Cancer

The term “cancer” is used to characterize diseases in which abnormal cells divide uncontrollably. A cancerous cell loses its ability to regulate its own growth, control cell division, and communicate with other cells. Cancer cells can invade nearby tissues and can spread through the bloodstream and lymphatic system to other parts of the body (NCI, n.d.). The risk of developing cancer increases with age. Environmental exposures, genetic predisposition, certain viruses, and socioeconomic factors may all play a role in the development and progression of the disease.

Cancer continues to be the second leading cause of death in the U.S., accounting for about 21 percent of all deaths in 2017 (General Mortality indicator). Many different types of cancer exist. These can develop in various organs and tissues within the body and contributing causal factors can vary depending on the cancer site and type. Therefore, tracking rates for individual cancer sites provides additional context when evaluating cancer trends.

Many factors are known to contribute, or are suspected of contributing, to cancer risk. These include lifestyle factors (for instance, tobacco and alcohol use), exposures on the job, or other environmental exposures, including medical exposures. These factors may contribute individually (i.e., additively) or synergistically (i.e., producing an effect greater than the sum of each factor acting alone) to the development of cancer. Further, the cancer hazard to any individual is dependent on the amount and duration of exposure and the individual’s susceptibility to a particular substance. Only in a small number of cases is it known what specific exposures or conditions are responsible for the onset and development of cancers (NTP, 2016).

This indicator presents cancer incidence rates for the U.S. population from 1973 to 2017. For 1973 to 1998, this indicator uses data collected through the National Cancer Institute’s (NCI's) Surveillance, Epidemiology, and End Results (SEER) Program. The SEER Program collects and publishes cancer incidence and survival data from 9 (SEER 9), 13 (SEER 13), 18 (SEER 18), and 21 (SEER 21) population-based cancer registries, including state, central, metropolitan, and Alaska Native registries. Specifically, this indicator uses data from NCI’s SEER 9 Registries, which cover 9 percent of the U.S. population and have the most years of available data (NCI, 2018, 2020). For 1999 to 2017, this indicator uses data from the United States Cancer Statistics (USCS) database. The USCS combines data from NCI’s SEER Registries and the Centers for Disease Control and Prevention’s (CDC's) National Program of Cancer Registries (NPCR). These data are available beginning in 1999 and represent the official federal statistics on cancer incidence for registries that meet annual data criteria for all 50 states and the District of Columbia. Beginning in 2005, the USCS data also include Puerto Rico. Due to differences between these two sources (e.g., population coverage), data shown for 1973 to 1998 should not be directly compared to data shown for 1999 to 2017. The 10 most commonly diagnosed cancer sites presented are based on 2017 data compiled by USCS (CDC and NCI, 2020).

What the Data Show

Although a slow, steady increase in cancer incidence generally occurred between 1973 and 1992,

peaking in 1992 with an age-adjusted cancer incidence of 511 cases per 100,000, overall incidence rates appear to have remained stable or slowly declined since that time. Some differences exist in incidence rates across age, sex, and racial groups (Exhibit 1).

During 2017, those aged 65 and older had the highest incidence rates (1,970 cases per 100,000) compared to all other age categories. Total (all sites combined) cancer incidence rates are higher for males compared to females and comparable among blacks and whites. The age-adjusted cancer incidence rate in 2017 for males was 475 cases per 100,000 compared to 441 cases per 100,000 for females; the age-adjusted cancer incidence rate in 2017 was 453 cases per 100,000 for whites compared to 446 cases per 100,000 for blacks (Exhibit 1).

Exhibits 2 and 3 show the differences between the top 10 cancer sites in males and females, respectively. In 2017, the top four cancers for males and the top three cancers for females represent roughly half of all newly identified cancer cases. Among the most notable differences between males and females is the rate of urinary bladder cancer, which is the fourth leading cancer identified among males (32.9 cases per 100,000 in 2017). This rate is four times that of females (8.2 cases per 100,000 in 2017) (data not shown). Melanoma of the skin is also higher among males (29.0 cases per 100,000 in 2017) than females (18.1 cases per 100,000 in 2017). In 2017, thyroid cancer is the fifth leading cancer in females (19.4 cases per 100,000), but this cancer site is not among the top 10 for males (7.0 cases per 100,000) (data not shown).

Exhibit 4 displays age-adjusted cancer incidence rates for the top 10 cancers in males in 2017, and shows incidence rate trends for these 10 cancers between 1973 and 2017. Prostate cancer incidence rates increased dramatically between 1986 and the early 1990s, with a decline in rates between 1992 and 1995. This increase is likely due to the introduction of serum prostate-specific antigen testing for the early detection and screening of prostate cancer (Hankey et al., 1999). Prostate cancer rates have continued to decline in recent years, though a slight increase was seen each year after 2014 (100.2 cases per 100,000 in 2014 compared to 106.5 cases per 100,000 in 2017). Cancer rates for colon and rectum, lung and bronchus, urinary bladder, non-Hodgkin's lymphoma, and leukemia have all declined over the last 10 years. The incidence rate of melanoma of the skin exceeded that of non-Hodgkin's lymphoma for the last 13 years; prior to 2005, this pattern was reversed.

Trends over the last 10 years among the less prevalent site-specific cancers in males show slight increases in incidence rates. For example, the incidence rate for cancer of the kidney and renal pelvis has increased from 22.1 (2008) to 22.7 (2017) cases per 100,000. The incidence rate for cancer of the pancreas has increased from 13.9 (2008) to 14.8 (2017) cases per 100,000 (Exhibit 4).

As shown in Exhibit 5, breast cancer remains the leading cancer among females and incidence rates generally increased from 1973 to 1998, with a small but notable decline observed between 1999 and 2017. Lung and bronchus is the second leading cancer site among both men and women in 2017, with a decline in rates seen in both groups over the past decade.

The incidence rate of colon and rectum cancer among women increased between 1973 and 1985, and then declined between 1986 and 1998. This decrease continues to be observed from 1999 through 2017. The incidence of uterine (corpus and uterus) cancer in females remained relatively stable from the mid-1980s through 1998; rates have increased slightly in the last 10 years from 24.8 cases per 100,000 in 2008 to 27.2 cases per 100,000 in 2017. The incidence rates of melanoma of the skin and thyroid cancer have increased over the entire reporting period, with rates of thyroid cancer surpassing that of melanoma of the skin in 2006. Of the top 10 cancers, the incidence rate of thyroid cancer has increased to the greatest extent, with a two-fold increase since 1999 (Exhibit 5). The reported increase in melanoma and thyroid cancer incidence rates may be in part due to increased diagnostic scrutiny (Jemal et al., 2017).

Trends over the last 10 years among the less prevalent site-specific cancers in females show declining incidence rates for non-Hodgkin's lymphoma and leukemia, but increasing rates for cancer of the kidney and renal pelvis and cancer of the pancreas (Exhibit 5).

Limitations

- SEER 9 Registries data cover 9 percent of the U.S. population, though it is designed to be representative of the entire U.S. population (NCI, 2018, 2020). However, these data provide the longest temporal record of cancer incidence in the U.S.
- USCS population coverage varies year to year, depending on which registries met CDC's NPCR and NCI's SER publication criteria. Population coverage may also be affected by the suppression of state incidence data if 16 or fewer cases were reported or if the state requested that the data be suppressed. However, the USCS data set used for this indicator provides coverage for approximately 98 percent of the U.S. population from 1999-2017 (CDC, 2020).
- Due to differences between the two source data sets used for this indicator (e.g., population coverage), cancer incidence estimates for 1973-1998 from SEER 9 Registries (NCI, 2018, 2020) cannot be directly compared to cancer incidence estimates for 1999-2017 from USCS (CDC and NCI, 2020).

Data Sources

Cancer incidence data for this indicator from 1973-1998 were obtained by querying the NCI's SEER Program database through its Cancer Query System (CanQues) (NCI, 2018, 2020), available at https://seer.cancer.gov/canques/incidence.html. Cancer incidence data from 1999-2017 were accessed from the USCS database housed in CDC's Wide-ranging Online Data for Epidemiologic Research (WONDER) system (CDC and NCI, 2020), available via https://wonder.cdc.gov/cancer.html.

References

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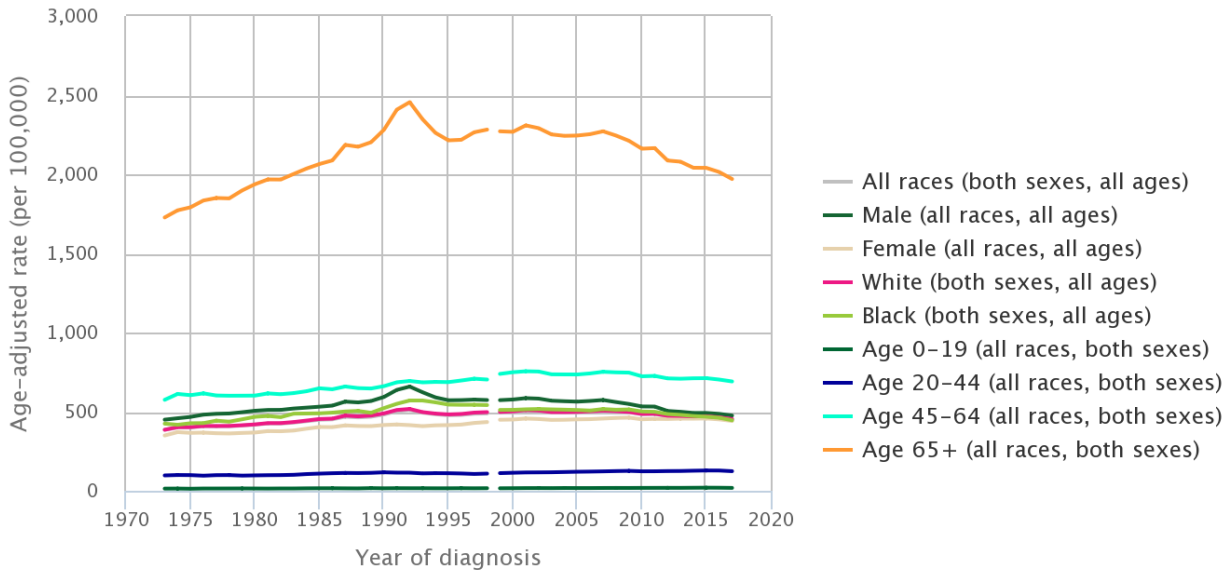
Exhibit 1. Age-adjusted cancer incidence rates in the U.S., 1973–2017: All cancer sites for all ages, by sex, race, and age group



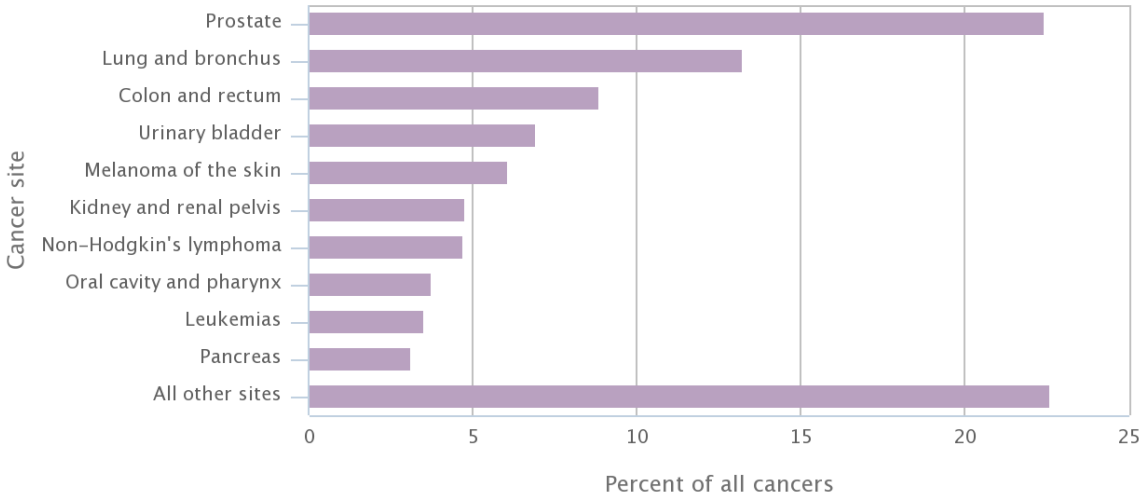
Due to differences in the data sets used to estimate cancer incidence, data from 1973–1998 (NCI, 2018, 2020) should not be directly compared with data from 1999–2017 (CDC and NCI, 2020).

Rates are age-adjusted to the 2000 U.S. standard population.

Information on the statistical significance of the trends in this exhibit is not presented here. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: CDC and NCI, 2020; NCI, 2018, 2020

Exhibit 2. Age-adjusted cancer incidence rates in the U.S., 2017: 10 leading cancer sites for males



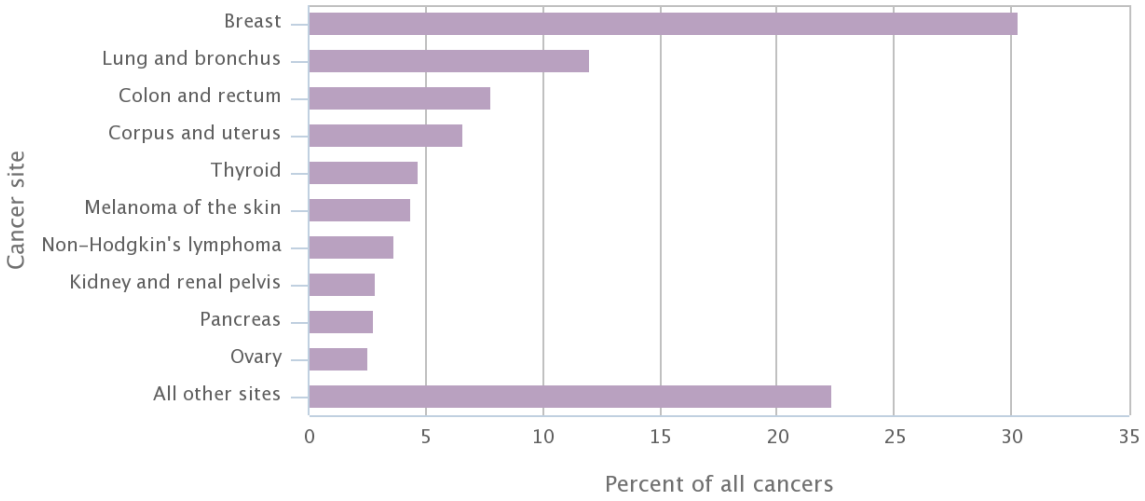
Excludes basal and squamous cell skin cancers and in situ carcinoma, except urinary bladder.

Rates are age-adjusted to the 2000 U.S. standard population.

Trend analysis has not been conducted because these data represent a single snapshot in time. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: CDC and NCI, 2020

Exhibit 3. Age-adjusted cancer incidence rates in the U.S., 2017: 10 leading cancer sites for females



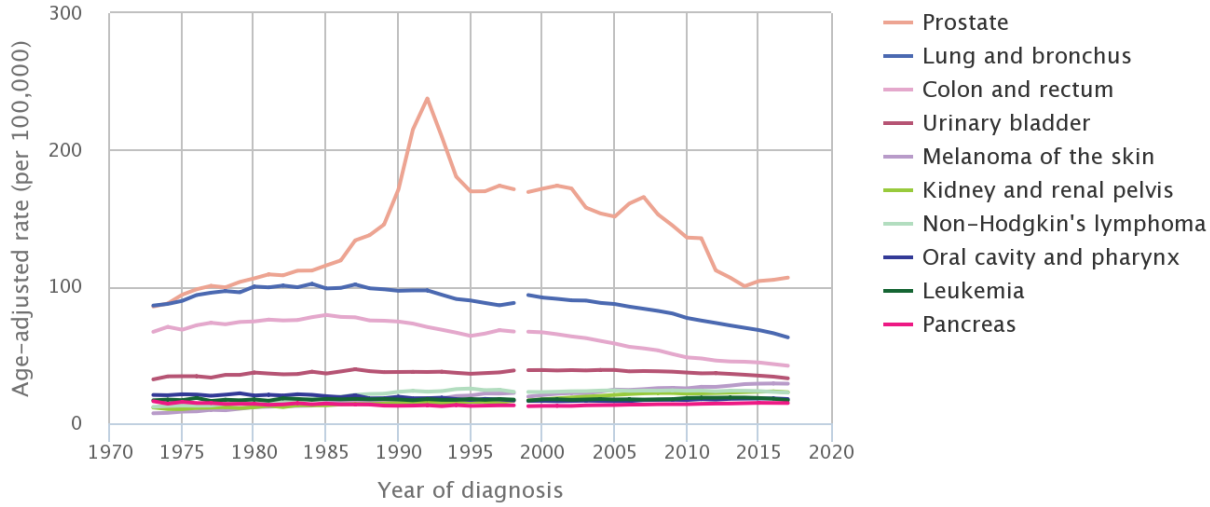
Excludes basal and squamous cell skin cancers and in situ carcinoma, except urinary bladder.

Rates are age-adjusted to the 2000 U.S. standard population.

Trend analysis has not been conducted because these data represent a single snapshot in time. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: CDC and NCI, 2020

Exhibit 4. Age-adjusted cancer incidence rates in the U.S., 1973–2017: Top 10 cancers in males of all ages



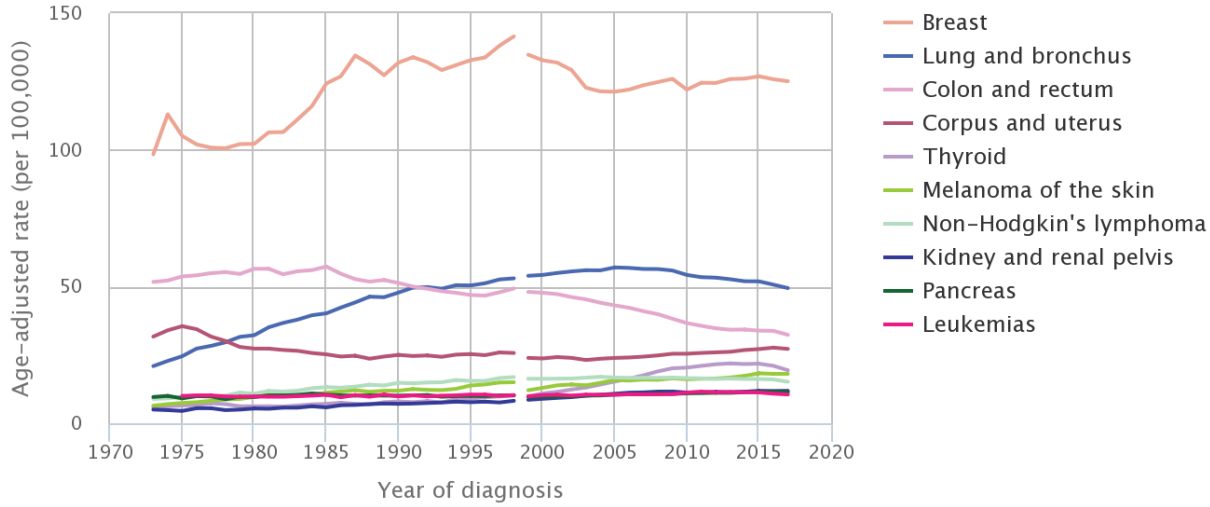
Due to differences in the data sets used to estimate cancer incidence, data from 1973–1998 (NCI, 2018, 2020) should not be directly compared with data from 1999–2017 (CDC and NCI, 2020).

Rates are age-adjusted to the 2000 U.S. standard population.

Information on the statistical significance of the trends in this exhibit is not presented here. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: CDC and NCI, 2020; NCI, 2018, 2020

Exhibit 5. Age-adjusted cancer incidence rates in the U.S., 1973–2017: Top 10 cancers in females of all ages



Due to differences in the data sets used to estimate cancer incidence, data from 1973–1998 (NCI, 2018, 2020) should not be directly compared with data from 1999–2017 (CDC and NCI, 2020).

Rates are age-adjusted to the 2000 U.S. standard population.

Information on the statistical significance of the trends in this exhibit is not presented here. For more information about uncertainty, variability, and statistical analysis, view the technical documentation for this indicator.

Data source: CDC and NCI, 2020; NCI, 2018, 2020