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Friday, March 31, 2017
10:00 am EDT

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"Annual Report to the Nation on the Status of Cancer, 1975–2014, Featuring Survival" *Questions and Answers*

What is the purpose of this report and who created it?

This report provides a yearly update of cancer incidence (new cases) and mortality (death) rates, and trends in these rates in the United States. The special feature section of this year's report highlights population-based survival.

The American Cancer Society (ACS), the Centers for Disease Control and Prevention (CDC), the National Cancer Institute (NCI), part of the National Institutes of Health, and the North American Association of Central Cancer Registries (NAACCR), have collaborated since 1998 to produce the Annual Report to the Nation on the Status of Cancer.

What are the sources of the data?

Cancer mortality information in the United States is based on causes of death reported by physicians on death certificates and filed by each state's vital statistics offices. The mortality information is processed and consolidated in a national database by the CDC through the National Vital Statistics System, which covers the entire U.S.

Population-based cancer incidence data by age, sex, and race/ethnicity were obtained from 39 states and two metropolitan area registries that participate in the CDC's National Program of Cancer Registries (NPCR) and/or the NCI's Surveillance, Epidemiology, and End Results (SEER) program. The data represents cases covering 89% of the US population. This is the first annual report to derive all incidence statistics from a single database.

Which reporting periods were chosen as a main focus of the report?

The periods from 2009-2013 for incidence and from 2010-2014 for mortality were used for describing the most recent burden and trends in the cancer rates for all race/ethnicity combined and by race and ethnicity in the United States. The periods from 1999-2013 for incidence and from 2000-2014 for mortality were chosen to provide the best perspective on long-term trends in the cancer rates.

What is detailed in the special feature section of this year's report?

Each Annual Report to the Nation features an in-depth analysis of a selected topic. This year's report features survival by stage, race/ethnicity, and state for common cancers. In addition to death and incidence rates, survival is an important measure for assessing progress in efforts to improve cancer outcomes. In this report, we examine temporal changes in overall and stage-specific survival for all races/ethnicities combined and in overall survival by race, and contemporary overall survival by race and ethnicity and state of residence. We interpret these survival statistics in the context of changes in screening, early detection, and treatment.

Update on Incidence and Mortality Trends for All Cancer Sites Combined and the Most Common Cancers

What is happening with cancer incidence trends overall?

Incidence rates represent the number of reported new cases over a period of time per 100,000 people in the general population. Incidence rates for men decreased 0.6% per year during 1999-2008, and 2.3% per year during 2008-2013. In contrast, rates for women remained stable over the same 15-year time period. Incidence rates decreased for seven of the 17 most common cancers in men and seven of the 18 most common cancers in women, including lung and colorectal cancers; whereas rates increased for seven cancers in men and nine cancers in women, including liver, myeloma, melanoma, oral cavity, pancreas, and thyroid in both men. Of note is the 0.4% increase per year over the past 5 years in breast cancer incidence, the most common cancer among women.

Among children in each racial and ethnic group, incidence rates increased by 0.4% to 1.0% per year during 2009-2013 except in American Indian/Alaska Native (AI/AN), whereas death rates during 2010-2014 decreased by 1.5% to 2.6%, except AI/AN populations in whom rates could not be calculated because of sparse data.

Are drops in cancer incidence always good news?

While declines in cancer mortality rates are always good news, changes in incidence rates may represent both good and bad news. Declines in cancer incidence rates that occur as a result of decreased modifiable risk factors or increased use of screening tests (colorectal and cervical cancer screening) that allow the detection and removal of precancerous lesions are good news. However, a drop in screening rates can also reflect fewer cancers being detected early and that may not be discovered until they are at a more advanced stage.

What is happening with cancer mortality trends overall?

From 2010–2014, cancer death rates continue to decrease in both men and women for all major racial and ethnic groups. Rates decreased for 11 of the 16 most common cancers in men and for 13 of the 18 most common cancers in women, including lung, colorectal, female breast, and prostate cancers, except for stable rates for breast cancer among Hispanic women, lung cancer and colorectal cancer among AI/AN men and colorectal cancer among API (Asian Pacific Islander) and AI/AN women. In contrast, death rates increased for liver cancer in men and women, for pancreas cancer and brain cancer in men, and for uterine cancer in women. Death rates for most of the other cancer sites declined or were stable among men and women in each racial and ethnic group.

Age-adjusted death rates are the best indicator of progress against cancer, although other measures, such as quality of life, are also important.

If cancer death rates continue to fall, does that mean the number of people dying from cancer will also continue to fall?

Not necessarily. The data described in the report are rates (for example, the number of deaths per 100,000 people in the U.S.) and are adjusted for age so they can be compared across groups that vary by factors such as race, time period, and regions with different age structures (i.e., some areas have higher concentrations of older people while others have more young people). The actual number of people dying from cancer (sometimes called the count) can be influenced by several factors, including the growth in the number of older people in the U.S. (cancer is primarily a disease of aging), as well as an increase in the size of the population.

Therefore, although the cancer death rate may go down during a particular period, the actual number of cancer deaths could go up because the number of older Americans is increasing and the overall size of the population is increasing.

Special Section: Cancer survival

Five-year survival for patients diagnosed between 1975-1977 and 2006-2012 increased significantly in for all 20 cancer types but two cancer types (cervix and uterus), with the greatest absolute changes (25% or greater) observed for prostate, kidney, non-Hodgkin lymphoma, myeloma, and leukemia. The greatest proportional changes (100% or greater) were observed for esophagus, stomach, pancreas, liver, and myeloma.

Cancers with the lowest 5-year relative survival rates for cases diagnosed in 2006-2012 were pancreas (8.5%), liver (18.1%), lung (18.7%), esophagus (20.5%), stomach (31.1%), and brain (35%); those with the highest were prostate (99.3%), thyroid (98.3%), melanoma (93.2%), and female breast (90.8%). When comparing cases diagnosed in 1975-1977 versus 2006-2012, survival improved substantially in the later-diagnosed group for both early (localized) and late-

stage (regional, distant) diseases for most cancer types including liver, esophagus, colorectal, female breast, and NHL.

Between 1975-1977 and 2006-2012, cancer types and stages that demonstrated a large absolute gain (20% or greater) in survival included NHL for distant stage, esophagus for localized and regional stages, and oral cavity for regional and distant stages, pancreas and liver cancers for local stage, and female breast and colorectal for regional stage. Although improvements in survival for distant-stage disease over the past 30 years generally appeared to be small in absolute terms (<10% absolute gain), they were large in proportionate terms, with survival rates more than doubling for eight cancers.

Five-year survival for select childhood cancers diagnosed during two calendar periods, 1975-1977 and 2006-2012 showed survival improved substantially between the two periods for all cancer types, ranging from an absolute increase of 16.8% (95% CI, 9.2%, 24.3%) for Hodgkin lymphoma to 48.3% (95% CI, 37.7%-59.0%) for acute myeloid leukemia.

Survival varied substantially by race/ethnicity and state. For example, the adjusted relative risk of death for all cancers combined was 33% higher in non-Hispanic blacks and 51% higher in non-Hispanic American Indian/Alaska Native compared to non-Hispanic whites. In general, survival for common cancers (e.g. female breast, colon and rectum) tended to be lowest in select Southern and Midwestern states and highest in Northeastern states.

How to Read This Report

How are cancer incidence and death rates presented?

Cancer incidence rates and death rates are typically measured as the number of cases or deaths per 100,000 people per year and are age-adjusted to the 2000 U.S. standard population. When a cancer affects only one sex (e.g.: prostate cancer), then the number is per 100,000 people of that sex. The numbers are age-adjusted, which allows for comparison of rates from different populations with varying age composition over time and in different regions.

What is the average annual percentage change (AAPC)?

The average annual percentage change (AAPC) quantifies the annual percentage change (APC) trend over a fixed period of multiple years (i.e., how fast or slowly a cancer rate has increased or decreased each year over a period of years). A negative AAPC describes a decreasing trend and a positive AAPC describes an increasing trend. The number is given as a percent, such as 'an approximate 1 percent per year decrease.'

In this report, all trends mentioned in the text are statistically significant unless noted otherwise. For non-statistically significant trends, terms such as "stable" were used.

Why were rates adjusted for delays in reporting incidence data?

The report presents cancer incidence rates with adjustment for reporting delays and more complete information. Adjusting for these delays and accumulating more complete and accurate information provides the basis for a potentially more definitive assessment of incidence rates and trends, particularly in the most recent years for which data are available. Cancer registries routinely take two years to three years to compile their current cancer statistics. An additional one to two years may be required to have more complete incidence data on certain cancers, such as melanomas and leukemias when they are diagnosed in outpatient settings. Cancer registries continue to update incidence rates to include these cases. Consequently, the data initially reported for certain cancer incidence rates may be an underestimate.

Long-term reporting patterns in NCI's SEER (Surveillance, Epidemiology and End Results) registries and CDC's National Program of Cancer Registries have been analyzed and it is now possible to adjust incidence rates for all cancers combined and for site-specific cancers with a correction for expected reporting delays and more complete information. This is the first Annual Report to the Nation that has used a single database (41 quality certified cancer registries, covering 89% of the US population) to provide all delay-adjusted incidence statistics. In future years as the number of quality certified registries increases, we hope to cover a larger proportion of the US population and/or present trends using a longer time series.

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Reference: Jemal, A., et al. Annual Report to the Nation on the Status of Cancer, 1975-2014, Featuring Survival. *JNCI*. Online March 31, 2017. DOI: [djx030 doi: 10.1093/jnci/djx030](https://doi.org/10.1093/jnci/djx030)