Cancer Incidence and Mortality in Nebraska: 2016

October 2019

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

What t 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
2016 ANNUAL REPORT

Nebraska Department of Health and Human Services

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EXECUTIVE SUMMARY

The Cancer Incidence and Mortality in Nebraska annual report for 2016 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 2016, there were 9,851 diagnoses of cancer among Nebraska residents. This number is slightly lower than the number of cancers that were diagnosed in 2015 (9,864).

- ***Cancer Incidence by Gender:*** In 2016, 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 2016.

- ***Cancer Incidence by Age:*** During the past five years (2012-2016), 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 years of age.

- ***Cancer Incidence by Site:*** During the past five years (2012-2016), cancers of the stomach, liver, in situ female breast, thyroid, lung, non-Hodgkin lymphoma, and leukemia were diagnosed significantly less often among Nebraska residents when compared to the US as a whole, while Hodgkin lymphoma, myeloma, colorectal, melanoma of skin, corpus uterus, and testicular cancers were diagnosed significantly more often. The number of melanomas diagnosed among Nebraska residents set a new single-year record in 2016, with 586 cases.

- ***Cancer Incidence by Race:*** During the past decade (2007-2016), African-Americans in Nebraska were significantly more likely to be diagnosed with myeloma, colorectal, kidney, lung, pancreas, and prostate cancers than were whites. Liver cancer diagnoses were also significantly more frequent among Native Americans, Asian-American/Pacific Islanders and Hispanics compared to whites.

- ***Overall Cancer Mortality:*** In 2016, 3,454 Nebraska residents died from cancer, which is a slight decrease from the 2015 cancer death total of 3,490. Cancer was the leading cause of death in Nebraska in 2016, surpassing heart disease by 156 deaths.

- ***Cancer Mortality by Site:*** During the past five years (2012-2016), deaths from cancers of the stomach, liver, and lung occurred significantly less often among Nebraska residents when compared to the US as a whole, while deaths from soft tissues cancer occurred significantly more often. Lung cancer was the leading cause of cancer mortality in Nebraska in 2016, accounting for 24.6% 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 more than 50%, which is consistent with national trends.

- ***Cancer Incidence by County:*** Below are the Nebraska counties where cancer incidence during 2012-2016 was significantly different ($p<.05$) from the state. (NOTE: counties with fewer than 20 cases are not included.)

Significantly lower ▼		*Significantly higher ▲*	
County	*Primary Sites*	*County*	*Primary Sites*
Adams	Kidney & renal pelvis	Burt	Prostate
Antelope	Female breast	Dodge	Prostate
Box Butte	Lung & bronchus Female breast	Douglas	Lung & bronchus
		Hall	Leukemia
Buffalo	Lung & bronchus	Holt	Prostate
Dawes	Female breast	Keith	Non-Hodgkin lymphoma
Gage	Melanoma of skin	Lincoln	Urinary bladder Non-Hodgkin lymphoma Leukemia
Hamilton	Female breast		
Holt	Female breast Lung & bronchus		
		Nance	Colon & rectum
Lancaster	Non-Hodgkin lymphoma	Nemaha	Lung & bronchus
Lincoln	Female breast	Phelps	Female Breast
Madison	Female breast Leukemia Urinary bladder	Saunders	Prostate
		Sarpy	Female Breast Melanoma of skin
Phelps	Prostate	Thayer	Colon & rectum
Red Willow	Female Breast		
Sarpy	Prostate		
Scotts Bluff	Lung & bronchus Female breast		

- ***Annual Report Special Topic:*** The special topic for this report is pediatric cancers. For this report, Pediatric cancers are defined as those cancers occurring among anyone under the age of 20. During the past five years (2012-2016), pediatric cancers accounted for 594 new cases including invasive cases and benign brain and central nervous system tumors and 57 deaths among Nebraska residents. Both state and national trends of the past decade has shown increasing incidence of pediatric cancers.

INTRODUCTION

This publication represents the 30th 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, 2016 and December 31, 2016, as well as during the past five years (January 1, 2012-December 31, 2016).

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 Methodist Hospital Association. Analysis of registry data and preparation of the annual statistical report are the responsibilities 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 high-risk populations and long-term disease 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 provides data upon request for research studies and public information, and has provided data to the North American Association of Central Cancer Registries (NAACCR), the National Cancer Institute (NCI), the American Cancer Society (ACS), CDC, and the University of Nebraska Medical Center, among others. 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 collected, NAACCR has awarded the NCR its gold standard certificate of data quality for 22 consecutive years, from 1995 to 2016.

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/Pages/Cancer-Registry.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 from 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 were compiled by CDC's National Program of Cancer Registries (NPCR) and NCI's Surveillance, Epidemiology, and End Results (SEER) Program. NPCR provides support for cancer registries in 46 states (including Nebraska), the District of Columbia, and some US territories, and covers 97% of the total US population. The mortality data presented in this report were 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 2015.

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 must 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 ensure 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 22 consecutive years (1995-2016), 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 of colorectal cancer 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 2016 bridged-race population estimates developed by the US Census Bureau and the National Center for Health Statistics. Incidence and mortality rates for multiple years (2012-2016) (see Tables 1, 2, 5, 6, 9-20) were calculated using population estimates for the years 2012-2016 combined, while rates for 2007-2016 (see Tables 3 and 7) were calculated using population estimates for the years 2007-2016 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, 2018. However, because some cases diagnosed during or even before 2016 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 be considered no longer 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, 2018; Nebraska data available on the CDC/NPCR website include cases that were reported through November 30, 2018.

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.

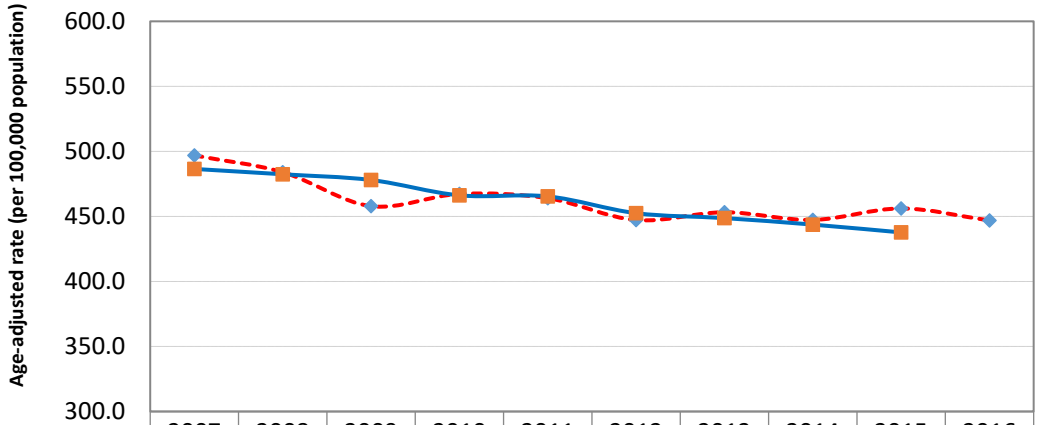
CANCER INCIDENCE IN NEBRASKA

The Nebraska Cancer Registry recorded 9,851 diagnoses of cancer among Nebraska residents in 2016, an increase from the 9,864 diagnoses recorded in 2015. The 2016 number translates into an incidence rate of 446.9 cases per 100,000 population. By primary site, cancers of the lung, breast, prostate, colon and rectum occurred most frequently, accounting for about half (48.9%) of all diagnoses. Recent registry experience suggests that as the registry continues to record cases, the final count for 2016 will probably increase by 100 to 300 cases.

Table 1 presents the number and rate of cancers diagnosed among Nebraska residents during 2016 and 2012-2016, for all sites combined and for cancers of specific sites. The most current estimates of US cancer incidence, which cover the years 2011-2015, 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 stomach, liver, in situ female breast, and lung (Nebraska rates are lower than the US) and for cancers of the colon and rectum, melanoma of skin, and testes (Nebraska rates are higher than the US). Table 2 presents the number of cancers diagnosed in Nebraska during 2012-2016 by age at diagnosis. Table 3 presents Nebraska incidence data by race and ethnicity for the years 2007-2016.

Cancer (All Sites)

Incidence Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	496.9	484.0	457.9	467.3	464.0	447.2	453.2	447.3	456.1	446.9
US	486.5	482.4	478.0	466.2	465.4	452.5	448.7	443.7	437.7	

TABLE 1: Cancer Incidence
Number of Cases and Rates, by Selected Primary Site and Gender
Nebraska (2016 and 2012-2016) & US (2011-2015)

Site	NEBRASKA 2016						NEBRASKA 2012-2016						US 2011-2015		
	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	5,055	484.6	4,796	421.4	9,851	446.9	24,710	495.3	23,469	422.7	48,179	451.8	493.8	419.0	449.2
Oral Cavity & Pharynx	202	19.2	73	6.2	275	12.3	895	17.5	363	6.4	1,258	11.6	17.6	6.4	11.6
Esophagus	88	8.1	21	1.6	109	4.6	428	8.5	100	1.7	528	4.8	7.9	1.8	4.6
Stomach	80	7.6	40	3.3	120	5.3	360	7.3	169	2.9	529	4.9	9.1	4.6	6.6
Small Intestine	28	2.7	27	2.4	55	2.6	147	3.0	111	2.0	258	2.5	2.7	2.1	2.4
Colon & Rectum	491	48.4	470	40.4	961	44.2	2,415	49.2	2,162	37.5	4,577	43.0	45.1	34.3	39.2
Liver & Intrahepatic Bile Ducts	106	9.6	31	2.6	137	5.8	458	8.7	166	2.8	624	5.6	12.4	4.3	8.1
Pancreas	169	16.7	145	11.6	314	14.1	739	15.1	663	11.2	1,402	13.0	14.4	11.1	12.6
Larynx	46	4.1	12	1.0	58	2.4	254	4.8	73	1.3	327	2.9	5.8	1.3	3.4
Lung & Bronchus	582	55.8	580	48.1	1,162	51.3	3,317	67.5	2,933	50.4	6,250	57.7	70.8	52.2	60.2
Soft Tissue	51	5.5	22	2.0	73	3.6	217	4.6	128	2.3	345	3.4	3.9	2.8	3.3
Melanoma of the Skin	320	31.7	266	26.4	586	28.4	1,313	26.7	1,123	22.3	2,436	23.9	27.3	16.8	21.3
Breast (invasive cases only)	26	2.4	1,433	127.5	1,459	67.6	84	1.7	6,842	124.6	6,926	65.9	1.3	124.7	66.8
Uterine Cervix	---	---	57	5.7	---	---	---	---	336	7.3	---	---	---	7.5	---
Uterine Corpus & Unspecified	---	---	317	27.4	---	---	---	---	1,541	27.3	---	---	---	26.2	---

TABLE 1 (continued): Cancer Incidence

Site	NEBRASKA 2016						NEBRASKA 2012-2016						US 2011-2015		
	Male		Female		Total		Male		Female		Total		Male	Female	Total
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	Rate	Rate	Rate
Ovary	---	---	88	8.0	---	---	---	---	593	10.8	---	---	---	11.3	---
Prostate	1,261	112.6	---	---	---	---	5,881	111.2	---	---	---	---	109.0	---	---
Testis	60	6.8	---	---	---	---	314	7.1	---	---	---	---	5.6	---	---
Urinary Bladder	320	31.6	105	8.1	425	18.7	1,666	34.8	530	8.7	2,196	20.2	35.4	8.8	20.3
Kidney & Renal Pelvis	253	24.6	126	10.8	379	17.4	1,180	23.3	650	11.7	1,830	17.2	22.1	11.4	16.4
Brain & Central Nervous System (invasive cases only)	80	8.3	56	5.2	136	6.6	389	8.0	301	5.8	690	6.8	7.7	5.5	6.5
Thyroid Gland	75	7.5	203	21.5	278	14.4	348	7.3	1,010	21.3	1,358	14.3	7.3	21.4	14.5
Hodgkin Lymphoma	31	3.5	14	1.5	45	2.5	157	3.4	118	2.5	275	2.9	3.0	2.3	2.6
Non-Hodgkin Lymphoma	214	20.7	177	15.3	391	17.6	1,152	23.8	926	16.2	2,078	19.5	22.8	15.6	18.9
Myeloma	70	6.9	51	4.4	121	5.5	400	8.1	268	4.5	668	6.1	8.2	5.3	6.6
Leukemia	195	19.4	113	10.2	308	14.3	901	18.6	596	10.7	1,497	14.3	17.7	10.8	13.8
Brain & Central Nervous System (benign & uncertain cases only)	73	7.2	127	12.2	200	9.8	364	7.5	669	12.8	1,033	10.2	8.8	15.6	12.4
Breast (in situ cases only)	---	---	296	27.6	---	---	---	---	1,451	27.3	---	---	0.1	30.4	16.0

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 (2012-2016)

	0-17 Yrs.		18-44 Yrs.		45-64 Yrs.		65+ Yrs.		TOTAL	
	Number	%	Number	%	Number	%	Number	%	Number	%
All Sites	451	0.9	3,558	7.4	17,307	35.9	26,863	55.8	48,179	100.0
Oral Cavity & Pharynx	5	0.4	83	6.6	574	45.6	596	47.4	1,258	100.0
Esophagus	0	0.0	10	1.9	195	36.9	323	61.2	528	100.0
Stomach	0	0.0	31	5.9	182	34.4	316	59.7	529	100.0
Small Intestine	0	0.0	22	8.5	104	40.3	132	51.2	258	100.0
Colon & Rectum (Colorectal)	10	0.2	242	5.3	1,560	34.1	2,765	60.4	4,577	100.0
Liver & Intrahepatic Bile Ducts	7	1.3	8	1.5	256	48.5	257	48.7	528	100.0
Pancreas	0	0.0	42	3.0	413	29.5	947	67.5	1,402	100.0
Larynx	0	0.0	10	3.1	139	42.5	178	54.4	327	100.0
Lung & Bronchus	1	0.0	63	1.0	1,792	28.7	4,394	70.3	6,250	100.0
Soft Tissue	21	6.1	61	17.7	102	29.6	161	46.7	345	100.0
Melanoma of the Skin	5	0.2	432	17.7	941	38.6	1,058	43.4	2,436	100.0
Female Breast (invasive cases only)	0	0.0	577	8.4	3,044	44.5	3,221	47.1	6,842	100.0
Uterine Cervix	1	0.3	132	39.3	150	44.6	53	15.8	336	100.0
Uterine Corpus & Unspecified	0	0.0	110	7.1	785	50.9	646	41.9	1,541	100.0
Ovary	6	1.0	73	12.4	238	40.5	271	46.1	588	100.0
Prostate	0	0.0	18	0.3	2,391	40.7	3,472	59.0	5,881	100.0
Testis	3	1.0	250	79.6	51	16.2	10	3.2	314	100.0
Urinary Bladder	0	0.0	37	1.7	490	22.3	1,669	76.0	2,196	100.0
Kidney & Renal Pelvis	16	0.9	121	6.6	791	43.2	902	49.3	1,830	100.0
Brain & Central Nervous System (invasive cases only)	91	13.2	110	15.9	205	29.7	284	41.2	690	100.0
Thyroid Gland	17	1.3	503	37.0	546	40.2	292	21.5	1,358	100.0
Hodgkin Lymphoma	34	12.4	122	44.4	67	24.4	52	18.9	275	100.0
Non-Hodgkin Lymphoma	17	0.8	135	6.5	664	32.0	1,262	60.7	2,078	100.0
Myeloma	0	0.0	20	3.0	237	35.5	411	61.5	668	100.0
Leukemia	115	7.7	137	9.2	386	25.8	859	57.4	1,497	100.0
Brain & Central Nervous System (benign & uncertain	46	4.5	174	16.8	402	38.9	411	39.8	1,033	100.0
Female Breast (in situ cases only)	0	0.0	124	8.5	767	52.9	560	38.6	1,451	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 (2007-2016)

	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	89,475	458.8	All Sites	3,215	506.5	All Sites	508	403.3	All Sites	715	283.9	All Sites	2,062	276.5
Rank															
1	Female Breast	12,542	124.7	Prostate	576	193.3	Female Breast	77	98.2	Female Breast	100	62.7	Female Breast	280	72.3
2	Lung & Bronchus	11,673	58.9	Lung & Bronchus	453	77.8	Lung & Bronchus	72	73.4	Lung & Bronchus	83	38.5	Prostate	200	69.8
3	Prostate	11,647	123.5	Female Breast	408	118.2	Colon & Rectum	54	44.1	Colon & Rectum	75	32.2	Colon & Rectum	188	28.4
4	Colon & Rectum	8,992	45.5	Colon & Rectum	336	56.5	Prostate	38	78.8	Prostate	56	68.0	Lung & Bronchus	151	28.5
5	Urinary Bladder	4,199	21.0	Kidney & Renal Pelvis	167	26.1	Kidney & Renal Pelvis	35	22.2	Thyroid	55	14.6	Thyroid	115	10.1
6	Non-Hodgkin Lymphoma	3,959	20.4	Pancreas	108	19.0	Liver & Intrahepatic Bile Ducts	25	15.6	Liver & Intrahepatic Bile Ducts	47	19.1	Kidney & Renal Pelvis	113	15.3
7	Melanoma	3,922	21.2	Liver & Intrahepatic Bile Ducts	103	14.5	Leukemia	22	14.3	Oral Cavity & Pharynx	35	11.8	Non-Hodgkin Lymphoma	112	15.3
8	Kidney & Renal Pelvis	3,317	17.0	Non-Hodgkin Lymphoma	102	15.5	Non-Hodgkin Lymphoma	15	9.9	Non-Hodgkin Lymphoma	28	11.8	Leukemia	102	9.1
9	Uterine Corpus & Unspecified	2,833	27.4	Myeloma	91	15.1	Uterine Corpus & Unspecified	14	16.5	Leukemia	25	8.4	Brain & Central Nervous System	63	5.8
10	Leukemia	2,779	14.4	Urinary Bladder	75	13.7	Thyroid	14	6.7	Stomach	18	7.3	Uterine Corpus & Unspecified	60	14.6

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.

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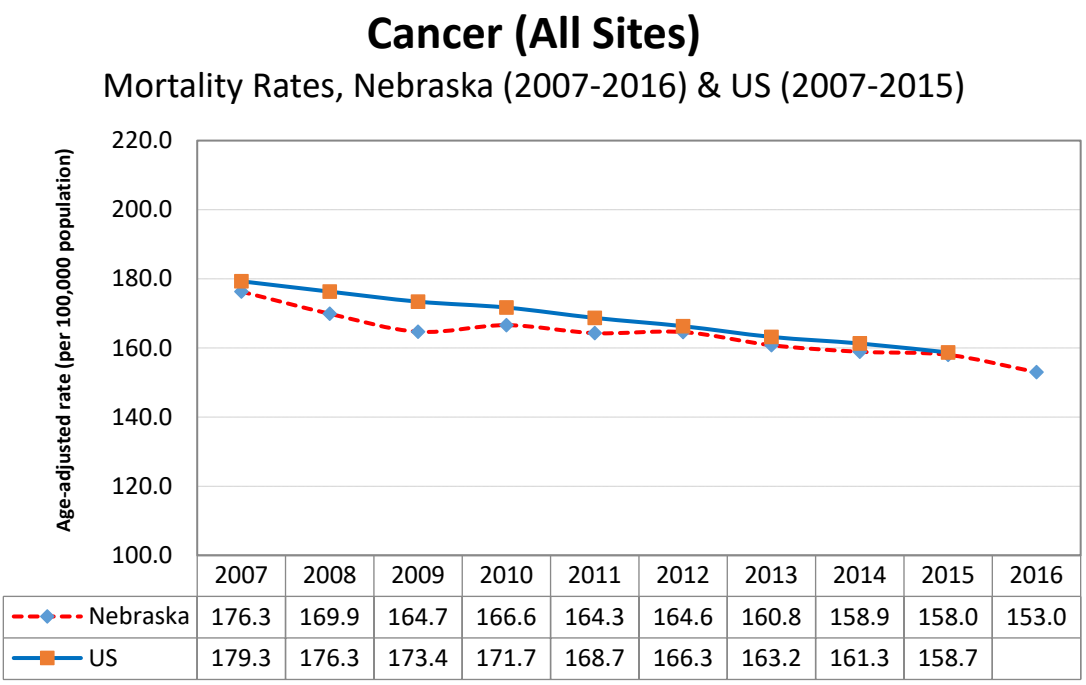
CANCER MORTALITY IN NEBRASKA

In 2016, 3,454 Nebraska residents died from cancer, a decrease from the state's 2015 tally of 3,490 cancer deaths. The 2016 count translates into a rate of 153.0 cancer deaths per 100,000 population. Cancer was the leading cause of mortality among Nebraska residents in 2016, followed by heart disease with 3,298 deaths. By primary site, cancers of the lung, colon and rectum, breast, and pancreas accounted for just under half (48.4%) of Nebraska's cancer deaths in 2016.

Table 4 presents the number and rate of cancer deaths that occurred among Nebraska residents during 2016 and 2012-2016, for all sites combined and for specific sites. The most recent US cancer mortality rates, which cover the years 2011 through 2015, 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, liver, and lung (Nebraska rates lower than the US) and for soft tissue cancer (Nebraska rates higher than the US). Table 5 presents the number of Nebraska cancer deaths during 2012-2016 by age at death. Table 6 presents Nebraska cancer mortality data by race and ethnicity for the years 2007-2016.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	176.3	169.9	164.7	166.6	164.3	164.6	160.8	158.9	158.0	153.0
US	179.3	176.3	173.4	171.7	168.7	166.3	163.2	161.3	158.7	

TABLE 4: Cancer Mortality
Number of Deaths and Rates, by Selected Primary Site and Gender
Nebraska (2016 and 2012-2016) & US (2011-2015)

Site	NEBRASKA 2016						NEBRASKA 2012-2016						US 2011-2015		
	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	1,784	178.2	1,670	135.1	3,454	153.0	9,091	189.4	8,218	136.5	17,309	158.6	196.8	139.6	163.5
Oral Cavity & Pharynx	31	3.1	24	2.0	55	2.5	155	3.1	85	1.4	240	2.2	3.9	1.3	2.5
Esophagus	85	8.3	23	1.7	108	4.8	404	8.1	90	1.5	494	4.5	7.2	1.5	4.0
Stomach	34	3.4	8	0.6	42	1.9	140	2.9	66	1.1	206	1.9	4.3	2.3	3.2
Colon & Rectum (Colorectal)	158	15.7	155	12.5	313	14.0	837	17.4	806	13.1	1,643	15.0	17.3	12.2	14.5
Liver & Intrahepatic Bile Ducts	73	6.5	42	3.4	115	4.9	340	6.6	166	2.8	506	4.6	9.4	3.8	6.4
Pancreas	131	13.4	136	10.9	267	12.1	623	12.9	565	9.3	1,188	10.9	12.6	9.5	10.9
Larynx	9	0.8	6	0.4	15	0.6	91	1.8	25	0.4	116	1.1	1.8	0.4	1.0
Lung & Bronchus	434	42.8	416	33.6	850	37.3	2,418	50.3	2,034	34.1	4,452	41.0	53.8	35.4	43.4
Melanoma of the Skin	32	3.3	14	1.0	46	2.0	197	4.1	105	1.8	302	2.8	3.9	1.6	2.6
Breast	3	0.3	243	19.9	246	11.0	10	0.2	1,214	20.3	1,224	11.2	0.3	20.9	11.6
Uterine Cervix	---	---	19	1.7	---	---	---	---	109	2.1	---	---	---	2.3	---

TABLE 4 (continued): Cancer Mortality

Site	NEBRASKA 2016						NEBRASKA 2012-2016						US 2011-2015		
	Male		Female		Total		Male		Female		Total		Male	Female	Total
	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	Rate	Rate	Rate
Uterine Corpus & Unspecified	---	---	61	4.9	---	---	---	---	268	4.5	---	---	---	4.6	---
Ovary	---	---	80	6.4	---	---	---	---	402	6.8	---	---	---	7.2	---
Prostate	145	15.3	---	---	---	---	861	18.9	---	---	---	---	19.5	---	---
Kidney & Renal Pelvis	64	6.0	25	2.0	89	3.7	308	6.2	155	2.5	463	4.2	5.6	2.4	3.8
Urinary Bladder	66	6.8	29	2.1	95	4.1	308	6.6	130	2.0	438	3.9	7.6	2.2	4.4
Brain & Other Nervous System	66	6.5	39	3.6	105	4.9	297	6.1	228	4.1	525	5.0	5.3	3.6	4.4
Thyroid	1	0.1	4	0.3	5	0.2	25	0.5	32	0.5	57	0.5	0.5	0.5	0.5
Hodgkin Lymphoma	2	0.2	1	0.1	3	0.1	10	0.2	14	0.2	24	0.2	0.4	0.3	0.3
Non-Hodgkin Lymphoma	71	7.6	44	3.5	115	5.2	340	7.3	273	4.3	613	5.6	7.4	4.5	5.7
Leukemia	104	10.6	60	5.0	164	7.4	445	9.5	327	5.3	772	7.1	9.0	5.0	6.7
Myeloma	48	4.7	22	1.7	70	3.1	226	4.7	139	2.2	365	3.3	4.2	2.7	3.3

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 5: Cancer Mortality
Number of Deaths and Percentage Distribution, by Selected Primary Site and Age at Death
Nebraska (2012-2016)

	0-17 Yrs.		18-44 Yrs.		45-64 Yrs.		65+ Yrs		TOTAL	
	Number	%	Number	%	Number	%	Number	%	Number	%
All Sites	62	0.4	428	2.5	4,239	24.5	12,580	72.7	17,309	100.0
Oral Cavity & Pharynx	0	0.0	8	3.3	86	35.8	146	60.8	240	100.0
Esophagus	0	0.0	6	1.2	159	32.2	329	66.6	494	100.0
Stomach	0	0.0	8	3.9	53	25.7	145	70.4	206	100.0
Colon & Rectum (Colorectal)	0	0.0	52	3.2	370	22.5	1,221	74.3	1,643	100.0
Liver & Intrahepatic Bile Ducts	1	0.2	12	2.4	204	40.3	289	57.1	506	100.0
Pancreas	0	0.0	16	1.3	304	25.6	868	73.1	1,188	100.0
Lung & Bronchus	0	0.0	30	0.7	1,121	25.2	3,301	74.1	4,452	100.0
Melanoma of the Skin	0	0.0	15	5.0	95	31.5	192	63.6	302	100.0
Female Breast	0	0.0	60	4.9	353	29.1	801	66.0	1,214	100.0
Uterine Cervix	0	0.0	20	18.3	56	51.4	33	30.3	109	100.0
Uterine Corpus & Unspecified	0	0.0	5	1.9	77	28.6	187	69.5	269	100.0
Ovary	0	0.0	8	2.0	122	30.3	272	67.7	402	100.0
Prostate	0	0.0	0	0.0	71	8.2	790	91.8	861	100.0
Kidney & Renal Pelvis	0	0.0	8	1.7	137	29.6	318	68.7	463	100.0
Urinary Bladder	0	0.0	2	0.5	64	14.6	372	84.9	438	100.0
Brain & Central Nervous System	25	4.8	51	9.7	168	32.0	281	53.5	525	100.0
Thyroid	0	0.0	0	0.0	11	19.3	46	80.7	57	100.0
Hodgkin Lymphoma	0	0.0	0	0.0	9	37.5	15	62.5	24	100.0
Non-Hodgkin Lymphoma	3	0.5	19	3.1	105	17.1	486	79.3	613	100.0
Leukemia	10	1.3	31	4.0	117	15.2	614	79.5	772	100.0
Myeloma	0	0.0	2	0.5	65	17.8	298	81.6	365	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 (2007-2016)

	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	32,672	161.8	All Sites	1,170	209.4	All Sites	169	153.7	All Sites	228	104.5	All Sites	567	99.0
Rank															
1	Lung & Bronchus	8,523	42.7	Lung & Bronchus	315	57.6	Lung & Bronchus	48	50.2	Lung & Bronchus	49	22.8	Lung & Bronchus	94	18.8
2	Colon & Rectum	3,256	16.0	Colon & Rectum	134	25.8	Colon & Rectum	21	15.3	Liver & Intrahepatic Bile Ducts	37	14.7	Colon & Rectum	45	8.0
3	Female Breast	2,198	19.8	Female Breast	88	27.3	Female Breast	14	22.7	Colon & Rectum	18	8.6	Female Breast	40	11.1
4	Pancreas	2,136	10.6	Pancreas	81	14.6	Liver & Intrahepatic Bile Ducts	7	4.4	Pancreas	13	6.7	Liver & Intrahepatic Bile Ducts	37	6.7
5	Prostate	1,718	20.4	Prostate	69	37.2	Leukemia	6	4.6	Female Breast	12	8.3	Leukemia	32	4.2
6	Leukemia	1,420	7.1	Liver & Intrahepatic Bile Ducts	63	8.9	Pancreas	6	4.2	Non-Hodgkin Lymphoma	10	4.5	Prostate	29	17.3
7	Non-Hodgkin Lymphoma	1,261	6.2	Myeloma	43	8.1	Kidney & Renal Pelvis	6	4.0	Leukemia	10	4.1	Stomach	28	4.0
8	Brain & CNS	999	5.2	Esophagus	34	5.5	Stomach	5	3.8	Oral Cavity & Pharynx	9	3.0	Non-Hodgkin Lymphoma	27	5.6
9	Esophagus	903	4.5	Stomach	27	4.9	Prostate	4	9.2	Stomach	8	2.6	Kidney & Renal Pelvis	27	4.4
10	Kidney & Renal Pelvis	875	4.3	Leukemia	27	4.3	Oral Cavity & Pharynx	4	7.4	Ovary	6	5.0	Brain & CNS	26	3.3

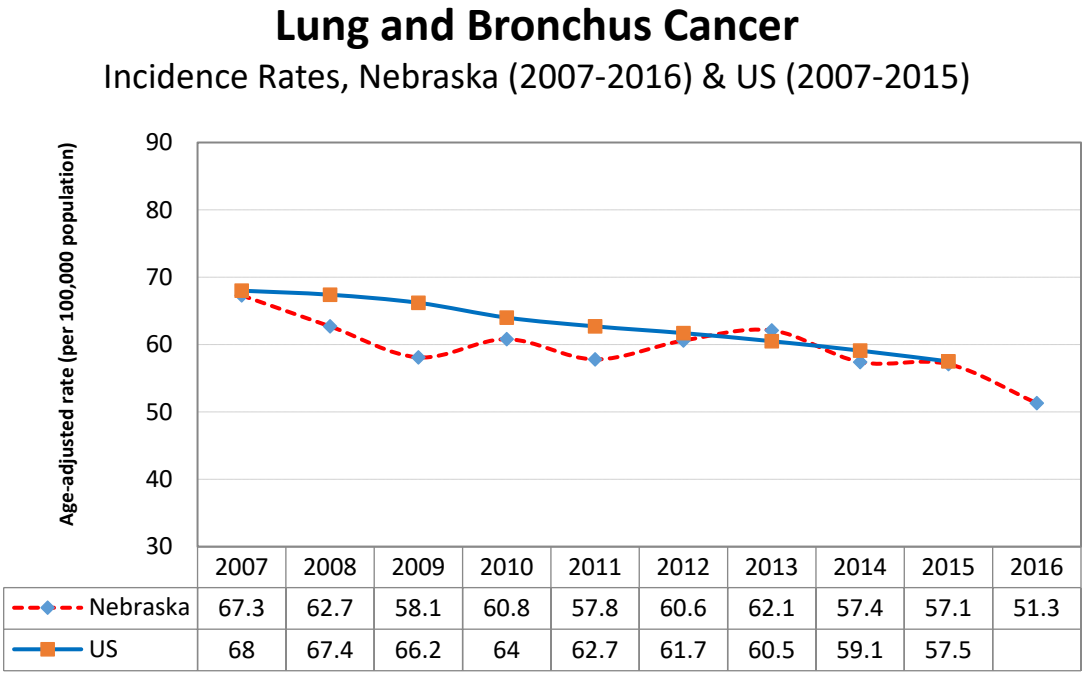
Rates are per 100,000 population, excluding gender-specific sites (prostate, female breast, ovary), which are per 100,000 male or female population. All rates are age-adjusted to the 2000 US population.
Abbreviation: CNS, central nervous system

INCIDENCE AND MORTALITY FOR SELECTED PRIMARY SITES

Lung and Bronchus

Although lung cancer was only the third most frequently diagnosed cancer among Nebraska residents in 2016, it was the year's leading cause of cancer mortality, accounting for 25% of the state's cancer deaths. During the past five years (2012-2016), lung cancer has averaged over 1,200 diagnoses and almost 900 deaths in Nebraska per year. Although lung cancer is more likely to strike men than women, the lung cancer death rate for Nebraska men has fallen by over 40% since 1990, while remaining almost unchanged for Nebraska women. Due to the small number of cases that are detected at an early stage of the disease, the 5-year relative survival rate for people diagnosed with lung cancer is less than 20%.

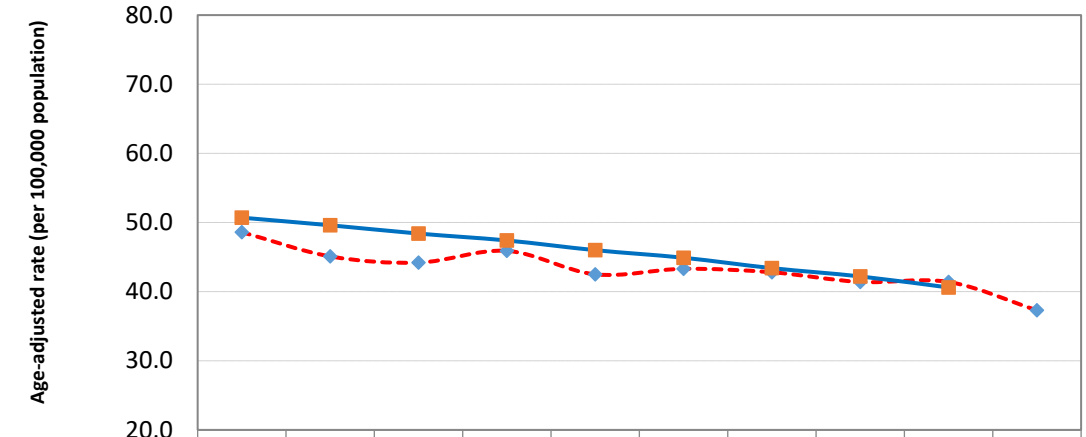
Cigarette smoking is the major risk factor for lung cancer and causes about 80% of lung cancer deaths. People who smoke cigarettes are 15 to 30 times more likely to die from lung cancer than non-smokers. Quitting smoking at any age reduces the risk of lung cancer, although the risk for smokers is higher than the risk for a lifelong non-smoker. The US Preventive Services Task Force (USPSTF) and ACS have both endorsed screening for lung cancer, using low-dose computed tomography (LDCT), 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.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	67.3	62.7	58.1	60.8	57.8	60.6	62.1	57.4	57.1	51.3
US	68	67.4	66.2	64	62.7	61.7	60.5	59.1	57.5	

Lung and Bronchus Cancer

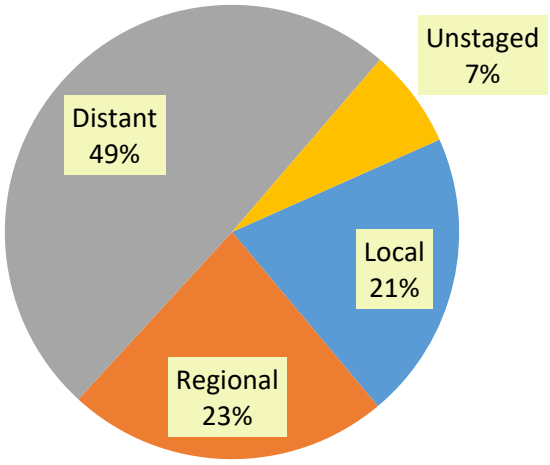
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	48.6	45.1	44.2	45.9	42.5	43.3	42.8	41.4	41.4	37.3
US	50.7	49.6	48.4	47.4	46	44.9	43.4	42.2	40.6	

Lung and Bronchus Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016

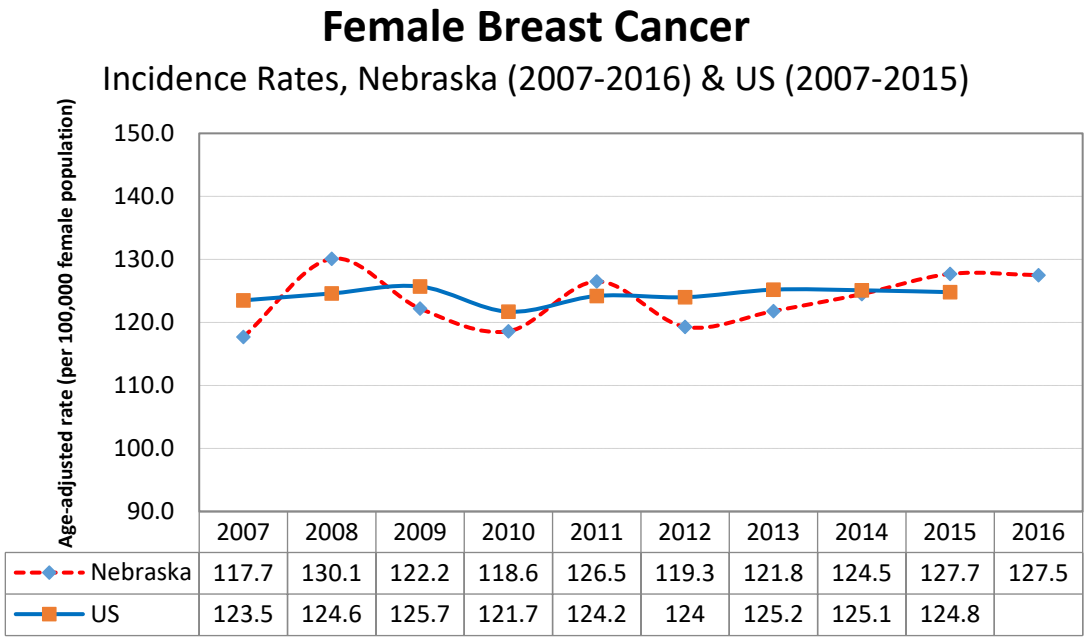


Breast (Female only)

Breast cancer is the most common type of cancer among women and the second most frequent cause of female cancer deaths. Between 2012 and 2016, 6,842 Nebraska women were diagnosed with invasive breast cancer (and another 1,451 were diagnosed with in situ breast cancer) and 1,214 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, early detection through screening, and increased awareness.

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.

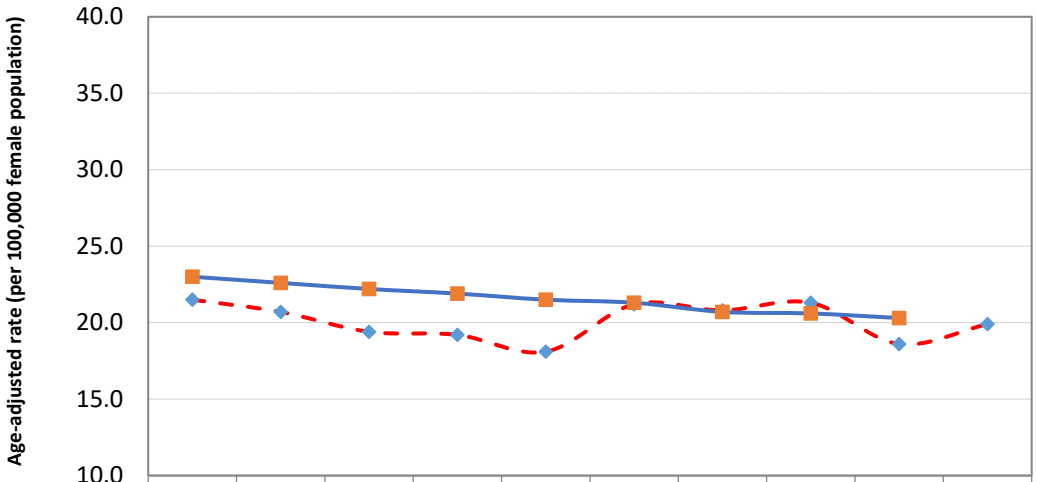
Screening for breast cancer is known to save lives, although opinion varies on how and when to screen. USPSTF guidelines recommend mammography for women 50-74 on an every-other-year schedule. However, ACS guidelines recommend that women 40-44 have the choice for annual mammography; women 45-54 have annual 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.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	117.7	130.1	122.2	118.6	126.5	119.3	121.8	124.5	127.7	127.5
US	123.5	124.6	125.7	121.7	124.2	124	125.2	125.1	124.8	

Female Breast Cancer

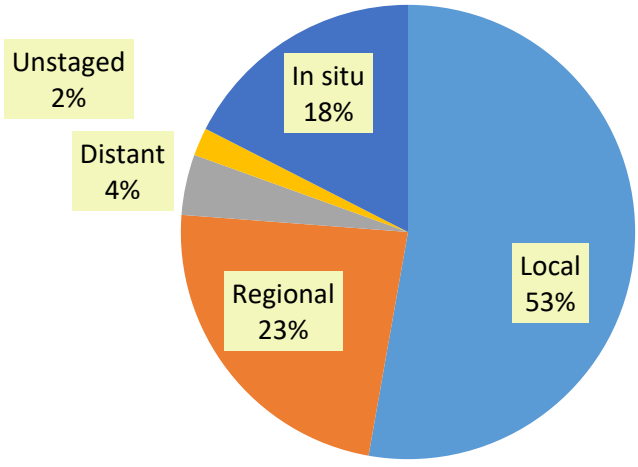
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	21.5	20.7	19.4	19.2	18.1	21.2	20.8	21.3	18.6	19.9
US	23.0	22.6	22.2	21.9	21.5	21.3	20.7	20.6	20.3	

Female Breast Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016

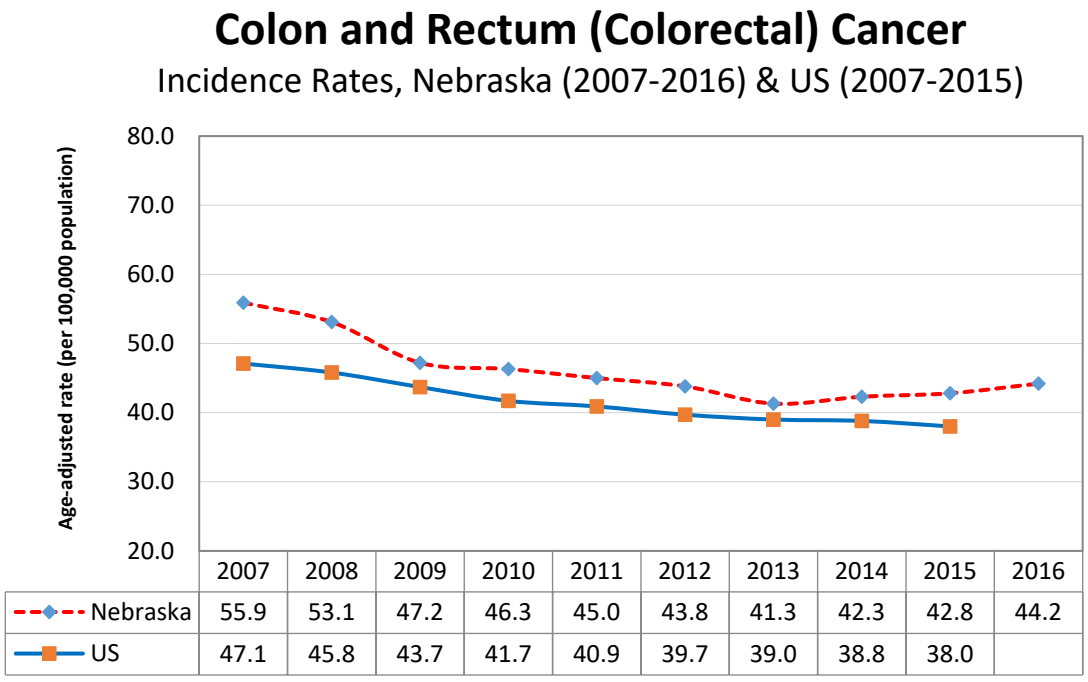


Colon and Rectum (Colorectal)

In 2016, colorectal cancer was the fourth most frequently diagnosed cancer among Nebraska residents, accounting for 961 new cases. It was also the second leading cause of cancer mortality in the state, accounting for 313 deaths.

The risk of developing colorectal cancer increases with age. More than half (60.4%) of all colorectal cancer cases that occurred in Nebraska during 2012-2016 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.

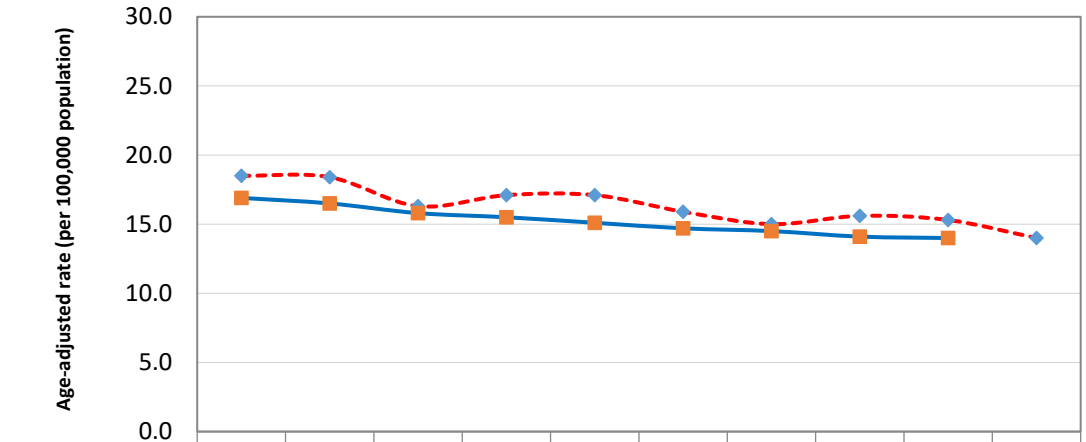
Screening for asymptomatic polyps and tumors is known to prevent colorectal cancer cases and deaths, and there are a number of recommended test options. Among them include several types of stool tests, flexible sigmoidoscopy, colonoscopy, CT colonography (virtual colonoscopy), and double-contrast barium enema. Recommended frequency varies by type of test. For people of average risk without symptoms, the USPSTF recommends screening for those 50-75 years of age, while the ACS recommends screening for anyone 45 and older. However, the ACS also recommends that 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 45 and/or be screened more often.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	55.9	53.1	47.2	46.3	45.0	43.8	41.3	42.3	42.8	44.2
US	47.1	45.8	43.7	41.7	40.9	39.7	39.0	38.8	38.0	

Colon and Rectum (Colorectal) Cancer

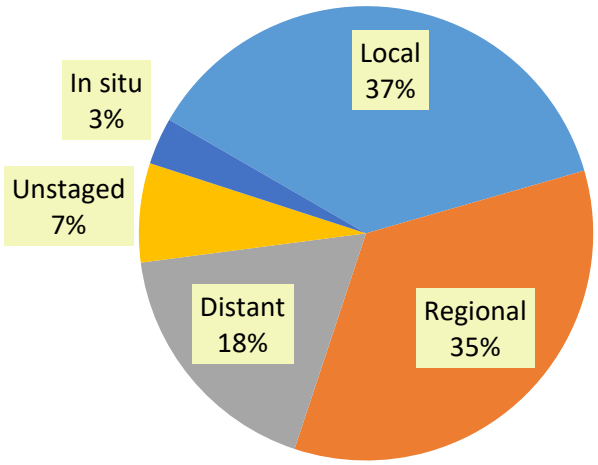
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	18.5	18.4	16.3	17.1	17.1	15.9	15.0	15.6	15.3	14.0
US	16.9	16.5	15.8	15.5	15.1	14.7	14.5	14.1	14.0	

Colon and Rectum (Colorectal) Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016

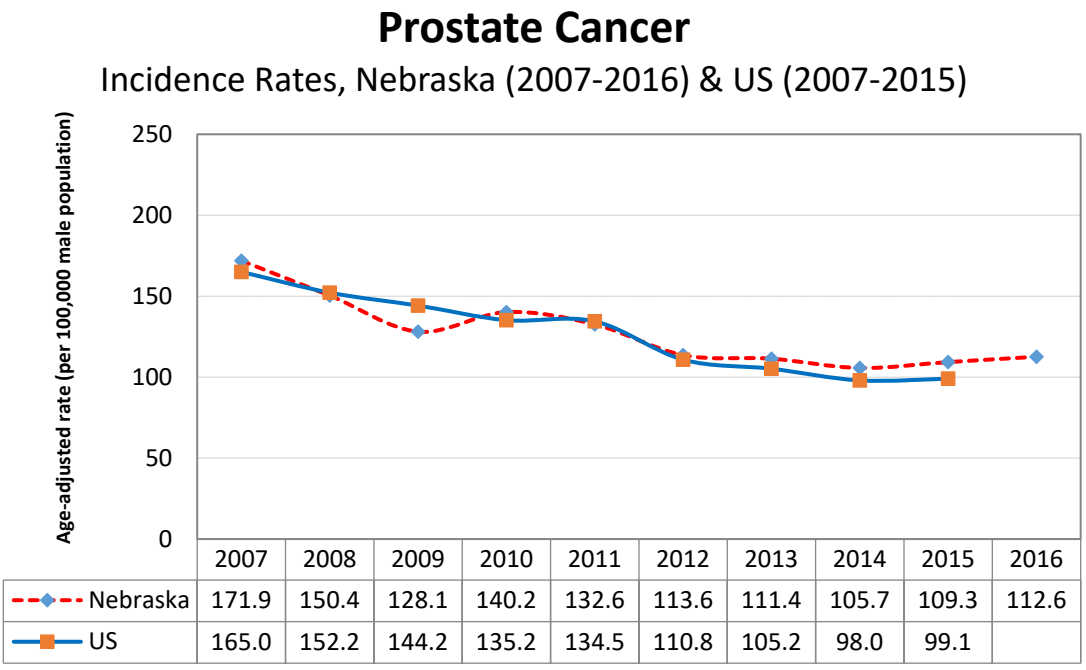


Prostate

With 1,261 diagnoses in 2016, prostate cancer was the most common cancer among Nebraska men, accounting for over 24% of all new cancers. During the past five years (2012-2016), it has also been the second leading cause of cancer deaths among Nebraska men, accounting for 861 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 59% of Nebraska men diagnosed with prostate cancer during 2012-2016 were 65 or older) and is significantly greater among African-Americans. During the past decade (2007-2016), the incidence of prostate cancer among African-American men in Nebraska has been 36% 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.

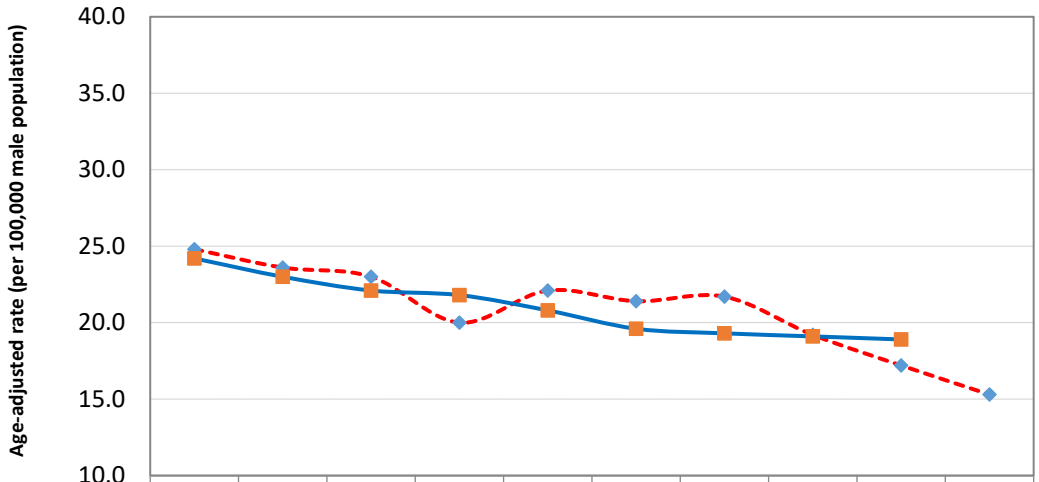
Current ACS guidelines recommend that men make an informed decision with their health care provider about whether to be screened for prostate cancer. This discussion should begin at age 50 for men who are at average risk of prostate cancer and have a life expectancy of at least 10 years. This discussion 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 with or without a digital rectal exam. By contrast, the USPSTF recommend screening for prostate cancer for men aged 55 to 69 should be an individual decision and need discussion with the health providers about the potential benefits and risks.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	171.9	150.4	128.1	140.2	132.6	113.6	111.4	105.7	109.3	112.6
US	165.0	152.2	144.2	135.2	134.5	110.8	105.2	98.0	99.1	

Prostate Cancer

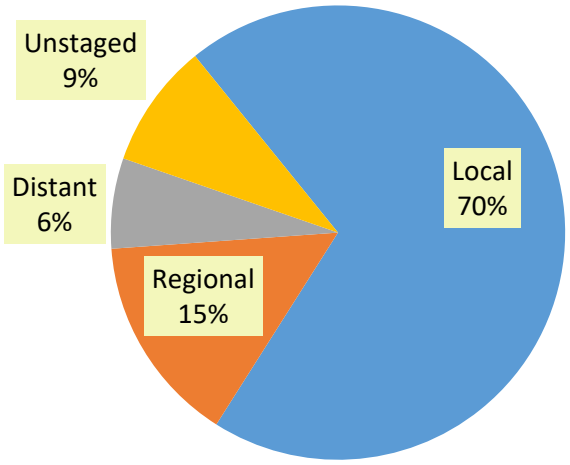
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	24.8	23.6	23.0	20.0	22.1	21.4	21.7	19.2	17.2	15.3
US	24.2	23.0	22.1	21.8	20.8	19.6	19.3	19.1	18.9	

Prostate Cancer

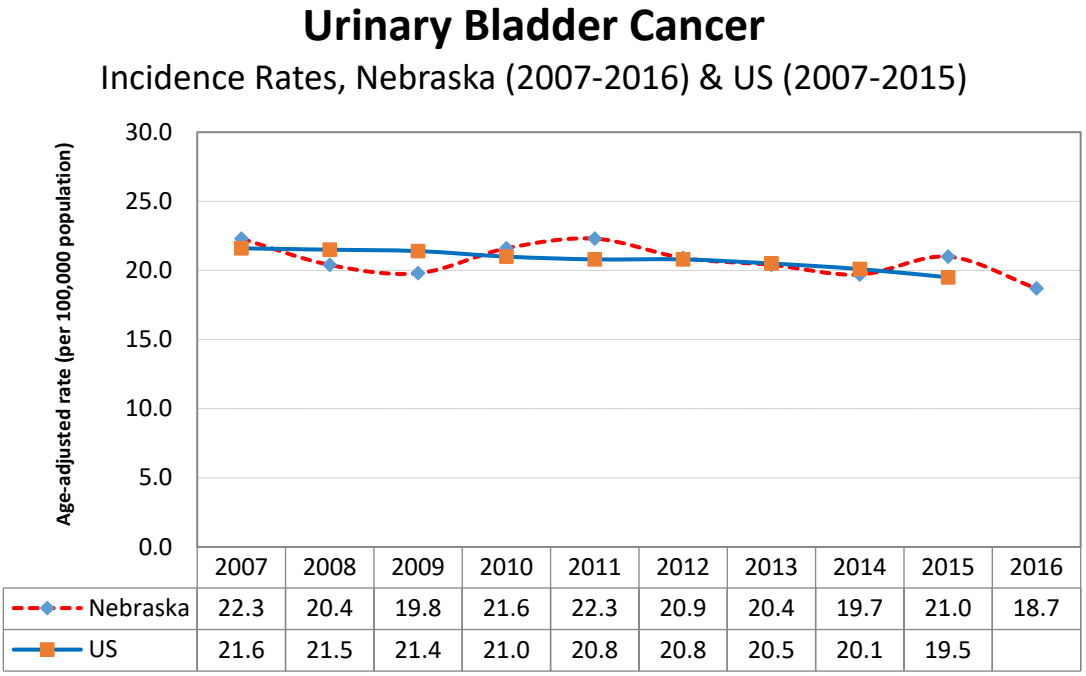
Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016



Urinary Bladder

Between 2012 and 2016, 2,196 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 (438 Nebraska residents died from it during 2012-2016), 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 77%.

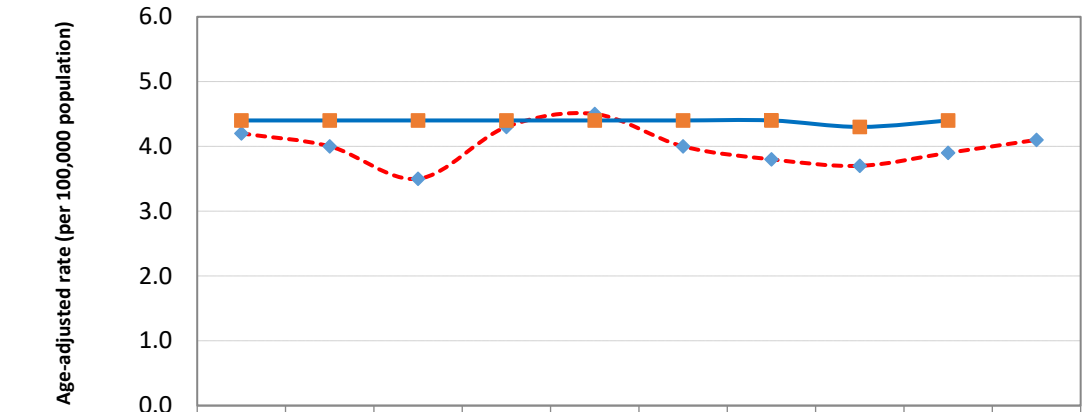
Cigarette smoking is the most important known risk factor for bladder cancer. Smokers develop bladder cancer three times more often than non-smokers, and about half of all cases are attributable to smoking. Risk factors also include occupational exposures to certain chemicals used to make dyes (benzidine 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: 76% of the cases that occurred in Nebraska during 2012-2016 were at least 65 years old when diagnosed.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	22.3	20.4	19.8	21.6	22.3	20.9	20.4	19.7	21.0	18.7
US	21.6	21.5	21.4	21.0	20.8	20.8	20.5	20.1	19.5	

Urinary Bladder Cancer

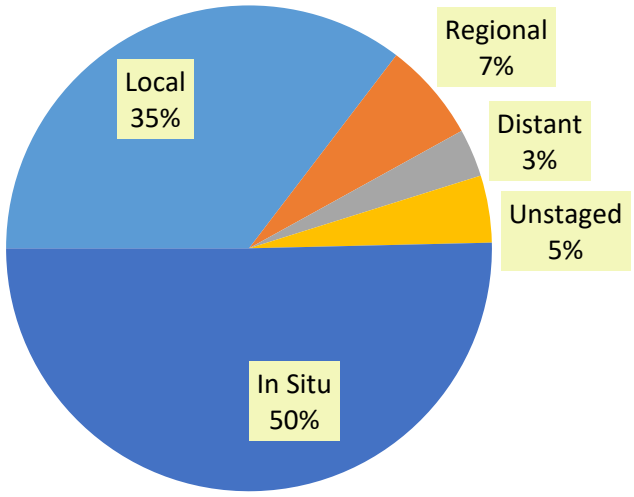
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	4.2	4.0	3.5	4.3	4.5	4.0	3.8	3.7	3.9	4.1
US	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.3	4.4	

Urinary Bladder Cancer

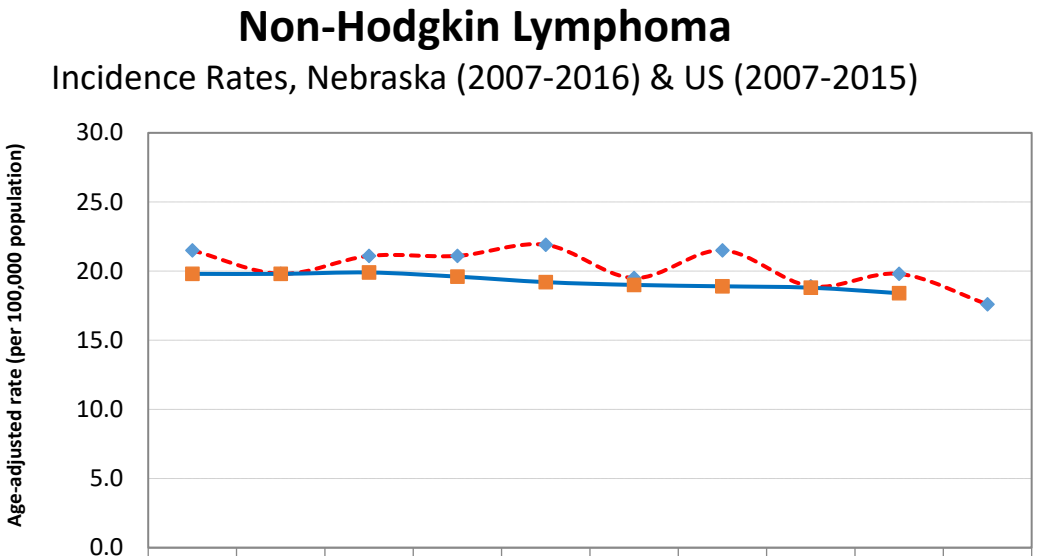
Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016



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 2,078 diagnoses and 613 deaths among Nebraska residents between 2012 and 2016 (for Hodgkin lymphoma, the comparable figures are 275 diagnoses and 24 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 current trends from 2007 to 2016 have shown that both incidence as well as mortality rate of prostate cancer have steadily declined at the state and national level.

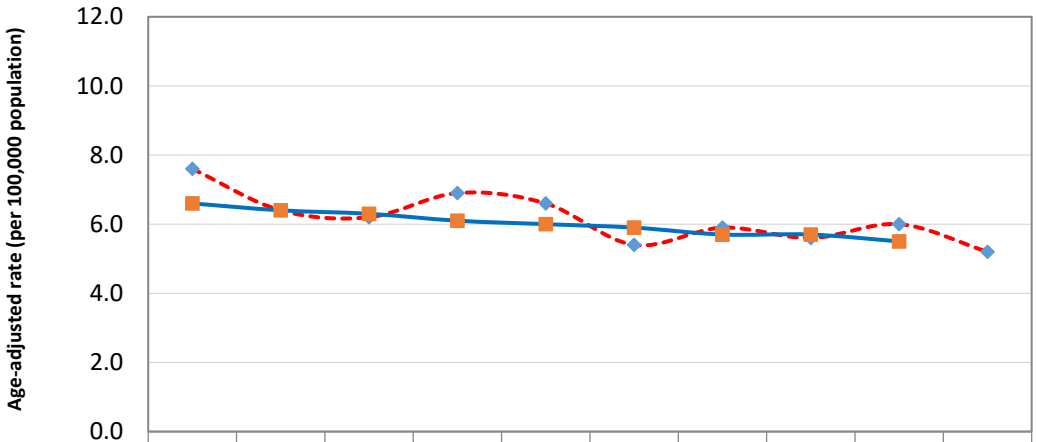
The causes of Non-Hodgkin lymphoma are unknown, although there is evidence that viral exposures and reduced immune function are associated with the disease. People whose immune systems have been suppressed by drugs, particularly those who have received an organ transplant, are at high risk of Non-Hodgkin 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.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	21.5	19.8	21.1	21.1	21.9	19.5	21.5	18.9	19.8	17.6
US	19.8	19.8	19.9	19.6	19.2	19.0	18.9	18.8	18.4	

Non-Hodgkin Lymphoma

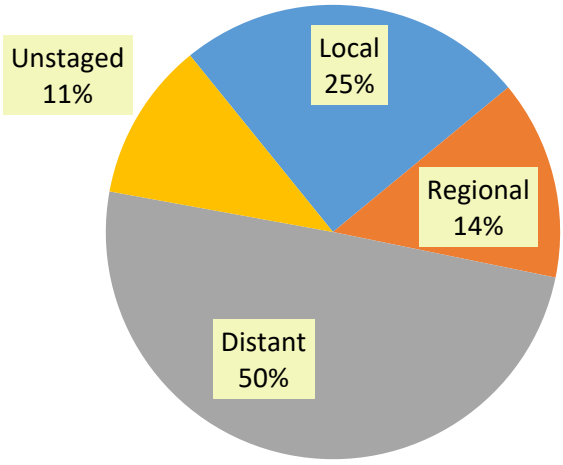
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	7.6	6.4	6.2	6.9	6.6	5.4	5.9	5.6	6.0	5.2
US	6.6	6.4	6.3	6.1	6.0	5.9	5.7	5.7	5.5	

Non-Hodgkin Lymphoma

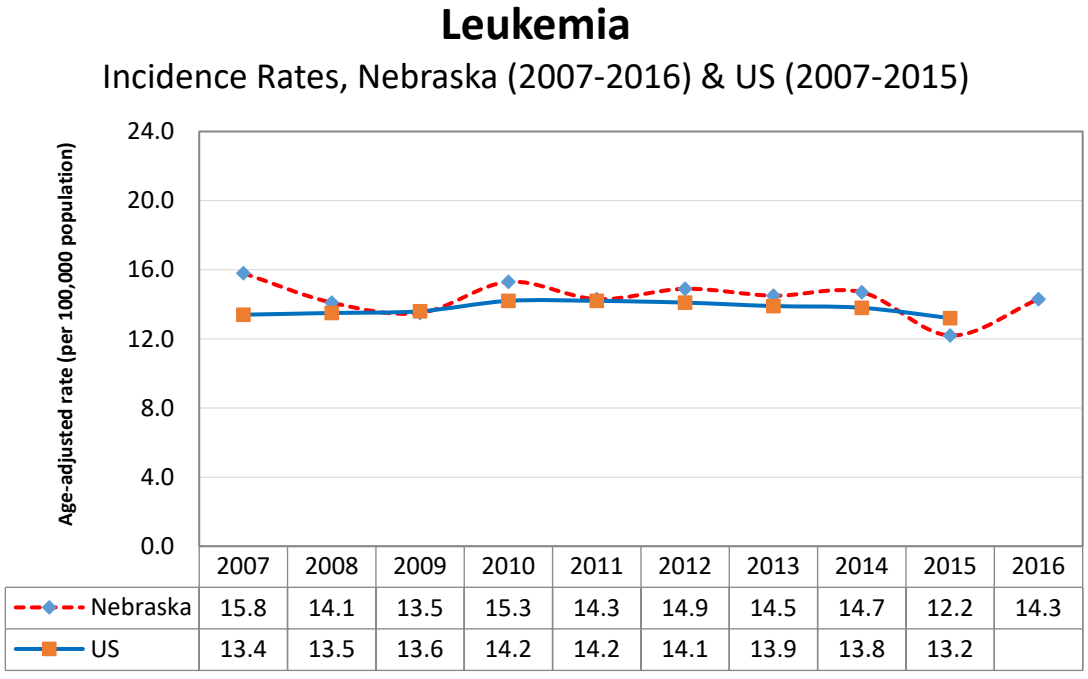
Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016



Leukemia

Between 2012 and 2016, leukemia accounted for 1,497 diagnoses and 772 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 2012 and 2016 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 and teens, 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 over 62%.

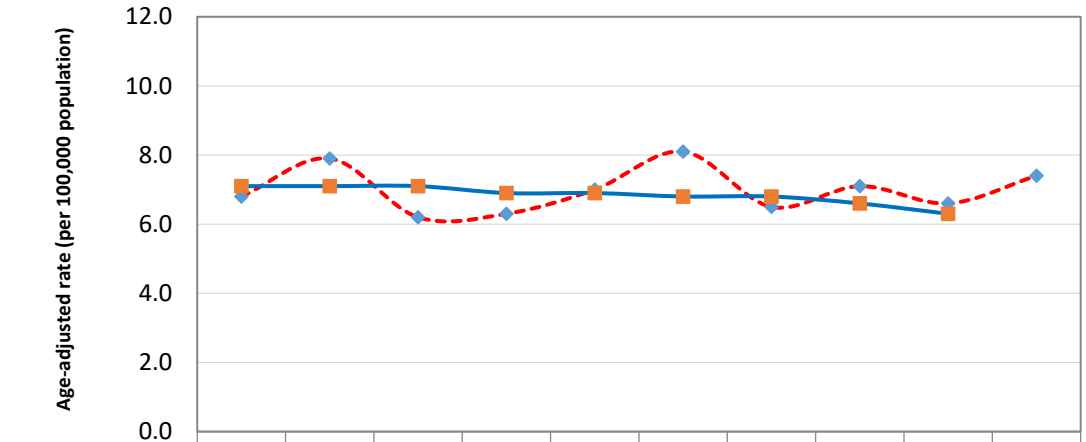
The major causes of most types of leukemia are unknown. Nevertheless, several risk factors have been identified, and include genetic abnormalities (such as Down syndrome), exposure to ionizing radiation, and workplace exposure to benzene and other related solvents. Adult T-cell acute lymphocytic leukemia is strongly associated with infection by a retrovirus, the human T-cell lymphoma/leukemia 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.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	15.8	14.1	13.5	15.3	14.3	14.9	14.5	14.7	12.2	14.3
US	13.4	13.5	13.6	14.2	14.2	14.1	13.9	13.8	13.2	

Leukemia

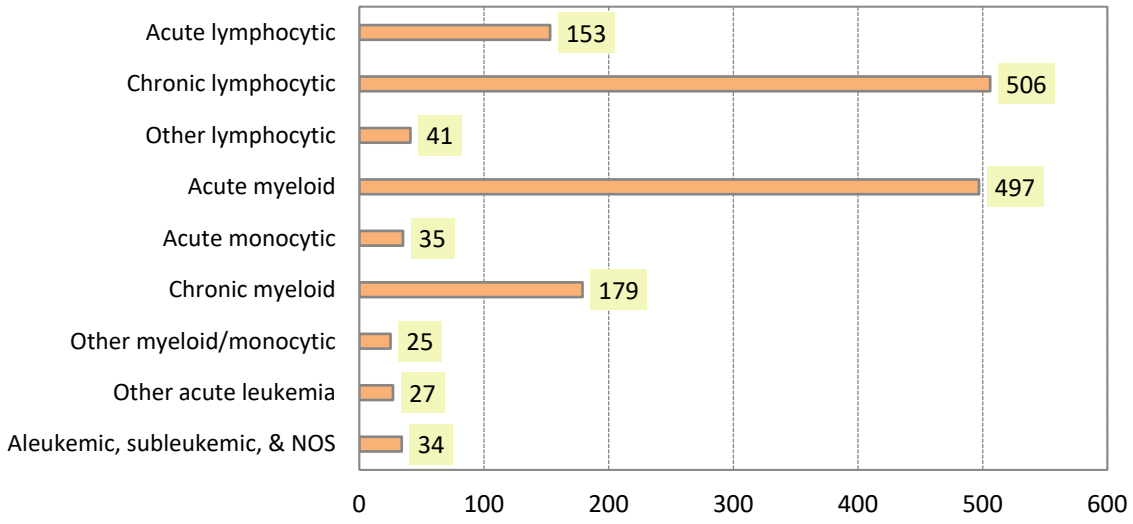
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	6.8	7.9	6.2	6.3	7.0	8.1	6.5	7.1	6.6	7.4
US	7.1	7.1	7.1	6.9	6.9	6.8	6.8	6.6	6.3	

Leukemia

Number of Cases by Histologic Type, Nebraska, 2012-2016

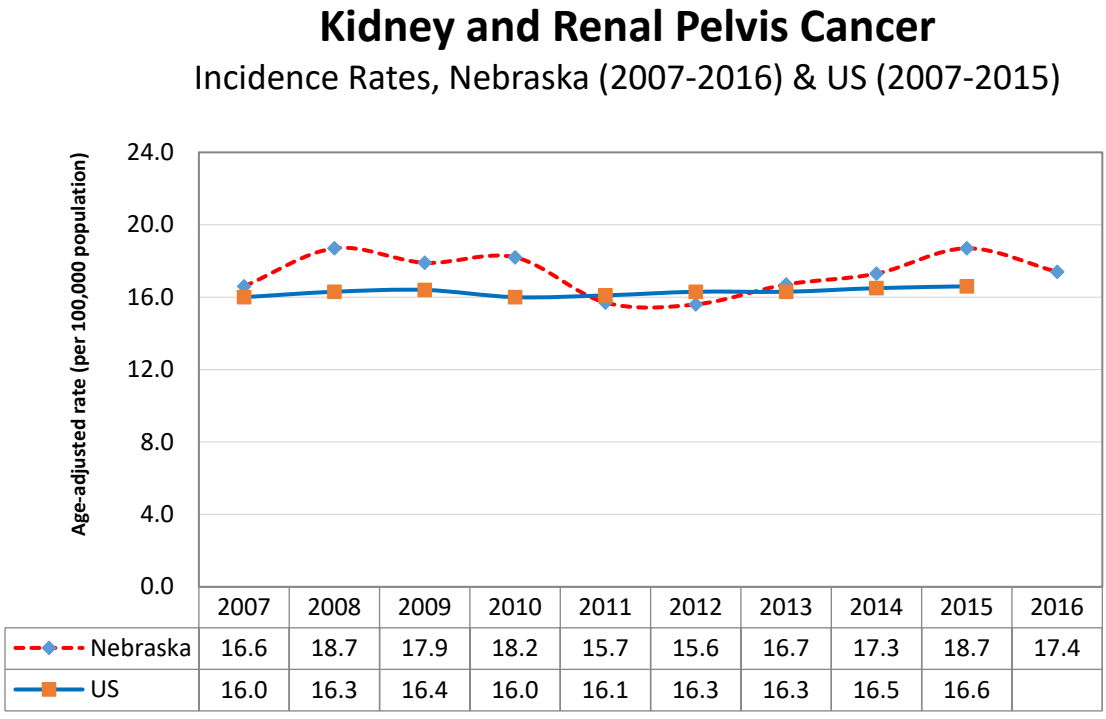


Abbreviation: NOS, not otherwise specified

Kidney and Renal Pelvis

Cancers of the kidney and renal pelvis accounted for 1,830 diagnoses in Nebraska between 2012 and 2016, and also accounted for 463 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 74%.

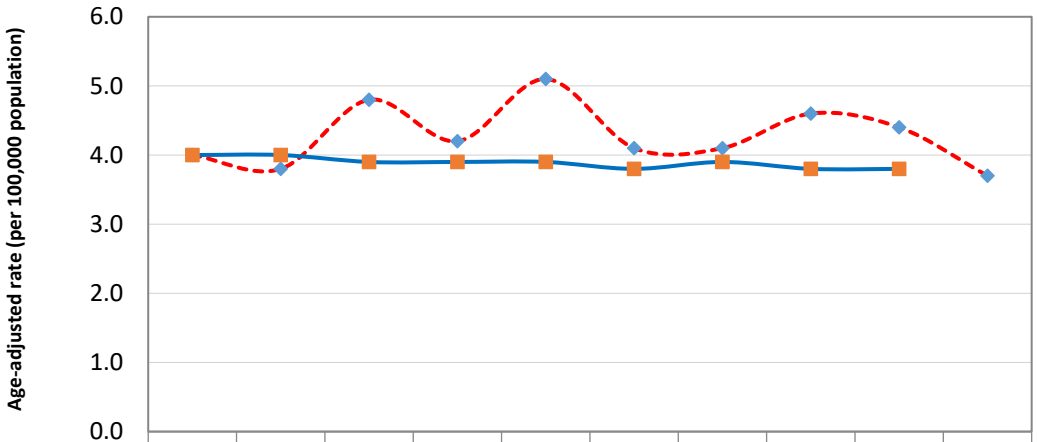
Preventable risk factors for cancer of the kidney include cigarette smoking and obesity. Current estimates indicate that cigarette smoking is responsible for about 20 percent of all kidney cancer deaths. Kidney cancer is more likely to strike at younger ages than most other types; in Nebraska, more than half (50.7%) of all cases that were diagnosed during 2012-2016 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.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	16.6	18.7	17.9	18.2	15.7	15.6	16.7	17.3	18.7	17.4
US	16.0	16.3	16.4	16.0	16.1	16.3	16.3	16.5	16.6	

Kidney and Renal Pelvis Cancer

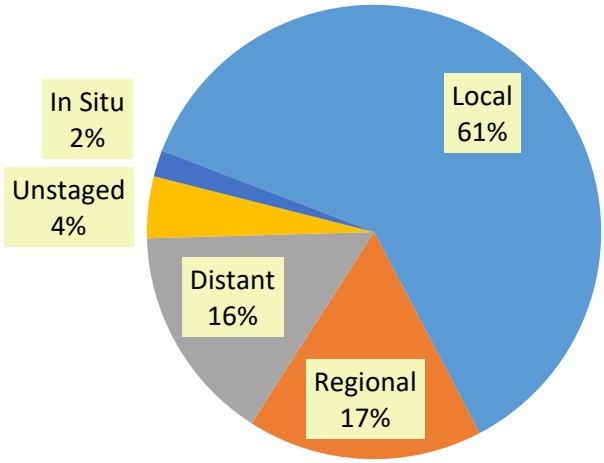
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	4.0	3.8	4.8	4.2	5.1	4.1	4.1	4.6	4.4	3.7
US	4.0	4.0	3.9	3.9	3.9	3.8	3.9	3.8	3.8	

Kidney and Renal Pelvis Cancer

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016

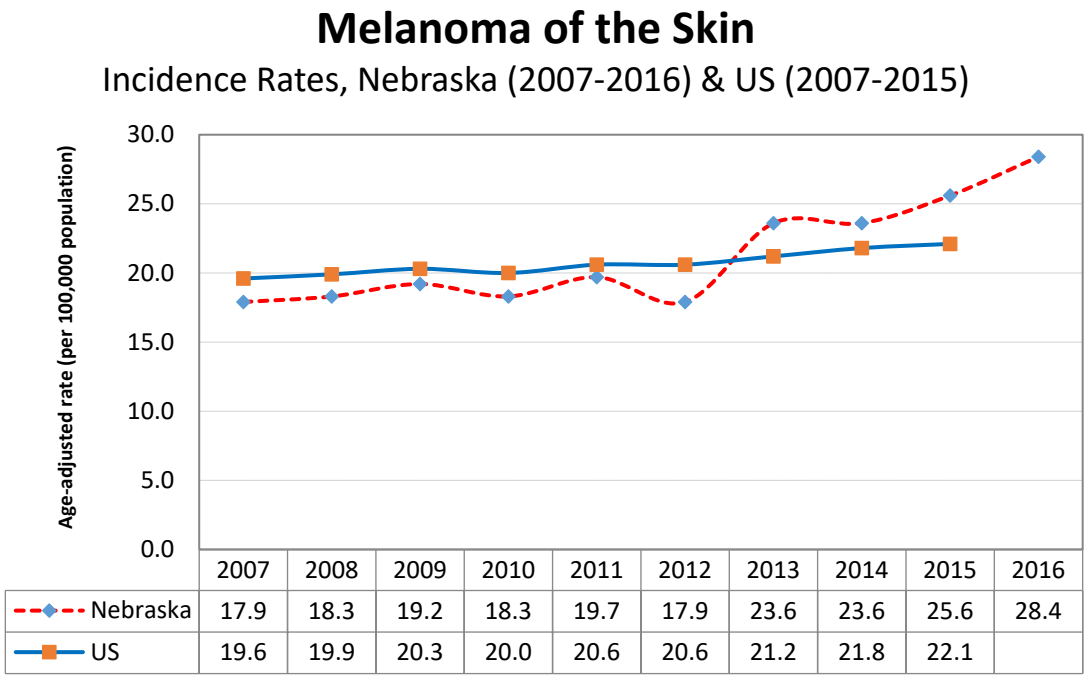


Melanoma of the Skin

There are several different types of skin cancer, but melanomas are the most serious. Nationally, melanomas comprise about 1% of all skin cancer diagnoses but the vast majority of all skin cancer deaths. In Nebraska, melanomas of the skin accounted for 2,436 diagnoses and 302 deaths between 2012 and 2016. 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 92%.

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.

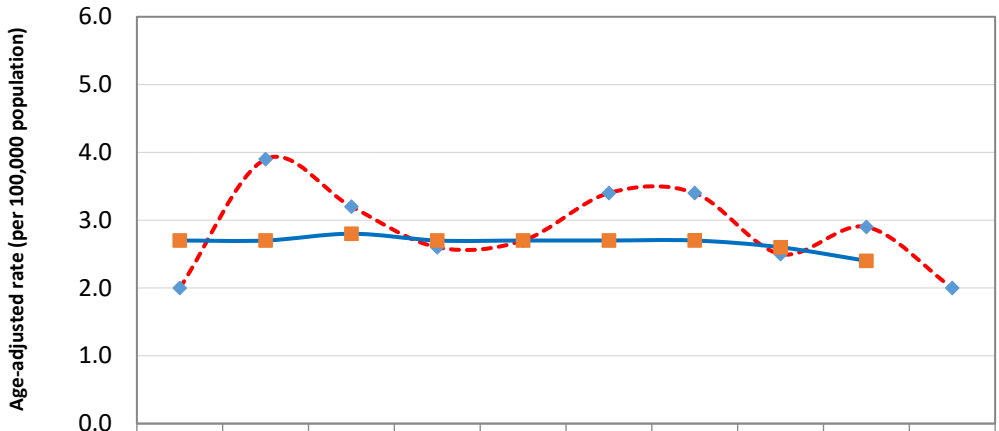
Skin melanomas are among the most preventable and treatable of all cancers. Wearing protective clothing and using sunscreen are the best methods for preventing the disease, and children in particular should have such protection. In addition, early detection can greatly reduce the risk of melanoma mortality. 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.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	17.9	18.3	19.2	18.3	19.7	17.9	23.6	23.6	25.6	28.4
US	19.6	19.9	20.3	20.0	20.6	20.6	21.2	21.8	22.1	

Melanoma of the Skin

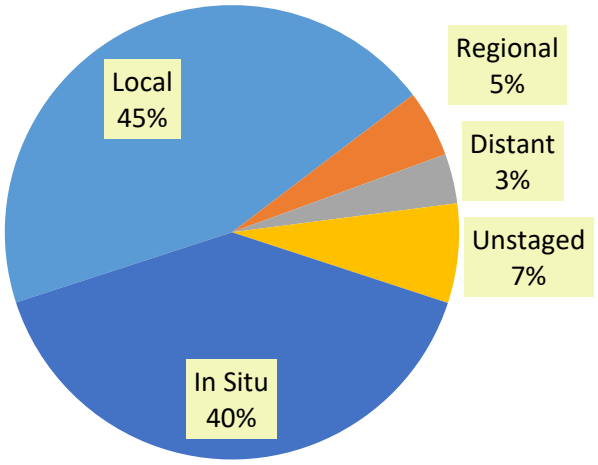
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	2.0	3.9	3.2	2.6	2.7	3.4	3.4	2.5	2.9	2.0
US	2.7	2.7	2.8	2.7	2.7	2.7	2.7	2.6	2.4	

Melanoma of the Skin

Percentage of Cases, by Stage of Disease at Diagnosis
Nebraska, 2012-2016



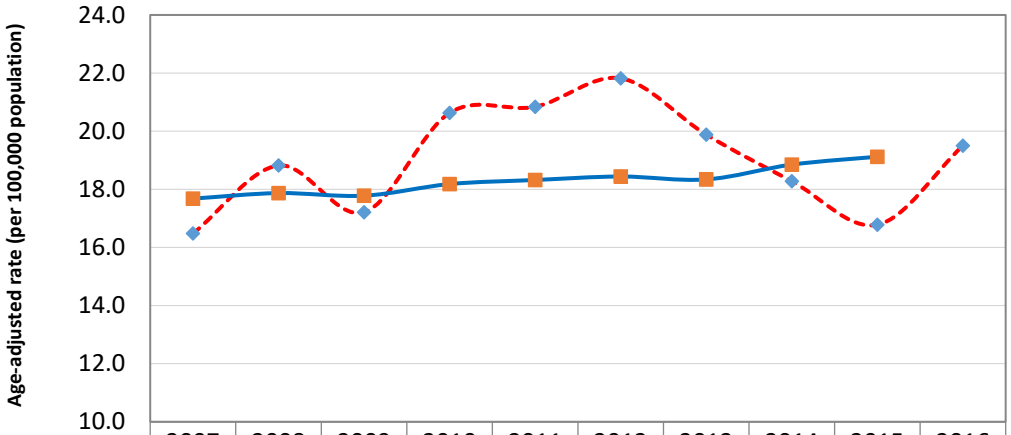
Pediatric Cancers

Pediatric cancer refers to those cancers diagnosed among anyone under 20 years of age. In Nebraska, 594 invasive pediatric cancers were diagnosed among Nebraska residents between 2012 and 2016. During this same period, 57 Nebraska children and adolescents died from cancer. The three most common pediatric cancer diagnoses, brain and central nervous system tumors, leukemia, and lymphoma, accounted for approximately 60 percent of all Nebraska's pediatric cancer cases during 2012-2016. Nebraska data also show that leukemia is the most common type of cancer among children under five years of age; Brain and central nervous system tumors are the most common among children 5-14 years of age, and lymphomas predominate among those 15-19 years of age. Little is known about the causes of pediatric cancer: a few environmental factors, such as radiation exposure, have been linked with some types of pediatric cancer, and inherited genetic mutations can increase the risk for some types as well. Since the 1970s, survival has increased substantially for most types of pediatric cancer, particularly the leukemia. Overall, the relative five-year survival rate for pediatric cancer for the entire U.S. is estimated at over 84%.

National data show that the incidence of pediatric cancer has increased significantly in recent decades, but with improvements in survival, pediatric cancer deaths have declined significantly at the same time. Nebraska and U.S. incidence data show much the same trend during the past decade, although Nebraska's rates have increased more sharply from 2009 to 2013 and have begun to pull ahead of U.S. rates.

Pediatric Cancer

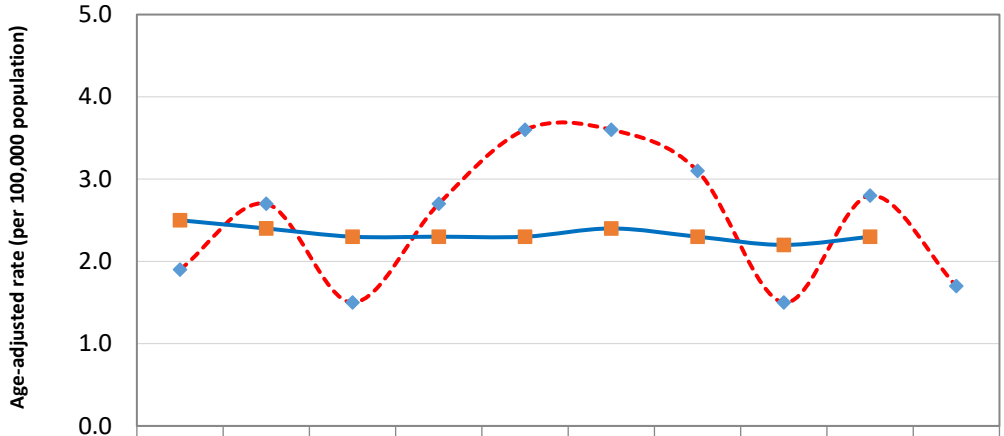
Incidence Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	16.5	18.8	17.2	20.6	20.8	21.8	19.9	18.3	16.8	19.5
US	17.7	17.9	17.8	18.2	18.3	18.4	18.3	18.9	19.1	

Pediatric Cancer

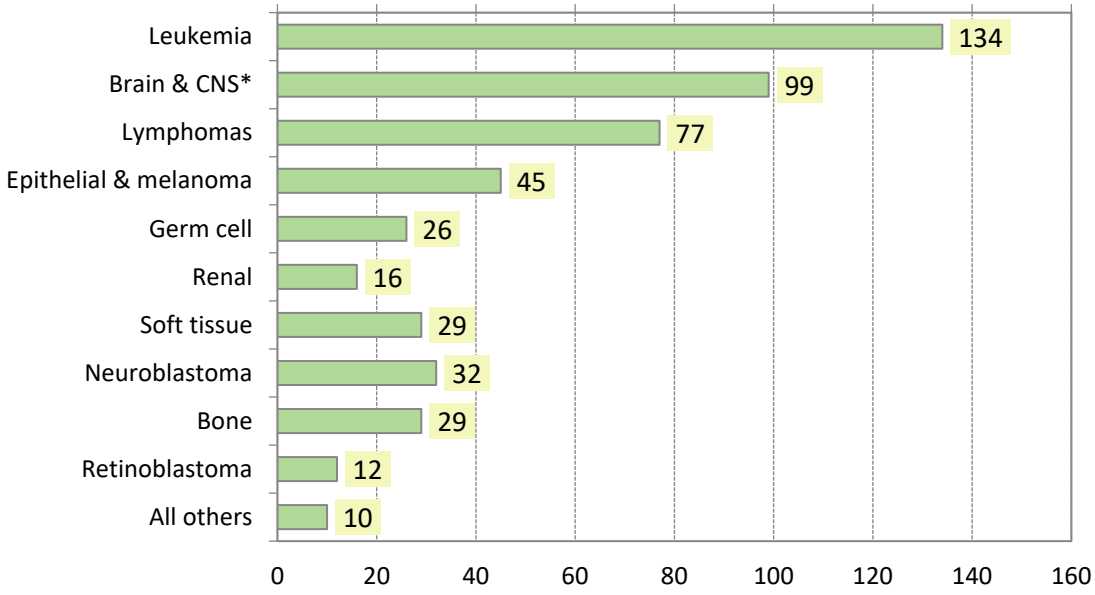
Mortality Rates, Nebraska (2007-2016) & US (2007-2015)



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nebraska	1.9	2.7	1.5	2.7	3.6	3.6	3.1	1.5	2.8	1.7
US	2.5	2.4	2.3	2.3	2.3	2.4	2.3	2.2	2.3	

Pediatric Cancer

Number of Cases, by Primary Site at Diagnosis
Nebraska, 2012-2016



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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 Illinois, Kansas, Minnesota, Missouri, and South Dakota.

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