Cancer in Utah: An Overview of Cancer Incidence and Mortality from 1973-2010



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Preface

Preface

This report presents cancer incidence and mortality information for the entire state of Utah from 1973 through 2010, with comparisons to national rates. The report is made possible through data collected by the Utah Cancer Registry (UCR) as well as cancer registries nationwide. Information in this monograph is meant to serve as a reference for researchers as well as the general public; however, we encourage you to visit the Utah Cancer Registry website at http://ucr.utah.edu/ for additional information about the Registry, Registry publications, and additional sources of cancer statistics. The website includes links to the Utah Department of Health's (UDOH) Indicator-Based Information System for Public Health (IBIS-PH), the SEER program's SEER*Stat software, and the National Cancer Institute's State Cancer Profiles.

History of the Utah Cancer Registry and Cancer Surveillance in Utah

The Utah Cancer Registry (UCR), through a letter of agreement between the Utah Department of Health and the University of Utah, has been designated as the official repository for cancer surveillance data for the State of Utah. UCR is a population-based, central cancer registry, and has served the State of Utah since 1966, when it was founded by Dr. Charles Smart under the auspices of the Regional Medical Program. In 1973, the Utah Cancer Registry became one of the founding registries of the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program, and has been a leading contributor to national cancer statistics ever since.

In collaboration with local health care facilities and cancer registrars, Utah Cancer Registry staff members identify incident cases of cancer through routine, systematic review of pathology reports, medical records, radiation therapy records, hospital discharge lists, and state vital records. Information regarding patient characteristics, cancer diagnosis, and first-course treatment is ascertained primarily from specific statements in the medical record and other sources such as death certificates and physician reports. Cancer surveillance in Utah is conducted in accordance with cancer reporting standards set by the State of Utah Cancer Reporting Rule (R384-100), SEER, and the North American Association of Central Cancer Registries (NAACCR).

Data Quality and Completeness

Data quality and completeness are evaluated regularly by the NCI's SEER program and by NAACCR. States are responsible for ensuring compliance with program standards. The Utah Cancer Registry regularly ranks amongst the top cancer registries in the nation for data quality and completeness and has routinely received one of the highest honors awarded by SEER and NAACCR.

Confidentiality of Patient Data

The Utah Cancer Registry takes the protection of patient confidentiality very seriously. All UCR employees complete confidentiality training and sign confidentiality pledges. Absolutely no personal or identifying information, such as name or social security number, is given to researchers without direct authorization from the individual patient. If a researcher wants to obtain identifiable information from the Utah Cancer Registry for research purposes, they must receive approval from an Institutional Review Board (IRB) and from the UCR Advisory Research Committee (ARC). After obtaining IRB and ARC approval, the UCR contacts each patient individually to obtain their permission as well.

Uses of Registry Data

Utah Cancer Registry data are utilized for cancer surveillance and research. Specifically, UCR data is routinely used for the following:

- To supply cancer surveillance data to inform public health policy, planning, and cancer prevention and control efforts at the local, state, and national levels.
- To contribute to the publically available SEER, NAACCR, and UDOH interactive cancer statistic databases.
- To support epidemiological research into the cause, distribution, prevention, and treatment of cancer.
- To assist with local cancer investigations.

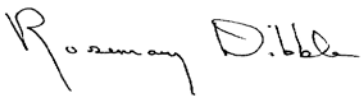
In addition, UCR data are included in the National Cancer Institute's Annual Report to the Nation on the Status of Cancer. UCR data are also included in national and international publications by the North American Association of Central Cancer Registries (NAACCR) and the International Agency for Research on Cancer (IARC). UCR also provides cancer data to the Utah Department of Health for population-based cancer publications and surveillance. Additionally, UCR data has been used in numerous scientific publications. A list of publications utilizing UCR data can be found at http://ucr.utah.edu/research/publications/index.htm.

Acknowledgement

Cancer surveillance in Utah is made possible by the collaborative efforts of a number of local and national agencies. The UCR would like to acknowledge the contributions of the local health care providers, administrators, and cancer registrars who are crucial to the success of cancer registration and surveillance as they provide the cancer surveillance data necessary for this report. We'd additionally like to thank the staff members of the Utah Cancer Registry, past and present. We appreciate their many contributions to the success of our organization. Their commitment and ongoing efforts make the Utah Cancer Registry one of the premier cancer registries in the nation.

I would also like to acknowledge Janna Harrell, MS and Kim Herget, MStat, for preparing the majority of this report.

Sincerely,



Rosemary Dibble, CTR
Director of Operations
Utah Cancer Registry

Overview

Overview

Cancer continues to be the second leading cause of death in Utah, exceeded only by heart disease. In 2010, 9,233 Utahns were diagnosed with cancer and 2,810 died of cancer. The five year age-adjusted incidence rate in Utah for 2006-2010 was 418.6 cases per 100,000 Utahns, while the age-adjusted mortality rate was 131.3 deaths per 100,000 Utahns.

Utah routinely has one of the lowest cancer incidence and mortality rates in the nation. The five year age-adjusted incidence rate for 2006-2010 was 11% below the national rate while the mortality rate was 26% below the national rate. Utah's low incidence and mortality rates are driven in part by the exceptionally low rate of tobacco related cancers. In 2006-2010 Utah's lung cancer incidence and mortality rates were both 57% below the national rate. In addition, the esophageal cancer incidence and mortality rate were both 35% lower than the national rate. Furthermore, Utah's five year age-adjusted incidence and mortality rates, for 2006-2010, were the lowest in the nation for both lung and colorectal cancers.

In 2010, 4,252 Utah women were diagnosed with cancer and 1,303 died of cancer. The five most common cancer sites in Utah women were breast, thyroid, colorectal, corpus and uterus, and melanoma of the skin. In stark contrast to much of the rest of the United States, lung and bronchus cancer was not among the leading cancer sites. However, it was the second leading cause of cancer death in Utah women in 2010. Breast cancer was the leading cause of death with colorectal and pancreatic cancers following lung cancer.

Prostate cancer was the most common cancer diagnosed in Utah men in 2010. Prostate cancer alone accounted for over 34% of new cancer cases in Utah males. Overall in 2010, 4,981 Utah men were diagnosed with cancer and 1,507 died of cancer. After prostate cancer, melanoma of the skin, colorectal, lung and bronchus, and urinary bladder were the most common cancers diagnosed in Utah men. Prostate, lung and bronchus, and colorectal cancers were also the leading causes of cancer death in Utah men.

Surprisingly, given that Utah has the lowest incidence and mortality rates from lung cancer in the nation; lung cancer incidence in Utah women has been rising for decades. From 1973 to 1987, lung cancer incidence rose by a significant 5.1% on average per year in Utah women. Since 1987 the incidence of female lung cancer has slowed, but it continues to increase by an average of 0.9% each year. The U.S. saw a similar pattern in female lung cancer from 1973 to 2007, but since 2007, lung cancer incidence has been falling in U.S. women by a statistically significant 2.6% per year.

In contrast, Utah men have seen decreasing rates of lung cancer since 1973. From 1993 to 2010 the steady decline accelerated by an average of 2.1% per year. This is greater than the decline experienced nationally in men. Since 1991, the incidence of lung cancer in men has been falling by 1.8% per year nationally. Deaths from lung cancer are also falling in Utah men. From 2000 to 2010, the rate of lung cancer deaths has fallen by 3.4% per year in Utah men. Nationally, the lung cancer death rate is also dropping in men, but not as sharply.

Contrary to Utah's low lung cancer rates, Utah's rate of melanoma is among the highest in the nation. The five year, 2006-2010, age-adjusted incidence rate of melanoma of the skin was 61% higher in Utah than the national rate. The Utah mortality rate was also a substantial 30% higher than the national rate. Melanoma rates by sex were similarly much higher than national rates. Utah women experienced melanoma incidence rates which

were 45% above national rates and death rates which were 18% above the national rates. The rate of melanoma in Utah men was even more striking. The five year, 2006-2010, age-adjusted incidence rate in Utah men was 69% higher than national rates and the death rate was 32% higher than national rates.

Melanoma incidence has been rising nationwide for decades. Since 1973 the incidence of melanoma of the skin in Utah women has increased by an average of 2.3% per year. National rates in women have also been rising. From 1996 to 2010 the incidence of melanoma rose by an average of 2% per year in women in the U.S. Utah men also have experienced consistently rising melanoma incidence. From 1973 to 2003 the incidence increased by a significant 3.4% per year on average in Utah men. Since 2003, the rate has continued to rise in Utah men, as well as in men and women nationwide.

Figures

Figure 1: Number of New Cases and Deaths from Common Cancers in Utah, 2010

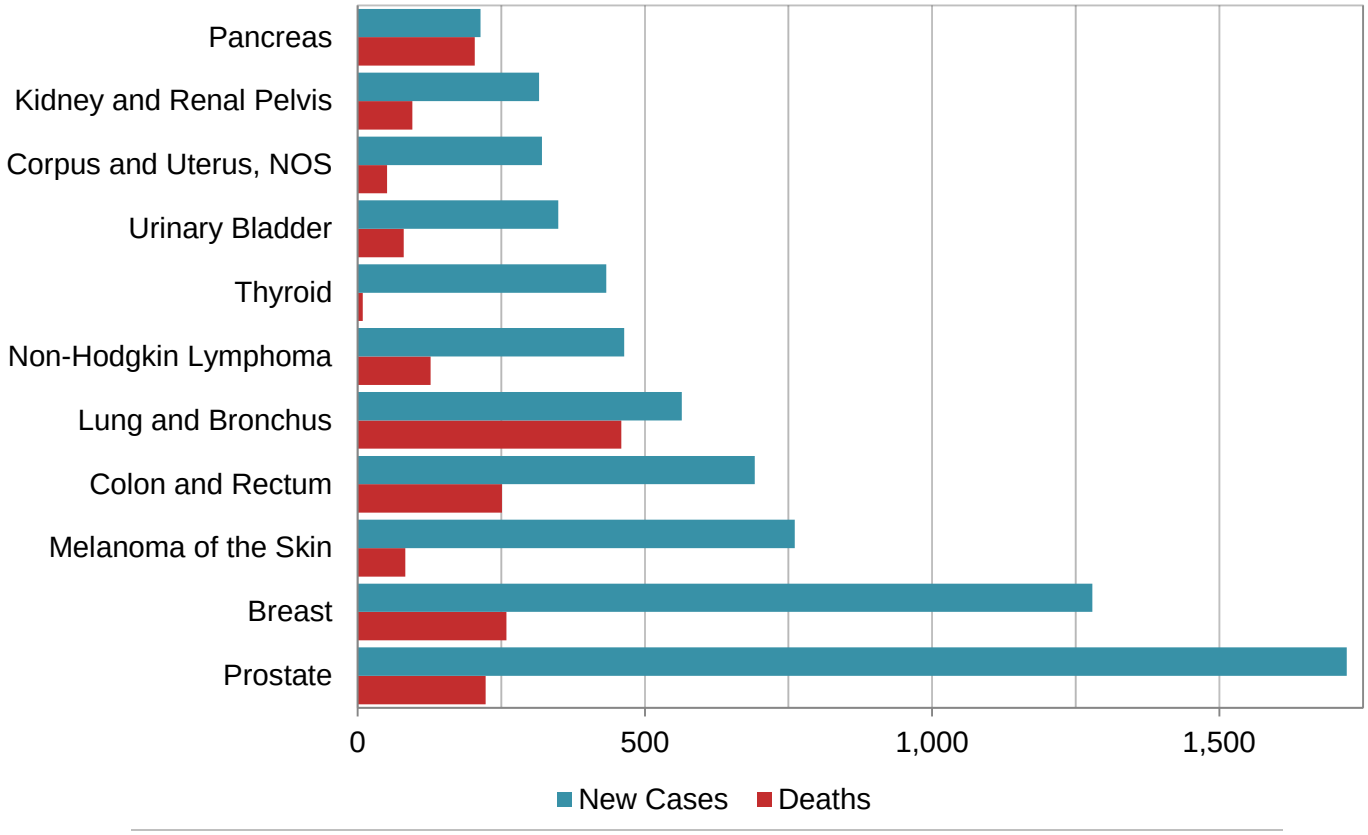


Figure 1 displays the number of new malignant cancer cases (incidence) and cancer deaths (mortality) in Utah residents in 2010.

- In 2010, 9,233 Utahns were diagnosed with cancer and 2,810 died of cancer. Cancer is the second leading cause of death in Utah and the United States, exceeded only by heart disease.

- Five cancer sites alone account for more than half of all new cancer diagnoses. These include prostate (18.7%), breast (13.9%), melanoma of the skin (8.2%), colon and rectum (7.5%), and lung and bronchus (6.1%) cancers.

- The most common causes of death from cancer in Utah were lung and bronchus (16.3%), breast (9.2%), colon and rectum (8.9%), prostate (7.9%), and pancreas (7.3%). These five sites accounted for nearly 50% of cancer deaths in Utah.

- The number of new cases (214) and deaths (204) from pancreatic cancer were very close in Utah in 2010. In contrast, thyroid cancer was diagnosed in 433 Utahns, but caused fewer than 10 deaths.

Note: Cancer deaths may have been diagnosed in previous calendar years.
Data Source: Utah Cancer Registry; SEER NAACCR Incidence- Cina+ Dataset

Data Table

Figure 2: Comparison of Utah and U.S. Incidence Rates for Select Cancer Sites, 2006 – 2010

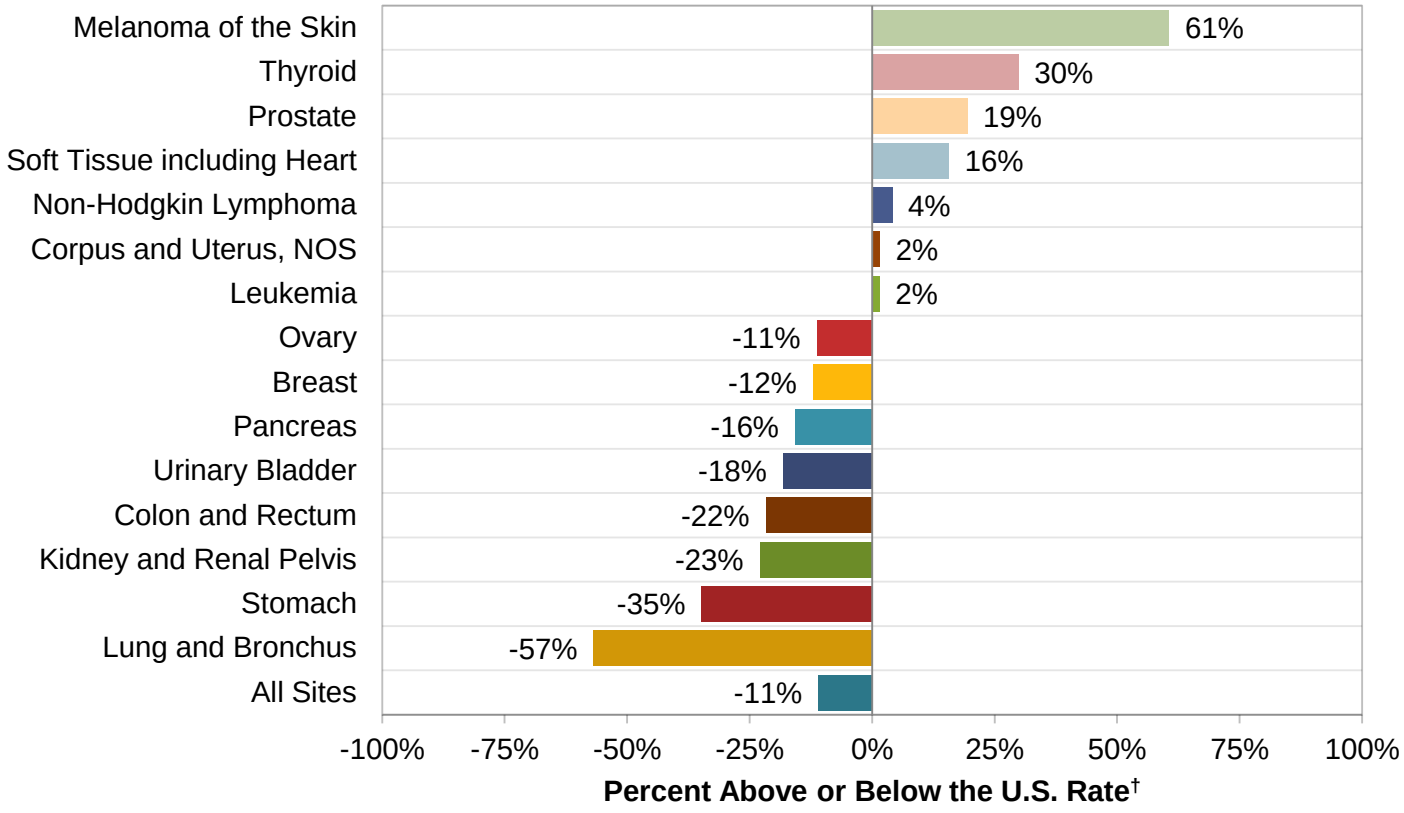


Figure 2 presents the Utah-U.S. incidence rate ratio (IRR). The IRR was calculated from the five-year, 2006 to 2010, age-adjusted cancer incidence rates in Utah and the United States (excluding Utah). The IRR indicates which cancer sites in Utah were above or below the U.S. age-adjusted incidence rate. This information is important for understanding Utah's unique cancer burden.

- Utah's cancer incidence rate was 11% lower than the national rate and is routinely one of the lowest cancer incidence rates in the nation. The age-adjusted incidence rate in Utah from 2006-2010 was 418.6 cases per 100,000 Utahns.
- Utah's low overall cancer rate is driven in part by the exceptionally low incidence rate of lung and bronchus cancer. The lung and bronchus incidence rate in Utah from 2006-2010 was 28.1 cases per 100,000 Utahns, which was a remarkable 57% lower than the national rate.
- In contrast, the incidence rate of melanoma of the skin in Utah was a striking 61% higher than the U.S. incidence rate and was the highest rate in the nation. The age-adjusted incidence rate of melanoma of the skin in Utah from 2006-2010 was 31 cases per 100,000 Utahns while the U.S. rate was 19.3 cases per 100,000 U.S residents.

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

Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ Dataset

Data Table

Figure 3: Comparison of Utah and U.S. Mortality Rates for Select Cancer Sites, 2006 – 2010

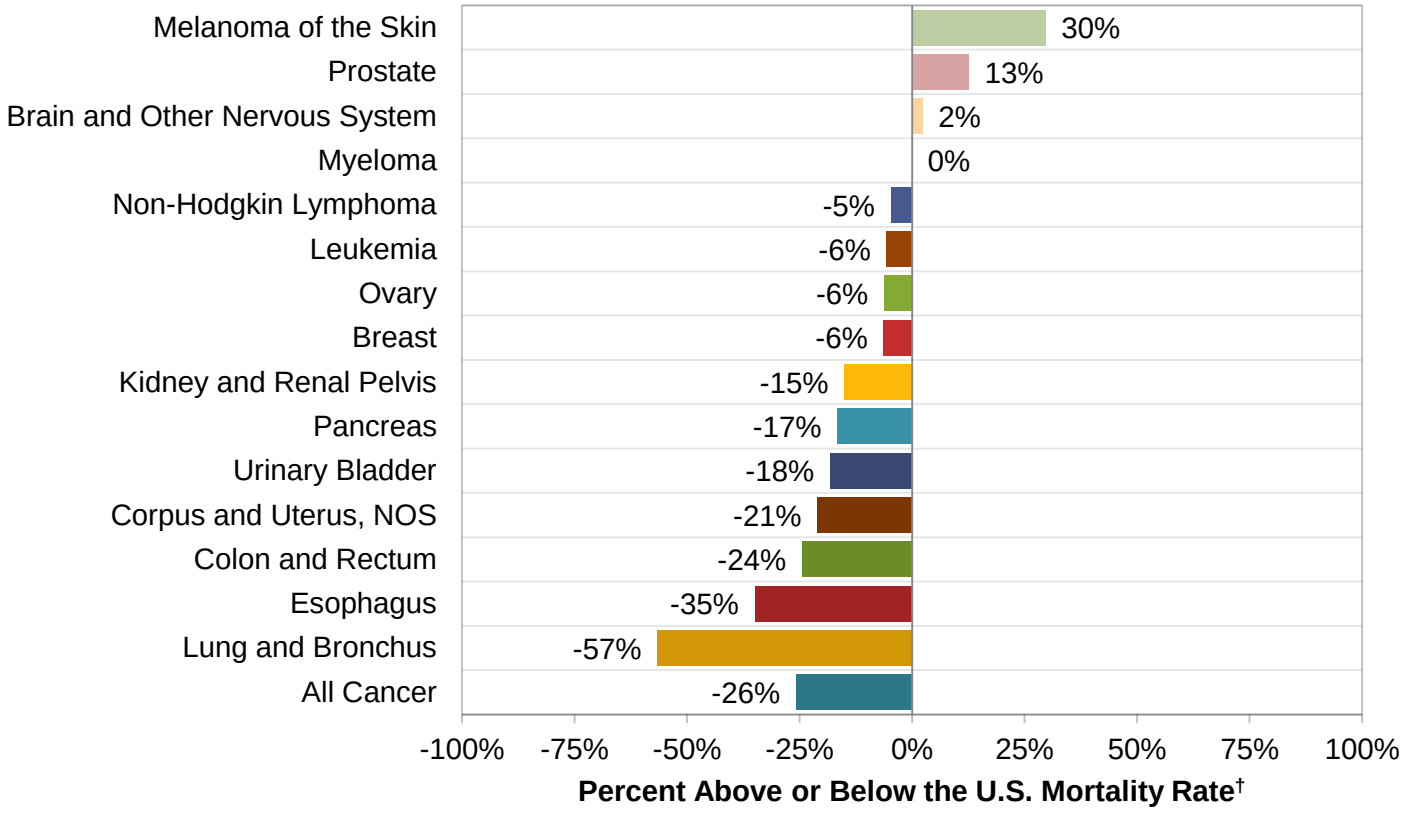


Figure 3 presents the Utah-U.S. mortality rate ratio (MRR). The MRR was calculated from the five-year, 2006-2010, age-adjusted cancer mortality rates in Utah and the United States (excluding Utah). The MRR indicates which cancer sites in Utah were above or below the U.S. mortality rate. This information is important for understanding Utah's unique cancer burden.

- Utah routinely has one of the lowest cancer mortality rates in the nation. The age-adjusted mortality rate from 2006-2010 was 131.3 deaths per 100,000 Utahns, which was 26% lower than the national mortality rate.

- The mortality rate from lung and bronchus cancer in Utah (21.6 deaths per 100,000) was exceptionally low when compared to the rest of the nation. The rate from 2006-2010 was 57% lower than the national mortality rate. Additionally, the mortality rate of cancer of the esophagus was 35% lower in Utah than the national rate. The low mortality rates in Utah from both of these cancers are critical elements in Utah's low cancer mortality rates overall.

- Conversely, Utah had higher mortality rates from melanoma of the skin (+30%) and prostate (+13%) cancers than the rest of the nation.

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

Data Source: Utah Cancer Registry; SEER Mortality Dataset

Data Table

Figure 4: Trends in Age-Adjusted Cancer Incidence and Mortality Rates in Utah and the U.S., 1973 – 2010

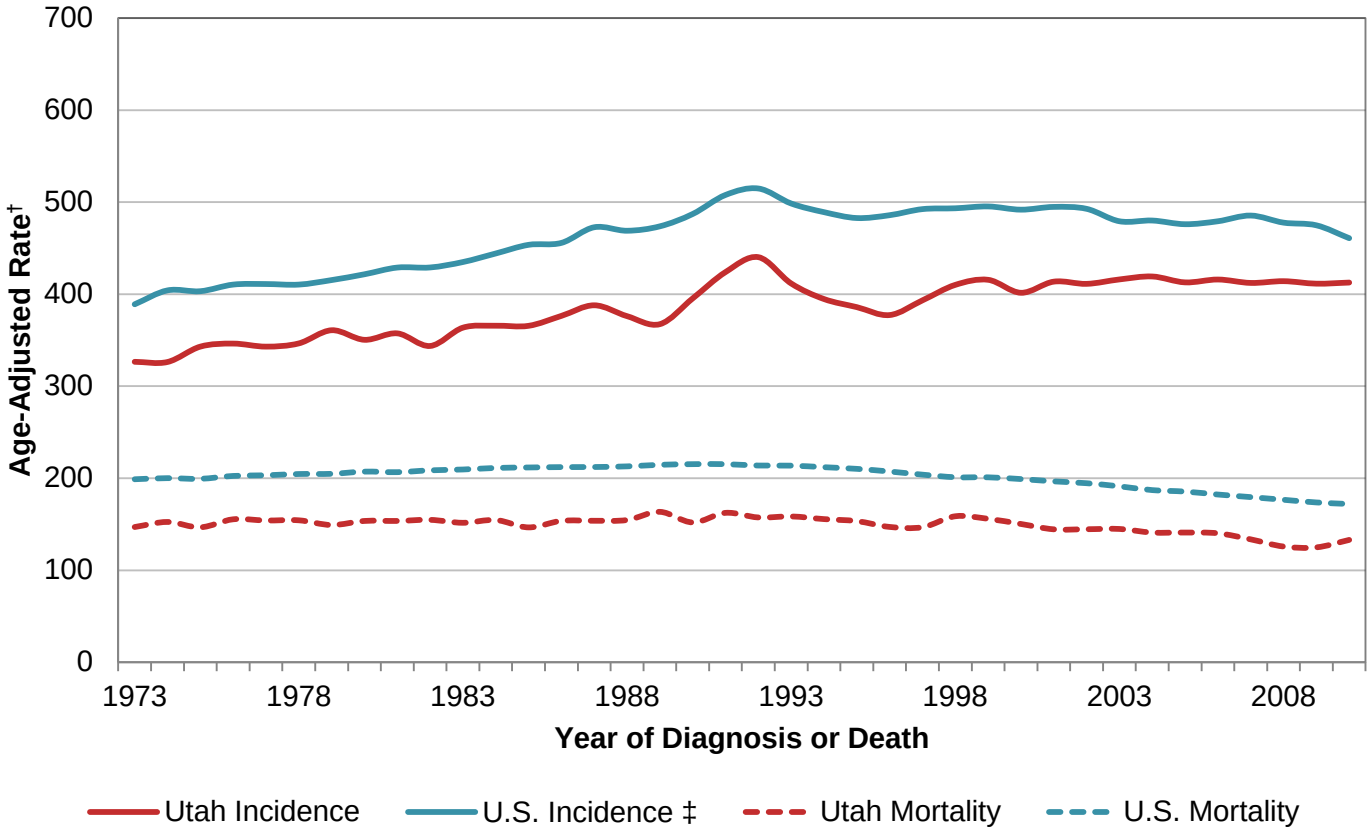


Figure 4 presents the annual age-adjusted incidence (new cases) and mortality (deaths) rates for Utah and the U.S. from 1973-2010. Monitoring historical changes in rates over time (long-term trends) is important for understanding cancer patterns and the effectiveness of cancer control efforts.

- Cancer incidence has consistently been lower in Utah as compared to the U.S. From 1973-1989 incidence rates in Utah rose by a small, but significant 0.9%* per year. This was similar to the pattern seen in the rest of the nation.
- In the late-1980s to the mid-1990s the introduction of prostate-specific antigen (PSA) screening impacted cancer incidence rates across the nation. A sharp rise and decline in incidence is visible.
- Utah experienced a significant increase in cancer incidence rates of 2.3%* per year from 1995-1999. However since 1999, cancer incidence rates in Utah have remained fairly flat with no significant increase or decrease. In contrast since 1999, national cancer incidence rates have fallen by 0.5%* annually.
- Cancer mortality rates in Utah have remained below U.S. rates for nearly forty years. For decades mortality rates nationwide remained fairly stable. However since 1998, mortality rates in Utah have decreased by 1.6%* per year, while national rates have fallen at a slower rate of 1.5%* per year.

†Rates are per 100,000 and age-adjusted to the 2000 U.S. population standard
‡ U.S. Incidence rates based on data from the SEER 9 registries (excluding Utah).
*The annual percent change (APC) is significantly different from zero ($p<0.05$).
Data Source: Utah Cancer Registry; SEER 9 Incidence and SEER Mortality Datasets

Data Table

Figure 5: Number of New Cases and Deaths from Common Cancers in Utah Females, 2010

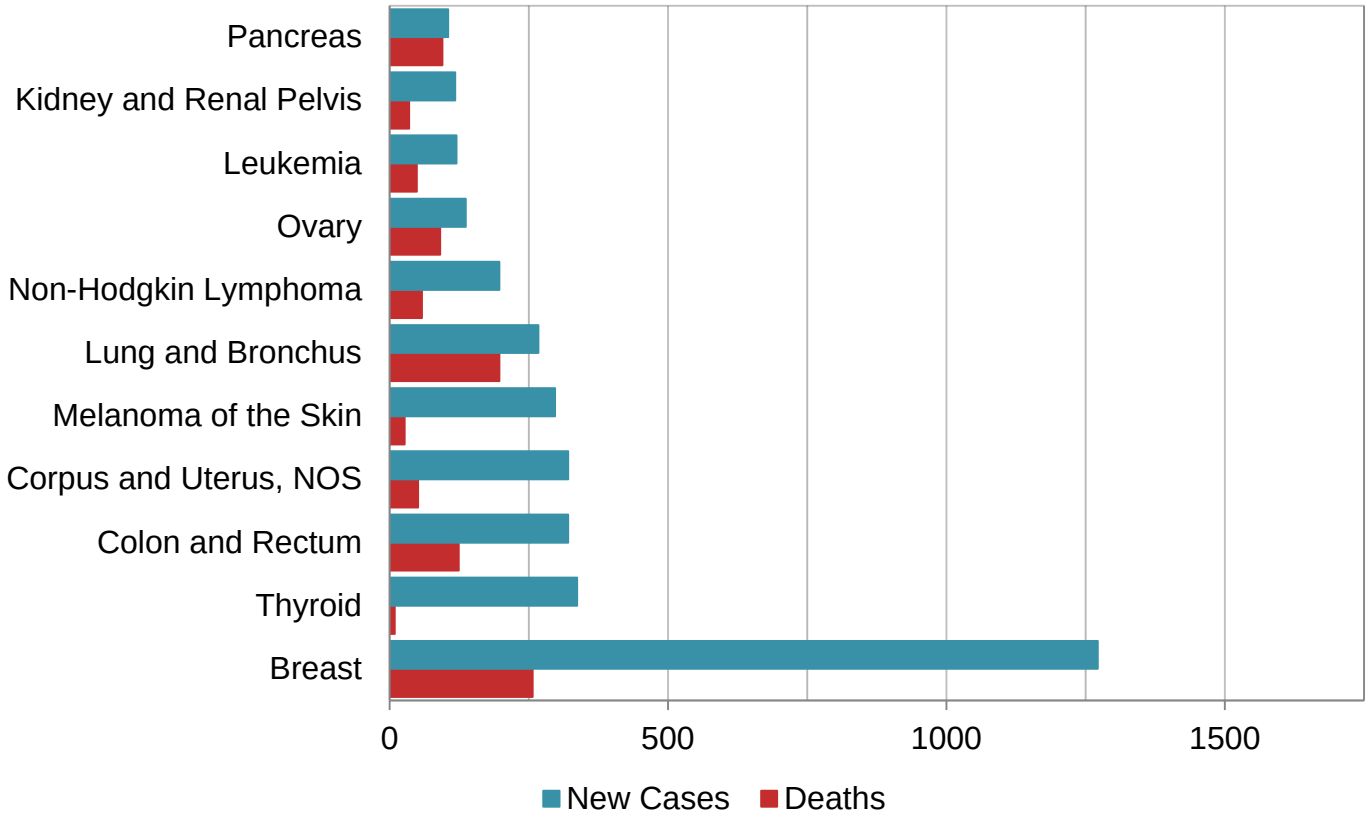


Figure 5 displays the counts of new malignant cancer diagnoses and cancer deaths in Utah females in 2010.

- Cancer is the second leading cause of death in women in Utah and the United States. In 2010, 4,252 Utah women were diagnosed with cancer and 1,303 women died of cancer.

- The five most common cancer sites in Utah women accounted for nearly 60% of all cancer cases. These include breast (29.9%), thyroid (7.9%), colon and rectum (7.6%), corpus and uterus (7.6%), and melanoma of the skin (7%). In stark contrast to the rest of the United States, lung and bronchus cancer was not among the five leading cancer sites diagnosed in Utah women in 2010.

- The leading cause of cancer death in Utah women in 2010 was breast (19.7%), followed by lung and bronchus (15.1%), colon and rectum (9.5%), and pancreas (7.3%). More than 50% of cancer deaths in Utah women in 2010 were attributed to these four sites.

- The number of new cases (105) and deaths (95) from pancreatic cancer were almost identical in Utah women in 2010. Thyroid cancer, on the other hand, resulted in fewer than 10 deaths, but was diagnosed in 337 Utah women in 2010.

Note: Cancer deaths may have been diagnosed in previous calendar years.
Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ Dataset

Data Table

Figure 6: Comparison of Utah and U.S. Incidence Rates for Females by Select Cancer Sites, 2006 – 2010

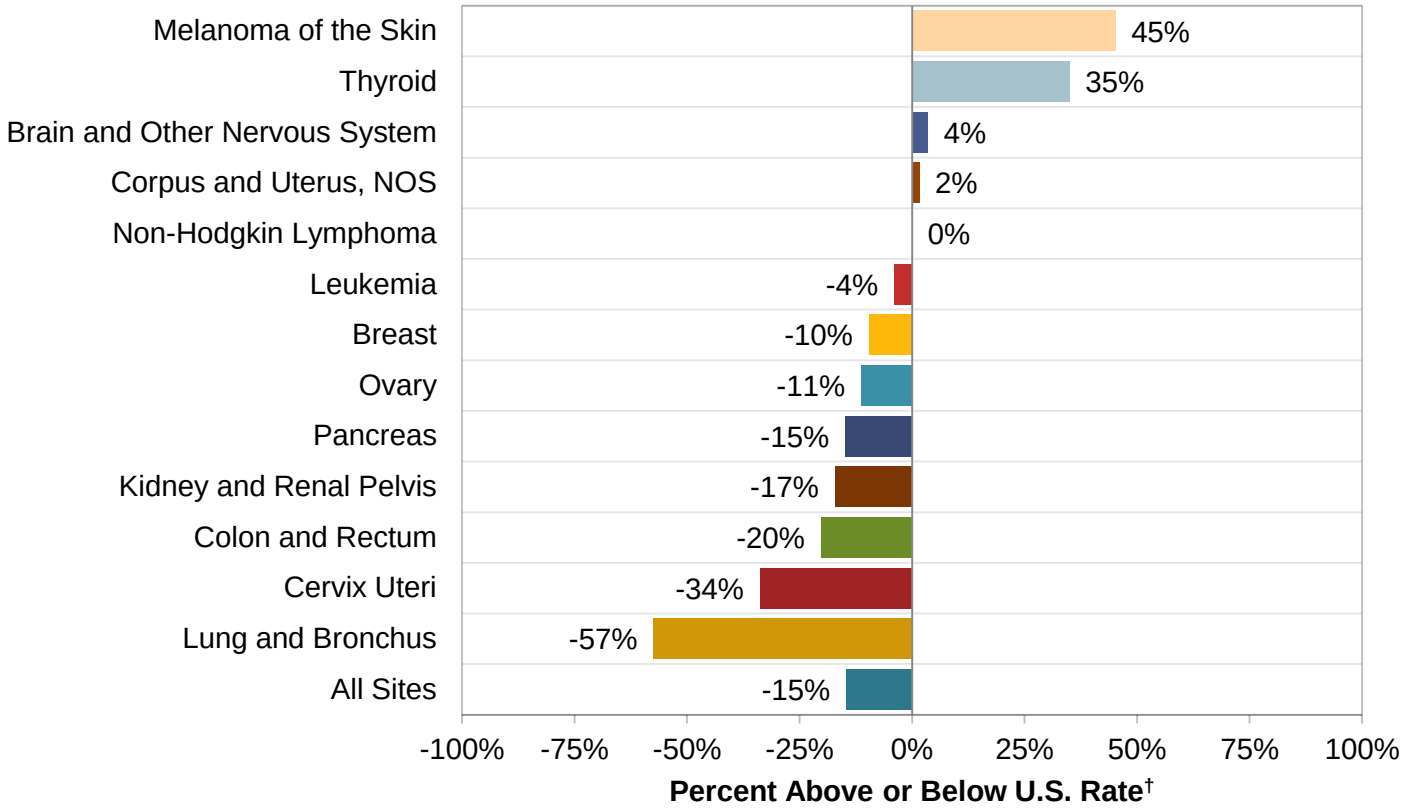


Figure 6 presents the Utah-U.S. incidence rate ratio (IRR) for females. The IRR indicates which cancer sites were above or below the U.S. incidence rate. This information is important for understanding Utah's unique female cancer burden.

- Utah women had the lowest cancer incidence rate in the United States from 2006-2010. The age-adjusted incidence rate for Utah women was 357.7 cancer cases per 100,000 women, which was 15% below the national rate of 418.7 cancer cases per 100,000 U.S. women.

- Utah women had the lowest incidence rate of lung and bronchus cancer in the United States. The age-adjusted incidence rate of lung and bronchus cancer in Utah women was 23.3 cancer cases per 100,000 women, which was 57% lower than the national rate.

- Utah women also had the lowest incidence rate of colon and rectum cancer in the nation. The age-adjusted incidence rate of colon and rectum cancer in Utah women was 31.2 cases per 100,000.

- In contrast, incidence of melanoma of the skin in Utah women is routinely one of the highest in the nation. At 22.5 cases per 100,000 Utah women, it was 45% above the national rate of 15.4 cases per 100,000.

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

Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ Dataset

Data Table

Figure 7: Comparison of Utah and U.S. Mortality Rates for Females by Select Cancer Sites, 2006 – 2010

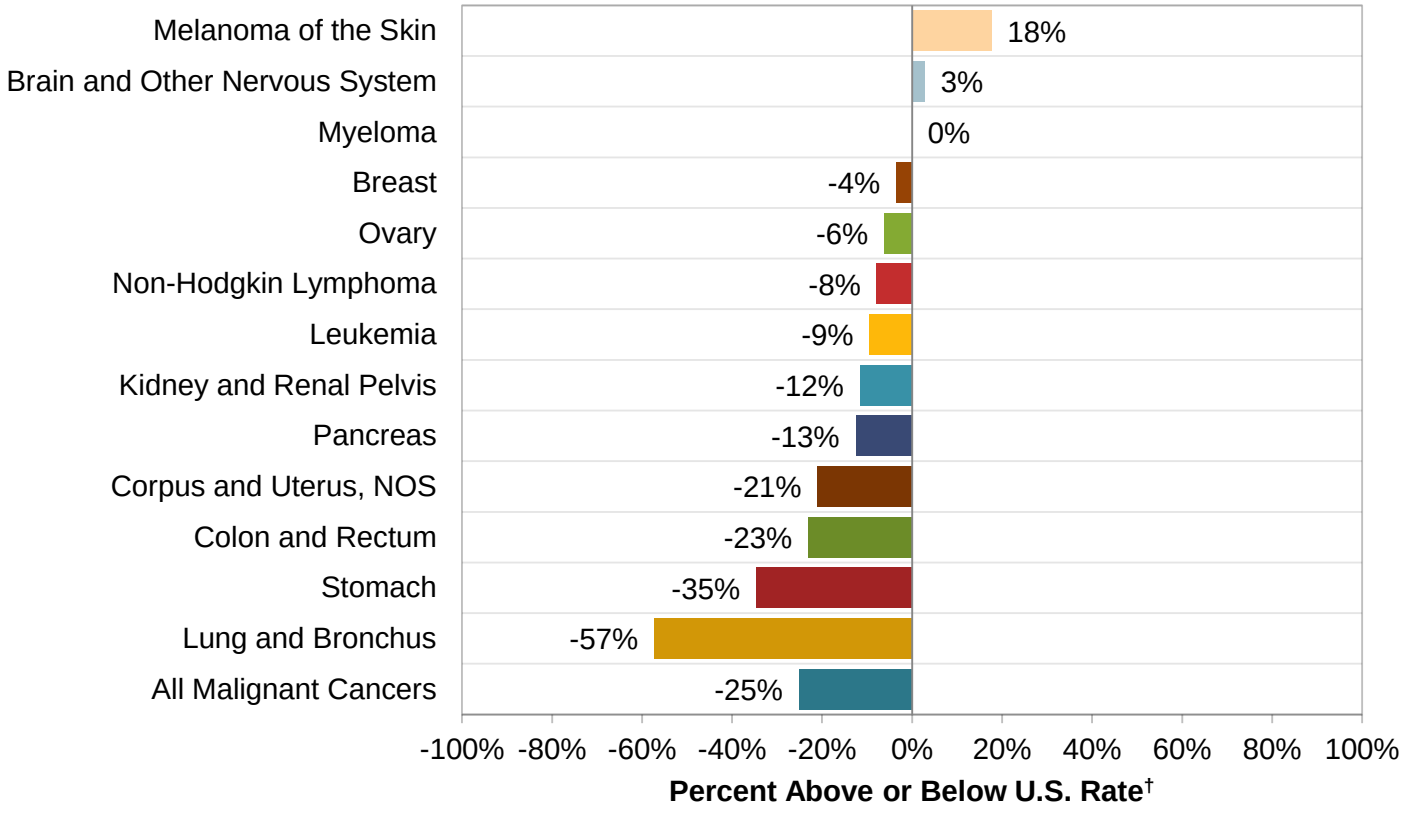


Figure 7 presents the Utah-U.S. mortality rate ratio (MRR) for females. The MRR indicates which cancer sites were above or below the U.S. mortality rate. This information is important for understanding Utah's unique female cancer burden.

- Utah women had the lowest cancer mortality rate in the United States from 2006-2010. The age-adjusted mortality rate for Utah women was 112.3 cancer deaths per 100,000 people, which was 25% lower than the national rate.

- Death from lung and bronchus cancer was the lowest in the nation for Utah females. At 16.8 lung and bronchus deaths per 100,000 Utah women it was a substantial 57% lower than the national female mortality rate.

- Utah women had higher mortality rates than the nation for only two leading cancer sites, melanoma of the skin and brain and other nervous system. The age-adjusted mortality rate for melanoma was 2.0 deaths per 100,000 women which was 18% above the national death rate. The mortality rate for brain and other nervous system cancers was 3.6 deaths per 100,000, which was only 3% above the national mortality rate.

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

Data Source: Utah Cancer Registry; SEER Mortality Dataset

Data Table

Figure 8: Trends in Age-Adjusted Cancer Incidence and Mortality Rates in Females in Utah and the U.S., 1973 – 2010

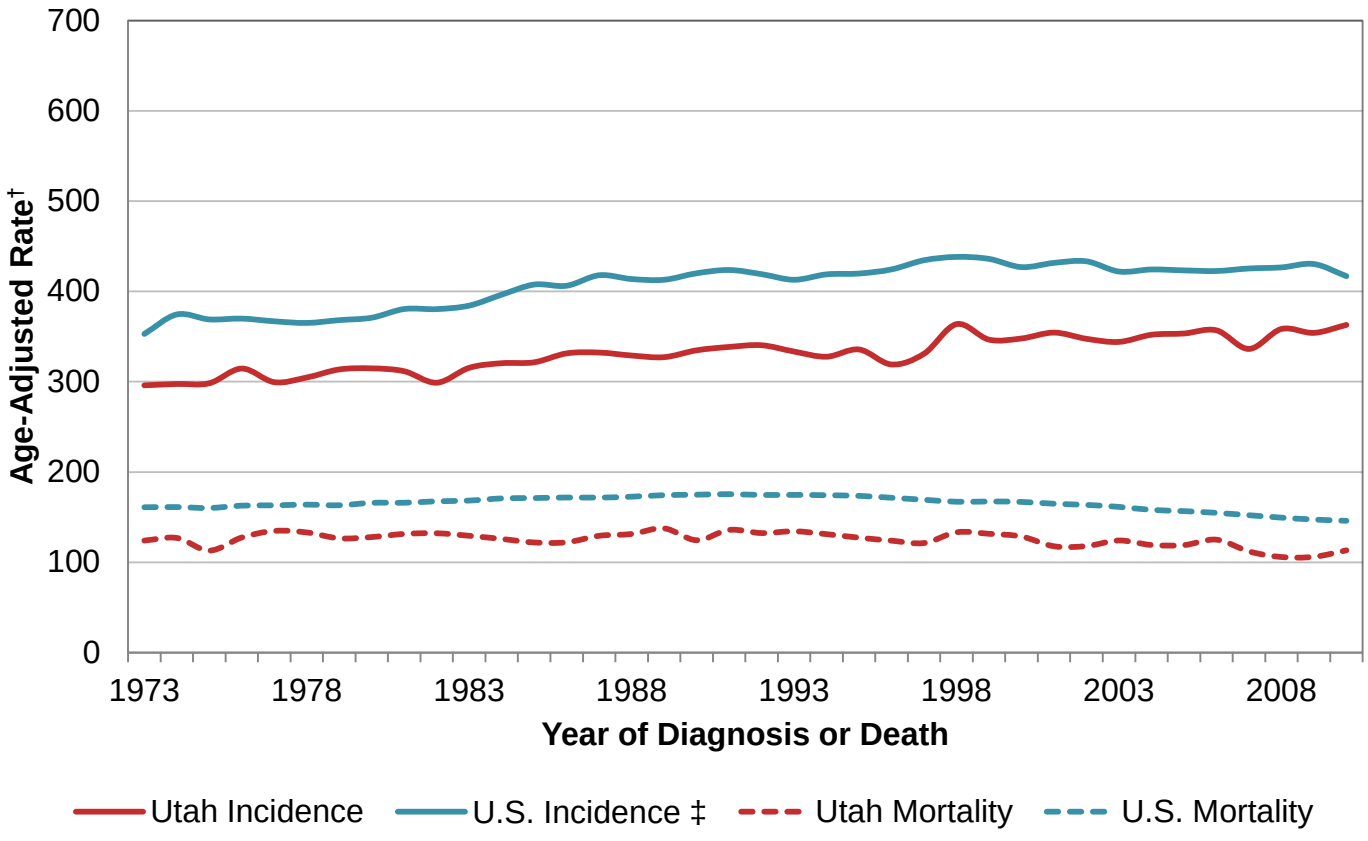


Figure 8 presents the annual age-adjusted incidence (new cases) and mortality (deaths) rates for females in Utah and the U.S. from 1973-2010. Monitoring historical changes in rates over time (long-term trends) is important for understanding cancer patterns and the effectiveness of cancer control efforts.

- Historically, Utah females have consistently had one of the lowest cancer incidence rates in the nation. However, for decades cancer incidence rates in Utah females has been rising. Since 1973, incidence rates in Utah females have risen by 0.5% per year. In 2010, incidence rates reach an historic high of 362.9 per 100,000. This is a substantial increase from 1973, the first year of available data, when Utah women experienced their lowest incidence rate (296.0 per 100,000)

- Like cancer incidence, cancer mortality in Utah females has remained lower than national rates for nearly forty years. From 1998-2010, cancer mortality rates in Utah females has been dropping by 1.5%* per year. This mirrors the national mortality trend in women, which declined by 1.4%* per year from 2001-2010.

- In 2008, the mortality rate in Utah females was an historic low of 105.9 deaths per 100,000 women.

†Rates are per 100,000 and age-adjusted to the 2000 U.S. population standard
‡ U.S. Incidence rates based on data from the SEER 9 registries (excluding Utah).
*The annual percent change (APC) is significantly different from zero ($p<0.05$).
Data Source: Utah Cancer Registry; SEER 9 Incidence and SEER Mortality Datasets

Data Table

Figure 9: Trends in Age-Adjusted Incidence Rates in Utah Females for Common Cancer Sites, 1973 – 2010

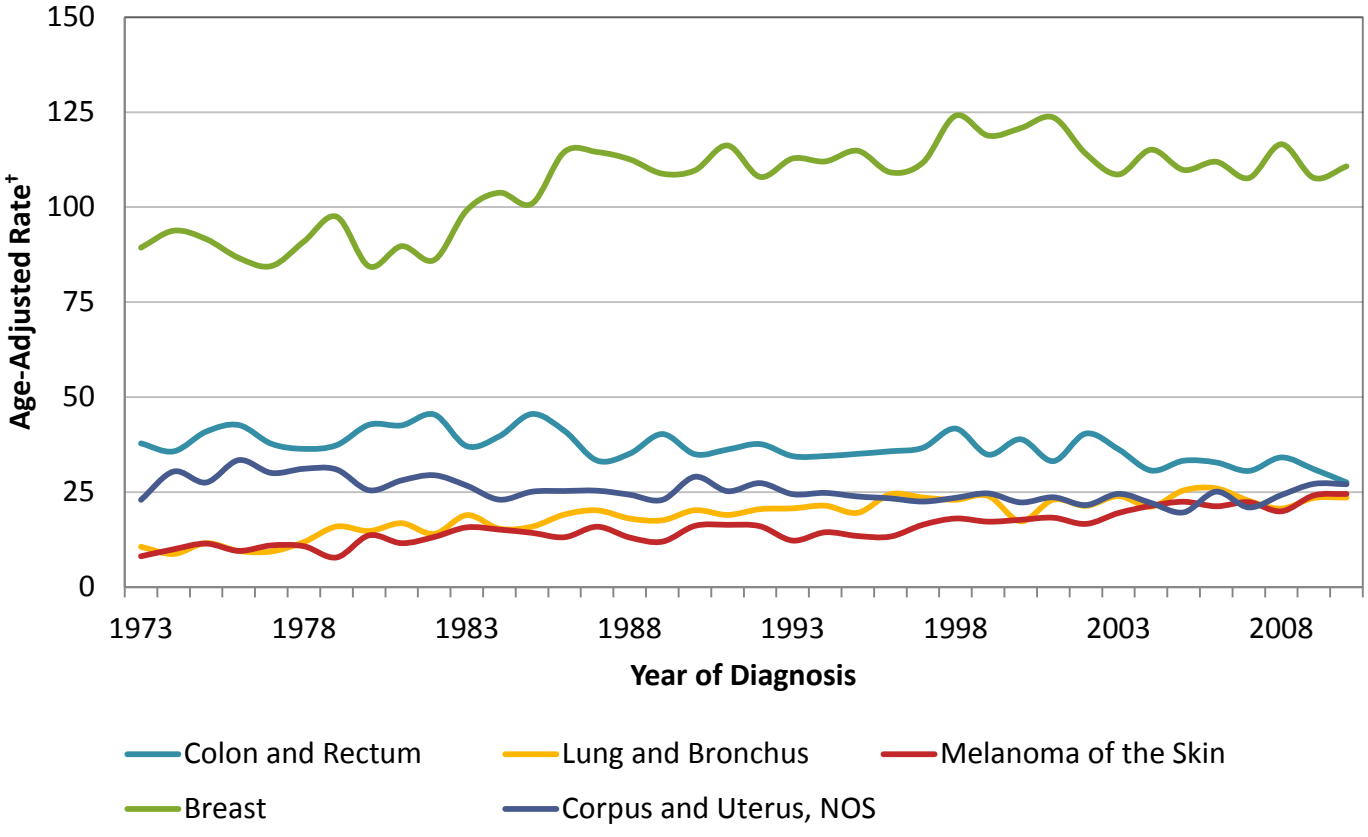


Figure 9 presents the annual age-adjusted incidence (new cases) rates for females in Utah from 1973-2010 for the five most common cancers. Examining site specific long-term trends can provide vital insight into progress in the war on cancer.

- Surprisingly, given that Utah has the lowest incidence and mortality rates from lung cancer in the nation, lung and bronchus cancer incidence in Utah females has been rising for decades. From 1973 to 1987, the incidence of lung and bronchus cancer rose 5.1%* annually in Utah females. Since 1987 rates have slowed, but continue to increase by 0.9%* per year. This mirrors national trends in female lung and bronchus cancer incidence except that since 2007 national incidence rates have been decreasing by 2.6%* per year.
- From 1973 to 1999 breast cancer incidence rates in Utah females climbed from 89.3 cases per 100,000 in 1973 to 124.1 cases per 100,000 at the highest in 1998. In 2010 the breast cancer incidence rate in Utah females was 110.8 cases per 100,000.
- The incidence of colon and rectum cancer in Utah females has been decreasing by 0.7%* per year since 1973. In 2010 the incidence rate was an all-time low of 27.6 cases per 100,000 Utah females.
- In contrast, in 2010 incidence rates for melanoma of the skin in Utah females reached an historic high of 24.5 cases per 100,000. From 1973 to 2010 melanoma incidence rates increased by 2.3%* per year in Utah women.

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

*The annual percent change (APC) is significantly different from zero ($p<0.05$).

Data Source: Utah Cancer Registry; SEER 9 Incidence Dataset

Data Table

Figure 10: Trends in Age-Adjusted Mortality Rates in Utah Females for Common Cancer Sites, 1973 – 2010

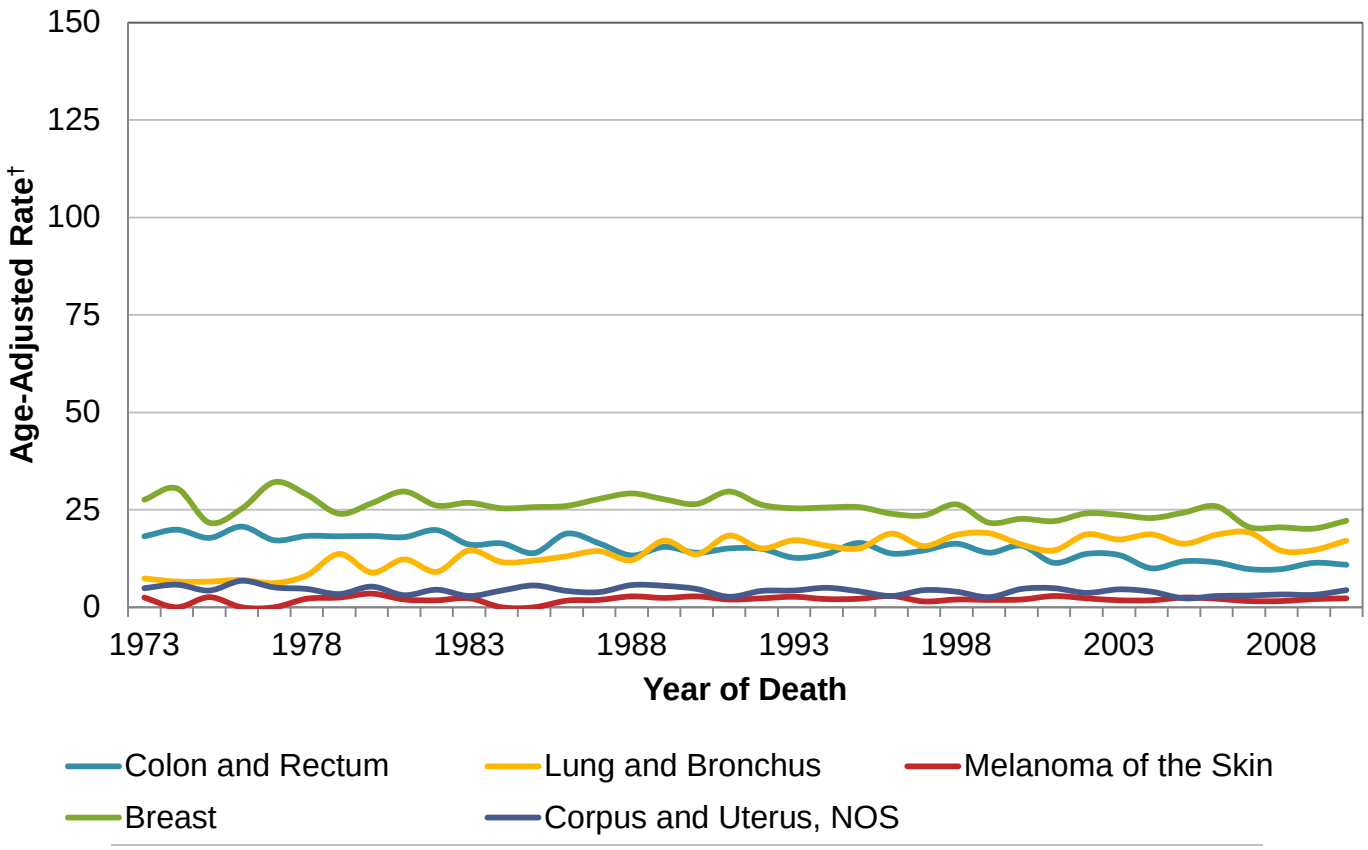


Figure 10 presents the annual age-adjusted mortality (death) rates for females in Utah from 1973-2010 for the five most common cancers. Examining site specific long-term trends can provide vital insight into progress in the war on cancer.

- From 1973 to 1991, death from cancer of the lung and bronchus in Utah females rose sharply by 5%* per year. National mortality rates from lung and bronchus cancer in women also rose steadily from 1973 to 2004, however from 2004 to 2010 national death rates from lung and bronchus cancer in women in the United States dropped by 1.4%* per year.

- Corpus and uterus cancer mortality rates have been steadily declining by 1.1%* per year since 1973.

- Breast and colon and rectum cancers have both seen steady declines in deaths in Utah women since 1973. Breast cancer deaths have declined by 0.8%* per year and colon and rectum deaths have declined by 1.6%* per year.

†Rates are per 100,000 and age-adjusted to the 2000 U.S. population standard
*The annual percent change (APC) is significantly different from zero ($p<0.05$).
Data Source: Utah Cancer Registry; SEER Mortality Dataset

Data Table

Figure 11: Number of New Cases and Deaths from Common Cancers in Utah Males, 2010

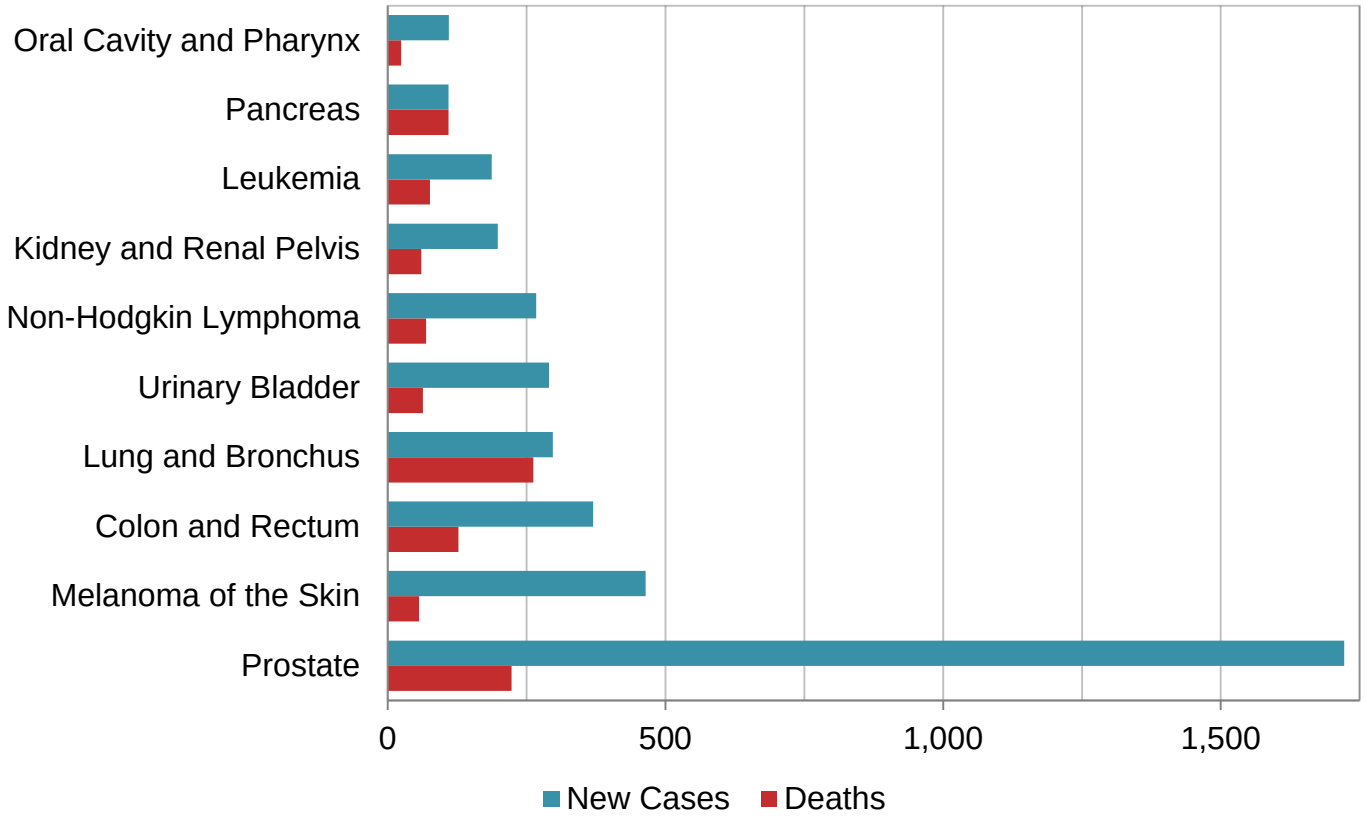


Figure 11 displays the counts of new malignant cancer cases (incidence) and cancer deaths (mortality) in Utah men in 2010.

- Cancer is the second leading cause of death in males in Utah and the United States; however, many more Utah men are diagnosed with cancer each year than die from cancer. In 2010, 1,507 Utah men died from cancer while 4,981 were newly diagnosed with cancer.

- Prostate cancer was overwhelmingly the most diagnosed cancer in Utah and U.S. males in 2010. Prostate cancer alone represented 34.6% of newly diagnosed cancers in Utah men in 2010.

- In contrast, the next four most common cancers, melanoma of the skin (9.3%), colon and rectum (7.4%), lung and bronchus (6%), and urinary bladder (5.8%) each accounted for less than 10% of new cancer cases in Utah men.

- Lung and bronchus (17.4%), prostate (14.8%), colon and rectum (8.4%), pancreas (7.2%), and leukemia (5%) were the leading causes of cancer deaths in Utah men in 2010.

- The number of new cases (109) of pancreatic cancer was identical to the number of deaths (109) from pancreatic cancer in Utah males in 2010.

Note: Cancer deaths may have been diagnosed in previous calendar years.
Data Source: Utah Cancer Registry; SEER NAACCR Incidence- Cina+ Dataset

Data Table

Figure 12: Comparison of Utah and U.S. Incidence Rates for Males by Select Cancer Sites, 2006 – 2010

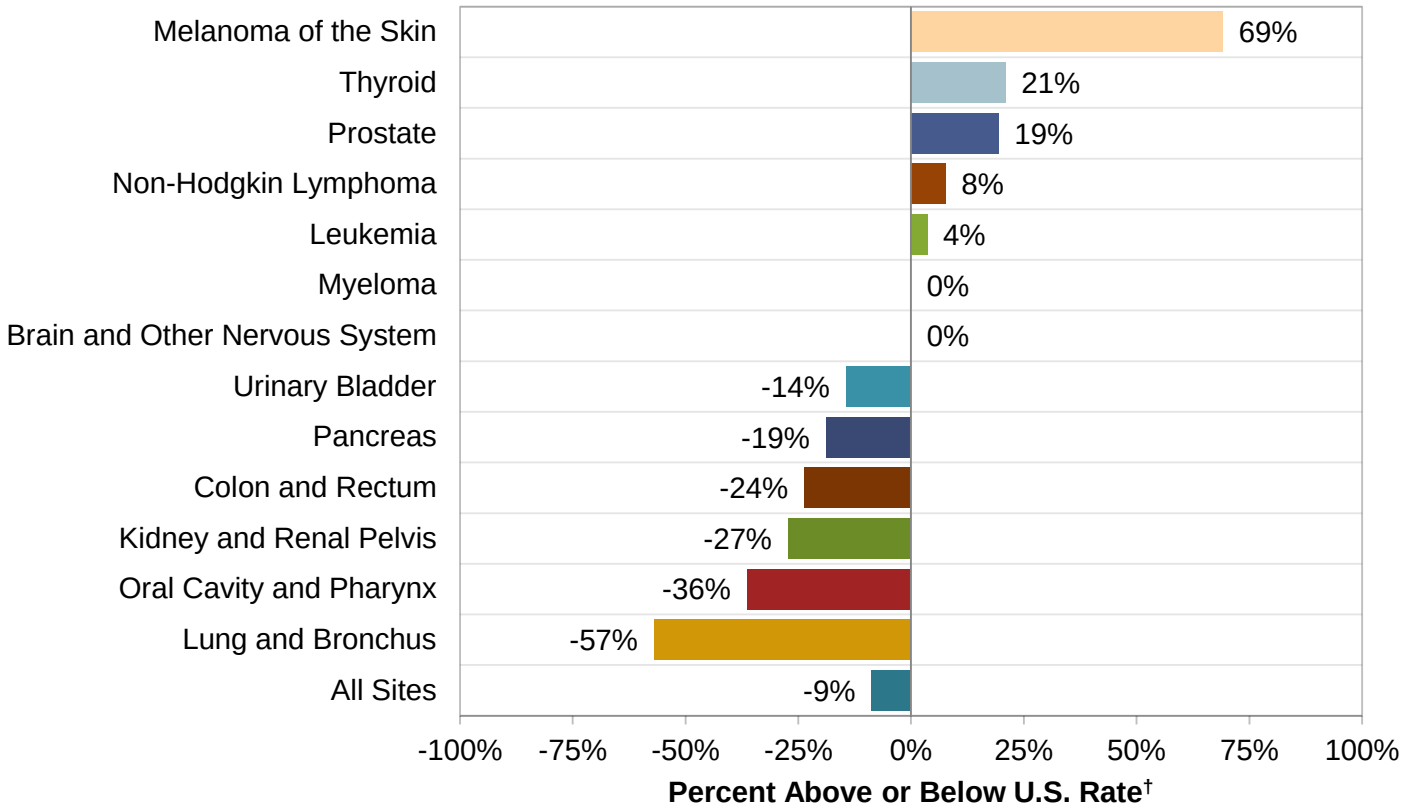


Figure 12 presents the Utah-U.S. incidence rate ratio (IRR) for males. The IRR indicates which cancer sites were above or below the U.S. incidence rate. This information is important for understanding Utah's unique male cancer burden.

- Utah men had one of the lowest cancer incidence rates in the United States from 2006-2010. From 2006-2010 the age-adjusted incidence rate for Utah men was 494.8 cancer cases per 100,000, which was 9% lower than the national rate.
- The lung and bronchus cancer incidence rate for Utah men was by far the lowest in the nation, at 34.1 cases per 100,000 Utah men. This was 57% lower than the national rate of 79.2 per 100,000. Utah males also had the lowest incidence rates of oral cavity and pharynx and colon and rectum cancers. These sites were 36% and 24% lower than the national rate, respectively.
- The incidence rate of melanoma of the skin in Utah males was 69% higher than the national rate. At 41.6 cases per 100,000, Utah men had the highest incidence rate of melanoma of the skin in the nation.
- Prostate cancer incidence rates in Utah males were also among the highest in the nation. The incidence rate in Utah males was 175.9 cases per 100,000, which was 19% higher than the national incidence rate.

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

Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ Dataset

Data Table

Figure 13: Comparison of Utah and U.S. Mortality Rates for Males by Select Cancer Sites, 2006 – 2010

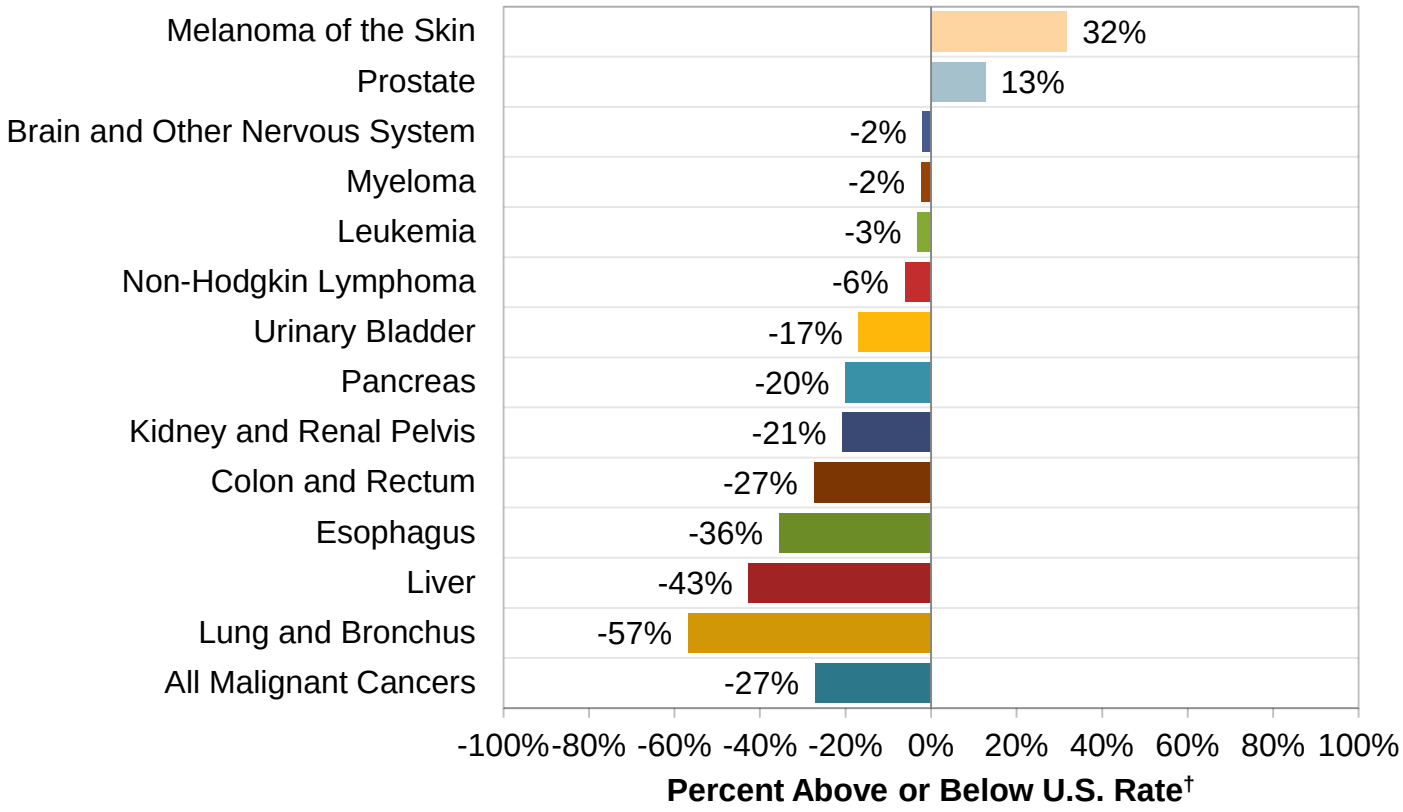


Figure 13 presents the Utah-U.S. mortality rate ratio (MRR) for males. The MRR indicates which cancer sites were above or below the U.S. mortality rate. This information is important for understanding Utah's unique male cancer burden.

- Utah males had the lowest cancer mortality rate in the nation in 2006-2010. At 157.1 deaths per 100,000 Utah males the death rate was 27% lower than the national rate.
- Like Utah women, Utah men had the lowest mortality rate in the nation from lung and bronchus cancer. At 27.5 deaths per 100,000 Utah males it was substantially lower than the national male mortality rate of 63.7 deaths per 100,000. Utah males also experienced the lowest mortality rates in the nation for cancers of the esophagus, pancreas, and colon and rectum.
- In contrast, Utah men had the highest rate of melanoma of the skin at 5.4 deaths per 100,000 Utah males. This was 32% above the national rate.
- Prostate cancer deaths were also above the national rate in Utah men. The age-adjusted mortality rate was 25.9 deaths per 100,000 males, which was 13% above the national rate.

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

Data Source: Utah Cancer Registry; SEER Mortality Dataset

Data Table

Figure 14: Trends in Age-Adjusted Cancer Incidence and Mortality Rates in Males in Utah and the U.S., 1973 – 2010

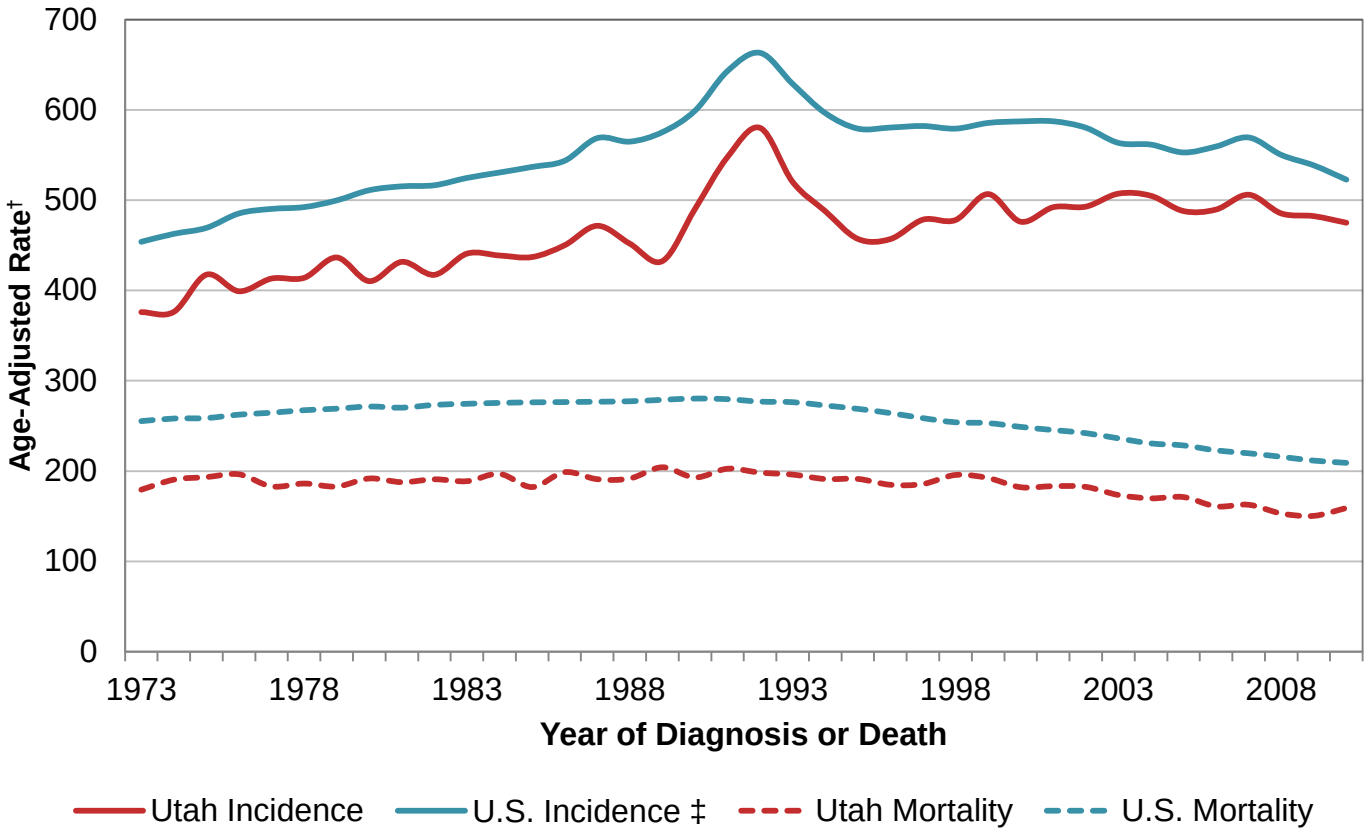


Figure 14 presents the annual age-adjusted incidence (new cases) and mortality (deaths) rates for males in Utah and the U.S. from 1973-2010. Monitoring historical changes in rates over time (long-term trends) is important for understanding cancer patterns and the effectiveness of cancer control efforts.

- Utah males have routinely seen lower cancer incidence rates than the rest of the nation. However, the long-term incidence trends experienced by Utah males largely mirrors national trends. From 1973 to 1989 incidence rates in Utah rose by 1%* and in U.S. males by 1.4%* annually. Incidence then rose and fell sharply across the nation from 1989 to 1995 with the introduction of PSA screening for prostate cancer. After this, from 1995 to 2003, cancer incidence in Utah males rose by 1.3%* per year.

- Recently, this trend has changed. Cancer incidence in Utah males has been dropping by 0.8%* annually since 2003. Nationally, males have experienced a decline in cancer incidence of 1.0%* since 2000.

- Cancer mortality rates in Utah males had also been consistently lower than the U.S. rates. From 1998-2010 cancer mortality rates fell among Utah males by 2%* per year. Nationally, male cancer mortality rates have also been declining. However, the national rates began to drop earlier (in 1990) but at a slower rate.

- In 2009, the mortality rate in Utah males was an historic low of 150.4 deaths per 100,000 males.

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

‡ U.S. Incidence rates based on data from the SEER 9 registries (excluding Utah).

*The annual percent change (APC) is significantly different from zero ($p<0.05$).

Data Source: Utah Cancer Registry; SEER 9 Incidence and SEER Mortality Datasets

Data Table

Figure 15: Trends in Age-Adjusted Incidence Rates in Utah Males for Common Cancer Sites, 1973 – 2010

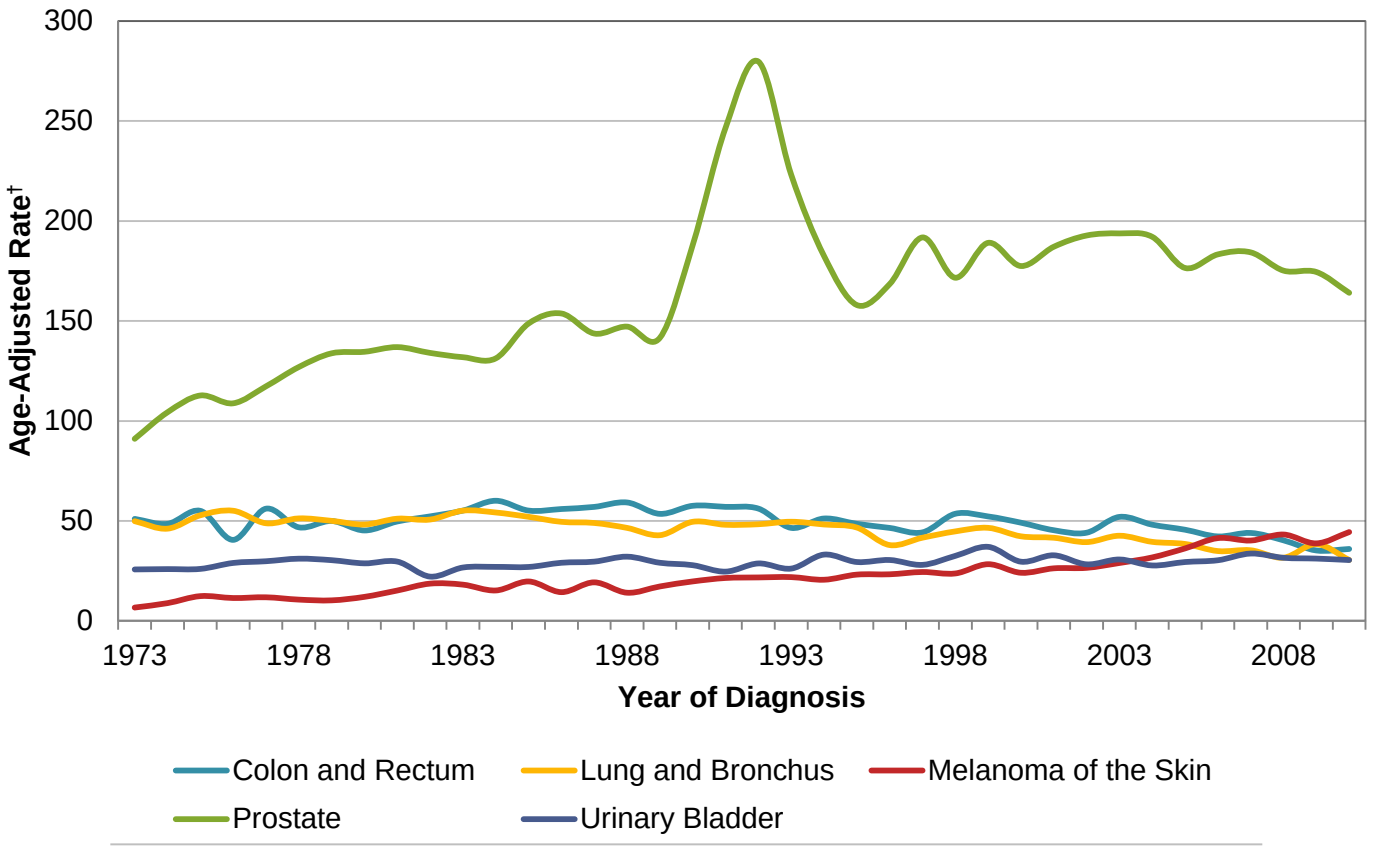


Figure 15 presents the annual age-adjusted incidence (new cases) rates for the five most common cancers in Utah males from 1973-2010. Examining site specific long-term trends can provide vital insight into progress in the war on cancer.

- Prostate cancer is overwhelmingly the most commonly diagnosed cancer in men. The age-adjusted incidence rates of prostate cancer increased by 2.3%* per year in Utah males from 1973 to 1989. Incidence then saw a dramatic change with rates rising sharply until 1992 when they peaked at 279.7 cases per 100,000 Utah men, after which rates dropped abruptly. This unprecedented spike has been attributed to the widespread introduction of prostate-specific antigen (PSA) testing. From 1995 to 2002 prostate cancer incidence continued to increase significantly by 2.7%* per year. However, since 2002 incidence rates in Utah men have been dropping annually by 1.8%*per year. This pattern largely mirrors national trends.

- Incidence rates of lung and bronchus cancer has been decreasing in Utah males since 1973. From 1993 to 2010 the decline accelerated to 2.1%* per year.

- The incidence rates of melanoma of the skin have been steadily rising in Utah males. From 1973 to 2003 incidence rates rose significantly by 3.4%* per year. Incidence rates of melanoma of the skin reached an all-time high in 2010 with 44.4 cases per 100,000 Utah males.

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

*The annual percent change (APC) is significantly different from zero ($p<0.05$).

Data Source: Utah Cancer Registry; SEER 9 Incidence Dataset

Data Table

Figure 16: Trends in Age-Adjusted Mortality Rates in Utah Males for Common Cancer Sites, 1973 – 2010

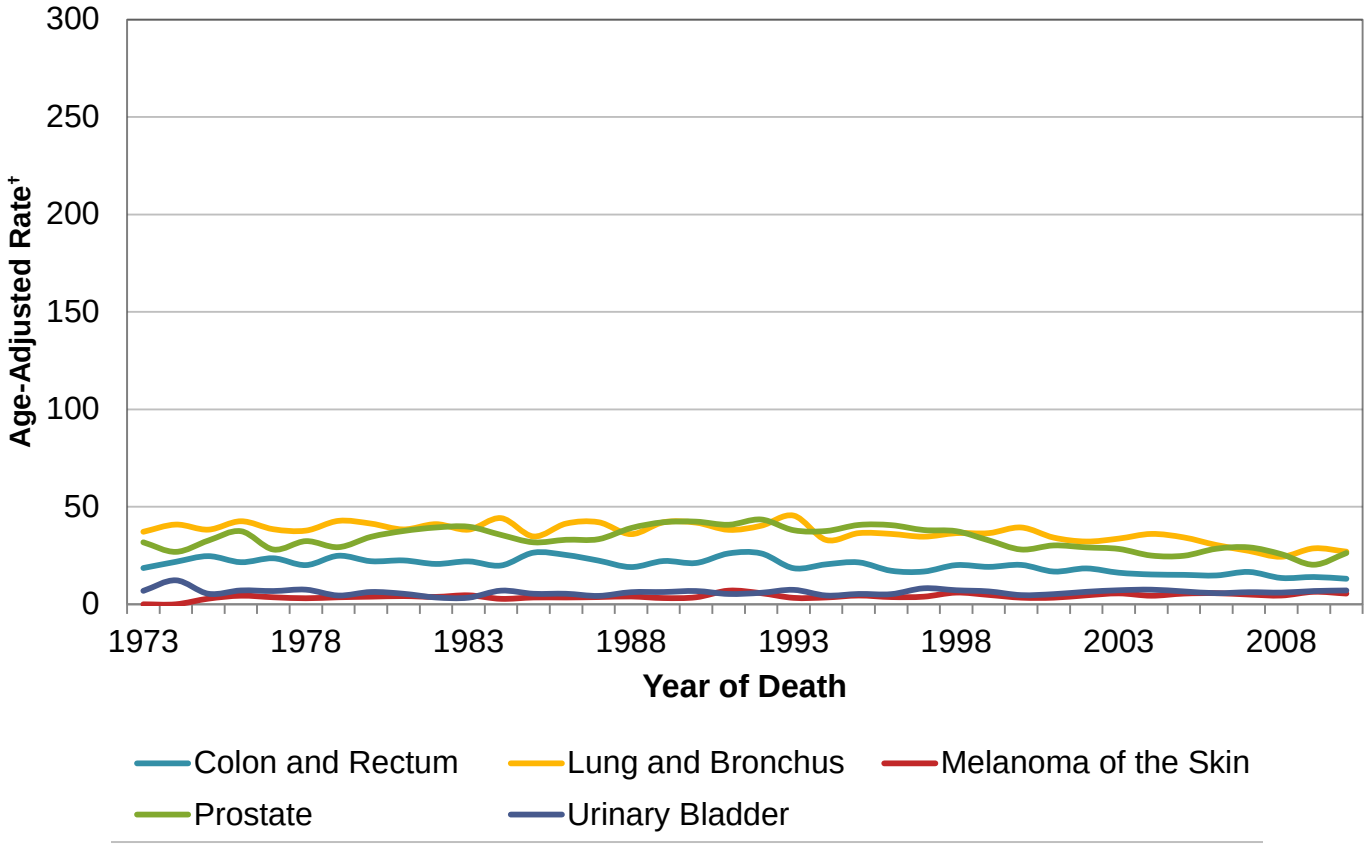


Figure 16 presents the annual age-adjusted mortality (death) rates for males in Utah from 1973-2010 for the five most common cancers. Examining site specific long-term trends can provide vital insight into progress in the war on cancer.

- Deaths from lung and bronchus cancer fell in Utah males from 2000 to 2010. Mortality rates decreased during this time period by 3.4%* per year. Nationally, mortality rates from lung and bronchus cancer in males began to fall in 1990, which was much earlier than in Utah males.

- Colon and rectum death rates fell in Utah males from 1991 to 2010, by 2.8%* annually. In contrast, national mortality from colon and rectum cancer has been declining since 1979.

- Prostate cancer deaths increased in Utah males from 1973 to 1992 by 1.7%* per year. In 1992 rates peaked at 43.5 deaths per 100,000 Utah males. From 1992 to 2010 prostate deaths in Utah males have been in sharp decline, at 3.2% annually. National rates have seen a similar rate of decline over the same time period.

†Rates are per 100,000 and age-adjusted to the 2000 U.S. population standard
*The annual percent change (APC) is significantly different from zero ($p<0.05$).
Data Source: Utah Cancer Registry; SEER Mortality Dataset

Data Table

Tables

Table 1: Counts of New Cases and Deaths from Cancer in Utah, 2010

Cancer Site	Males and Females		Females		Males	
	New Cases	Deaths	New Cases	Deaths	New Cases	Deaths
All Sites	9,233	2,810	4,252	1,303	4,981	1,507
Oral Cavity and Pharynx	171	34	61	10	110	24
Esophagus	^	63	^	16	59	47
Stomach	98	43	27	13	71	30
Small Intestine	61	^	26	^	35	^
Colon and Rectum	691	251	321	124	370	127
Anus, Anal Canal and Anorectum	^	^	17	^	^	^
Liver	85	69	22	22	63	47
Intrahepatic Bile Duct	^	^	11	^	^	14
Gallbladder	^	^	16	^	^	^
Other Biliary	29	^	16	10	13	^
Pancreas	214	204	105	95	109	109
Retroperitoneum	^	^	^	0	^	^
Peritoneum, Omentum and Mesentery	^	^	^	^	^	^
Other Digestive Organs	^	^	^	^	^	^
Nose, Nasal Cavity and Middle Ear	^	^	^	^	^	^
Larynx	^	^	^	^	38	10
Lung and Bronchus	564	459	267	197	297	262
Pleura	0	^	0	0	0	^
Trachea, Mediastinum and Other Respiratory Organs	^	^	0	0	^	^
Bones and Joints	33	^	14	^	19	^
Soft Tissue including Heart	93	33	40	10	53	23
Melanoma of the Skin	761	83	297	27	464	56
Other Non-Epithelial Skin	59	^	33	^	26	13
Breast	^	^	1,272	257	^	^
Cervix Uteri	74	^	74	^	0	0
Corpus and Uterus, NOS	321	51	321	51	0	0
Ovary	137	91	137	91	0	0
Vagina	^	^	^	^	0	0
Vulva	24	^	24	^	0	0
Other Female Genital Organs	14	^	14	^	0	0
Prostate	1,722	223	0	0	1,722	223
Testis	93	^	0	0	93	^
Penis	^	0	0	0	^	0
Other Male Genital Organs	^	0	0	0	^	0
Urinary Bladder	349	80	59	17	290	63
Kidney and Renal Pelvis	316	95	118	35	198	60
Ureter	^	0	^	0	^	0
Other Urinary Organs	^	^	^	^	^	^
Eye and Orbit	27	^	11	^	16	^
Brain and Other Nervous System	174	82	76	35	98	47
Thyroid	433	^	337	^	96	^
Other Endocrine including Thymus	^	^	^	^	10	^
Hodgkin Lymphoma	74	^	36	^	38	^
Non-Hodgkin Lymphoma	464	127	197	58	267	69
Myeloma	131	59	50	21	81	38
Leukemia	307	125	120	49	187	76
Miscellaneous	144	232	74	107	70	125

^ Statistic suppressed due to small cell size (<10) or allows inference of a small cell

Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ Dataset

Table 2a: Incidence and Mortality Rates in Utah and U.S., 2006-2010

Cancer Site	Incidence						Mortality					
	Utah		U.S.		Rate Ratio		Utah		U.S.		Rate Ratio	
	Rate	95% CI	Rate	95% CI	Absolute	95% CI	Rate	95% CI	Rate	95% CI	Absolute	95% CI
All Sites	418.6	(414.6,422.6)	470	(469.7,470.4)	-10.9%	(-11.7%,-10.1%)	131.3	(129.1,133.6)	176.7	(176.5,176.9)	-25.7%	(-26.8%,-24.5%)
Oral Cavity and Pharynx	7.5	(7.0,8.1)	11	(10.9,11.0)	-31.8%	(-36.1%,-27.3%)	1.4	(1.2,1.7)	2.5	(2.4,2.5)	-44.0%	(-49.5%,-37.9%)
Esophagus	3.1	(2.8,3.5)	4.8	(4.8,4.8)	-35.4%	(-41.6%,-28.6%)	2.8	(2.5,3.1)	4.3	(4.2,4.3)	-34.9%	(-41.8%,-27.2%)
Stomach	4.5	(4.1,4.9)	6.9	(6.9,7.0)	-34.8%	(-39.2%,-30.1%)	2.3	(2.0,2.6)	3.6	(3.5,3.6)	-36.1%	(-44.2%,-26.9%)
Small Intestine	2.2	(1.9,2.5)	2.1	(2.1,2.2)	4.8%	(-4.4%,14.8%)	0.3	(0.2,0.4)	0.4	(0.4,0.4)	-25.0%	(-57.3%,31.8%)
Colon and Rectum	35	(33.8,36.2)	44.7	(44.6,44.8)	-21.7%	(-24.0%,-19.3%)	12.4	(11.7,13.1)	16.4	(16.3,16.5)	-24.4%	(-28.4%,-20.1%)
Anus, Anal Canal and Anorectum	1.1	(0.9,1.3)	1.7	(1.7,1.7)	-35.3%	(-43.9%,-25.4%)	0.1	(0.1,0.2)	0.2	(0.2,0.2)	-50.0%	(^,^)
Liver	3.8	(3.5,4.2)	6.5	(6.4,6.5)	-41.5%	(-45.9%,-36.8%)	2.7	(2.4,3.1)	4.3	(4.3,4.3)	-37.2%	(-44.0%,-29.6%)
Intrahepatic Bile Duct	0.6	(0.4,0.7)	0.7	(0.7,0.7)	-14.3%	(-36.6%,15.9%)	1.0	(0.8,1.2)	1.3	(1.3,1.3)	-23.1%	(-35.2%,-8.7%)
Gallbladder	0.9	(0.8,1.2)	1.2	(1.1,1.2)	-25.0%	(-37.9%,-9.5%)	0.4	(0.3,0.5)	0.6	(0.6,0.6)	-33.3%	(-55.2%,-0.8%)
Other Biliary	1.2	(1.0,1.4)	1.8	(1.7,1.8)	-33.3%	(-41.6%,-23.9%)	0.4	(0.3,0.6)	0.4	(0.4,0.5)	0.0%	(^,^)
Pancreas	10.2	(9.5,10.8)	12.1	(12.1,12.2)	-15.7%	(-20.0%,-11.1%)	9.1	(8.5,9.7)	10.9	(10.9,11.0)	-16.5%	(-21.3%,-11.4%)
Retroperitoneum	0.5	(0.4,0.7)	0.4	(0.4,0.4)	25.0%	(-19.3%,93.6%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Peritoneum, Omentum and Mesentery	0.7	(0.6,0.9)	0.6	(0.6,0.6)	16.7%	(-13.8%,57.8%)	0.3	(0.2,0.4)	0.3	(0.2,0.3)	0.0%	(^,^)
Other Digestive Organs	0.5	(0.4,0.7)	0.5	(0.4,0.5)	0.0%	(^,^)	0.3	(0.2,0.4)	0.3	(0.3,0.3)	0.0%	(^,^)
Nose, Nasal Cavity and Middle Ear	0.6	(0.5,0.8)	0.7	(0.7,0.7)	-14.3%	(-36.6%,15.9%)	^	(^,^)	0.2	(0.1,0.2)	^	(^,^)
Larynx	1.9	(1.6,2.2)	3.7	(3.7,3.7)	-48.6%	(-52.2%,-44.8%)	0.4	(0.3,0.6)	1.1	(1.1,1.2)	-63.6%	(-72.6%,-51.7%)
Lung and Bronchus	28.1	(27.1,29.2)	65.1	(65.0,65.2)	-56.8%	(-57.8%,-55.8%)	21.6	(20.7,22.5)	49.7	(49.6,49.8)	-56.5%	(-57.8%,-55.2%)
Pleura	^	(^,^)	0	(0.0,0.0)	^	(^,^)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Trachea, Mediastinum and Other Respiratory Organs	0.1	(0.1,0.2)	0.2	(0.2,0.2)	-50.0%	(^,^)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Bones and Joints	1.3	(1.1,1.5)	0.9	(0.9,1.0)	44.4%	(20.6%,73.0%)	0.4	(0.3,0.5)	0.4	(0.4,0.4)	0.0%	(^,^)
Soft Tissue including Heart	3.7	(3.4,4.1)	3.2	(3.2,3.3)	15.6%	(3.2%,29.6%)	1.3	(1.1,1.5)	1.3	(1.3,1.3)	0.0%	(^,^)
Melanoma of the Skin	31	(29.9,32.1)	19.3	(19.2,19.4)	60.6%	(54.4%,67.1%)	3.5	(3.2,3.9)	2.7	(2.7,2.8)	29.6%	(14.2%,47.2%)
Other Non-Epithelial Skin	2.5	(2.2,2.8)	1.7	(1.6,1.7)	47.1%	(21.7%,77.6%)	0.9	(0.7,1.1)	0.9	(0.9,0.9)	0.0%	(^,^)
Breast	58.3	(56.8,59.8)	66.3	(66.1,66.4)	-12.1%	(-14.3%,-9.8%)	11.9	(11.2,12.6)	12.7	(12.6,12.8)	-6.3%	(-10.7%,-1.7%)
Cervix Uteri	5.3	(4.7,5.9)	8	(7.9,8.0)	-33.8%	(-39.4%,-27.5%)	1.2	(0.9,1.5)	2.4	(2.3,2.4)	-50.0%	(-55.4%,-44.0%)
Corpus and Uterus, NOS	25	(23.7,26.4)	24.6	(24.5,24.7)	1.6%	(-3.9%,7.5%)	3.4	(2.9,3.9)	4.3	(4.2,4.3)	-20.9%	(-32.2%,-7.8%)
Ovary	11	(10.1,11.9)	12.4	(12.3,12.4)	-11.3%	(-18.4%,-3.5%)	7.6	(6.9,8.4)	8.1	(8.0,8.1)	-6.2%	(-15.1%,3.7%)
Vagina	0.5	(0.3,0.7)	0.7	(0.7,0.7)	-28.6%	(-48.6%,-0.7%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Vulva	2.1	(1.7,2.5)	2.4	(2.4,2.5)	-12.5%	(-26.5%,4.2%)	0.2	(0.1,0.4)	0.5	(0.5,0.5)	-60.0%	(-78.0%,-27.2%)
Other Female Genital Organs	0.8	(0.6,1.1)	0.9	(0.9,0.9)	-11.1%	(-29.4%,12.0%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Prostate	175.9	(172.1,179.7)	147.3	(147.0,147.6)	19.4%	(16.7%,22.2%)	25.9	(24.3,27.6)	23.0	(22.9,23.2)	12.6%	(5.6%,20.1%)
Testis	7.1	(6.5,7.8)	5.5	(5.4,5.5)	29.1%	(17.5%,41.8%)	0.2	(0.1,0.3)	0.2	(0.2,0.3)	0.0%	(^,^)
Penis	0.7	(0.4,0.9)	0.9	(0.8,0.9)	-22.2%	(-39.2%,-0.5%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Other Male Genital Organs	0.3	(0.2,0.5)	0.2	(0.2,0.2)	50.0%	(-32.2%,232.1%)	^	(^,^)	0.0	(0.0,0.0)	^	(^,^)
Urinary Bladder	17.1	(16.2,17.9)	20.9	(20.8,21.0)	-18.2%	(-21.5%,-14.7%)	3.6	(3.2,4.0)	4.4	(4.4,4.4)	-18.2%	(-25.8%,-9.7%)
Kidney and Renal Pelvis	12.1	(11.5,12.8)	15.7	(15.7,15.8)	-22.9%	(-26.1%,-19.6%)	3.4	(3.0,3.8)	4.0	(3.9,4.0)	-15.0%	(-23.6%,-5.5%)
Ureter	0.4	(0.3,0.5)	0.6	(0.6,0.6)	-33.3%	(-55.2%,-0.8%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Other Urinary Organs	0.3	(0.2,0.4)	0.3	(0.3,0.3)	0.0%	(^,^)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Eye and Orbit	1.1	(0.9,1.3)	0.8	(0.8,0.8)	37.5%	(11.7%,69.3%)	0.1	(0.1,0.2)	0.1	(0.1,0.1)	0.0%	(^,^)
Brain and Other Nervous System	6.8	(6.4,7.3)	6.7	(6.6,6.7)	1.5%	(-4.2%,7.6%)	4.4	(4.0,4.8)	4.3	(4.2,4.3)	2.3%	(-6.5%,12.0%)
Thyroid	16.1	(15.4,16.9)	12.4	(12.3,12.4)	29.8%	(22.8%,37.2%)	0.5	(0.4,0.7)	0.5	(0.5,0.5)	0.0%	(^,^)
Other Endocrine including Thymus	0.5	(0.4,0.7)	0.8	(0.7,0.8)	-37.5%	(-54.0%,-15.0%)	0.2	(0.1,0.3)	0.3	(0.3,0.3)	-33.3%	(^,^)
Hodgkin Lymphoma	2.7	(2.4,3.0)	2.8	(2.8,2.8)	-3.6%	(-10.2%,3.6%)	0.3	(0.2,0.4)	0.4	(0.4,0.4)	-25.0%	(-57.3%,31.8%)
Non-Hodgkin Lymphoma	20.3	(19.5,21.2)	19.5	(19.4,19.5)	4.1%	(0.1%,8.3%)	6.1	(5.6,6.6)	6.4	(6.4,6.5)	-4.7%	(-13.2%,4.7%)
Myeloma	5.7	(5.2,6.2)	6	(5.9,6.0)	-5.0%	(-11.2%,1.6%)	3.4	(3.0,3.7)	3.4	(3.4,3.4)	0.0%	(^,^)
Leukemia	13.1	(12.4,13.8)	12.9	(12.8,12.9)	1.6%	(-4.4%,7.9%)	6.7	(6.2,7.3)	7.1	(7.0,7.1)	-5.6%	(-13.3%,2.8%)
Miscellaneous	12.2	(11.5,12.9)	17.4	(17.3,17.5)	-29.9%	(-33.5%,-26.0%)	11.1	(10.4,11.8)	13.2	(13.1,13.2)	-15.9%	(-19.9%,-11.7%)

^ Statistic suppressed due to small cell size (<10) or allows inference of a small cell

Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ and SEER Mortality Datasets

Table 2b: Incidence and Mortality Rates in Utah and the U.S., 2006-2010: Females

Cancer Site	Incidence						Mortality					
	Utah		U.S.		Rate Ratio		Utah		U.S.		Rate Ratio	
	Rate	95% CI	Rate	95% CI	Absolute	95% CI	Rate	95% CI	Rate	95% CI	Absolute	95% CI
All Sites	357.7	(352.7,362.7)	418.7	(418.3,419.2)	-14.6%	(-15.7%,-13.4%)	112.3	(109.5,115.2)	149.9	(149.6,150.2)	-25.1%	(-26.8%,-23.4%)
Oral Cavity and Pharynx	4.8	(4.2,5.4)	6.3	(6.2,6.3)	-23.8%	(-31.5%,-15.2%)	1.1	(0.8,1.4)	1.4	(1.4,1.4)	-21.4%	(-32.9%,-8.0%)
Esophagus	0.9	(0.7,1.2)	1.9	(1.9,1.9)	-52.6%	(-59.1%,-45.2%)	1.0	(0.7,1.3)	1.6	(1.6,1.6)	-37.5%	(-46.4%,-27.1%)
Stomach	3.1	(2.7,3.7)	4.8	(4.8,4.9)	-35.4%	(-41.6%,-28.6%)	1.7	(1.4,2.1)	2.6	(2.5,2.6)	-34.6%	(-45.7%,-21.3%)
Small Intestine	1.7	(1.4,2.1)	1.8	(1.8,1.9)	-5.6%	(-24.5%,18.2%)	0.3	(0.1,0.4)	0.3	(0.3,0.3)	0.0%	(^,^)
Colon and Rectum	31.2	(29.7,32.7)	39.1	(39.0,39.2)	-20.2%	(-23.7%,-16.5%)	10.7	(9.8,11.6)	13.9	(13.8,13.9)	-23.0%	(-27.8%,-17.9%)
Anus, Anal Canal and Anorectum	1.4	(1.1,1.7)	2	(1.9,2.0)	-30.0%	(-44.6%,-11.6%)	0.2	(0.1,0.3)	0.2	(0.2,0.3)	0.0%	(^,^)
Liver	2	(1.7,2.5)	3.2	(3.1,3.2)	-37.5%	(-46.4%,-27.1%)	1.7	(1.4,2.1)	2.2	(2.2,2.2)	-22.7%	(-36.9%,-5.4%)
Intrahepatic Bile Duct	0.5	(0.3,0.7)	0.6	(0.6,0.6)	-16.7%	(-41.7%,19.1%)	0.8	(0.6,1.1)	1.1	(1.1,1.2)	-27.3%	(-40.9%,-10.5%)
Gallbladder	1.2	(0.9,1.6)	1.4	(1.4,1.4)	-14.3%	(-36.6%,15.9%)	0.6	(0.4,0.8)	0.8	(0.7,0.8)	-25.0%	(-43.4%,-0.6%)
Other Biliary	1.1	(0.9,1.4)	1.5	(1.4,1.5)	-26.7%	(-37.0%,-14.6%)	0.5	(0.4,0.8)	0.4	(0.4,0.4)	25.0%	(-19.3%,93.6%)
Pancreas	9.2	(8.4,10.0)	10.8	(10.7,10.8)	-14.8%	(-21.3%,-7.9%)	8.4	(7.6,9.2)	9.6	(9.5,9.6)	-12.5%	(-19.8%,-4.5%)
Retroperitoneum	0.5	(0.3,0.7)	0.4	(0.3,0.4)	25.0%	(-19.3%,93.6%)	^	(^,^)	0.1	(0.0,0.1)	^	(^,^)
Peritoneum, Omentum and Mesentery	1.3	(1.0,1.6)	1	(1.0,1.1)	30.0%	(-7.7%,83.2%)	0.4	(0.3,0.6)	0.4	(0.4,0.4)	0.0%	(^,^)
Other Digestive Organs	0.5	(0.3,0.7)	0.4	(0.4,0.4)	25.0%	(-19.3%,93.6%)	0.2	(0.1,0.4)	0.2	(0.2,0.2)	0.0%	(^,^)
Nose, Nasal Cavity and Middle Ear	0.6	(0.4,0.8)	0.5	(0.5,0.5)	20.0%	(-16.1%,71.5%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Larynx	0.7	(0.5,0.9)	1.4	(1.4,1.4)	-50.0%	(-58.8%,-39.3%)	0.2	(0.1,0.4)	0.4	(0.4,0.4)	-50.0%	(-74.7%,-1.4%)
Lung and Bronchus	23.3	(22.0,24.6)	54.7	(54.5,54.8)	-57.4%	(-59.0%,-55.8%)	16.8	(15.7,17.9)	39.3	(39.2,39.4)	-57.3%	(-59.1%,-55.3%)
Pleura	^	(^,^)	0	(0.0,0.0)	^	(^,^)	^	(^,^)	0.0	(0.0,0.0)	^	(^,^)
Trachea, Mediastinum and Other Respiratory Organs	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)	^	(^,^)	0.0	(0.0,0.1)	^	(^,^)
Bones and Joints	0.9	(0.6,1.1)	0.8	(0.8,0.8)	12.5%	(-10.7%,41.7%)	0.3	(0.2,0.5)	0.3	(0.3,0.4)	0.0%	(^,^)
Soft Tissue including Heart	3.2	(2.7,3.7)	2.7	(2.7,2.8)	18.5%	(3.7%,35.4%)	1.1	(0.9,1.4)	1.1	(1.1,1.2)	0.0%	(^,^)
Melanoma of the Skin	22.5	(21.3,23.8)	15.5	(15.4,15.6)	45.2%	(36.4%,54.5%)	2.0	(1.6,2.4)	1.7	(1.7,1.7)	17.6%	(-4.9%,45.5%)
Other Non-Epithelial Skin	1.9	(1.6,2.3)	1.2	(1.2,1.3)	58.3%	(22.4%,104.8%)	0.3	(0.2,0.5)	0.4	(0.4,0.4)	-25.0%	(-57.3%,31.8%)
Breast	110.8	(108.0,113.7)	122.5	(122.3,122.8)	-9.6%	(-11.7%,-7.4%)	21.8	(20.6,23.1)	22.6	(22.5,22.7)	-3.5%	(-8.6%,1.8%)
Cervix Uteri	5.3	(4.7,5.9)	8	(7.9,8.0)	-33.8%	(-39.4%,-27.5%)	1.2	(0.9,1.5)	2.4	(2.3,2.4)	-50.0%	(-55.4%,-44.0%)
Corpus and Uterus, NOS	25	(23.7,26.4)	24.6	(24.5,24.7)	1.6%	(-3.9%,7.5%)	3.4	(2.9,3.9)	4.3	(4.2,4.3)	-20.9%	(-32.2%,-7.8%)
Ovary	11	(10.1,11.9)	12.4	(12.3,12.4)	-11.3%	(-18.4%,-3.5%)	7.6	(6.9,8.4)	8.1	(8.0,8.1)	-6.2%	(-15.1%,3.7%)
Vagina	0.5	(0.3,0.7)	0.7	(0.7,0.7)	-28.6%	(-48.6%,-0.7%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Vulva	2.1	(1.7,2.5)	2.4	(2.4,2.5)	-12.5%	(-26.5%,4.2%)	0.2	(0.1,0.4)	0.5	(0.5,0.5)	-60.0%	(-78.0%,-27.2%)
Other Female Genital Organs	0.8	(0.6,1.1)	0.9	(0.9,0.9)	-11.1%	(-29.4%,12.0%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Prostate	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Testis	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Penis	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Other Male Genital Organs	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Urinary Bladder	5.3	(4.7,6.0)	9.1	(9.0,9.2)	-41.8%	(-46.4%,-36.7%)	1.5	(1.2,1.9)	2.2	(2.2,2.3)	-31.8%	(-45.0%,-15.5%)
Kidney and Renal Pelvis	9.2	(8.4,10.1)	11.1	(11.0,11.2)	-17.1%	(-23.3%,-10.4%)	2.3	(2.0,2.8)	2.6	(2.5,2.6)	-11.5%	(-24.6%,3.8%)
Ureter	0.2	(0.1,0.4)	0.4	(0.4,0.4)	-50.0%	(-74.7%,-1.4%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Other Urinary Organs	0.2	(0.1,0.3)	0.2	(0.2,0.2)	0.0%	(^,^)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Eye and Orbit	0.9	(0.7,1.2)	0.7	(0.7,0.7)	28.6%	(0.5%,64.5%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Brain and Other Nervous System	5.9	(5.3,6.5)	5.7	(5.6,5.7)	3.5%	(-6.5%,14.6%)	3.6	(3.1,4.2)	3.5	(3.4,3.5)	2.9%	(-12.8%,21.4%)
Thyroid	24.7	(23.5,26.1)	18.3	(18.2,18.4)	35.0%	(26.6%,43.9%)	0.4	(0.3,0.6)	0.5	(0.5,0.5)	-20.0%	(-48.3%,23.9%)
Other Endocrine including Thymus	0.4	(0.3,0.6)	0.7	(0.7,0.7)	-42.9%	(-60.4%,-17.6%)	0.2	(0.1,0.4)	0.3	(0.3,0.3)	-33.3%	(-69.9%,47.6%)
Hodgkin Lymphoma	2.2	(1.9,2.6)	2.5	(2.4,2.5)	-12.0%	(-25.5%,4.0%)	0.3	(0.1,0.4)	0.3	(0.3,0.3)	0.0%	(^,^)
Non-Hodgkin Lymphoma	16.3	(15.2,17.4)	16.3	(16.2,16.4)	0.0%	(^,^)	4.7	(4.1,5.3)	5.1	(5.1,5.2)	-7.8%	(-18.3%,3.9%)
Myeloma	4.2	(3.7,4.8)	4.9	(4.8,4.9)	-14.3%	(-24.7%,-2.4%)	2.7	(2.2,3.1)	2.7	(2.7,2.8)	0.0%	(^,^)
Leukemia	9.7	(8.9,10.6)	10.1	(10.0,10.1)	-4.0%	(-11.3%,4.0%)	4.8	(4.2,5.5)	5.3	(5.3,5.4)	-9.4%	(-19.4%,1.8%)
Miscellaneous	10.3	(9.5,11.2)	14.8	(14.7,14.9)	-30.4%	(-34.7%,-25.9%)	8.8	(8.0,9.6)	10.6	(10.5,10.6)	-17.0%	(-23.4%,-10.0%)

^ Statistic suppressed due to small cell size (<10) or allows inference of a small cell

Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ and SEER Mortality Datasets

Table 2c: Incidence and Mortality Rates in Utah and the U.S., 2006-2010: Males

Cancer Site	Incidence						Mortality					
	Utah		U.S.		Rate Ratio		Utah		U.S.		Rate Ratio	
	Rate	95% CI	Rate	95% CI	Absolute	95% CI	Rate	95% CI	Rate	95% CI	Absolute	95% CI
All Sites	494.8	(488.4,501.2)	542.3	(541.7,542.8)	-8.8%	(-9.9%,-7.6%)	157.1	(153.4,161.0)	215.6	(215.3,216.0)	-27.1%	(-28.6%,-25.6%)
Oral Cavity and Pharynx	10.5	(9.6,11.5)	16.5	(16.4,16.6)	-36.4%	(-40.9%,-31.5%)	1.8	(1.4,2.2)	3.8	(3.7,3.8)	-52.6%	(-59.1%,-45.2%)
Esophagus	5.7	(5.0,6.4)	8.4	(8.3,8.4)	-32.1%	(-39.4%,-24.1%)	4.9	(4.3,5.6)	7.6	(7.6,7.7)	-35.5%	(-41.4%,-29.1%)
Stomach	6	(5.3,6.7)	9.6	(9.5,9.7)	-37.5%	(-43.6%,-30.8%)	3.0	(2.5,3.6)	4.9	(4.8,4.9)	-38.8%	(-47.4%,-28.7%)
Small Intestine	2.6	(2.2,3.1)	2.5	(2.5,2.6)	4.0%	(-10.8%,21.3%)	0.3	(0.2,0.5)	0.4	(0.4,0.5)	-25.0%	(-57.3%,31.8%)
Colon and Rectum	39.4	(37.6,41.2)	51.6	(51.5,51.8)	-23.6%	(-26.6%,-20.6%)	14.3	(13.2,15.5)	19.7	(19.6,19.8)	-27.4%	(-32.4%,-22.1%)
Anus, Anal Canal and Anorectum	0.8	(0.6,1.1)	1.4	(1.4,1.5)	-42.9%	(-52.4%,-31.4%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Liver	5.8	(5.1,6.5)	10.3	(10.3,10.4)	-43.7%	(-47.8%,-39.3%)	3.9	(3.3,4.5)	6.8	(6.8,6.9)	-42.6%	(-48.8%,-35.8%)
Intrahepatic Bile Duct	0.7	(0.4,0.9)	0.8	(0.8,0.8)	-12.5%	(-32.6%,13.7%)	1.2	(0.9,1.6)	1.5	(1.5,1.5)	-20.0%	(-40.2%,7.1%)
Gallbladder	0.6	(0.4,0.9)	0.8	(0.8,0.9)	-25.0%	(-43.4%,-0.6%)	^	(^,^)	0.5	(0.5,0.5)	^	(^,^)
Other Biliary	1.3	(1.0,1.7)	2.2	(2.1,2.2)	-40.9%	(-53.0%,-25.7%)	0.3	(0.1,0.5)	0.5	(0.5,0.5)	-40.0%	(-63.6%,-1.0%)
Pancreas	11.2	(10.3,12.3)	13.8	(13.7,13.8)	-18.8%	(-25.0%,-12.2%)	10.0	(9.0,10.9)	12.5	(12.5,12.6)	-20.0%	(-26.7%,-12.7%)
Retroperitoneum	0.5	(0.4,0.8)	0.4	(0.4,0.4)	25.0%	(-19.3%,93.6%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Peritoneum, Omentum and Mesentery	0.1	(0.0,0.3)	0.1	(0.1,0.1)	0.0%	(^,^)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Other Digestive Organs	0.5	(0.3,0.8)	0.5	(0.5,0.5)	0.0%	(^,^)	0.3	(0.2,0.5)	0.4	(0.4,0.4)	-25.0%	(-57.3%,31.8%)
Nose, Nasal Cavity and Middle Ear	0.7	(0.5,0.9)	0.9	(0.9,0.9)	-22.2%	(-39.2%,-0.5%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Larynx	3.3	(2.8,3.8)	6.5	(6.5,6.6)	-49.2%	(-55.2%,-42.5%)	0.7	(0.5,1.0)	2.0	(2.0,2.1)	-65.0%	(-70.1%,-59.0%)
Lung and Bronchus	34.1	(32.4,35.9)	79.2	(79.0,79.4)	-56.9%	(-58.3%,-55.5%)	27.5	(26.0,29.1)	63.7	(63.5,63.9)	-56.8%	(-58.4%,-55.2%)
Pleura	^	(^,^)	0	(0.0,0.1)	^	(^,^)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Trachea, Mediastinum and Other Respiratory Organs	0.2	(0.1,0.4)	0.3	(0.3,0.3)	-33.3%	(-69.9%,47.6%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Bones and Joints	1.7	(1.3,2.0)	1.1	(1.1,1.1)	54.5%	(16.3%,105.4%)	0.5	(0.3,0.7)	0.5	(0.5,0.6)	0.0%	(^,^)
Soft Tissue including Heart	4.4	(3.9,5.0)	3.8	(3.8,3.9)	15.8%	(0.3%,33.7%)	1.5	(1.2,1.9)	1.5	(1.5,1.5)	0.0%	(^,^)
Melanoma of the Skin	41.6	(39.8,43.5)	24.6	(24.5,24.7)	69.1%	(60.1%,78.6%)	5.4	(4.8,6.1)	4.1	(4.0,4.1)	31.7%	(11.6%,55.5%)
Other Non-Epithelial Skin	3.3	(2.8,3.9)	2.3	(2.2,2.3)	43.5%	(16.0%,77.4%)	1.6	(1.2,2.0)	1.5	(1.5,1.5)	6.7%	(-17.2%,37.4%)
Breast	0.8	(0.6,1.1)	1.4	(1.4,1.4)	-42.9%	(-52.4%,-31.4%)	0.3	(0.1,0.4)	0.3	(0.3,0.3)	0.0%	(^,^)
Cervix Uteri	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Corpus and Uterus, NOS	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Ovary	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Vagina	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Vulva	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Other Female Genital Organs	0	(0.0,0.1)	0	(0.0,0.0)	^	(^,^)	0.0	(0.0,0.1)	0.0	(0.0,0.0)	^	(^,^)
Prostate	175.9	(172.1,179.7)	147.3	(147.0,147.6)	19.4%	(16.7%,22.2%)	25.9	(24.3,27.6)	23.0	(22.9,23.2)	12.6%	(5.6%,20.1%)
Testis	7.1	(6.5,7.8)	5.5	(5.4,5.5)	29.1%	(17.5%,41.8%)	0.2	(0.1,0.3)	0.2	(0.2,0.3)	0.0%	(^,^)
Penis	0.7	(0.4,0.9)	0.9	(0.8,0.9)	-22.2%	(-39.2%,-0.5%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Other Male Genital Organs	0.3	(0.2,0.5)	0.2	(0.2,0.2)	50.0%	(-32.2%,232.1%)	^	(^,^)	0.0	(0.0,0.0)	^	(^,^)
Urinary Bladder	31.4	(29.8,33.2)	36.7	(36.6,36.9)	-14.4%	(-18.8%,-9.9%)	6.4	(5.6,7.2)	7.7	(7.6,7.8)	-16.9%	(-25.7%,-7.1%)
Kidney and Renal Pelvis	15.5	(14.4,16.6)	21.3	(21.2,21.4)	-27.2%	(-31.8%,-22.3%)	4.6	(4.0,5.3)	5.8	(5.7,5.8)	-20.7%	(-29.2%,-11.1%)
Ureter	0.6	(0.4,0.9)	0.8	(0.8,0.8)	-25.0%	(-43.4%,-0.6%)	^	(^,^)	0.1	(0.1,0.2)	^	(^,^)
Other Urinary Organs	0.4	(0.2,0.6)	0.5	(0.5,0.5)	-20.0%	(-48.3%,23.9%)	^	(^,^)	0.2	(0.2,0.2)	^	(^,^)
Eye and Orbit	1.4	(1.0,1.7)	0.9	(0.9,1.0)	55.6%	(10.0%,119.9%)	^	(^,^)	0.1	(0.1,0.1)	^	(^,^)
Brain and Other Nervous System	7.8	(7.1,8.6)	7.8	(7.8,7.9)	0.0%	(^,^)	5.1	(4.5,5.8)	5.2	(5.1,5.2)	-1.9%	(-12.5%,9.9%)
Thyroid	7.5	(6.8,8.3)	6.2	(6.2,6.3)	21.0%	(7.8%,35.7%)	0.7	(0.4,1.0)	0.5	(0.5,0.5)	40.0%	(0.7%,94.7%)
Other Endocrine including Thymus	0.7	(0.5,0.9)	0.8	(0.8,0.9)	-12.5%	(-32.6%,13.7%)	0.2	(0.1,0.4)	0.3	(0.3,0.3)	-33.3%	(-69.9%,47.6%)
Hodgkin Lymphoma	3.1	(2.7,3.6)	3.2	(3.1,3.2)	-3.1%	(-14.5%,9.7%)	0.4	(0.2,0.6)	0.5	(0.5,0.5)	-20.0%	(-48.3%,23.9%)
Non-Hodgkin Lymphoma	25.2	(23.7,26.6)	23.4	(23.3,23.5)	7.7%	(1.7%,14.0%)	7.7	(6.8,8.5)	8.2	(8.1,8.3)	-6.1%	(-14.9%,3.6%)
Myeloma	7.4	(6.6,8.2)	7.4	(7.3,7.5)	0.0%	(^,^)	4.2	(3.6,4.9)	4.3	(4.2,4.3)	-2.3%	(-14.9%,12.2%)
Leukemia	17.1	(16.0,18.4)	16.5	(16.4,16.6)	3.6%	(-3.4%,11.2%)	9.2	(8.3,10.1)	9.5	(9.4,9.6)	-3.2%	(-12.8%,7.5%)
Miscellaneous	14.6	(13.5,15.8)	20.9	(20.8,21.0)	-30.1%	(-34.7%,-25.2%)	14.0	(12.9,15.2)	16.7	(16.6,16.8)	-16.2%	(-22.4%,-9.4%)

^ Statistic suppressed due to small cell size (<10) or allows inference of a small cell

Data Source: Utah Cancer Registry; SEER NAACCR Incidence - Cina+ and SEER Mortality Dataset

Table 3: Incidence and Mortality Rates by Sex in Utah and the U.S. 1973 – 2010

Year	Males and Females				Females				Males			
	Incidence		Mortality		Incidence		Mortality		Incidence		Mortality	
	Utah	U.S.	Utah	U.S.	Utah	U.S.	Utah	U.S.	Utah	U.S.	Utah	U.S.
1973 Rate	326.5	389	147	198.9	296	352.9	124.1	161.0	376.0	453.9	179.4	255.3
1974 Rate	326.3	404.1	152.5	200.1	297.5	374.5	127.0	161.2	376.3	462.7	190.5	258.2
1975 Rate	343	403.2	146.7	199.4	298.3	369	113.0	160.2	417.5	469.3	193.3	258.7
1976 Rate	346.3	410.4	155.4	202.5	314.6	369.9	127.5	162.8	399.1	485.3	196.4	262.5
1977 Rate	343	411	154.1	203.2	299.5	366.9	134.8	163.1	413.2	490.3	183	264.6
1978 Rate	346.5	410.4	154.3	204.6	304.7	365.1	133.1	163.9	414.0	492.3	186.2	267.4
1979 Rate	360.8	415.3	149.2	204.8	313.6	368.2	126.6	163.2	436.5	499.7	182.9	269.1
1980 Rate	350.4	421.6	153.6	207.2	314.8	370.9	128.0	165.9	410.3	511.0	191.8	271.5
1981 Rate	357.4	428.9	153.6	206.6	311.6	380.5	131.5	166.0	431.7	515.3	187.7	270.2
1982 Rate	343.7	429	154.8	208.6	298.9	380.4	132.2	167.6	417.3	516.5	190.9	273.3
1983 Rate	363.6	434.9	151.6	209.5	315.4	384.3	129.4	168.4	440.8	524.6	188.8	274.5
1984 Rate	365.7	444.2	154.6	211.2	320.5	396.4	125.9	170.8	438.7	530.6	196.9	275.5
1985 Rate	365.6	453.6	146.6	211.7	321.5	407.6	122.0	171.2	437.0	536.8	182.3	276.1
1986 Rate	376.4	455.7	153.7	212.1	331.4	406.3	122.2	171.8	450.1	543.6	198.8	276.4
1987 Rate	387.9	472.7	153.8	212.2	332.3	417.9	129.4	171.7	471.6	568.7	191	276.8
1988 Rate	376.1	468.9	154.6	212.9	329	413.7	131.4	172.7	451.8	564.8	191.8	277.3
1989 Rate	367.4	473.7	163.5	214.6	327.2	412.9	137.6	174.4	432.5	575.3	204.2	278.9
1990 Rate	395.4	487.1	152	215.3	334.8	420.1	124.5	174.9	490.2	599.0	192.9	280.3
1991 Rate	424	507.8	162.4	215.3	338.5	423.7	135.9	175.5	547.8	643.0	202.6	279.6
1992 Rate	440.2	514.8	157.4	213.8	340.4	419.1	132.4	174.6	580.0	663.1	198.3	276.9
1993 Rate	411.6	498.5	158.5	213.7	333.4	412.9	134.4	174.7	520.1	628.7	196.1	276.3
1994 Rate	394.7	489.1	155.6	212	327.7	418.9	131.2	174.3	487.8	596.4	191.2	272.6
1995 Rate	385.9	482.7	153.4	210.2	335.7	419.8	127.3	173.6	457.1	579.2	191.3	268.9
1996 Rate	377.3	485.8	147.1	207.3	319.1	424.4	124.0	171.5	456.9	580.4	184.8	264.2
1997 Rate	393.3	492.4	146.8	203.9	331	434.5	121.4	169.3	478.4	582.1	185.7	258.6
1998 Rate	410.1	493.3	158.7	201.1	363.8	438.2	133.3	167.1	478.0	579.2	195.7	254.0
1999 Rate	415.6	495.3	155.9	201	346.6	436	131.6	167.4	506.7	585.5	192.3	253.1
2000 Rate	401.5	491.8	150.3	199.1	347.9	426.9	128.6	166.9	476.1	587.2	182.1	248.9
2001 Rate	413.6	494.8	144.5	196.6	354.4	431.6	117.8	164.9	492.2	587.3	183.3	245.4
2002 Rate	411.2	492.7	144.6	194.6	347.5	433.3	118.0	163.6	492.8	580.2	182.5	242.0
2003 Rate	416	479.2	144.9	191.2	344.1	422	124.2	161.4	507.2	563.4	173.5	236.2
2004 Rate	419.2	480	141	187.1	352	424.3	119.2	158.1	504.8	561.5	169.8	230.6
2005 Rate	412.8	476	141	185.5	353.4	423.3	119.1	156.7	487.9	552.8	171.2	228.4
2006 Rate	415.9	479.2	140.2	182.3	356.9	422.6	125.1	154.8	489.6	559.4	160.9	222.9
2007 Rate	412.2	485.4	133.6	179.5	336.3	425.4	112.1	152.2	506.0	569.4	162.7	219.7
2008 Rate	414.1	477.7	125.8	176.6	358.4	426.6	105.9	149.5	485.3	550.1	153.1	215.8
2009 Rate	411.4	474.8	124.9	173.7	354.1	430.3	106.1	147.4	482.3	538.5	150.4	211.6
2010 Rate	412.6	460.8	133	172	362.9	416.9	113.3	146.0	475.0	522.7	159.1	209.1

Rates are per 100,000 and are age-adjusted to the 2000 U.S. Standard Population

Data Source: Utah Cancer Registry; SEER 9 Incidence and SEER Mortality Datasets

Table 4a: Incidence and Mortality Rates in Utah and the U.S. for Select Cancer Sites, 2006 – 2010: Females

Year	Colon and Rectum		Lung and Bronchus		Melanoma of the Skin		Breast		Corpus and Uterus, NOS	
	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality
1973 Rate	37.8	18.2	10.6	7.4	8.1	2.5	89.3	27.6	23.0	4.9
1974 Rate	35.7	19.9	8.7	6.6	10.0	^	93.8	30.5	30.4	5.8
1975 Rate	40.9	17.8	11.6	6.6	11.5	2.6	91.6	21.7	27.5	4.3
1976 Rate	42.7	20.7	9.5	7.0	9.6	^	86.6	25.3	33.4	6.8
1977 Rate	37.7	17.2	9.4	6.2	11.0	^	84.5	32.1	30.1	5.1
1978 Rate	36.4	18.3	11.9	8.2	10.8	2.2	91.0	28.9	31.2	4.7
1979 Rate	37.4	18.2	16.0	13.7	7.8	2.5	97.5	24.0	31.0	3.4
1980 Rate	42.7	18.3	14.8	8.9	13.6	3.5	84.4	26.7	25.5	5.3
1981 Rate	42.6	18.0	16.8	12.3	11.6	2.0	89.7	29.7	28.1	3.1
1982 Rate	45.4	19.8	14.0	9.1	13.2	1.8	86.1	26.1	29.5	4.5
1983 Rate	37.1	16.1	19.0	14.6	15.7	2.3	99.2	26.8	26.7	2.9
1984 Rate	39.7	16.4	15.4	11.6	15.2	^	103.8	25.4	23.0	4.3
1985 Rate	45.6	13.9	15.9	12.0	14.3	^	100.9	25.7	25.1	5.6
1986 Rate	41.1	18.9	19.1	13.1	13.2	1.7	114.6	26.0	25.3	4.2
1987 Rate	33.3	16.4	20.2	14.4	15.9	1.9	114.5	27.8	25.4	3.9
1988 Rate	35.1	13.3	18.1	12.1	13.1	2.8	112.6	29.2	24.3	5.7
1989 Rate	40.3	15.5	17.6	17.1	12.0	2.4	108.8	27.7	23.0	5.5
1990 Rate	35.0	14.0	20.3	13.6	16.1	2.8	109.7	26.5	29.1	4.7
1991 Rate	36.2	15.1	19.0	18.4	16.4	2.0	116.2	29.7	25.3	2.7
1992 Rate	37.7	15.0	20.5	15.1	16.0	2.3	108.0	26.3	27.4	4.2
1993 Rate	34.5	12.7	20.7	17.2	12.3	2.7	112.8	25.4	24.5	4.3
1994 Rate	34.5	13.7	21.4	15.8	14.4	2.1	112.0	25.6	24.8	5.0
1995 Rate	35.1	16.5	19.6	15.1	13.5	2.2	114.8	25.7	23.9	4.1
1996 Rate	35.8	13.8	24.5	18.9	13.3	2.9	109.2	24.0	23.4	2.9
1997 Rate	36.7	14.6	23.6	15.7	16.4	1.5	111.8	23.6	22.5	4.4
1998 Rate	41.7	16.3	23.0	18.6	18.1	2.0	124.1	26.4	23.5	4.0
1999 Rate	34.9	14.0	24.0	19.0	17.2	1.9	118.8	21.7	24.7	2.6
2000 Rate	38.9	15.8	17.3	16.1	17.7	2.0	120.8	22.7	22.3	4.7
2001 Rate	33.2	11.4	23.0	14.6	18.3	2.9	123.6	22.1	23.6	4.9
2002 Rate	40.4	13.7	21.4	18.7	16.7	2.3	114.0	24.1	21.6	3.7
2003 Rate	36.3	13.4	24.0	17.4	19.5	1.8	108.6	23.7	24.6	4.6
2004 Rate	30.7	10.0	21.2	18.7	21.4	1.8	115.1	22.9	22.2	4.0
2005 Rate	33.3	11.8	25.5	16.3	22.5	2.5	109.8	24.3	19.7	2.3
2006 Rate	32.8	11.5	26.0	18.6	21.3	2.2	111.9	25.9	25.1	2.9
2007 Rate	30.6	9.8	22.7	19.2	22.4	1.6	107.7	20.6	21.0	3.0
2008 Rate	34.1	9.8	20.7	14.5	20.0	1.6	116.6	20.5	24.3	3.3
2009 Rate	31.0	11.4	23.5	14.7	24.2	2.1	107.7	20.2	27.2	3.2
2010 Rate	27.6	10.9	23.6	17.1	24.5	2.3	110.8	22.2	27.1	4.4

Rates are per 100,000 and are age-adjusted to the 2000 U.S. Standard Population
Data Source: Utah Cancer Registry; SEER 9 Incidence and SEER Mortality Datasets

Table 4b: Incidence and Mortality Rates in Utah and the U.S. for Select Cancer Sites, 2006 – 2010: Males

Year	Colon and Rectum		Lung and Bronchus		Melanoma of the Skin		Prostate		Urinary Bladder	
	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality	Incidence	Mortality
1973 Rate	51.0	18.6	49.9	37.2	6.7	^	91.0	31.8	25.7	6.9
1974 Rate	48.5	21.8	46.1	40.9	8.9	^	104.3	26.9	25.9	12.3
1975 Rate	55.0	24.7	52.8	38.3	12.4	2.9	112.7	32.7	26.0	5.4
1976 Rate	40.5	21.6	55.1	42.6	11.4	4.4	108.8	37.5	29.0	7.1
1977 Rate	56.1	23.6	48.8	38.5	11.8	3.6	117.3	28.1	29.8	6.8
1978 Rate	46.8	20.1	51.3	37.8	10.6	3.1	127.0	32.4	31.1	7.5
1979 Rate	50.0	24.9	50.0	42.8	10.3	3.6	133.8	29.3	30.4	4.5
1980 Rate	45.2	22.1	48.2	41.4	12.0	3.9	134.6	34.6	28.8	6.3
1981 Rate	49.7	22.5	51.1	38.4	15.2	4.2	136.9	37.6	29.6	5.4
1982 Rate	52.3	20.7	50.7	41.1	18.6	3.8	134.0	39.4	22.1	3.5
1983 Rate	55.2	22.0	55.1	38.3	18.1	4.6	131.9	39.8	26.7	3.4
1984 Rate	60.1	19.9	54.2	44.2	15.2	2.8	131.3	35.6	27.0	7.0
1985 Rate	55.2	26.5	52.0	34.8	19.7	3.5	148.7	31.8	27.0	5.4
1986 Rate	55.9	25.3	49.5	41.4	14.4	3.5	153.7	33.1	29.1	5.4
1987 Rate	57.0	22.4	49.0	42.1	19.3	3.7	143.7	33.4	29.6	4.3
1988 Rate	59.2	19.1	46.5	36.0	14.1	4.0	147.2	39.1	32.1	6.2
1989 Rate	53.5	22.2	42.8	42.1	17.2	3.2	141.6	42.1	29.1	6.3
1990 Rate	57.6	21.2	49.6	41.9	19.7	3.6	188.0	42.4	27.8	6.8
1991 Rate	57.0	26.1	48.1	38.2	21.4	7.0	246.6	40.8	24.6	5.3
1992 Rate	56.2	26.1	48.3	40.3	21.7	5.7	279.7	43.5	28.7	5.9
1993 Rate	46.5	18.5	49.6	45.5	21.9	3.3	223.2	38.0	26.2	7.4
1994 Rate	51.2	20.5	48.2	33.0	20.6	3.5	182.5	37.6	33.1	4.5
1995 Rate	48.5	21.5	46.7	36.5	23.1	4.5	158.0	40.7	29.4	5.3
1996 Rate	46.5	17.2	37.9	36.1	23.3	3.7	168.4	40.6	30.4	5.2
1997 Rate	44.3	16.8	41.6	34.7	24.4	3.9	191.8	38.1	28.0	8.2
1998 Rate	53.6	20.1	44.7	36.5	23.7	6.0	171.6	37.5	32.5	7.2
1999 Rate	52.2	19.2	46.5	36.5	28.3	4.8	189.1	32.8	37.0	6.6
2000 Rate	49.1	20.2	42.3	39.4	24.1	3.4	177.5	28.1	29.6	4.7
2001 Rate	45.3	16.8	41.6	34.2	26.3	3.4	187.1	30.2	32.8	5.2
2002 Rate	44.1	18.4	39.4	32.2	26.5	4.6	192.7	29.2	28.3	6.4
2003 Rate	52.0	16.2	42.6	33.7	28.9	5.6	193.8	28.4	30.7	7.2
2004 Rate	48.1	15.3	39.5	36.1	31.7	4.4	192.1	25.0	27.7	7.5
2005 Rate	45.6	15.1	38.5	34.3	36.2	5.5	176.5	24.9	29.4	6.6
2006 Rate	42.2	14.8	34.9	30.4	41.4	5.7	183.3	28.5	30.3	5.7
2007 Rate	44.0	16.6	35.3	27.4	40.2	5.0	184.3	29.2	33.7	6.2
2008 Rate	40.3	13.5	31.6	24.4	43.2	4.5	175.2	25.7	31.5	6.0
2009 Rate	35.2	14.0	38.4	28.7	38.8	6.4	174.5	20.3	31.2	6.8
2010 Rate	36.0	13.1	30.5	27.0	44.4	5.5	164.1	26.3	30.4	7.1

Rates are per 100,000 and are age-adjusted to the 2000 U.S. Standard Population

Data Source: Utah Cancer Registry; SEER 9 Incidence and SEER Mortality Datasets

Data Sources and Software

Data Sources:

Incidence, 2006 – 2010:

Surveillance, Epidemiology and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: NAACCR Incidence - CiNA+ in SEER*Stat 2006-2010, All Races, North American Association of Central Cancer Registries.

Incidence, 1973 – 2010:

Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 9 Regs Research Data, Nov 2012 Sub (1973-2010) <Katrina/Rita Population Adjustment> - Linked To County Attributes - Total U.S., 1969-2011 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Surveillance Systems Branch, released April 2013, based on the November 2012 submission.

Mortality:

Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1969-2010) <Katrina/Rita Population Adjustment>, National Cancer Institute, DCCPS, Surveillance Research Program, Surveillance Systems Branch, released April 2013. Underlying mortality data provided by NCHS (www.cdc.gov/nchs).

Software Used for Calculation:

Age-adjusted Rates and Confidence Intervals:

Surveillance Research Program, National Cancer Institute (2013). SEER*Stat (version 8.1.2) [Computer Software]. Calverton, MD. (http://seer.cancer.gov/seerstat)

Trend Analysis:

Statistical Research and Applications Branch, National Cancer Institute (2013). Joinpoint Regression Program (Version 4.0.4) [Computer Software]. Calverton, MD. (http://surveillance.cancer.gov/joinpoint/)

Rate Ratios:

Microsoft Corporation (2010). Microsoft Excel (Version 14.0.7106.5003 (32-bit)) [Computer Software]. Microsoft Corporation, Redmond, WA.

Materials and Methods

Materials and Methods:

Cancer data in this report are based on new cases of malignant primary cancer or cancer deaths among Utah residents occurring between January 1, 1973 and the last calendar year with available data. Because of the complexity of the data collection and quality control process, there is a delay between a new cancer diagnosis and the new data being ready for analysis. The standard delay is 22 months after the end of the calendar year of diagnosis.

Data Sources and Statistical Methods:

Incidence Data

Data on all incident cancer cases diagnosed among Utah residents were provided by the Utah Cancer Registry as part of the routine, annual submissions to the National Cancer Institute Surveillance, Epidemiology and End Results (SEER) Program. Limited Utah data were combined with data from the North American Association of Central Cancer Registries (NAACCR), which included 43 additional states and Washington DC, representing approximately 89% of the U.S. population, and made available for analyses using the CINA+ dataset in the SEER*Stat statistical application software. Incident data are presented for all primary, invasive cancers, and are grouped following the conventions of the SEER program, which uses primary site and histology codes defined in the International Classification of Diseases for Oncology (ICD-O), Third Edition (Fritz, et al., 2000).

Mortality Data

Mortality data were provided to SEER by the National Center for Health Statistics (NCHS) as a part of the Centers for Disease Control (CDC). Mortality data was available for all 50 states, as well as Washington DC, and is recorded back to 1969. Mortality (death) rates were calculated in the SEER*Stat statistical application software (not shown). The data in SEER*Stat not only includes all cancer deaths, but deaths from any cause which are based on anatomical site codes from the International Classification of Diseases, Tenth Edition (World Health Organization, 1992).

Trend Analysis

National trend analyses were conducted using data from the original nine SEER registries (excluding Utah) with cancer data available from the early 1970s forward. The nine SEER registries cover approximately 10% of the U.S. population and include Atlanta, Connecticut, Detroit, Hawaii, Iowa, New Mexico, San Francisco-Oakland, Seattle-Puget Sound, and Utah. Long-term incidence and mortality trends were analyzed using JoinPoint analysis (not shown), which is a statistical method that describes changing trends over successive segments of time by selecting the best fitting point or points where the rate of increase or decrease changes significantly (Kim, Fay, Feuer, & Midthune, 2000). Rates were calculated utilizing SEER*Stat software and analyzed using the JoinPoint Regression Program. Significant trends were determined using the annual percent change (APC) statistic for each segment set at $p<0.05$.

Population Estimates and Denominators

The population figures used to calculate age-adjusted rates were provided by the U.S. Census Bureau's Population Estimates Program, in collaboration with the National Center for Health Statistics, and with support from the National Cancer Institute through an interagency agreement. These population data are based on intercensal estimates from 2001-2009, the actual census population from 2010, and current estimates for all years after 2010. All of the rates were age-adjusted to the 2000 U.S. Standard Population weights, based on 19 age groups. For additional information about the U.S. population data, please visit the SEER website at http://seer.cancer.gov/popdata/.

Statistical Terms:

Age-adjusted Rates

An age-adjusted rate is a weighted average of age-specific rates, where weights are based on the proportions of persons in each corresponding age group of a standard population. This allows for meaningful comparison of cancer rates between populations and reduces the potential for confounding the effects of age when comparing populations. Age-adjusted rates were calculated by the direct method using the 2000 U.S. standard population in SEER*Stat software. Cancer incidence and mortality rates are expressed per 100,000 persons. Confidence intervals were calculated using the Tiwari method (Tiwari, Clegg, & Zou, 2006). For an in depth description, please visit the SEER website at http://seer.cancer.gov/seerstat/tutorials/aarates/definition.html.

Age-adjusted Rate Ratio

Age-adjusted rate ratios were calculated by dividing the average annual age-adjusted rates in Utah by those for the U.S. and subtracting from one. The age-adjusted rate ratio represents the relative risk of cancer in Utah as compared to the United State. Confidence intervals were calculated using the method described by Boyle and Parkin (Boyle & Parkin, 1991).

Annual Percent Change (APC)

The estimated annual percent change (APC) indicates the average percent increase or decrease in cancer rates per year over a stated time period. It is calculated by fitting a straight line to the natural logarithm of the data presented by calendar year. The estimated APCs were computed utilizing the JoinPoint Regression Program based on rates calculated in SEER*Stat . For more information on the calculation of APC and trend algorithms please visit the SEER website at http://surveillance.cancer.gov/joinpoint/

Cautions on Interpreting the Data:

When interpreting cancer incidence and mortality data it is imperative to keep in mind that a variety of factors can influence cancer rates. It is important to use caution when interpreting the data and to consider the following:

Completeness

The cancer data this report is based on is dynamic and it is possible that even after the standard reporting delay, a few new cases may be reported. This may have a minor impact on the data in this report, particularly for the most recent years of diagnosis.

Comparability of cancer incidence and mortality

Migration may impact the comparability of cancer incidence and mortality rates. The Utah incidence and mortality rates presented in this report are for Utah residents. It is possible that a Utah resident, who was diagnosed with cancer in Utah, later moved out of state and died or a person could have been diagnosed in another state and moved to Utah and died. In this first instance, the case would be included in the incidence data, but not in the mortality data and in the second the case would be included in the mortality data and not the incidence data.

Small numbers

Caution should be used when interpreting rates based on only a few cases. Due to Utah's relatively small population, some rare cancers are seen in very small frequencies. In order to protect patient confidentiality and because of the instability of rates based on small numbers, data based on counts smaller than 10 have been suppressed. Additionally, the confidence intervals associated with some cancers are very large, and caution should be used when interpreting the data.

Race and Ethnicity

Cancer incidence and mortality can vary greatly by race/ethnicity. While we would like to present detailed information on specific rates for racial and ethnic groupings, Utah's small minority populations make it difficult to do so while still maintaining patient confidentiality. Additionally, rates based on small numbers may be unstable and unreliable. According to the 2010 U.S. census (United States Census Bureau, 2010), non-Hispanic Whites account for 80.4% of Utah's population, and Hispanic Whites (Utah's largest minority group), account for 13% of Utah's population. Given Utah's small minority population, displaying detailed information by racial/ethnic group quickly leads to cell counts that are too small to display publically and rates that may be unstable.

Trends

Trend data should be interpreted with caution. Increases and decreases in rates over time may reflect changes in diagnostic methods or case reporting rather than genuine changes in cancer occurrence.

National Comparisons

Incidence and mortality rates may be influenced by many factors. Rates for certain cancers vary among different racial and ethnic populations. Geographic differences in cancer rates may also result from behavioral or lifestyle differences. For example smoking and obesity rates or cancer screening behavior in a community may impact cancer rates. Caution should be used when comparing rates between different populations.

References

Boyle, P., & Parkin, D. (1991). Statistical methods for registries. In I. A. Cancer, *Cancer Registration: Principles and Methods* (pp. 126 - 158). Lyon: International Agency for Research on Cancer.

Fritz, A., Percy, C., Jack, A., Shanmugaratnam, K., Sobin, L., Parkin, D., . . . (Eds). (2000). *International Classification of Diseases for Oncology, Third Edition.* Geneva: World Heath Organization.

Kim, H., Fay, M., Feuer, E., & Midthune, D. (2000). Permutation test for joinpoint regression with applications to cancer rates. *Stat Med, 19*, 335-351.

Tiwari, R., Clegg, L., & Zou, Z. (2006, Dec). Efficient interval estimation for age-adjusted cancer rates. *Stat Mathods Med Res, 15*(6), 547-569.

United States Census Bureau. (2010). American FactFinder. (K. Herget, Ed.) United States Census Bureau. Retrieved from http://factfinder2.census.gov

World Health Organization. (1992). *International Statistical Classification of Diseases and Related Health Problems, Tenth Revision (3 vols).* Geneva: World Health Organization.