

Cancer Incidence and Mortality in Nebraska: 2013



August, 2016

The Nebraska Cancer Registry contains a wealth of information, not all of which is included in this report:

What types of data are available?

- Demographic: age at diagnosis, gender, race/ethnicity, county of residence
- Medical history: date of diagnosis, primary site, cell type, stage of disease at diagnosis
- Therapy: surgery, radiation therapy, chemotherapy, immunotherapy, hormone therapy
- Follow up: length of survival, cause of death

Who may request data from the Nebraska Cancer Registry?

- Medical Researchers
- Health Planners
- Market Researchers
- Health Care Facility Administrators
- Physicians
- Nurses
- Health Care Facility Cancer Committees
- Oncology Conference Planners and Speakers
- Patient Care Evaluators
- Pharmaceutical Companies
- Government Officials
- Concerned Citizens
- Students

How do I make a request?

Contact the Office of Health Statistics at the
Nebraska Department of Health and Human Services
Division of Public Health
P.O. Box 95026, Lincoln, NE 68509-5026
Phone 402-471-2180, Monday-Friday between 8 AM and 5 PM

Please note: To comply with confidentiality regulations, the Nebraska Department of Health and Human Services reserves the right to limit the amount and type of data that are released in response to a request.

NEBRASKA CANCER REGISTRY 2013 ANNUAL REPORT

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EXECUTIVE SUMMARY

The Cancer Incidence and Mortality in Nebraska annual report for 2013 provides a comprehensive overview of the impact of cancer in Nebraska. The purpose of the report is to present the most recent statistics that describe cancer incidence and mortality in Nebraska, for the entire state and by county and region; in-depth analyses of selected cancer sites; and comparisons of trends between Nebraska and the United States. Findings from the report include:

- **Overall Cancer Incidence:** In 2013, there were 9,338 diagnoses of cancer among Nebraska residents. This number is higher than the number of cancers that were diagnosed in 2012 (9,208).
- **Cancer Incidence by Gender:** In 2013, prostate, lung, and colorectal cancers were the most frequently diagnosed cases among Nebraska men, while breast, lung, and colorectal cancers were the most frequently diagnosed cases among Nebraska women. Taken together, these cancers accounted for about half of all cancer cases diagnosed among Nebraska residents in 2013.
- **Cancer Incidence by Age:** During the past five years (2009-2013), more than half (56%) of all cancers in Nebraska occurred among people 65 years of age and older. Less than 1% were diagnosed among children and adolescents. The average age at diagnosis was 65.6 years of age.
- **Cancer Incidence by Site:** In 2013, the number of melanoma cases diagnosed among Nebraska residents during a single year topped 400 for the first time ever; by contrast, the number of colorectal cancers diagnosed statewide during a single year fell below 900 for the first time. During the past five years (2009-2013), cancers of the liver, lung, ovaries, prostate, and stomach and in situ female breast were diagnosed significantly less often among Nebraska residents when compared to the US as a whole, while non-Hodgkin lymphoma and colorectal, endometrial, testicular, and brain and nervous system cancers were diagnosed significantly more often.
- **Cancer Incidence by Race:** During the past decade (2004-2013), African-Americans in Nebraska were significantly more likely to be diagnosed with myeloma, colorectal, kidney, lung, pancreas, prostate, stomach, and liver cancers than were whites. Liver cancer diagnoses were also significantly more frequent among Native Americans, Asian-American/Pacific Islanders and Hispanics compared to whites. Hispanics were also more likely to be diagnosed with stomach cancer when compared with whites.
- **Overall Cancer Mortality:** In 2013, 3,458 Nebraska residents died from cancer, which is a slight decrease from the 2012 cancer death total of 3,481. This is the fifth year in a row that cancer has surpassed heart disease as Nebraska's leading cause of death.
- **Cancer Mortality by Site:** During the past five years (2009-2013), deaths from cancers of the stomach, liver, lung, and female breast occurred significantly less

often among Nebraska residents when compared to the U.S. as a whole, while deaths from cancers of the kidney and renal pelvis and invasive brain tumors occurred significantly more often. Lung cancer was the leading cause of cancer mortality in Nebraska in 2013, accounting for 26% of all cancer deaths, followed by colorectal cancer. During the past two decades, prostate and female breast cancer mortality rates in Nebraska have both declined by about 40%, which is consistent with national trends.

- **Cancer Incidence by County:** Below are the Nebraska counties where cancer incidence during 2009-2013 was significantly different ($p < .01$) from the state:

<i>Significantly lower ▼</i>		<i>Significantly higher ▲</i>	
<i>County</i>	<i>Primary Sites</i>	<i>County</i>	<i>Primary Sites</i>
Antelope	Urinary bladder	Douglas	Lung & bronchus
Cedar	Lung & bronchus, non-Hodgkin lymphoma (NHL)	Lincoln	Urinary bladder, myelodysplastic syndromes (MDS)
Dawes	Kidney & renal pelvis	Hall	Prostate, NHL, MDS
Dawson	Female breast	Saline	Colon & rectum
Hitchcock	Female breast		
Jefferson	Prostate		
Perkins	Female breast		
Pierce	Female breast		
Scotts Bluff	Lung & bronchus		
Sheridan	Urinary bladder		
Stanton	Lung & bronchus		
Thayer	Female breast		
Wayne	Lung & bronchus		
York	Lung & bronchus, colon & rectum		

- **Annual Report Special Topic:** The special topic for this report is myelodysplastic syndromes (MDS). MDS are a group of cancers in which immature blood cells in the bone marrow do not mature or become healthy blood cells. Age and past treatment for cancer with chemotherapy or radiation therapy are known risk factors for MDS. During the past five years (2009-2013), MDS accounted for 407 new cases and 251 deaths among Nebraska residents.

INTRODUCTION

This publication represents the 27th annual statistical summary of the Nebraska Cancer Registry (NCR) since it began collecting data in 1987. The purpose of this report is to present the registry's most recent data to the citizens of the State of Nebraska. The majority of the data covers cancer diagnoses and cancer deaths that occurred between January 1, 2013 and December 31, 2013, as well as during the past five years (January 1, 2009-December 31, 2013).

The NCR was founded in 1986, when the Nebraska Unicameral authorized funding for a state cancer registry using a portion of funds generated by the state's cigarette tax. The establishment of the registry successfully combined the efforts of many Nebraska physicians, legislators, concerned citizens, and the Nebraska Medical Foundation, all of whom had worked for years toward this goal. The Nebraska Medical Foundation also helped establish the registry with financial assistance. Since 1994, the NCR has received additional funding from the Centers for Disease Control and Prevention (CDC).

The NCR is managed by the Nebraska Department of Health and Human Services (DHHS) in Lincoln. However, registry data is collected and edited by NCR staff in Omaha, under contract to the Nebraska Medical Foundation. Analysis of registry data and preparation of the annual statistical report are the responsibility of DHHS.

The purpose of the registry is to gather data that describes how many Nebraska residents are diagnosed with cancer, what types of cancer they have, how far the disease has advanced at the time of diagnosis, what types of treatment they receive, and how long they survive after diagnosis. These data are put to a variety of uses both inside and outside of DHHS. Within DHHS, they are used to identify geographic patterns and long-term trends, to compare Nebraska's cancer experience with the rest of the nation, to investigate reports of possible cancer clusters, and to help plan and evaluate cancer control programs. Outside of DHHS, the registry has furnished data to many individuals, institutions, and organizations, including the North American Association of Central Cancer Registries (NAACCR), the National Cancer Institute (NCI), the American Cancer Society (ACS), the CDC, and the University of Nebraska Medical Center. The NCR also contributes its data to several national cancer incidence databases (see page 5). In recognition of the accuracy and completeness of the data that it has collected, NAACCR has awarded the NCR its gold standard certificate of data quality for 19 consecutive years, from 1995 to 2013.

All individual records in the cancer registry are kept in strict confidence as prescribed by both state and federal law. The NCR follows all of the privacy safeguards in the Health Insurance Portability and Accountability Act (HIPAA), although some of the procedural requirements do not apply to the registry.

DHHS welcomes inquiries about cancer from the public for aggregate statistics or general information from the registry. To obtain cancer data or information about the registry not included in this report, please refer to the instructions provided inside the front cover.

An electronic copy of this report is available on the DHHS website at http://dhhs.ne.gov/publichealth/Pages/ced_cancer_index.aspx

METHODOLOGY

Data Collection and Management

The NCR gathers data on Nebraska residents diagnosed and treated for invasive and in situ tumors. The registry does not include benign tumors (except for benign brain and other nervous system tumors, which became reportable as of January 1, 2004), benign polyps, and basal cell and squamous cell carcinomas of the skin. Information gathered from each case includes the patient's name, address, birth date, race, gender, and Social Security number; date of diagnosis; primary site of the cancer (coded according to the International Classification of Diseases for Oncology, 3rd edition [ICD-O-3]); stage of disease at diagnosis; facility where the initial diagnosis was made; basis of staging; method of diagnostic confirmation; histological type (also classified according to the ICD-O-3); and initial treatment. The registry does not actively collect follow-up information on registered cases, but many facilities provide it, and it includes the date of last contact with the patient, status of disease, type of additional treatment, and quality of survival. The registry collects information from every hospital in the state where cancer patients are diagnosed and/or treated on an inpatient basis. The registry also includes Nebraska residents who are diagnosed with and/or treated for cancer out of state, as well as cases identified through pathology laboratories, outpatient treatment facilities, physician offices, and death certificates. Death of registered cases is ascertained using death certificates available at DHHS and from the National Death Index.

Nebraska cancer mortality data are obtained from death certificates on file with DHHS. Mortality data are available for every Nebraska resident who dies from cancer, whether death occurs in or outside of Nebraska. The mortality data presented in this report is limited to those deaths where cancer is listed as the underlying (i.e., primary) cause of death. Causes of death are coded according to the Tenth Edition of the International Classification of Disease (ICD-10).

The US cancer incidence data presented in this report was compiled by CDC's National Program of Cancer Registries (NPCR) and, for benign brain tumors and myelodysplastic syndromes, NCI's Surveillance, Epidemiology, and End Results (SEER) Program. NPCR provides support for cancer registries in 45 states (including Nebraska), the District of Columbia, and some US territories, and covers 96% of the total US population. The mortality data presented in this report was compiled by the National Center for Health Statistics (NCHS) and include all US resident cancer deaths. Incidence data from NPCR and mortality data from NCHS are available through 2013.

Confidentiality

All data obtained by the NCR, from the medical records of individual patients, is held in strict confidence by DHHS. As specified in state statute, researchers may obtain case-specific and/or patient-identifiable information from the registry by submitting a written application that describes how the data will be used for scientific study. In situations where contact with a patient or patient's family is proposed, the applicant must substantiate the need for any such contact and submit approval from an Institutional Review Board. In addition, before any individual's name can be given to a researcher, the registry will obtain

permission from the individual that they are willing to be a research subject. Upon favorable review by DHHS, the applicant must also agree to maintain the confidentiality and security of the data throughout the course of the study, to destroy or return the registry data at the end of the study and to present material to the registry prior to publication to assure that no identifiable information is released.

Aggregate data (i.e., statistical information) from the registry are considered open to the public and are available upon request. Details on how to obtain such data are provided inside the front cover of this report.

Quality Assurance

The NCR and reporting facilities spend a great deal of time and energy to ensure that the information they gather is both accurate and complete, and these efforts have met with consistent success. For 19 consecutive years (1995-2013), the NCR has met all of the criteria necessary to earn the gold standard certificate of data quality awarded by NAACCR, which is the accrediting body for all US and Canadian central cancer registries. These criteria include:

- 1) Completeness of case ascertainment—The registry must find at least 95% of the total number of cases that are estimated to have occurred.
- 2) Completeness of information—The proportion of registry cases missing information on age at diagnosis, gender, and county of residence must be no more than 2%, and the proportion missing information on race must be no more than 3%.
- 3) Data accuracy—Error rates based on edit checks of selected data items must be no greater than 1%.
- 4) Timeliness—All data for a single calendar year must be submitted to NAACCR for review no more than 23 months after the year has ended.

Gold standard certification also requires that all cases pass strict edits and that the proportion of registry cases found solely through a review of death certificates must be no more than 3% and that the proportion of duplicate cases in the registry must be no more than one per 1,000.

Since the NCR has achieved the highest quality standards, its data are included in several national cancer incidence databases. These databases compile information from cancer registries throughout the United States and Canada that meet the same data quality standards as the NCR. These databases include:

- 1) *Cancer in North America* (<http://www.naaccr.org>)
- 2) *United States Cancer Statistics* (<https://nccd.cdc.gov/uscs/>)
- 3) *Cancer Facts & Statistics* (<http://www.cancer.org/research/cancerfactsstatistics/index>)
- 4) *Cancer Control PLANET* (<http://cancercontrolplanet.cancer.gov/>)

Definitions

Several technical terms are used in presenting the information in this report. The following definitions are provided here to assist the reader.

Incidence rate

Incidence rate is the number of new cases of a disease that occur within a specific population during a given time period, divided by the size of the population. For example, if 10 residents of a county with 20,000 residents are diagnosed with colorectal cancer during a single year, then the incidence rate for that county for that year is .0005. Since cancer incidence rates are usually expressed per 100,000 population, this figure is then multiplied by 100,000 to yield a rate of 50 per 100,000 per year.

Mortality rate

Mortality rate is the number of deaths that occur within a specific population during a given time period, divided by the size of the population. Like incidence rates, mortality rates are usually expressed as the number of deaths per 100,000 population per year.

Age-adjusted rate

Age-adjustment is a simple mathematical procedure that makes it possible to compare rates between populations that have different age distributions, and to compare rates within a single population over time. All of the incidence and mortality rates in this report are age-adjusted using the US population in 2000 as the standard. Statewide and national rates are age-adjusted using 19 age groups (<1, 1-4, 5-9, 10-14, 15-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80-84, 85+ years), while county and regional rates are age-adjusted using 11 age groups (<1, 1-4, 5-14, 15-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84, 85+ years).

Stage of Disease at Diagnosis

In situ

Tumors diagnosed as in situ consist of invasive cells that are growing in place. In situ tumors are confined to the cell group of origin, and have not penetrated the supporting structure of the organ on which they arose.

Invasive

Tumors diagnosed as invasive have spread beyond the cell group of the organ where they began, and may have spread further. The organ where a malignancy began is also known as the primary site. Invasive tumors are subdivided into three categories:

Localized--A localized invasive tumor has not spread beyond the organ where it started.

Regional--A regional invasive tumor has spread beyond the organ where it began, by direct extension to immediately adjacent organs or tissues and/or by spread to regional lymph nodes.

Distant--A distant invasive tumor has spread beyond the primary site to distant parts of the body.

Data Analysis

All of the rates presented in this report were calculated using Vintage 2014 bridged-race population estimates developed by the US Census Bureau and the National Center for Health Statistics. Incidence and mortality rates for multiple years (2009-2013) (see Tables 1, 2, 5, 6, 9-20) were calculated using population estimates for the years 2009-2013 combined, while rates for 2004-2013 (see Tables 3 and 7) were calculated using population estimates for the years 2004-2013 combined. Rates that are based on more than one year of data should be interpreted as an average annual rate.

All of the data presented in this report are current through December 31, 2015. However, because some cases diagnosed during or even before 2013 may not yet have been reported to the registry, the incidence data presented in this report should be considered subject to change. **In addition, the incidence data reported in previous editions of this report should no longer be considered complete.**

Internet users should also be aware that the cancer statistics for Nebraska that are published in this report and those that are posted on non-DHHS websites (see page 5) may differ. Some discrepancies may be the result of differences in the dates at which the data were compiled. As noted above, Nebraska incidence data published in this report include all cases reported to the registry through December 31, 2015; Nebraska data available on the CDC/NPCR website include cases that were reported through November 30, 2013.

With the exception of bladder cancer, in situ female breast cancer, and benign brain tumors, all of the site-specific incidence rates in this report were calculated with invasive cases only, to maintain comparability with statistics from the NPCR and other cancer registries throughout the United States. For bladder cancer, incidence rates were calculated with invasive and in situ cases combined. All incidence and mortality rates in this report were calculated per 100,000 population, and were age-adjusted according to the age distribution of the population of the United States in 2000. Statewide rates were also calculated for males and females separately, and for both sexes combined. The number of cases for any county with fewer than three cases is not shown in order to reduce the possibility of identifying a specific person.

To evaluate the statistical significance of the differences between rates, confidence intervals for rates were calculated using the formula $CI = r \pm (RC \times SE)$, where CI = confidence interval, r = rate, RC = 1.96 (for 95% confidence intervals) or 2.58 (for 99% confidence intervals), and SE = standard error. The standard error for a rate was determined by dividing the rate by the square root of the number of events (cancer diagnoses or deaths). A statistically significant difference exists and is indicated in those instances where the confidence intervals of a pair of rates being compared to each other do not overlap.

CANCER INCIDENCE IN NEBRASKA

The Nebraska Cancer Registry recorded 9,338 diagnoses of cancer among Nebraska residents in 2013, an increase from the 9,208 diagnoses recorded in 2012. The 2013 number translates into an incidence rate of 445.1 cases per 100,000 population. By primary site, cancers of the lung, breast, prostate, colon and rectum occurred most frequently, accounting for about half (49.1%) of all diagnoses. Recent registry experience suggests that as the registry continues to record cases, the final count for 2013 will probably increase by 100 to 300 cases.

Table 1 presents the number and rate of cancers diagnosed among Nebraska residents during 2013 and 2009-2013, for all sites combined and for cancers of specific sites. The most current estimates of US cancer incidence, which cover the years 2009-2013, are also included. Comparison of the most recent state and national incidence rates for the past five years shows significant differences ($p < .01$) for cancers of the prostate, lung, stomach, liver, and ovaries and in situ female breast (Nebraska rates lower than the US) and for non-Hodgkin lymphoma, invasive brain tumors, and cancers of the colon and rectum, endometrium, and testes (Nebraska rates higher than the US). Table 2 presents the number of cancers diagnosed in Nebraska during 2009-2013 by age at diagnosis. Table 3 presents Nebraska incidence data by race and ethnicity for the years 2004-2013.

Maps on pages 13-14 present cancer incidence rates for 2013 and 2009-2013 by county of residence; county-specific numbers of cases and incidence rates are also found in an appendix to this report ([Table 1A](#)). The graph below presents the annual incidence rates for all cancers for Nebraska and the United States since 2003.

Cancer (All Sites)

Incidence Rates, Nebraska & US (2003-2013)

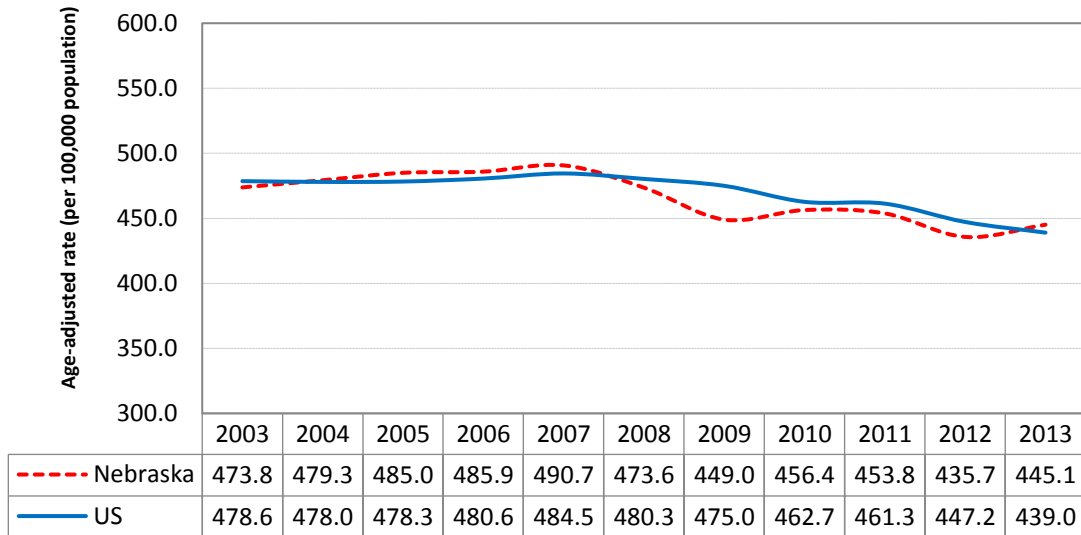


TABLE 1: Cancer Incidence
Number of Cases and Rates, by Selected Primary Site and Gender
 Nebraska (2013 and 2009-2013) & US (2009-2013)

Site	NEBRASKA 2013						NEBRASKA 2009-2013						US 2009-2013		
	Male		Female		Total		Male		Female		Total		Male	Female	Total
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	Rate	Rate	Rate
All Sites	4,788	490.5	4,550	415.0	9,338	445.1	23,985	510.8	22,272	414.3	46,260	454.3	511.3	418.2	461.9
Oral Cavity & Pharynx	174	17.5	70	6.6	244	11.7	815	16.8	347	6.3	1,162	11.2	17.1	6.3	11.4
Esophagus	75	7.7	21	1.8	96	4.6	419	8.7	100	1.8	519	5.0	8.1	1.8	4.7
Stomach	73	7.7	26	2.3	99	4.7	367	8.0	162	2.9	529	5.1	9.2	4.6	6.7
Small Intestine	28	2.9	22	1.8	50	2.4	135	2.9	86	1.6	221	2.2	2.6	2.0	2.3
Colon & Rectum (Colorectal)	469	48.8	386	33.8	855	40.6	2,361	50.9	2,198	39.0	4,559	44.4	46.8	35.5	40.6
Liver & Intrahepatic Bile Ducts	86	8.6	37	3.1	123	5.7	423	8.6	160	2.9	584	5.6	11.7	4.0	7.6
Pancreas	133	13.8	122	10.5	255	12.1	631	13.5	588	10.3	1,219	11.8	14.1	10.9	12.4
Larynx	44	4.4	18	1.6	62	2.9	277	5.6	71	1.3	348	3.3	6.2	1.4	3.5
Lung & Bronchus	693	72.4	608	53.0	1,301	61.2	3,329	72.4	2,782	49.9	6,113	59.6	74.6	53.4	62.5
Soft Tissue	32	3.5	26	2.3	58	2.9	174	3.8	133	2.5	307	3.1	3.9	2.8	3.3
Melanoma of the Skin	254	26.4	214	21.3	468	23.4	1,064	23.0	861	17.4	1,925	19.7	26.0	16.2	20.3
Breast (invasive cases only)	16	1.6	1,291	118.9	1,307	62.9	65	1.4	6,388	120.8	6,453	64.2	1.3	123.4	66.3
Uterine Cervix	---	---	68	7.4	---	---	---	---	320	7.2	---	---	---	7.6	---
Uterine Corpus & Unspecified	---	---	309	27.5	---	---	---	---	1,455	26.7	---	---	---	24.8	---

TABLE 1 (continued): Cancer Incidence

Site	NEBRASKA 2013						NEBRASKA 2009-2013						US 2009-2013		
	Male No.	Male Rate	Female No.	Female Rate	Total No.	Total Rate	Male No.	Male Rate	Female No.	Female Rate	Total No.	Total Rate	Male Rate	Female Rate	Total Rate
Ovary	---	---	123	11.8	---	---	---	---	555	10.5	---	---	---	11.6	---
Prostate	1,126	109.0	---	---	---	---	6,026	123.6	---	---	---	---	123.2	---	---
Testis	64	7.2	---	---	---	---	301	6.7	---	---	---	---	5.5	---	---
Urinary Bladder	338	35.6	98	8.4	436	20.3	1,669	37.0	480	8.4	2,149	20.9	36.1	8.9	20.7
Kidney & Renal Pelvis	211	21.1	135	12.6	346	16.5	1,096	22.8	610	11.5	1,706	16.7	21.6	11.3	16.0
Brain & Central Nervous System (invasive cases only)	76	8.1	58	5.3	134	6.6	400	8.8	312	6.0	712	7.3	7.8	5.6	6.6
Thyroid Gland	68	7.4	207	21.8	275	14.6	315	6.7	993	21.4	1,308	14.0	7.0	20.8	14.0
Hodgkin Lymphoma	26	2.8	29	2.9	55	2.8	146	3.2	131	2.8	277	3.0	3.1	2.4	2.7
Non-Hodgkin Lymphoma	240	25.1	195	17.5	435	20.9	1,122	24.3	977	17.7	2,099	20.6	23.0	15.9	19.1
Myeloma	66	6.4	48	4.1	114	5.2	362	7.8	278	4.8	640	6.2	7.9	5.2	6.4
Leukemia	170	18.1	117	10.5	287	13.5	840	18.4	580	10.4	1,420	14.0	17.3	10.6	13.5
Brain & Central Nervous System (benign & uncertain cases only)	51	5.3	138	13.8	189	9.7	329	7.0	624	12.2	953	9.7	8.3	14.6	11.8
Breast (in situ cases only)	3	0.3	288	27.8	291	14.4	7	0.2	1,441	28.2	1,448	14.7	0.2	30.9	16.3

Total rates are per 100,000 population and are age-adjusted to the 2000 US population
Gender-specific rates are per 100,000 male or female population and are age-adjusted to the 2000 US population

TABLE 2: Cancer Incidence
Number of Cases and Percentage Distribution, by Selected Primary Site and Age at Diagnosis
 Nebraska (2009-2013)

	<u>0-17 Yrs.</u>		<u>18-44 Yrs.</u>		<u>45-64 Yrs.</u>		<u>65+ Yrs.</u>		<u>TOTAL</u>	
	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>
All Sites	443	1.0	3,271	7.1	16,680	36.1	25,866	55.9	46,260	100.0
Oral Cavity & Pharynx	3	0.3	73	6.3	536	46.1	550	47.3	1,162	100.0
Esophagus	0	0.0	14	2.7	190	36.6	315	60.7	519	100.0
Stomach	0	0.0	26	4.9	174	32.9	329	62.2	529	100.0
Small Intestine	0	0.0	12	5.4	103	46.6	106	48.0	221	100.0
Colon & Rectum (Colorectal)	6	0.1	202	4.4	1,442	31.6	2,909	63.8	4,559	100.0
Liver & Intrahepatic Bile Ducts	6	1.0	20	3.4	278	47.6	280	47.9	584	100.0
Pancreas	1	0.1	21	1.7	374	30.7	823	67.5	1,219	100.0
Larynx	0	0.0	9	2.6	160	46.0	179	51.4	348	100.0
Lung & Bronchus	0	0.0	63	1.0	1,734	28.4	4,316	70.6	6,113	100.0
Soft Tissue	17	5.5	56	18.2	108	35.2	126	41.0	307	100.0
Melanoma of the Skin	3	0.2	337	17.5	774	40.2	811	42.1	1,925	100.0
Female Breast (invasive cases only)	0	0.0	559	8.8	2,891	45.3	2,938	46.0	6,388	100.0
Uterine Cervix	1	0.3	142	44.4	123	38.4	54	16.9	320	100.0
Uterine Corpus & Unspecified	0	0.0	100	6.9	779	53.5	576	39.6	1,455	100.0
Ovary	6	1.1	61	11.0	225	40.5	263	47.4	555	100.0
Prostate	0	0.0	20	0.3	2,484	41.2	3,522	58.4	6,026	100.0
Testis	10	3.3	221	73.4	61	20.3	9	3.0	301	100.0
Urinary Bladder	0	0.0	40	1.9	490	22.8	1,619	75.3	2,149	100.0
Kidney & Renal Pelvis	20	1.2	114	6.7	721	42.3	851	49.9	1,706	100.0
Brain & Central Nervous System (invasive cases only)	101	14.2	110	15.4	210	29.5	291	40.9	712	100.0
Thyroid Gland	19	1.5	464	35.5	555	42.4	270	20.6	1,308	100.0
Hodgkin Lymphoma	34	12.3	117	42.2	76	27.4	50	18.1	277	100.0
Non-Hodgkin Lymphoma	28	1.3	144	6.9	667	31.8	1,260	60.0	2,099	100.0
Myeloma	0	0.0	17	2.7	214	33.4	409	63.9	640	100.0
Leukemia	101	7.1	125	8.8	388	27.3	806	56.8	1,420	100.0
Brain & Central Nervous System (benign & uncertain cases)	46	4.8	159	16.7	380	39.9	368	38.6	953	100.0
Female Breast (in situ cases only)	0	0.0	130	9.0	769	53.4	542	37.6	1,441	100.0

NOTE: Due to rounding, percentages may not sum to 100.0.

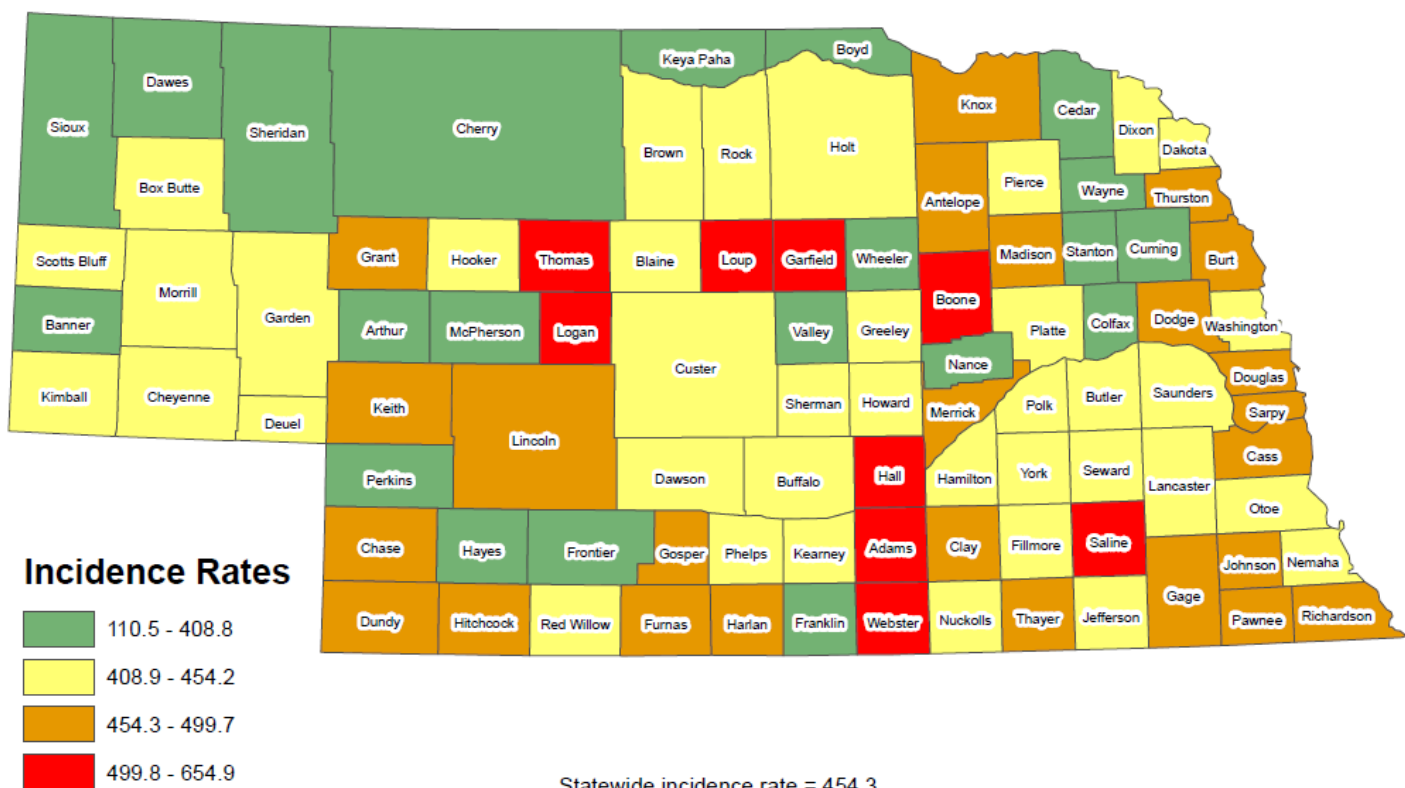
TABLE 3: Cancer Incidence
Number of Cases and Rates, All Sites and Top Ten Primary Sites, by Race and Ethnicity
 Nebraska (2004-2013)

Rank	White			African-American			Native American			Asian/Pacific Islander			Hispanic		
	Site	Number	Rate	Site	Number	Rate	Site	Number	Rate	Site	Number	Rate	Site	Number	Rate
	All Sites	87,030	464.7	All Sites	2,964	519.2	All Sites	391	352.2	All Sites	581	283.8	All Sites	1,719	276.2
1	Female Breast	12,030	123.6	Prostate	521	201.0	Female Breast	56	80.6	Female Breast	83	63.7	Female Breast	220	67.2
2	Prostate	11,986	136.8	Lung & Bronchus	441	83.2	Lung & Bronchus	47	56.6	Colon & Rectum	75	39.6	Prostate	170	72.9
3	Lung & Bronchus	11,676	61.7	Female Breast	398	126.1	Colon & Rectum	47	44.7	Lung & Bronchus	72	40.2	Colon & Rectum	138	25.0
4	Colon & Rectum	9,377	49.1	Colon & Rectum	334	64.9	Kidney & Renal Pelvis	33	25.2	Prostate	45	64.6	Lung & Bronchus	125	28.8
5	Urinary Bladder	4,077	21.3	Kidney & Renal Pelvis	125	22.1	Prostate	26	63.9	Liver & Intrahepatic Bile Ducts	37	17.5	Kidney & Renal Pelvis	96	15.4
6	Non-Hodgkin Lymphoma	3,892	20.8	Non-Hodgkin Lymphoma	92	15.3	Non-Hodgkin Lymphoma	20	15.4	Thyroid	35	10.8	Thyroid	96	10.5
7	Melanoma	3,237	18.1	Pancreas	91	17.5	Liver & Intrahepatic Bile Ducts	17	13.2	Non-Hodgkin Lymphoma	26	12.8	Non-Hodgkin Lymphoma	89	14.0
8	Kidney & Renal Pelvis	3,032	16.2	Liver & Intrahepatic Bile Ducts	84	12.8	Oral Cavity & Pharynx	13	11.6	Oral Cavity & Pharynx	26	11.9	Leukemia	76	7.9
9	Leukemia	2,685	14.4	Myeloma	79	14.2	Leukemia	12	5.6	Leukemia	20	8.4	Liver & Intrahepatic Bile Ducts	58	10.8
10	Uterine Corpus & Unspecified	2,680	26.9	Urinary Bladder	72	13.8	Urinary Bladder	10	13.8	Kidney & Renal Pelvis	17	8.4	Stomach	53	8.8

Rates are per 100,000 population, excluding gender-specific sites (prostate, female breast, uterine corpus), which are per 100,000 male or female population. All rates are age-adjusted to the 2000 US population.

Cancer (All Sites) Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



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CANCER MORTALITY IN NEBRASKA

In 2013, 3,458 Nebraska residents died from cancer, a number that translates into a rate of 163.0 cancer deaths per 100,000 population. These figures represent an increase from the state's 2012 figures of 3,481 (cancer deaths) and 164.7 (cancer mortality rate). For the fifth consecutive year, cancer was the leading cause of mortality among Nebraska residents in 2013, surpassing heart disease by 80 deaths. By primary site, cancers of the lung, breast, prostate, colon and rectum accounted for just under half (48.4%) of Nebraska's cancer deaths in 2013.

Table 5 presents the number and rate of cancer deaths that occurred among Nebraska residents during 2013 and 2009-2013, for all sites combined and for specific sites. The most recent US cancer mortality rates, which cover the years 2009 through 2013, are also included. Comparison of the most recent state and national mortality rates for the past five years shows significant differences ($p < .01$) for cancers of the stomach, lung, liver, and female breast (Nebraska rates lower than the US) and for cancers of the kidney and renal pelvis and brain and central nervous system tumors (Nebraska rates higher than the US). Table 6 presents the number of Nebraska cancer deaths during 2009-2013 by age at death. Table 7 presents Nebraska cancer mortality data by race and ethnicity for the years 2004-2013.

Maps on pages 21-22 present cancer mortality rates for 2013 and 2009-2013 by county of residence; county-specific numbers of deaths and mortality rates are also found in an appendix to this report ([Table 2A](#)). The graph below shows annual mortality rates for cancer for Nebraska and the US since 2003.

Cancer (All Sites)

Mortality Rates, Nebraska & US (2003-2013)

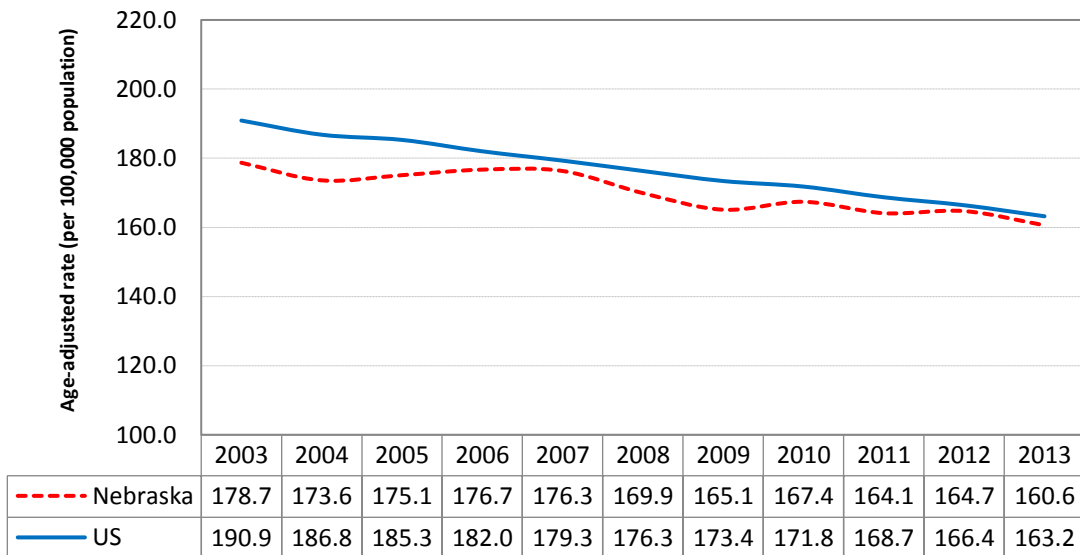


TABLE 4: Cancer Mortality
Number of Deaths and Rates, by Selected Primary Site and Gender
 Nebraska (2013 and 2009-2013) & US (2009-2013)

Site	NEBRASKA 2013						NEBRASKA 2009-2013						US 2009-2013		
	Male		Female		Total		Male		Female		Total		Male	Female	Total
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	Rate	Rate	Rate
All Sites	1,799	191.2	1,659	139.4	3,458	160.6	9,010	198.4	8,105	139.5	17,115	164.1	204.0	143.9	168.9
Oral Cavity & Pharynx	21	2.0	8	0.6	29	1.2	163	3.4	82	1.4	245	2.3	3.8	1.3	2.4
Esophagus	74	7.3	18	1.5	92	4.1	393	8.3	91	1.6	484	4.6	7.4	1.5	4.1
Stomach	15	1.6	9	0.7	24	1.1	132	2.8	79	1.4	211	2.0	4.5	2.4	3.3
Colon & Rectum (Colorectal)	161	17.2	157	13.1	318	14.9	854	18.7	858	14.3	1,712	16.3	18.1	12.8	15.1
Liver & Intrahepatic Bile Ducts	72	7.2	27	2.3	99	4.6	343	7.1	163	2.9	506	4.8	9.1	3.7	6.2
Pancreas	122	12.8	120	9.7	242	11.2	574	12.3	552	9.4	1,126	10.8	12.6	9.6	10.9
Larynx	23	2.4	5	0.4	28	1.4	70	1.5	14	0.3	84	0.8	1.9	0.4	1.1
Lung & Bronchus	511	54.3	402	33.9	913	42.8	2,498	55.0	1,993	35.0	4,491	43.6	57.7	37.1	46.0
Melanoma of the Skin	42	4.3	31	2.8	73	3.4	187	4.1	124	2.2	311	3.1	4.1	1.7	2.7
Breast	3	0.3	245	20.8	248	11.5	11	0.2	1,133	19.7	1,144	10.9	0.3	21.6	12.0
Uterine Cervix	---	---	25	2.4	---	---	---	---	99	2.0	---	---	---	2.3	---

TABLE 4 (continued): Cancer Mortality

Site	NEBRASKA 2013						NEBRASKA 2009-2013						US 2009-2013		
	Male No.	Male Rate	Female No.	Female Rate	Total No.	Total Rate	Male No.	Male Rate	Female No.	Female Rate	Total No.	Total Rate	Male Rate	Female Rate	Total Rate
Uterine Corpus & Unspecified	---	---	61	5.2	---	---	---	---	257	4.5	---	---	---	4.5	---
Ovary	---	---	87	7.6	---	---	---	---	403	7.1	---	---	---	7.6	---
Prostate	194	21.6	---	---	---	---	933	21.6	---	---	---	---	20.6	---	---
Kidney & Renal Pelvis	53	5.4	35	2.9	88	4.1	314	6.6	158	2.6	472	4.5	5.7	2.5	3.9
Urinary Bladder	64	7.0	20	1.6	84	3.8	304	7.0	125	2.0	429	4.0	7.7	2.2	4.4
Brain & Other Nervous System	58	6.3	52	4.7	110	5.4	283	6.2	225	4.1	508	5.1	5.3	3.5	4.3
Thyroid	6	0.6	8	0.6	14	0.6	31	0.6	31	0.5	62	0.6	0.5	0.5	0.5
Hodgkin Lymphoma	1	0.1	2	0.1	3	0.1	25	0.6	11	0.2	36	0.4	0.4	0.3	0.4
Non-Hodgkin Lymphoma	64	6.9	62	5.1	126	5.9	336	7.5	313	5.1	649	6.2	7.7	4.7	6.0
Leukemia	72	8.1	65	5.2	137	6.5	396	9.0	311	5.2	707	6.8	9.2	5.1	6.9
Myeloma	39	4.1	31	2.4	70	3.1	193	4.2	157	2.6	350	3.3	4.4	2.8	3.5

Total rates are per 100,000 population and are age-adjusted to the 2000 US population
 Gender-specific rates are per 100,000 male or female population and are age-adjusted to the 2000 US population

TABLE 5: Cancer Mortality
Number of Deaths and Percentage Distribution, by Selected Primary Site and Age at Death
 Nebraska (2009-2013)

	<u>0-17 Yrs.</u>		<u>18-44 Yrs.</u>		<u>45-64 Yrs.</u>		<u>65+ Yrs</u>		<u>TOTAL</u>	
	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>	<u>Number</u>	<u>%</u>
All Sites	67	0.4	413	2.4	4,268	24.9	12,367	72.3	17,115	100.0
Oral Cavity & Pharynx	0	0.0	4	1.6	95	38.8	146	59.6	245	100.0
Esophagus	0	0.0	9	1.9	157	32.4	318	65.7	484	100.0
Stomach	0	0.0	11	5.2	66	31.3	134	63.5	211	100.0
Colon & Rectum (Colorectal)	0	0.0	33	1.9	404	23.6	1,275	74.5	1,712	100.0
Liver & Intrahepatic Bile Ducts	1	0.2	13	2.6	203	40.1	289	57.1	506	100.0
Pancreas	0	0.0	9	0.8	277	24.6	840	74.6	1,126	100.0
Lung & Bronchus	0	0.0	28	0.6	1,119	24.9	3,344	74.5	4,491	100.0
Melanoma of the Skin	0	0.0	27	8.7	106	34.1	178	57.2	311	100.0
Female Breast	0	0.0	55	4.9	354	31.2	724	63.9	1,133	100.0
Uterine Cervix	0	0.0	25	25.3	51	51.5	23	23.2	99	100.0
Uterine Corpus & Unspecified	0	0.0	7	2.7	71	27.6	179	69.6	257	100.0
Ovary	0	0.0	11	2.7	135	33.5	257	63.8	403	100.0
Prostate	0	0.0	1	0.1	77	8.3	855	91.6	933	100.0
Kidney & Renal Pelvis	2	0.4	7	1.5	160	33.9	303	64.2	472	100.0
Urinary Bladder	0	0.0	2	0.5	54	12.6	373	87.0	429	100.0
Brain & Central Nervous System	25	4.9	47	9.3	151	29.7	285	56.1	508	100.0
Thyroid	0	0.0	0	0.0	14	22.6	48	77.4	62	100.0
Hodgkin Lymphoma	0	0.0	5	13.9	16	44.4	15	41.7	36	100.0
Non-Hodgkin Lymphoma	4	0.6	23	3.5	102	15.7	520	80.1	649	100.0
Leukemia	11	1.6	28	4.0	126	17.8	542	76.7	707	100.0
Myeloma	0	0.0	1	0.3	73	20.9	276	78.9	350	100.0

NOTE: Due to rounding, percentages may not sum to 100.0.

TABLE 6: Cancer Mortality
Number of Deaths and Rates, All Sites and Top Ten Primary Sites, by Race and Ethnicity
 Nebraska (2004-2013)

Rank	White			African-American			Native American			Asian/Pacific Islander			Hispanic		
	Site	Number	Rate	Site	Number	Rate	Site	Number	Rate	Site	Number	Rate	Site	Number	Rate
	All Sites	32,435	167.3	All Sites	1,129	222.7	All Sites	157	168.1	All Sites	192	110.4	All Sites	497	102.4
1	Lung & Bronchus	8,569	44.9	Lung & Bronchus	316	63.6	Lung & Bronchus	47	58.2	Lung & Bronchus	42	24.7	Lung & Bronchus	79	19.0
2	Colon & Rectum	3,392	17.2	Colon & Rectum	128	28.2	Colon & Rectum	19	16.4	Liver & Intrahepatic Bile Ducts	32	14.6	Female Breast	39	13.3
3	Female Breast	2,229	20.8	Female Breast	85	28.3	Female Breast	11	16.4	Colon & Rectum	19	11.9	Liver & Intrahepatic Bile Ducts	38	8.1
4	Pancreas	2,003	10.3	Pancreas	80	16.3	Kidney & Renal Pelvis	7	8.3	Pancreas	13	8.0	Colon & Rectum	38	8.0
5	Prostate	1,817	22.8	Prostate	61	34.7	Liver & Intrahepatic Bile Ducts	7	5.5	Non-Hodgkin Lymphoma	12	8.5	Prostate	28	20.6
6	Leukemia	1,370	7.1	Liver & Intrahepatic Bile Ducts	51	8.0	Pancreas	7	4.7	Female Breast	11	9.3	Stomach	25	3.9
7	Non-Hodgkin Lymphoma	1,318	6.7	Myeloma	40	8.3	Ovary	6	10.9	Leukemia	7	3.4	Leukemia	24	3.9
8	Brain & CNS	947	5.2	Esophagus	35	6.3	Stomach	6	5.9	Stomach	7	2.8	Non-Hodgkin Lymphoma	23	5.2
9	Kidney & Renal Pelvis	864	4.5	Stomach	28	5.1	Prostate	5	10.0	Brain & CNS	6	2.7	Kidney & Renal Pelvis	22	3.7
10	Esophagus	846	4.4	Leukemia	28	4.9	Oral Cavity & Pharynx	5	8.3	Kidney & Renal Pelvis	4	2.3	Pancreas	20	4.7

Rates are per 100,000 population, excluding gender-specific sites (prostate, female breast, ovary), which are per 100,000 male or female population. All rates are age-adjusted to the 2000 US population.

Abbreviation: CNS, central nervous system

INCIDENCE AND MORTALITY FOR SELECTED PRIMARY SITES

Lung and Bronchus

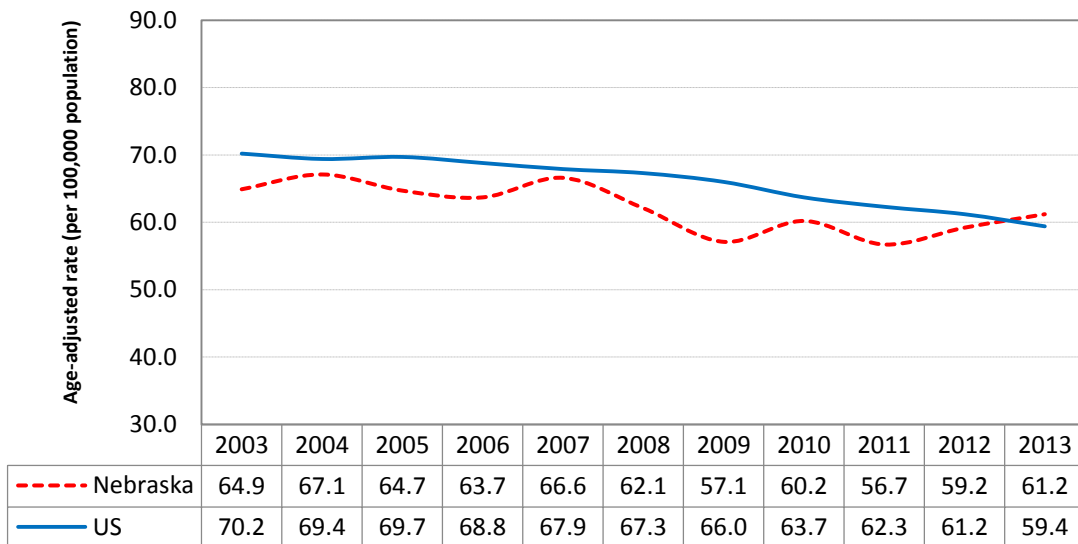
Although lung cancer was only the second most frequently diagnosed cancer among Nebraska residents in 2013, it was the year's leading cause of cancer mortality, accounting for 26% of the state's cancer deaths. During the past five years (2009-2013), lung cancer has averaged about 1,300 diagnoses and 900 deaths in Nebraska per year. Although lung cancer is more likely to strike men than women, there has been a 30% drop in the rate of lung cancer deaths among Nebraska men since 1990, but a slight increase in the rate for Nebraska women. The large number of lung cancer deaths is due to the small number of cases that are detected at an early stage: as a result, the 5-year relative survival rate for people lung cancer cases is less than 20%.

Cigarette smoking is the major risk factor for lung cancer and causes about 85% of lung cancer deaths. People who smoke two or more packs of cigarettes per day are 15 to 25 times more likely to die from lung cancer than non-smokers. Quitting smoking reduces the risk of lung cancer, although it takes 10-15 years for an ex-smoker's risk to drop to the level of a lifelong non-smoker. The US Preventive Services Task Force (USPSTF) and ACS have both endorsed screening for lung cancer, using low-dose helical computed tomography, but only for people 55-74 years of age (the USPSTF recommendation includes people 55-80) who currently smoke or who have quit within the past 15 years, are in good health, and have at least a 30 pack-year smoking history.

Maps on pages 45-46 present lung & bronchus cancer incidence and mortality rates by county of residence; county-specific statistics are also found in an appendix to this report ([Table 3A](#)).

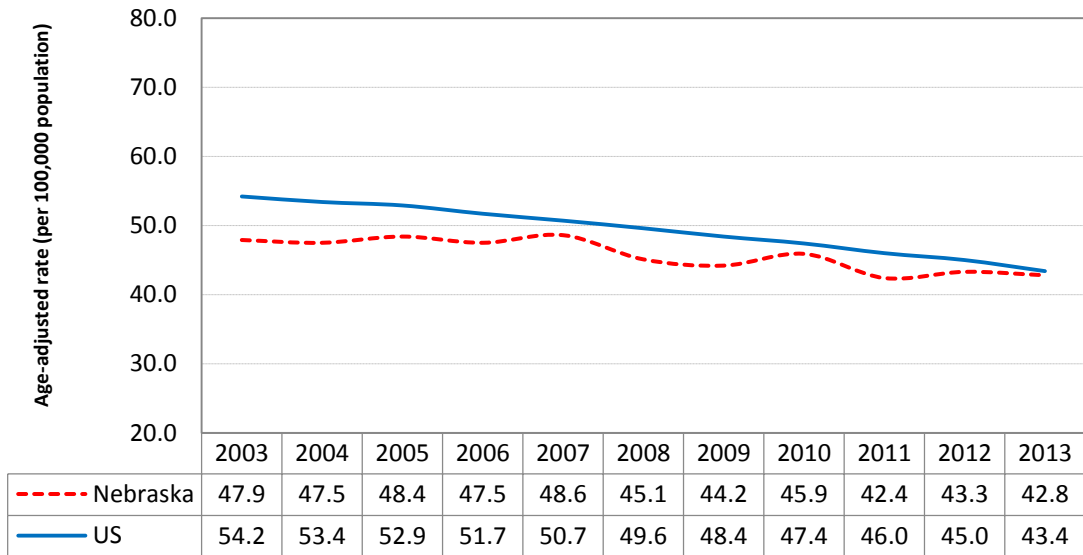
Lung and Bronchus Cancer

Incidence Rates, Nebraska & US (2003-2013)



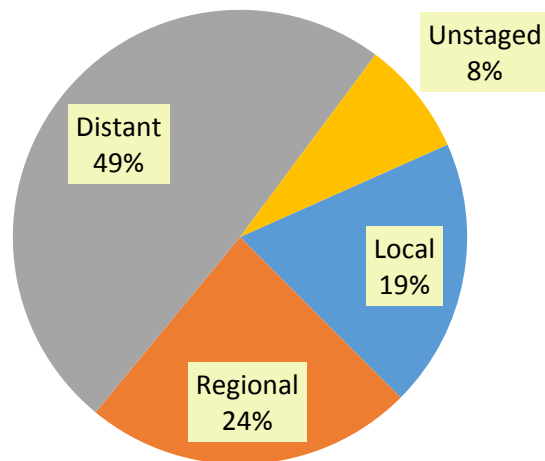
Lung and Bronchus Cancer

Mortality Rates, Nebraska & US (2003-2013)



Lung and Bronchus Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Breast (Female only)

Breast cancer is the most common type of cancer among women and the second most frequent cause of female cancer deaths. Between 2009 and 2013, 6,388 Nebraska women were diagnosed with invasive breast cancer (and another 1,441 were diagnosed with in situ breast cancer) and 1,132 women died from breast cancer. Since 1990, the rate of breast cancer deaths in Nebraska and the US has declined significantly. Recent declines in the rate of breast cancer diagnoses have been attributed to the decreasing use of post-menopausal hormone replacement therapy.

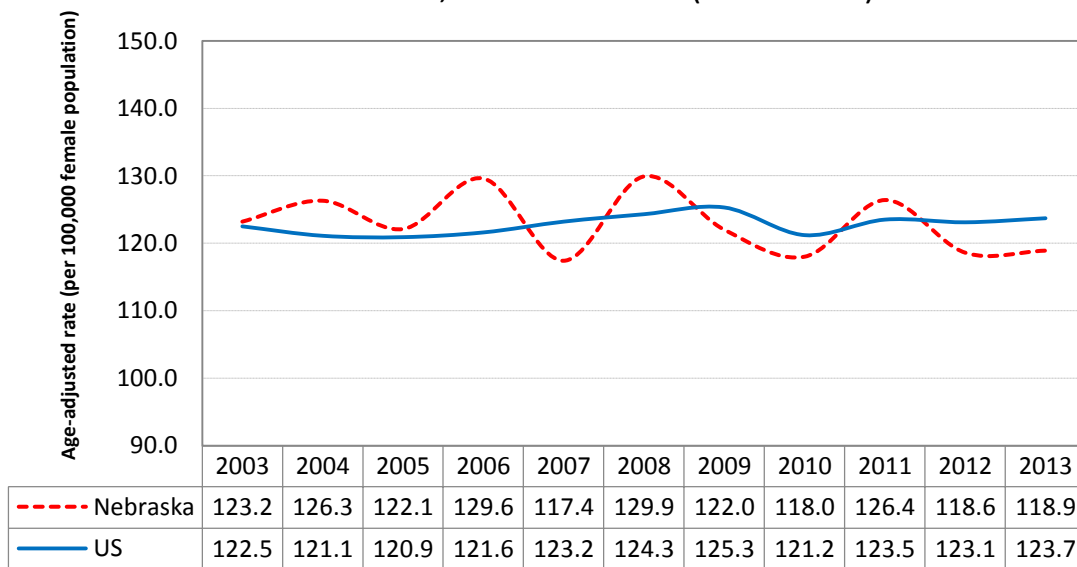
Age is an important risk factor for breast cancer, with 80% of all cases occurring among women age 50 and older. Other risk factors include genetic mutations, a personal or family history of breast cancer, some forms of benign breast disease, early menstruation, late menopause, never having children or having a first child after age 30, and for post-menopausal women, obesity and long-term hormone replacement therapy.

Screening for breast cancer is known to save lives, although opinion varies on how and when to screen. USPSTF guidelines recommend mammography for women 50-74 on an every other year schedule. However, recently-updated ACS guidelines recommend that women 40-44 have the choice for annual mammography; women 45-54 have annual mammography; and women 55 and older have the choice to continue annual mammography or to have it on an every other year schedule, continuing as long as their overall health is good and life expectancy is 10 or more years. For some women who have an increased risk of breast cancer, the ACS recommends annual magnetic resonance imaging (MRI) in addition to mammography, usually starting at age 30.

Maps on pages 47-48 present female breast cancer incidence and mortality rates by county of residence; county-specific statistics are also found in an appendix to this report ([Table 4A](#)).

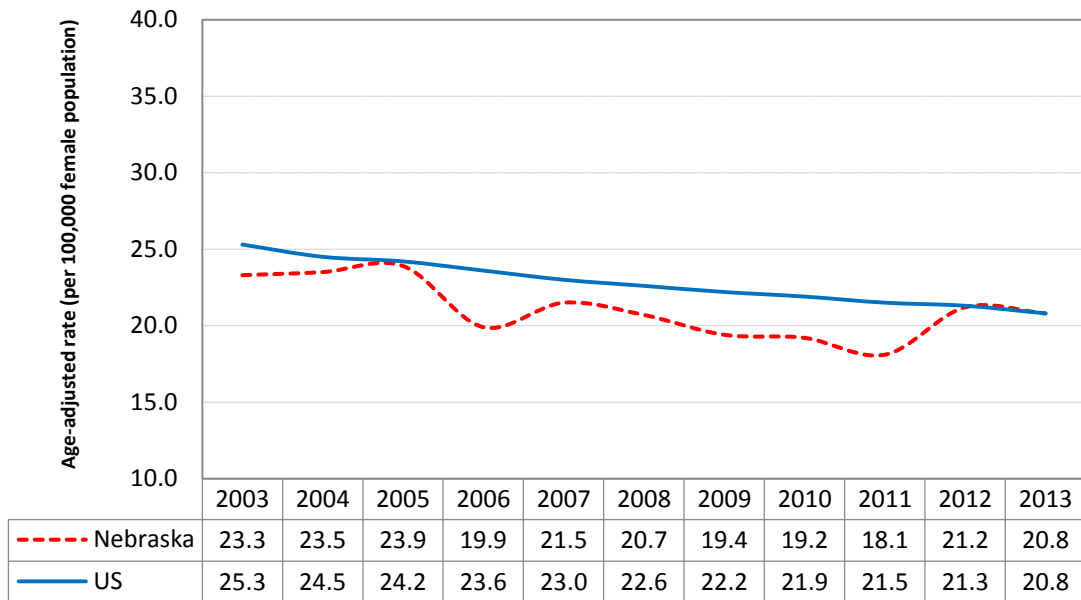
Female Breast Cancer

Incidence Rates, Nebraska & US (2003-2013)



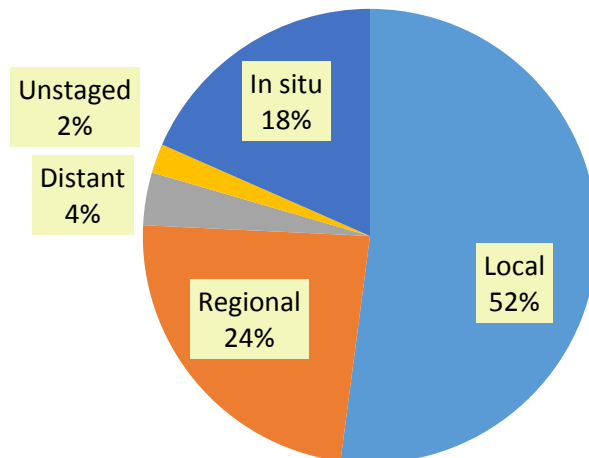
Female Breast Cancer

Mortality Rates, Nebraska & US (2003-2013)



Female Breast Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Colon and Rectum (Colorectal)

In 2013, colorectal cancer was the fourth most frequently diagnosed cancer among Nebraska residents, accounting for 855 new cases. It was also the second leading cause of cancer mortality in the state, accounting for 318 deaths.

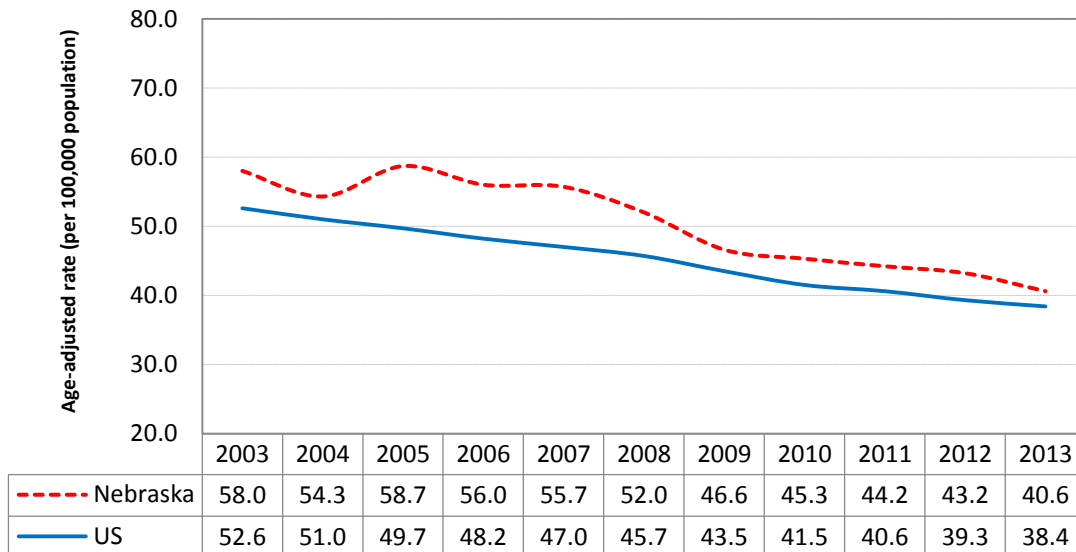
The risk of developing colorectal cancer increases with age. About two-thirds (63.8%) of all colorectal cancer cases that occurred in Nebraska during 2009-2013 were 65 or older at diagnosis. Other risk factors include a personal or family history of colorectal cancer or polyps, a personal history of chronic inflammatory bowel disease, and certain hereditary colorectal cancer syndromes. Modifiable risk factors include physical inactivity, obesity, smoking, a high-fat diet (especially fat from animal sources), and heavy alcohol use.

Screening for asymptomatic polyps and tumors is known to prevent colorectal cancer cases and deaths. The USPSTF recommends that people between the ages of 50 and 75 follow one of these schedules: 1) an annual high-sensitivity fecal occult blood test (FOBT), 2) sigmoidoscopy every 5 years combined with a high-sensitivity FOBT every 3 years, or 3) colonoscopy every 10 years. People at increased risk (i.e., a personal or family history of colorectal cancer or polyps, a personal history of chronic inflammatory bowel disease, or a family history of hereditary colorectal cancer syndromes) may be advised to begin screening before age 50 and/or be screened more often. Other screening tests that are included in the most recent ACS guidelines include double-contrast barium enema (every 5 years), virtual colonoscopy (every 5 years), the fecal immunochemical test (FIT) (every year), and the stool DNA test (every 3 years).

Maps on pages 49-50 present incidence and mortality rates for cancers of the colon & rectum by county of residence; county-specific statistics are also found in an appendix to this report ([Table 5A](#)).

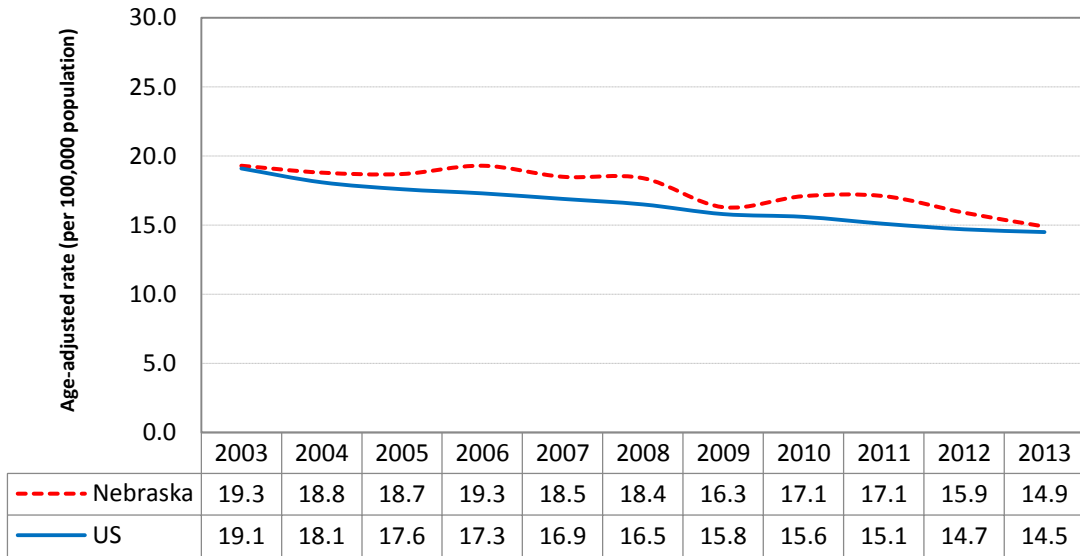
Colon and Rectum (Colorectal) Cancer

Incidence Rates, Nebraska & US (2003-2013)



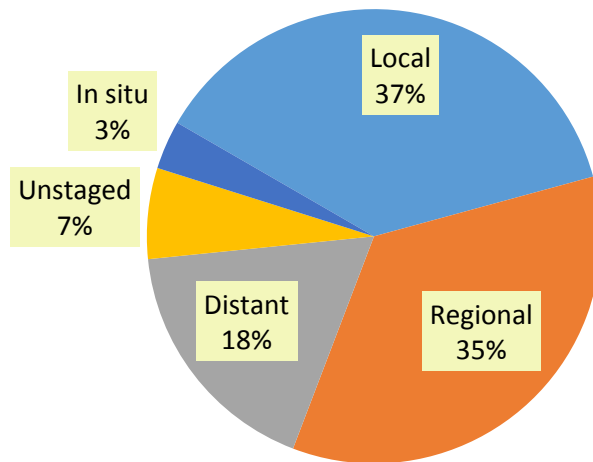
Colon and Rectum (Colorectal) Cancer

Mortality Rates, Nebraska & US (2003-2013)



Colon and Rectum (Colorectal) Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Prostate

With 1,126 diagnoses in 2013, prostate cancer was the most common cancer among Nebraska men, accounting for over 23% of all new cancers. During the past five years (2009-2013), it has also been the second leading cause of cancer deaths among Nebraska men, accounting for 933 deaths. Since the mid-1990s, prostate cancer death rates have declined substantially, both in Nebraska and throughout the United States.

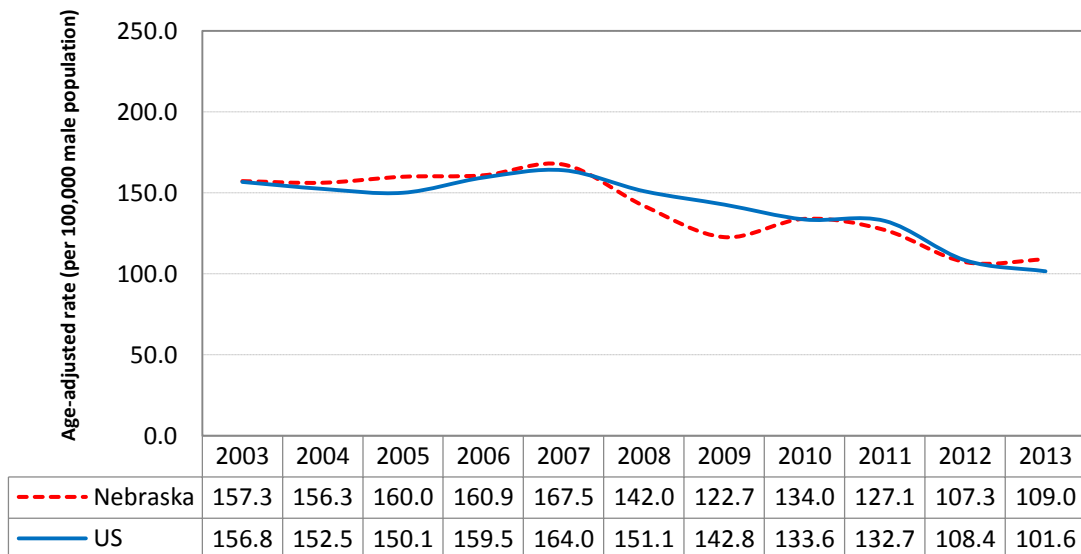
Little is known about what causes prostate cancer. Risk increases with age (about 58% of Nebraska men diagnosed with prostate cancer during 2009-2013 were 65 or older) and is significantly greater among African-Americans. During the past decade (2004-2013), the incidence of prostate cancer among African-American men in Nebraska has been 33% higher than among whites. Men with a close relative (father, brother, or son) who have had prostate cancer, especially at a young age, are also at increased risk.

Current ACS guidelines recommend that men make an informed decision with their health care provider about whether to be screened for prostate cancer. This discussion should begin at age 50 for men who are at average risk of prostate cancer and have a life expectancy of at least 10 years. This discussion should begin at age 45 for men at high risk (African-Americans and men with a father, brother, or son diagnosed with prostate cancer before age 65) and at age 40 for men of even higher risk (men with several first-degree relatives diagnosed before age 65). For men who choose to be screened, the ACS recommends the prostate-specific antigen (PSA) test and an optional digital rectal exam. By contrast, the USPSTF does not recommend screening for prostate cancer.

Maps on pages 51-52 present incidence and mortality rates for prostate cancer by county of residence; county-specific statistics are also found in an appendix to this report ([Table 6A](#)).

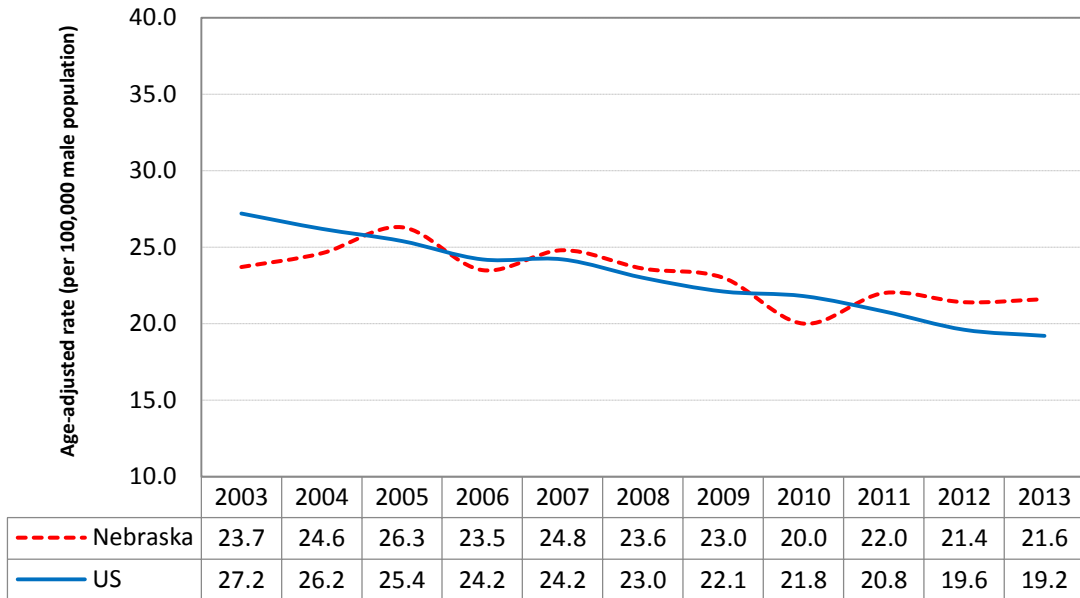
Prostate Cancer

Incidence Rates, Nebraska & US (2003-2013)



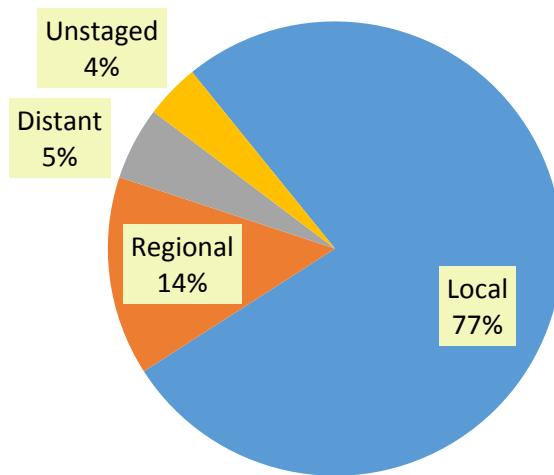
Prostate Cancer

Mortality Rates, Nebraska & US (2003-2013)



Prostate Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Urinary Bladder

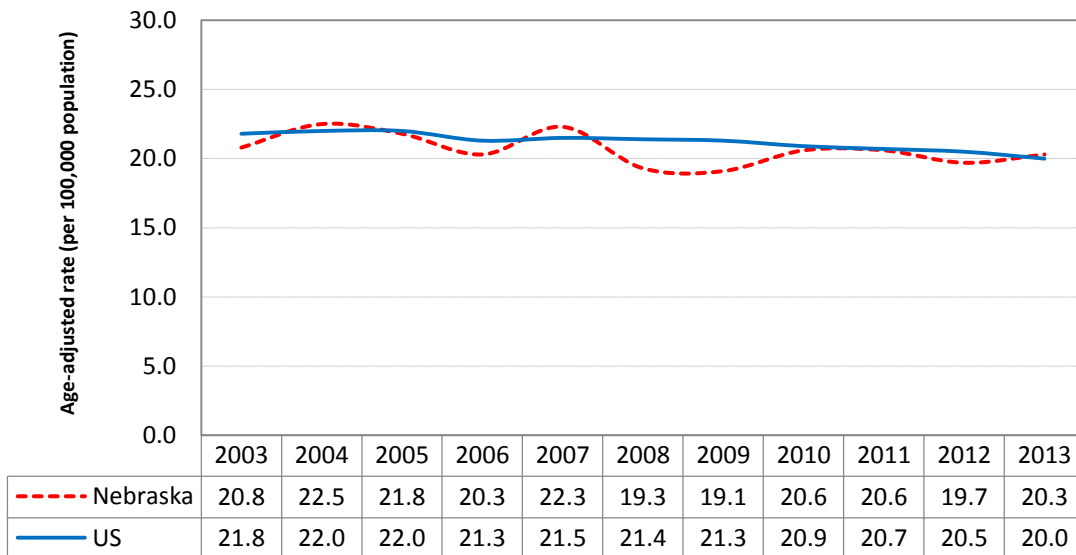
Between 2009 and 2013, 2,149 Nebraska residents were diagnosed with bladder cancer. Bladder cancer occurs much more frequently among men than women (by about a 3-to-1 ratio), and it now ranks as the fourth most common site of cancer diagnoses among Nebraska men. However, deaths from bladder cancer occur far less often (428 Nebraska residents died from it during 2009-2013), which is the result of a high percentage of early-stage diagnoses and the existence of effective treatments. Survival prospects have improved considerably in recent decades, to the point where the most current national data show that the five-year relative survival rate for all bladder cancer patients is about 80%.

Cigarette smoking is the most important known risk factor for bladder cancer. Smokers develop bladder cancer two to three times more often than non-smokers, and about one-third of all cases are attributable to smoking. Risk factors also include occupational exposures to certain chemicals used to make dyes (benzidine and beta-naphthylamine), as well as working in the manufacture of rubber and leather. Like most cancers, the risk of bladder cancer increases with age: more than 75% of the cases that occurred in Nebraska during 2009-2013 were at least 65 years old when diagnosed.

Maps on pages 53-54 present incidence and mortality rates for urinary bladder cancer by county of residence; county-specific statistics are also found in an appendix to this report ([Table 7A](#)).

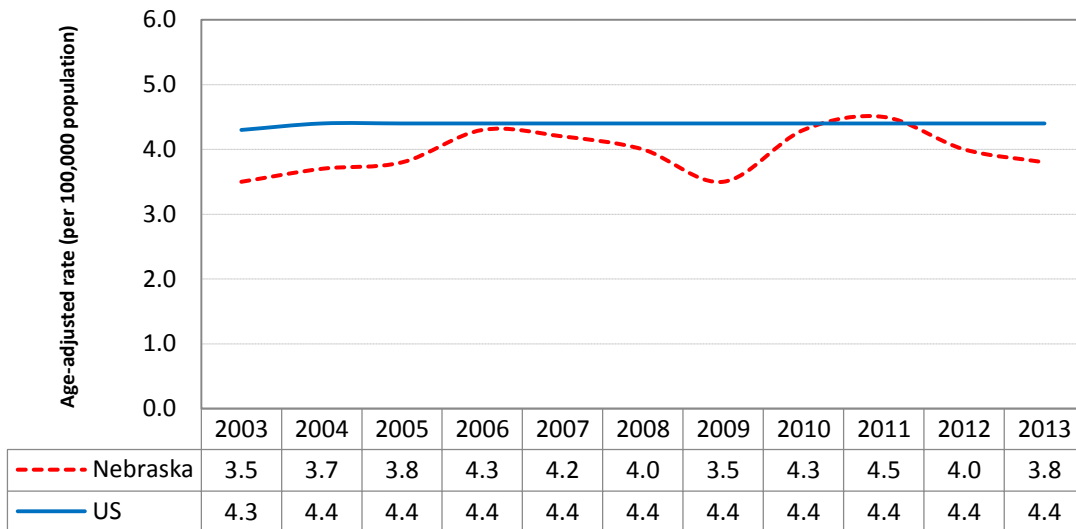
Urinary Bladder Cancer

Incidence Rates, Nebraska & US (2003-2013)



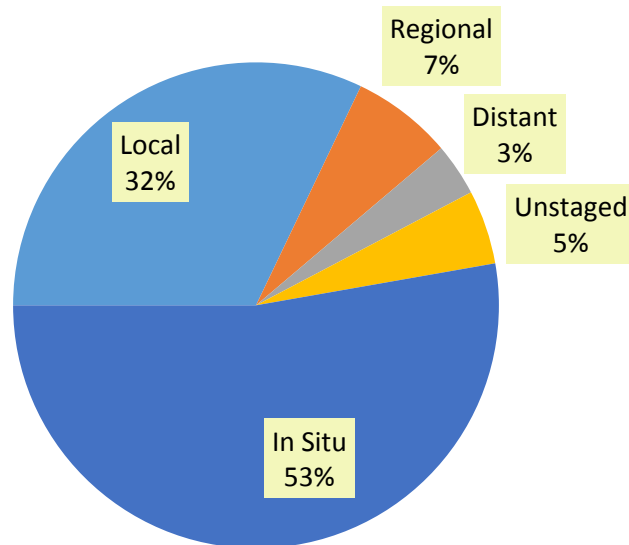
Urinary Bladder Cancer

Mortality Rates, Nebraska & US (2003-2013)



Urinary Bladder Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Non-Hodgkin Lymphoma

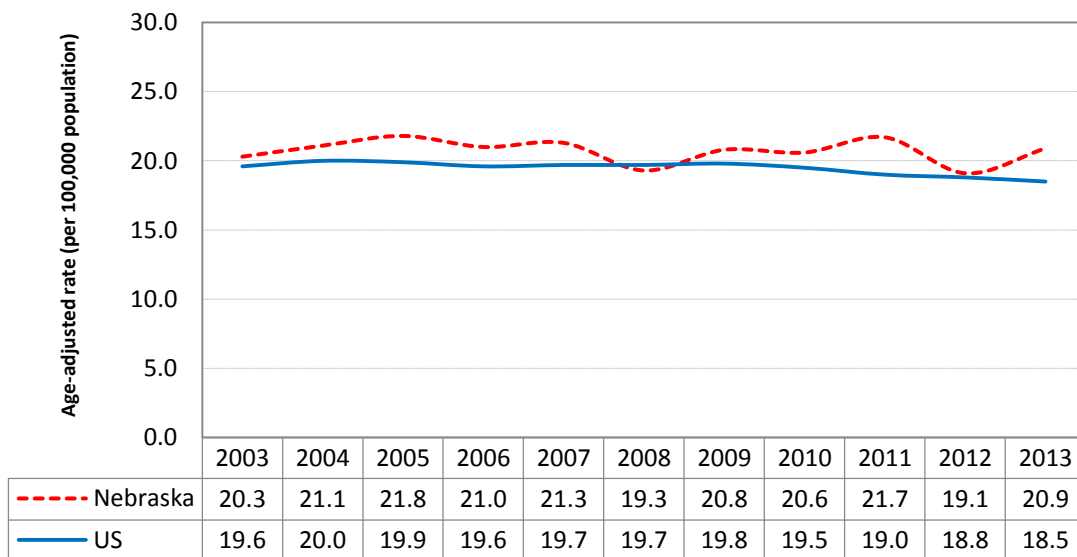
Lymphomas are cancers that affect the white blood cells of the immune system, and are usually classified as either Hodgkin or Non-Hodgkin lymphoma. Non-Hodgkin lymphoma is by far the more common disorder of the two, accounting for 2,099 diagnoses and 648 deaths among Nebraska residents between 2009 and 2013 (for Hodgkin lymphoma, the comparable figures are 277 diagnoses and 36 deaths). National statistics indicate that the incidence rate for Non-Hodgkin lymphoma has increased by about 80% since the mid-1970s, and some of this increase is related to the appearance of AIDS. However, both state and national data show that Non-Hodgkin lymphoma deaths have been increasing since at least 1950, which indicates that factors other than AIDS are also responsible.

The causes of Non-Hodgkin lymphoma are unknown, although there is evidence that viral exposures and reduced immune function are associated with the disease. People whose immune systems have been suppressed by drugs, particularly those who have received an organ transplant, are at high risk of Non-Hodgkin lymphoma, and it also occurs more frequently among people with congenital and acquired immunologic disorders, including AIDS. The increased incidence of the disease among people with congenital disorders of the immune system suggests that hereditary factors may increase risk. Some studies have found that occupational exposure to certain herbicides is a risk factor as well.

Maps on pages 55-56 present incidence and mortality rates for Non-Hodgkin lymphoma by county of residence; county-specific statistics are also found in an appendix to this report ([Table 8A](#)).

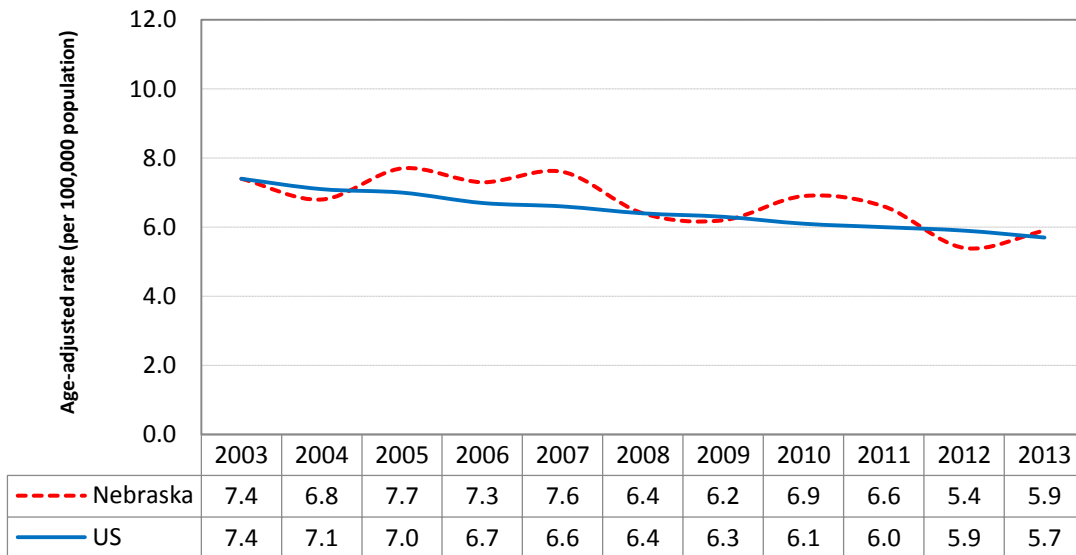
Non-Hodgkin Lymphoma

Incidence Rates, Nebraska & US (2003-2013)



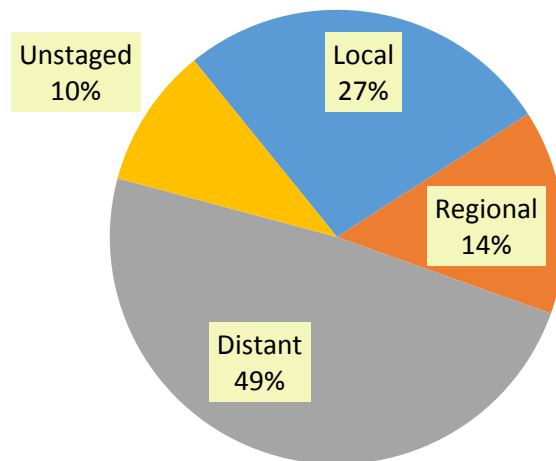
Non-Hodgkin Lymphoma

Mortality Rates, Nebraska & US (2003-2013)



Non-Hodgkin Lymphoma

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Leukemia

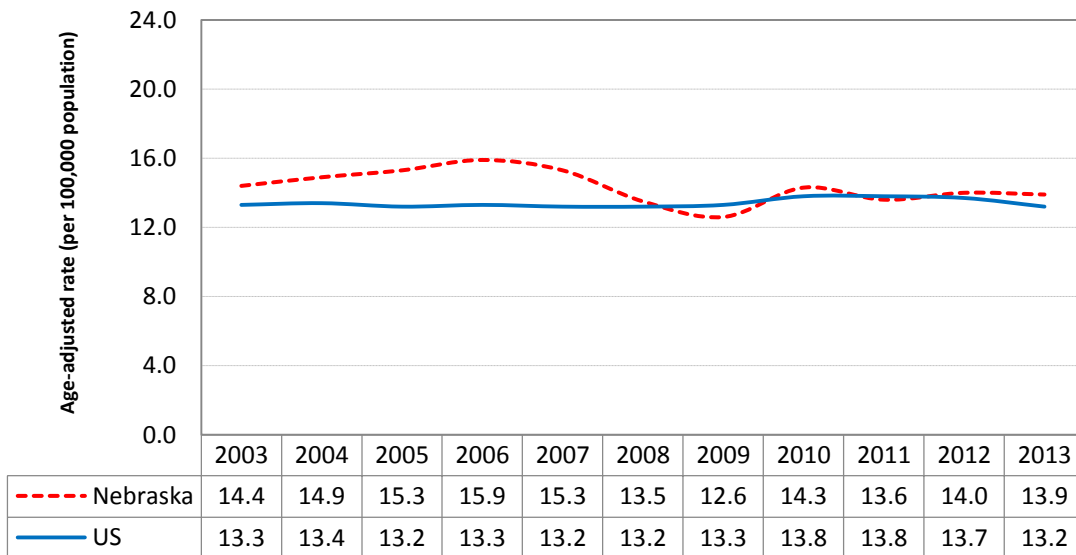
Between 2009 and 2013, leukemia accounted for over 1,400 diagnoses and 707 deaths among Nebraska residents. Although leukemia is one of the most common types of cancer diagnosed among children and adolescents, over half (57%) of the leukemia cases that occurred in Nebraska between 2009 and 2013 were 65 years of age or older at diagnosis. There are many different types of leukemia: acute lymphocytic leukemia is the most frequently diagnosed among children, while acute myeloid and chronic lymphocytic are the most common types among adults. Survival times vary widely by type: overall, the relative five-year survival rate for all leukemia patients in the United States is almost 60%.

The major causes of most types of leukemia are unknown. Nevertheless, several risk factors have been identified, and include genetic abnormalities (such as Down's syndrome), exposure to ionizing radiation, and workplace exposure to benzene and other related solvents. Adult T-cell leukemia is strongly associated with infection by a retrovirus, the human T-cell lymphotropic virus, type I (HTLV-I). Cigarette smoking is a risk factor for acute myeloid leukemia, while people who have a family history of chronic lymphocytic leukemia carry an increased risk of the disease themselves.

Maps on pages 57-58 present incidence and mortality rates for leukemia by county of residence; county-specific statistics are also found in an appendix to this report ([Table 9A](#)).

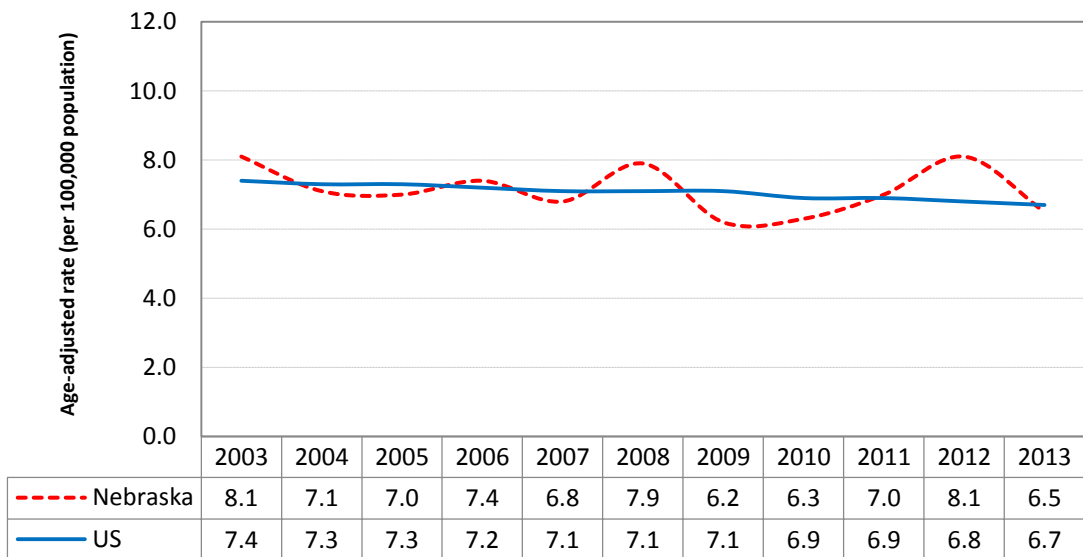
Leukemia

Incidence Rates, Nebraska & US (2003-2013)



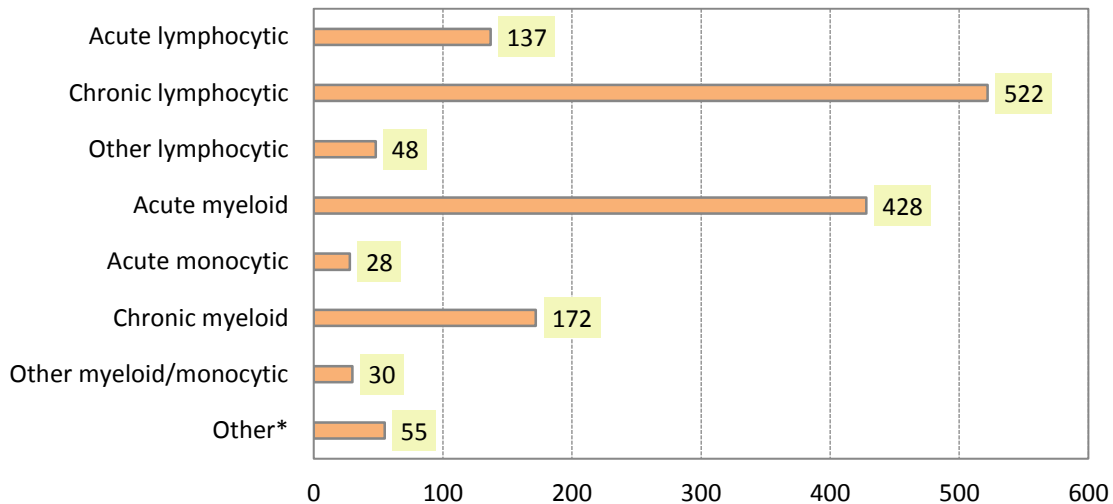
Leukemia

Mortality Rates, Nebraska & US (2003-2013)



Leukemia

Number of Cases by Histologic Type, Nebraska, 2009-2013



*includes plasma cell leukemia (3 cases); aggressive NK-cell leukemia (1 case); T-cell large granular lymphocytic leukemia (3 cases); adult T-cell leukemia (HTLV-1 positive) (1 case); hyper eosinophilic syndrome (3 cases); acute panmyelosis with myelofibrosis (1 case); acute leukemia, NOS (23 cases); leukemia, NOS (20 cases)

Abbreviation: NOS, not otherwise specified

Kidney and Renal Pelvis

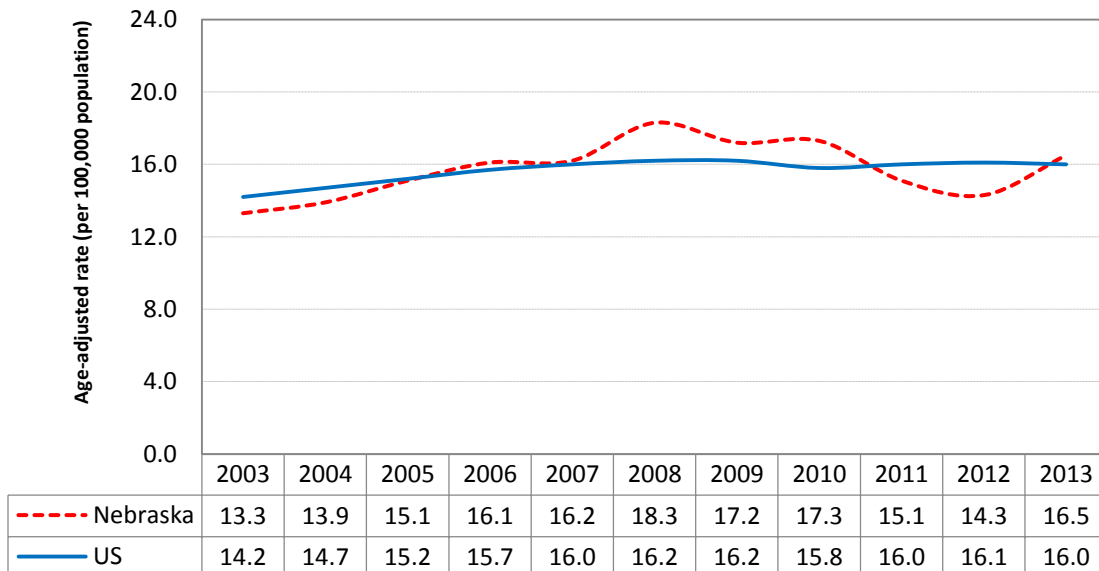
Cancers of the kidney and renal pelvis accounted for 1,706 diagnoses in Nebraska between 2009 and 2013, and also accounted for 471 deaths in Nebraska during the same years. State and national trends since 1990 show a significant increase in the rate of diagnosis of these cancers, but little change in the mortality rate. The chances of survival for people with kidney cancer are relatively high, with the most current national statistics showing that the five-year relative survival rate for cancers of the kidney and renal pelvis is now over 70%.

Preventable risk factors for cancer of the kidney include cigarette smoking and obesity. Current estimates indicate that cigarette smoking is responsible for about one-third of all kidney cancer deaths. Kidney cancer is more likely to strike at younger ages than most other types; in Nebraska, just over half (50.1%) of all cases that were diagnosed during 2009-2013 were under the age of 65. Other non-preventable risk factors for cancer of the kidney include a family history of kidney cancer and high blood pressure. However, since people with high blood pressure are often treated with drugs, it is unclear whether their increased risk is related to their high blood pressure or the drugs. Nevertheless, people who need drugs to lower their blood pressure should take them.

Maps on pages 59-60 present incidence and mortality rates for cancers of the kidney & renal pelvis by county of residence; county-specific statistics are also found in an appendix to this report ([Table 10A](#)).

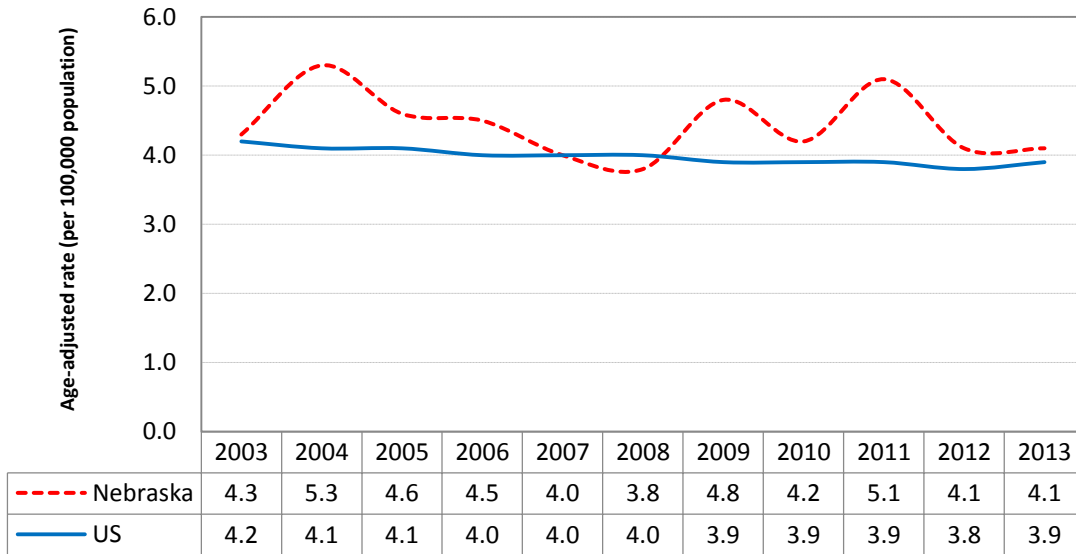
Kidney and Renal Pelvis Cancer

Incidence Rates, Nebraska & US (2003-2013)



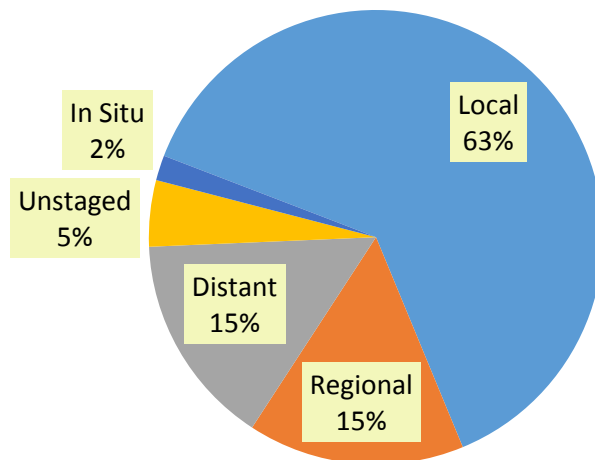
Kidney and Renal Pelvis Cancer

Mortality Rates, Nebraska & US (2003-2013)



Kidney and Renal Pelvis Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Melanoma of the Skin

There are several different types of skin cancer, but melanomas are the most serious. Nationally, melanomas comprise only about 5% of all skin cancer diagnoses but about 80% of all skin cancer deaths. In Nebraska, melanomas of the skin accounted for 1,925 diagnoses and 310 deaths between 2009 and 2013. The incidence of melanoma continues to increase significantly in Nebraska and throughout the United States. Because most melanomas are discovered early in their development and can be surgically removed, the relative five-year survival rate is now over 90%.

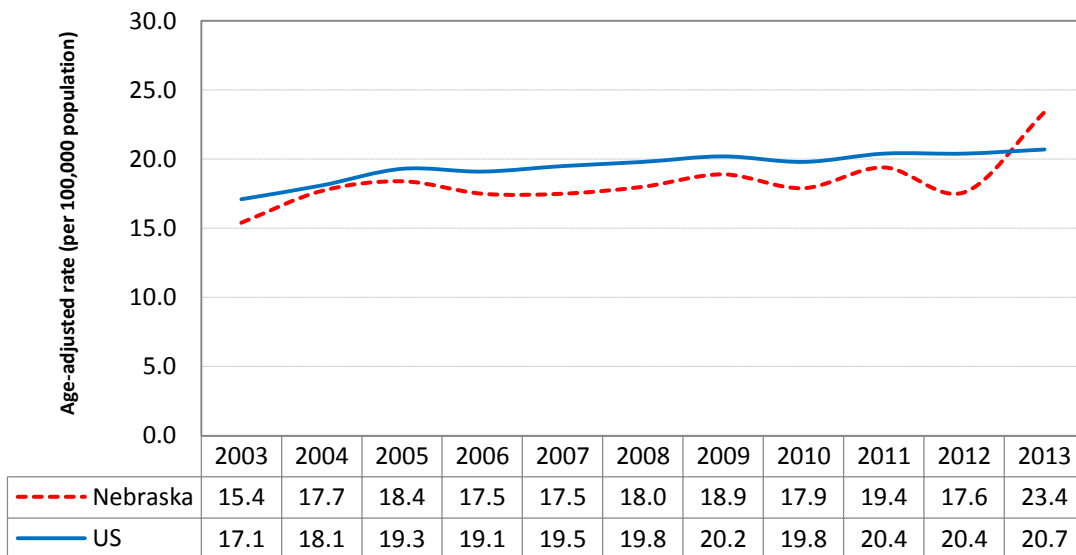
Melanoma is related to exposure to ultraviolet radiation (most of which comes from the sun), particularly exposures during childhood that resulted in severe sunburns. The risk of developing melanoma is particularly high among people with light skin. Sun exposure is not the only risk factor. Family history of melanoma and the presence of numerous dysplastic nevi (large moles with irregular coloration and shape) also increase a person's risk of the disease.

Skin melanomas are among the most preventable and treatable of all cancers. Wearing protective clothing and using sunscreen are the best methods for preventing the disease, and children in particular should have such protection. In addition, early detection can greatly reduce the risk of melanoma mortality. Recognition of changes in skin growths or the appearance of new growths is the best way to find melanomas early in their development. The ACS suggests that adults practice skin self-examination on a monthly basis, and that suspicious lesions should be evaluated promptly by a physician.

Maps on pages 61-62 present incidence and mortality rates for melanoma of the skin by county of residence; county-specific statistics are also found in an appendix to this report ([Table 11A](#)).

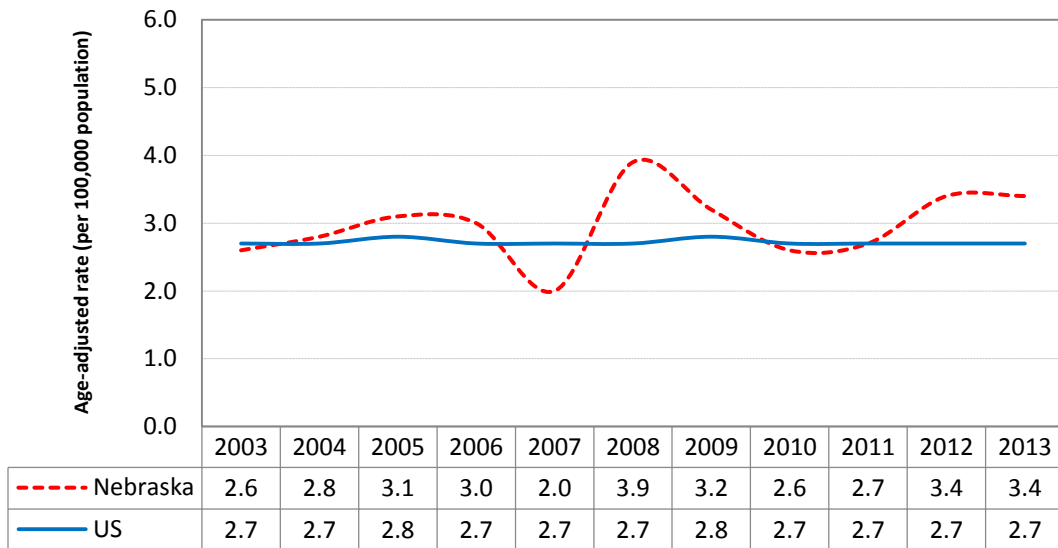
Melanoma of the Skin

Incidence Rates, Nebraska & US (2003-2013)



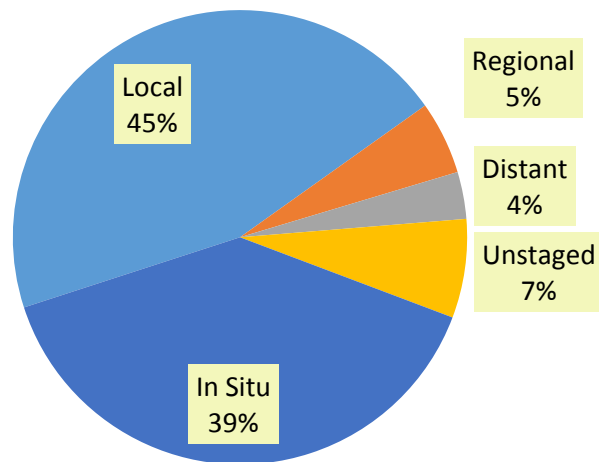
Melanoma of the Skin

Mortality Rates, Nebraska & US (2003-2013)



Melanoma of the Skin

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2009-2013



Myelodysplastic Syndromes

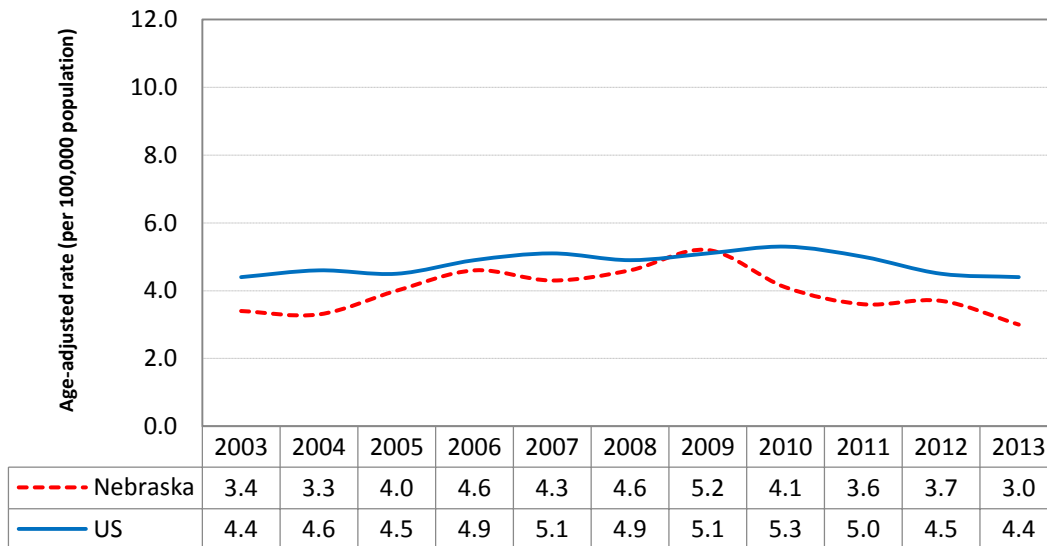
Myelodysplastic syndromes (MDS) are a group of cancers characterized by the failure of the bone marrow to produce enough healthy blood cells, and are often referred to as “bone marrow failure disorders”. There are several different types of MDS, which are diagnosed based on certain changes in the blood cells and bone marrow. Failure of the bone marrow to produce healthy blood cells occurs gradually, so MDS are not necessarily fatal. Some patients do succumb to the direct effects of the disease, which can result in the body’s loss of ability to fight infections and control bleeding. In addition, about 30% of all MDS cases eventually progress to acute myeloid leukemia (AML). In Nebraska, 407 MDS cases were diagnosed and 251 people died from MDS during the past five years (2009-2013); the latter number does not include MDS cases that later resulted in an AML death.

The exact cause of MDS in most patients is unknown. However, age is a risk factor for MDS, with almost 80% of MDS cases that occurred among Nebraska residents during the past five years (2009-2013) being 65 years of age or older at diagnosis. The risk of MDS is also elevated among cancer patients who have taken chemotherapy drugs or have received radiation therapy, for up to 10 years following such treatment. Long-term exposure to certain environmental and industrial chemicals, such as benzene, also increases the risk of MDS.

Maps on pages 63-64 present incidence and mortality rates for myelodysplastic syndromes by county of residence; county-specific statistics are also found in an appendix to this report ([Table 12A](#)).

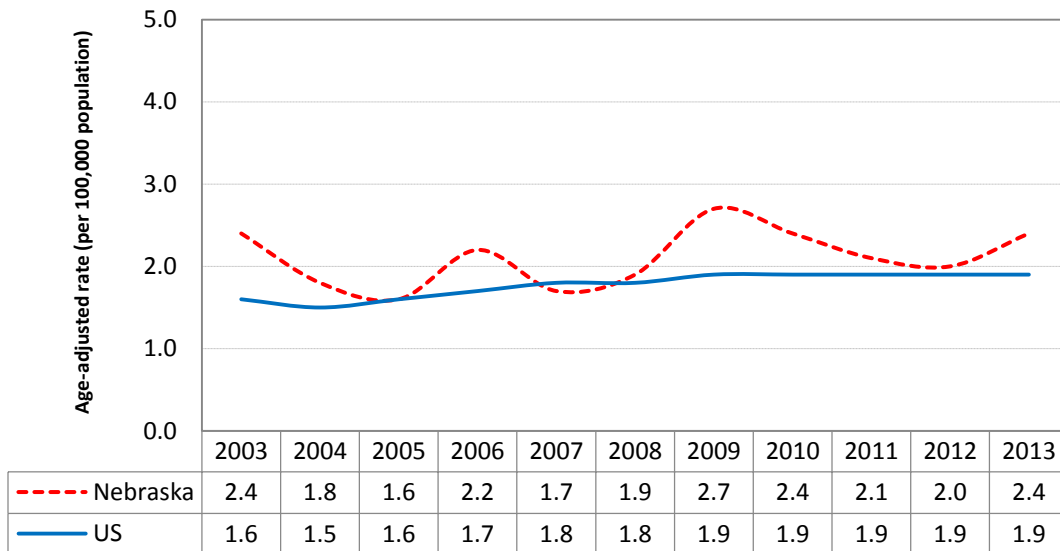
Myelodysplastic Syndromes

Incidence Rates, Nebraska & US (2009-2013)



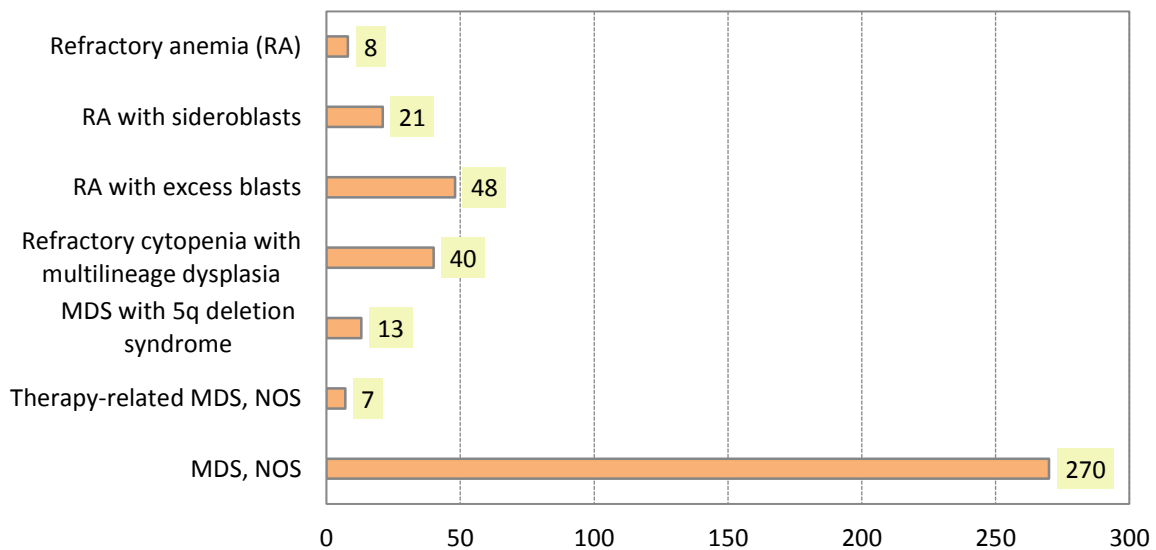
Myelodysplastic Syndromes

Mortality Rates, Nebraska & US (2009-2013)



Myelodysplastic Syndromes (MDS)

Number of Cases by Histologic Type, Nebraska, 2009-2013



Abbreviation: NOS, not otherwise specified

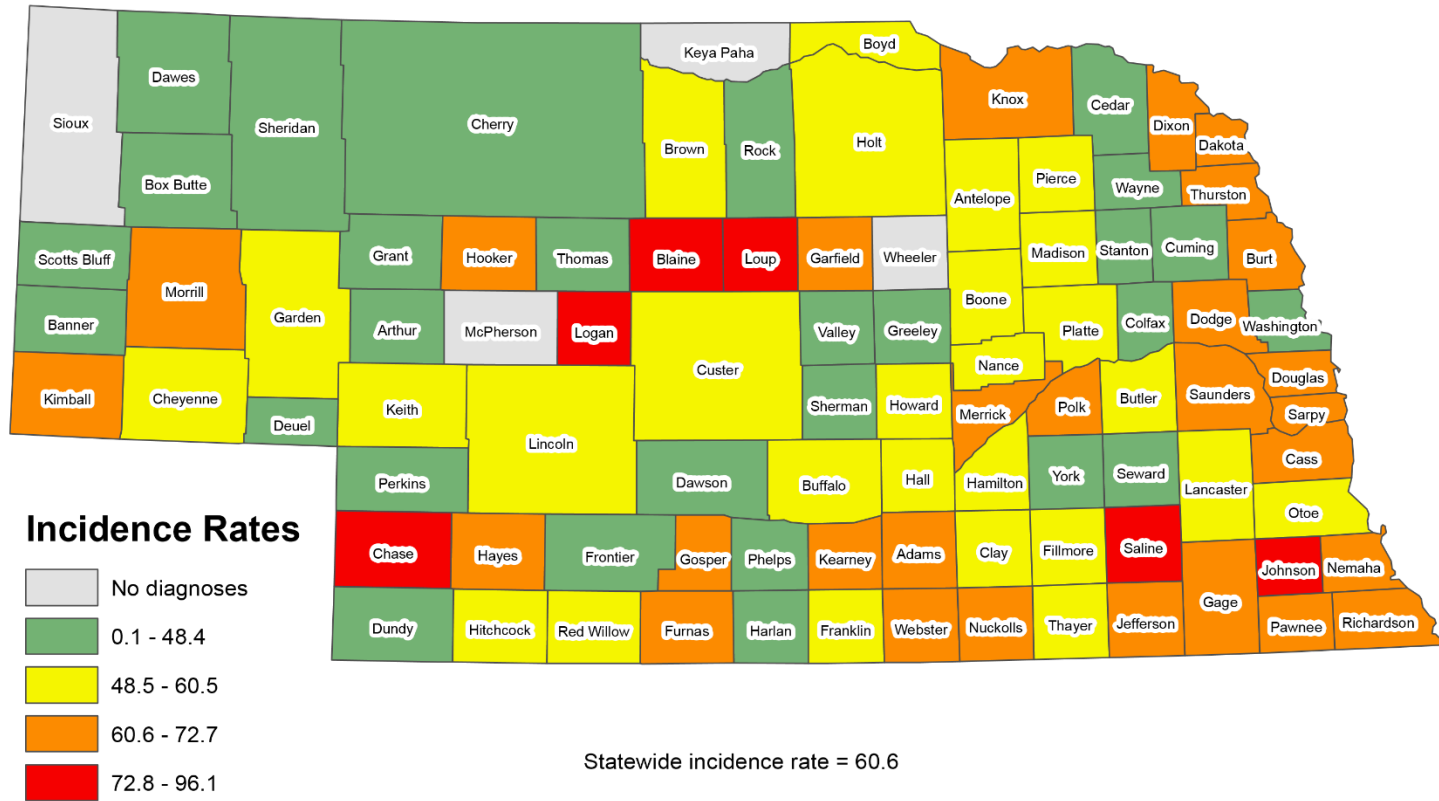
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INCIDENCE & MORTALITY RATE MAPS, FOR SELECTED PRIMARY SITES

<u>Primary Site</u>	<u>Contents</u>	<u>Page</u>
Lung & bronchus	Incidence Mortality	45 46
Female breast	Incidence Mortality	47 48
Colon & rectum (colorectal)	Incidence Mortality	49 50
Prostate	Incidence Mortality	51 52
Urinary bladder	Incidence Mortality	53 54
Non-Hodgkin lymphoma	Incidence Mortality	55 56
Leukemia	Incidence Mortality	57 58
Kidney & renal pelvis	Incidence Mortality	59 60
Melanoma of the skin	Incidence Mortality	61 62
Myelodysplastic syndromes	Incidence Mortality	63 64

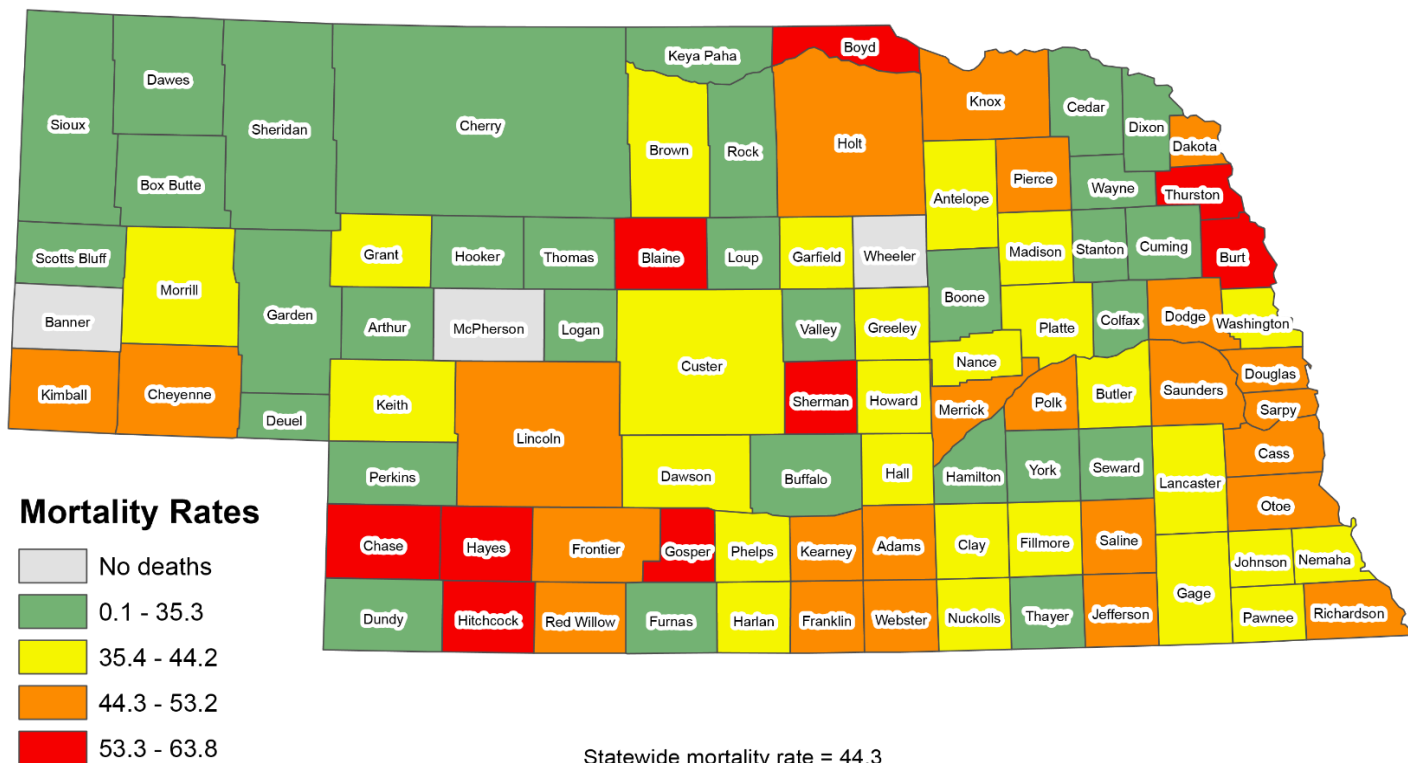
Lung & Bronchus Cancer Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



Lung & Bronchus Cancer Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

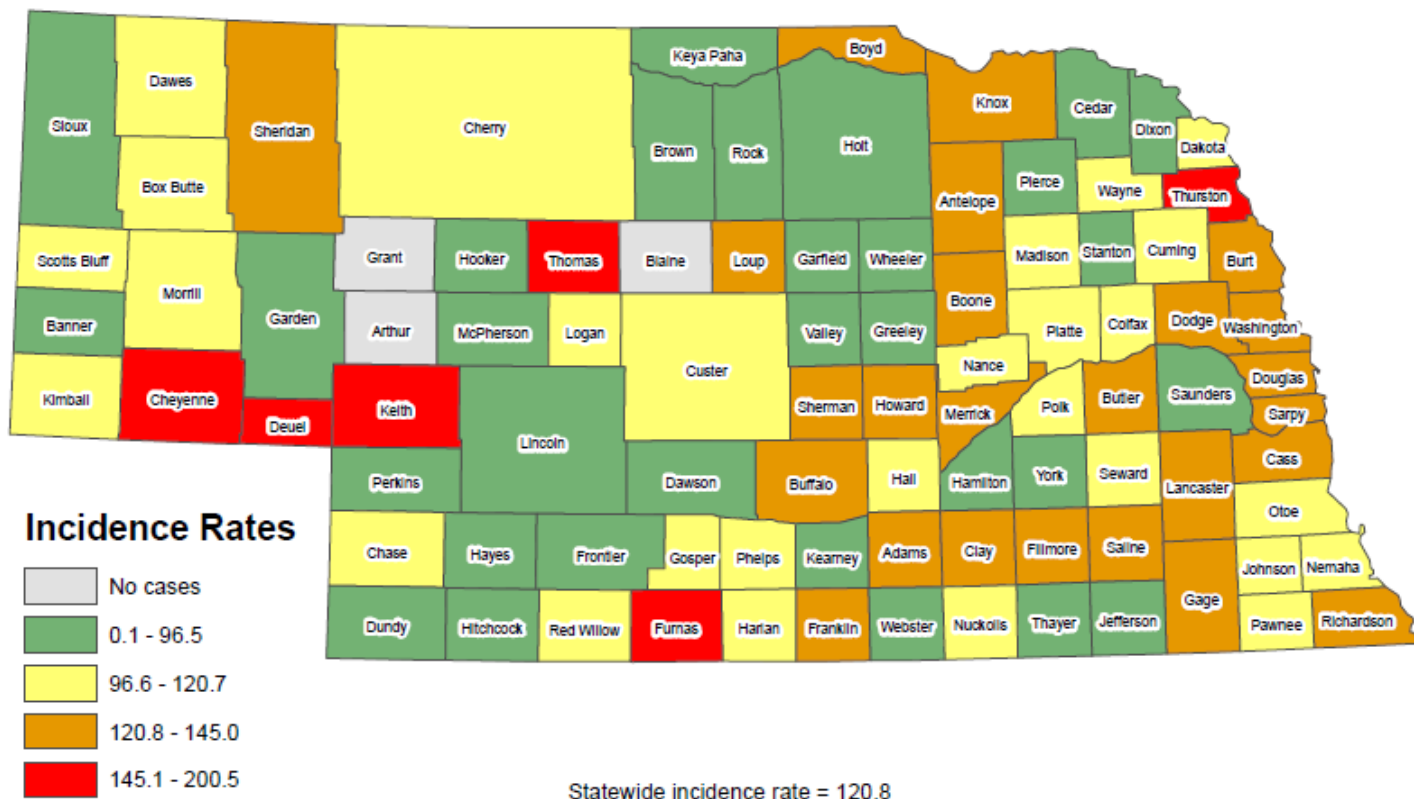
Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



Statewide mortality rate = 44.3

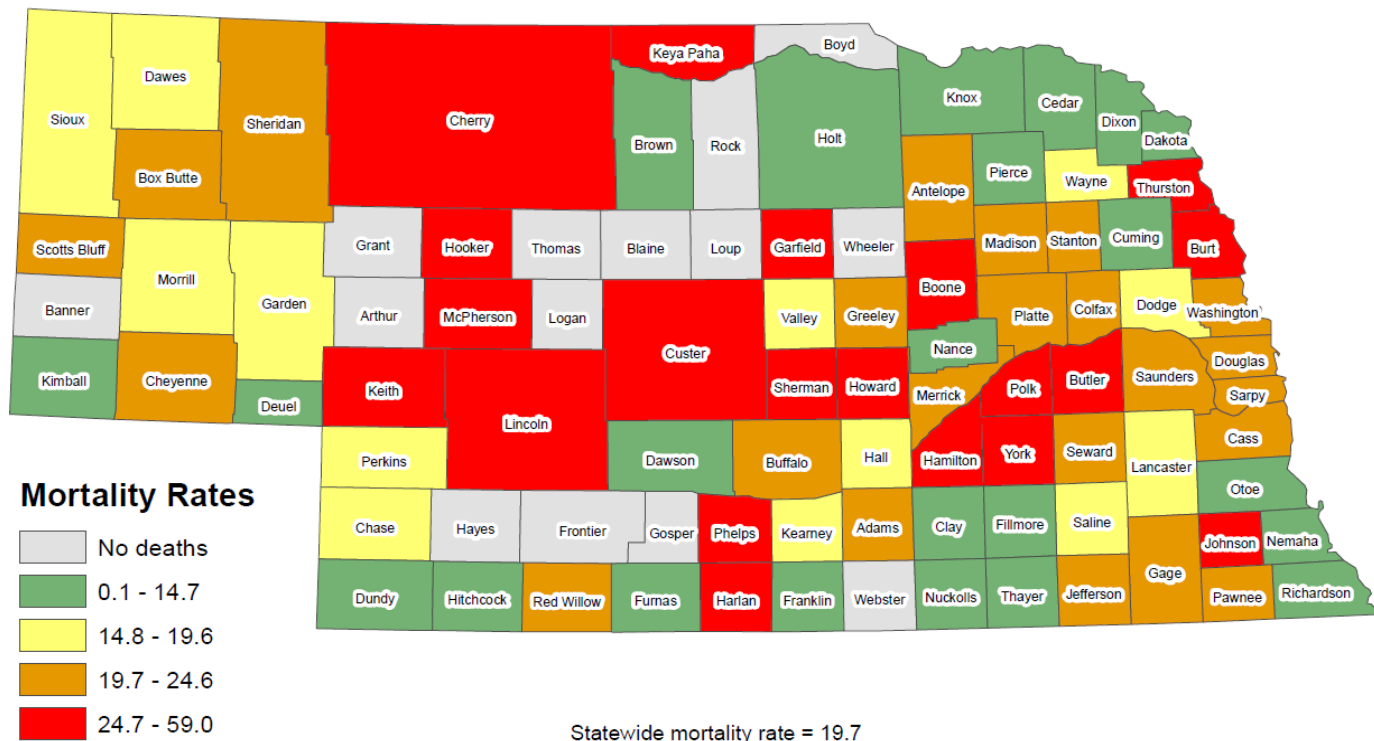
Female Breast Cancer Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 female population, and are age-adjusted to the 2000 US population



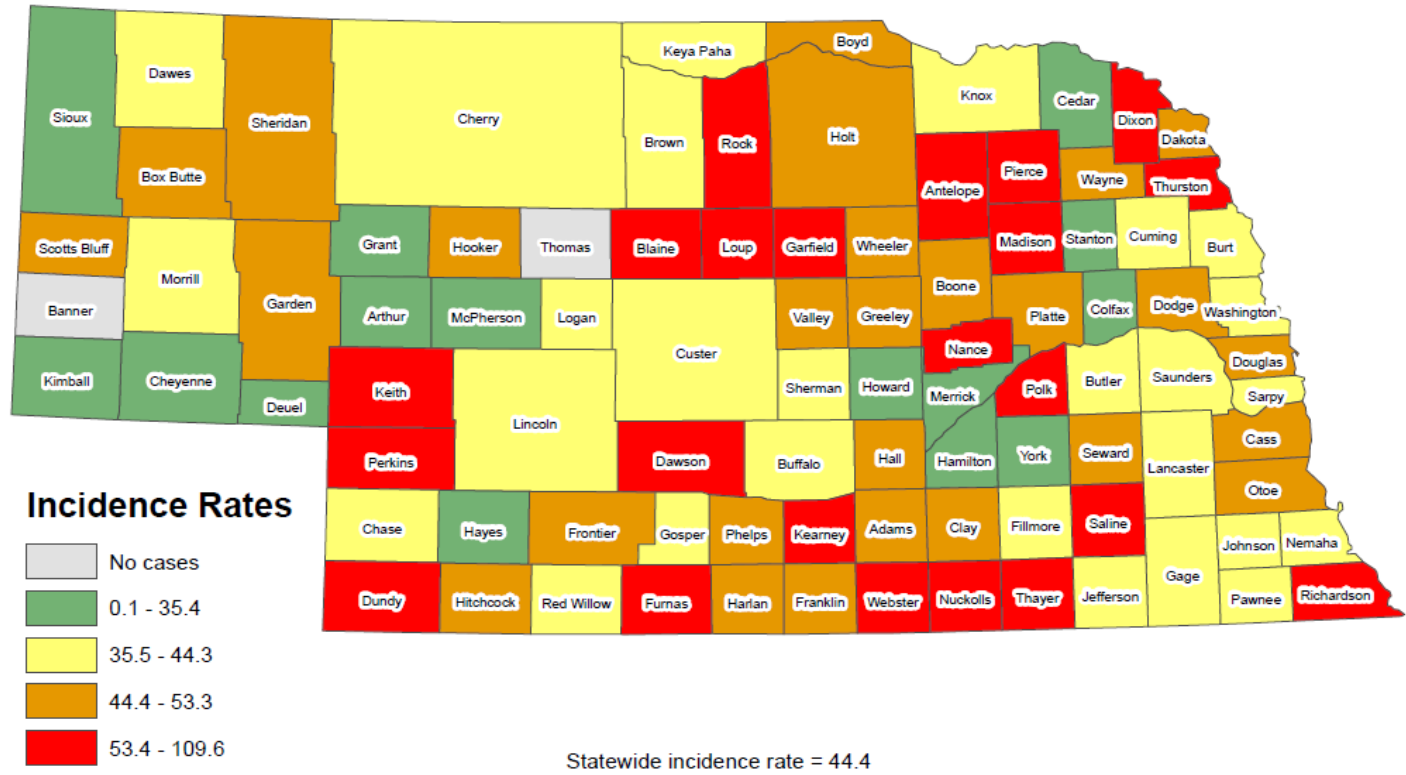
Female Breast Cancer Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 female population, and are age-adjusted to the 2000 US population



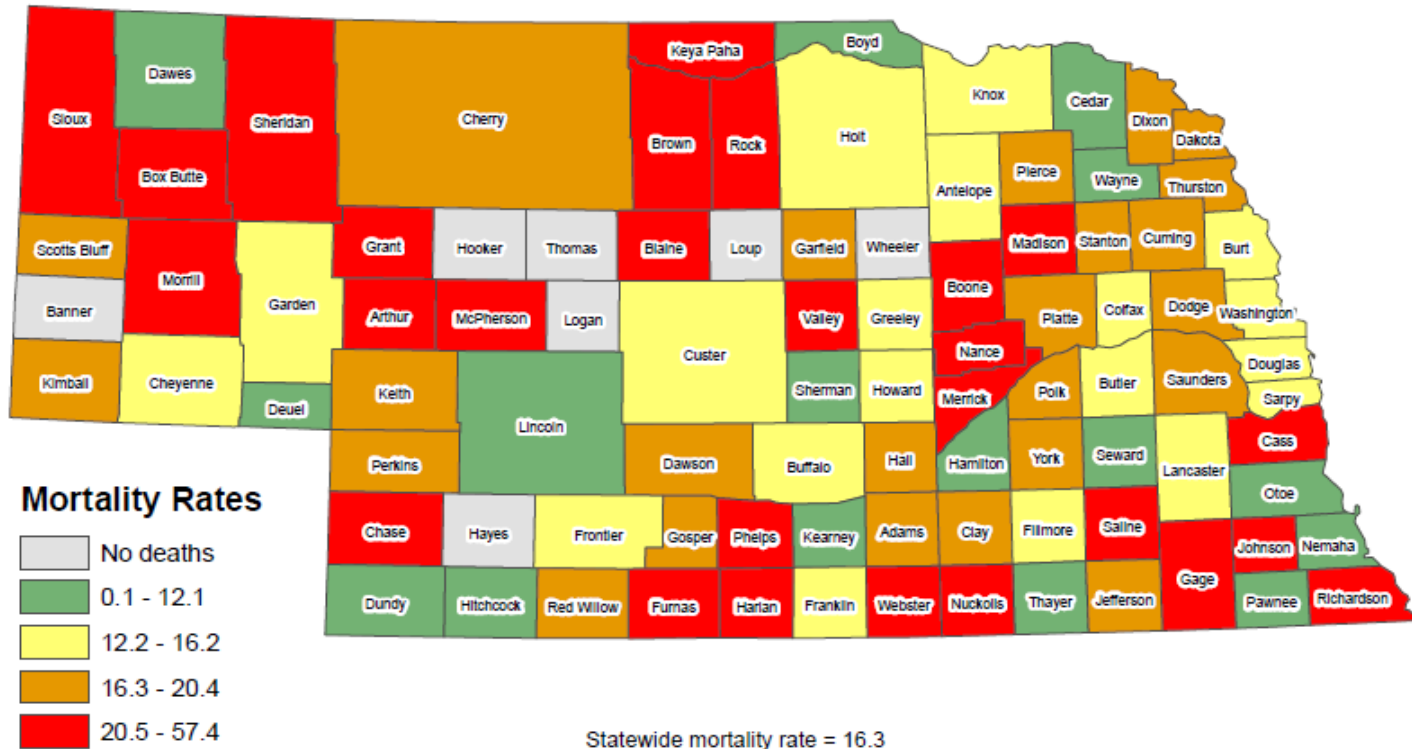
Colon & Rectum (Colorectal) Cancer Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



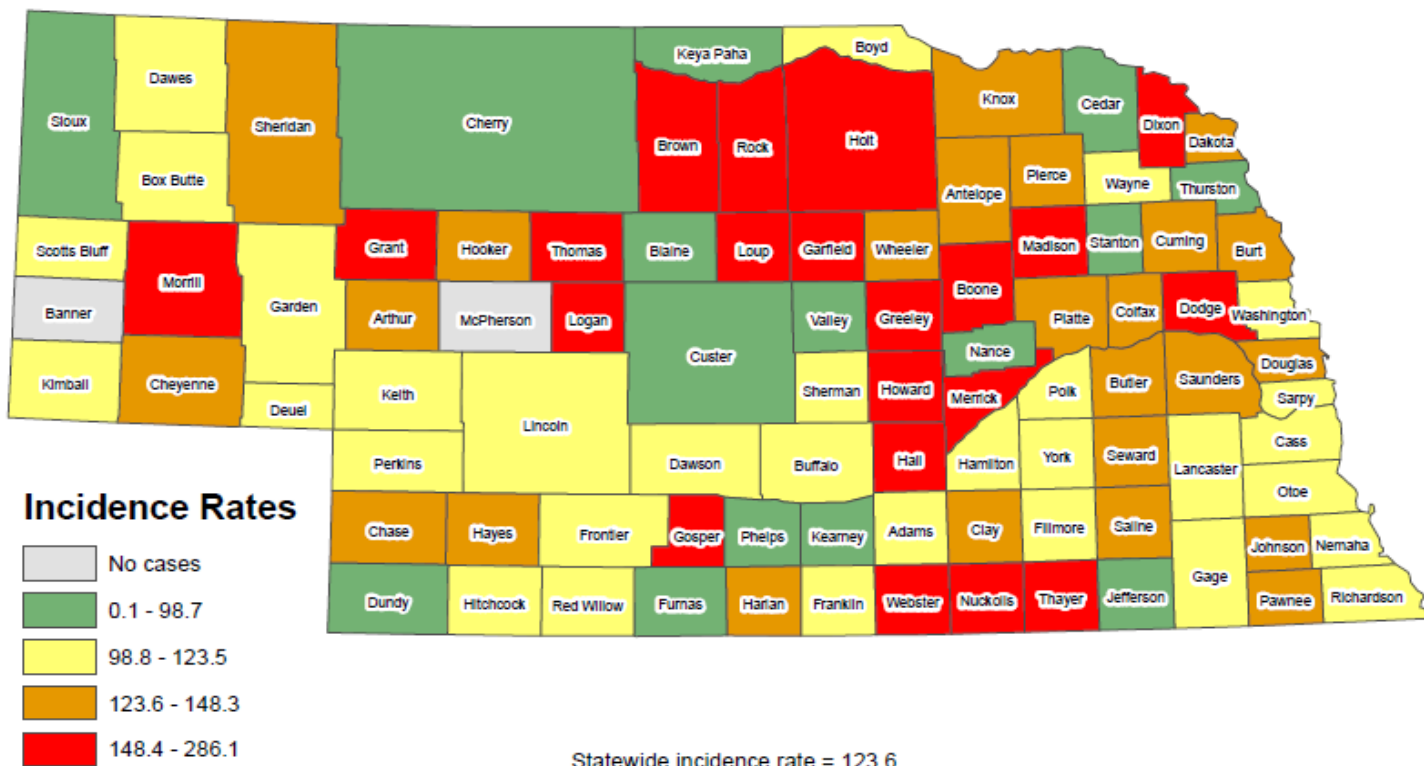
Colon & Rectum (Colorectal) Cancer Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



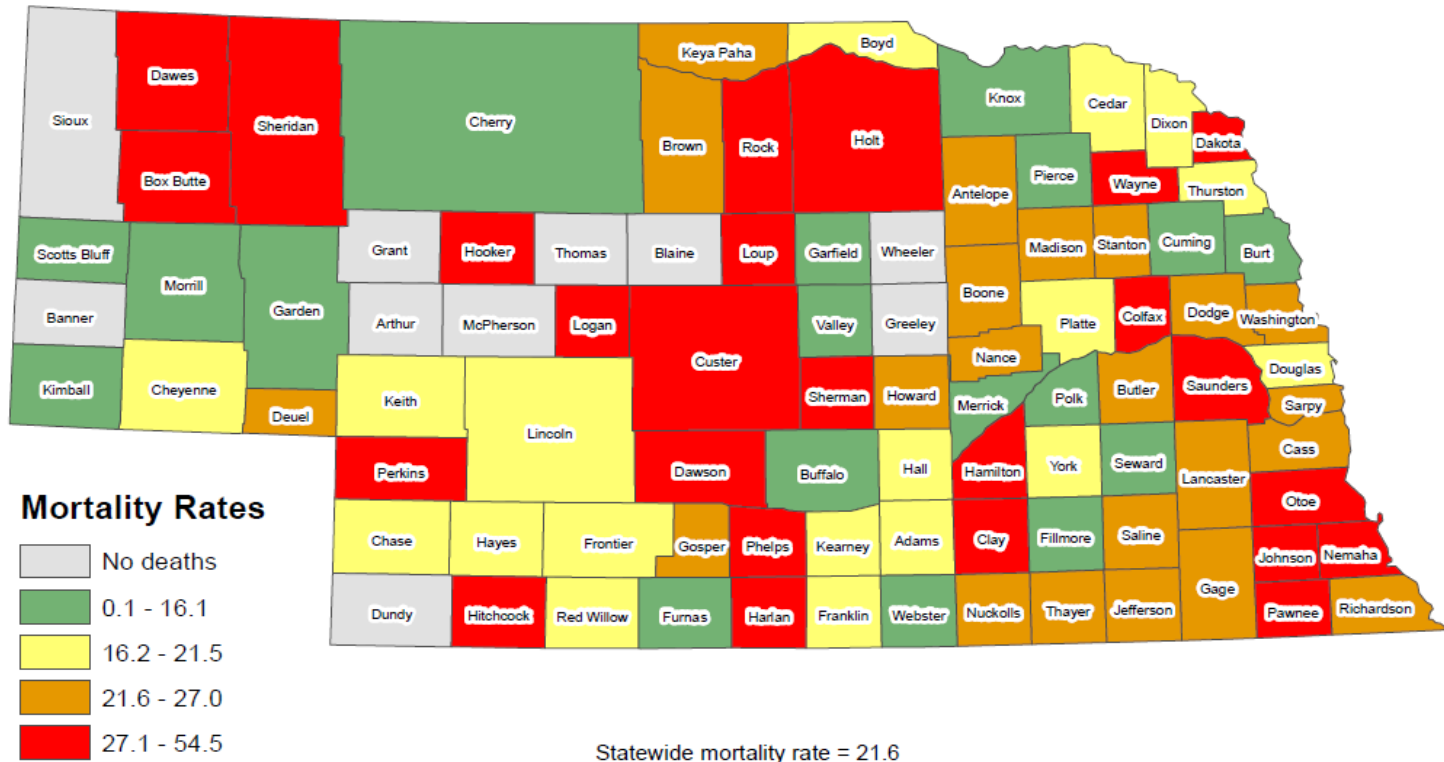
Prostate Cancer Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 male population, and are age-adjusted to the 2000 US population



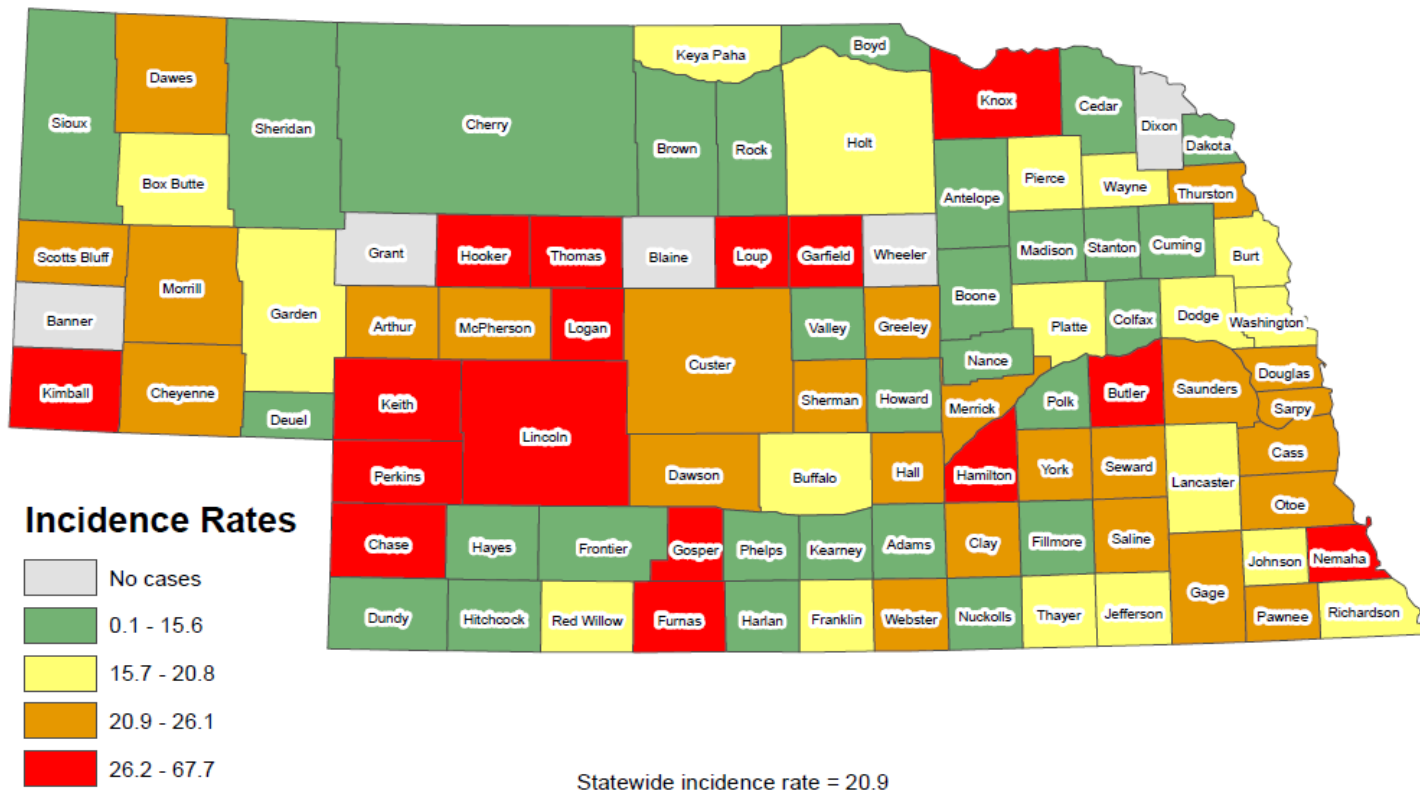
Prostate Cancer Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per male 100,000 population, and are age-adjusted to the 2000 US population



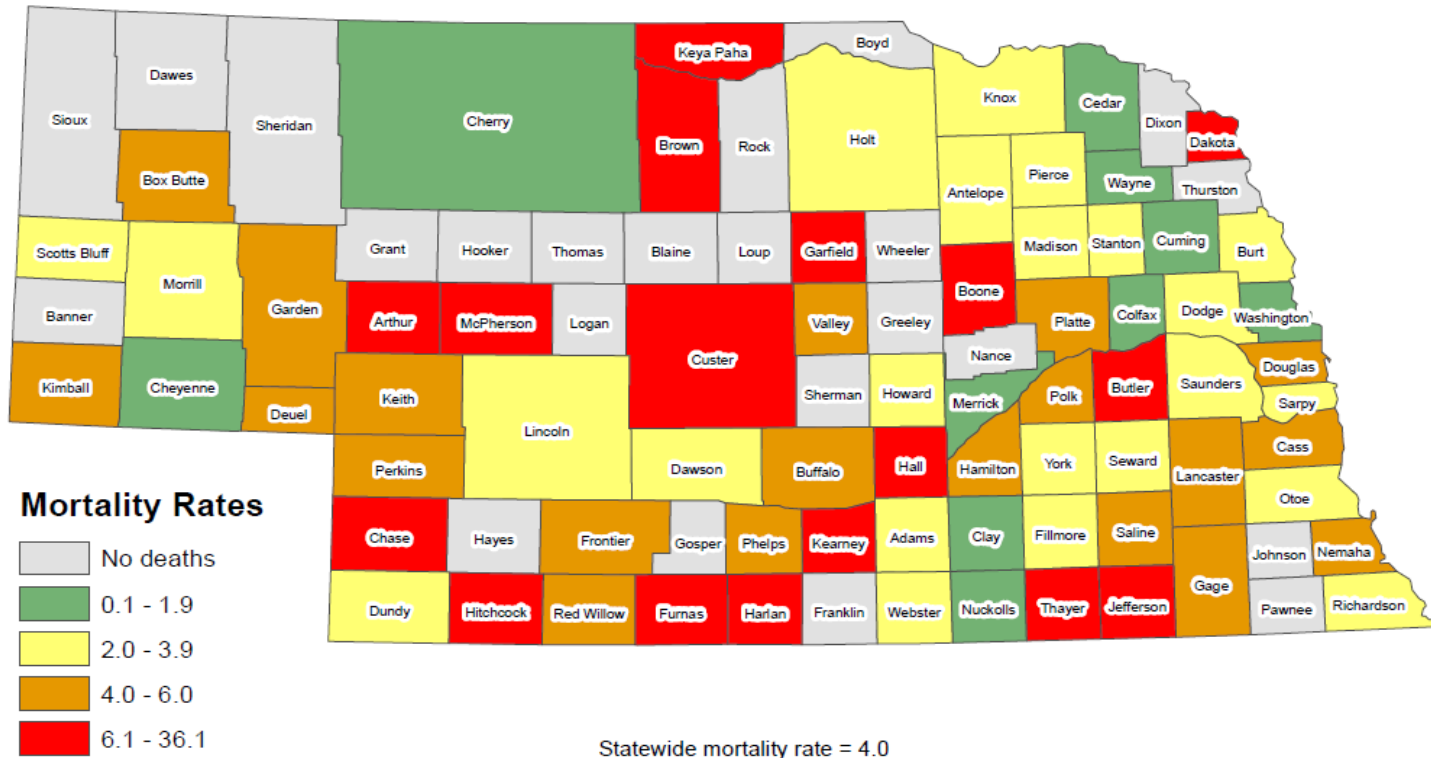
Urinary Bladder Cancer Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



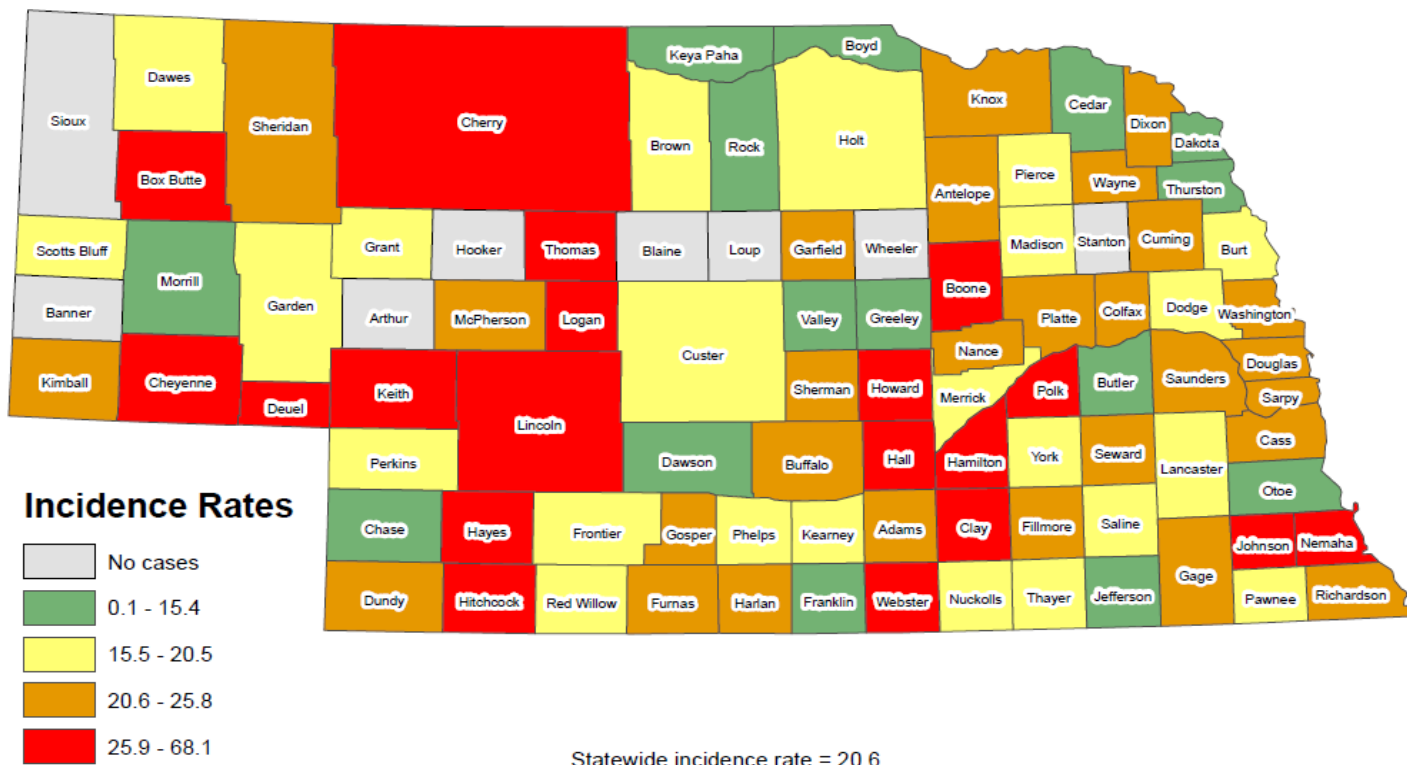
Urinary Bladder Cancer Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



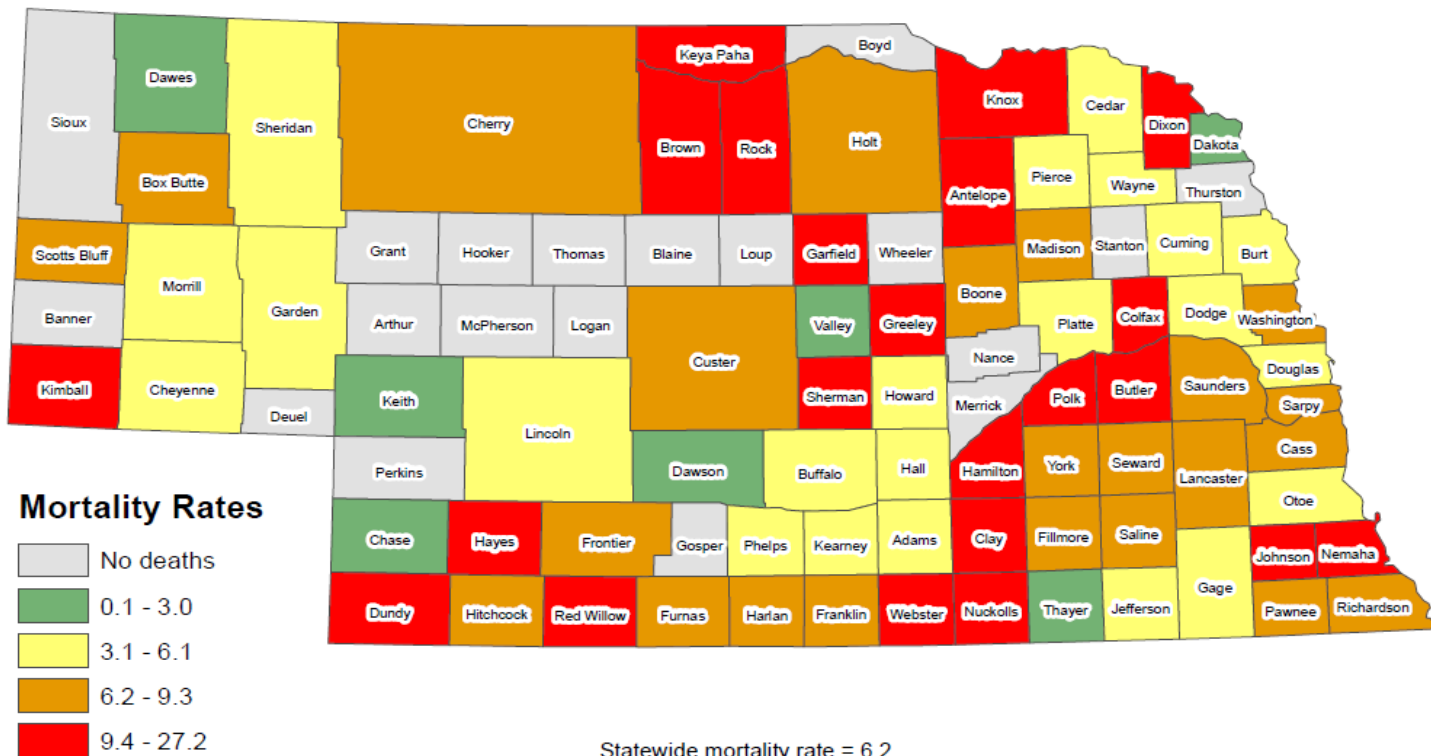
Non-Hodgkin Lymphoma Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



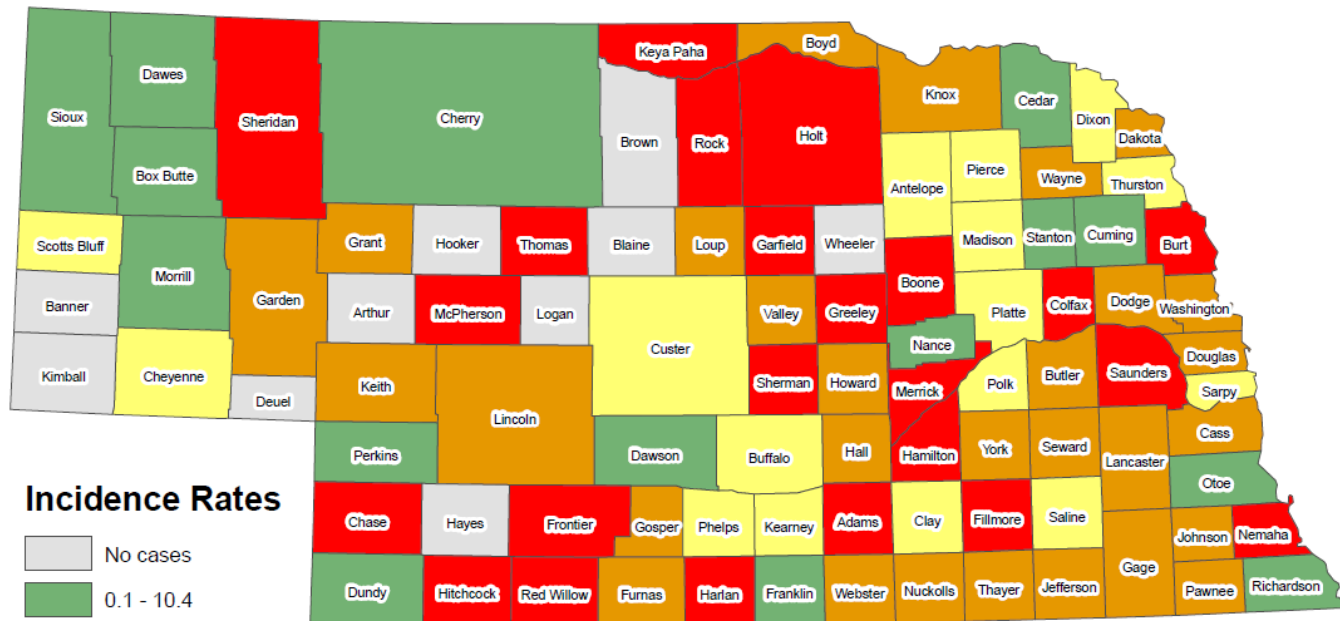
Non-Hodgkin Lymphoma Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



Leukemia Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



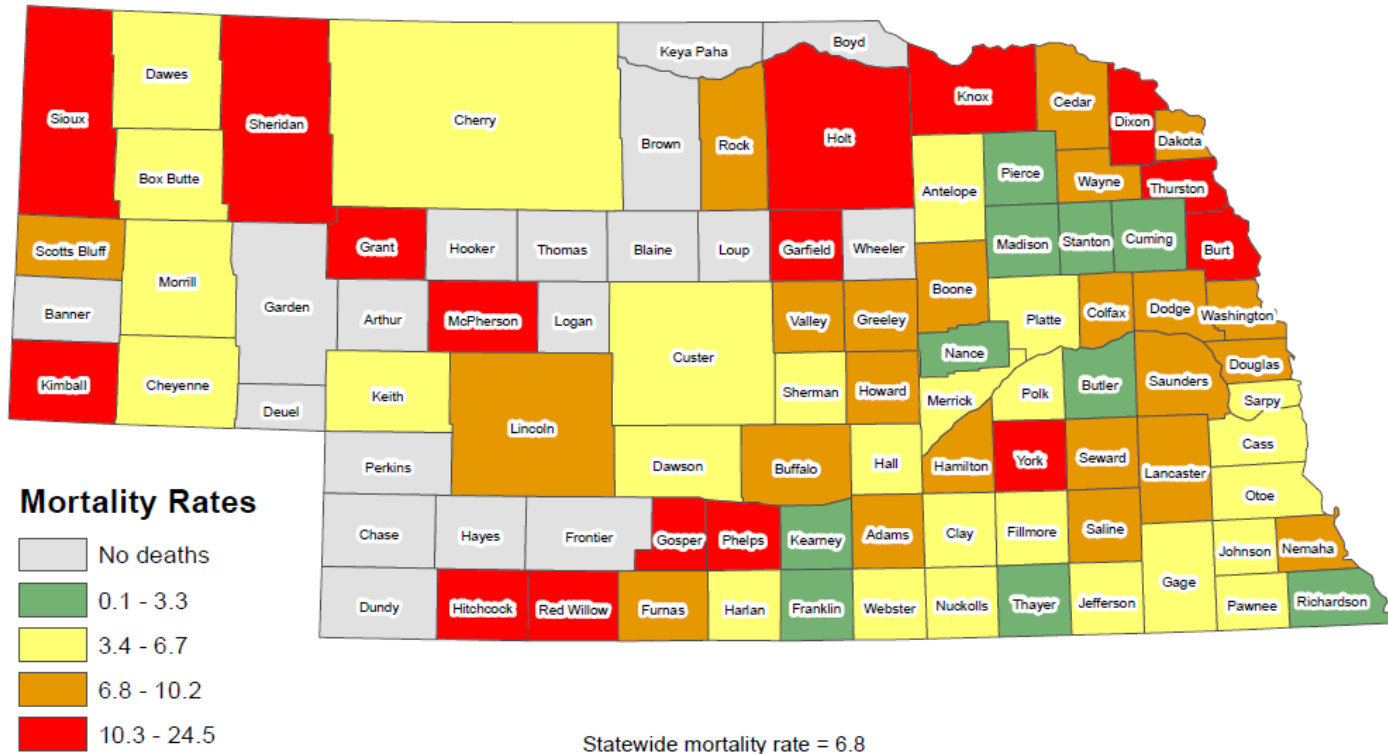
Incidence Rates

- No cases
- 0.1 - 10.4
- 10.5 - 13.9
- 14.0 - 17.5
- 17.6 - 81.8

Statewide incidence rate = 14.0

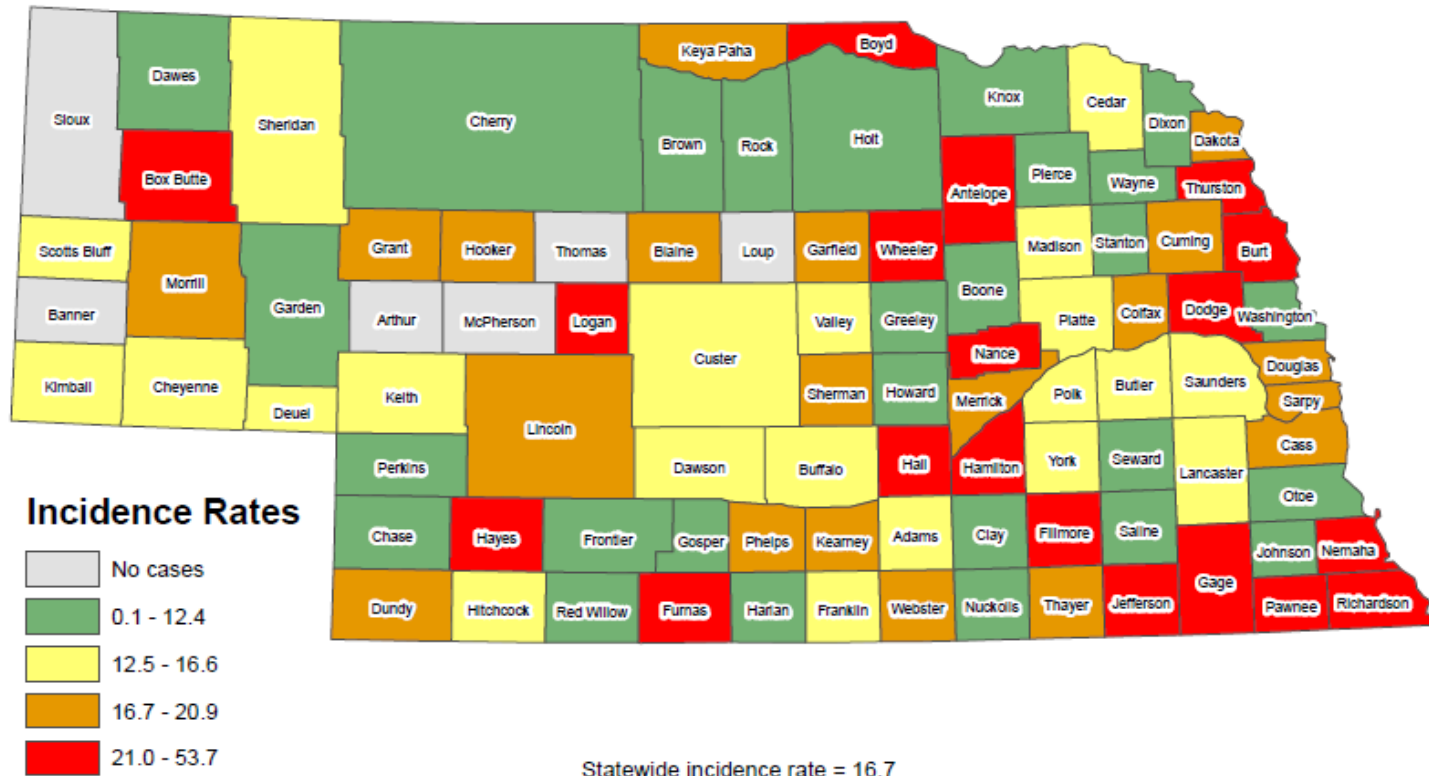
Leukemia Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



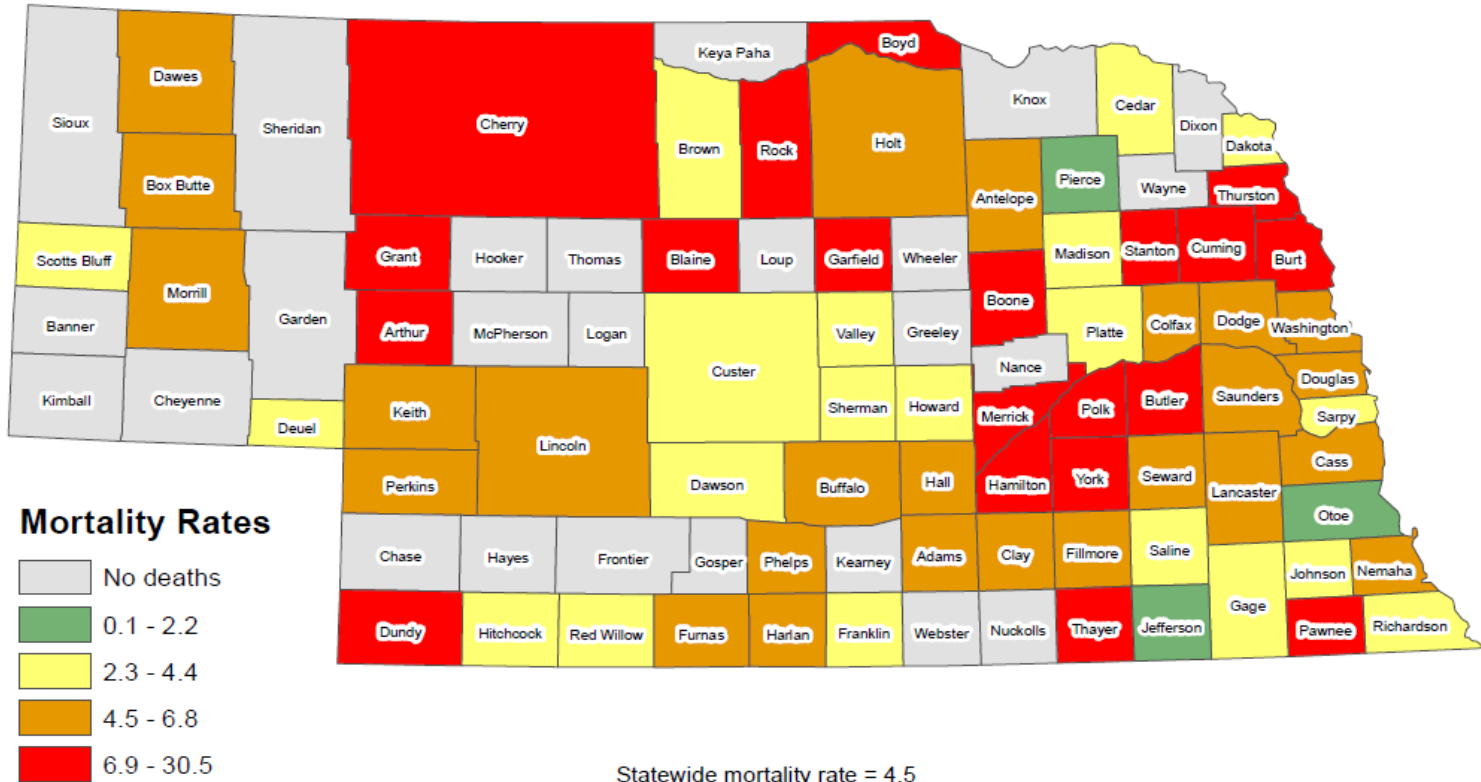
Kidney & Renal Pelvis Cancer Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



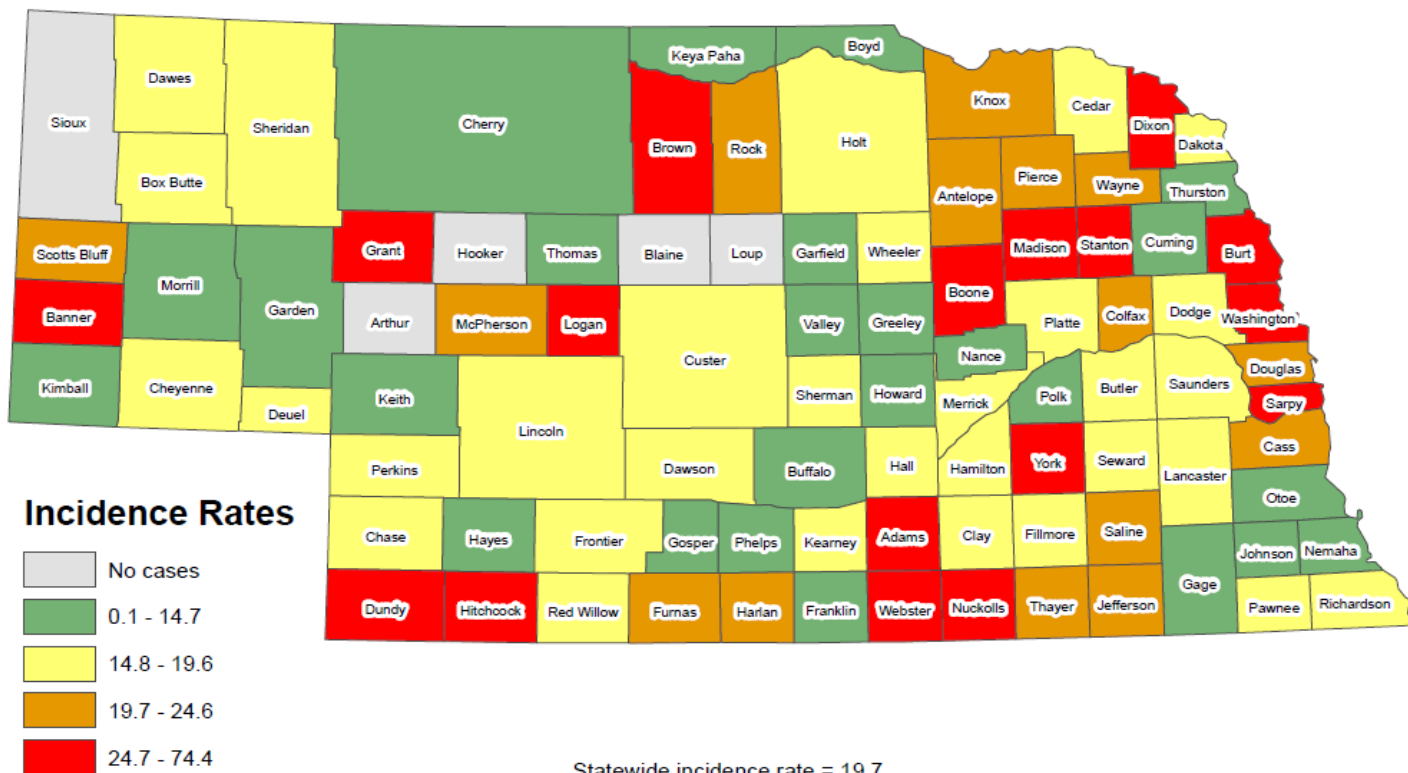
Kidney & Renal Pelvis Cancer Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



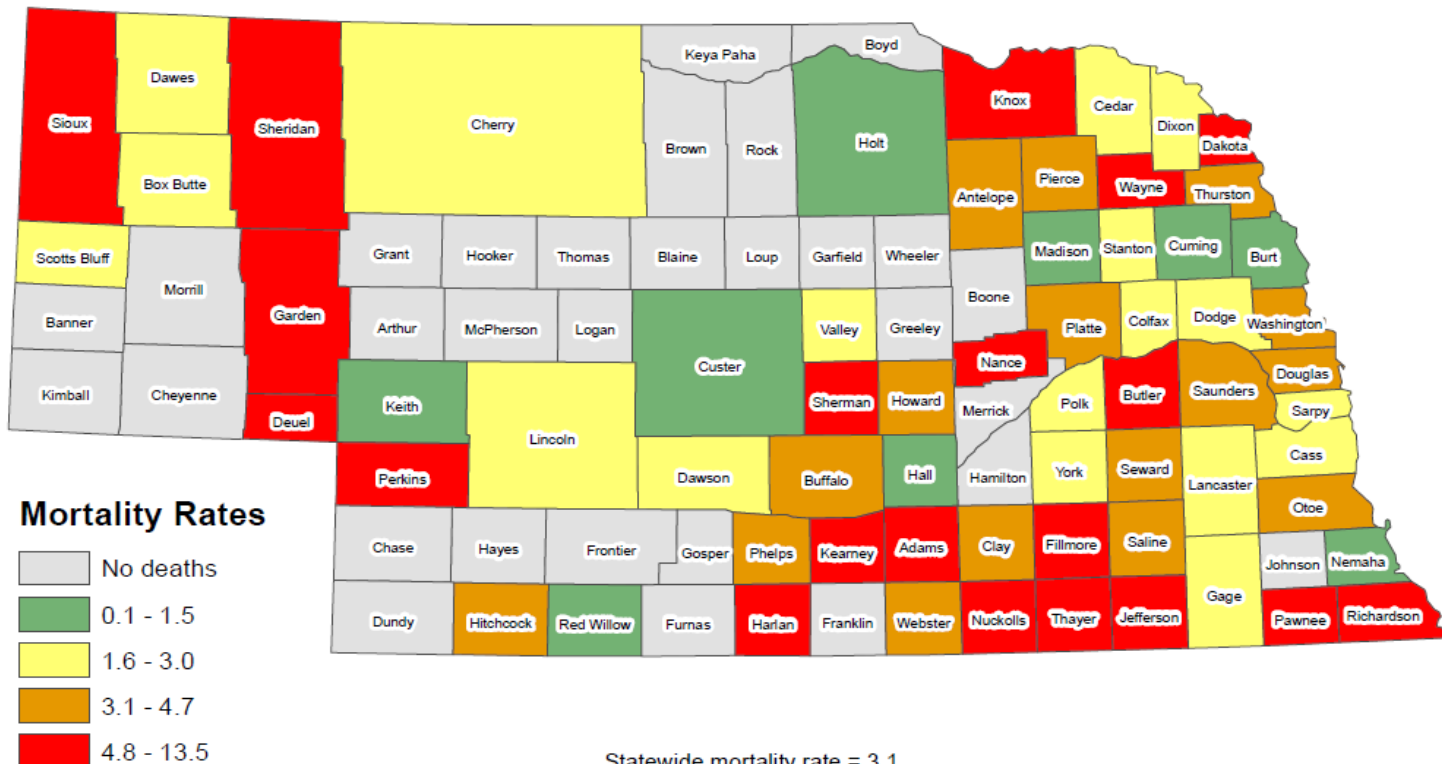
Melanoma of the Skin Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



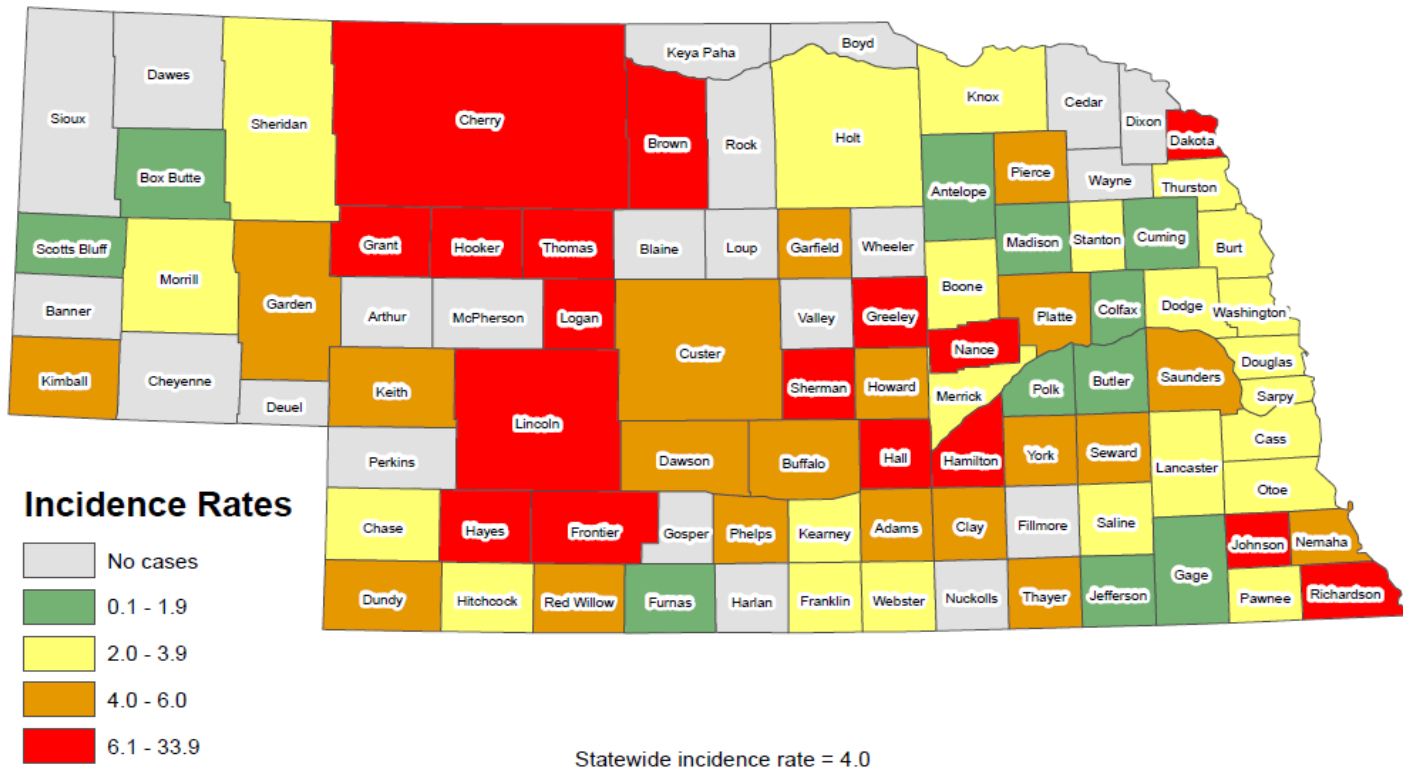
Melanoma of the Skin Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



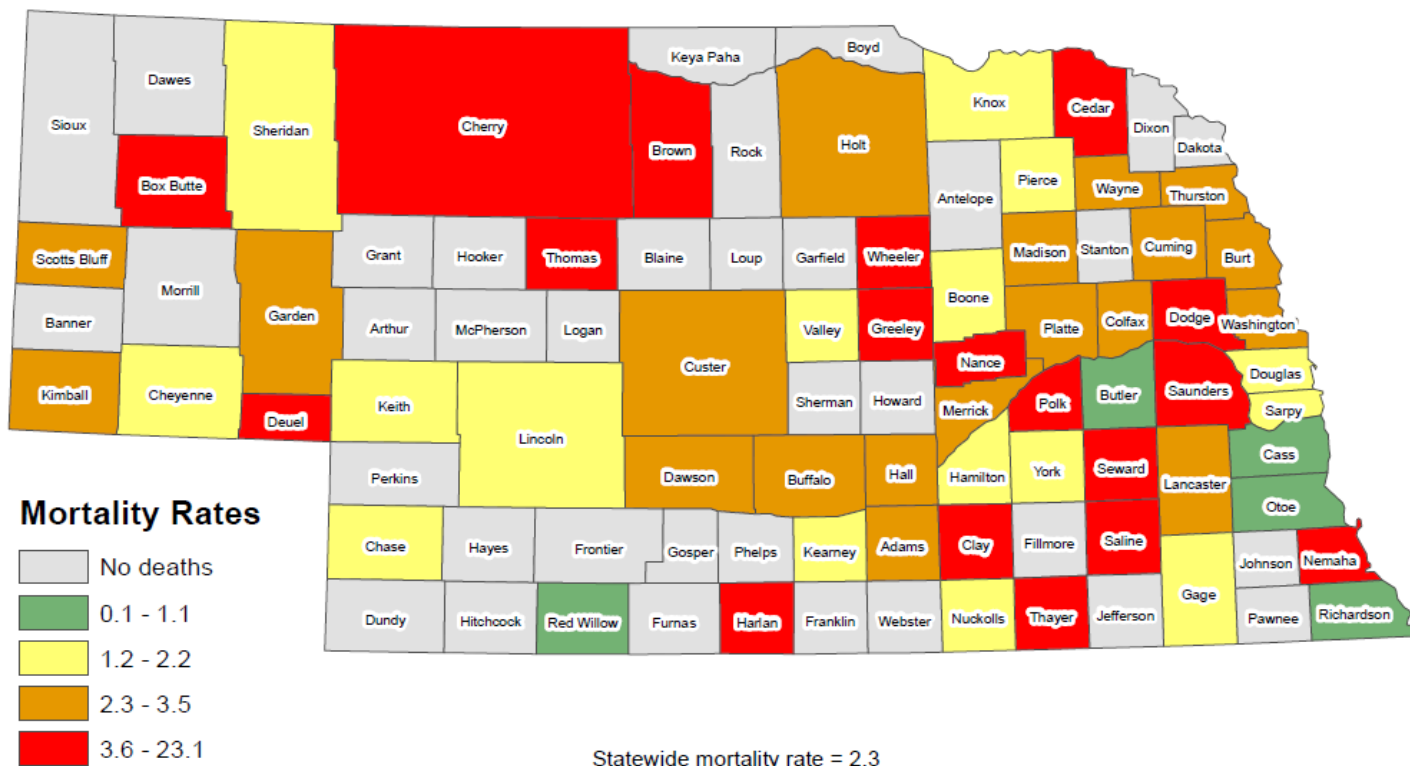
Myelodysplastic Syndromes Diagnoses in Nebraska, 2009-2013 Incidence Rates by County of Residence

Rates are expressed as the average annual number of new cases per 100,000 population, and are age-adjusted to the 2000 US population



Myelodysplastic Syndromes Deaths in Nebraska, 2009-2013 Mortality Rates by County of Residence

Rates are expressed as the average annual number of deaths per 100,000 population, and are age-adjusted to the 2000 US population



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REPORTING FACILITIES

Ainsworth--Brown County Hospital
Albion--Boone County Health Center
Alliance--Box Butte General Hospital
Alma--Harlan County Health System
Atkinson--West Holt Memorial Hospital, Inc.
Auburn--Nemaha County Hospital
Aurora--Memorial Hospital
Bassett--Rock County Hospital
Beatrice--Beatrice Community Hospital & Health Center, Inc.
Benkelman--Dundy County Hospital
Blair--Memorial Community Hospital
Bridgeport--Morrill County Community Hospital
Broken Bow--Jennie Melham Memorial Medical Ctr.
Callaway--Callaway District Hospital
Cambridge--Tri Valley Health System
Central City--Litzenberg Memorial County Hospital
Chadron--Chadron Community Hospital & Health Services
Columbus--Columbus Community Hospital, Inc.
Cozad--Cozad Community Hospital
Creighton--Creighton Area Health Services
Crete--Crete Area Medical Center
David City--Butler County Health Care Center
Fairbury--Jefferson Community Health Center, Inc.
Falls City--Community Medical Center, Inc.
Franklin--Franklin County Memorial Hospital
Fremont--Fremont Area Medical Center
Friend--Warren Memorial Hospital
Geneva--Fillmore County Hospital
Genoa--Genoa Community Hospital/LTC
Gordon--Gordon Memorial Hospital District
Gothenburg--Gothenburg Memorial Hospital
Grand Island--CHI Health St. Francis
Grant--Perkins County Health Services
Hastings--Mary Lanning Memorial Hospital
Hebron--Thayer County Health Services
Henderson--Henderson Health Care Services
Holdrege--Phelps Memorial Health Center
Imperial--Chase County Community Hospital
Kearney--CHI Health Good Samaritan
Kearney--CHI Health Good Samaritan Pathology
Kimball--Kimball Health Services & Hospital
Lexington--Tri-County Area Hospital District
Lincoln--Bryan-LGH Medical Center East & West
Lincoln--CHI Health Saint Elizabeth
Lincoln--Pathology Medical Services
Lincoln--Williamsburg Radiation Center
Lincoln--CHI Health Nebraska Heart
Lincoln--UNMC College of Dentistry
Lynch--Niobrara Valley Hospital Corp.
McCook--Community Hospital
Minden--Kearney County Health Services
Nebraska City--CHI Health St. Mary's
Neligh--Antelope Memorial Hospital

Norfolk--Faith Regional Health Services East & West
North Platte--Great Plains Regional Medical Center
North Platte--Pathology Services
Oakland--Oakland Memorial Hospital
Ogallala--Ogallala Community Hospital
Omaha--CHI Health Bergan Mercy
Omaha--CHI Health Immanuel
Omaha--Children's Hospital
Omaha--VA Nebraska-Western Iowa Health Care System
Omaha--Methodist Hospital Pathology Center
Omaha--Nebraska Medical Center
Omaha--Nebraska Methodist Hospital
Omaha--CHI Health Creighton University Med. Ctr.
Omaha--Boys Town National Research Hospital
Omaha--CHI Health Lakeside
Omaha--CHI Health Bergan Mercy Pathology
Omaha--Bishop Clarkson Hospital Pathology
Omaha--Creighton Pathology Associates
Omaha--Physicians Lab
O'Neill--Avera St. Anthony's Hospital
Ord--Valley County Hospital
Osceola--Annie Jeffrey Memorial County Health Ctr.
Oshkosh--Garden County Health Services
Osmond--Osmond General Hospital
Papillion--CHI Health Midlands
Pawnee City--Pawnee County Memorial Hospital
Pender--Pender Community Hospital
Plainview--CHI Health Plainview
Red Cloud--Webster County Community Hospital
Schuyler--CHI Health Schuyler
Scottsbluff--Regional West Medical Center
Scottsbluff--Western Pathology Consultants
Seward--Memorial Hospital
Sidney--Memorial Health Center
St. Paul--Howard County Community Hospital
Superior--Brodstone Memorial Hospital
Syracuse--Community Memorial Hospital
Tecumseh--Johnson County Hospital
Tilden--Tilden Community Hospital
Valentine--Cherry County Hospital
Wahoo--Saunders County Health Services
Wayne--Providence Medical Center
West Point--St. Francis Memorial Hospital
Winnebago--USPHS Indian Hospital
York--York General Hospital

Other States:

Sioux City, IA--Mercy Medical Center


State cancer registries participating in the National Interstate Data Exchange Agreement, and the state cancer registries of Arizona, Illinois, Iowa, Kansas, Minnesota, Missouri, and South Dakota.

THE NEBRASKA DEPARTMENT OF HEALTH AND HUMAN SERVICES
IS COMMITTED TO AFFIRMATIVE ACTION/
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