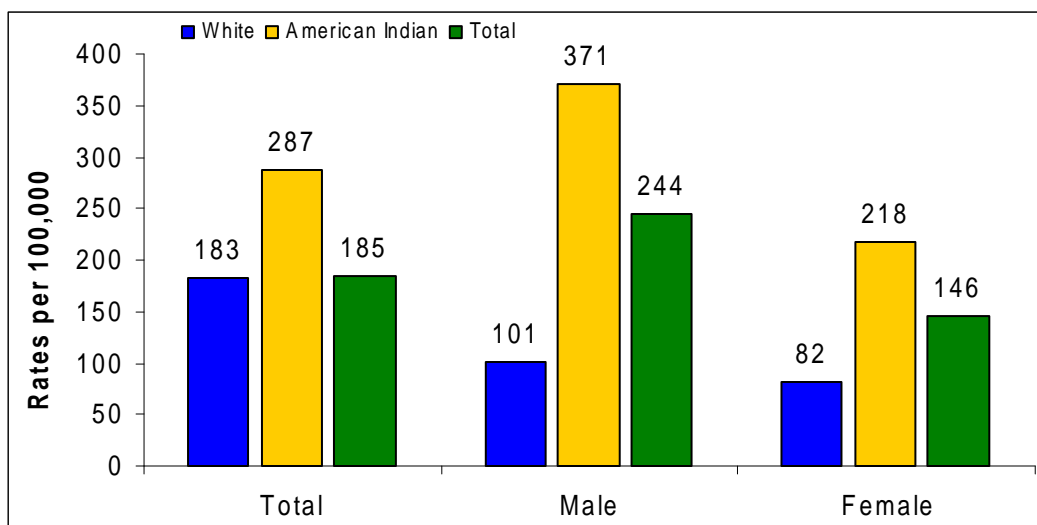
Table 10: Percentage of Cancer Deaths by Age Groups, South Dakota, 2006

Age Group	0-19	20-34	35-49	50-64	65-74	75-84	85+
All Sites	0%	1%	4%	19%	23%	32%	21%
Bladder	0%	0%	3%	10%	8%	48%	33%
Breast, Female	0%	1%	7%	29%	19%	26%	17%
Colorectal	0%	0%	6%	21%	26%	32%	15%
Corpus & Uterus, NOS	0%	2%	15%	48%	19%	13%	3%
Hodgkin Lymphoma	0%	0%	50%	0%	50%	0%	0%
Kidney and Renal Pelvis	0%	2%	4%	28%	24%	26%	15%
Leukemia	5%	2%	5%	14%	15%	32%	29%
Lung & Bronchus	0%	0%	3%	23%	27%	32%	14%
Melanomas of the Skin	0%	4%	17%	26%	13%	22%	17%
Non-Hodgkin Lymphoma	0%	0%	5%	16%	21%	30%	29%
Pancreas	0%	0%	3%	16%	26%	30%	25%
Prostate	0%	0%	0%	5%	18%	45%	32%

Source: South Dakota Department of Health

Overall, in 2006 more persons 75 to 84 years of age died from cancer in South Dakota than any other age group (Table 4). However, there is cause for concern when too many people die from cancer at a young age. For example, 50% of Hodgkin lymphoma cancer deaths, 22% of melanoma of the skin cancer deaths, and 17% corpus and uterus, nos cancer deaths were persons under 50 years of age.

Figure 8: All Sites Cancer Death Rates by Race, South Dakota, 2006



Note: Rates are per 100,000 persons age-adjusted to the 2000 U.S. standard population.
Source: South Dakota Department of Health

Figure 8 illustrates that males had higher death rates than females for all races, whites, and American Indians. American Indians had higher death rates than whites.

VIII. YEARS OF POTENTIAL LIFE LOST

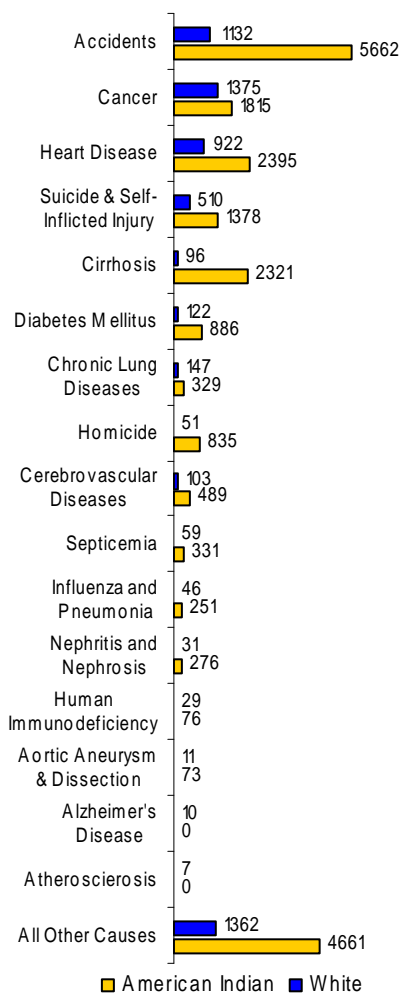
In both 2006 and the five-year period 2002 to 2006, cancer ranked second in years of potential years lost (YPLL) age-adjusted rates (Figures 9 and 10). There were 9,588 years of potential years lost due to cancer in 2006, compared to 10,194 years in 2001.

Table 11: Leading Causes of Years of Potential Life Lost (to 75 years of age), South Dakota, 2006

Accidents	10811
Cancer	9588
Heart Disease	7048
Suicide & Self-Inflicted Injury	4276
Cirrhosis	1625
Diabetes Mellitus	1099
Chronic Lung Disease	1076
Homicide	868
Cerebrovascular Disease	849
Septicemia	508
Pneumonia & Influenza	406
All Other Causes	12605

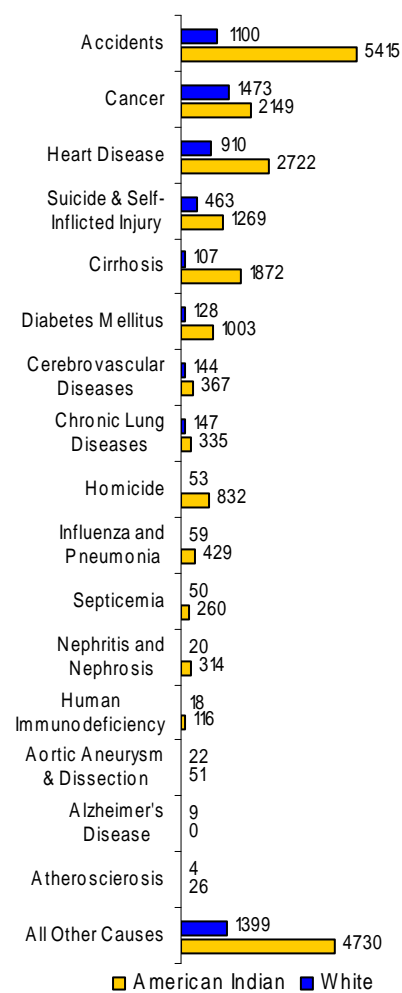
Source: South Dakota Department of Health

Figure 9: Leading Cause of Years of Potential Life Lost Before Age 75 in South Dakota, Age-adjusted Rates 2006



Note: Rates are age-adjusted to the 2000 US standard population.
Source: South Dakota Department of Health

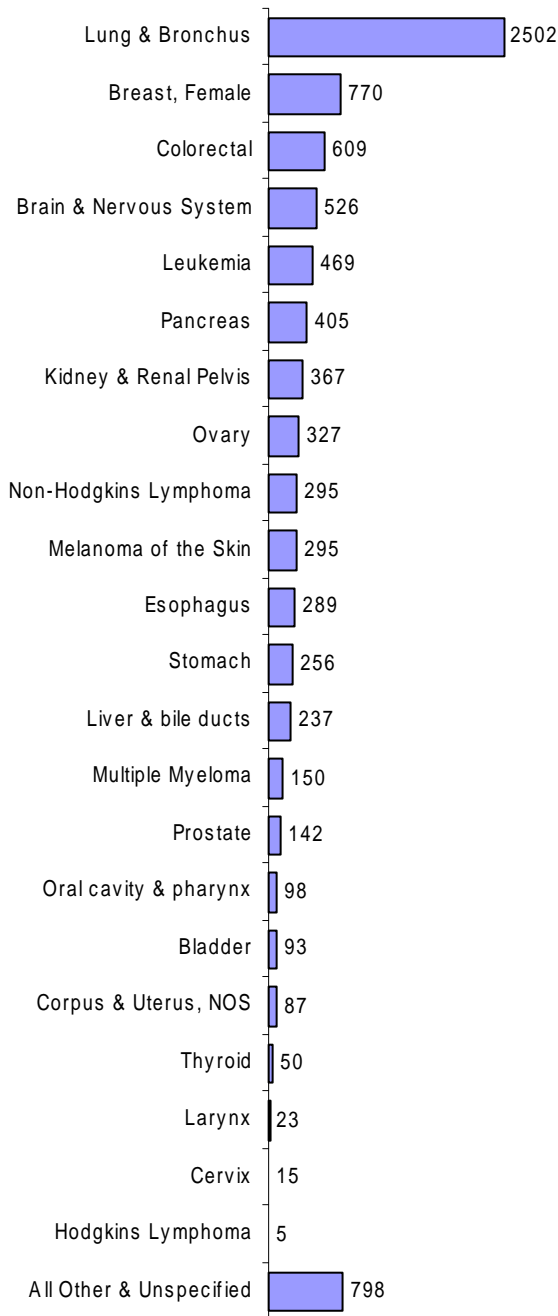
Figure 10: Leading Cause of Years of Potential Life Lost Before Age 75 in South Dakota, Age-adjusted Rates 2002-2006



Note: Rates are age-adjusted to the 2000 US standard population.
Source: South Dakota Department of Health

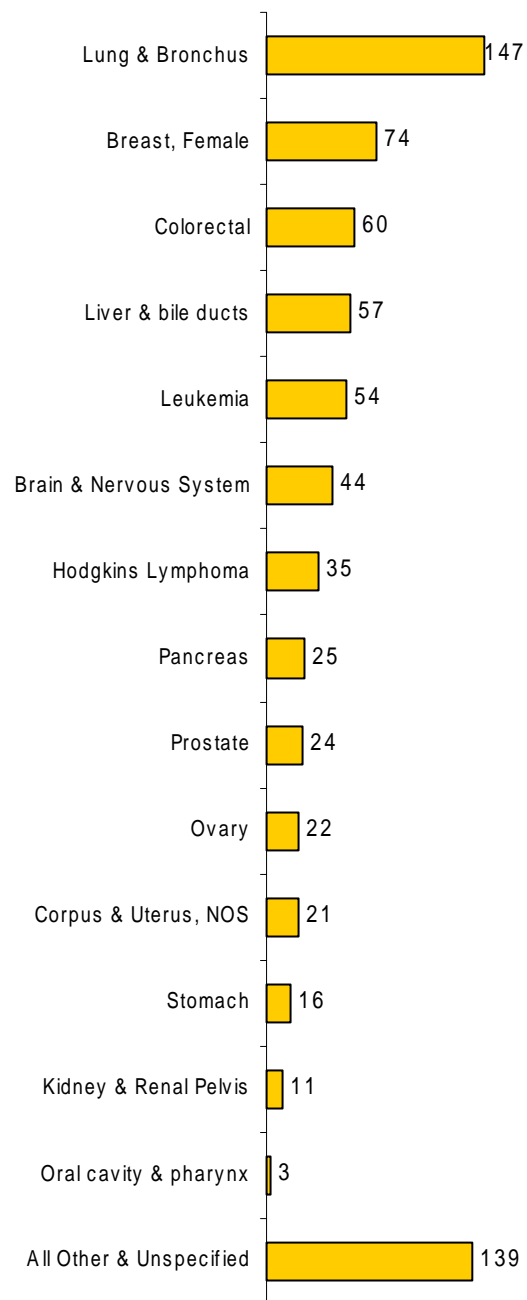
The differences in YPLL in Figures 11 and 12 reflect the number of cases by primary sites. For example, the YPLL for lung and bronchus for whites was 2502 for 216 deaths whereas the YPLL for American Indians was 147 years for 17 deaths which occurred during 2006. Not all cancers were present among the American Indian population during 2006, hence the differences in the cancer sites presented.

Figure 11: Years of Potential Life Lost for Selected Cancers Among Whites, South Dakota, 2006



Source: South Dakota Department of Health

Figure 12: Years of Potential Life Lost for Selected Cancers Among American Indians, South Dakota, 2006

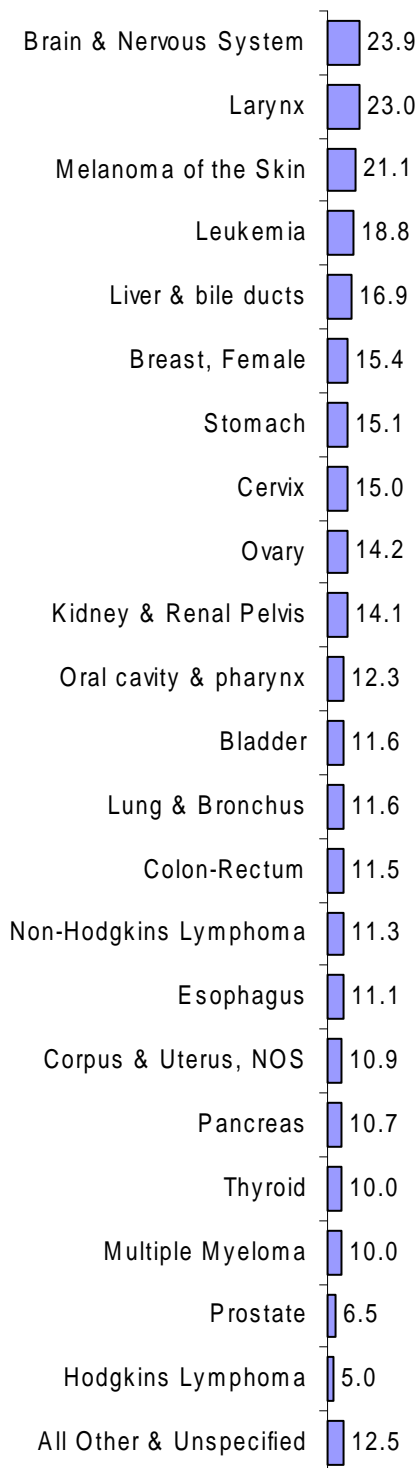


Source: South Dakota Department of Health

IX. AVERAGE YEARS OF LIFE LOST

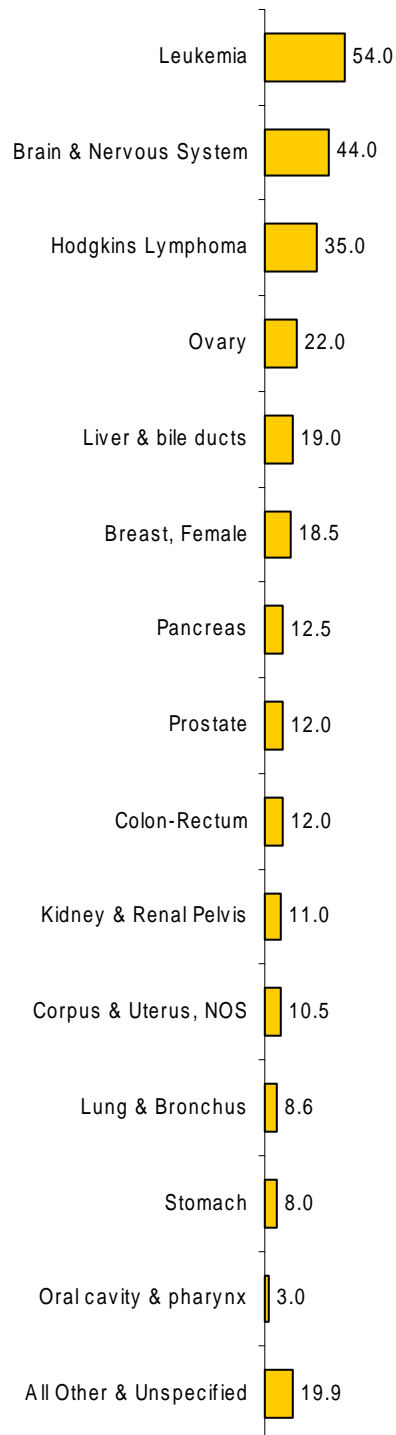
South Dakota's average years of life lost (AYLL) to cancer in 2006 was 10.6 years, twelfth in rank compared to a seventh ranking in 2001 and 12.7 years. Leukemia ranked first among cancer sites for American Indians at 54.0 years compared to whites that averaged 18.8 years with a fourth ranking.

Figure 13: Average Years of Life Lost for Selected Cancers Among Whites, South Dakota, 2006



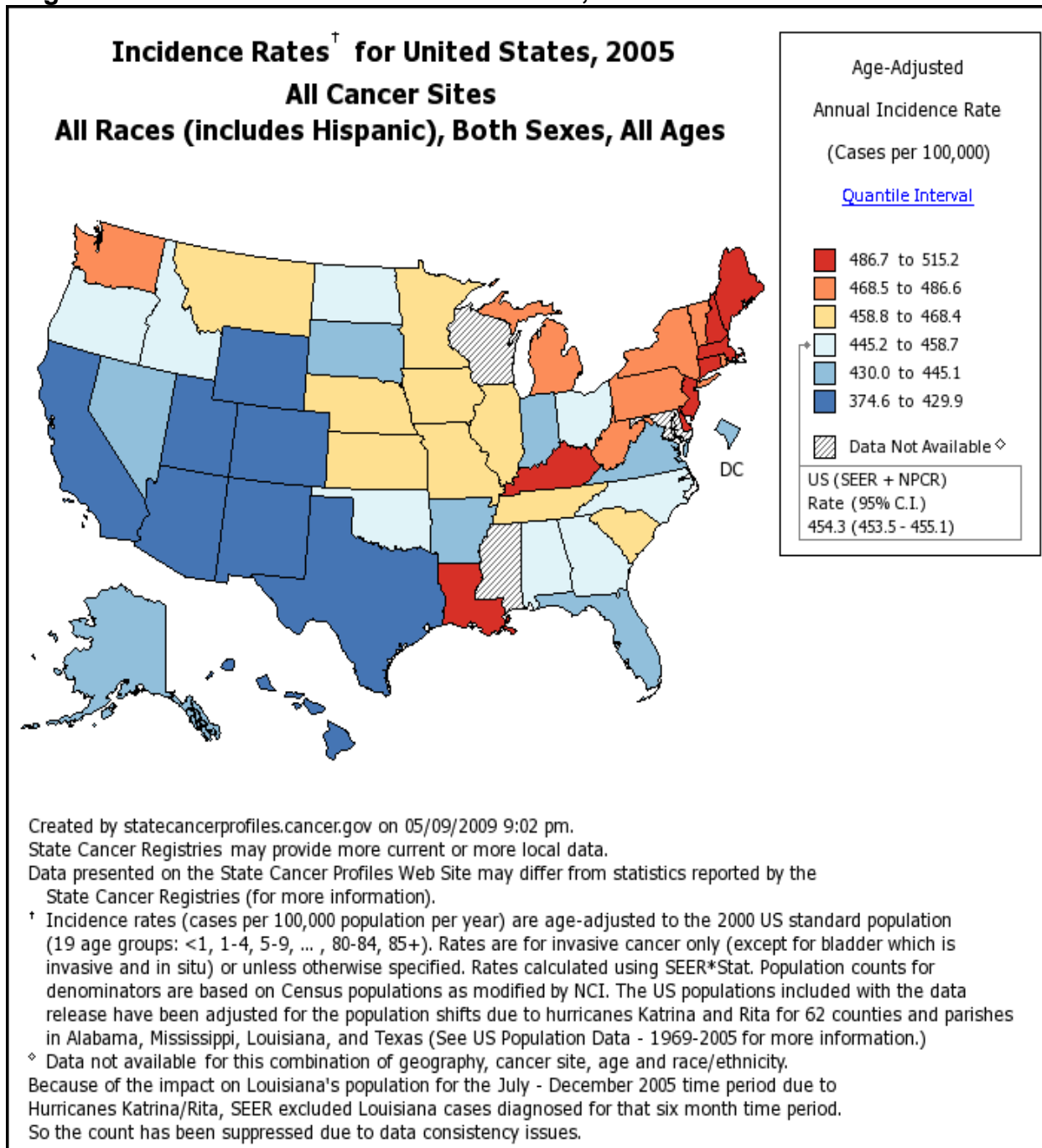
Source: South Dakota Department of Health

Figure 14: Average Years of Life Lost for Selected Cancers Among American Indians, South Dakota, 2006



Source: South Dakota Department of Health

Figure 15: Incidence Rates for United States, 2005



X. CANCER DISPARITIES AMONG MALE, FEMALE AND RACES

Cancer among men*

Three most common cancers among men:

- Prostate cancer (142.4)
 - First among men of all races and Hispanic origin.
- Lung cancer (84.6)
 - Second among men of all races and Hispanic origin.
- Colorectal cancer (58.2)
 - Third among men of all races and Hispanic origin.

Leading causes of cancer death among men:

- Lung cancer (69.4)
 - First among men of all races and Hispanic origin.
- Prostate cancer (25.4)
 - Second among white (22.7), black (54.1), American Indian/Alaska Native (18.0) and Hispanic origin (18.7) men.
- Liver cancer
 - Second among Asian/Pacific Islander men (14.5).
- Colorectal cancer (21.0)
 - Third among men of all races and Hispanic origin.

Cancer among women*

Three most common cancers among women:

- Breast cancer (117.7)
 - First among women of all races and Hispanic origin.
- Lung cancer (55.2)
 - Second among white (56.6), black (50.9), American Indian/Alaska Native (37.6), and
 - Third among Asian/Pacific Islander (26.9), Hispanic (25.2) women.
- Colorectal cancer (41.9)
 - Second among Asian/Pacific Islander (32.2), and Hispanic (33.9), and
 - Third among white (40.8), Black (49.4), and American Indian/Alaska Native women (24.5) women.

Leading causes of cancer death among women:

- Lung cancer (40.6)
 - First among white (41.6), black (40.2), Asian/Pacific Islander (18.2), American Indian/Alaska Native (29.2) women, and
 - Second among Hispanic women (14.4).
- Breast cancer (24.0)
 - First among Hispanic women (15.1), and
 - Second among white (23.3), black (32.9), Asian/Pacific Islander (12.3), and American Indian/Alaska Native (15.3) women.
- Colorectal cancer (14.6)
 - Third among women of all races and Hispanic origin.

Geographic Variations for Four Most Common Cancers

Breast Cancer

- The incidence rate for the United States is 117.5.
 - Incidence rates are highest in the Northeast U.S. Census region (124.0), followed by West (118.5), and South (113.0).
 - Registry incidence rates range from 96.4 to 137.6.
- The death rate for the United States is 24.0.
 - Death rates are highest in the Midwest U.S. Census region (24.6), followed by the Northeast (24.5), South (both 24.3) and the West (22.4).
 - State death rates range from 17.9 to 29.9.

Prostate Cancer

- The incidence rate for the United States is 142.4.
 - Incidence rates are highest in the Northeast U.S. Census region (152.1), followed by the South (139.2), and West (137.7).
 - Registry incidence rates range from 105.5 to 181.7.
- The death rate for the United States is 24.6.
 - Death rates are highest in the Midwest U.S. Census region (25.1), followed by the South (25.0), West (24.3) and the Northeast (23.9).
 - State death rates range from 21.2 to 41.7.

Lung Cancer

Men

- The incidence rate for the United States is 84.6.
 - Incidence rates are highest in the South U.S. Census region (95.5), followed by the, Northeast (82.3), and West (64.6).
 - Registry incidence rates range from 23.7 to 126.2.
- The death rate for the United States is 69.4.
 - Death rates are highest in the South U.S. Census region (79.5), followed by the Midwest (73.0), Northeast (64.0), and West (53.5).
 - State death rates range from 36.4 to 107.2.

Women

- The incidence rate for the United States is 55.2.
 - Incidence rates are highest in the Northeast U.S. Census region (57.2), followed by the South(57.0), and West (48.0).
 - Registry incidence rates range from 23.7 to 78.3.
- The death rate for the United States is 40.9.
 - Death rates are highest in the Midwest U.S. Census region (42.7), followed by the South (42.4), Northeast (39.4), and West (36.2).
 - State death rates range from 15.9 to 56.2.

Colorectal Cancer

Men

- The incidence rate for the United States is 56.4.
 - Incidence rates are highest in the Northeast U.S. Census region (60.5), followed by the South (56.5), and West (49.9).
 - Registry incidence rates range from 42.5 to 68.7.
- The death rate for the United States is 21.0.
 - Death rates are highest in the Midwest U.S. Census region (21.9), followed by the South (21.6), Northeast (21.3), and West (18.7).
 - State death rates range from 14.6 to 26.3.

Women

- The incidence rate for the United States is 41.9.
 - Incidence rates are highest in the Northeast U.S. Census region (44.9), followed by the South (41.1), and West (37.7).
 - Registry incidence rates range from 32.6 to 49.7.
- The death rate for the United States is 14.6.
 - Death rates are highest in the Northeast and Midwest U.S. Census regions (15.3), followed by the South (14.5) and West (13.4).
 - State death rates range from 9.2 to 16.9.

Racial or Ethnic Variations

- Among four races and Hispanic origin, for all cancers combined:
 - American Indian/Alaska Native men have the lowest incidence rates of cancer; however, Asian/Pacific Islander men have the lowest death rates from cancer.
 - White women have the highest incidence rates of cancer; however, black women have the highest death rates from cancer.
 - American Indian/Alaska Native women have the lowest incidence rates of cancer and the third-highest cancer death rates..

Note: The rates mentioned are per 100,000 persons and age-adjusted to the 2000 U.S. standard population.

*The combined rate for all races is presented when the ranking of cancer sites did not differ across race and ethnicity; race- or ethnicity-specific rates are presented when ranking differed by race or ethnicity.

Source: U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999–2005 Incidence and Mortality Web-based Report*. Atlanta (GA): Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2009. Available at: <http://www.cdc.gov/uscs>.

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Page last updated: January 7, 2009

Content source: [Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion](#)

XI. SCREENABLE CANCERS

CDC supports screening for breast, cervical, and colorectal (colon) cancers as recommended by the [U.S. Preventive Services Task Force](http://www.ahrq.gov/clinic/uspstfix.htm). (<http://www.ahrq.gov/clinic/uspstfix.htm>)

Breast Cancer

Currently, the best way to find breast cancer is with a mammogram. Mammograms are the best method to detect breast cancer early when it is easier to treat. For more information, visit [Breast Cancer Screening](http://www.cdc.gov/cancer/breast/basic_info/screening.htm). (http://www.cdc.gov/cancer/breast/basic_info/screening.htm)

Cervical Cancer

The Pap test can find abnormal cells in the cervix which may turn into cancer. Pap tests can also find cervical cancer early, when the chance of being cured is very high. For more information, visit [Cervical Cancer Screening](http://www.cdc.gov/cancer/cervical/basic_info/screening/). (http://www.cdc.gov/cancer/cervical/basic_info/screening/)

The U.S. Food and Drug Administration has approved a human papilloma virus (HPV) vaccine for females aged 9–26 to prevent cervical cancer. However, the HPV vaccine does not substitute for routine cervical cancer screening (Pap tests), according to recommended screening guidelines. For more information, visit [Basic Information about Cervical Cancer](http://www.cdc.gov/cancer/cervical/basic_info/). (http://www.cdc.gov/cancer/cervical/basic_info/)

Colorectal (Colon) Cancer

Colorectal cancer almost always develops from precancerous polyps (abnormal growths) in the colon or rectum. Screening tests can find precancerous polyps, so that they can be removed before they turn into cancer. Screening tests can also find colorectal cancer early, when treatment works best. For more information, visit [Colorectal Cancer Screening](http://www.cdc.gov/cancer/colorectal/basic_info/screening/). (http://www.cdc.gov/cancer/colorectal/basic_info/screening/)

The [Colorectal Cancer Screening Demonstration Program](http://www.cdc.gov/cancer/colorectal/what_cdc_is_doing/demonstration/) (http://www.cdc.gov/cancer/colorectal/what_cdc_is_doing/demonstration/) offers free or low-cost screening at five sites.

Screening for lung, ovarian, prostate, and skin cancers has not been shown to reduce deaths from those cancers.

Lung Cancer

Scientists have studied several types of screening tests for lung cancer. A review of these studies by experts shows that more information is needed. It is not known if these tests can help prevent deaths from lung cancer. For more information, visit [Lung Cancer Screening](http://www.cdc.gov/cancer/lung/basic_info/screening.htm). (http://www.cdc.gov/cancer/lung/basic_info/screening.htm)

Ovarian Cancer

There is no evidence that any screening test reduces deaths from ovarian cancer. For more information, visit [Basic Information about Ovarian Cancer](http://www.cdc.gov/cancer/ovarian/basic_info/). (http://www.cdc.gov/cancer/ovarian/basic_info/)

Prostate Cancer

Because current evidence is insufficient to determine whether the potential benefits of prostate cancer screening outweigh important harms, there is no scientific consensus that such screening is beneficial. For more information, visit [Prostate Cancer Screening](http://www.cdc.gov/cancer/prostate/basic_info/screening.htm). (http://www.cdc.gov/cancer/prostate/basic_info/screening.htm)

Skin Cancer

The U.S. Preventive Services Task Force has concluded that there is not enough evidence to recommend for or against routine screening (total-body examination by a clinician) to detect skin cancers early. For more information, visit [Basic Information about Skin Cancer](http://www.cdc.gov/cancer/skin/basic_info/). (http://www.cdc.gov/cancer/skin/basic_info/)

XII. SELECTED CANCER SITES INCIDENCE & 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 lymphoma, pancreas, prostate, stomach and thyroid.

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

Topics for each cancer include incidence and mortality data including age-specific rates, trends, comparison with national data, risk and associated risk factors, prevention.

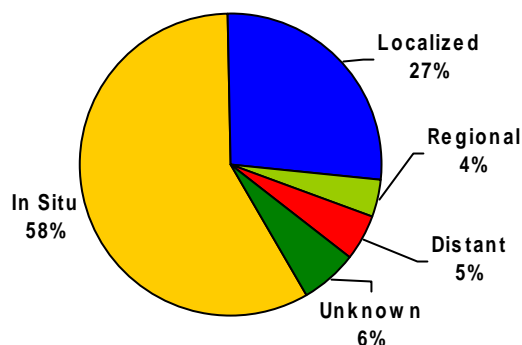
BLADDER

Table 12: Incidence and Mortality Summary, South Dakota, 2006

Bladder Cancer	Total	Male	Female
No. of Invasive Cases	182	141	41
SD Incidence Rate	21.9	39.8	8.8
US Incidence Rate *(2005)	21.7	38.2	9.7
SD Cancer Deaths	40	31	9
SD Mortality Rate	4.5	9.0	1.6
US Mortality Rate *(2005)	4.3	7.5	2.3

¹Includes in situ bladder; * SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population. Source: South Dakota Department of Health

Figure 16: Bladder Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: In 2006, it was estimated that over 60,240 cases of bladder cancer would be diagnosed in the United States. There were 182 cases of bladder cancer reported in South Dakota, of these, 105 were in situ (noninvasive). There were 141 men and only 41 women diagnosed in 2006. Statistically, men are diagnosed four times more frequently than women. There was only one American Indian diagnosed in 2006. In the United States it is the fourth most frequent cancer. In South Dakota it was the fifth most frequent cancer diagnosed.

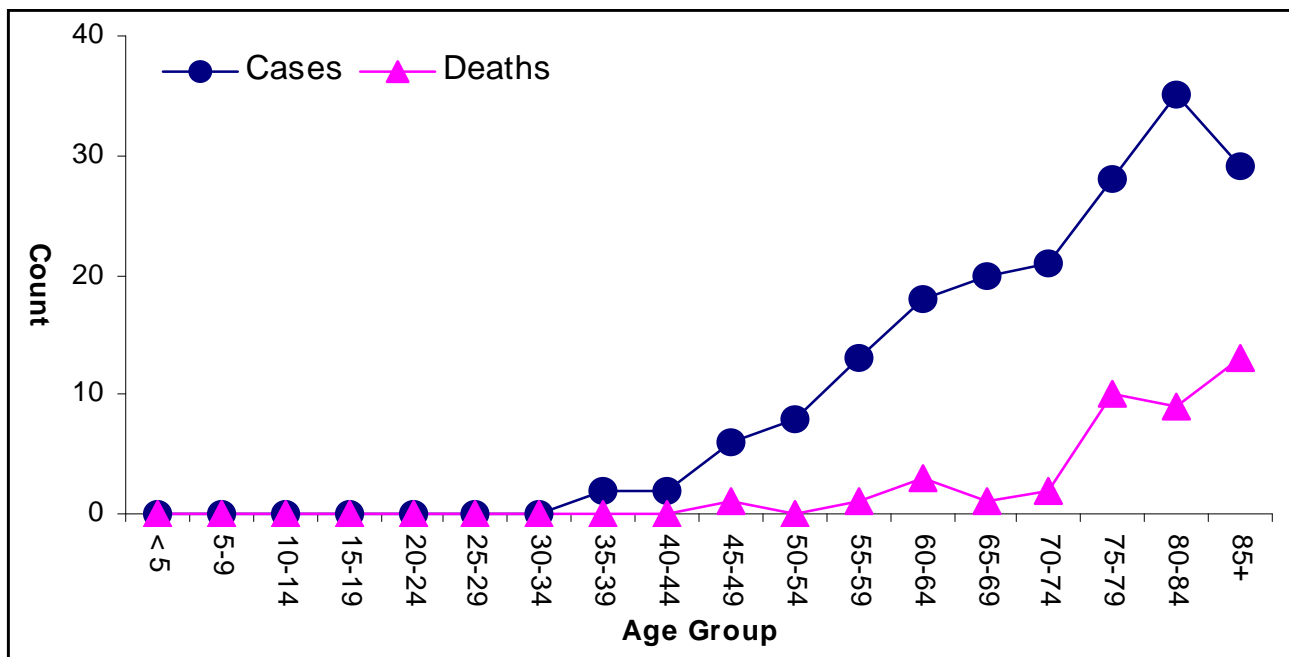
Stage at Diagnosis: Cancer is categorized as noninvasive and invasive. There were 105 noninvasive bladder cancers reported in 2006. There were 77 invasive. Fifty-eight percent of all bladder cancer cases were diagnosed at noninvasive, in situ stage. Nationally 50% of the cases of urinary bladder cancer 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 US distant stage accounted for 4% of the bladder cancers reported.

Mortality: The majority (58%) of all bladder 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 60 and above have the highest mortality. In 2006, the South Dakota mortality rate was 4.5 compared to the U.S. (2005) rate which was 4.3.

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 2 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.

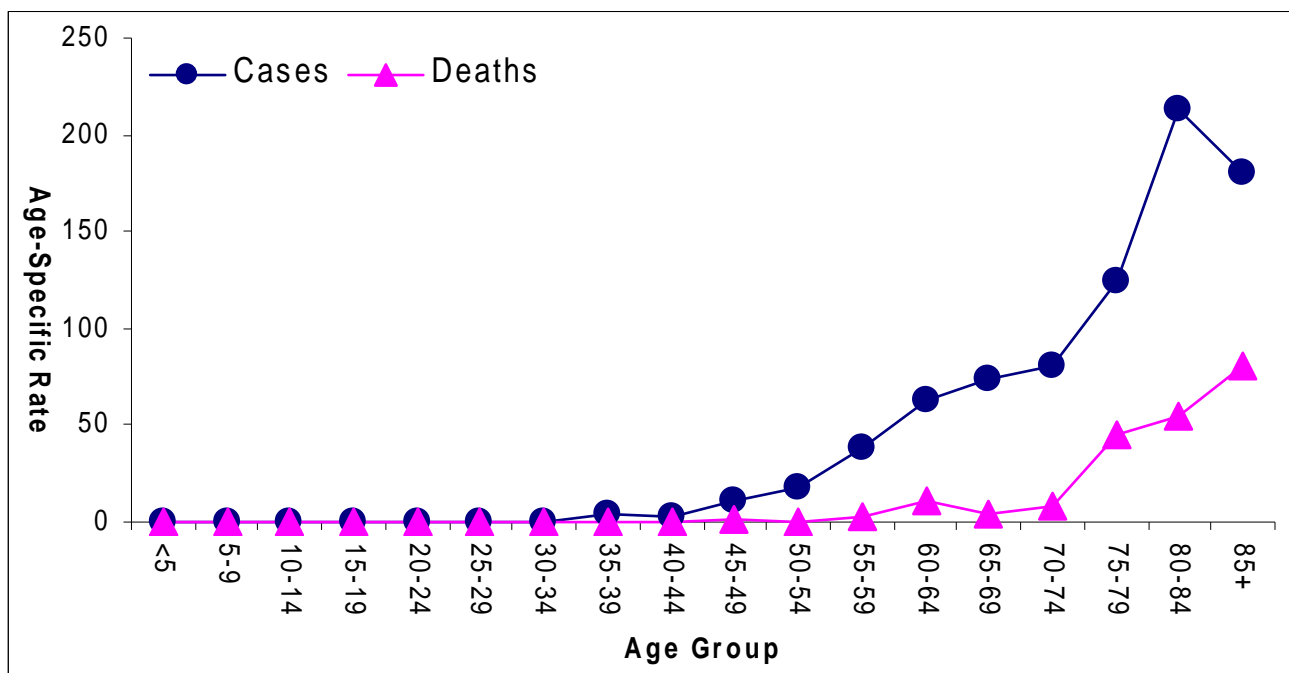
Figure 17: Bladder Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

The ages include both in situ and invasive diagnosis of bladder cancer.

Figure 18: Bladder Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

The mortality data includes both in situ and invasive bladder cancer.

BREAST (FEMALE)

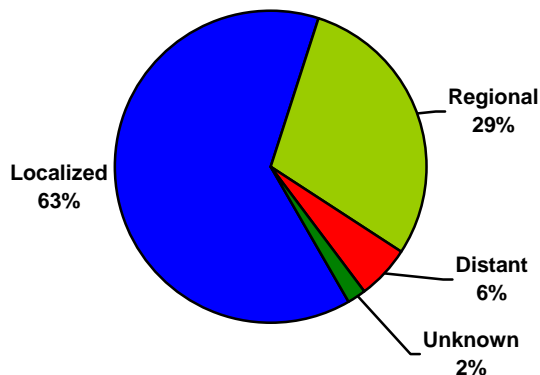
Table 13: Incidence and Mortality Summary, South Dakota, 2006

Breast (female) Cancer	Total	White	American Indian
No. of Invasive Cases	473	443	24
SD Incidence Rate	115.0	114.1	128.9
US Incidence Rate *(2005)	123.2	125.0	65.1
SD Cancer Deaths	95	90	5
SD Mortality Rate	21.2	21.1	28.3
US Mortality Rate * (2005)	25.0	24.4	14.3

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to U.S. standard population.

Source: South Dakota Department of Health

Figure 19: Female Breast Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Health Department

Descriptive Epidemiology

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 2001-2004. This decrease may be in part due to the lower number of women using hormone replacement therapy. There were 473 cases of female breast cancer reported in 2006. In South Dakota, 13.4% of all cancer cases reported were female breast. Nationally, 16% of all cancer cases are female breast cancer. South Dakota in 2006 was lower than the national average for diagnosed and reported breast cancer cases. For women, breast cancer represented 29% of the cases diagnosed for South Dakota women in 2006.

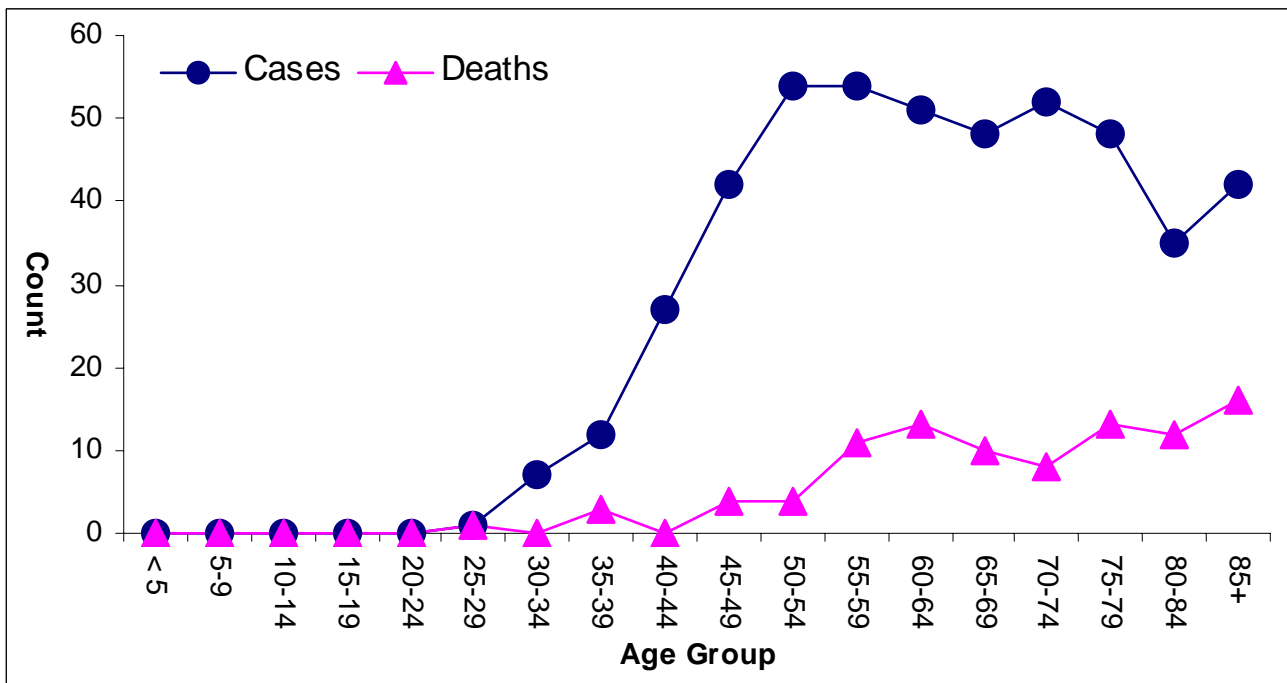
Stage at Diagnosis: Of the 473 cases diagnosed in 2006, 301 cases were diagnosed at localized stage. This represents 63% of all reported breast cancer cases. There were 139 cases that had progressed beyond the breast. There were 27 that were diagnosed as a distant stage and 9 that were staged as unknown.

Mortality: Breast cancer is the fourth 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 old, it has decreased among women younger than 55 years of age. In 2006 there were 95 deaths. Of those cases, 90 were white and 5 were American Indian.

Risk and Associated Factors: Among the known risk factors for breast cancer 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 cancer or endometrial and specific tumor suppressor genes such as BRCA1 and BRCA2.

Early Detection and Prevention: Early detection and prevention is the key to survival of breast cancer. Monthly self-examination and annual examination by a health professional are the mainstays of early detection. Mammograms should begin at age 40.

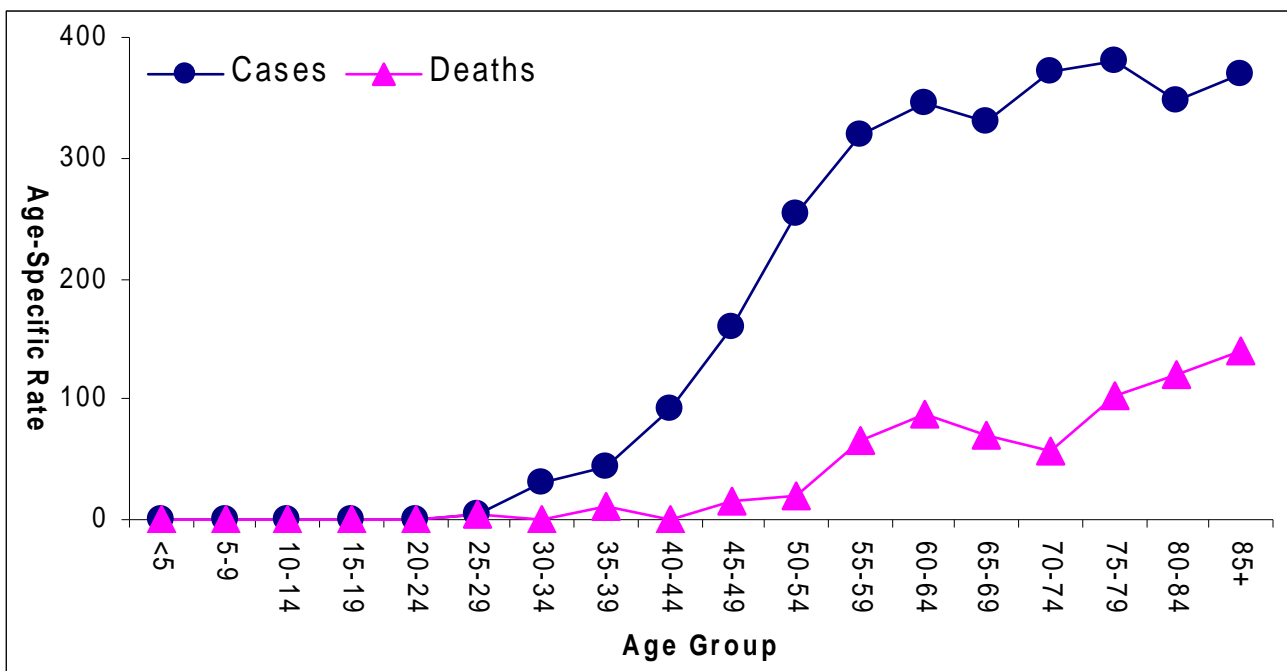
Figure 20: Female Breast Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

The incidence peak for 2006 was in the age group from 50-54 and 55-59. The median age at diagnosis was 63 years of age.

Figure 21: Female Breast Cancer Age-specific Cancer Incidence and Death Rates, 2006



Source: South Dakota Department of Health

CERVIX UTERI

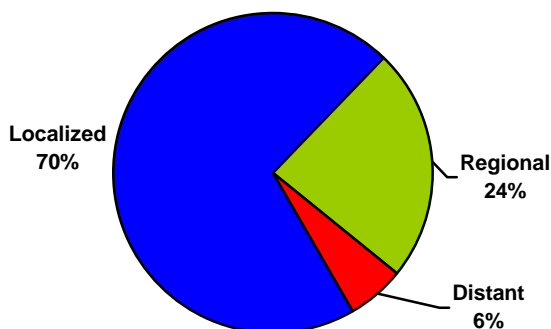
Table 14: Incidence and Mortality Summary, South Dakota, 2006

Cervix Uteri Cancer	Total	White	American Indian
No. of Invasive Cases	17	14	3
SD Incidence Rate	4.6	4.1	13.1
US Incidence Rate *(2005)	8.5	8.0	6.6
SD Cancer Deaths	1	1	0
SD Mortality Rate	0.3	0.3	00
US Mortality Rate * (2005)	2.5	2.3	

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to U.S. standard population.

Source: South Dakota Department of Health

Figure 22: Cervix Uteri Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Health Department

Descriptive Epidemiology

Incidence: The incidence rate in South Dakota is 4.6 and in the United States it is 8.5. Cervical cancer is the third most common female genital tract malignancy. Invasive cervical cancer accounted for .5% of all cases reported and 1.05% of all females diagnosed with cancer in South Dakota in 2006. SEER incidence reports that .2% of cases are younger than 20 years of age.

Stage at Diagnosis: Early stage of diagnosis clearly provides the best opportunity for cure. In South Dakota, 70% of the cases reported were diagnosed at localized stage. SEER reports that 50% of the cases diagnosed nationally were at the localized stage.

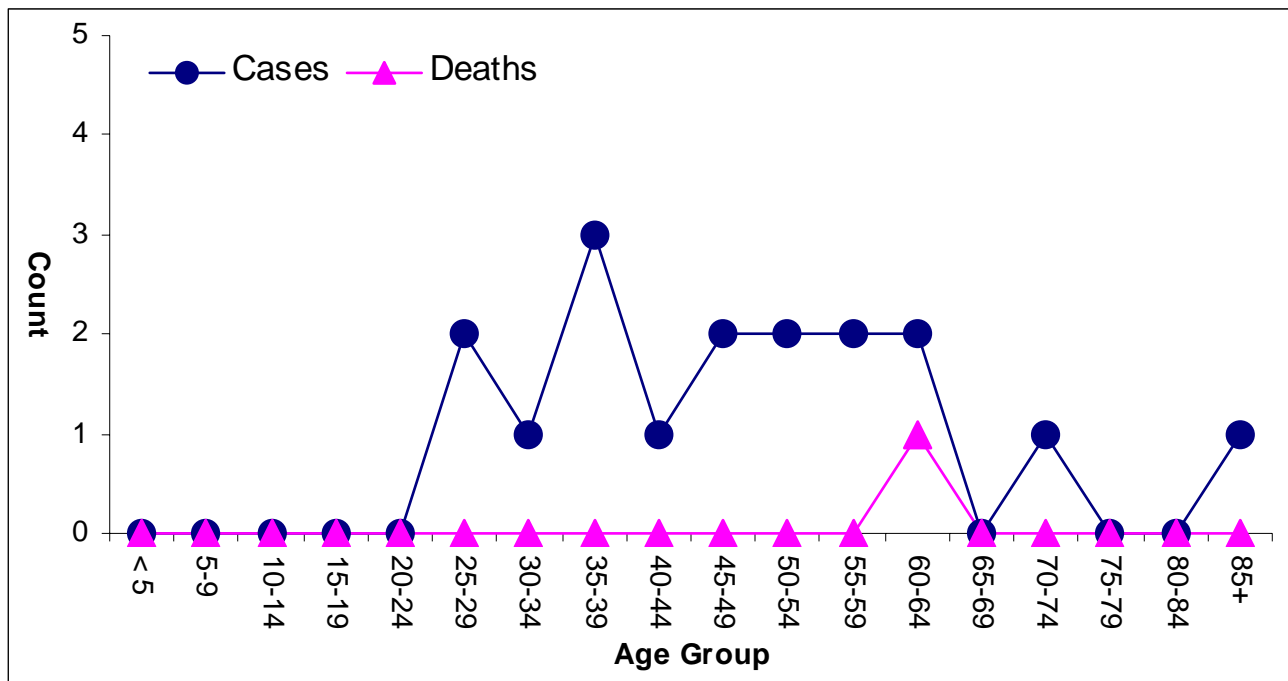
Mortality: The death rate in South Dakota is only 0.3 for cancer of the cervix uteri. In the United States the rate is 2.5. The stage of disease at diagnosis affects the mortality rate. Cases diagnosed at a localized stage have a 92% survival rate according to the American Cancer Society. When diagnosed at distant stage, the percentage of survival drops to 15% at 5 years. There was only 1 case in 2006 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/>

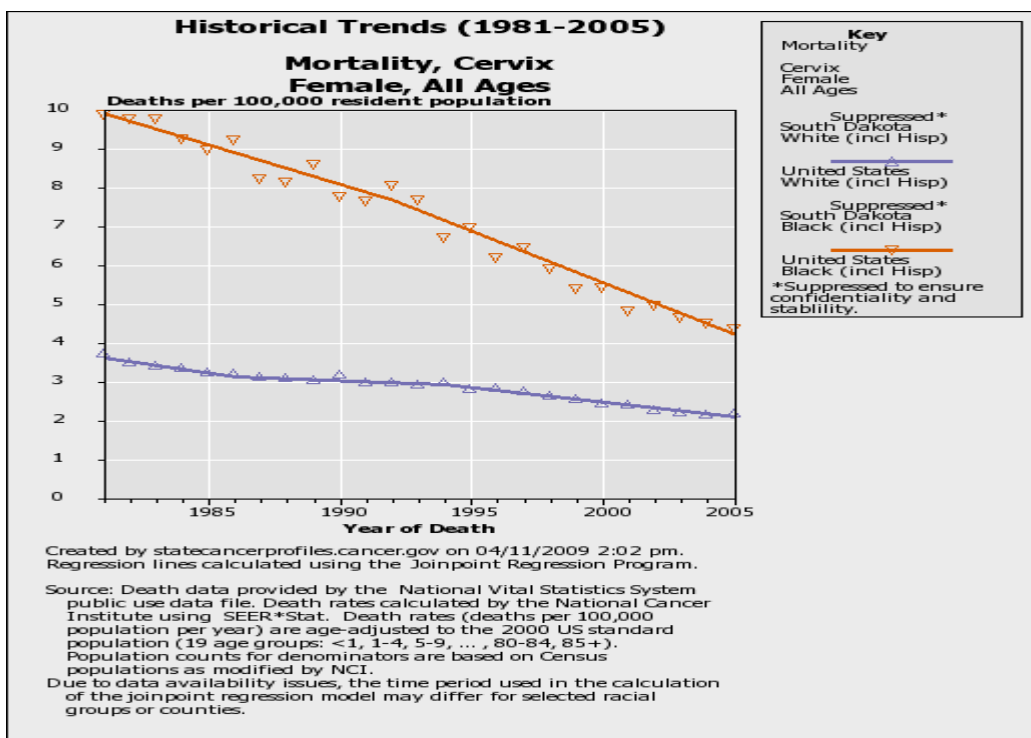
Figure 23: Cervix Uteri Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

The incidence of cervical cancer (cervix uteri) was relatively stable in each age group in 2006, varying only one or two in each group.

Figure 24: Historical Trends (1981-2005) Mortality, Cervix



Source: Statecancerprofiles.cancer.gov

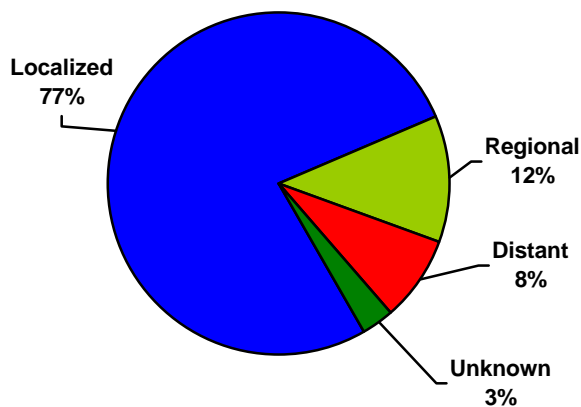
CORPUS and UTERUS, NOS

Table 15: Incidence and Mortality Summary, South Dakota, 2006

Corpus and Uterus, NOS Cancer	Total	White	American Indian
No. of Invasive Cases	100	92	8
SD Incidence Rate	25.6	24.9	36.8
US Incidence Rate *(2005)	23.7	24.2	14.2
SD Cancer Deaths	19	16	3
SD Mortality Rate	4.0	3.5	20.1
US Mortality Rate *(2005)	4.1	3.9	2.3

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population
Source: South Dakota Department of Health

Figure 25: Corpus and Uterus, NOS Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Health Department

Descriptive Epidemiology

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 2006. Cancer of the corpus uteri represents 6.11% of all of the cancers diagnosed in South

Dakota females in 2006. Endometrial cancer affects primarily postmenopausal women. The median age at diagnosis in the United States is 58. In South Dakota the median age is 61 years of age.

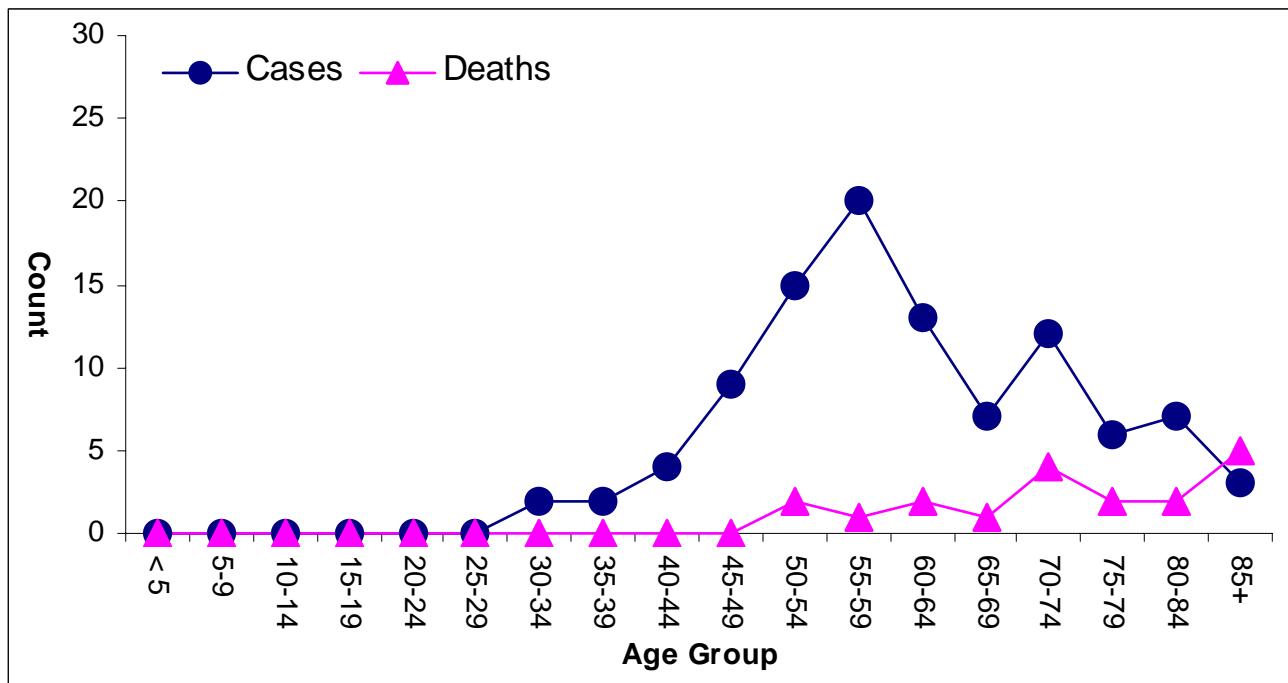
Stage at Diagnosis: Cancer in the uterus is treated surgically. Staging for these diseases is done following surgery, unless it is obvious that the disease has progressed and is advanced. Cases with obvious advanced disease do not benefit from surgical procedures and are staged by physical examination. These cases are treated without operative staging. In South Dakota, during 2006, 77% of all corpus uteri cases were diagnosed at localized stage. Only 3 (8%) were diagnosed at distant stage.

Mortality: The death rate in South Dakota for the reporting period is only 4.0 for deaths attributed to uterine cancer. In the United States the rate is 4.1. Only 19 South Dakota female deaths were attributed to cancer of the uterus in 2006. The stage of disease at diagnosis affects the mortality rate. Overall (all stages included) the five year relative survival rate was 82.9% in 2006.

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%.

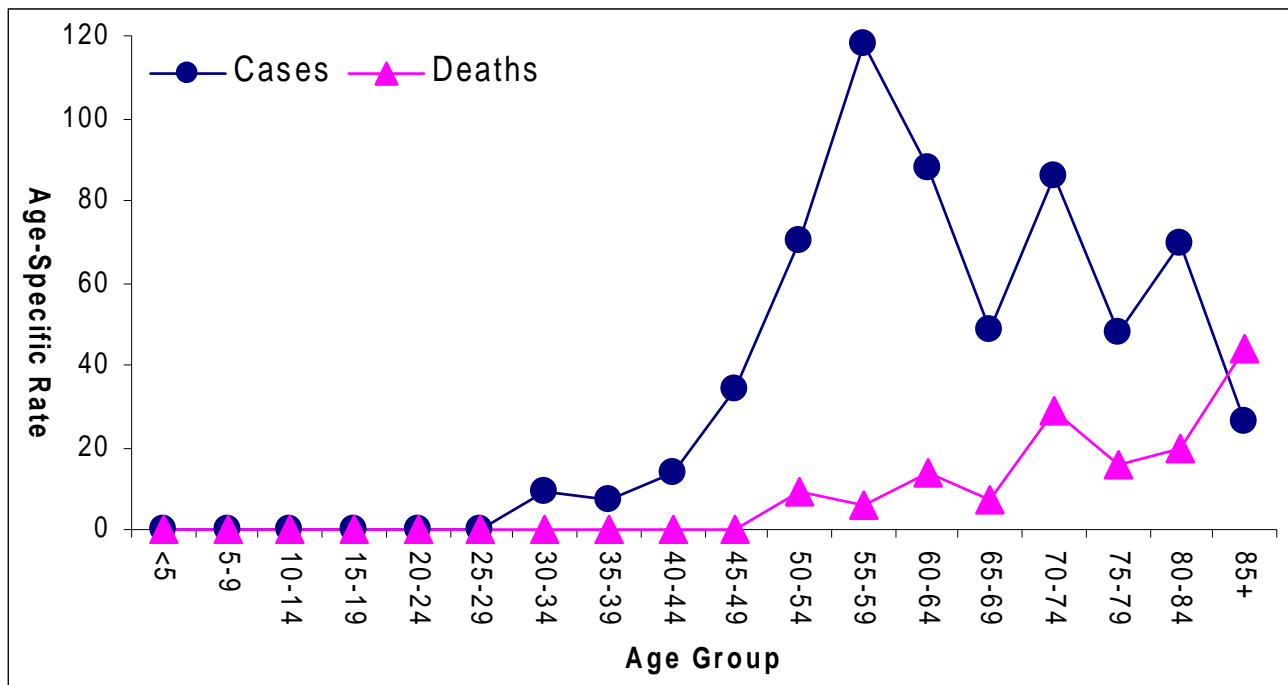
Figure 26: Corpus and Uterus, NOS Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

In South Dakota, in 2006 the incidence peaked in the 55-59 age group.

Figure 27: Corpus and Uterus, NOS Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

Deaths from corpus uteri cancer do not primarily affect the young. However, the incidence rate increases dramatically in the 55 to 59 age group in 2006.

COLORECTAL

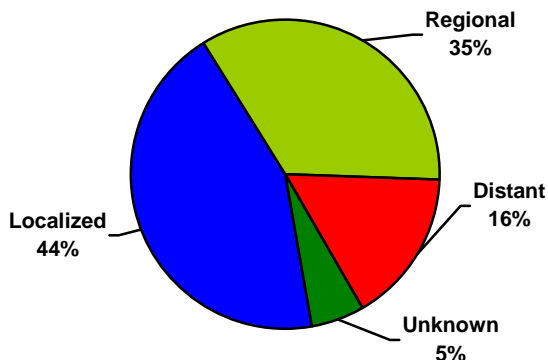
Table 16: Incidence and Mortality Summary, South Dakota, 2006

Colorectal Cancer	Total	Male	Female
No. of Invasive Cases	384	196	188
SD Incidence Rate	46.6	55.4	40.0
US Incidence Rate *(2005)	51.7	60.9	44.6
SD Cancer Deaths	149	81	68
SD Mortality Rate	17.3	23.2	12.9
US Mortality Rate *(2005)	18.8	22.7	15.9

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population

Source: South Dakota Department of Health

Figure 28: Colorectal Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: Colorectal cancer accounted for 11% of all cases reported in South Dakota in 2006. The median age at diagnosis was 73. There were 196 men and 188 women diagnosed with colorectal cancer in 2006 in South Dakota. Colorectal cancer is the fourth most diagnosed cancer in men and women. When reviewed separately, 10.1% of all cancers reported in males and 11.4% of all cancer reported in females were colorectal.

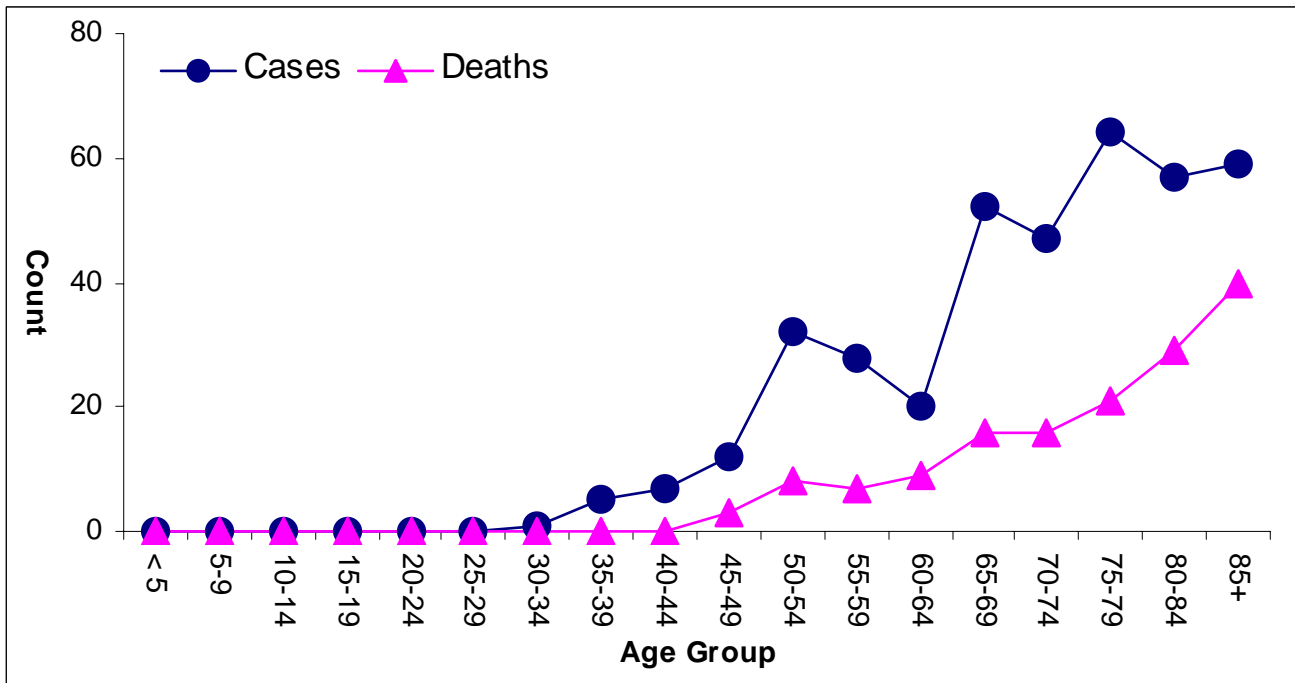
Stage at Diagnosis: The prognosis of the patient is greatly influenced by the stage of disease at diagnosis. In 2006 44% (168) of the cases of colorectal cancer were diagnosed at localized stage. Localized is defined as when the disease is still confined to the colon. The remaining 216 cases (56%) were diagnosed after the disease had spread beyond the colon. Of those 216 cases, 62 were diagnosed at distant stage when the disease had spread further involving other organs. The National Cancer Data Base states that the survival rate for five years for those who have distant stage at diagnosis is 6.1%.

Mortality: Overall incidence and mortality rates for colorectal cancer are decreasing. The overall 5 year survival rate for 1996-2005 from 17 SEER geographic areas was 65.4% for men and 65.2% for women. In 2006, there were a total of 145 deaths that were attributed to colorectal cancer in South Dakota. Of that number there were 81 men and 68 women. Of that number, 142 were white and only 5 were American Indian. The race was unknown in two cases. The median age at death was 77. The Seer Cancer Statistics states that the United States mortality rate in 2005 was 18.8. These rates are based on cases diagnosed in 2001-2005 from 17 SEER geographic areas.

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

Early Detection and Prevention: 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.

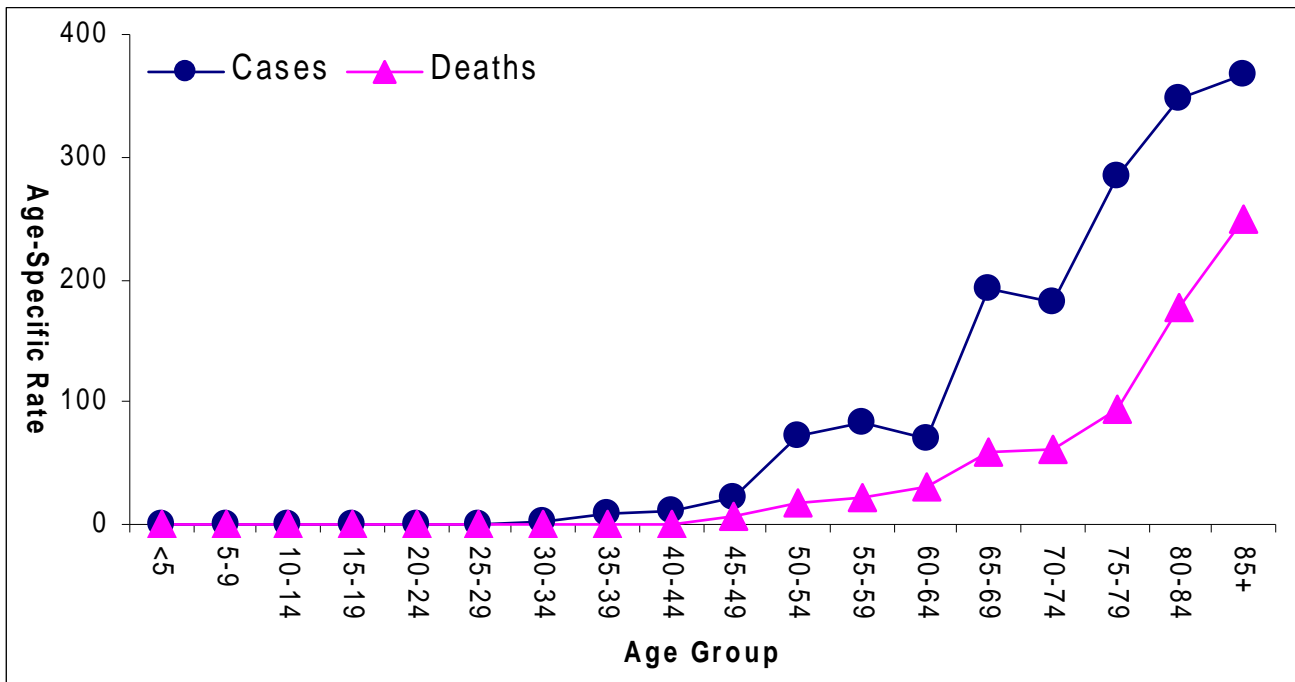
Figure 29: Colorectal Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Colorectal cancer gradually increases with age. In 2006 there was a dramatic increase in the incidence of cases in the 65 to 69 age group.

Figure 30: Colorectal Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

Age-specific rates continue to increase with age.

KIDNEY AND RENAL PELVIS

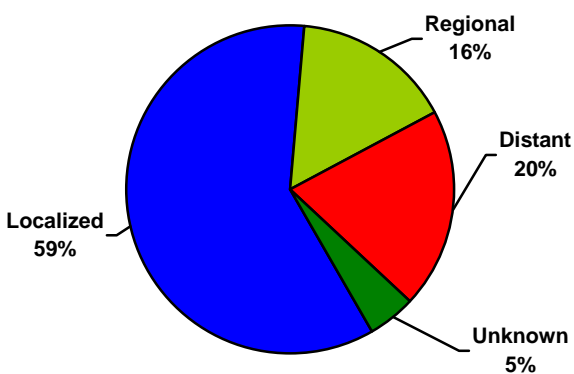
Table 17: Incidence and Mortality Summary, South Dakota, 2006

Kidney and Renal Pelvis Cancer	Total	Male	Female
No. of Invasive Cases	128	80	48
SD Incidence Rate	16.2	22.2	11.2
US Incidence Rate *(2005)	13.9	19.0	9.8
SD Cancer Deaths	46	28	18
SD Mortality Rate	5.6	8.0	3.8
US Mortality Rate * (2005)	4.2	6.0	2.7

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population

Source: South Dakota Department of Health

Figure 31: Kidney and Renal Pelvis Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Health Department

Descriptive Epidemiology

Incidence: In 2006 the American Cancer Society estimated there would be 38,890 new cases of kidney cancer in the United States. This accounts for only 2.7% of all reported malignancies in the United States. In South Dakota there were 128 reported cases representing 3.7% of all cases reported in 2006. 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 68 in South Dakota and 64 in the United States.

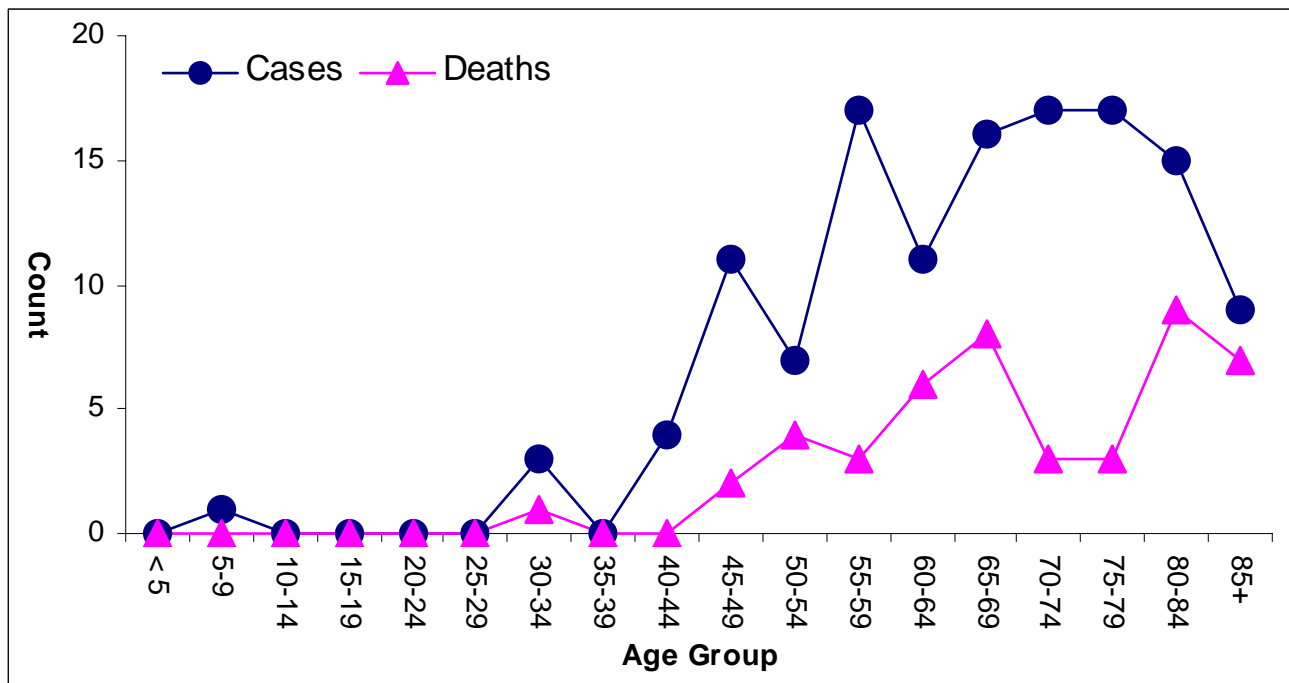
Stage at Diagnosis: As with all malignancies, early diagnosis is the key to better prognosis, and possible cure. Fifty-nine percent (76) of the cases in 2006 were diagnosed at localized stage. Unfortunately, symptoms do not always reflect the stage of disease. Blood in the urine is one of the symptoms that frequently presents at diagnosis. As with other cancers, kidney cancer can spread through the blood stream and/or lymphatic system. Approximately 20% (25) of all cases were diagnosed at distant stage.

Mortality: 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 5 year survival rate for localized stage kidney cancer is 90%. Of the kidney cancers reported to the South Dakota Central Cancer Registry 59% were diagnosed at localized stage. The survival rate for distant stage is 19%.

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.

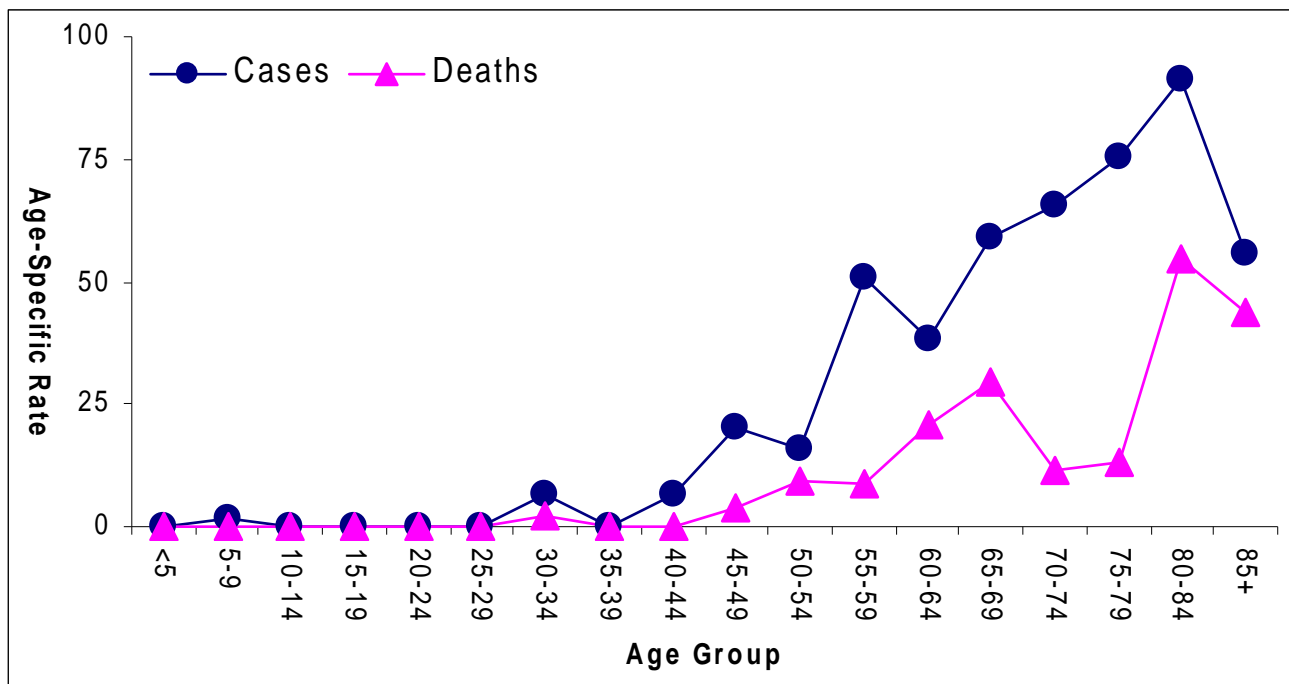
Figure 32: Kidney and Renal Pelvis Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

During 2006, the incidence of kidney cancer began to decrease gradually as the population aged.

Figure 33: Kidney and Renal Pelvis Age-specific Cancer Incidence and Death Rates, 2006



Source: South Dakota Department of Health

The death rate from kidney cancer began a steady increase until the 75 to 79 age group.

LEUKEMIA

Table 18: Incidence and Mortality Summary, South Dakota, 2006

Leukemia	Total	Male	Female
No. of Invasive Cases	102	61	41
SD Incidence Rate	12.7	17.1	9.1
US Incidence Rate *(2005)	12.3	16.0	9.6
SD Cancer Deaths	66	41	25
SD Mortality Rate	7.6	11.6	4.6
US Mortality Rate * (2005)	7.4	9.9	5.6

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population
Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: The American Cancer Society estimated that there would be 130 new cases of Leukemia in South Dakota during 2006. 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):

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 2006 there were 53 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 does the symptoms. There were 40 cases of acute leukemia in South Dakota in 2006.

These types of leukemia are further divided by the type of white blood cell that is affected. Leukemia can arise in lymphoid cells or myeloid cells. Leukemia that affects lymphoid cells is called lymphocytic leukemia. Leukemia that affects myeloid cells is called myeloid leukemia or myelogenous leukemia.

There are three common types of leukemia:

Chronic lymphocytic leukemia (CLL): CLL, accounts for about 7,000 new cases of leukemia each year. Most often, people diagnosed with the disease are over age 55. It almost never affects children. There were 44 cases in 2006 that were reported in South Dakota.

Chronic myeloid leukemia (CML): CML accounts for about 4,400 new cases of leukemia each year. It affects mainly adults. This form of leukemia is not as prevalent as CML. There were only 9 cases in 2006 in South Dakota.

Acute lymphocytic leukemia (ALL): ALL accounts for about 3,800 new cases of leukemia each year. It is the most common type of leukemia in young children. It also affects adults. There were 8 cases of ALL in 2006 in South Dakota.

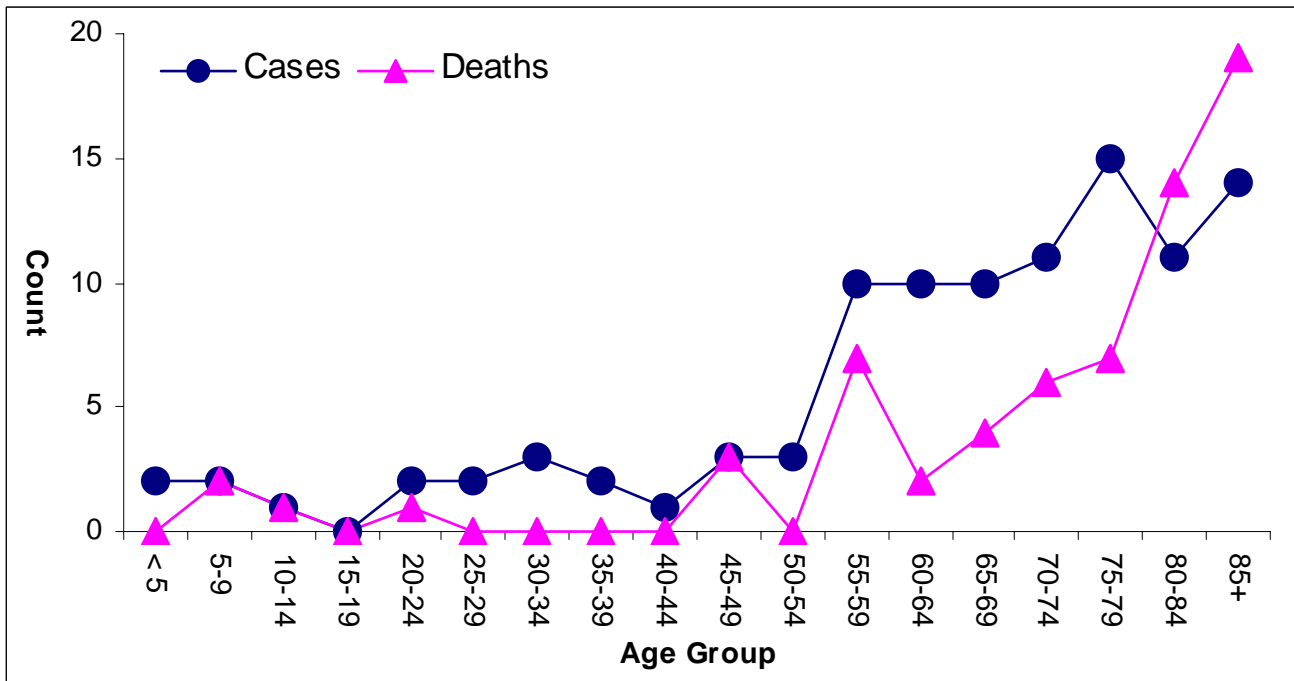
Risk Factors

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.

Down's syndrome and certain other genetic diseases caused by abnormal chromosomes may increase the risk of leukemia.

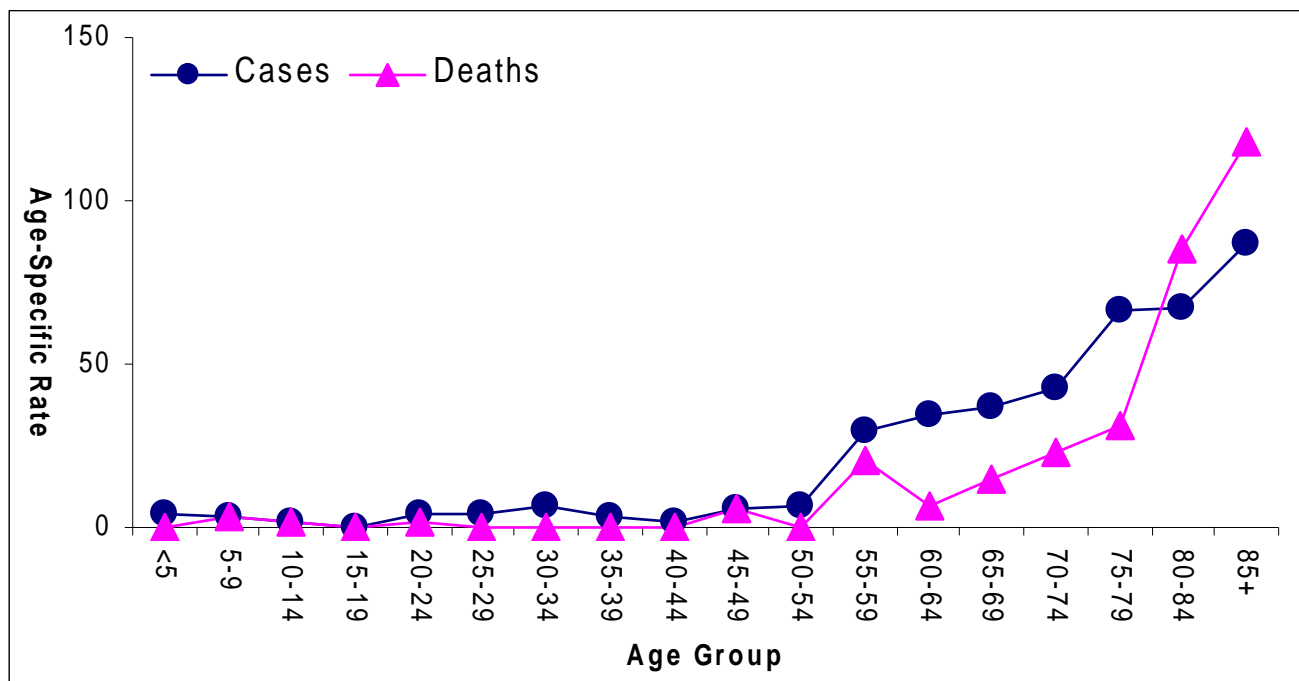
Figure 34: Leukemia Number of cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Leukemia is frequently diagnosed in children, but as with all malignancies it is a disease of the elderly. The incidence of leukemia rapidly increases after the age of 55.

Figure 35: Leukemia Age-specific Cancer Incidence and Death Rates, 2006



Source: South Dakota Department of Health

LUNG AND BRONCHUS

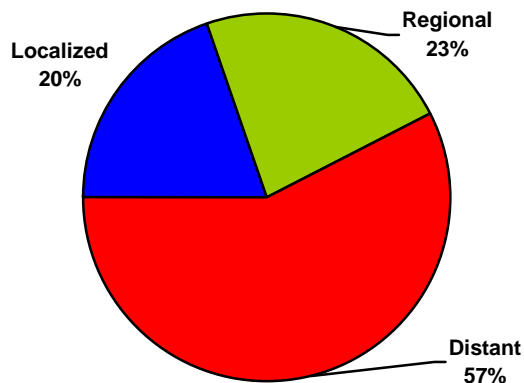
Table 19: Incidence and Mortality Summary, South Dakota, 2006

Lung and Bronchus Cancer	Total	Male	Female
No. of Invasive Cases	523	300	223
SD Incidence Rate	64.3	83.9	50.6
US Incidence Rate *(2005)	69.1	87.8	55.4
SD Cancer Deaths	435	248	187
SD Mortality Rate	52.6	69.8	41.1
US Mortality Rate *(2005)	54.1	72.0	41.0

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population.

Source: South Dakota Department of Health

Figure 36: Lung and Bronchus Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: Lung cancer is a major public health dilemma, accounting for more than 163,000 deaths in the United States annually. 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 523 lung cancer cases diagnosed in 2006.

Stage at Diagnosis: The presentation of lung cancer is extremely variable and depends on local manifestations of the tumor, distant metastases or associated paraneoplastic

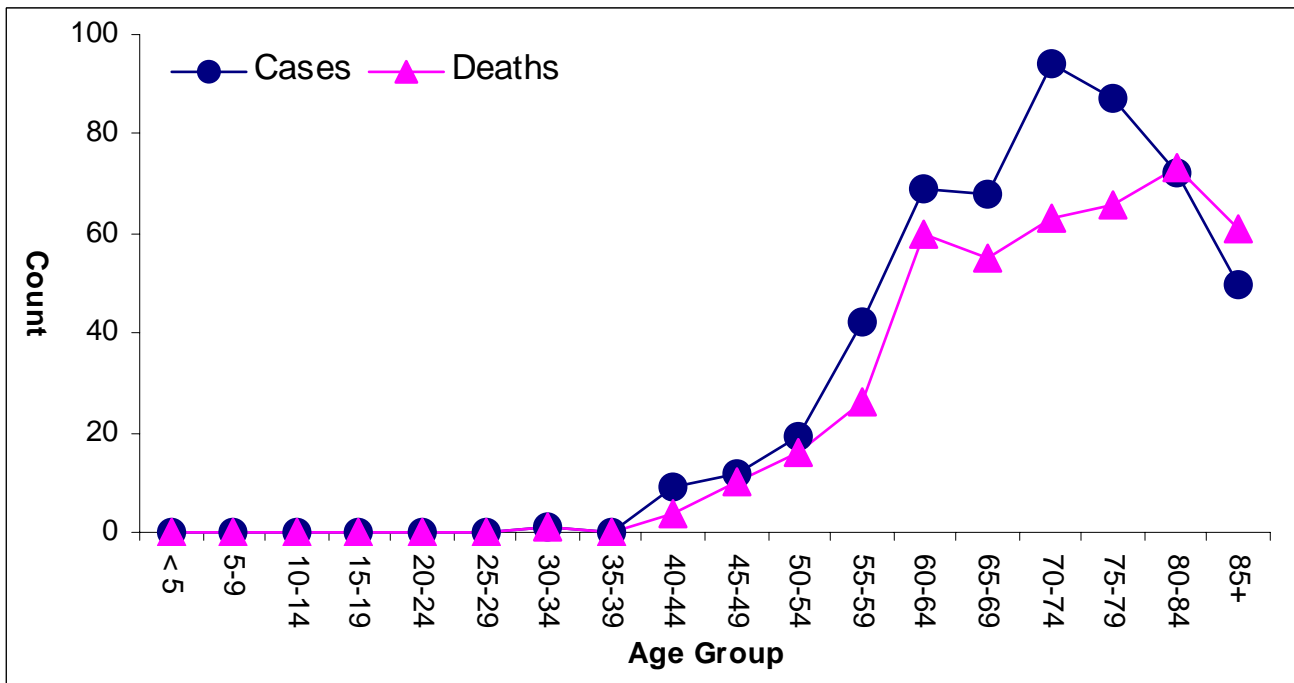
syndromes. In 2006, 20% of lung cancer patients were diagnosed at localized stage. The higher the stage, the poorer the prognosis is for the patient. In 2006, 285 (57%) of all cases were diagnosed when disease had progressed beyond the lung and metastasized to a distant location. Approximately 80% of cases in 2006 were diagnosed after the disease had progressed beyond the lung to lymph nodes, regional areas, or distant sites, such as brain or bone

Mortality: There were 435 lung cancer deaths in South Dakota in 2006. Incidence and mortality rates have significantly increased during the last century. Lung cancer accounts for approximately 29% of all US deaths attributed to cancer. In South Dakota, lung cancer accounts for 28.4% 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 cancer 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.

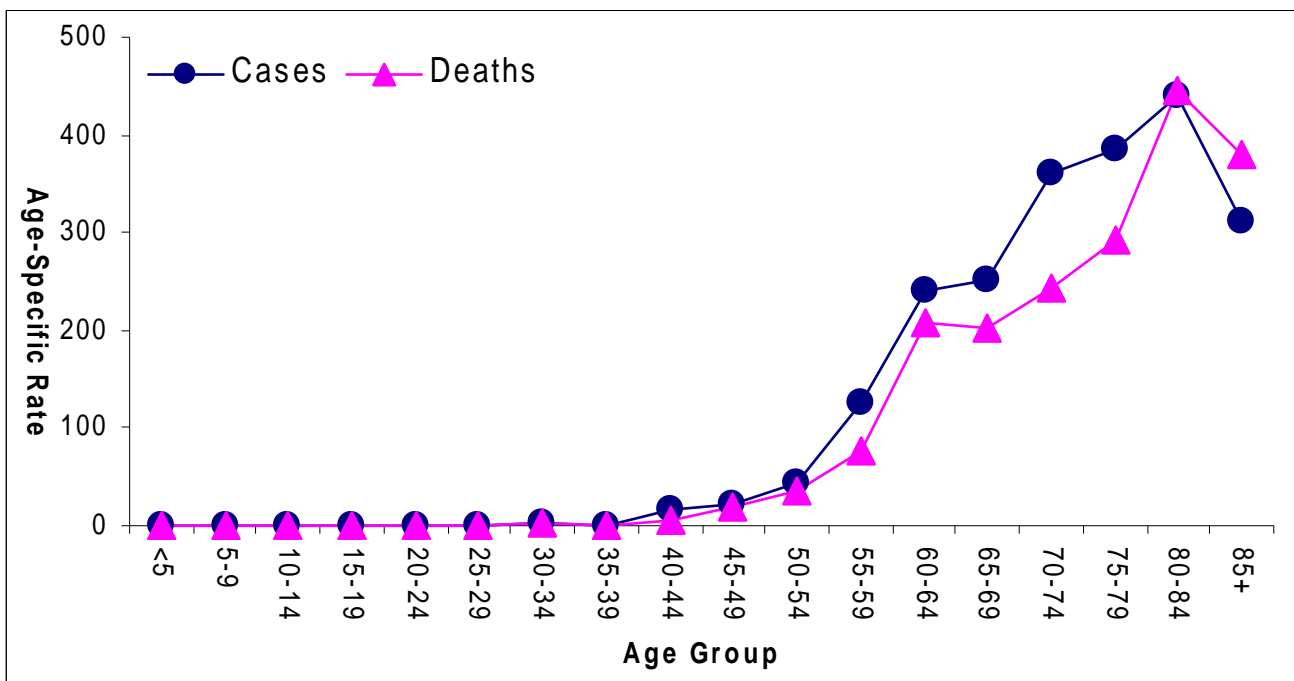
Figure 37: Lung and Bronchus Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Incidence peaked in the 70-74 age group while the age at death peaked in the 80-84 age group.

Figure 38: Lung and Bronchus Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

MELANOMA (SKIN)

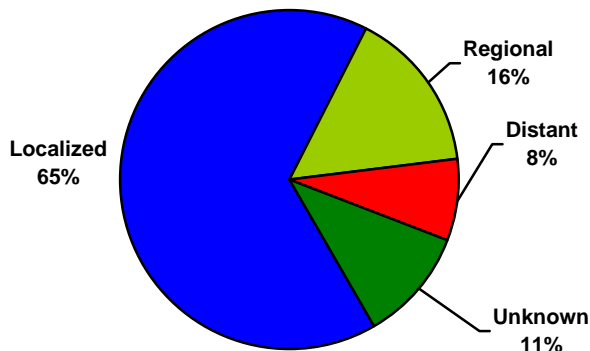
Table 20: Incidence and Mortality Summary South Dakota 2006

Melanoma (Skin) Cancer	Total	Male	Female
No. of Invasive Cases	125	74	51
SD Incidence Rate	16.3	20.8	12.4
US Incidence Rate *(2005)	17.5	22.0	14.3
SD Cancer Deaths	23	17	6
SD Mortality Rate	2.9	4.9	1.5
US Mortality Rate *(2005)	2.7	22.0	14.5

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population

Source: South Dakota Department of Health

Figure 39: Melanoma (Skin) Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: In the United States in 2006, the American Cancer Society estimated that there would be 62,190 new cases of melanoma of the skin. Melanoma is the most common skin cancer in the United States. There are three forms of skin cancer: basal, 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 16.3 and the US has an incidence rate of 17.5.

Stage at Diagnosis: Melanoma is staged by the depth of invasion and the extension of the lesion. In 2006, there were 125 cases of melanoma of the skin reported for South Dakota. Of this number, 84 (65%) were staged as localized disease. The survival rate for localized melanoma is 98%. For distant disease or stage 7 the survival rate is 16% at 5 years.

Mortality: There were 23 deaths attributed to melanoma of the skin in South Dakota in 2006 with a mortality rate of 2.9. The mortality rate for the United States was 2.7. The median age for death in South Dakota for this cancer was 84 in 2006. In 2001-2005 nationwide, the median age at death was 68 for melanoma of the skin.

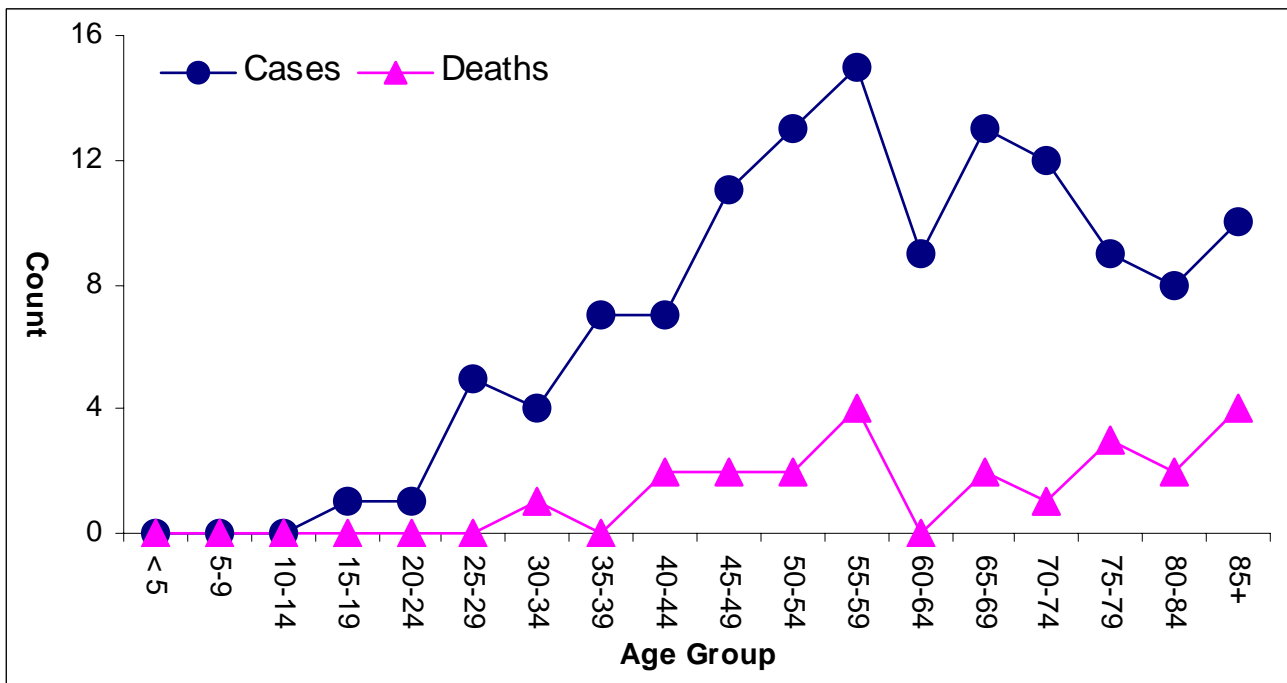
Risk and Associated Factors: Certain factors are more likely to contribute to a higher risk. These are:

- 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 suntan lotion regularly
- stay in the shade
- cover skin
- wear a hat

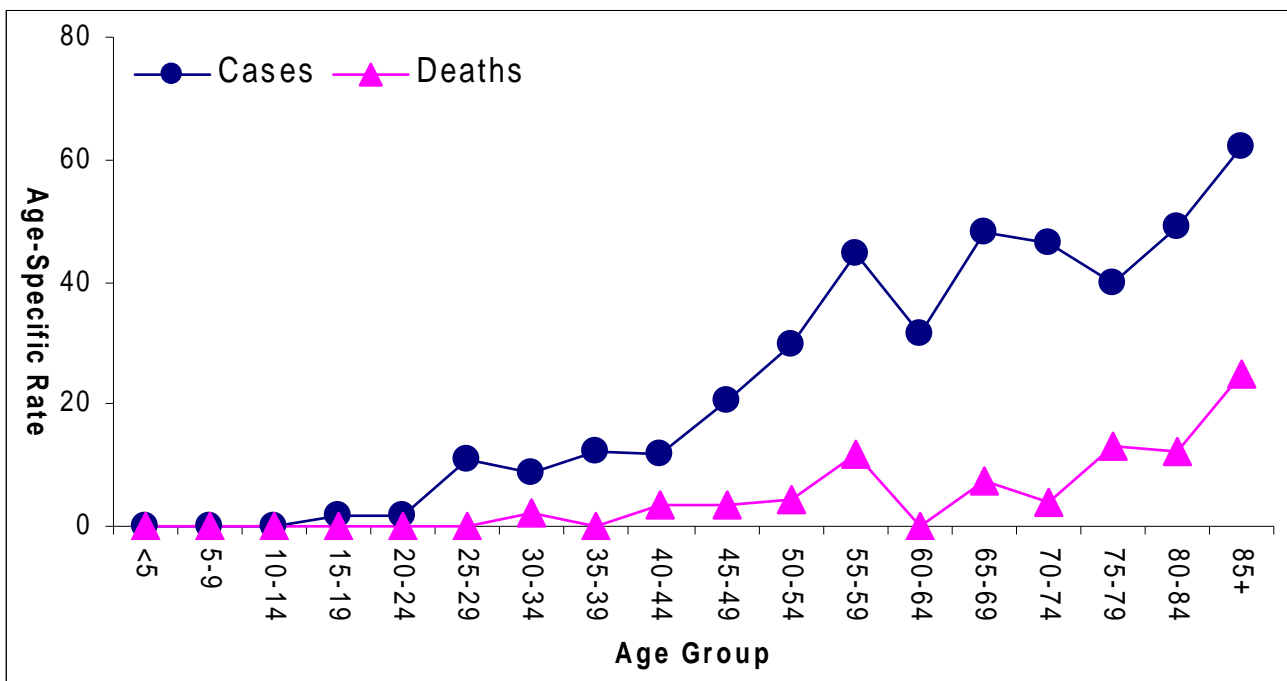
Figure 40: Melanoma (Skin) Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

The incidence of melanoma increases with age until the 60-64 age group. The number of deaths also increases until the 60-64 age group. Note that there is only an increase of one or two within each group.

Figure 41: Melanoma (Skin) Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

MYELOMA §

Table 21: Incidence and Mortality Summary, South Dakota, 2006

Myeloma §	Total	Male	Female
No. of Invasive Cases	44	28	16
SD Incidence Rate	5.7	7.8	3.8
US Incidence Rate *(2005)	5.6	7.1	4.6
SD Cancer Deaths	36	21	15
SD Mortality Rate	4.3	5.9	3.2
US Mortality Rate * (2005)	3.6	4.5	2.9

*SEER.cancer.gov; Rates are per 100,000 persons, age- adjusted to 2000 U.S. standard population

§ can include NOS, multiple, plasma cell and solitary.

Source: South Dakota Department of Health

Descriptive Epidemiology

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 2006 myeloma accounted for less than one percent of total cancer cases reported. Median age at diagnosis in South Dakota and the United States was 71. The incidence rate is higher in men (7.8) than women (3.8). Myeloma is more common among the elderly. African Americans have approximately twice the incidence and mortality rates of whites.

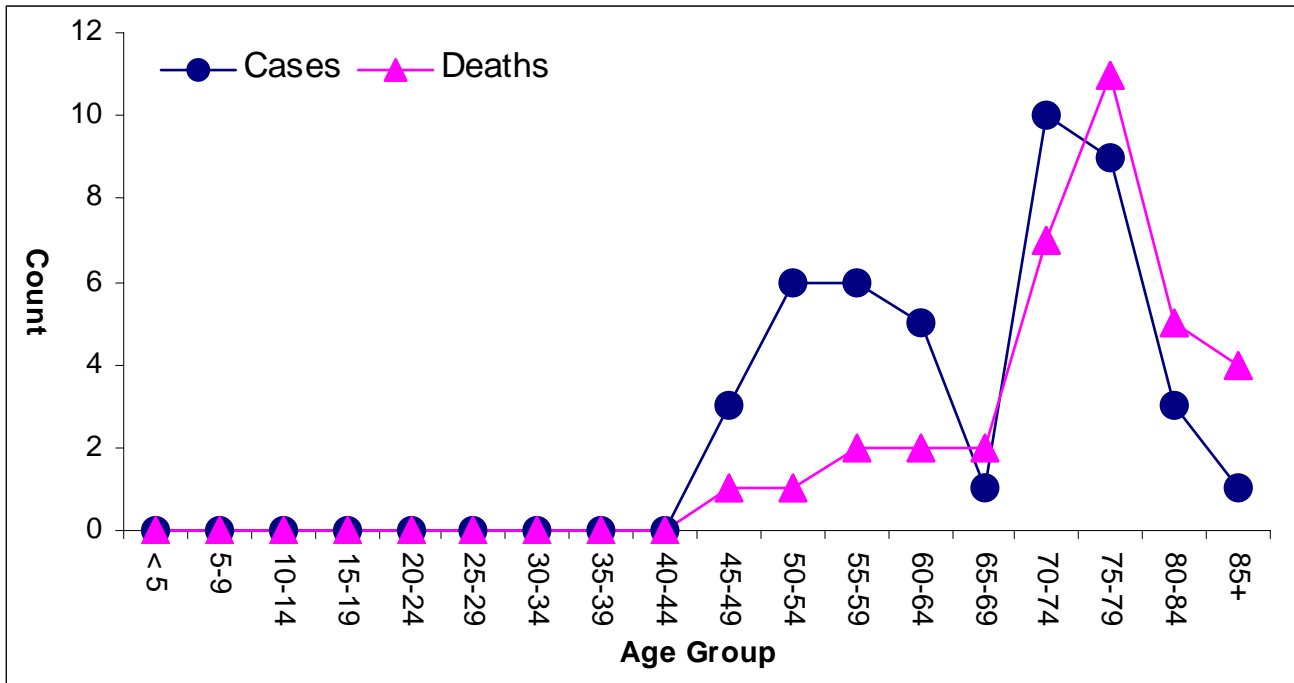
Stage at Diagnosis: Stage of disease for myeloma is always distant per SEER Summary Staging Manual.

Mortality: The median survival prior to the common use of chemotherapy was about 7 months. After the introduction of chemotherapy, prognosis improved significantly with a median survival of 24 to 30 months and a ten-year survival of 3%. During 2006 there were 36 deaths attributed to myeloma in South Dakota. Twenty-one were male and 15 were female. The mortality rate for South Dakota is 4.3. For men the rate is 5.9 and for women it is 3.2. These rates compare to U.S. mortality rates for 2005 at 3.6, 4.5 for men and 2.9 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.

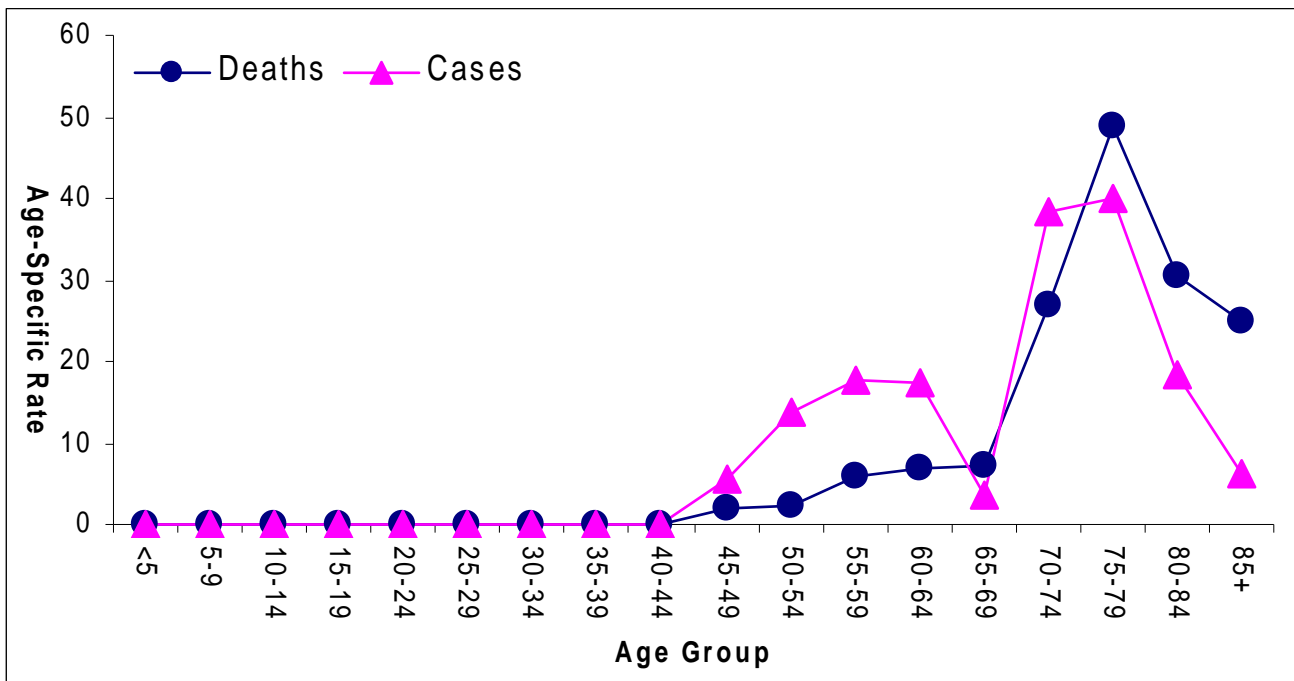
Early Detection and Prevention: There is no known test for screening for early detection. Some cases of myeloma progress very slowly, and they are referred to as smoldering or indolent myeloma. The presence of plasma cells and proteinuria do not automatically lead to myeloma, but it can be an early symptom.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

Figure 42: Myeloma Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Figure 43: Myeloma Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

NON-HODGKIN LYMPHOMA

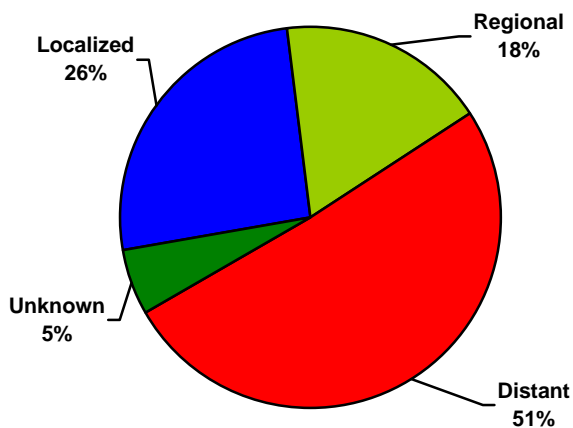
Table 22: Incidence and Mortality Summary, South Dakota, 2006

Non-Hodgkin Lymphoma	Total	Male	Female
No. of Invasive Cases	147	77	70
SD Incidence Rate	18.5	21.4	15.9
US Incidence Rate *(2005)	19.2	23.0	16.2
SD Cancer Deaths	63	39	24
SD Mortality Rate	7.3	11.2	4.7
US Mortality Rate * (2005)	7.3	9.3	5.9

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population.

+Source: South Dakota Department of Health

Figure 44: Non-Hodgkin Lymphoma Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: Non-Hodgkin lymphoma is a cancer that originates in the lymphatic system, the disease-fighting network spread throughout the body. It develops in lymphocytes, a type of white blood cell. Non-Hodgkin 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 disease in South Dakota was 147 cases in 2006. The median age at diagnosis in South Dakota in 2006 was 67

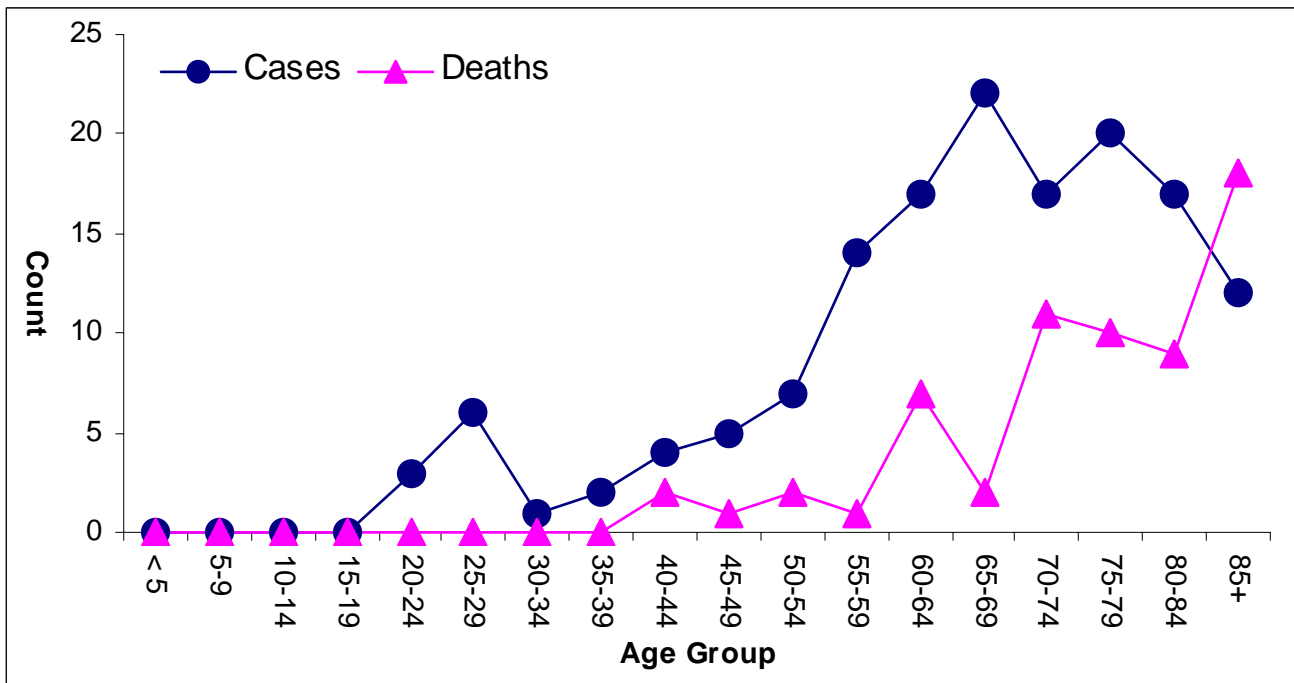
Stage at Diagnosis: Stage is based on where lymphoma cells are found (in the lymph or in other organs or tissues). The stage also depends on how many areas are involved. Localized stage only involves a single lymph node or single extralymphatic organ. When two or more lymph node regions are involved and the regions are on both sides of the diaphragm the stage will be staged as distant stage. In 2006, 75 (51%) of the cases were diagnosed at distant stage.

Mortality: There were 63 deaths reported in South Dakota that were attributed to Non-Hodgkin Lymphoma. The five year survival rate has improved (2000-2004) for Non-Hodgkin Lymphoma for all ages. The median age at death for those, whose death was attributed to Non-Hodgkin lymphoma was 75 years of age.

Risk and Associated Factors: Getting older is a strong risk factor for this disease, with most cases occurring in the 60's or 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.

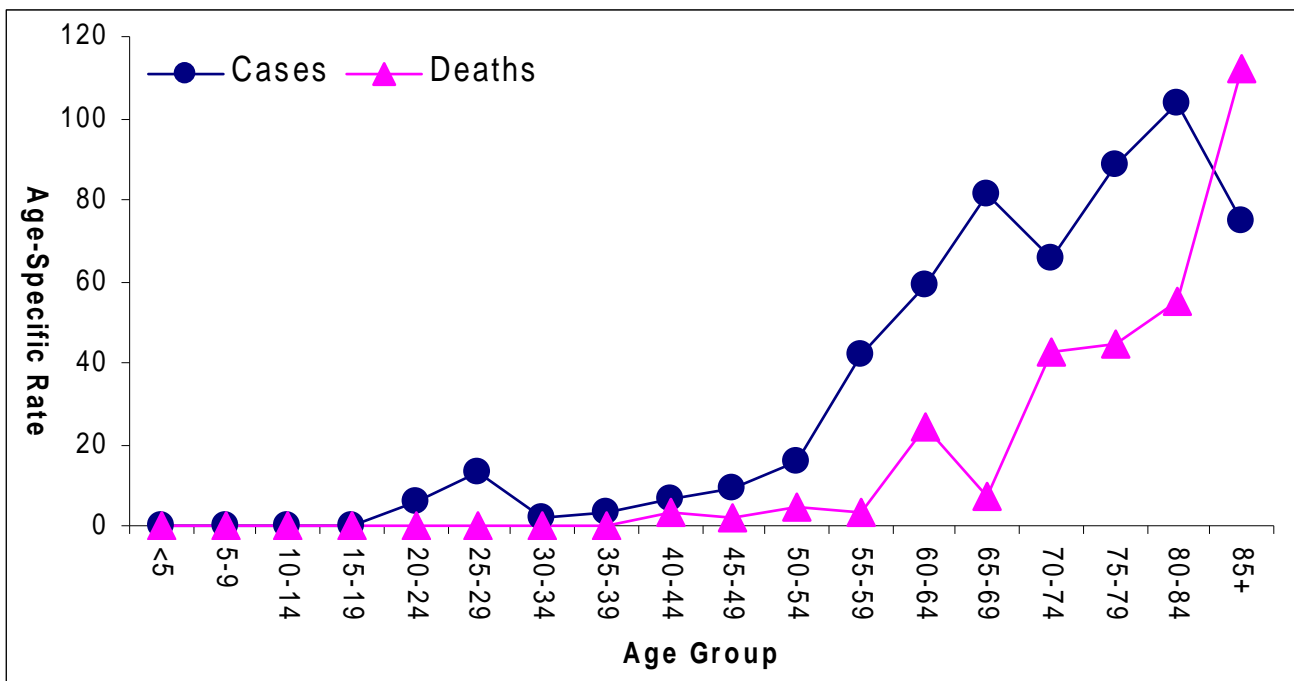
Early Detection and Prevention: Non-Hodgkin lymphoma may present with various symptoms. Symptoms may include signs resulting from local effects of cancer growth. Non-Hodgkin lymphoma can also produce generalized symptoms, such as unexplained weight loss, fever, drenching night sweats and severe itching.

Figure 45: Non-Hodgkin Lymphoma Number of Cases and Death by Age, 2006



Source: South Dakota Health Department

Figure 46: Non-Hodgkin Lymphoma Age-specific Incidence and Death Rates, 2006



Source: South Dakota Health Department

OVARY

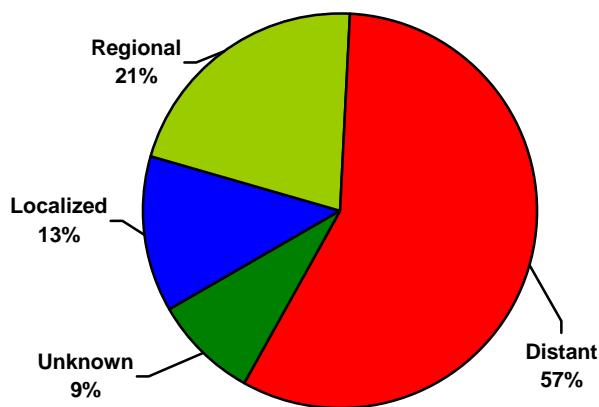
Table 23: Incidence and Mortality Summary, South Dakota, 2006

Ovarian Cancer	Total	White	American Indian
No. of Invasive Cases	47	45	2
SD Incidence Rate	10.7	10.8	11.1
US Incidence Rate *(2005)	13.3	13.7	7.9
SD Cancer Deaths	49	48	1
SD Mortality Rate	10.6	10.8	4.8
US Mortality Rate *(2005)	8.8	9.2	5.7

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population

Source: South Dakota Department of Health

Figure 47: Ovarian Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: The incidence of ovarian cancer varies greatly. There were 47 cases of ovarian cancer reported in 2006 in South Dakota. This accounted for 1.4% of all cases in 2006 in South Dakota. The lifetime risk of a woman developing ovarian cancer is 1.39%. Nine cases were diagnosed at younger than 49 years of age. There were 16 cases diagnosed in the 70-79 age group. The median age at diagnosis in South Dakota was 71; nationally it was 63.

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 2006 in South Dakota 27 (57%) of the 49 cases were diagnosed at distant stage.

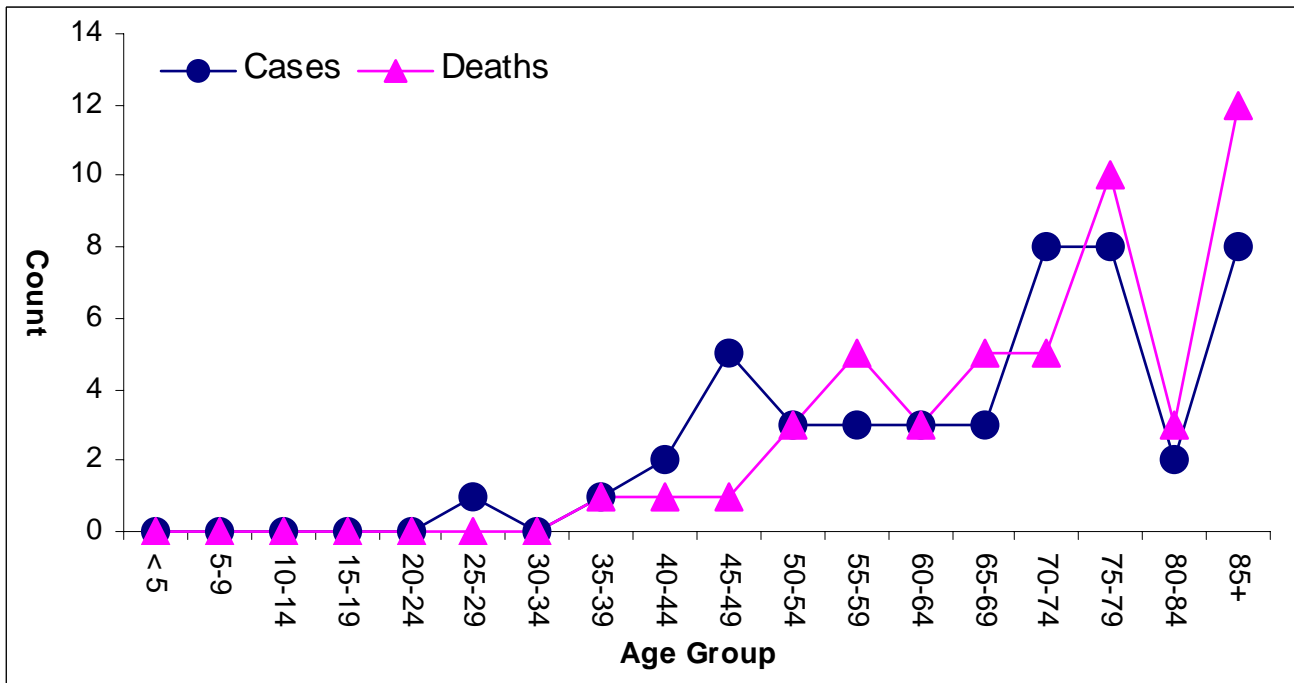
Mortality: Doctors are using dramatic new therapies to fight ovarian cancer, extending the lives of women who five or 10 years ago would have died of the disease. Survival rates for the last several decades are only about 25% for those with advanced disease. Most ovarian cancer present at advanced disease. Only 28.2% 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 94% curable. In South Dakota 49 patients died in 2006. The mortality rate was 10.6 for white women and 4.8 for American Indian 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 any women after 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.

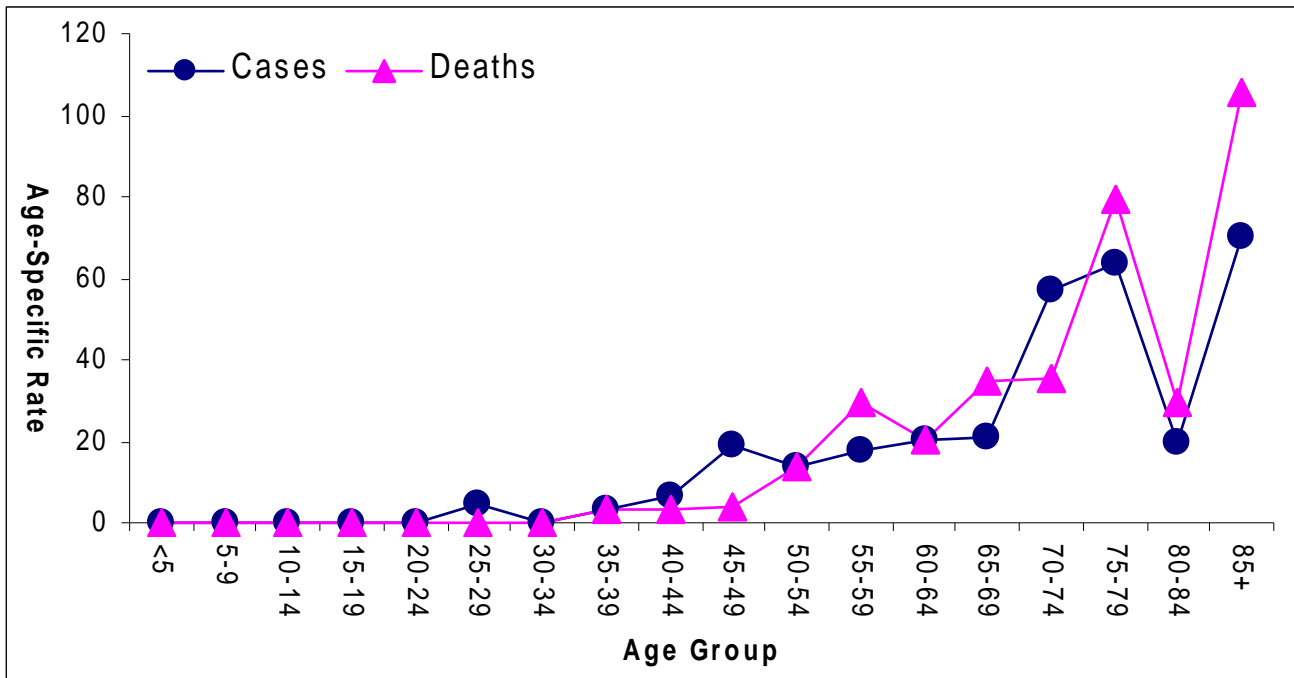
Ovarian cancer can be difficult to detect until it has advanced. Transvaginal ultrasound or measuring the tumor marker CA 126 have become two of the most useful diagnostic tools.

Figure 48: Ovarian Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Figure 49: Ovarian Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

PANCREAS

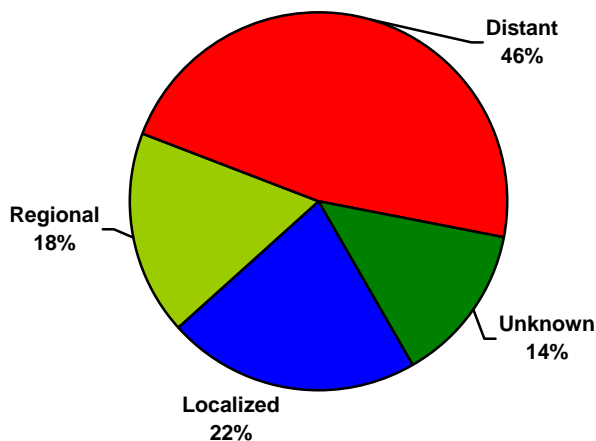
Table 24: Incidence and Mortality Summary, South Dakota, 2006

Pancreatic Cancer	Total	Male	Female
No. of Invasive Cases	75	37	38
SD Incidence Rate	9.0	10.5	8.1
US Incidence Rate *(2005)	11.3	12.9	10.0
SD Cancer Deaths	89	48	41
SD Mortality Rate	10.5	13.7	8.1
US Mortality Rate * (2005)	10.6	12.2	9.3

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population

Source: South Dakota Department of Health

Figure 50: Pancreatic Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: The incidence of pancreatic cancer increases steadily with age. An estimated 33,730 new cases of pancreatic cancer were expected to be diagnosed in 2006. The majority of the cases occur in the age group from 60 to 80. Fifty-three cases or 71% that were diagnosed in 2006 were in those age groups. In the United States this cancer occurs more in females than in males. In South Dakota, there is no statistical difference in male and female. There is a higher incidence rate in blacks of both genders. The median age at diagnosis was 76 in South Dakota and 72 years in the US.

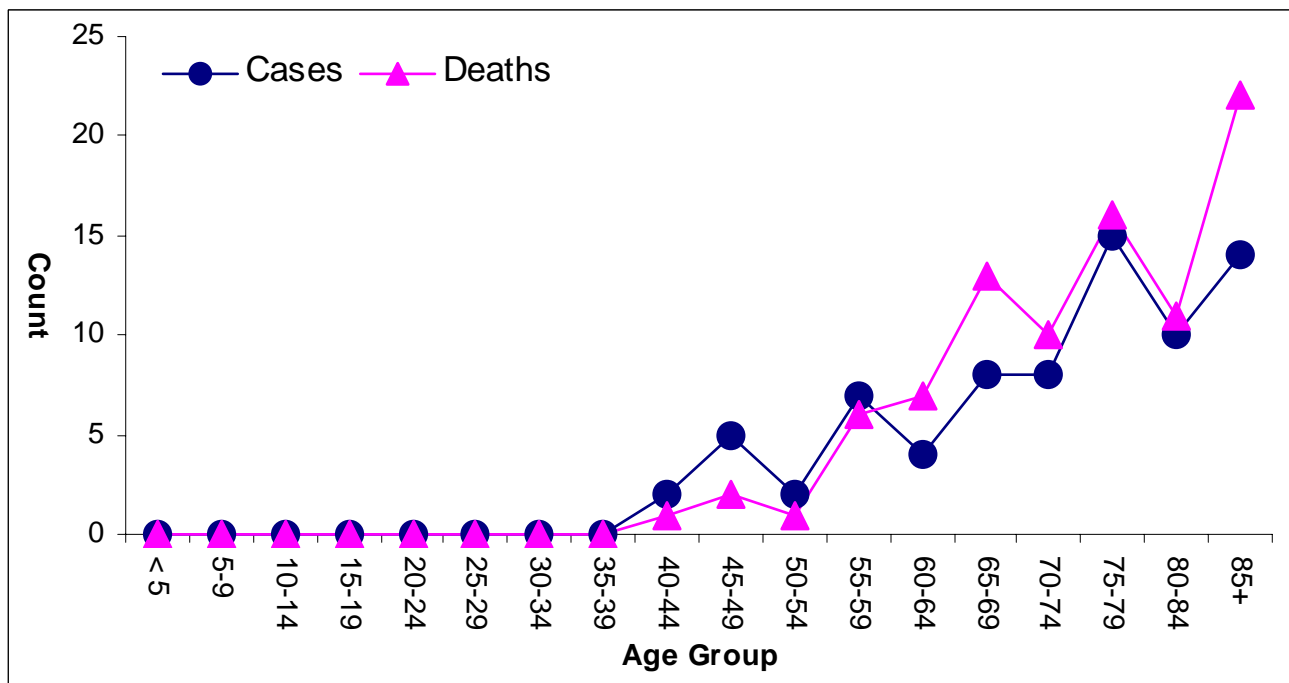
Stage at Diagnosis: Often pancreatic cancer is diagnosed late in the disease process. Patients who have local stage disease may be acceptable for resection. Only 10 to 20% of patients with pancreatic cancer are candidates for surgical resection. In South Dakota there were more cases diagnosed at late stage (distant and unknown) than all other stages combined.

Mortality: The overall survival for cancer of the pancreas is poor. Studies reveal that the 5 year survival rate is approximately 5%. More recently, prospective studies show survival improvement with postoperative chemotherapy. In 2006, there were 89 deaths and the median age was 76 in South Dakota.

Risk and Associated Factors: No one knows the exact causes of pancreatic cancer. 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 also.

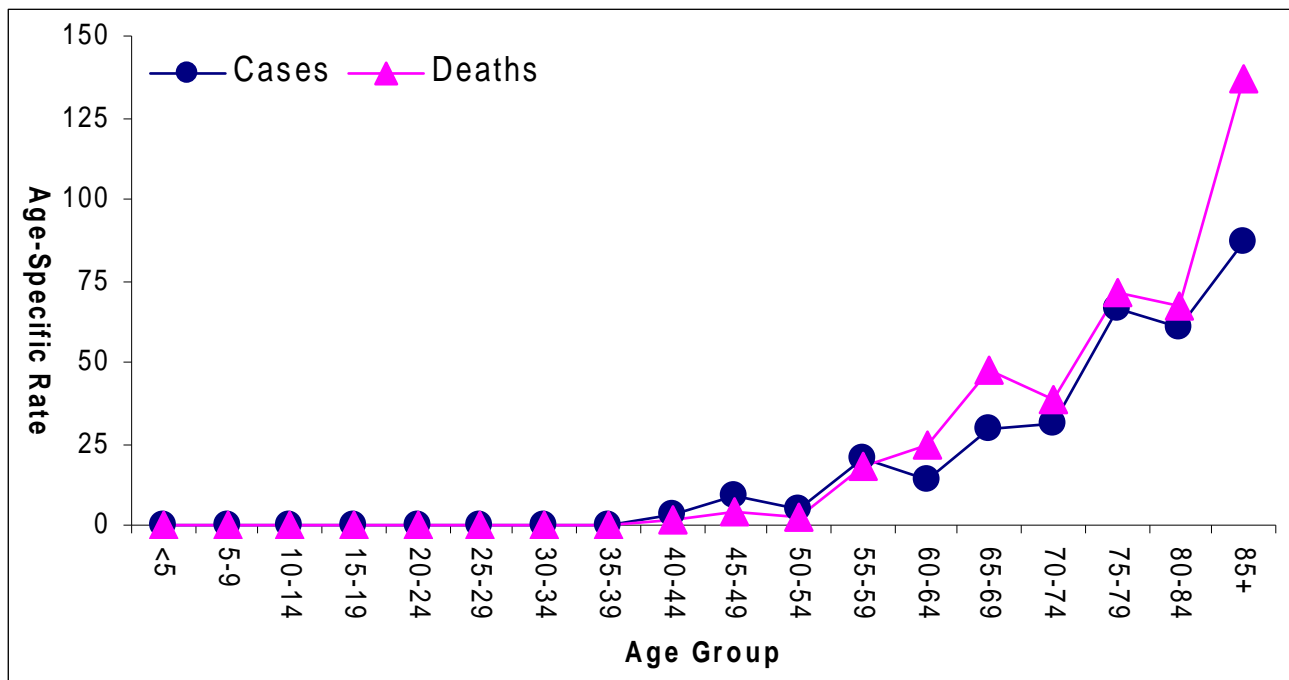
Prevention and Early Detection: Currently there are no known screenings for pancreatic cancer. Also, there is no specific prevention except to avoid smoking.

Figure 51: Pancreatic Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Figure 52: Pancreas Cancer Age-specific Incidence and Deaths Rates, 2006



Source: South Dakota Department of Health

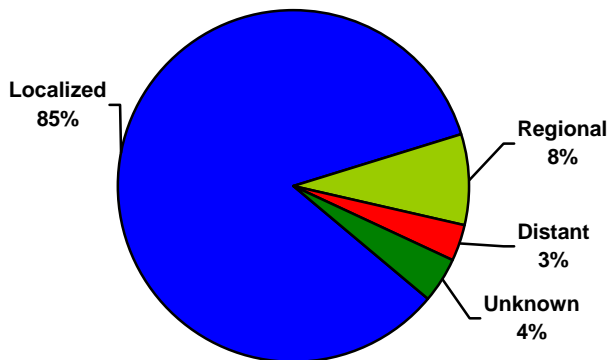
PROSTATE

Table 25: Incidence and Mortality Summary, South Dakota, 2006

Prostate Cancer	Total	White	American Indian
No. of Invasive Cases	590	565	18
SD Incidence Rate	163.8	164.0	147.0
US Incidence Rate *(2005)	157.0	147.5	80.7
SD Cancer Deaths	103	98	4
SD Mortality Rate	30.1	29.5	41.3
US Mortality Rate * (2005)	26.7	24.6	17.8

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population
Source: South Dakota Department of Health

Figure 53: Prostate Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: Carcinoma of the prostate is predominately a tumor of older men. The median age at diagnosis in South Dakota is 68. Also, in South Dakota the incidence of prostate cancer begins to increase in the 60's age group. Nationwide 8 out of 10 men diagnosed with prostate cancer are over the age of 65. Prostate cancer is the number one site of all cancers reported in the state.

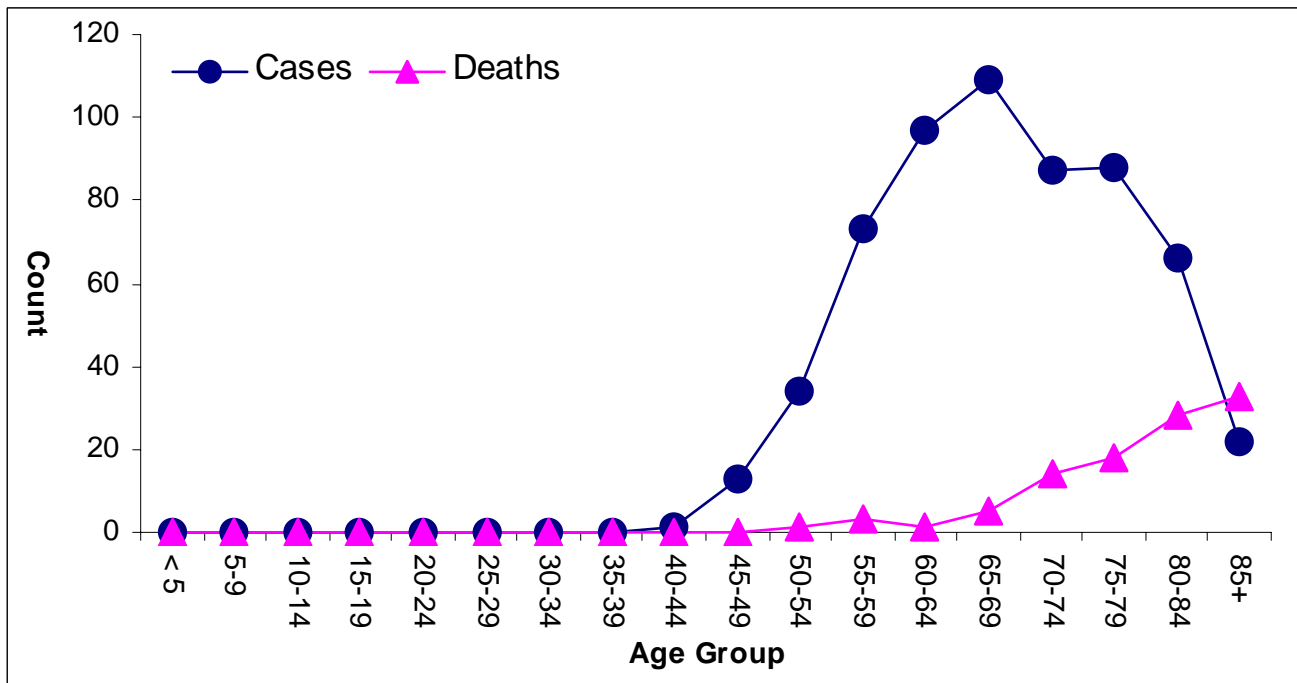
Stage at Diagnosis: The greatest number of cases were diagnosed at an early stage. In 2006, 85% of the cases were diagnosed as localized (not extending outside the prostate). Frequently the elderly may simply be monitored (watchful waiting) by their physician to assess the rate of growth; others may be given hormonal therapy. New treatments for prostate cancer include the de Vinci Robotic assisted prostatectomy, proton therapy, and brachytherapy radiation.

Mortality: Prostate cancer was the third leading cancer death in men in South Dakota in 2006. 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 2006 was 82 years old. There were only 4 American Indians to die during 2006. Many patients have co-morbid conditions and will die of causes other 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 expose to heavy metals may increase risk. Smoking has also been indicated as a risk. Diets high in saturated fat intake may also contribute.

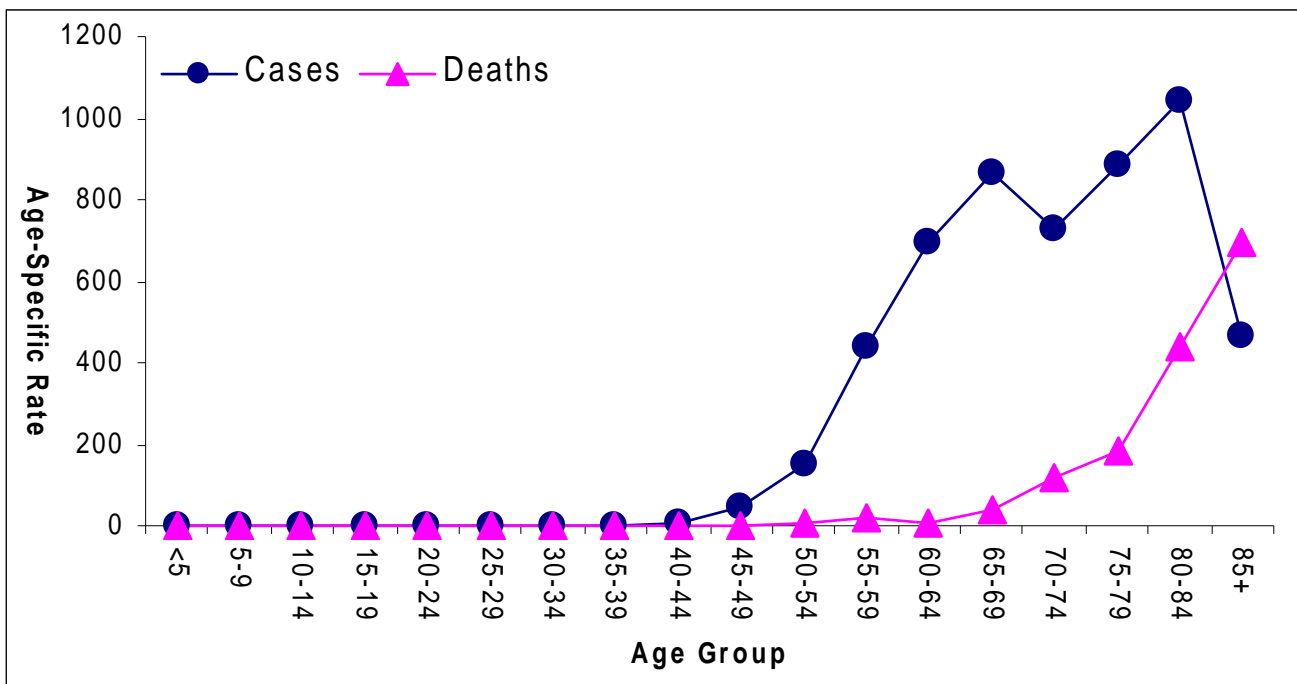
Early Detection and Prevention: The availability of the Prostate Specific Antigen (PSA) test as a diagnostic test coupled with increased awareness by the public of the disease has produced an increase in the number of new cases diagnosed each year in the United States. Disease detected by elevated PSA in the presence of a palpably 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 54: Prostate Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Figure 55: Prostate Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

STOMACH

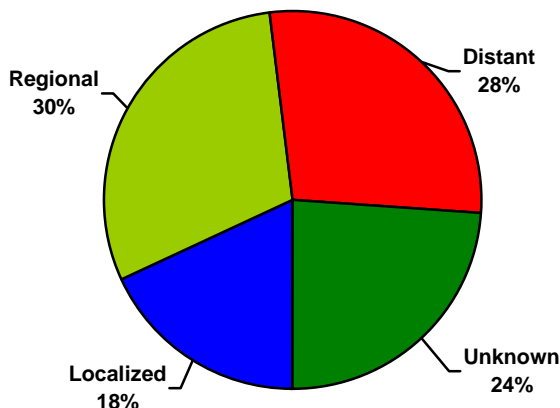
Table 26: Incidence and Mortality Summary, South Dakota, 2006

Stomach Cancer	Total	Male	Female
No. of Invasive Cases	45	34	11
SD Incidence Rate	5.6	9.4	2.4
US Incidence Rate *(2005)	7.1	10.1	4.9
SD Cancer Deaths	37	25	12
SD Mortality Rate	4.4	7.0	2.4
US Mortality Rate * (2005)	4.1	5.7	2.9

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population.

Source: South Dakota Department of Health

Figure 56: Stomach Cancer Stage of Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: Stomach cancer continues to account for approximately 1.3% of all cancers in South Dakota. Of the 45 cases diagnosed in 2006, 34 were male and 11 were female. South Dakota's incidence rate reflects a male to female 3:1 ratio. It is predominately a disease of men as the statistics of South Dakota support. 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 71 in both the United States and South Dakota.

Stage at Diagnosis: In 2006 data demonstrates that 9 (18%) of cases were diagnosed at stage 1 (localized). When a patient is diagnosed at an early stage prognosis is much better. Fifteen cases (30%) were diagnosed at regional stage. There were 14 (28%) 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

Mortality: Stomach cancer accounted for 2.6% of cancer deaths in South Dakota in 2006. There were 37 (45.6%) males and 12 females. The median age at death was 73 in South Dakota and also in the United States. The age adjusted death rate was 7.0 for men and 2.4 in women in South Dakota. These rates are based on patients who died in 2006 in South Dakota. Four of these deaths were American Indians making up 10.8% of all cancer deaths attributed to stomach cancer.

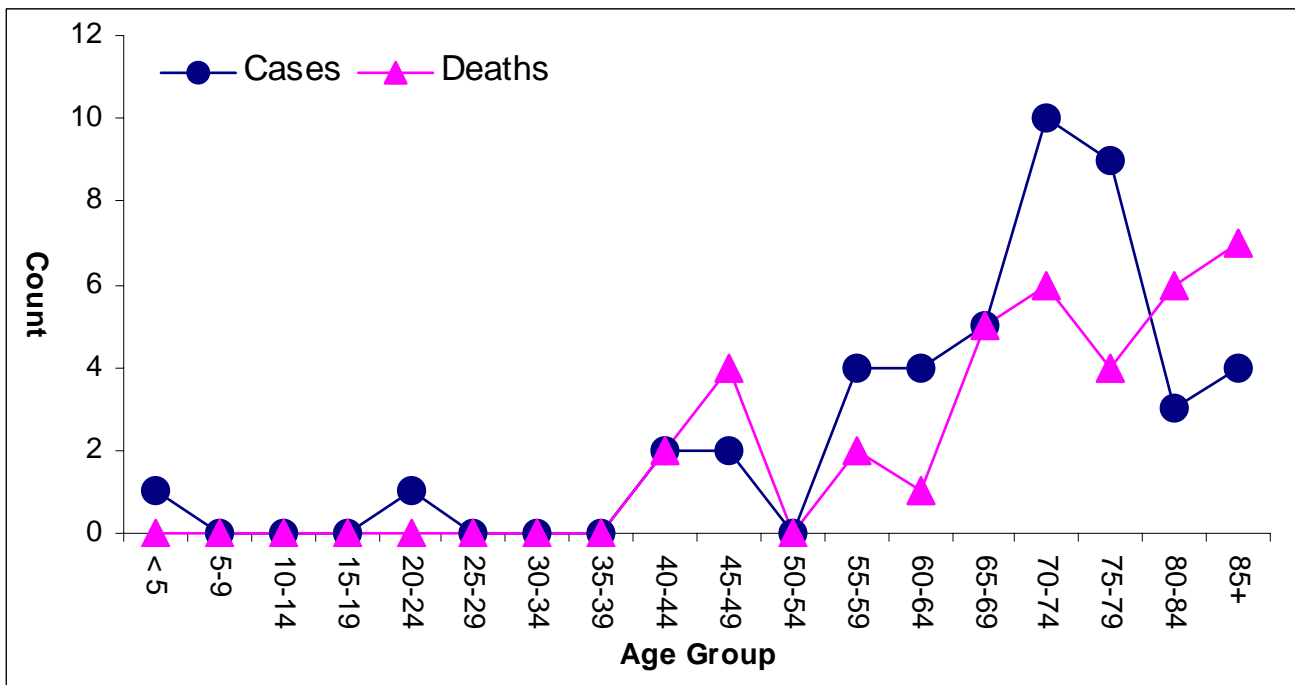
Risk and Associated Factors: Men have twice the risk of women of developing stomach cancer. In recent years *Helicobacter pylori* bacteria has received considerable attention as a potential factor. Some researchers suspect this bacterium, which may cause stomach inflammation and ulcers, may be an important 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-carotene¹ and vitamin C² may decrease the risk of stomach cancer.

¹<http://www.cancer.gov/Common/PopUps/popDefinition.aspx?id=45328&version=Patient&language=English>

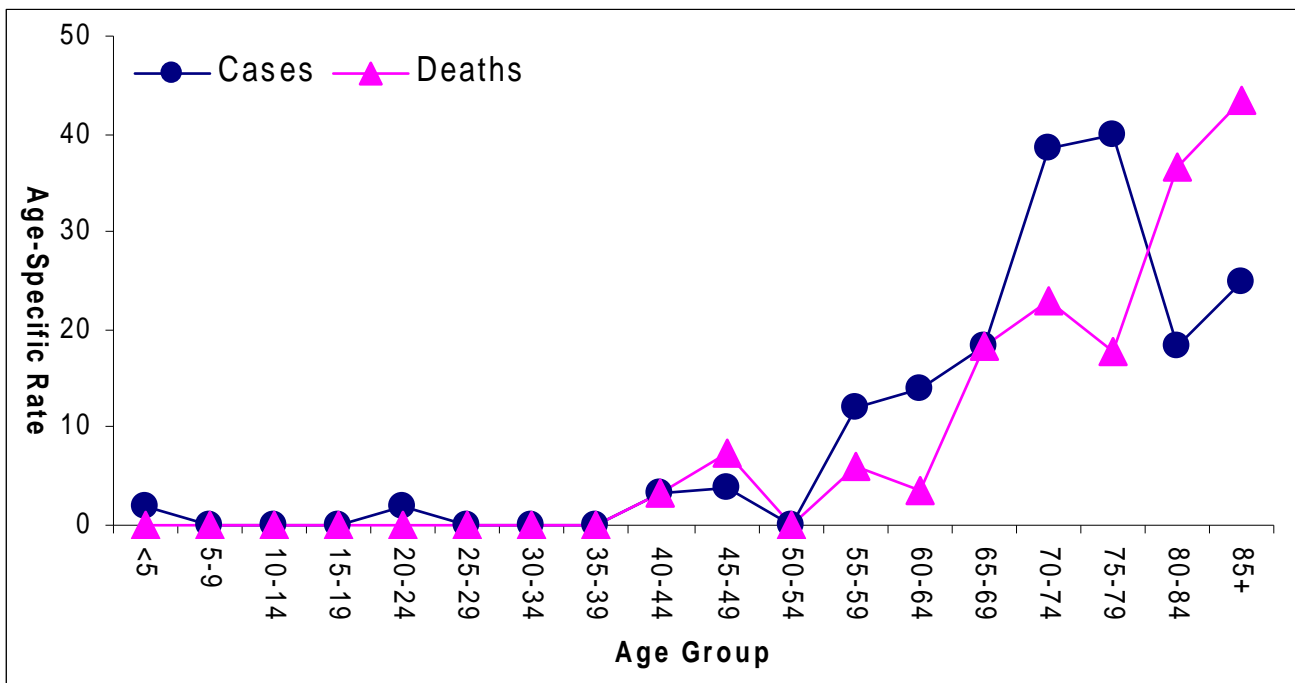
²<http://www.cancer.gov/Common/PopUps/popDefinition.aspx?id=439435&version=Patient&language=English>

Figure 57: Stomach Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Figure 58: Stomach Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

THYROID

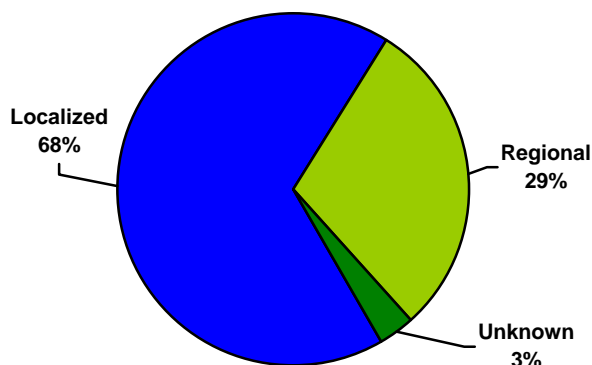
Table 27: Incidence and Mortality Summary, South Dakota, 2006

Thyroid Cancer	Total	Male	Female
No. of Invasive Cases	58	13	45
SD Incidence Rate	7.8	3.6	12.0
US Incidence Rate *(2005)	8.9	4.6	13.2
No. of Cancer Deaths	8	4	4
SD Mortality Rate	1.0	1.1	0.8
US Mortality Rate *(2005)	.5	.5	.5

* SEER.cancer.gov; Rates are per 100,000 persons, age-adjusted to 2000 U.S. standard population.

Source: South Dakota Department of Health

Figure 59: Thyroid Cancer Stage at Diagnosis, South Dakota, 2006



Source: South Dakota Department of Health

Descriptive Epidemiology

Incidence: The American Cancer Society estimated 30,180 cases would be diagnosed in the United States in 2006. Thyroid cancer continues to account for approximately 1.6% of all cancers in South Dakota. Of the 58 cases diagnosed in 2006, 13 were male and 45 were female. The median age at diagnosis is 47. In the US the median age is 48. Thyroid cancer is found more commonly in people between the ages of 50 and 70 years of age. It is predominately a disease of females as the statistics of South Dakota confirm.

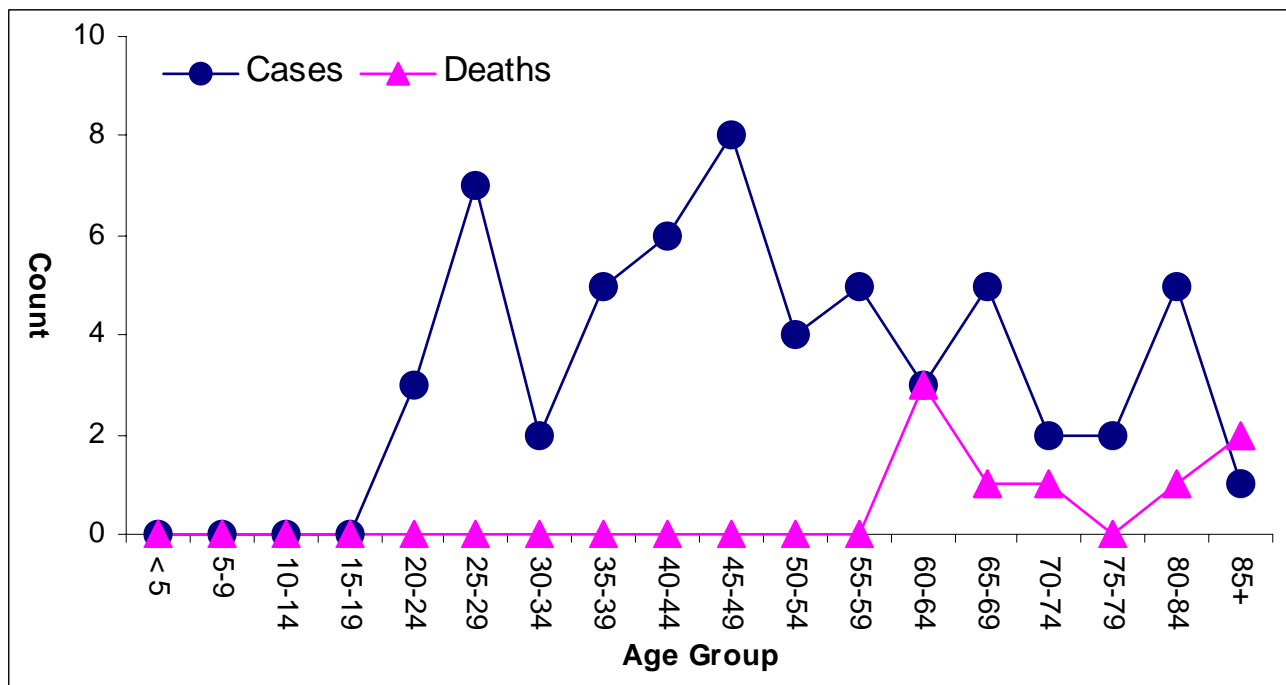
Stage at Diagnosis: In 2006 data demonstrates that 39 (68%) of cases were diagnosed at localized stage. When a patient is diagnosed at an early stage prognosis is much better for a cure. There were 17 (29%) cases diagnosed at regional stage. Only two cases (3%) were diagnosed at an unknown stage.

Mortality: According to the South Dakota Department of Health there were 8 deaths attributed to thyroid cancer in 2006. Interestingly enough, thyroid cancer occurs mainly in females, but half of the eight deaths were male. The 5-year relative survival rates were 99.7% for localized, 96.9% for regional and 89.5% for unknown stage.

Risk and Associated Factors: Thyroid cancer is very rare and accounted for only 1.6% of the cancer cases in South Dakota in 2006. 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. Based on rates from the 2003-2005, only 1 in 127 men and women will be diagnosed with cancer of the thyroid during their lifetime.

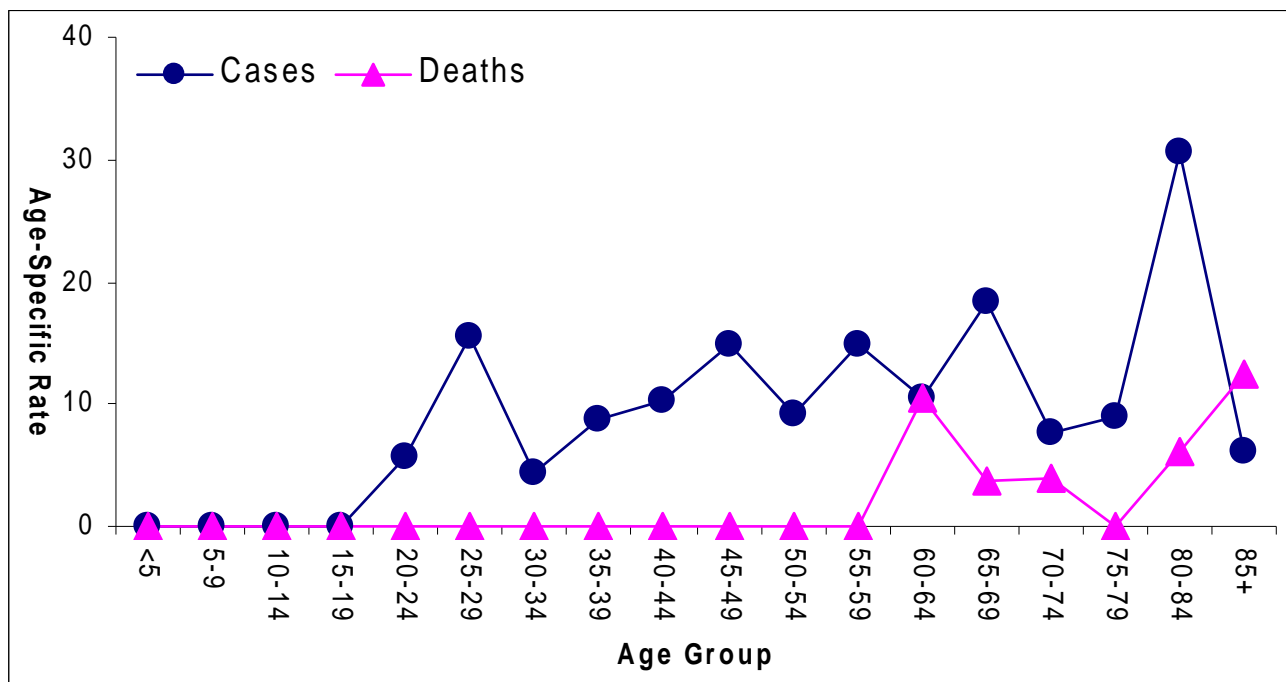
Early Detection and Prevention: Early detection of cancer of the thyroid is extremely important. There are currently no tests or screenings for early detection of thyroid cancer. Physical examinations may reveal a lump on the side of neck, hoarseness of the voice and difficulty swallowing. Most cancerous thyroid tumors are slow growing and curable.

Figure 60: Thyroid Cancer Number of Cases and Deaths by Age, 2006



Source: South Dakota Department of Health

Figure 61: Thyroid Cancer Age-specific Incidence and Death Rates, 2006



Source: South Dakota Department of Health

XIII: APPENDICES

Appendix A. 2000 United States Standard Million Population

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

Appendix B: Race in South Dakota by County, 2000 Census

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

U.S Census Bureau 2000

Appendix C: SEER Incidence Site Analysis Categories

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

Appendix C: SEER Incidence Site Analysis Categories (continued)

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

Appendix C: SEER Incidence Site Analysis Categories (continued)

Lymphoma			
Hodgkin Lymphoma			
Hodgkin - Nodal	C024, C098-C099, C111, C142, C379, C422, C770-C779	9650-9667	33011
Hodgkin - Extranodal	All other sites		33012
Non-Hodgkin Lymphoma			
NHL - Nodal	C024, C098,C099, C111,C142, C379,C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729, 9823, 9827	33041
NHL - Extranodal	All sites except C024, C098-C099, C111, C142, C379, C422, C770-C779	9590-9596, 9670-9671, 9673, 9675, 9678-9680, 9684, 9687, 9689-9691, 9695, 9698-9702, 9705, 9708-9709, 9714-9719, 9727-9729	33042
	All sites except C024, C098-C099, C111, C142, C379, C420-C422, C424, C770-C779	9823, 9827	
Myeloma		9731-9732, 9734	34000
Leukemia			
Lymphocytic Leukemia			
Acute Lymphocytic Leukemia		9826,9835-9837	35011
Chronic Lymphocytic Leukemia	C420, C421, C424	9823	35012
Other Lymphocytic Leukemia		9820, 9832-9834, 9940	35013
Myeloid and Monocytic Leukemia			
Acute Myeloid Leukemia		9840, 9861, 9866, 9867, 9871-9874, 9895-9897, 9910, 9920	35021
Acute Monocytic Leukemia		9891	35031
Chronic Myeloid Leukemia		9863, 9875, 9876, 9945, 9946	35022
Other Myeloid/Monocytic Leukemia		9860, 9930	35023
Other Leukemia			
Other Acute Leukemia		9801, 9805, 9931	35041
Aleukemic, subleukemic and NOS		9733, 9742, 9800, 9831, 9870, 9948, 9963, 9964	35043
	C420, C421, C424	9827	
Mesothelioma +		9050-9055	36010
Kaposi Sarcoma +		9140	36020
Miscellaneous		9740-9741, 9750-9758, 9760-9769, 9950, 9960-9962, 9970, 9975, 9980, 9982-9987, 9989	37000
	C760-C768, C809	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>

Appendix D: SEER Cancer Cause of Death Analysis Categories

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

Appendix D: 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 Lymphoma	C81
Non-Hodgkin Lymphoma	C82-C85, C96.3
Myeloma	C90.0, C90.2
Leukemia	
Lymphocytic Leukemia	
Acute Lymphocytic Leukemia	C91.0
Chronic Lymphocytic Leukemia	C91.1
Other Lymphocytic Leukemia	C91.2-C91.4, C91.7, C91.9
Myeloid and Monocytic Leukemia	
Acute Myeloid	C92.0, C92.4-C92.5, C94.0, C94.2
Acute Monocytic Leukemia	C93.0
Chronic Myeloid Leukemia	C92.1
Other Myeloid/Monocytic Leukemia	C92.2-C92.3, C92.7, C92.9, C93.1-C93.2, C93.7, C93.9
Other Acute Leukemia	C94.4, C94.5, C95.0
Aleukemic, Subleukemic and NOS	C90.1, C91.5, C94.1, C94.3, C94.7, C95.1, C95.2, C95.7,
Mesothelioma (ICD-10 only)+	C45+
Kaposi Sarcoma (ICD-10 only)+	C46+
Miscellaneous Malignant Cancer	C26.1, C45.7+, C45.9+, C76-C80, C88, C96.0-C96.2, C96.7, C96.9, C97

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

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