Childhood Cancer

The term "cancer" is used to characterize diseases in which abnormal cells divide without control. A cancerous cell loses its ability to regulate its own growth, control cell division, and communicate with other cells. If left unchecked, cancer cells can invade nearby tissues and can spread through the bloodstream and lymphatic system to other parts of the body (NCI, 2004). The cellular changes caused by cancer cells are complex and occur over a period of time. This may be accelerated in children. The classification of cancers in children differs from the classification used for adult cancers. The International Classification of Childhood Cancer classifies childhood cancer based on tumor morphology rather than, as for adults, the site of the tumor (Steliarova-Foucher et al., 2005).

As stated by NCI (2008), "The causes of childhood cancers are largely unknown. A few conditions, such as Down syndrome, other specific chromosomal and genetic abnormalities, and ionizing radiation exposures, explain a small percentage of cases." Environmental exposures have long been suspected of increasing the risk of certain childhood cancers. Researchers continue to examine environmental influences on childhood cancer (NCI, 2008).

This indicator presents incidence rates for childhood cancers from 1973 to 2011 using data collected through the National Cancer Institute's Surveillance, Epidemiology, and End Results (SEER) Program. The SEER Program collects and publishes cancer incidence and survival data from 18 population-based cancer registries, including state, central, metropolitan, and Alaska Native registries, which cover approximately 28 percent of the U.S. population (NCI, 2011).

What the Data Show

In general, overall childhood (ages 0-19 years) cancer incidence for the U.S. has increased slightly between 1973 and 2011 (Exhibit 1), increasing over time from an age-adjusted incidence rate of 13.8 per 100,000 in 1973 to a high of 17.9 per 100,000 in 2011. From 1973 to 2011, males generally had higher childhood cancer incidence rates than females. In 2011, females and males age 0-19 years had overall incidence rates of 17.1 and 18.6 cases per 100,000, respectively. Whites consistently had higher rates than blacks from 1973 to 2011. In 2011, whites and blacks had overall incidence rates of 19.5 and 13.0 cases per 100,000, respectively (Exhibit 1).

Exhibit 2 presents the age-adjusted incidence rates for the top 10 cancers among children 0-19 years of age in 2011, and shows incidence rate trends for these 10 cancers between 1973 and 2011. In general, there are no clearly identifiable temporal trends in rates among any of the top 10 cancers over the reported time period. In 2011, leukemia continued to be the most frequently diagnosed cancer in children age 0-19 years (4.6 cases per 100,000) followed by brain and other nervous system cancers (2.9 cases per 100,000). The incidence rates of Hodgkin's lymphoma, cancer of the soft tissue including heart, and non-Hodgkin's lymphoma are all very similar, with rates of 1.3, 1.2, and 1.1 cases per 100,000, respectively. Incidence rates for the remaining top 10 sites range from 0.6 to 1 case per 100,000, and include cancers of the thyroid, bones and joints, neuroblastoma, kidney and renal pelvis, and Wilms tumor.

Limitations

- SEER data cover approximately 28 percent of the U.S. population, though it is designed to be

representative of the entire U.S. population.

- Incidence data generated from SEER are updated annually. There may be changes in the numerator (e.g., revised counts of newly identified cases) or denominator (e.g., revised population counts) numbers that result in small changes in the overall incidence rates for the same year, depending on when a query is run within the SEER database. For example, the SEER database queried in 2009 generating incidence rates for the year 2000 may provide different incidence rates than the database queried in 2008 for the year 2000.

Data Sources

Cancer incidence data for this indicator were obtained by querying the National Cancer Institute's SEER Program database through its Cancer Query System (CanQues) (NCI, 2014), available at http://seer.cancer.gov/canques/incidence.html.

References

NCI (National Cancer Institute). 2014. Surveillance, Epidemiology, and End Results (SEER) Program SEER*Stat Database: Incidence - SEER 9 Regs Research Data, Nov 2013 Sub (1973-2011). National Cancer Institute, DCCPS, Surveillance Research Program, Surveillance Systems Branch, released April 2013, based on the November 2013 submission. Updated May 12, 2014. Accessed July 24, 2014. http://seer.cancer.gov/canques/incidence.html.

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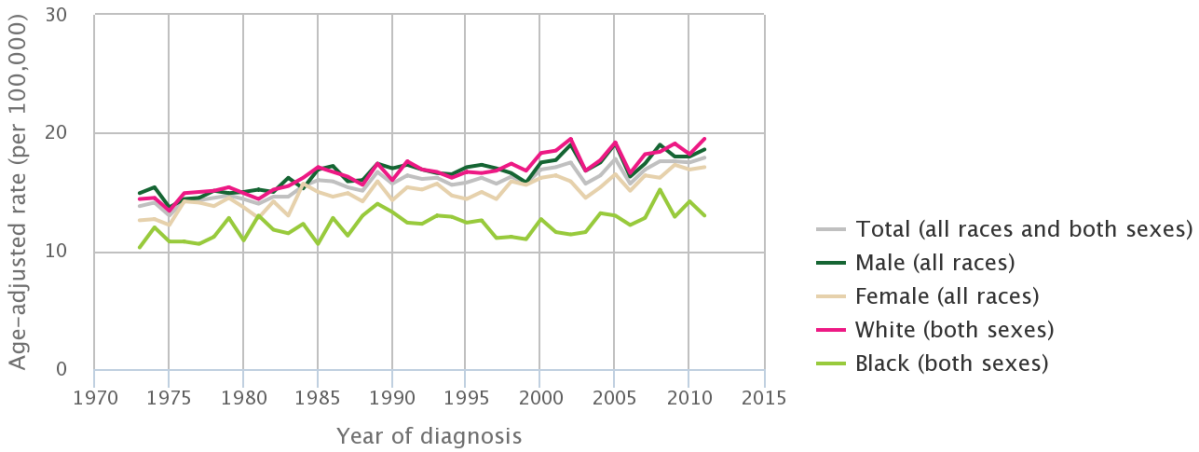
NCI. 2011. Data flow in NCI's SEER registries. September. http://seer.cancer.gov/about/factsheets/SEER_Data_Flow_.pdf (PDF) (2 pp, 1.5MB).

NCI. 2008. National Cancer Institute research on childhood cancers. Accessed November 30, 2012. http://www.cancer.gov/types/childhood-cancers/child-adolescent-cancers-fact-sheet.

Steliarova-Foucher, E., C. Stiller, B. Lacour, and P. Kaatsch. 2005. International classification of childhood cancer, third edition. Cancer 103(7):1457-1467. http://seer.cancer.gov/iccc/iccc3.html.

Exhibit 1. Age-adjusted cancer incidence rates in the U.S., 1973–2011: All cancer sites for ages 0–19, by sex and race

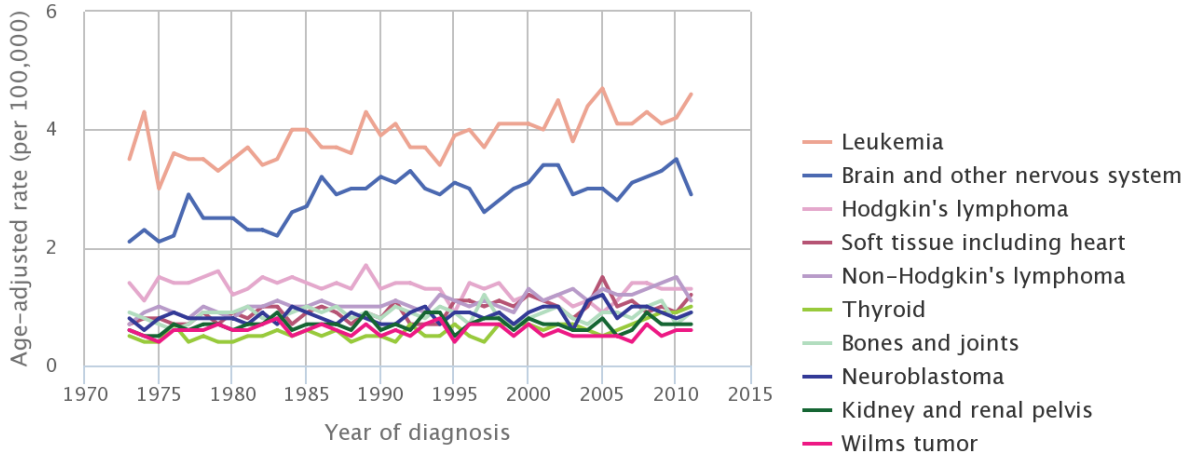


Rates are age-adjusted to the 2000 U.S. standard population.

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: NCI, 2014

Exhibit 2. Age-adjusted cancer incidence rates in the U.S., 1973–2011: Top 10 cancers for ages 0–19



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