X. SELECTED CANCER SITES INCIDENCE AND MORTALITY

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

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

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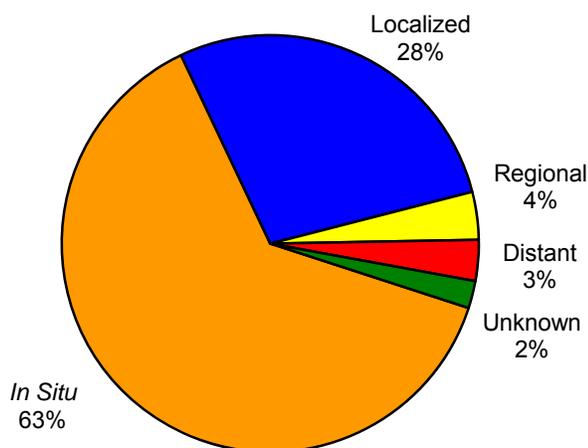
BLADDER

Table 12: Bladder Incidence and Mortality Summary, 2013

Bladder Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**189**	140	49	**46**	38	8
		Age Adjusted Rate	**18.9**	30.9	9.0	**4.3**	8.7	1.2
	White	# Cases / Deaths	**186**	138	48	**44**	36	8
		Age Adjusted Rate	**19.7**	32.0	9.5	**4.3**	8.5	1.2
	American Indian	# Cases / Deaths	**2**	2	0	**2**	2	0
		Age Adjusted Rate	**3.8**	8.1	0.0	**7.2**	18.0	0.0
United States	**Total**	Age Adjusted Rate	**19.2**	33.7	8.1	**4.4**	7.7	2.1
	White	Age Adjusted Rate	**20.9**	36.6	8.7	**4.7**	8.1	2.2
	American Indian	Age Adjusted Rate	**8.0**	12.5	4.5	**2.3**	3.2	1.8

[1]Includes *in situ* bladder; Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 15: Bladder Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Cancer is categorized as noninvasive and invasive. There were 119 noninvasive bladder cancers reported in 2013. There were 70 invasive. More than half, 63%, of bladder cancer cases in South Dakota 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, 3% of the cases were not diagnosed until the disease had spread to distant sites. In the United States, distant stage accounted for 4% of the bladder cancers reported.

*Incidence:* In 2013, it was estimated that over 72,570 cases of bladder cancer would be diagnosed in the United States. There were 189 cases of bladder cancer reported in South Dakota. There were 140 men and 49 women diagnosed with bladder cancer in 2013. Statistically, men were diagnosed about three times as often as women. There were only two American Indian cases diagnosed in 2013. In the United States it was the fifth most frequent cancer. In South Dakota it was the sixth most frequent cancer diagnosed.

Mortality: Over half (63%) of all bladder cancer cases reported in South Dakota were noninvasive in 2013. Advances in intravesical therapy and in the treatment of advanced disease with chemotherapy have reduced the percentage of mortality from bladder cancer. In South Dakota, ages from 70 and above have the highest mortality. In 2013, the South Dakota mortality rate was 4.3 compared to the US rate which was 4.4.

Risk and Associated Factors: Bladder cancer was one of the first malignancies associated with industrialization. Cigarette smoking increases the risk for bladder cancer by two times that of a nonsmoker. Work exposure to certain chemicals also increases risk. Some of those with the highest risk are makers of rubber, leather, textiles, paint products, and printing compounds.

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

Figure 16:   Bladder Cancer Number of Cases and Deaths by Age, South Dakota, 2013
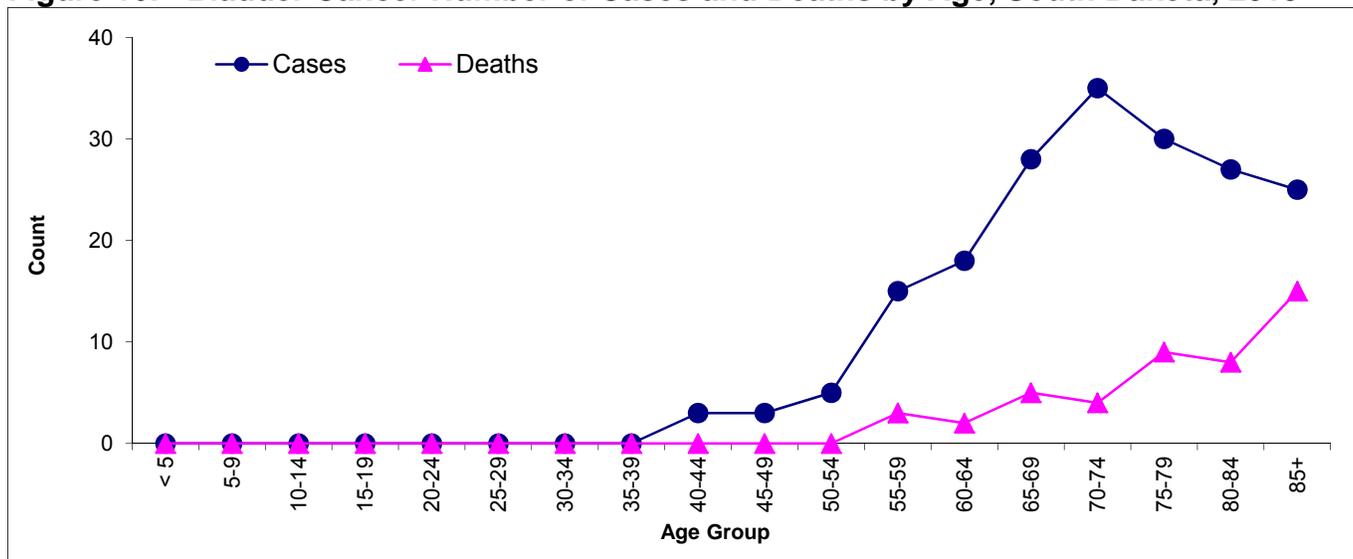
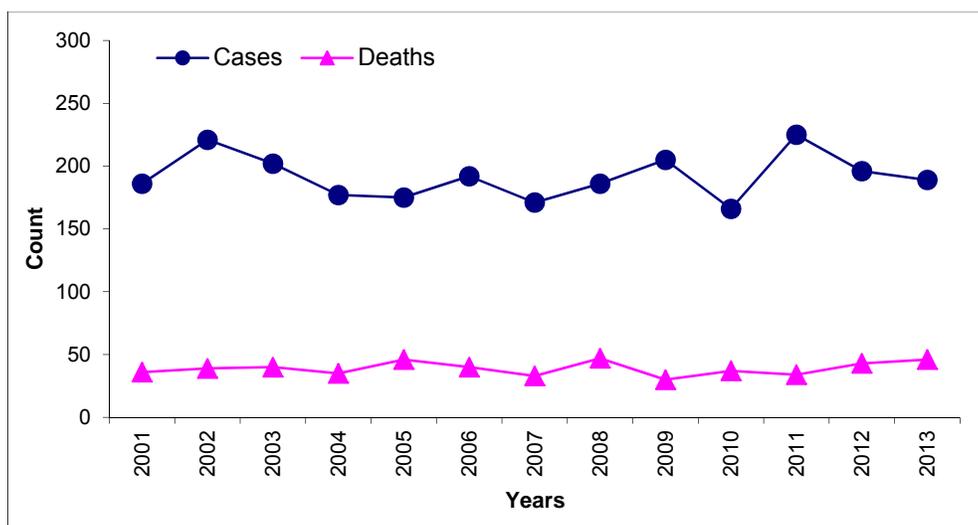Source: South Dakota Department of Health

Figure 17:   Bladder Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

Bladder cancer cases declined in 2012 and 2013 after tying an all-time high of 221 cases in 2011 the same number as in 2002.

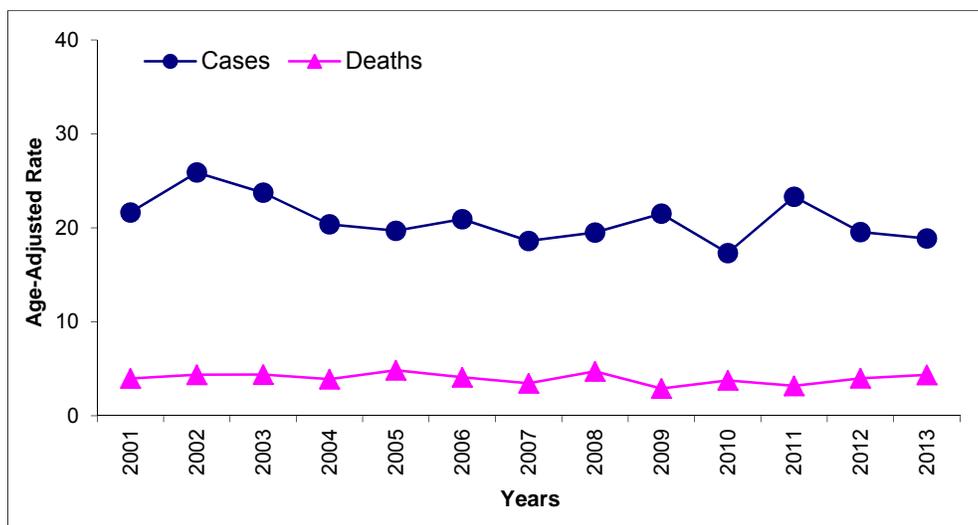Source: South Dakota Department of Health

Figure 18:   Bladder Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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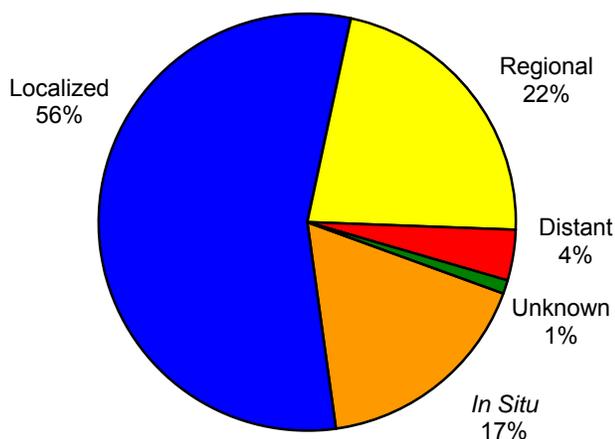Source: South Dakota Department of Health

Table 13: Female Breast Incidence and Mortality Summary, 2013

Female Breast Cancer			Incidence	Mortality
South Dakota	**Total**	# Cases / Deaths	715	108
		Age Adjusted Rate	146.0	19.3
	White	# Cases / Deaths	669	106
		Age Adjusted Rate	148.2	20.3
	American Indian	# Cases / Deaths	35	2
		Age Adjusted Rate	136.4	6.6
United States	**Total**	Age Adjusted Rate	125.4	20.7
	White	Age Adjusted Rate	127.8	20.3
	American Indian	Age Adjusted Rate	74.3	13.5

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 19: Female Breast Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Including *in situ* female breast cancer cases there were 864 cases diagnosed in 2013, of which 480 cases were diagnosed at localized stage. This represents 56% of all reported breast cancer cases. There were 192 cases that had progressed beyond the breast. There were 34 that were diagnosed as a distant stage and nine that were staged as unknown. The 149 *in situ* female breast cancer cases are reported but are not used in calculating incidence rates.

Incidence: Female breast cancer is the most common malignant tumor among women. The incidence rate increased from 1947-1990. The rates fell 3.5% per year from 2001-2005. This decrease may be in part due to the lower number of women using hormone replacement therapy. There were 715 cases of invasive female breast cancer reported in 2013. In South Dakota, 16.2% of all invasive cancer cases reported in 2013 were female breast. Nationally, 14% of all cancer cases are female breast cancer. Breast cancer represented 32% of the cancer cases diagnosed for South Dakota women in 2013.

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, it has decreased among women younger than 55 years of age. In 2013, there were 108 deaths. Of those deaths, 106 were white and two were American Indian.

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

Prevention and Early Detection: Prevention and early detection is the key to survival of breast cancer. Breast cancers found during screening exams are more likely to be smaller and still confined to the breast. Women should talk to their doctor for individualized screening recommendations.

Figure 20: Female Breast Cancer Number of Cases and Deaths by Age, South Dakota, 2013

Source: South Dakota Department of Health
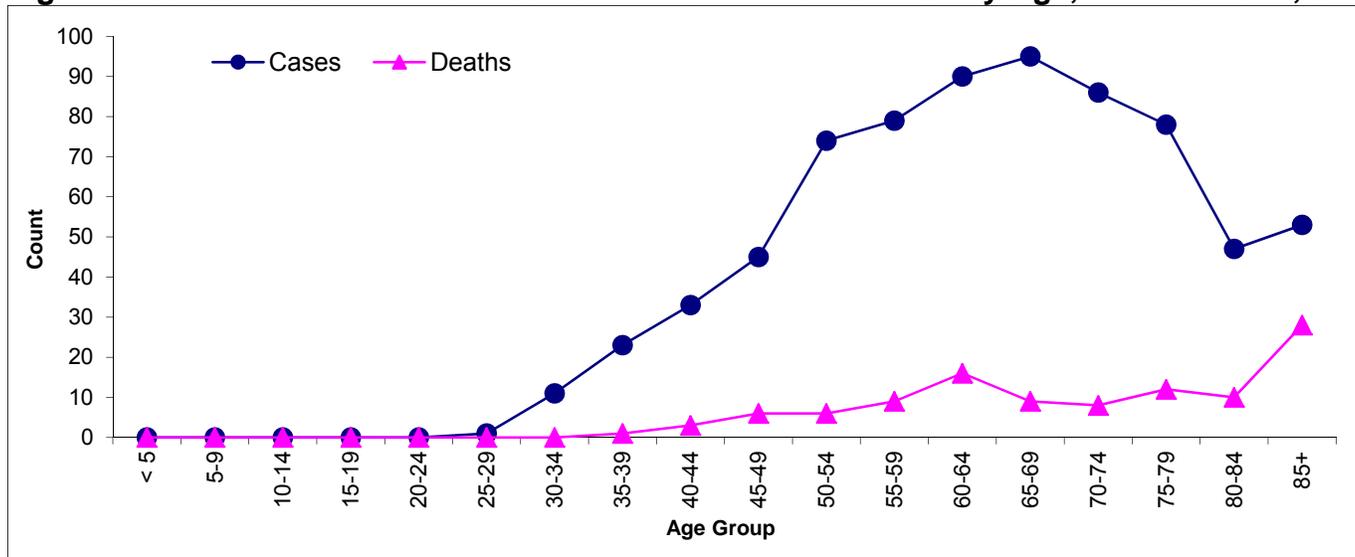
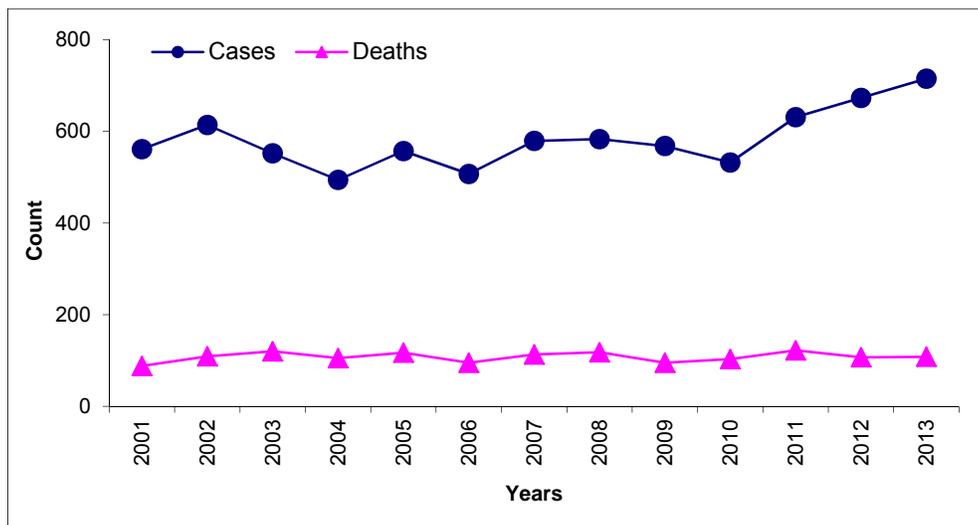Source: South Dakota Department of Health

Figure 21: Female Breast Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

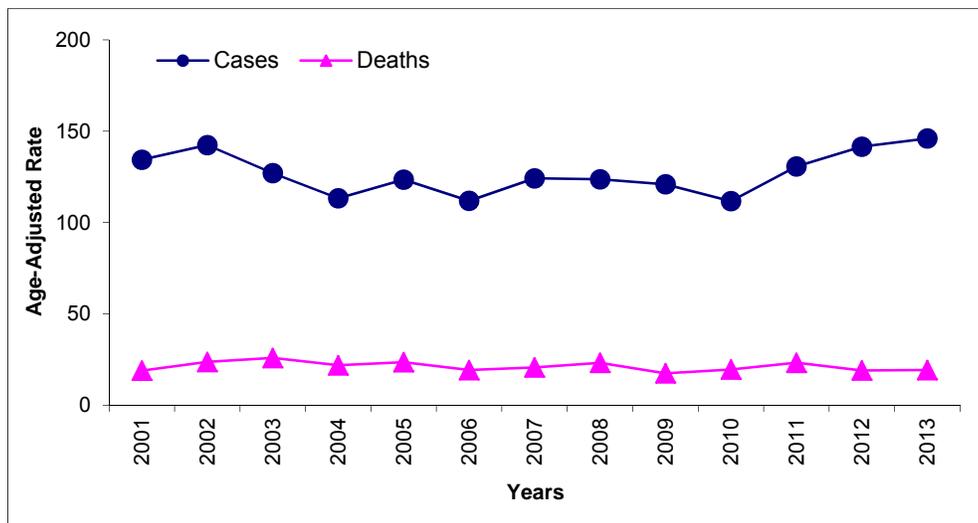The incidence for female breast cancer was at an all-time high in 2013.

Figure 22: Female Breast Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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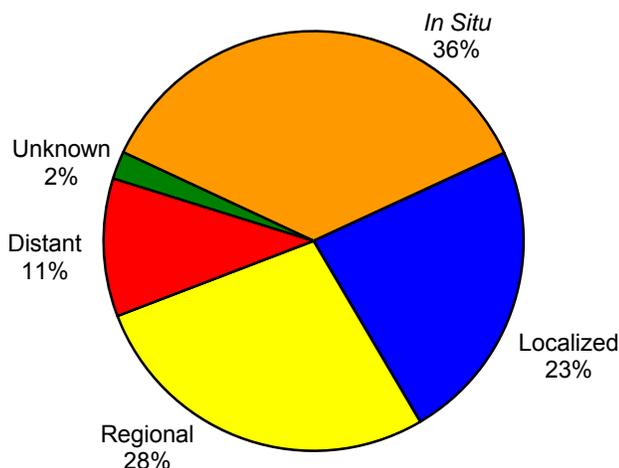Source: South Dakota Department of Health

CERVIX UTERI

Table 14:   Cervix Uteri Incidence and Mortality Summary, 2013

Cervix Uteri Cancer			Incidence	Mortality
South Dakota	Total	# Cases / Deaths	30	8
		Age Adjusted Rate	7.3	1.6
	White	# Cases / Deaths	26	4
		Age Adjusted Rate	7.0	0.9
	American Indian	# Cases / Deaths	3	2
		Age Adjusted Rate	11.8	6.0
United States	Total	Age Adjusted Rate	7.0	2.3
	White	Age Adjusted Rate	6.9	2.2
	American Indian	Age Adjusted Rate	8.0	2.7

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov   Source: South Dakota Department of Health

Figure 23: Cervix Uteri Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Early stage of diagnosis clearly provides the best opportunity for cure. In South Dakota, 23% of the cases reported were diagnosed at localized stage. SEER reports that 46% of the cases diagnosed nationally were at the localized stage.

Incidence: The incidence rate in South Dakota was 7.3 and in the United States it was 7.0. Both nationally and in South Dakota cervical cancer was the third most common female genital tract malignancy. Invasive cervical cancer accounted for 0.7% of all cases reported and 1.3% of all females diagnosed with cancer in South Dakota in 2013. SEER incidence reports that 0.2% of cases were younger than 20 years of age.

Mortality: The death rate in South Dakota was 1.6 for cancer of the cervix uteri. In the United States, the rate was 2.3. The stage of disease at diagnosis affects the mortality rate. Cases diagnosed at a localized stage have a 92% survival rate according to the American Cancer Society. Nationally, when diagnosed at distant stage, the percentage of survival drops to 15% at five years. In South Dakota, there were five cases in 2013 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. In the last decade the Human Papilloma virus (HPV) has been identified as the most likely cause. Among the other risk factors are nutritional deficiencies (Vitamin C and Vitamin B), low socioeconomic status, being sexual active at a young age, high-risk male partner, tobacco use as well as the use of oral contraceptives.

Prevention and Early Detection: The US Preventive Services Task Force (USPSTF) recommends screening for cervical cancer in women age 21 to 65 years with cytology (Pap smear) every 3 years or, for women age 30 to 65 years who want to lengthen the screening interval, screening with a combination of cytology and human papillomavirus (HPV) testing every 5 years.

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

Figure 24: Cervix Uteri Cancer Number of Cases and Deaths by Age, South Dakota, 2013
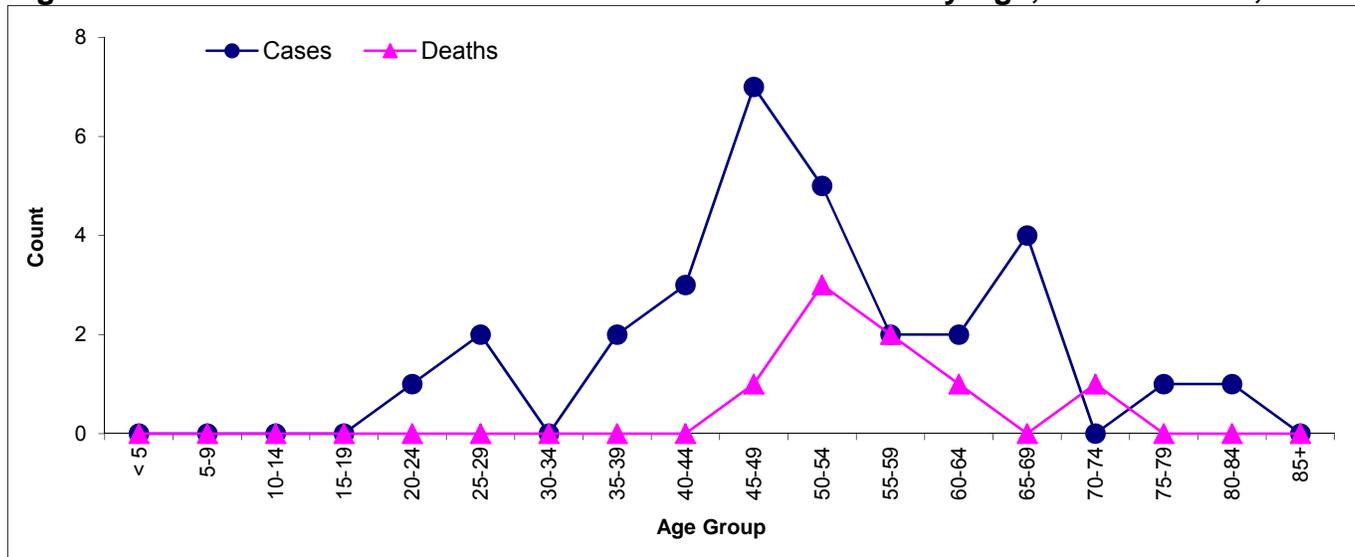
Source: South Dakota Department of Health

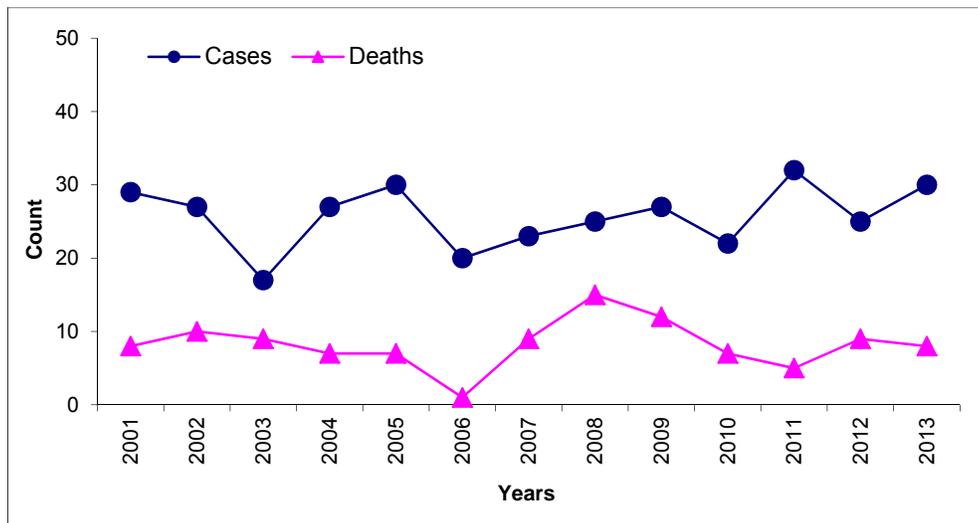More than half of the incidence of cervical cancer occurred in women under the age of 50 .

Source: South Dakota Department of Health

Figure 25:   Cervix Uteri Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

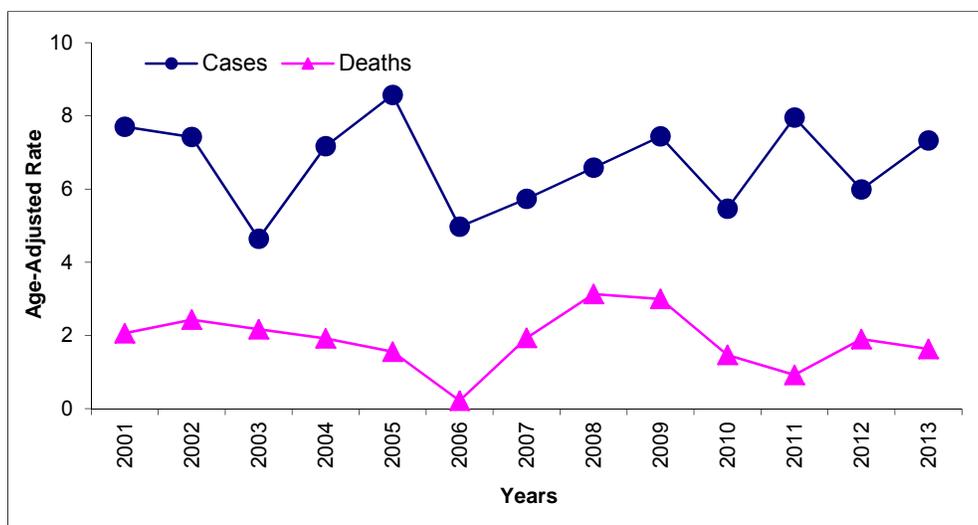The incidence peak for female cervix uteri cancer was in 2011.

Figure 26:   Cervix Uteri Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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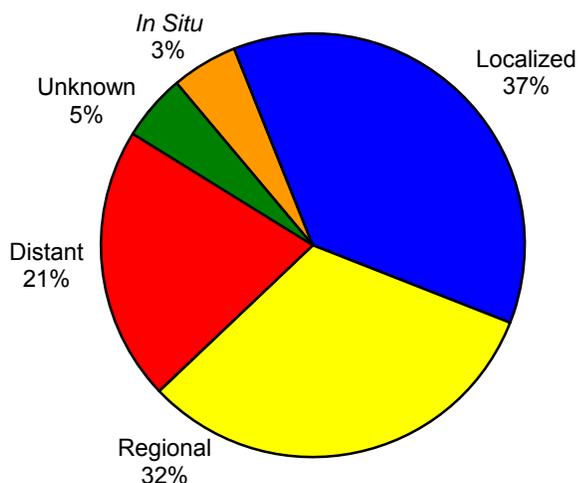Source: South Dakota Department of Health

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COLORECTAL

Table 15: Colorectal Incidence and Mortality Summary, 2013

Colorectal Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# Cases / Deaths	**413**	206	207	**166**	89	77
		Age Adjusted Rate	**40.7**	43.9	37.5	**16.5**	19.9	13.2
	White	# Cases / Deaths	**384**	191	193	**148**	80	68
		Age Adjusted Rate	**40.4**	43.5	37.2	**15.6**	19.1	12.4
	American Indian	# Cases / Deaths	**24**	13	11	**17**	9	8
		Age Adjusted Rate	**52.2**	62.9	42.7	**41.8**	34.4	42.9
United States	**Total**	Age Adjusted Rate	**38.5**	44.2	33.7	**14.5**	17.3	12.1
	White	Age Adjusted Rate	**37.7**	42.9	33.2	**14.1**	16.9	11.9
	American Indian	Age Adjusted Rate	**40.8**	41.3	40.3	**18.0**	21.5	15.3

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 27: Colorectal Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: The prognosis of the patient is greatly influenced by the stage of disease at diagnosis. In 2013, 37% (161) 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 230 invasive cases (53%) were diagnosed after the disease had spread beyond the colon. Of those 230 cases, 91 were diagnosed at distant stage when the disease had spread further involving other organs. The SEER National Cancer Institute website states that the 5-year survival rate for those who have distant stage at diagnosis is 13.5% for the 2006-2012 time period.

Incidence: Colorectal cancer accounted for 9.4% of all cases reported in South Dakota in 2013. The median age at diagnosis was 70. There were 206 men and 207 women diagnosed with colorectal cancer in 2013 in South Dakota. Overall, colorectal cancer was the fourth most diagnosed cancer. When reviewed by gender, it was the third most diagnosed cancer with 9.5% of the cancers reported in males and 9.2% of the cancers reported in females.

Mortality: Overall incidence and mortality rates for colorectal cancer are decreasing. The overall 5-year survival rate for 2006-2012 from SEER was 65.1% for men and women. In 2013, there were a total of 166 deaths that were attributed to colorectal cancer in South Dakota; more than half were men. Of that number, 148 were white and 17 were American Indian. The median age at death was 75. The SEER National Cancer Institute website states that the United States mortality rate was 14.5.

Risk and Associated Factors: Risk for colorectal cancer increases with age. Over 90% of cases occur in people who are 50 years old or older. Lifestyle factors that may contribute to an increased risk include: lack of regular physical activity, a diet low in fruit and vegetables, a low-fiber and high-fat diet, overweight and obesity, alcohol consumption, and tobacco use.

Prevention and Early Detection: The USPSTF recommends screening for colorectal cancer using high-sensitivity fecal occult blood testing (FOBT), sigmoidoscopy with interval FOBT, or colonoscopy for adults beginning at age 50 years and continuing until age 75 years. The risks and benefits of these screening methods vary.

Figure 28: Colorectal Cancer Number of Cases and Deaths by Age, South Dakota, 2013
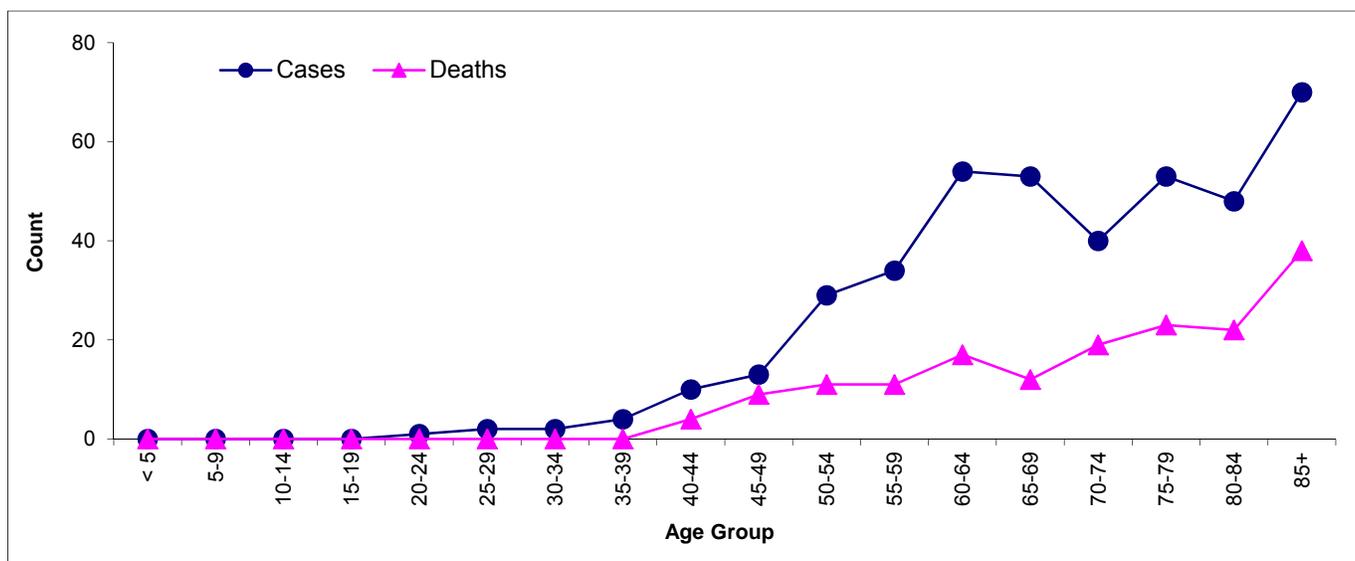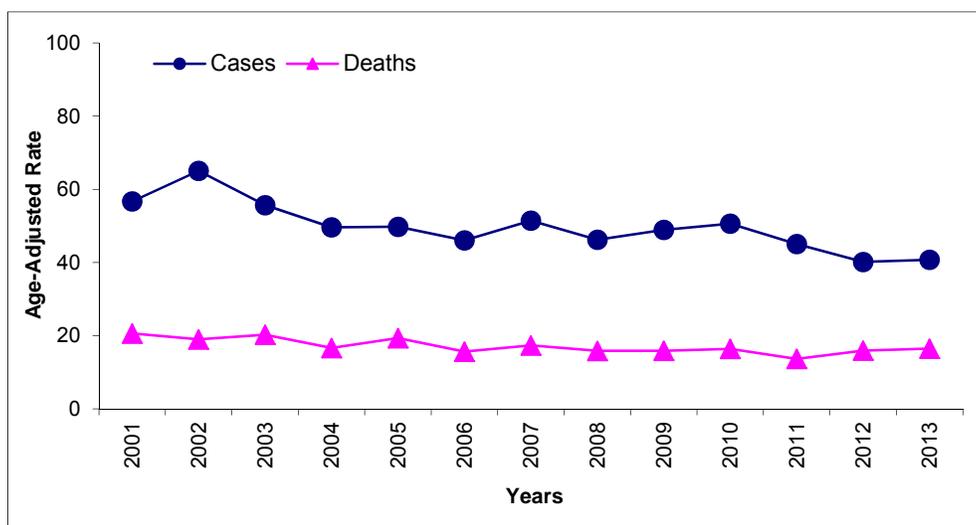

Source: South Dakota Department of Health
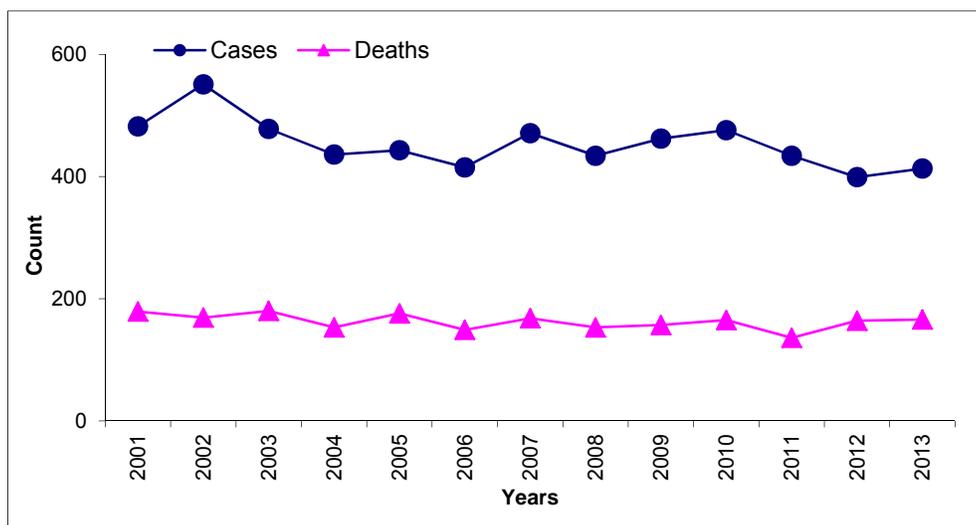
Source: South Dakota Department of Health

Figure 29: Colorectal Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

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

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

Figure 30: Colorectal Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

CORPUS and UTERUS, NOS

Table 16: Corpus and Uterus, NOS Incidence and Mortality Summary, 2013

Corpus and Uterus, NOS Cancer			Incidence	Mortality
South Dakota	**Total**	# Cases / Deaths	150	17
		Age Adjusted Rate	28.2	2.6
	White	# Cases / Deaths	144	15
		Age Adjusted Rate	29.5	2.4
	American Indian	# Cases / Deaths	5	1
		Age Adjusted Rate	21.0	6.4
United States	**Total**	Age Adjusted Rate	25.5	4.6
	White	Age Adjusted Rate	25.9	4.3
	American Indian	Age Adjusted Rate	24.3	3.2

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov   Source: South Dakota Department of Health

Figure 31: Corpus and Uterus, NOS Cancer Stage at Diagnosis, South Dakota, 2013
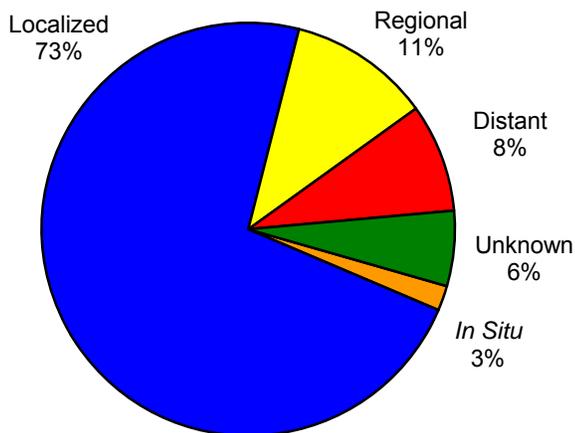
Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Cancer in the uterus is treated surgically. Staging for these diseases is done following surgery, unless it is obvious that the disease has progressed and advanced. Cases with obvious advanced disease do not benefit from surgical procedures and are staged by physical examination. These cases are treated without operative staging. In South Dakota, during 2013, 73% of corpus uteri cases were diagnosed at localized stage. Thirteen cases were diagnosed at distant stage, more than in 2012.

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 2013. Cancer of the corpus uteri represented 6.7% of all of the cancers diagnosed in South Dakota females in 2013. Endometrial cancer affects primarily postmenopausal women. The median age at diagnosis in the United States is 65. In South Dakota, the median age is 62 years of age.

Mortality: The death rate in South Dakota for the reporting period was 2.6 for deaths attributed to uterine cancer. In the United States, the 2011 rate was 4.6. Only 17 South Dakota female deaths were attributed to cancer of the uterus in 2013. The stage of disease at diagnosis affects the mortality rate. Overall (all stages included), the five-year relative survival rate was 81.7% in the United States.

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

Prevention and Early Detection: Other factors associated with an increased risk of developing uterine cancer include obesity, a high-fat diet and a prolonged exposure to the female hormone, estrogen. One pregnancy appears to lower the risk of uterine cancer by 50%.
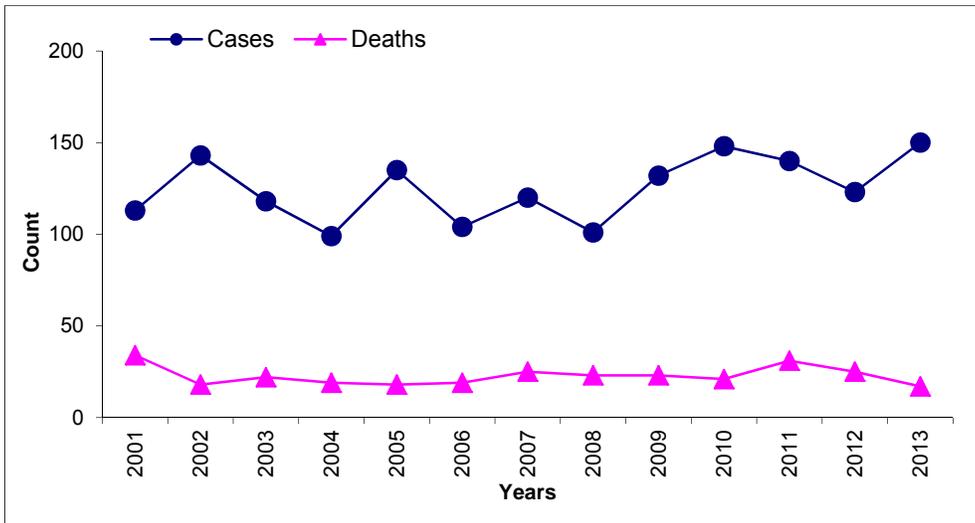
Figure 32: Corpus and Uterus, NOS Cancer Number of Cases and Deaths by Age, South Dakota, 2013
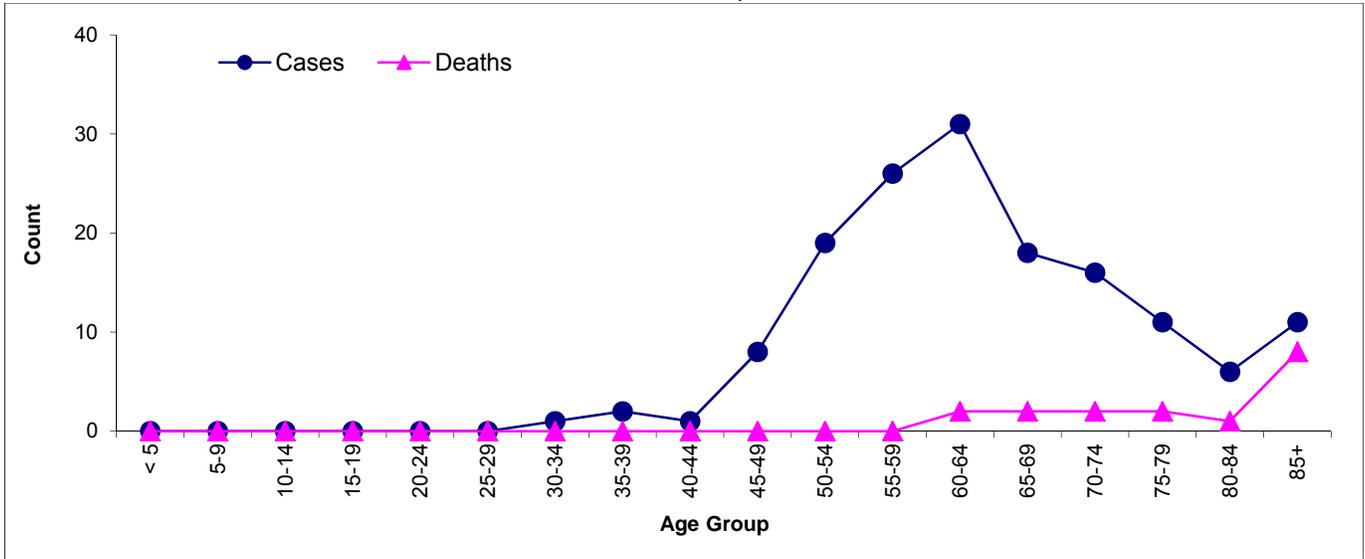
In South Dakota, in 2013 the incidence peaked in the 60-64 age group.
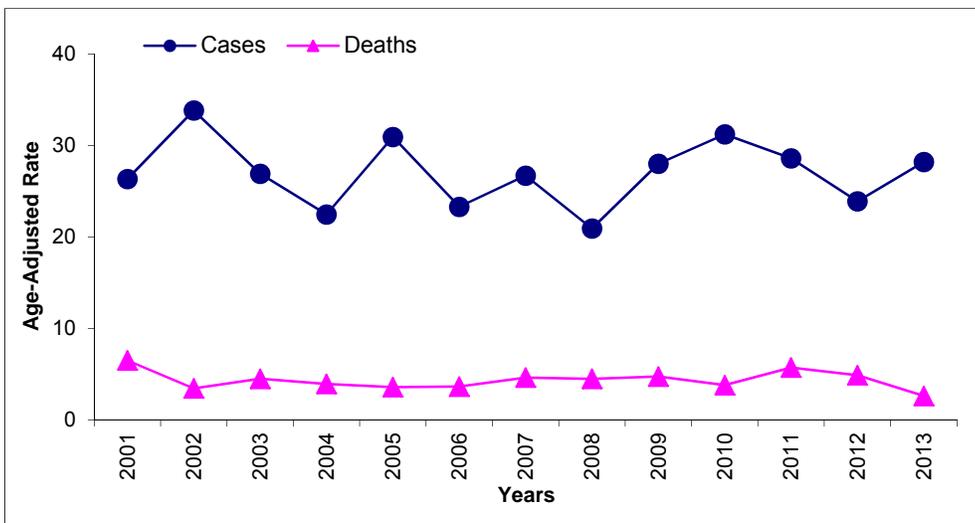

Figure 33: Corpus and Uterus, NOS Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

The incidence peak for female corpus and uterus, NOS cancer was in 2013.

Figure 34: Corpus and Uterus, NOS Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

KIDNEY AND RENAL PELVIS

Table 17:   Kidney and Renal Pelvis Incidence and Mortality Summary, 2013

Kidney and Renal Pelvis Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# Cases / Deaths	**164**	110	54	**44**	26	18
		Age Adjusted Rate	**17.0**	23.5	10.9	**4.2**	5.3	3.2
	White	# Cases / Deaths	**148**	96	52	**41**	24	17
		Age Adjusted Rate	**16.6**	22.2	11.4	**4.2**	5.3	3.2
	American Indian	# Cases / Deaths	**14**	12	2	**3**	2	1
		Age Adjusted Rate	**32.4**	61.9	9.0	**5.0**	7.5	3.3
United States	**Total**	Age Adjusted Rate	**15.6**	21.5	10.5	**3.9**	5.6	2.5
	White	Age Adjusted Rate	**16.0**	22.0	10.8	**4.0**	5.8	2.5
	American Indian	Age Adjusted Rate	**17.7**	25.5	11.5	**6.9**	9.9	4.7

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 35: Kidney and Renal Pelvis Cancer Stage at Diagnosis, South Dakota, 2013
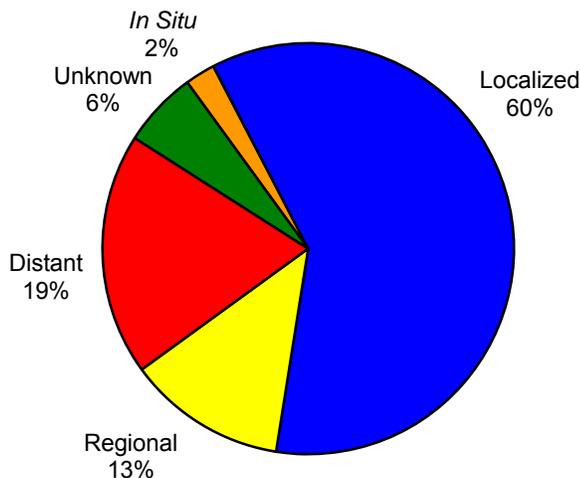
Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: As with all malignancies, early diagnosis is the key to better prognosis and possible cure. In 2013 60% of the cases were diagnosed at localized stage, with another 19% diagnosed at distant stage. Unfortunately, symptoms do not always reflect the stage of disease. Blood in the urine is one of the symptoms that frequently presents at diagnosis. As with other cancers, renal cancer can spread through the blood stream and/or lymphatic system. Survival rates associated with kidney cancer depend on how far the disease has progressed, the size of tumor, and whether or not it has metastasized. The latest five-year survival rate for localized stage kidney cancer is 92.5%. The survival rate for distant stage is 11.7%.

Incidence: In 2013 the American Cancer Society estimated there would be 65,150 new cases of kidney cancer in the United States. This accounts for 3.9% of all reported malignancies in the United States. In South Dakota there were 164 reported cases of kidney cancer in 2013 representing 3.7% of all cancer cases. Kidney cancer develops most often in people over 40. There is no known cause of this disease. Doctors can seldom explain why one person develops kidney cancer and another does not. The median age at diagnosis is 65 in South Dakota and 64 in the United States.

Mortality: This cancer was the ninth leading cause of cancer death for South Dakota in 2013. In the United States for 2009-2013 it was the thirteenth leading cause of death with a median age of death of 71 years. Death rates decreased by 0.7% per year from 2004 to 2013.

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

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

Figure 36: Kidney and Renal Pelvis Cancer Number of Cases and Deaths by Age, South Dakota, 2013

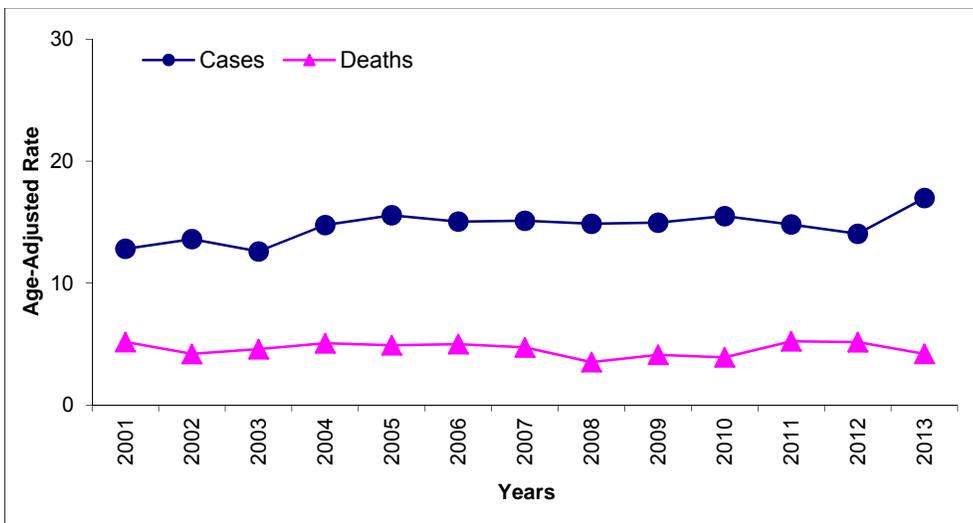Source: South Dakota Department of Health
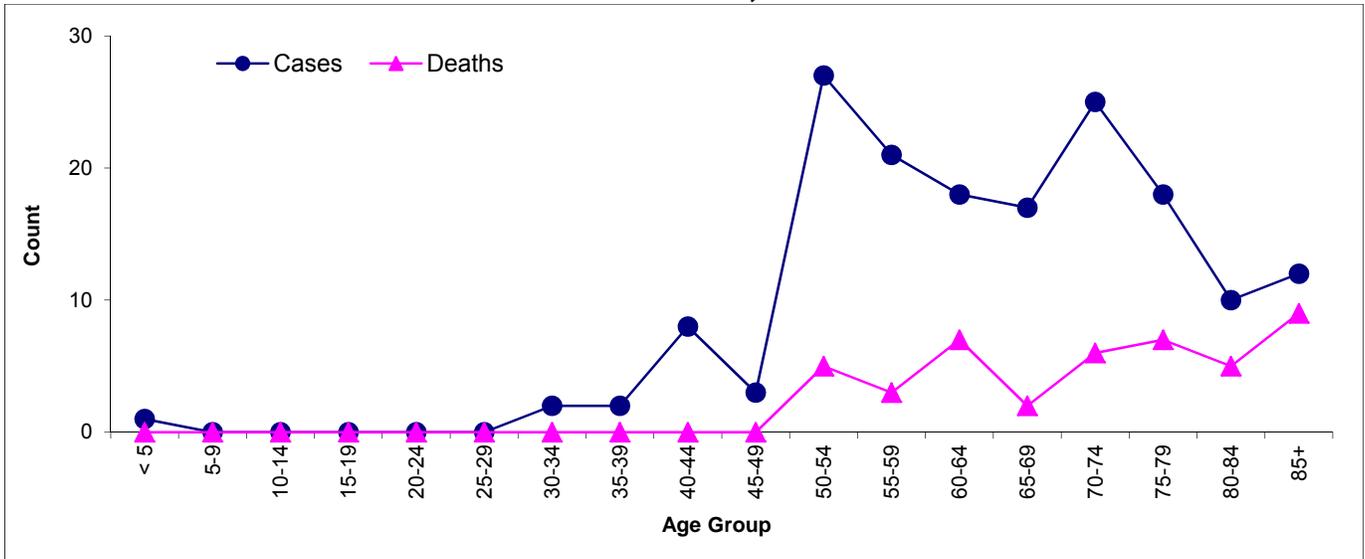
Source: South Dakota Department of Health

Figure 37:   Kidney and Renal Pelvis Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013
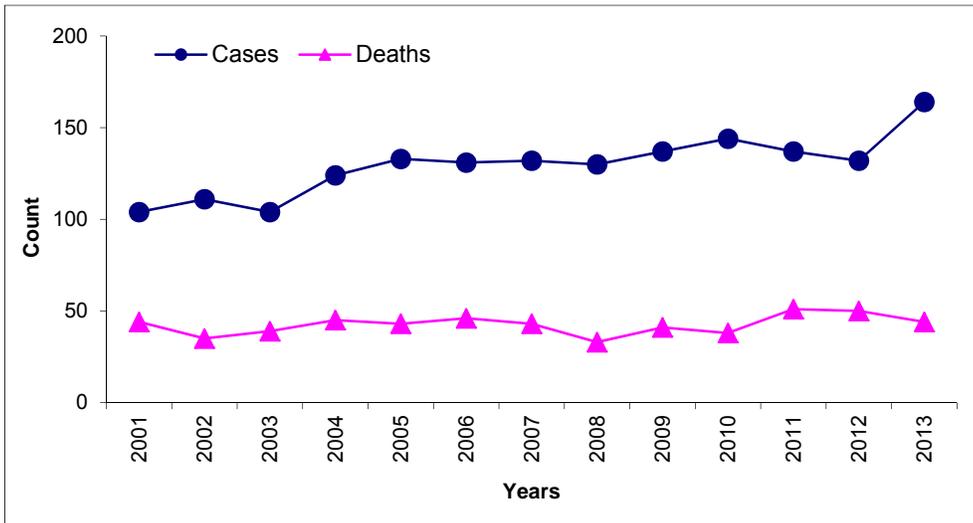
The incidence peak for kidney and renal pelvis cancer occurred in 2013.

Figure 38:   Kidney and Renal Pelvis Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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

LEUKEMIA

Table 18: Leukemia Incidence and Mortality Summary, 2013

Leukemia			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**150**	84	66	**89**	51	38
		Age Adjusted Rate	**15.3**	18.6	12.7	**8.9**	12.0	6.4
	White	# Cases / Deaths	**144**	81	63	**86**	49	37
		Age Adjusted Rate	**16.2**	19.4	13.7	**9.0**	12.0	6.7
	American Indian	# Cases / Deaths	**5**	2	3	**2**	1	1
		Age Adjusted Rate	**15.3**	10.5	15.8	**6.6**	4.2	6.4
United States	**Total**	Age Adjusted Rate	**13.4**	17.1	10.4	**6.7**	9.1	5.0
	White	Age Adjusted Rate	**14.1**	18.0	10.9	**7.0**	9.4	5.2
	American Indian	Age Adjusted Rate	**8.4**	9.6	7.3	**4.3**	4.8	3.9

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Leukemias are not staged because they may involve bone marrow throughout the body. Doctors classify them by type and subtype in an attempt to determine the prognosis and a recommended level of treatment. Chronic myelogenous leukemia is grouped by phases and chronic lymphocytic leukemia (CLL) uses a Rai classification. Leukemia is a type of cancer of the blood. It is defined by how quickly the disease progresses. Leukemia is either chronic (disease progresses slowly) or acute (progresses quickly).

Incidence: Leukemias are a diverse group of cancers and are subtyped by histology. Subtypes have different etiology, treatment, and prognosis. Leukemias accounted for 3.4% of the cancers reported in 2013 for South Dakota. The American Cancer Society estimated that there would be 150 new cases of leukemia in South Dakota during 2013 and 48,610 cases nationwide.

Mortality: Leukemia accounted for 5.7% of the cancer deaths in South Dakota in 2013. The subtype of acute myeloid leukemia was the most frequent cause of leukemia death. Over 78% of the deaths associated with leukemia occurred at the age of 65 or older.

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

Chronic Leukemia: Early in the disease process, the abnormal blood cells still have normal processes. Slowly, chronic leukemia does get worse. It causes symptoms as the number of abnormal cells in the blood rises. In South Dakota in 2013, there were 78 new cases of chronic leukemia.

Acute Leukemia: The blood cells are very abnormal. The blood cells cannot carry out their normal processes. The number of abnormal cells increases rapidly. Acute leukemia worsens quickly as do the symptoms. There were 66 new cases of acute leukemia in South Dakota in 2013.

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

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

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

Figure 39:   Leukemia Number of Cases and Deaths by Age, South Dakota, 2013
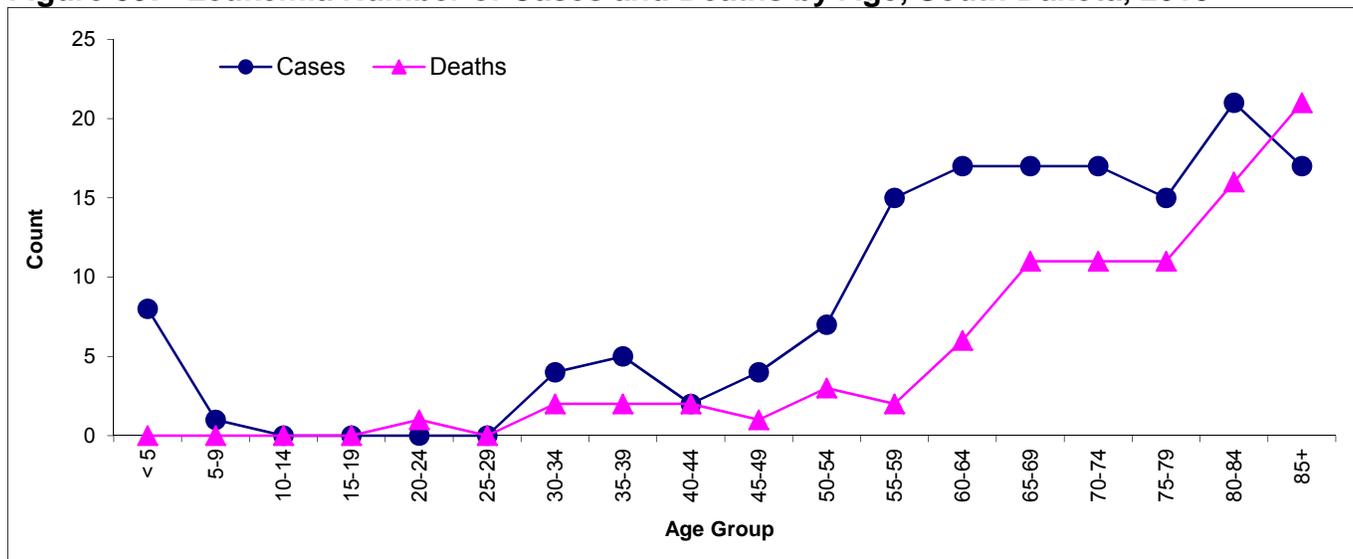
Source: South Dakota Department of Health

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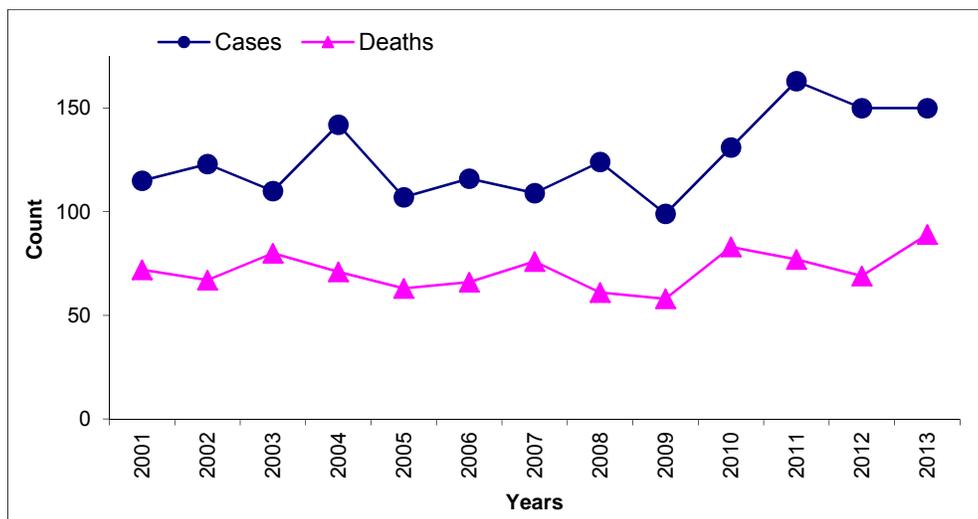

Figure 40:   Leukemia Cases and Deaths by Year, South Dakota, 2001 - 2013

The incidence peak for leukemia occurred in 2011.

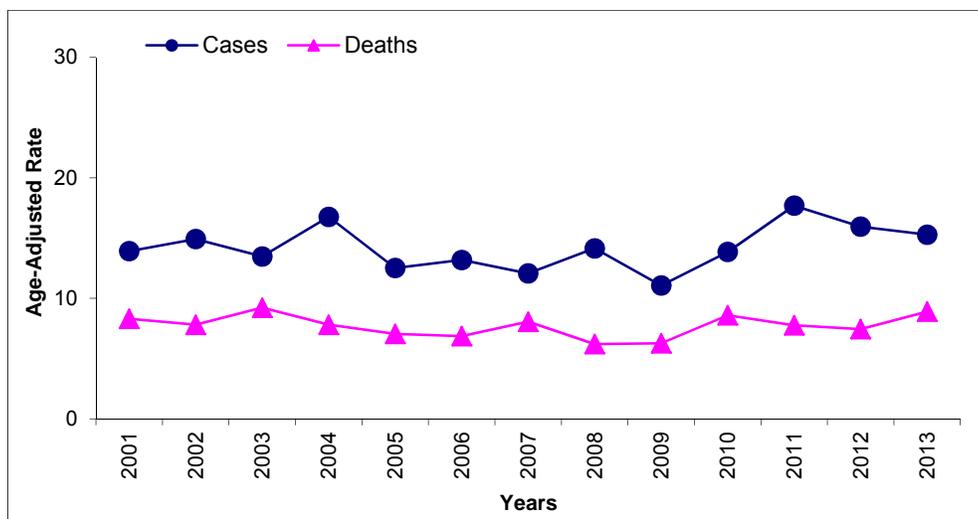Source: South Dakota Department of Health

Figure 41:   Leukemia Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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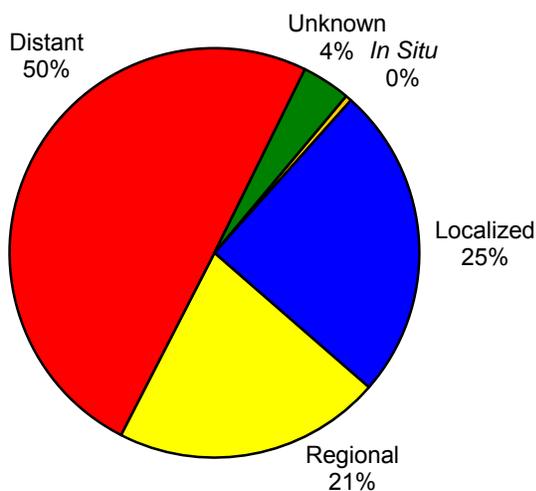Source: South Dakota Department of Health

LUNG AND BRONCHUS

Table 19: Lung and Bronchus Incidence and Mortality Summary, 2013

Lung and Bronchus Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**598**	309	289	**416**	239	177
		Age Adjusted Rate	**59.4**	67.3	55.0	**40.9**	52.4	32.1
	White	# Cases / Deaths	**560**	290	270	**389**	222	167
		Age Adjusted Rate	**59.2**	66.7	55.0	**40.5**	51.3	32.1
	American Indian	# Cases / Deaths	**34**	17	17	**24**	14	10
		Age Adjusted Rate	**84.2**	125.6	64.5	**64.6**	102.5	46.0
United States	**Total**	Age Adjusted Rate	**54.0**	62.8	47.4	**43.4**	53.9	35.4
	White	Age Adjusted Rate	**55.5**	63.0	49.9	**44.1**	53.8	36.6
	American Indian	Age Adjusted Rate	**38.1**	51.4	28.3	**36.5**	43.9	31.3

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 42: Lung and Bronchus Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

*Stage at Diagnosis***:** The presentation of lung cancer is extremely variable and depends on local manifestations of the tumor, distant metastases or associated paraneoplastic syndromes. In 2013, 21% of lung cancer patients were diagnosed at localized stage. The more advanced the stage, the poorer the prognosis is for the patient. In 2013, 299 (50%) cases were diagnosed when disease had progressed beyond the lung and metastasized to a distant location. Approximately 71% of cases in 2013 were diagnosed after the disease had progressed beyond the lung to lymph nodes, regional areas, or distant sites, such as brain or bone.

*Incidence:* Lung cancer is a major public health concern, with an estimated 228,190 new cases in the United States in 2013. 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 598 new invasive lung cancer cases diagnosed in 2013.

Mortality: There were 416 lung cancer deaths in South Dakota in 2013. Incidence and mortality rates have significantly increased during the last century. Lung cancer accounts for approximately 26.5% of all United States deaths attributed to cancer. In South Dakota, lung cancer accounts for 26.4% 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 the number one risk factor for lung cancer and is linked to approximately 90% of lung cancers. Other risk factors include second hand smoke exposure, occupational or environmental exposures to substances such as radon, arsenic, benzene, and asbestos, a personal or family history of lung cancer, and previous radiation therapy to the chest.

Prevention and Early Detection: The USPSTF recommends annual screening for lung cancer with low-dose computed tomography (LDCT) in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.

Figure 43: Lung and Bronchus Cancer Number of Cases and Deaths by Age, South Dakota, 2013

Source: South Dakota Department of Health
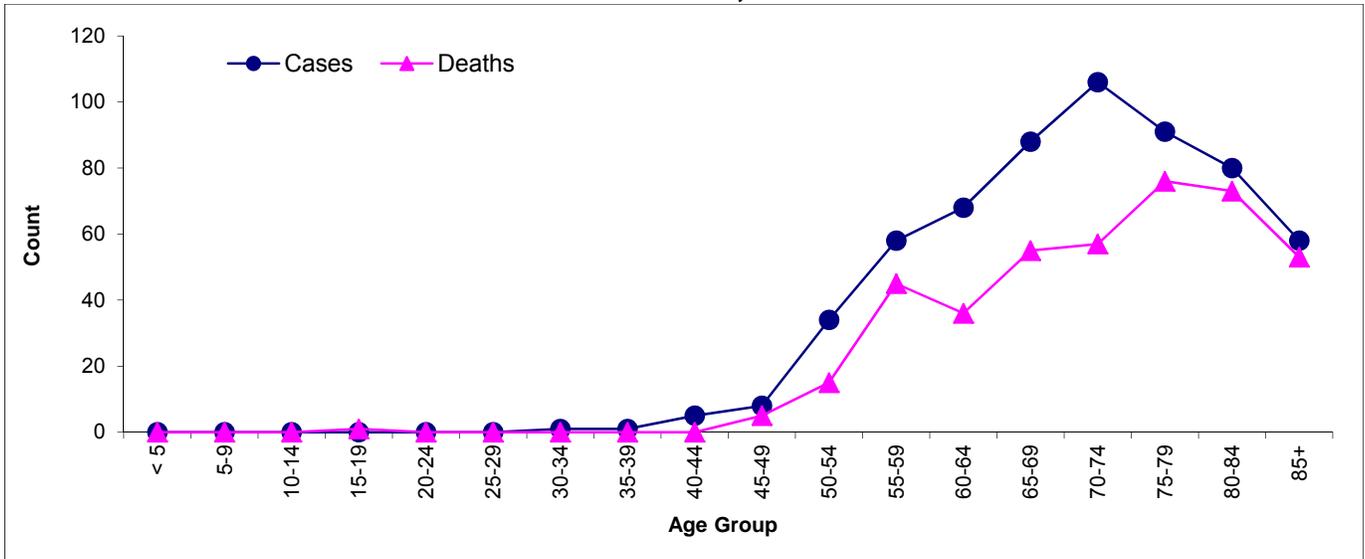
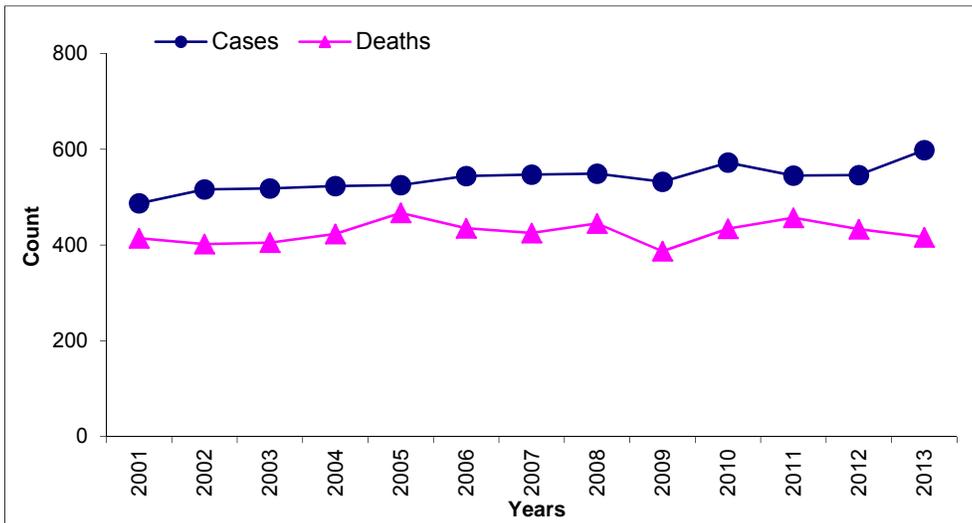Source: South Dakota Department of Health

Figure 44: Lung and Bronchus Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

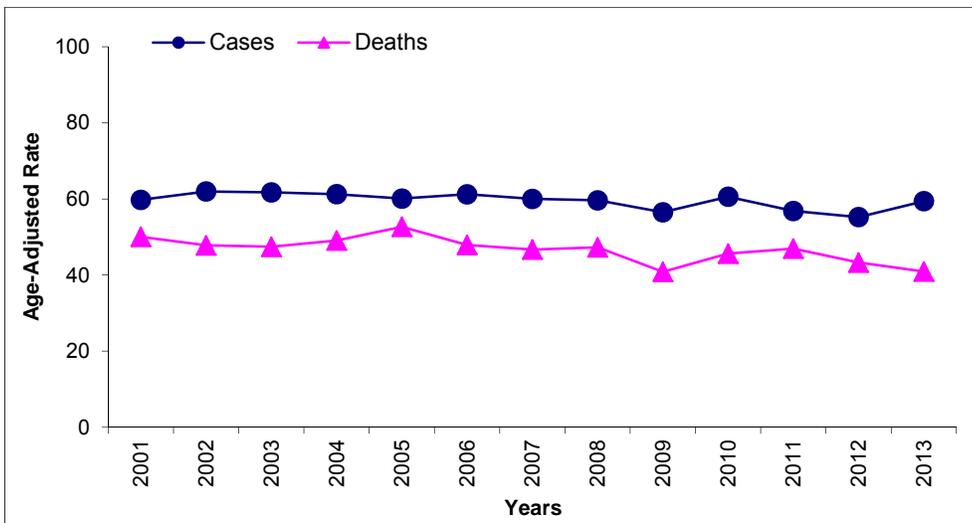The number of cases and deaths associated with lung and bronchus cancer remain constant.

Figure 45: Lung and Bronchus Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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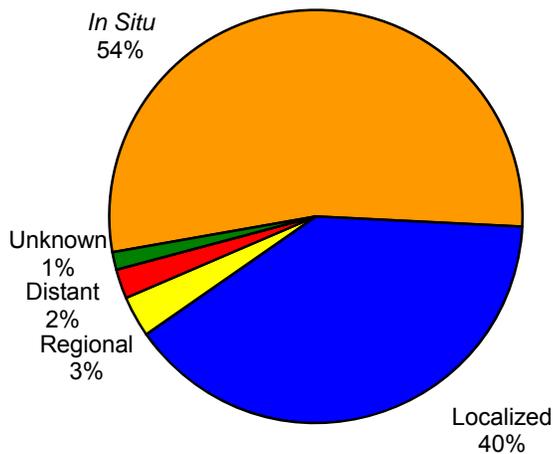Source: South Dakota Department of Health

MELANOMA OF THE SKIN

Table 20: Melanoma of the Skin Incidence and Mortality Summary, 2013

Melanoma of the Skin			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# Cases / Deaths	**202**	111	91	**21**	13	8
		Age Adjusted Rate	**21.4**	24.2	19.4	**2.1**	2.7	1.5
	White	# Cases / Deaths	**199**	109	90	**20**	13	7
		Age Adjusted Rate	**22.9**	25.5	21.1	**2.2**	3.0	1.4
	American Indian	# Cases / Deaths	**3**	2	1	**0**	0	0
		Age Adjusted Rate	**5.3**	6.5	4.1	**0.0**	0.0	0.0
United States	**Total**	Age Adjusted Rate	**22.4**	29.5	17.2	**2.7**	4.0	1.6
	White	Age Adjusted Rate	**26.5**	34.4	20.6	**3.1**	4.6	1.9
	American Indian	Age Adjusted Rate	**4.0**	4.9	3.2	**0.0**	0.0	0.0

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health
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Figure 46: Melanoma of the Skin Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Melanoma is staged by the depth of invasion and the extension of the lesion. In 2013, over half of the melanoma of the skin cases reported for South Dakota were *in situ*. Another 40% were staged as localized disease. The survival rate for localized melanoma is 98.4%. For distant disease, the survival rate is 17.9% at 5 years.

Incidence: In the United States in 2013, the American Cancer Society estimated that there would be 76,690 new cases of melanoma of the skin. There are three forms of skin cancer: basal cell, squamous cell, and melanoma. Melanoma is by far the most dangerous form of skin cancer.

Melanoma is primarily a cancer of the white populations. In South Dakota, the incidence rate was 21.4 and the United States had an incidence rate of 22.4 in 2013.

Mortality: There were 21 deaths attributed to melanoma of the skin in South Dakota in 2013 with a mortality rate of 2.1 and the United States mortality rate was 2.7. The median age for death in South Dakota for this cancer was 62 in 2013. Nationwide, the median age at death was 69 for melanoma of the skin.

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

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

Early Detection and Prevention: The best way to prevent skin cancer is to protect the skin from the sun. The CDC recommends five easy options for protection from sunburn:
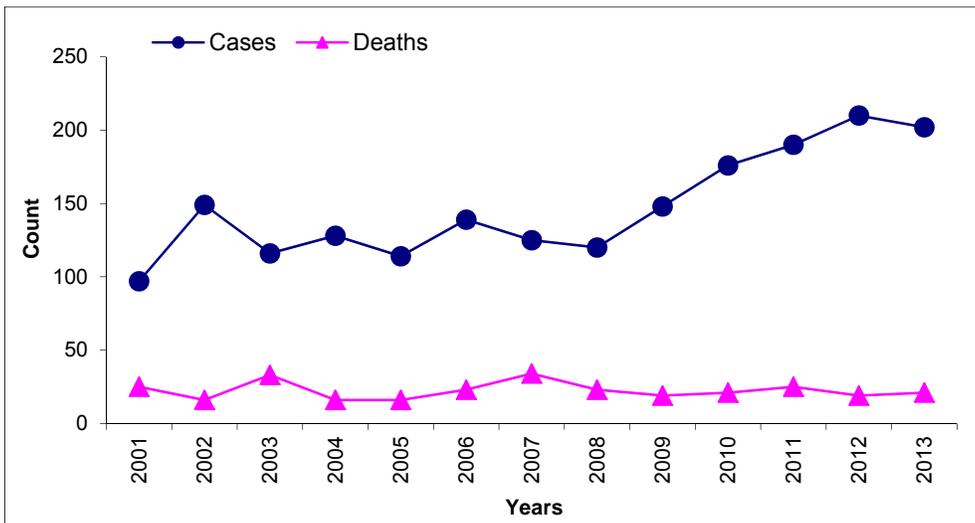
- use sun glasses
- use sunscreen regularly
- stay in the shade
- cover skin
- wear a hat

Figure 47: Melanoma of the Skin Number of Cases and Deaths by Age, South Dakota, 2013
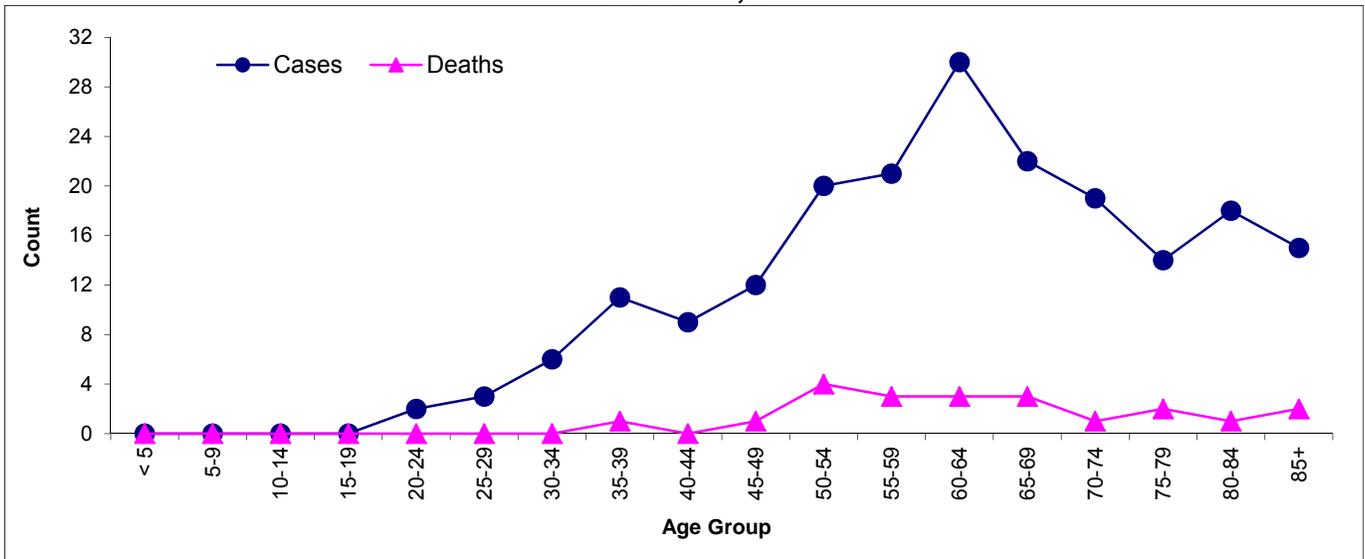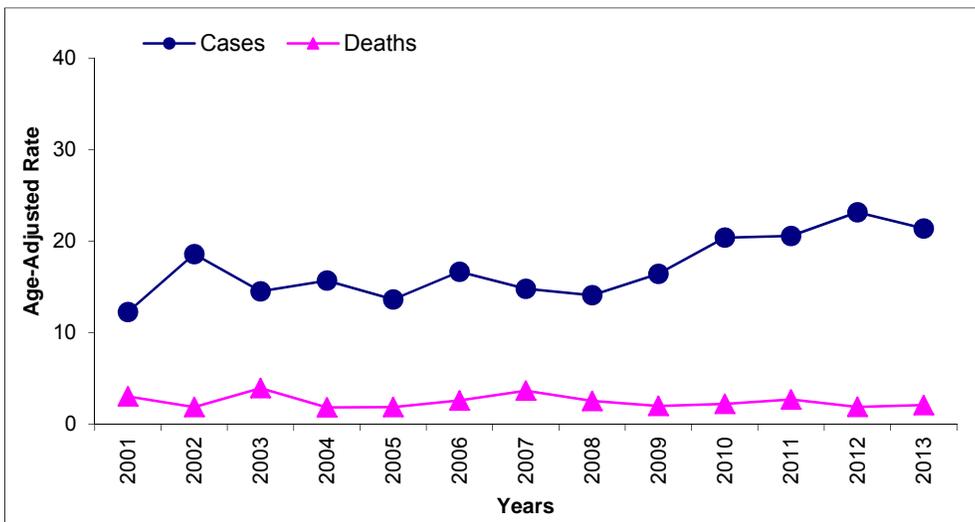

Source: South Dakota Department of Health

Figure 48: Melanoma of the Skin Cases and Deaths by Year, South Dakota, 2001 - 2013

Source: South Dakota Department of Health

Figure 49: Melanoma of the Skin Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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

MYELOMA [§]

Table 21: Myeloma Incidence and Mortality Summary, 2013

Myeloma §			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	**Total**	# Cases / Deaths	**63**	38	25	**32**	21	11
		Age Adjusted Rate	**6.2**	8.2	4.6	**3.0**	4.6	1.9
	White	# Cases / Deaths	**59**	35	24	**30**	20	10
		Age Adjusted Rate	**6.1**	8.0	4.6	**2.9**	4.5	1.8
	American Indian	# Cases / Deaths	**4**	3	1	**2**	1	1
		Age Adjusted Rate	**10.4**	16.3	5.3	**5.1**	7.1	3.7
United States	**Total**	Age Adjusted Rate	**6.4**	8.2	5.1	**3.3**	4.2	2.7
	White	Age Adjusted Rate	**5.8**	7.6	4.4	**3.1**	4.0	2.4
	American Indian	Age Adjusted Rate	**6.6**	6.4	6.8	**3.6**	4.3	3.2

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
§ can include NOS, multiple, plasma cell and solitary. US rates www.seer.cancer.gov   Source: South Dakota Department of Health

Descriptive Epidemiology

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

Incidence: Myeloma is a systemic malignancy of plasma cells that is highly treatable, but rarely curable. It is potentially curable when it presents as a solitary plasmacytoma of the bone or as an extramedullary plasmacytoma. In South Dakota during 2013, myeloma accounted for 1.4% of total cancer cases reported.   Median age at diagnosis in South Dakota was 73 and the United States was 69. The national incidence rate is higher in men (8.2) than women (5.1).   In South Dakota the incidence rate is also higher in men (8.2) than women (4.6). Myeloma is more common among the elderly. African Americans have approximately twice the incidence and mortality rates of whites.

Mortality: The median survival prior to the common use of chemotherapy was about seven months. After the introduction of chemotherapy, prognosis improved significantly with a median survival of 24 to 30 months and a 10-year survival of 3%.   During 2013, there were 32 deaths attributed to myeloma in South Dakota. Twenty-one were male and 11 were female. The mortality rate for South Dakota was 3.0.   The rate for men was 4.6 and 1.9 for women. These rates compare to United States mortality rates in 2013 of 3.3 overall, 4.2 for men and 2.7 for women.

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

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

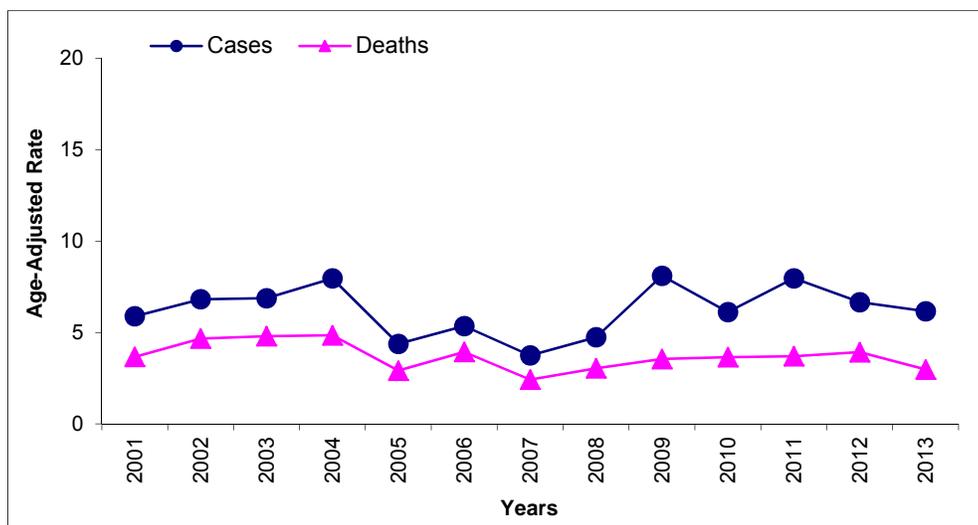**Figure 50:   Myeloma Number of Cases and Deaths by Age, South Dakota, 2013**
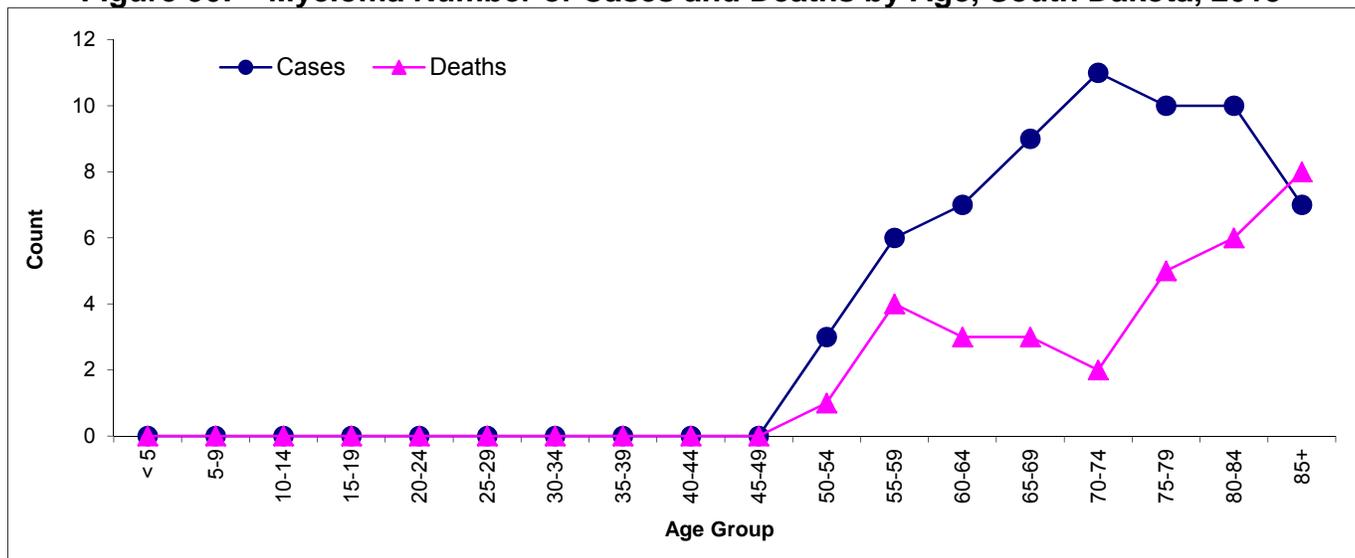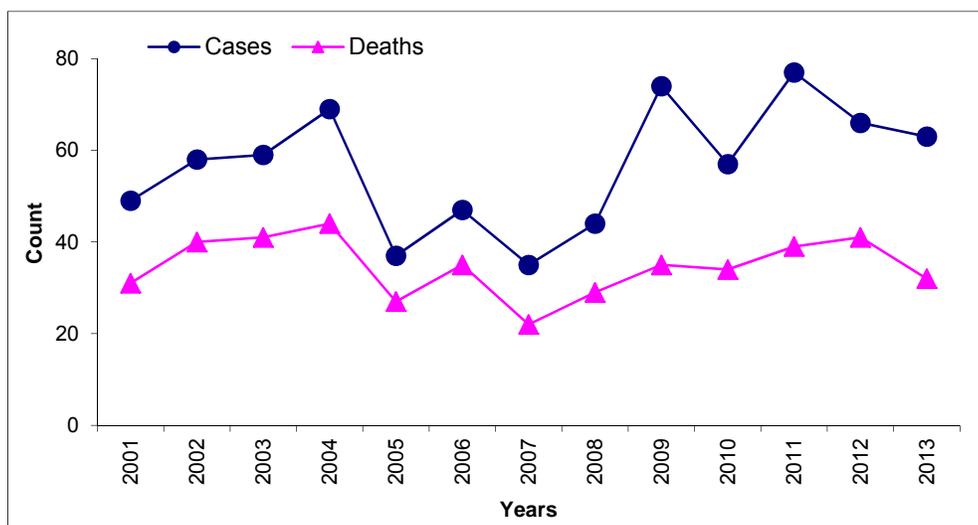
Source: South Dakota Department of Health

Figure 51: Myeloma Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

The incidence count for myeloma cancers took a sharp drop from 2004 to 2005, with an all-time high in 2011.

Source: South Dakota Department of Health

**Figure 52: Myeloma Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013**

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

Table 22: Non-Hodgkin's Lymphoma Incidence and Mortality Summary, 2013

Non-Hodgkin's Lymphoma			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	Total	# Cases / Deaths	**166**	87	79	**59**	27	32
		Age Adjusted Rate	**17.0**	19.5	14.9	**5.4**	5.7	5.0
	White	# Cases / Deaths	**159**	83	76	**57**	25	32
		Age Adjusted Rate	**17.6**	20.0	15.7	**5.5**	5.6	5.3
	American Indian	# Cases / Deaths	**7**	4	3	**1**	1	0
		Age Adjusted Rate	**19.0**	23.9	16.2	**1.7**	3.7	0.0
United States	Total	Age Adjusted Rate	**19.0**	23.2	15.5	**5.7**	7.4	4.4
	White	Age Adjusted Rate	**19.8**	24.2	16.2	**5.9**	7.7	4.6
	American Indian	Age Adjusted Rate	**10.9**	11.5	10.6	**4.2**	5.2	3.3

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 53: Non-Hodgkin's Lymphoma Stage at Diagnosis, South Dakota, 2013
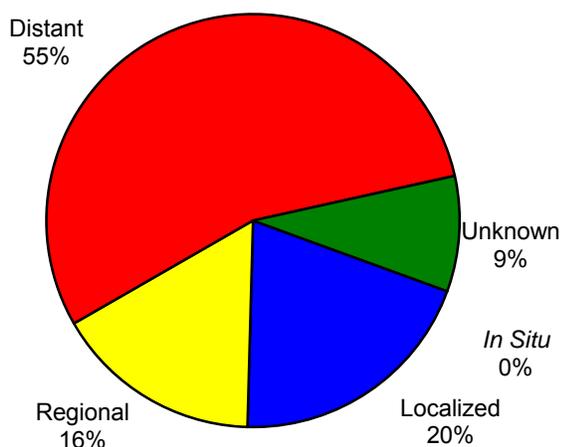
Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Stage is based on where lymphoma cells are found (in the lymph or in other organs or tissues). The stage also depends on how many areas are involved. Localized stage only involves a single lymph node region or single extralymphatic organ. When two or more lymph node regions are involved and the regions are on both sides of the diaphragm the cancer is staged as distant. In 2013, 55% of the cases were diagnosed at distant stage, an increase from 2011 when 47% were diagnosed at distant stage.

Incidence: Non-Hodgkin's lymphoma is a cancer that originates in the lymphatic system, the disease-fighting network that spreads throughout the body. It develops in lymphocytes, a type of white blood cell. Non-Hodgkin's lymphoma is more than five times as common as the other general type of lymphoma, Hodgkin's disease. The incidence rate has been increasing in the United States since the 1970s. The incidence of non-Hodgkin's disease in South Dakota was 166 cases in 2013. The median age at diagnosis in South Dakota in 2013 was 71.

Mortality: There were 59 deaths reported in South Dakota that were attributed to non-Hodgkin's lymphoma. The median age at death for those whose death was attributed to non-Hodgkin's lymphoma in South Dakota was 82 years of age. Nationally, the five-year survival rate is 70.7% for non-Hodgkin's lymphoma.

Risk and Associated Factors: Age is a strong risk factor for this disease, with most cases occurring from age 60 and older. Some studies suggest that exposure to chemicals such as benzene and certain herbicides and insecticides may be linked to an increased risk. Some chemotherapy used to treat other cancers can increase the risk as well as patients having been treated with radiation. The risk is higher for those having been treated with both. Certain infections increase the risk, such as HIV, Epstein - Barr virus, H. pylori bacteria, and Hepatitis C virus.

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

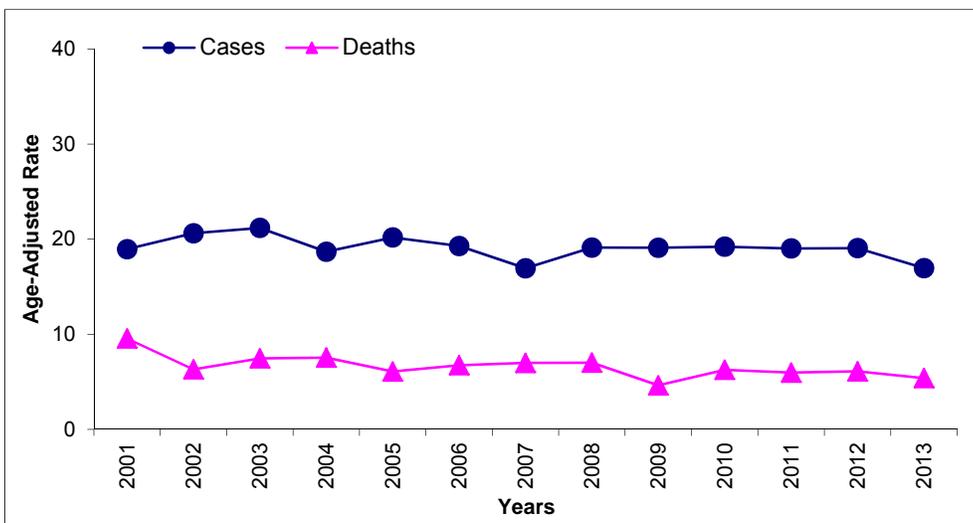**Figure 54:   Non-Hodgkin's Lymphoma Number of Cases and Death by Age, South Dakota, 2013**
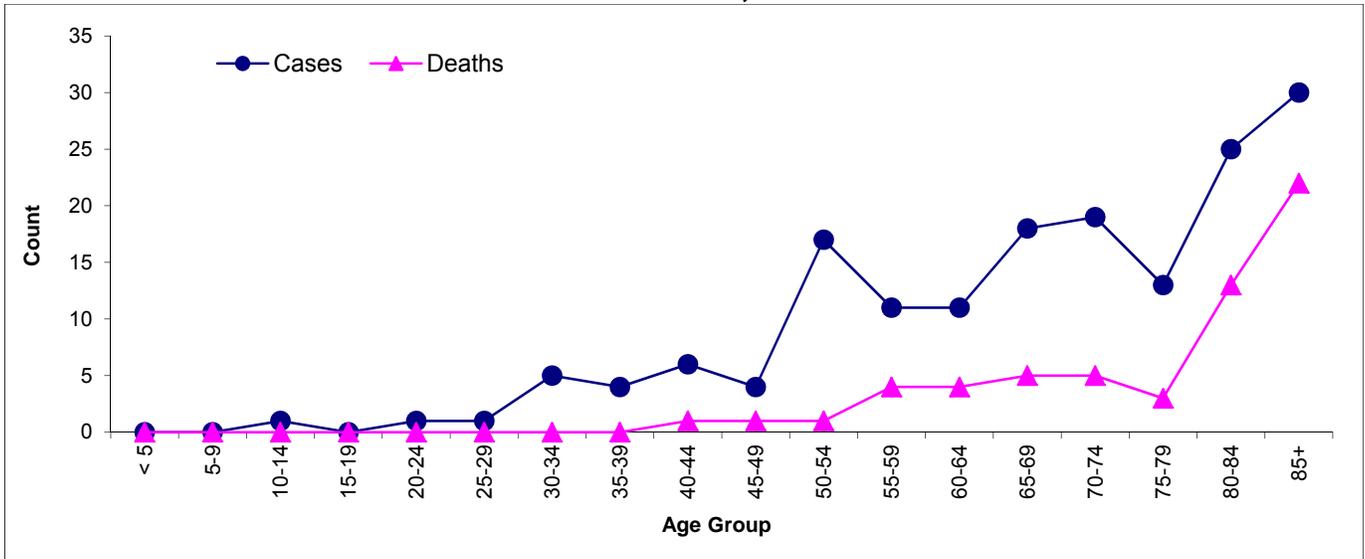
Source: South Dakota Department of Health

Figure 55: Non-Hodgkin's Lymphoma Cases and Deaths by Year, South Dakota, 2001 – 2013
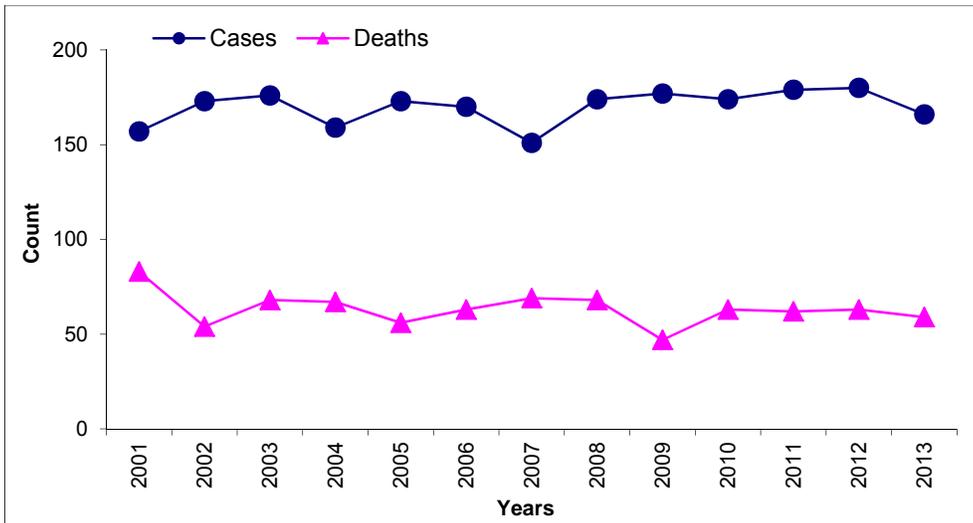
Source: South Dakota Department of Health

Figure 56: Non-Hodgkin's Lymphoma Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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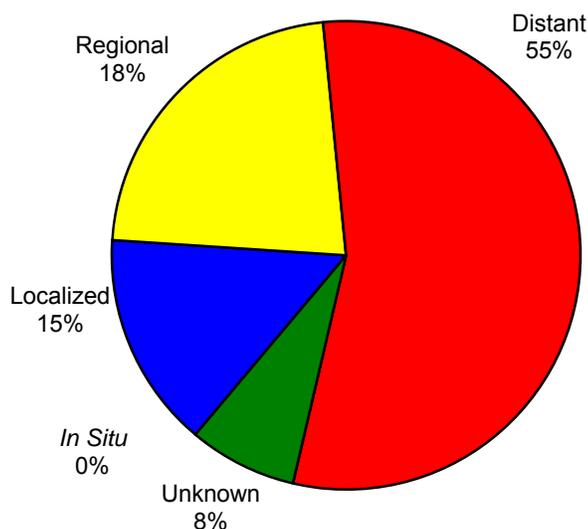Source: South Dakota Department of Health

Cancer in South Dakota 2013 *May 2016*

OVARY

Table 23: Ovarian Incidence and Mortality Summary, 2013

Ovarian Cancer			Incidence	Mortality
South Dakota	**Total**	# Cases / Deaths	67	36
		Age Adjusted Rate	13.7	5.9
	White	# Cases / Deaths	60	32
		Age Adjusted Rate	13.4	5.7
	American Indian	# Cases / Deaths	7	4
		Age Adjusted Rate	28.7	19.9
United States	**Total**	Age Adjusted Rate	11.3	7.2
	White	Age Adjusted Rate	11.7	7.5
	American Indian	Age Adjusted Rate	9.6	6.1

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov   Source: South Dakota Department of Health

Figure 57: Ovarian Cancer Stage at Diagnosis, South Dakota, 2013

Distant 55%
Regional 18%
Localized 15%
In Situ 0%
Unknown 8%

Source: South Dakota Department of Health

Descriptive Epidemiology

***Stage at Diagnosis*:** Staging of ovarian cancer is done by a surgical procedure to remove as much of the cancer as possible. Surgical staging is of critical importance in management of this disease. The morbidity associated with ovarian carcinoma is partially attributable to the fact that in the United States two-thirds of the patients present with advanced-stage disease at the time of diagnosis. In 2013, in South Dakota 37 (55%) of the 67 cases were diagnosed at distant stage.

Incidence: The incidence of ovarian cancer varies greatly. There were 67 cases of ovarian cancer reported in 2013 in South Dakota. This accounted for 3.0% of the cancer cases diagnosed in 2013 for South Dakota women.

The lifetime risk of a woman developing ovarian cancer is 1.4%. Twelve cases were diagnosed at younger than 49 years of age. There were 10 cases diagnosed in the 60-69 age group. The median age at diagnosis in South Dakota was 64; nationally it was 63.

Mortality: Doctors are using dramatic new therapies to fight ovarian cancer, extending the lives of women who five or 10 years ago would have died from the disease. Survival rates for the last several decades are only about 25% for those with advanced disease. Most ovarian cancer presents at advanced disease. Only 28.8% of those diagnosed at late stage survive five years. For those who are diagnosed early, before the disease spreads beyond the ovaries, the disease is 92.1% curable. In South Dakota, 36 patients died in 2013. The mortality rate was 5.9 for women in South Dakota.

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

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

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

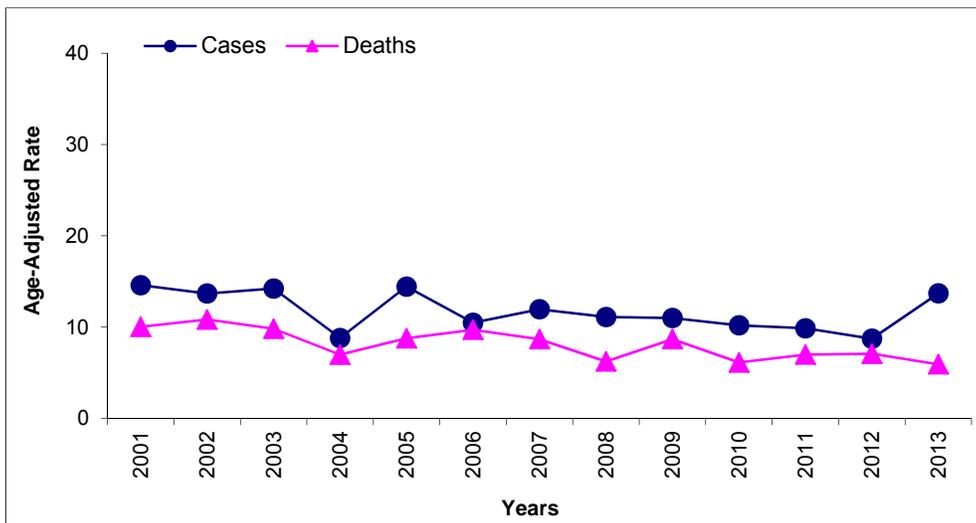**Figure 58: Ovarian Cancer Number of Cases and Deaths by Age, South Dakota, 2013**
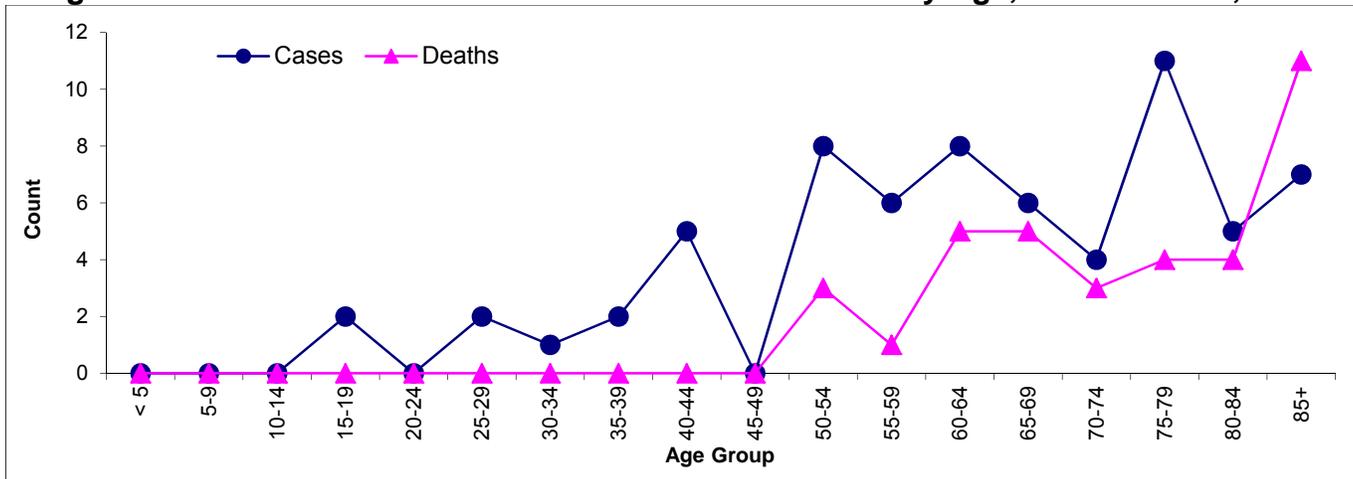
Source: South Dakota Department of Health

Figure 59: Ovarian Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013
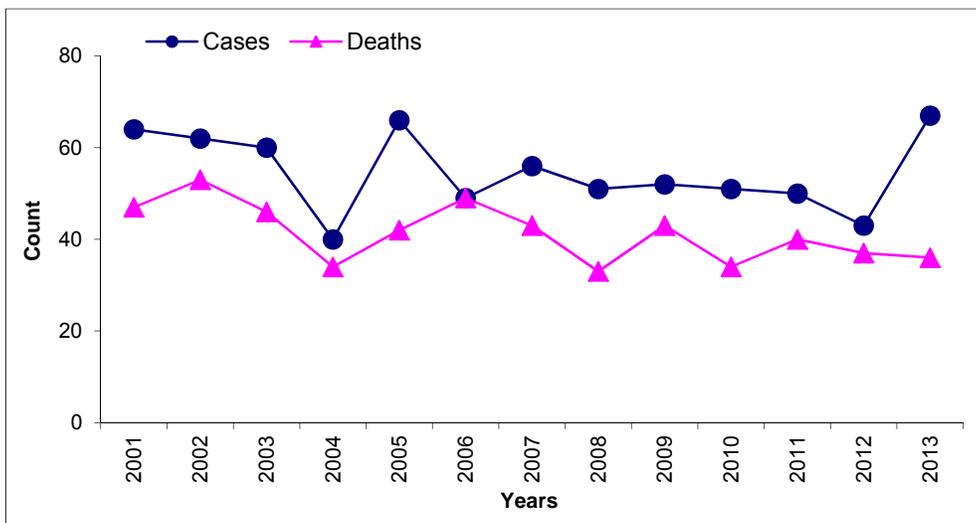
Source: South Dakota Department of Health

Figure 60: Ovarian Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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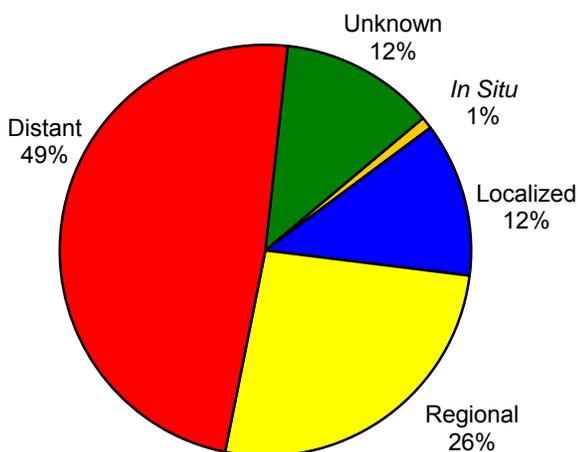Source: South Dakota Department of Health

Cancer in South Dakota 2013 *May 2016*

PANCREAS

Table 24: Pancreas Incidence and Mortality Summary, 2013

Pancreas Cancer			Incidence			Mortality		
			Total	Male	Female	Total	Male	Female
South Dakota	Total	# Cases / Deaths	106	56	50	109	49	60
		Age Adjusted Rate	10.4	11.8	8.9	10.6	10.1	10.5
	White	# Cases / Deaths	101	54	47	99	44	55
		Age Adjusted Rate	10.6	12.2	8.8	10.2	9.7	10.0
	American Indian	# Cases / Deaths	4	2	2	6	3	3
		Age Adjusted Rate	7.8	7.9	7.4	13.0	12.4	12.6
United States	Total	Age Adjusted Rate	12.5	14.2	11.0	10.8	12.4	9.4
	White	Age Adjusted Rate	12.4	14.1	11.0	10.7	12.4	9.3
	American Indian	Age Adjusted Rate	9.1	11.0	7.5	9.6	10.9	8.5

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 61: Pancreatic Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: Often pancreatic cancer is diagnosed late in the disease process. Patients who have local stage disease may be acceptable for resection. Only 10 to 20% of patients with pancreatic cancer are candidates for surgical resection. In South Dakota, 75% of new cases were diagnosed at late stage (regional and distant) in 2013.

Incidence: The incidence of pancreatic cancer increases steadily with age. An estimated 45,220 new cases of pancreatic cancer were expected to be diagnosed in 2013 in the United States. The majority of the cases occured in South Dakotans 65 years old or older. Seventy-three cases (68.9%) were diagnosed in 2013 in that age group. In the United States and South Dakota

this cancer occured slightly more in females than in males. Nationally, there was a higher incidence rate in blacks of both genders. The median age at diagnosis was 70 years in South Dakota and the United States.

Mortality: The overall survival for cancer of the pancreas is poor. Studies reveal that the 5-year survival rate is approximately 7.7%. More recently, prospective studies show survival improvement with postoperative chemotherapy. In 2013, there were 109 deaths and the median age at death was 71 in South Dakota.

Risk and Associated Factors: The exact causes of pancreatic cancer are unknown. Studies have found that certain factors increase a person's risk for developing pancreatic cancer. As one ages, the incidence of pancreatic cancer increases, especially after the age of 60. Cigarette smokers are two to three times more likely than nonsmokers to develop this cancer. Pancreatic cancer occurs frequently in those with diabetes. Also, African Americans are more likely than Asians, Hispanics, American Indians, or whites to have pancreatic cancer. The risk triples if the person's mother, father, sister, or brother had the disease. Also, a history of colon or ovarian cancer increases the risk. Some evidence shows that chronic pancreatitis may increase the risk.
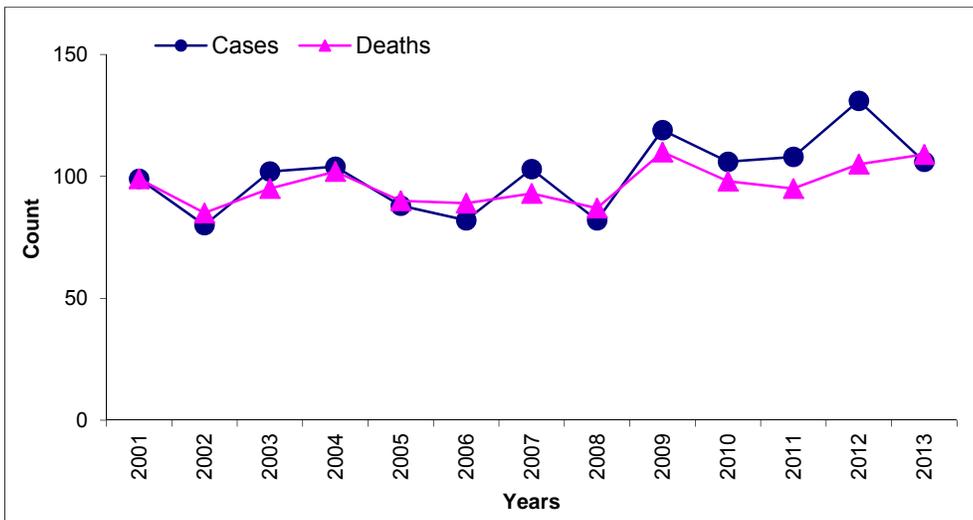
Prevention and Early Detection: Currently, there are no known screenings for pancreatic cancer. Also, there is no specific prevention except to avoid smoking.

Figure 62: Pancreatic Cancer Number of Cases and Deaths by Age, South Dakota, 2013
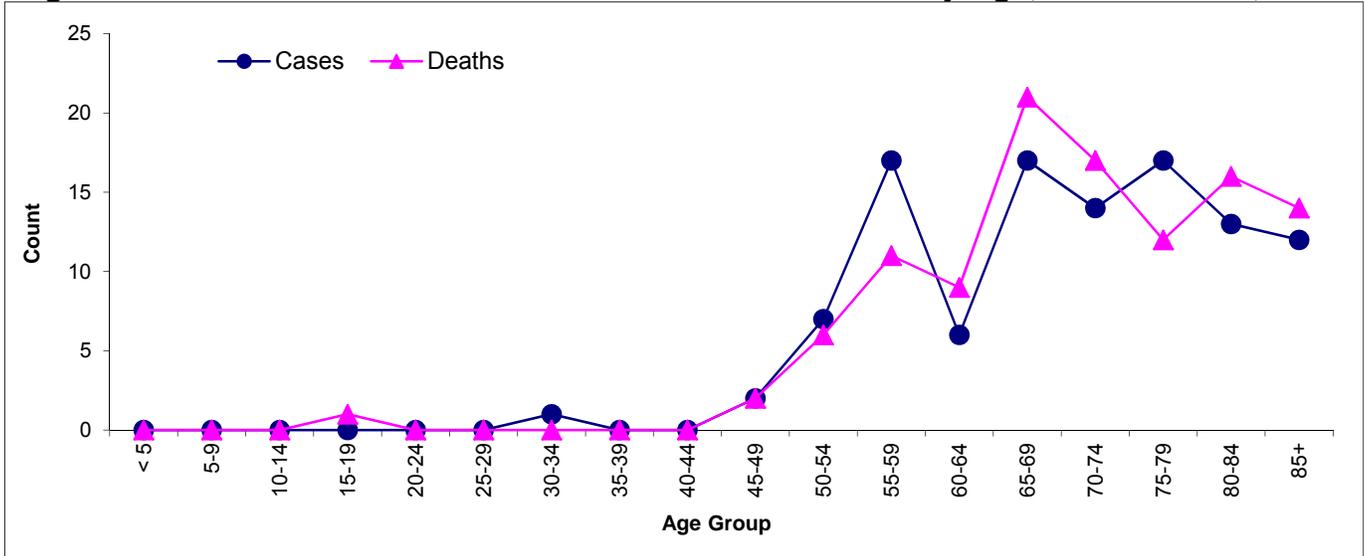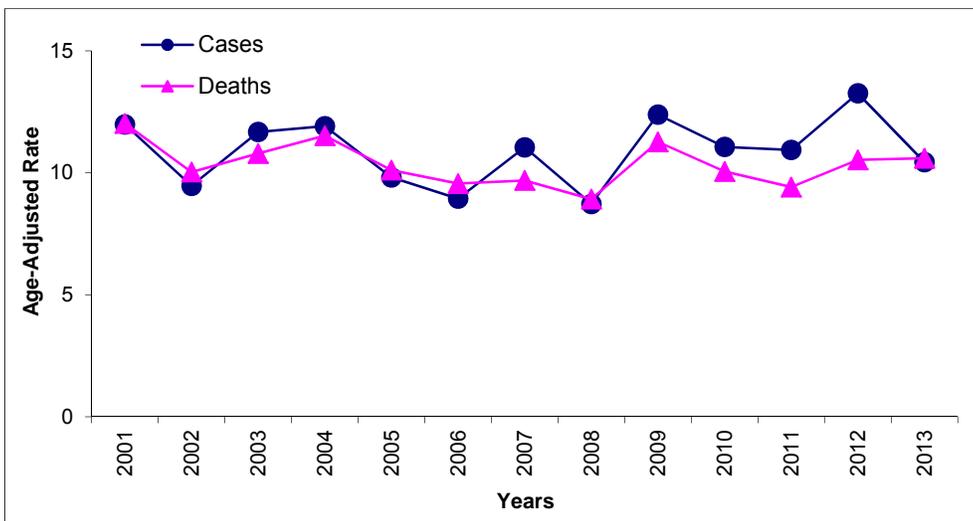

Source: South Dakota Department of Health

Figure 63: Pancreatic Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

Source: South Dakota Department of Health

Figure 64: Pancreatic Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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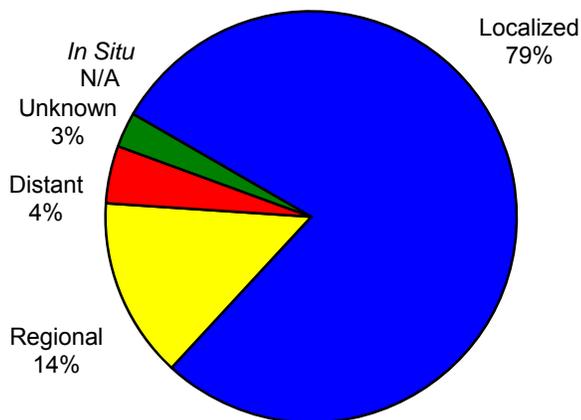Source: South Dakota Department of Health

PROSTATE

Table 25: Prostate Incidence and Mortality Summary, 2013

Prostate Cancer			Incidence	Mortality
South Dakota	**Total**	# Cases / Deaths	508	76
		Age Adjusted Rate	102.1	17.1
	White	# Cases / Deaths	485	70
		Age Adjusted Rate	103.8	16.6
	American Indian	# Cases / Deaths	19	4
		Age Adjusted Rate	88.2	34.0
United States	**Total**	Age Adjusted Rate	107.0	19.2
	White	Age Adjusted Rate	99.0	18.0
	American Indian	Age Adjusted Rate	55.8	17.4

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov   Source: South Dakota Department of Health

Figure 65: Prostate Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: The greatest number of cases was diagnosed at an early stage. In 2013, 79% of the cases were diagnosed as localized (not extending outside the prostate). Frequently older cases may simply be monitored (watchful waiting) by their physician to assess the rate of growth; others may be given hormonal therapy. New treatments for prostate cancer include the de Vinci Robotic assisted prostatectomy, proton therapy, and brachytherapy radiation.

Incidence: Carcinoma of the prostate is predominately a tumor of older men. The median age at diagnosis in South Dakota is 66. Also, in South Dakota the incidence of prostate cancer begins to increase in the 60's age group. Nationwide, eight out of 10 men diagnosed with prostate cancer are over the age of 65. Prostate cancer is the third most diagnosed site of all cancers reported in the state.

Mortality: Prostate cancer was the third leading cancer death in men in South Dakota in 2013. 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 2013 was 80 years old. Many patients have co-morbid conditions and will die of other causes rather than prostate cancer.

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

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

Figure 66:   Prostate Cancer Number of Cases and Deaths by Age, South Dakota, 2013
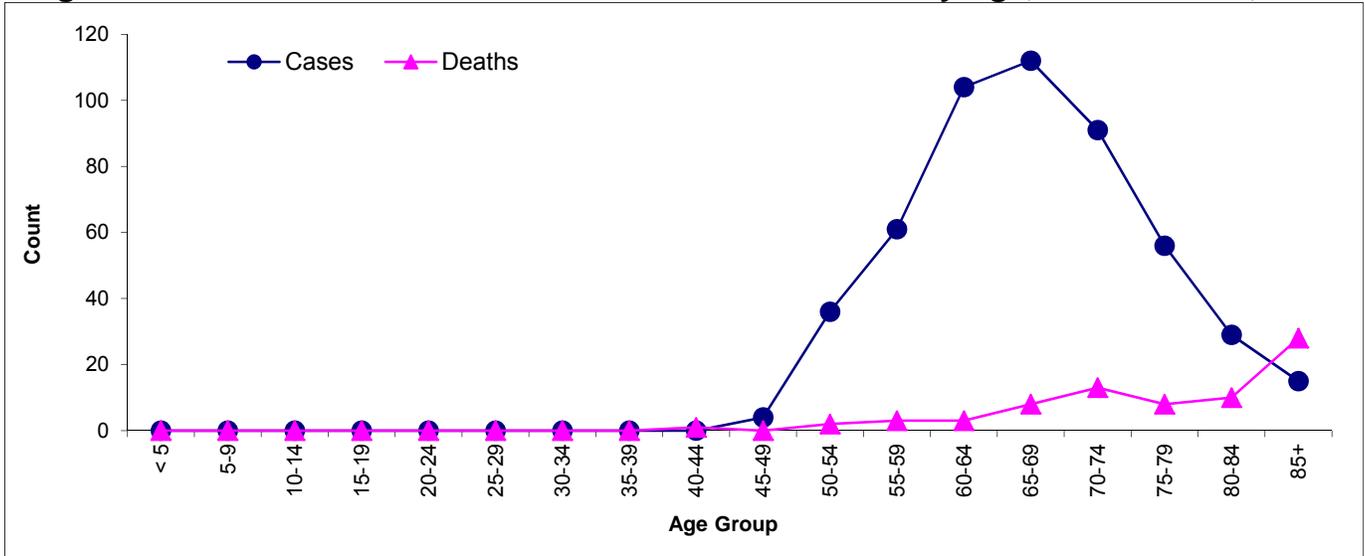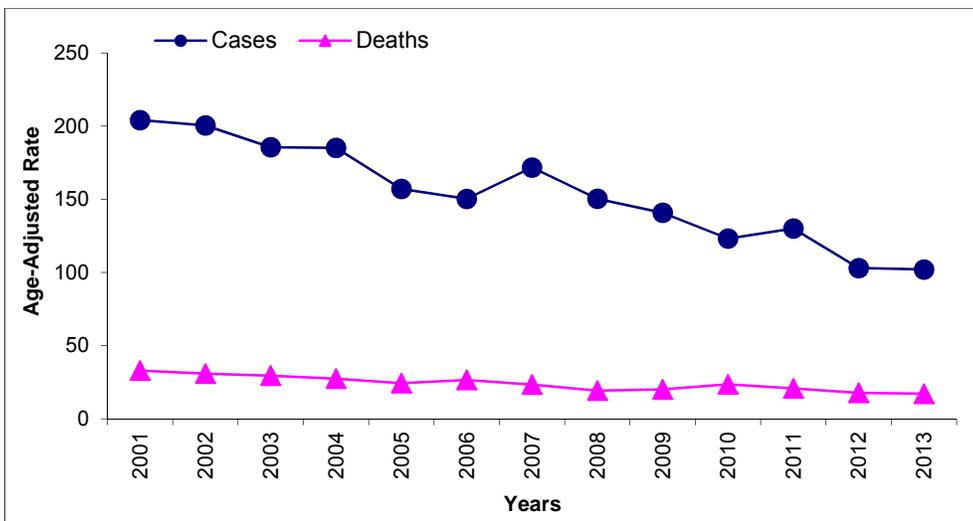

Source: South Dakota Department of Health

Figure 67: Prostate Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013
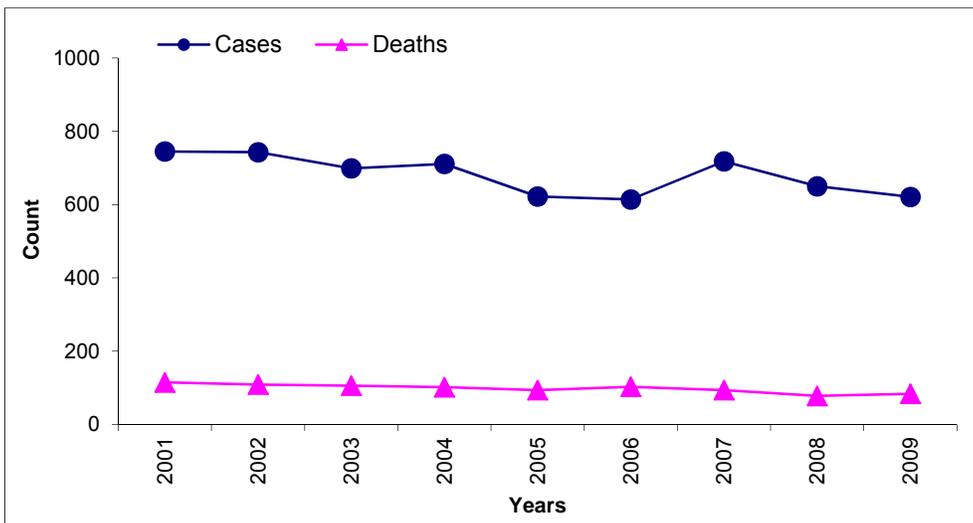
Source: South Dakota Department of Health

Figure 68: Prostate Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota 2001 - 2013

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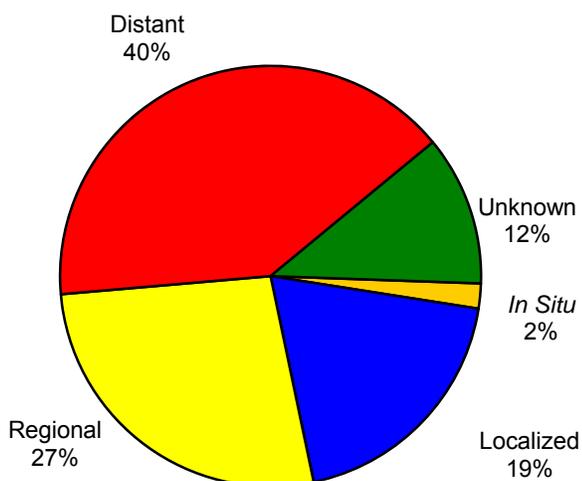Source: South Dakota Department of Health

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Table 26: Stomach Incidence and Mortality Summary, 2013

Stomach Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**51**	30	21	**24**	13	11
		Age Adjusted Rate	**5.4**	6.8	4.2	**2.4**	2.8	1.9
	White	# Cases / Deaths	**44**	26	18	**23**	12	11
		Age Adjusted Rate	**4.9**	6.3	3.6	**2.5**	2.7	2.0
	American Indian	# Cases / Deaths	**4**	1	3	**0**	0	0
		Age Adjusted Rate	**9.2**	8.4	10.7	**0.0**	0.0	0.0
United States	**Total**	Age Adjusted Rate	**7.1**	9.6	5.1	**3.2**	4.3	2.3
	White	Age Adjusted Rate	**6.3**	8.6	4.4	**2.8**	3.8	2.0
	American Indian	Age Adjusted Rate	**11.9**	15.7	8.5	**5.1**	5.9	4.4

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 69: Stomach Cancer Stage of Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: In 2013 data demonstrates that 10 (19%) cases were diagnosed at localized stage. When a patient is diagnosed at an early stage prognosis is much better. Fourteen cases (27%) were diagnosed at regional stage. There were 21 (40%) of the cases in South Dakota diagnosed at distant stage.   Prognosis for distant stage is very poor. The stage is based on whether the tumor has invaded nearby tissues, where the cancer has spread, and if so, to what extent.

Incidence: Stomach cancer continues to account for approximately 1.2% of all cancers in South Dakota. Of the 51 cases diagnosed in 2013, 30 were male and 21 were female. It is predominately a disease of men. Gastric (stomach) cancer is found more commonly in people between the ages of 50 and 70 years of age. The median age at diagnosis was 69 in the United States and 71 in South Dakota.

Mortality: Stomach cancer accounted for 1.5% of cancer deaths in South Dakota in 2013. The median age at death was 75 in South Dakota and 72 in the United States. The age-adjusted death rate was 2.8 for men and 1.9 in women in South Dakota. These rates are based on patients who died in 2013 in South Dakota. There were no American Indian stomach cancer deaths.
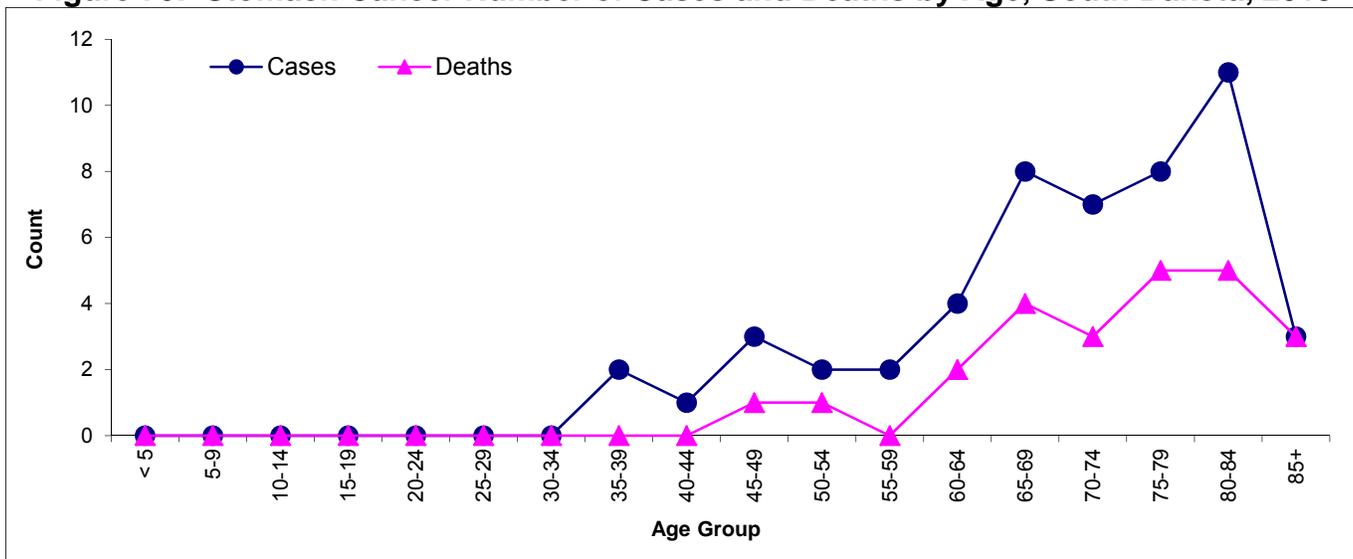
Risk and Associated Factors: Men have twice the risk of women for developing stomach cancer.   In recent years, Helicobacter pylori bacteria have received considerable attention as a potential factor. Some researchers suspect this bacterium, which causes stomach inflammation and ulcers, may be an important stomach cancer risk factor. Individuals with pernicious anemia (a vitamin B-12-related disorder) and achlorhydria or gastric atrophy, both of which result in lower than normal amounts of gastric juices, may be at higher risk.

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

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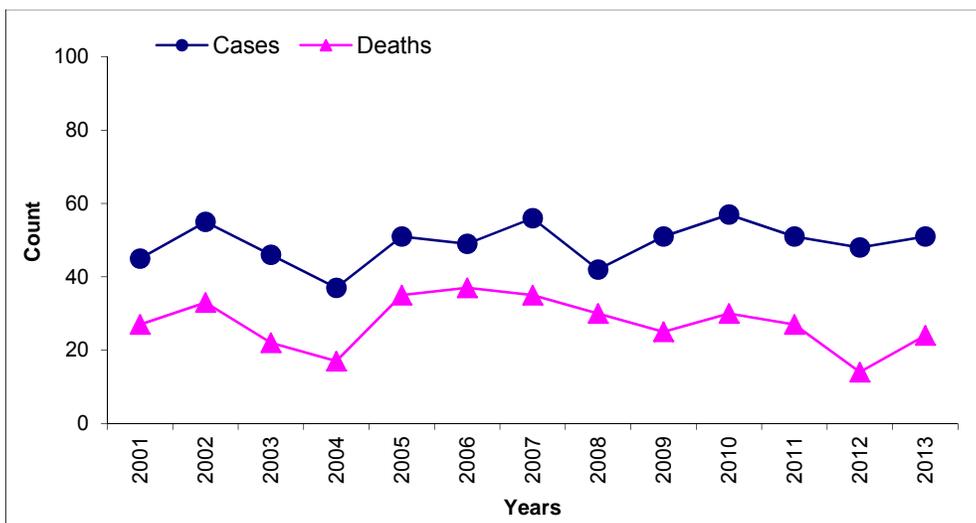[2] http://www.cancer.gov/Common/PopUps/popDefinition.aspx?id=439435&version=Patient&language=English

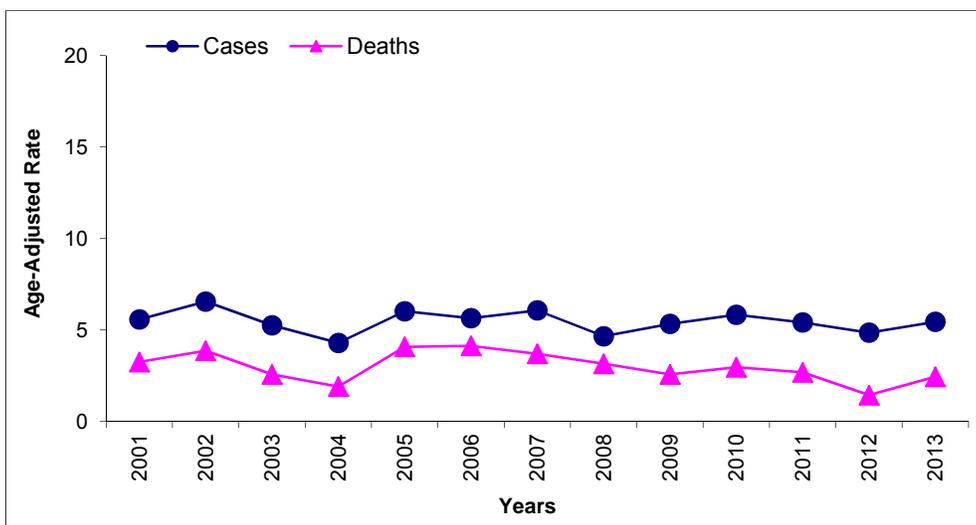## Figure 70: Stomach Cancer Number of Cases and Deaths by Age, South Dakota, 2013

Source: South Dakota Department of Health

Figure 71: Stomach Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013

Source: South Dakota Department of Health

Figure 72: Stomach Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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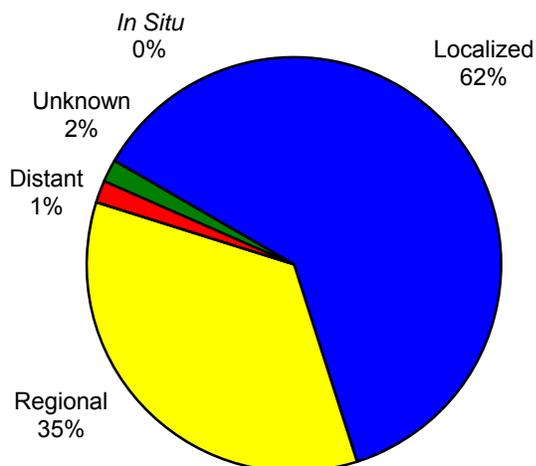Source: South Dakota Department of Health

Table 27: Thyroid Incidence and Mortality Summary, 2013

Thyroid Cancer			Incidence			Mortality		
			Total	Male	Female	**Total**	Male	Female
South Dakota	**Total**	# Cases / Deaths	**115**	28	87	**4**	2	2
		Age Adjusted Rate	**13.6**	6.3	21.1	**0.4**	0.5	0.4
	White	# Cases / Deaths	**105**	24	81	**3**	1	2
		Age Adjusted Rate	**13.9**	6.1	22.1	**0.4**	0.2	0.5
	American Indian	# Cases / Deaths	**7**	3	4	**1**	1	0
		Age Adjusted Rate	**10.3**	10.7	10.4	**4.2**	10.9	0.0
United States	**Total**	Age Adjusted Rate	**14.5**	7.3	21.5	**0.5**	0.5	0.5
	White	Age Adjusted Rate	**15.2**	7.8	22.7	**0.5**	0.5	0.5
	American Indian	Age Adjusted Rate	**8.7**	1.4	15.2	**0.9**	0.0	0.0

Rates per 100,000 age-adjusted to 2000 US standard population and 2013 SD estimated population.
US rates www.seer.cancer.gov Source: South Dakota Department of Health

Figure 73: Thyroid Cancer Stage at Diagnosis, South Dakota, 2013

Source: South Dakota Department of Health

Descriptive Epidemiology

Stage at Diagnosis: In 2013 data demonstrates that 71 (62%) 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 40 (35%) cases diagnosed at regional stage. Only two cases (1%) were diagnosed at a distant stage.

Incidence: The American Cancer Society estimated 60,220 thyroid cancer cases would be diagnosed in the United States in 2013. Thyroid cancer continues to account for approximately 2.6% of all cancers in South Dakota. Of the 115 cases diagnosed in 2013, 28 were male and 87 were female. The median age at diagnosis was 50. In the United States the median age was 51. Thyroid cancer is found more commonly in people between the ages of 45 and 70 years of age, with 82% diagnosed before age 65. It is predominately a disease of females as the statistics for South Dakota confirm.

Mortality: South Dakota had four deaths attributed to thyroid cancer in 2013. Nationally, the 5-year relative survival rates were 99.9% for localized, 97.8% for regional, and 88.2% for unknown stage.

Risk and Associated Factors: Thyroid cancer accounted for only 1.3% of the cancer cases in South Dakota in 2013. Risk factors include being exposed to radiation to the head and neck in childhood. Other risk factors for the development of thyroid cancer include a history of goiter, family history of thyroid disease, and Asian race.

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

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

Figure 74: Thyroid Cancer Number of Cases and Deaths by Age, South Dakota, 2013
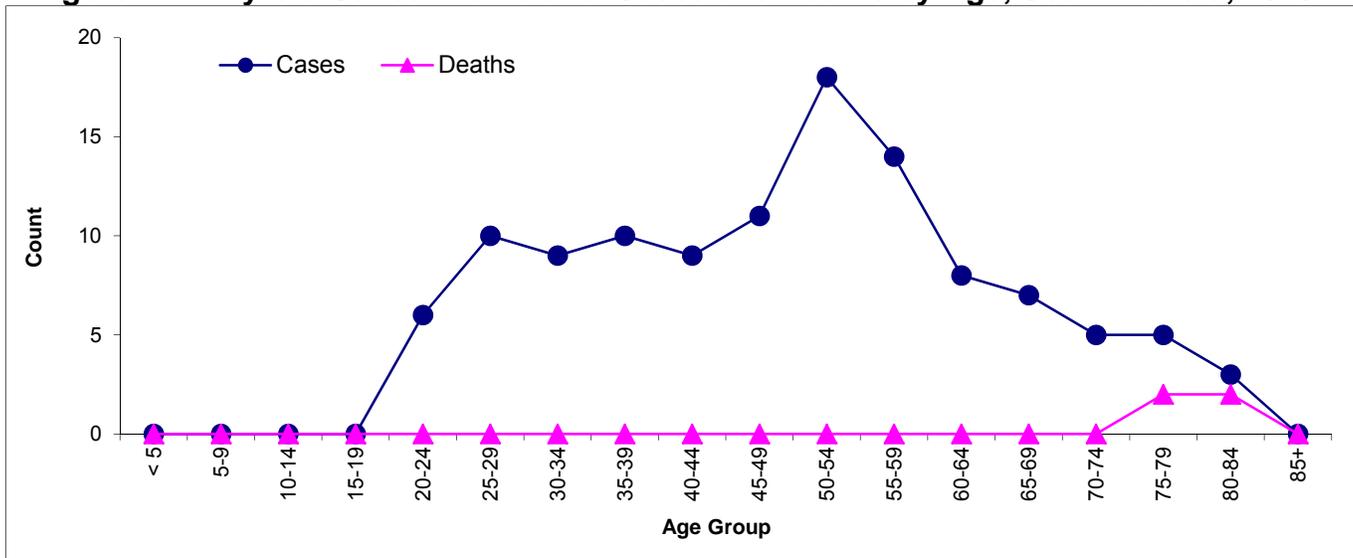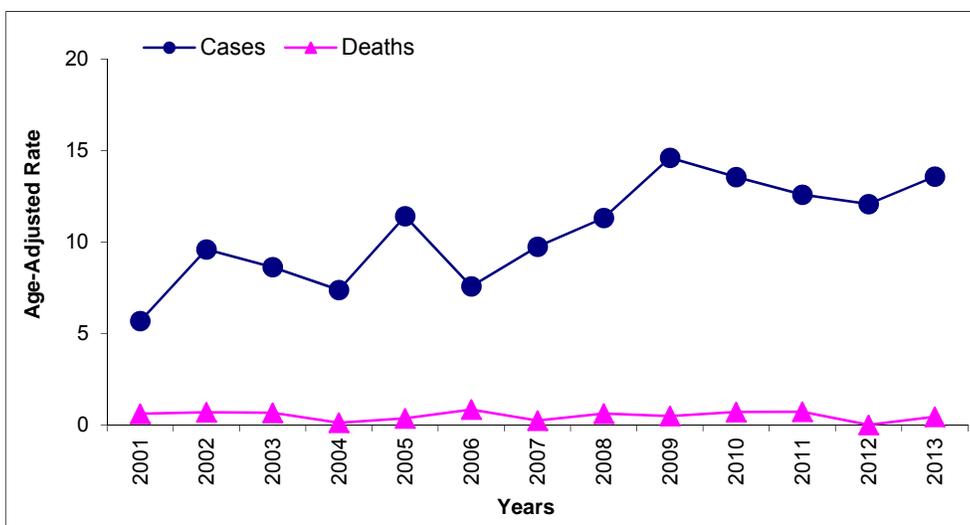

Source: South Dakota Department of Health

Figure 75: Thyroid Cancer Cases and Deaths by Year, South Dakota, 2001 - 2013
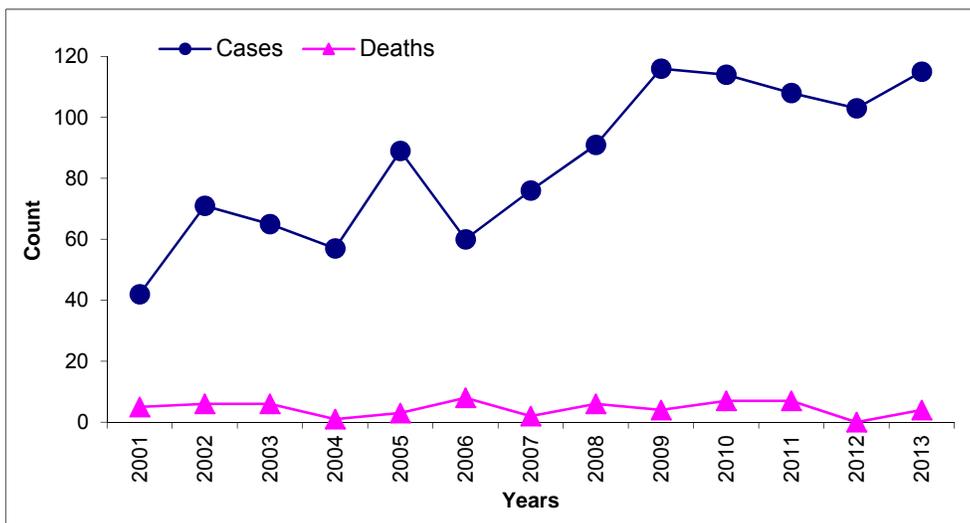
The incidence count for thyroid cancers peaked in 2009.

Source: South Dakota Department of Health

Figure 76: Thyroid Cancer Age-Adjusted Rates, Cases, and Deaths by Year, South Dakota, 2001 - 2013

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