Understanding Cancer Data

Cancer data can sometimes be difficult to interpret. Here is some information about common terms and methods used to better understand cancer data so that it can be effectively used to guide interventions and policy decisions.

Incidence (New cases)

Incidence refers to annual or average annual incidence. Annual incidence is the number of new cases of cancer diagnosed during a calendar year. Average annual incidence is the number of new cases diagnosed during a specified number of years. Indiana resident incidence data in this report, unless otherwise noted, were obtained from the Indiana State Cancer Registry (ISCR). Because there are delays in health care providers reporting cancer cases to the ISCR and the ISCR has to make sure data are complete and accurate before publishing them, the most current data available for this report were from 2012. Visit www.in.gov/isdh/24360.htm to see if more up-to-date data are available.

Mortality (Deaths)

Mortality refers to annual or average annual mortality. Annual mortality is the number of deaths from cancer during a calendar year (Note: the cancer was not necessarily diagnosed in the same year). Average annual mortality is the average number of deaths during a specified number of years. Mortality data reflect the underlying cause of death as recorded on the death certificate. Indiana resident mortality data in this report, unless otherwise noted, are from the ISCR who obtains annual death certificate record information from the Indiana State Department of Health Vital Records Department. Data from 2012 were the most current mortality data available for this report. Visit www.in.gov/isdh/24360.htm to see if more up-to-date data are available.

Cancer Rates

In this document, cancer rates represent the number of new cases of cancer per 100,000 people (incidence) or the number of cancer deaths per 100,000 people (mortality) during a specific period [see example below]. Typically, incidence rates are calculated based only on the number of invasive cancer cases that occurred during a period and do not include in situ cases. Invasive cancer is cancer that has spread beyond the layer of tissue in which it developed and is growing into surrounding, healthy tissues. See page 9 for additional information about in situ cancer.

Example: If a county's lung cancer incidence rate is 40.0 cases per 100,000 people that means 40 new cases of invasive lung cancer were diagnosed for every 100,000 people. If the county's population is 25,000, then an incidence rate of 40.0 means 10 new cases of invasive lung cancer were diagnosed in that county during that year. Rates provide a useful way to compare cancer burden irrespective of the actual population size. Rates can be used to compare demographic groups (males have higher lung cancer rates than females), race/ethnic groups (African American males have higher prostate cancer rates than white males), or geographic areas (Indiana has higher lung cancer incidence rates than California). Population data to calculate the incidence rates were obtained from www.seer.cancer.gov/popdata.

Age-Adjusted Rates

Older age groups generally have higher cancer rates than younger age groups. For example, in Indiana, more than 60 percent of new lung cancer cases occur in those ages 60 and older. As a result, if one county's lung cancer incidence rate is higher than another, the first question asked is whether the county with a higher rate has an older population.

To address this issue, all mortality and incidence rates presented in this report, unless otherwise noted, have been age-adjusted. This removes the impact of different age distributions between populations and allows for direct comparisons of those populations. Additionally, age-adjustment allows for a comparison of rates within a single population over time. An age-adjusted rate is not a real measure of the burden of the disease on a population, but rather an artificial measure that is used for comparison purposes. All mortality and incidence rates in this publication were age-adjusted using the direct method. This method weights the age-specific rates (*i.e.*, rates calculated for each age group) for a given sex, race, or geographic area by the age distribution of the standard population. The 2000 US standard million population and five-year age group population numbers were used to calculate all of the age-adjusted rates in this report.

Confidence Intervals and Statistical Significance

Because the ISCR collects information on all reportable cancer cases that occur in Indiana, the incidence and mortality rates in this report are not subject to sampling error (*i.e.*, error in estimating rates because one is working with sample rather than population data). However, cancer rates are often impacted by random variation, especially when looking at rates for rare types of cancer or among small geographic areas. Because of this random variation, confidence intervals (CIs) are used to describe the range of that variation. Most typically, 95% CIs are calculated, which provide a range of values in which one is 95% confident that the true rate exists, or, more technically, a 95% CI is such that if one repeated a study 100 times, 95 of the intervals would include the true rate.

For this report, CIs for the age-adjusted rates were calculated with a method based on the gamma distribution.[1] This method produces valid CIs even when the number of cases is very small. When the number of cases is large, the CIs produced with the gamma method are equivalent to those produced with the more traditional methods. The formulas for computing CIs can be found at www.in.gov/isdh/24360.htm

(click "Help" then "Index"). Generally, when the 95% CI for the area of interest does not overlap with the 95% CI for the comparison area, we would say that the two areas are statistically significantly different at the $P<.05$ level (*i.e.*, the difference between the two rates is more than that expected by random variation). The limitation of this method, though, is that if two rates have overlapping CIs, they are probably not significantly different, but there is a chance that they still could be. Therefore, some of the rates in this report (*e.g.*, county rates) not designated as being significantly above or below the comparison rate (*e.g.*, Indiana rate) could still be significantly different.

Other Common Terms Used and Groups Referenced in this Report:

Adults. Used in this report to refer to people ages 18 years and older.

Age-specific Rate. The total number of new cases or deaths among residents in a specific age group divided by the population of that age group then multiplied by 100,000.

American Cancer Society (ACS). A nationwide, community-based voluntary health organization dedicated to eliminating cancer as a major health problem by preventing cancer, saving lives, and diminishing suffering from cancer, through research, education, advocacy, and service. Additional information is available at www.cancer.org.

Burden. The number of new cases or deaths from cancer or overall impact of cancer in a community.

Carcinogen. Any chemical, physical, or viral agent that is known to cause cancer.

Centers for Disease Control and Prevention (CDC). The CDC's mission is the following: "Collaborating to create the expertise, information, and tools that people and communities need to protect their health — through health promotion, prevention of disease, injury and disability, and preparedness for new health threats." Additional information is available at www.cdc.gov.

Five-year Survival. The percentage of people who are alive five years after their cancer is diagnosed. While statistically valid, these percentages are based on historical data and might not reflect current advances in treatment. Therefore, five-year survival rates should not be seen as a predictor in an individual case.

Lifetime Risk. The probability that an individual, over the course of a lifetime, will develop or die from cancer.

Malignant. Cancer that has spread beyond the location in which it started.

Metastasis. Movement of cancer from part of the body to a separate area of the body.

Morbidity. The number of people who have a disease.

National Center for Health Statistics (NCHS). Contained within the CDC, the NCHS is the nation's principal health statistics agency. They compile statistical information to guide actions and policies to improve health. Additional information is available at www.cdc.gov/nchs.

Prevalence. A calculation of the proportion of people with a certain disease at a given time.

Risk Factor. Anything that increases a person's probability of getting a disease. Risk factors can be lifestyle-related, environmental, or genetic (inherited).

Surveillance, Epidemiology, and End Results (SEER) Program. Contained within the National Cancer Institute, SEER works to provide information on cancer statistics in an effort to reduce the burden of cancer among the US population. Additional information is available at www.seer.cancer.gov.

Staging. The process of finding out whether cancer has spread and, if so, how far. There is more than one system for staging (see page 9 for additional information).

References are provided throughout this report to provide readers with additional information. Web addresses are provided for online information.

REFERENCES

[1] Fay MP, Feuer EJ. Confidence intervals for directly standardized rates: a method based on the gamma distribution. *Statistics in Medicine*. 1997; 16: 791–801.

Common Questions about Cancer

What is cancer?

Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells. The cancer cells form tumors that destroy normal tissue. If cancer cells break away from a tumor, they can travel through the blood stream or the lymph system to other areas of the body, where they might form new tumors (metastases). If this growth is not controlled, cancer might be fatal.

Are all growths and tumors cancerous?

Not all irregular growths of abnormal cells lead to cancer. A tumor can be either benign (non-cancerous) or malignant (cancerous). Benign tumors do not metastasize and, with very rare exceptions, are not life threatening. Benign tumors usually grow slowly, remain localized, and do not destroy surrounding normal tissue.

What causes cancer?

All cancers develop because of damage to or mutation of genes that control cell growth and division. These genetic changes can be caused by exposure to external factors (*e.g.*, tobacco, poor diet, alcohol, chemicals, sunlight, radiation, infectious organisms) or internal factors (*e.g.*, inherited mutations, hormones, immune conditions, mutations that occur from metabolism). Only about five to ten percent of all cancers are the result of inherited gene mutations.[1]

External and internal factors often act together or in sequence to initiate or promote cancer development. Many years often pass between exposures or mutations and detectable cancer. Because of this, it is often difficult to directly identify causes of specific cancer cases.

Who gets cancer?

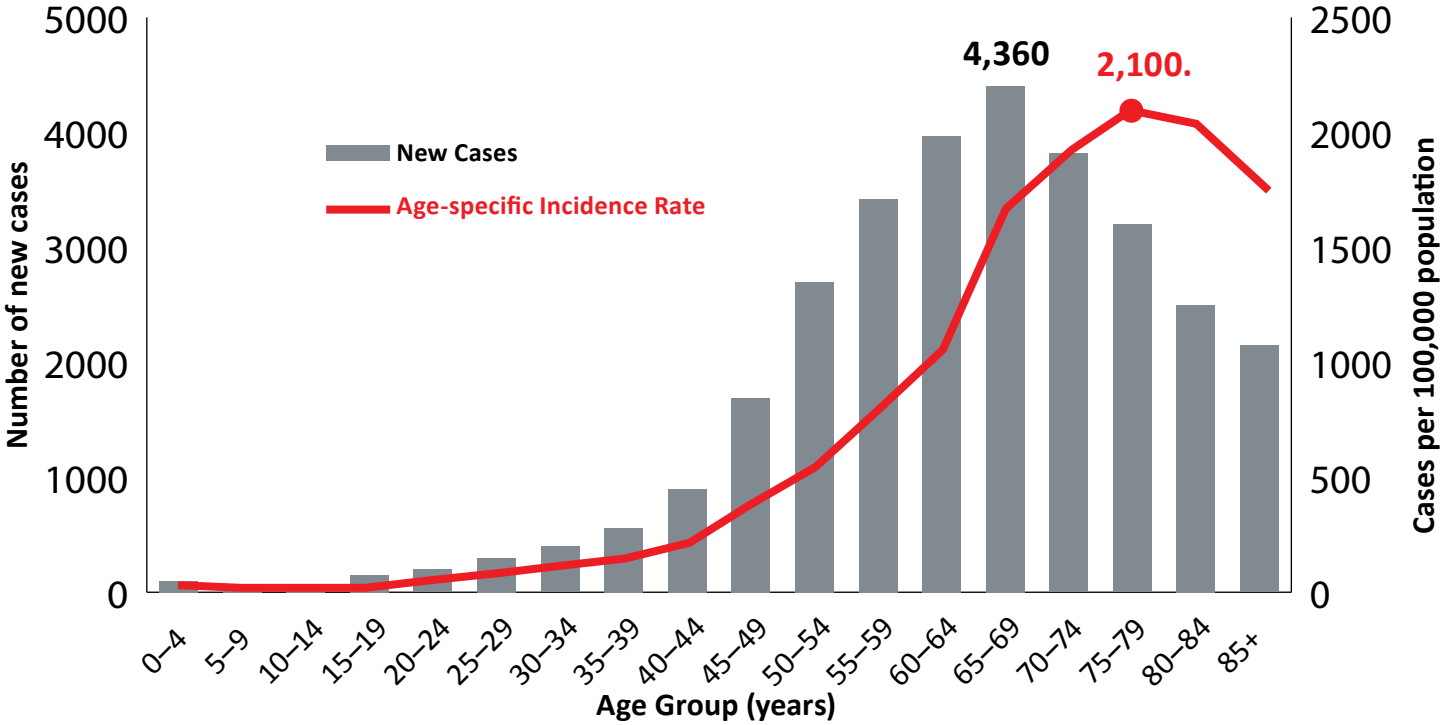
Anyone can get cancer at any age; however, middle and older aged people are most likely to develop cancer. In Indiana, during 2012, 66 percent of all cancers cases occurred among people ages 55–84, including 23 percent among people ages 55–64, 26 percent among people ages 65–74, and 18 percent among people ages 75–84 [Figure 1].

Additionally, individuals who have been exposed to certain external and internal risk factors have an increased risk of developing cancer. For example, male smokers are about 23 times more likely to develop lung cancer than nonsmokers.[2] Also, females who have a first degree relative (*i.e.*, mother, sister, or daughter) with a history of breast cancer have about twice the risk of developing breast cancer, compared to females who do not have this family history.[2]

Can cancer be prevented?

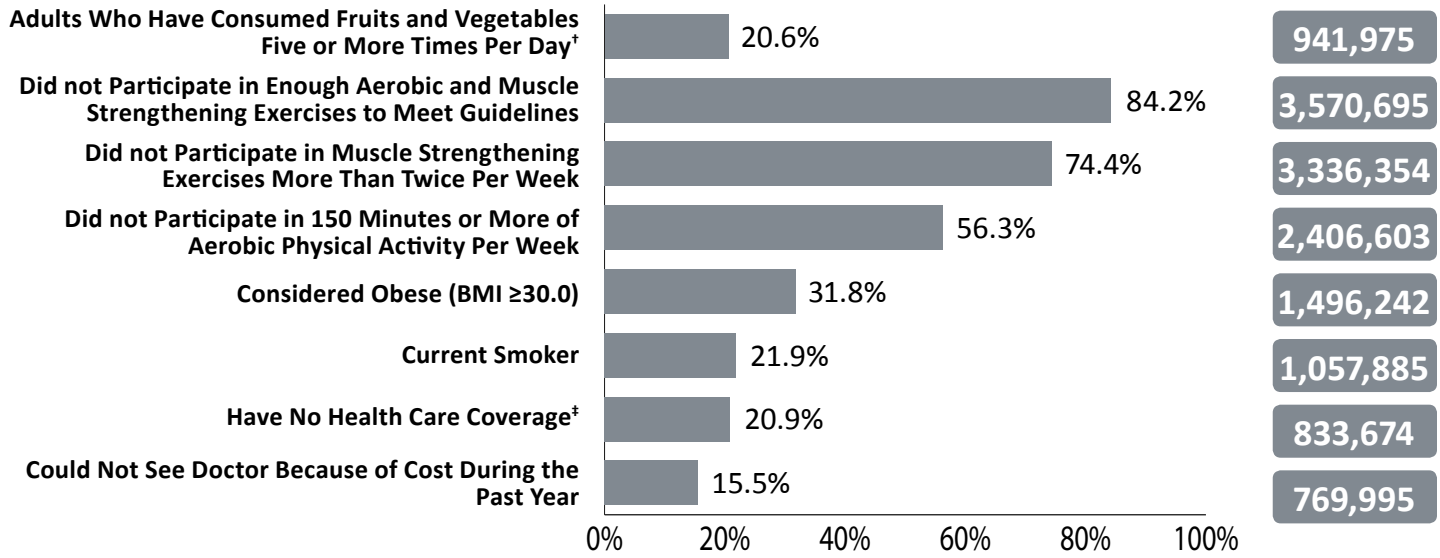
Many cancers can be prevented by modifying external risk factors and making lifestyle changes, such as eliminating tobacco use, improving dietary habits, increasing physical

Figure 1. Number and Rate of New Cancer Diagnoses among Residents — Indiana, 2012



Data are provided for the age groups with the largest number of cases and highest rate. Source: Indiana State Cancer Registry

Figure 2. Preventive Cancer Behaviors and Access to Medical Care among Adults* — Indiana, 2013



** Adults are people ages 18 years and older*

† Data from 2009

‡ Adults ages 18–64

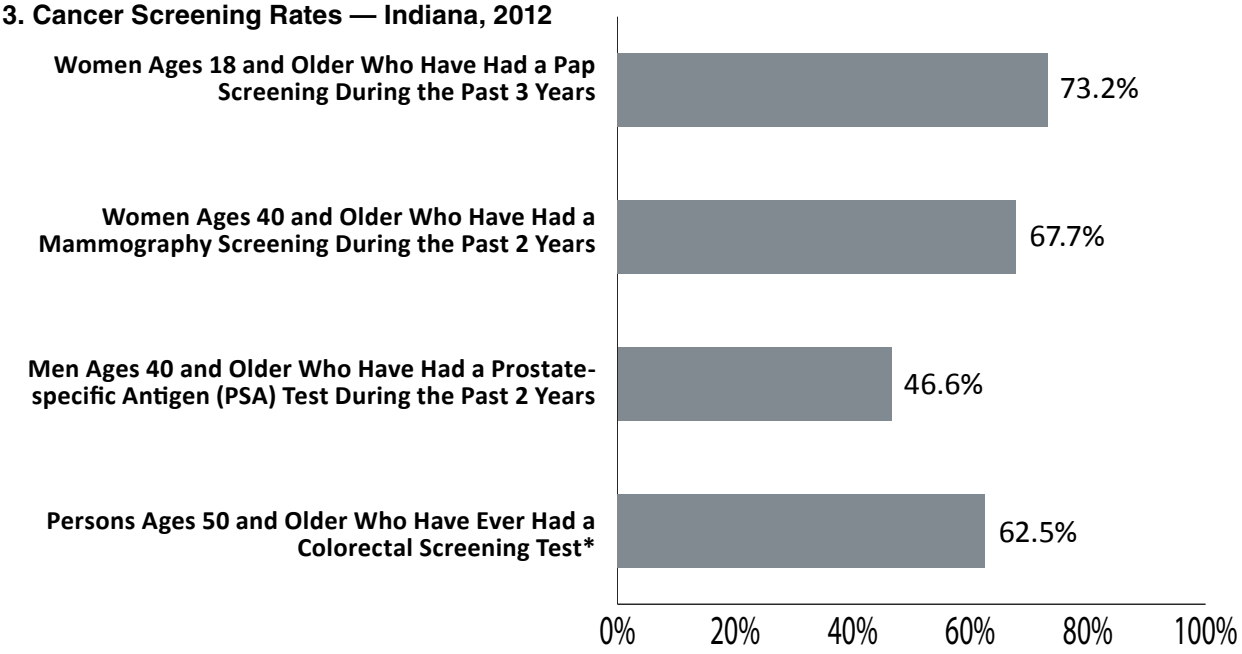
Source: Indiana Behavioral Risk Factor Surveillance System

activity, losing weight, and avoiding excessive sun and infectious disease exposures. Additionally, many cancers can be prevented or identified at an early stage if people receive regular medical care and obtain early detection cancer screenings. Figure 2 describes the burden of some lifestyle and external factors among Indiana adults and Figure 3 describes cancer screening rates among Indiana adults.

Additional information about cancer risk factors include:

- **Tobacco.** All cancers caused by the use of tobacco products could be prevented. The American Cancer Society (ACS) estimates that, during 2014, almost 176,000 cancer deaths were caused by tobacco use.[2] During 2013, 21.9 percent of Indiana adults were current smokers.[3]
- **Body Weight, Diet, and Physical Activity.** The World Cancer Research Fund estimates that about one-third of the 585,720 cancer deaths expected to have occurred during 2014 were related to overweight or obesity, physical inactivity, and poor nutrition.[2] During 2013, 31.8 percent of Indiana adults were considered obese.[3] Additionally, during 2013, 56.3 percent of Indiana adults did not get the recommended 150 minutes of exercise per week (recommendations available at www.cdc.gov/physicalactivity/everyone/guidelines/index.html).[3] During 2009, approximately 80 percent failed to eat fruits and vegetables five or more times each day.[3] Diets low in animal fat and high in fruits and vegetables could help prevent certain cancers.
- **Infection with HPV and Other Infectious Diseases.** The human papillomavirus (HPV) is the single greatest risk factor for cervical cancer.[4] The Centers for Disease Control and Prevention (CDC) estimates that 21,000 cancer cases each year could potentially be prevented with HPV vaccines. In all, an estimated 15 to 20 percent of cancers worldwide are related to infectious exposures, such as hepatitis B virus (HBV), human papillomavirus (HPV), human immunodeficiency virus (HIV), *Helicobacter* bacteria, and others.[5] Many of these infections can be prevented through behavioral changes or the use of vaccines or antibiotics.[5]
- **Sun Exposure.** Excessive exposure to ultraviolet (UV) radiation from the sun or other sources, like tanning beds, is the greatest risk factor for developing skin cancer. The US Department of Health and Human Services and the International Agency of Research on Cancer panel has found that exposure to sunlamps or sun beds is a known carcinogen.[6]
- **Health Care Coverage**. Uninsured and underinsured patients are substantially more likely to be diagnosed with cancer at a later stage, when treatment can be more extensive and costly.[2] According to the US Census Bureau, almost 48.6 million Americans were uninsured in 2011 — including one-third of Hispanics and one in 10 children (18 years and younger).[2] In 2013, approximately 21 percent (20.9) of Indiana residents ages 18-64 reported to having no health care coverage.[3] The Affordable Care Act is expected to continue to reduce the number of uninsured people — improving the health care system for cancer patients.[2]
- **Screening.** Early diagnosis through regular screening examinations saves lives by identifying cancers when they are most curable and treatment is more successful. Cancers that can be detected by screening include breast, cervix, colon, lung, oral cavity, rectum, skin, and testicular cancers.

Figure 3. Cancer Screening Rates — Indiana, 2012



* *Sigmoidoscopy or colonoscopy*

Source: Indiana Behavioral Risk Factor Surveillance System

How is cancer staged?

A cancer's stage is based on the primary tumor's size and location in the body and whether it has spread from the site of origin to other areas of the body. There are two main staging systems used to classify tumors.

The ***TNM staging system*** assesses tumors in three ways: extent of the primary tumor (T), absence or presence of regional lymph node involvement (N), and absence or presence of distant metastases (M). Once the T, N, and M are determined, a stage is assigned. Stages are given numbers (I, II, III, IV) and represent a scale — stage I is the earliest possible diagnosis, and stage IV is advanced.

Summary staging is useful for descriptive and statistical analyses of cancer data and is used throughout this report. An in situ tumor is a tumor at the earliest possible stage — when cells have not invaded surrounding tissue. This stage can only be diagnosed by microscopic examination. A localized tumor is any tumor that has not spread beyond the primary organ. A regional or distant tumor is one that has spread to other parts of the body (this is also referred to as a tumor that has metastasized), either through the blood or lymph systems. With an unstaged/unknown tumor, there is insufficient information available to determine the stage of the disease.

What is the impact of stage at diagnosis on survival?

Staging is essential in determining the choice of therapy and assessing prognosis. It is a strong predictor of survival; generally, the earlier the stage, the better the prognosis. Locally and nationally, about half of newly diagnosed cases are either in situ or localized [Figure 4].

How is cancer treated?

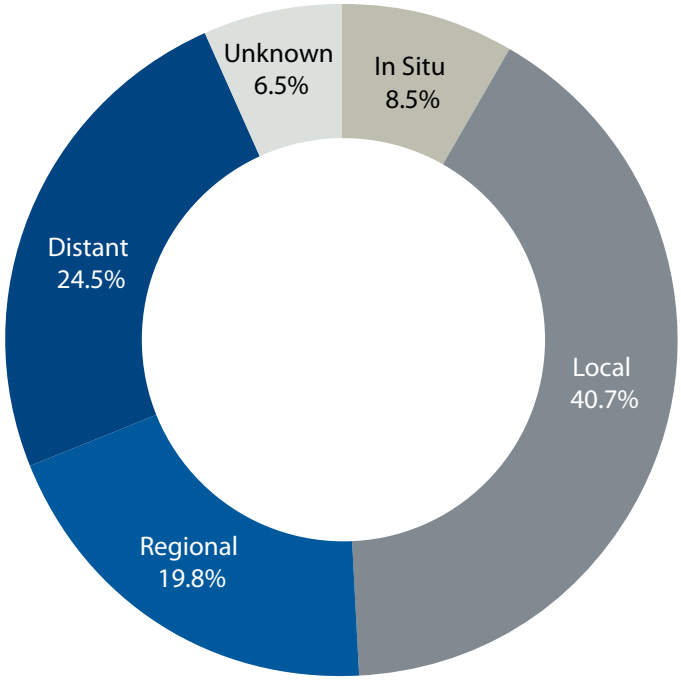
Treatment depends on the cancer type and stage, specific diagnosis, and overall health of the individual. Cancer is treated by one or more of the following therapies:

- **Surgery** removes the tumor by cutting out the cancerous mass; it is mostly used for localized tumors.
- **Chemotherapy** uses either intravenous or oral drugs to destroy cancer cells. It is used with the intention of curing or inducing remission in cancers in early stages.
- **Hormone therapy** might be given to block the body's natural hormones and to slow or stop the growth of certain cancers.
- **Immunotherapy or biologic therapies are** used to stimulate and strengthen a person's own immune system to destroy the cancer cells.
- **Radiation or radiotherapy** uses high-energy rays to destroy or slow the growth of cancer cells. It can be done with the intention of curing some cancers that have not spread too far from their site of origin or to relieve symptoms.

Can cancer be cured?

Many cancers can be cured if detected and promptly treated. For most types of cancer, if a person's cancer has been in remission (all signs and symptoms of the disease are absent) for five years, the cancer is considered cured. However, the length of remission at which a person is considered cured differs by cancer type. Certain skin cancers, such as a basal cell carcinoma, are considered cured as soon as the lesion is removed. For other cancers (*e.g.*, pancreatic), eight to ten years must pass before the person is considered cured.

Figure 4. Percent of Cancer Cases Diagnosed During Each Stage* — Indiana, 2008–2012



During 2008–2012, of the 169,378 Indiana residents who received an in situ or invasive cancer diagnosis, 83,269 (49.2%) were diagnosed in the in situ or local stage, 75,026 (44.3%) were diagnosed in the regional or distant stage, and 11,083 (6.5%) had unknown staging.

** Includes all in situ and invasive cancers except for basal and squamous cell skin cancers and in situ bladder, cervical, and prostate cancers, which are not reportable.*

Source: Indiana State Cancer Registry

What are the most common cancers?

The most commonly occurring cancers for both the state and the nation are the same. Excluding skin cancers, breast and prostate are the most prevalent cancers among females and males, respectively. Lung, including bronchus, and colon cancers are the next most common cancers among both sexes [Table 1]. Annually, lung cancer is responsible for the most cancer-related deaths among both sexes [Table 1].

How many people alive today will get cancer?

About 2.4 million Hoosiers, or 2 in 5 people now living in Indiana, will eventually develop cancer. Nationally, men have slightly less than a one in two chance of developing cancer in their lifetime; for women, the lifetime risk of developing cancer is a little more than one in three.[2]

How many people alive today have ever had cancer?

Approximately 13.7 million Americans with a history of cancer were alive on January 1, 2012.[2] Some of these individuals were cancer free, while others still had evidence of cancer and might have been undergoing treatment.

How many new cases of cancer are expected to occur this year?

The ACS estimated that approximately 35,620 Indiana residents will be diagnosed with cancer in 2015, amounting to almost four new cases of cancer diagnosed every hour of every day. Nationally, an estimated 1.6 million new cancer cases were diagnosed in 2014.[2] These estimates did not include cases of non-melanoma skin cancer and carcinoma in situ (except for in situ urinary bladder cancer cases).

How many people are expected to die from cancer this year?

During 2015, about 13,420 Indiana residents are expected to die of cancer, which translates to approximately 36 people every day.[2] Cancer is the second leading cause of death in Indiana following heart disease. Among children ages five to 14, cancer is the second leading cause of death following deaths from accidents.

How many people today survive cancer?

Using data from the Surveillance Epidemiology and End Results (SEER) registry, the five-year survival rate for

Table 1. Leading Sites of New Cancer Cases and Deaths among Indiana Residents by Sex, 2012

Number (%) of New Cases

Males	Count	%	Females	Count	%
Prostate	2,844	19.25%	Breast	4,366	27.83%
Lung and Bronchus	2,540	17.20%	Lung and Bronchus	2,134	13.60%
Colon and Rectum	1,447	9.80%	Colon and Rectum	1,378	8.78%
Urinary Bladder	1,071	7.25%	Corpus and Uterus, NOS	994	6.34%
Kidney and Renal Pelvis	688	4.66%	Brain and Other Nervous System	615	3.92%
Non-Hodgkin Lymphoma	657	4.45%	Thyroid	588	3.75%
Melanoma of the Skin	589	3.99%	Non-Hodgkin Lymphoma	545	3.47%
Oral Cavity and Pharynx	567	3.84%	Melanoma	502	3.20%
Brain and Other Nervous System	444	3.01%	Kidney and Renal Pelvis	429	2.73%
Pancreas	430	2.91%	Pancreas	420	2.68%
All Sites	**14,771**		**All Sites**	**15,689**	

Number (%) of Deaths

Males	Count	%	Females	Count	%
Lung and Bronchus	2,250	31.89%	Lung and Bronchus	1,708	27.29%
Colon and Rectum	613	8.69%	Breast	872	13.93%
Prostate	606	8.59%	Colon and Rectum	556	8.88%
Pancreas	395	5.60%	Pancreas	388	6.20%
Leukemia	308	4.37%	Leukemia	238	3.80%
Liver and Intrahepatic Bile Duct	294	4.17%	Non-Hodgkin Lymphoma	203	3.24%
Esophagus	280	3.97%	Corpus and Uterus, NOS	200	3.20%
Urinary Bladder	255	3.61%	Brain and Other Nervous System	161	2.57%
Non-Hodgkin Lymphoma	239	3.39%	Liver and Intrahepatic Bile Duct	156	2.49%
Kidney and Renal Pelvis	212	3.00%	Kidney and Renal Pelvis	118	1.89%
All Sites	**7,055**		**All Sites**	**6,258**	

Source: Indiana State Cancer Registry

Table 2. Cancer Incidence and Mortality (Death) Rate Comparisons between Indiana and the US, by Sex and Race, 2006–2010*

	Incidence rate per 100,000 people (2006–2010)			Mortality rate per 100,000 people (2006–2010)		
	Indiana	US	Difference (%)	Indiana	US	Difference (%)
Total	464.0†	469.1	-1.73	192.6†	176.4	9.18
Males	527.4†	541.1	-2.53	223.8†	215.3	3.95
Females	422.0†	417.8	1.01	161.5†	149.7	7.88
Whites	458.9†	469.3	-2.22	191.4†	175.8	8.87
African Americans	472.8	476.5	-0.78	221.4†	210.3	5.28

** Age-adjusted*

† Indiana rate is significantly higher (P<.05) than the US rate

Source: United States Cancer Statistics: 1999 — 2010 Mortality, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention; 2013. Accessed at http://wonder.cdc.gov/CancerMort-v2010.html on Mar 28, 2014 3:20:11 PM

2004–2010 from the 18 SEER geographic areas was 66.1 percent.[7] Factors such as early stage of disease at diagnosis can greatly improve the probability of survival after five years.

What are the costs of cancer?

During 2014, $1.83 billion was the estimated direct cost of treating Indiana residents with cancer. The estimated indirect costs totaled $11.12 billion for the same year.[8] The Milken Institute estimated that, should current trends continue, Indiana residents would spend $2.76 billion on direct costs for cancer care in 2023.[9]

How does cancer incidence and mortality in Indiana compare with the rest of the US?

Indiana's age-adjusted cancer incidence rate during 2006–2010 was 464.0 per 100,000 people. This was statistically higher than, but very similar to, the national rate of 469.1 per 100,000 people (<2% difference) [Table 2; Figure 5].

However, during the same period, Indiana's age-adjusted mortality rate was nine percent higher than the national rate (192.6 versus 176.4 deaths per 100,000 people). This included being almost four percent higher among Indiana males (223.8 versus 215.3 deaths per 100,000 males) and almost eight percent higher among Indiana females (161.5 versus 149.7 deaths per 100,000 females) [Table 2; Figure 6].

Lung cancer had the largest differences between the Indiana and US incidence and mortality rates, as the incidence rate among Indiana residents was almost 15 percent higher and the mortality rate was over 18 percent higher. This increase in risk is mostly attributable to Indiana having a high prevalence of smokers compared to the rest of the US. In 2013, Indiana had the 12th highest adult smoking rate in the country.[3]

Is the cancer burden in the US and Indiana lessening?

The burden of specific cancer types among US residents has changed over the years [Figures 7 and 8]. For example, with the gradual decrease in smoking rates among Americans over the past several decades, lung cancer mortality rates have begun to decrease, especially among US males.

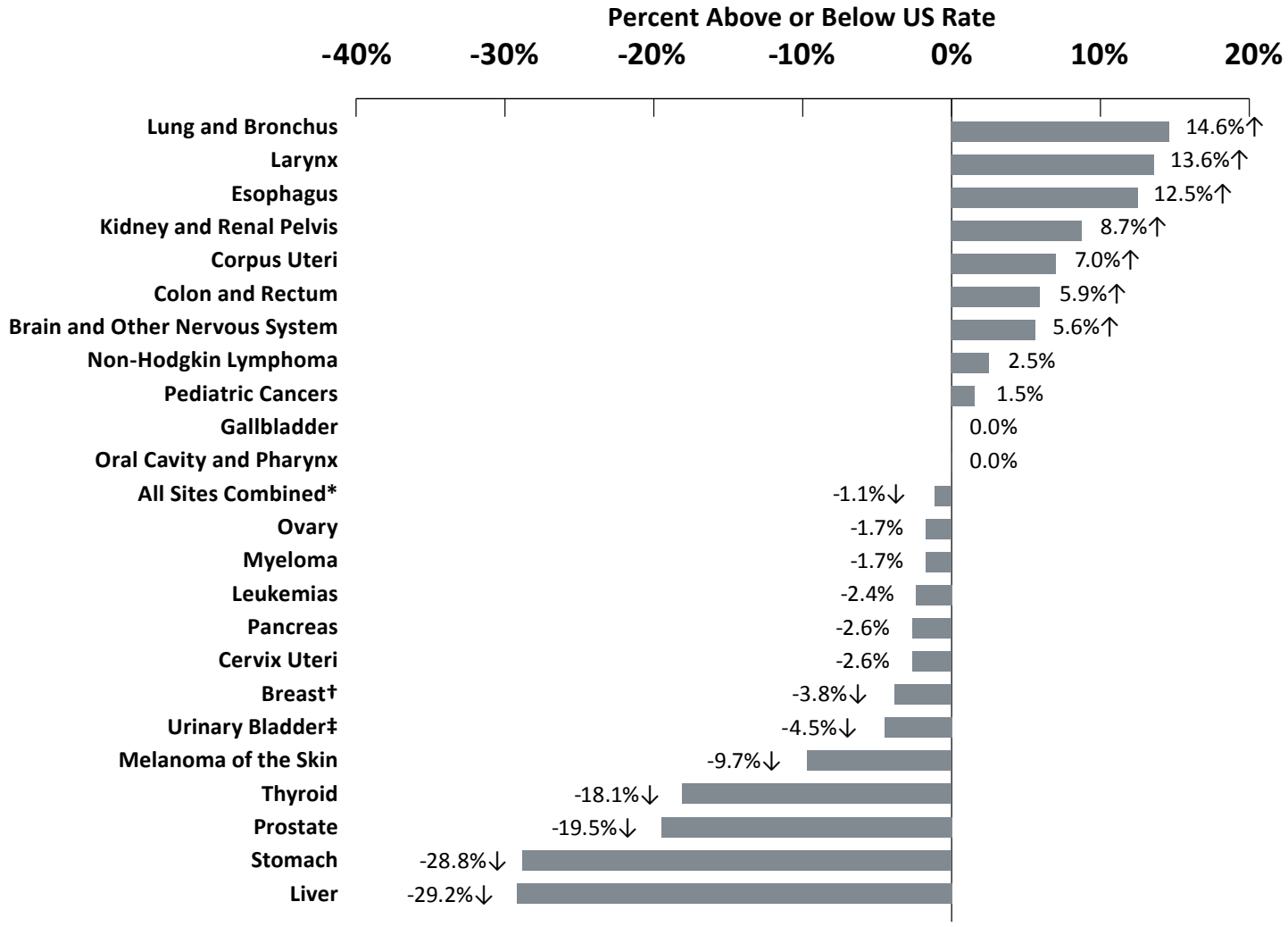
In Indiana, from 2003 to 2012, the age-adjusted incidence rates for all cancers combined decreased 13 percent from 490.2 to 428.0 cases per 100,000 people. Likewise, the age-adjusted mortality rates decreased 9.4 percent from 206.0 to 186.7 deaths per 100,000 people. However, trends varied among the different cancer types.

These statistics indicate that progress continues to be made in the early detection and treatment of certain cancers, and that the incidence and mortality of some cancers is declining. However, a significant cancer burden still exists among Indiana residents that require continued and more targeted cancer control efforts.

How does Indiana track changes in cancer risk and risk behavior data?

The Indiana State Cancer Registry was established in 1987 to compile information on cancer cases and other related data necessary to conduct epidemiological studies of cancer and develop appropriate preventive and control programs. The data in this registry allows for the evaluation of cancer prevention

Figure 5. How Do Indiana Cancer Incidence Rates Compare to US Rates?* (2006–2010)



** Age-adjusted*

† Female breast cancers only

‡ Urinary Bladder includes invasive and in situ.

Note: ↑↓ symbols denote whether Indiana's rate is significantly different than the US rate based on the 95% confidence interval overlap method (see Page 4 for description). ↑ = significantly higher; ↓ = significantly lower.

Source: United States Cancer Statistics: 1999–2010 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2013. Accessed at http://wonder.cdc.gov/cancer-v2010.html on Jul 14, 2014 3:56:43 PM

efforts and the measurement of progress toward reaching the state goal of reducing cancer incidence and mortality among Indiana residents.

Additionally, several data sources are used to describe the burden of risk factors (*e.g.*, obesity) and cancer screening rates among Indiana residents. The Behavioral Risk Factor Surveillance System (BRFSS) is the main source utilized to do this because it provides yearly data that can be used to generate Indiana-specific estimates for a large number of cancer risk and preventative factors. These findings can then be tracked over time and compared to other states to evaluate how Indiana is progressing in those areas. Additional local, state, and national data resources can be found in the Indiana Community Health Information Resource Guide (www.indianactsi.org/chep/resourceguide).

REFERENCES

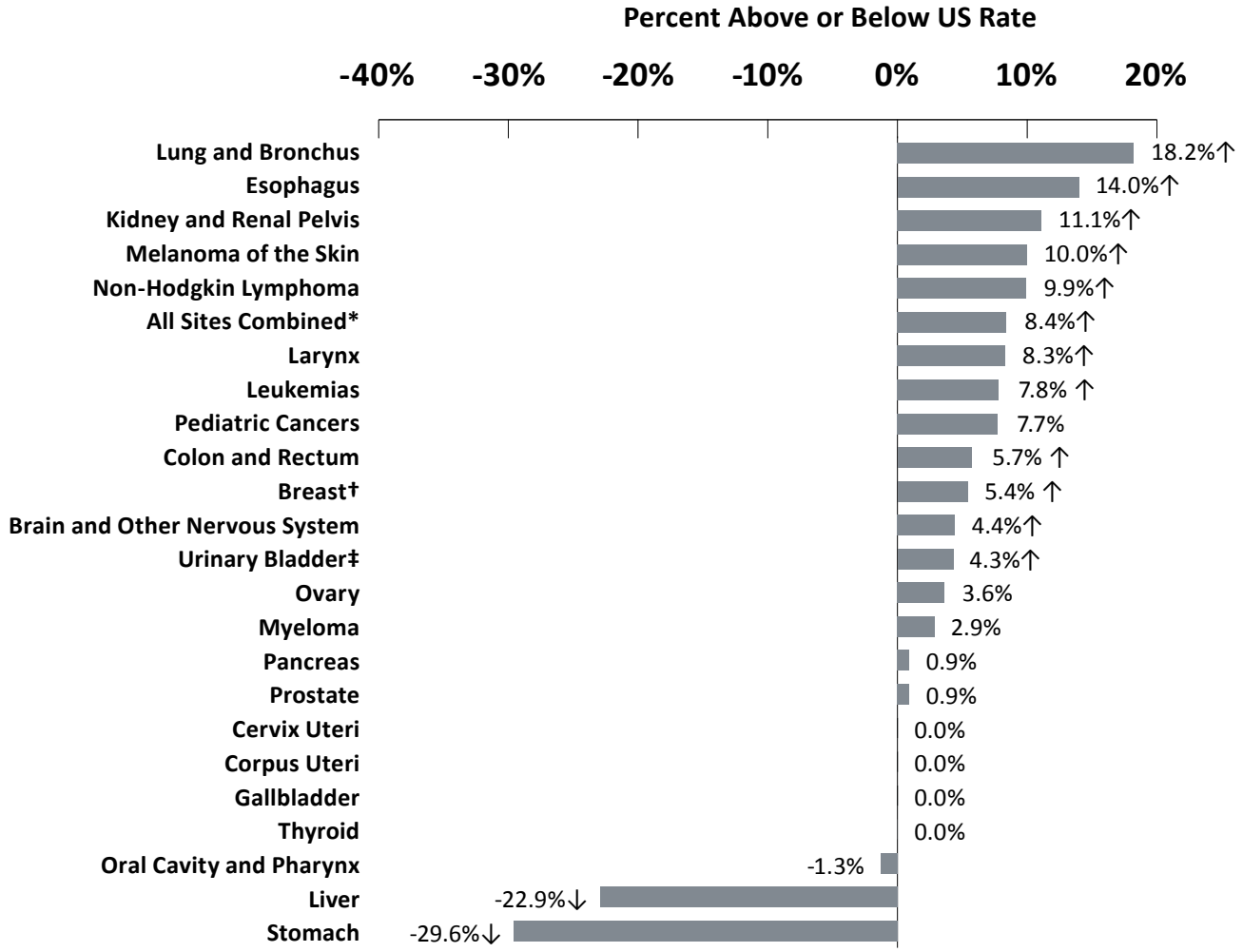
[1] American Cancer Society. *Family Cancer Syndromes*. [Online] June 2014. Accessed at www.cancer.org/cancer/cancercauses/geneticsandcancer/heredity-and-cancer on December 9, 2014.

[2] American Cancer Society. *Cancer Facts & Figures 2014*. [Online] Atlanta, GA. 2014. Accessed at www.cancer.org/Research/CancerFactsFigures/index on December 9, 2014.

[3] Indiana Behavioral Risk Factor Surveillance System. Accessed at www.in.gov/isdh/25194.htm on December 9, 2014.

[4] Centers for Disease Control and Prevention. *Cervical*

Figure 6. How Do Indiana Cancer Mortality (Death) Rates Compare to US Rates?* (2006–2010)



** Age-adjusted*

† Female breast cancers only

‡ Urinary Bladder includes invasive and in situ.

Note: ↑↓ symbols denote whether Indiana's rate is significantly different than the US rate based on the 95% confidence interval overlap method (see Page 4 for description). ↑ = significantly higher; ↓ = significantly lower.

Source: United States Cancer Statistics: 1999–2010 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2013. Accessed at http://wonder.cdc.gov/cancer-v2010.html on Jul 14, 2014 3:56:43 PM

Cancer Fact Sheet. [Online] Revised Jul 2012. Accessed at www.cdc.gov/cancer/cervical/pdf/cervical_facts.pdf on December 9, 2014.

[5] American Cancer Society. *Infections that Lead to Cancer.* [Online] Sept 2014. Accessed at www.cancer.org/Cancer/CancerCauses/OtherCarcinogens/InfectiousAgents/InfectiousAgentsandCancer/infectious-agents-and-cancer-intro on December 9, 2014.

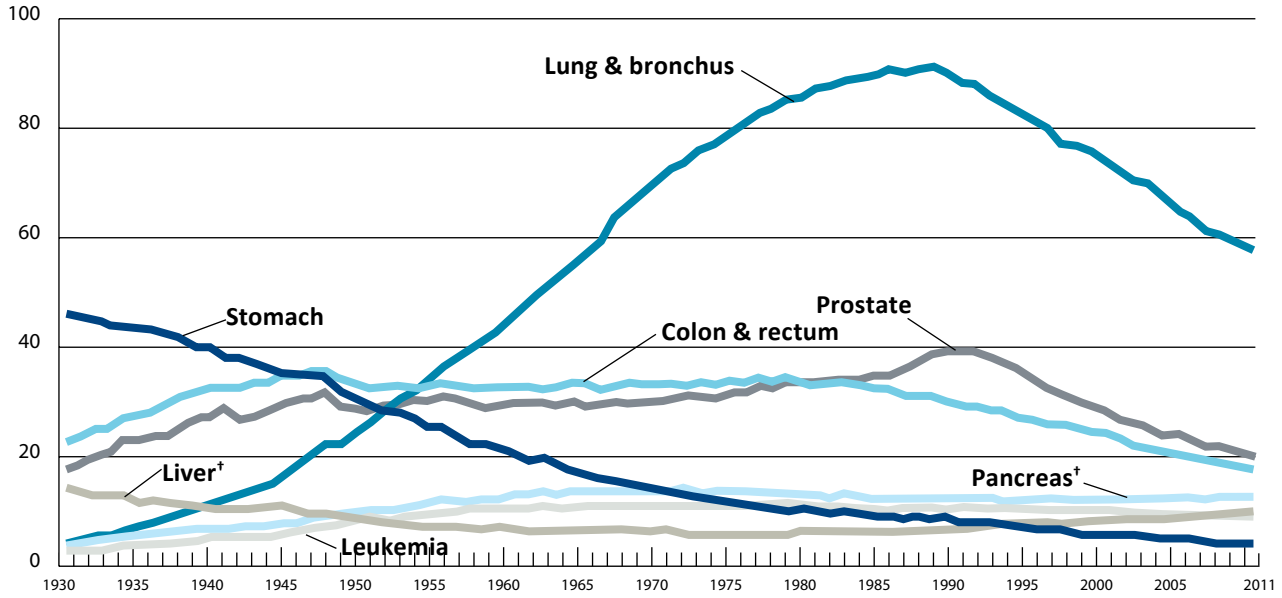
[6] US Department of Health and Human Services, Public Health Services, National Toxicology Program. *13th Report on Carcinogens 2014.* Accessed at http://ntp.niehs.nih.gov/pubhealth/roc/roc13/index.html on December 9, 2014.

[7] Howlader N, Noone AM, Krapcho M, Garshell J, Miller D, Altekruse SF, Kosary CL, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2011, National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/csr/1975_2011/, based on November 2013 SEER data submission, posted to the SEER web site, April 2014.

[8] DeVol R, Bedroussian A. *An Unhealthy America: The Economic Burden of Chronic Disease.* Milken Institute. [Online] Oct 2007. Accessed at http://www.milkeninstitute.org/publications/view/321 on December 9, 2014.

[9] American Cancer Society. *Economic Impact of Cancer.* [Online] Aug 2011. Accessed at www.cancer.org/Cancer/CancerBasics/economic-impact-of-cancer on December 9, 2014.

Figure 7. Cancer Mortality (Death) Rates among Males by Site* — US, 1930–2011



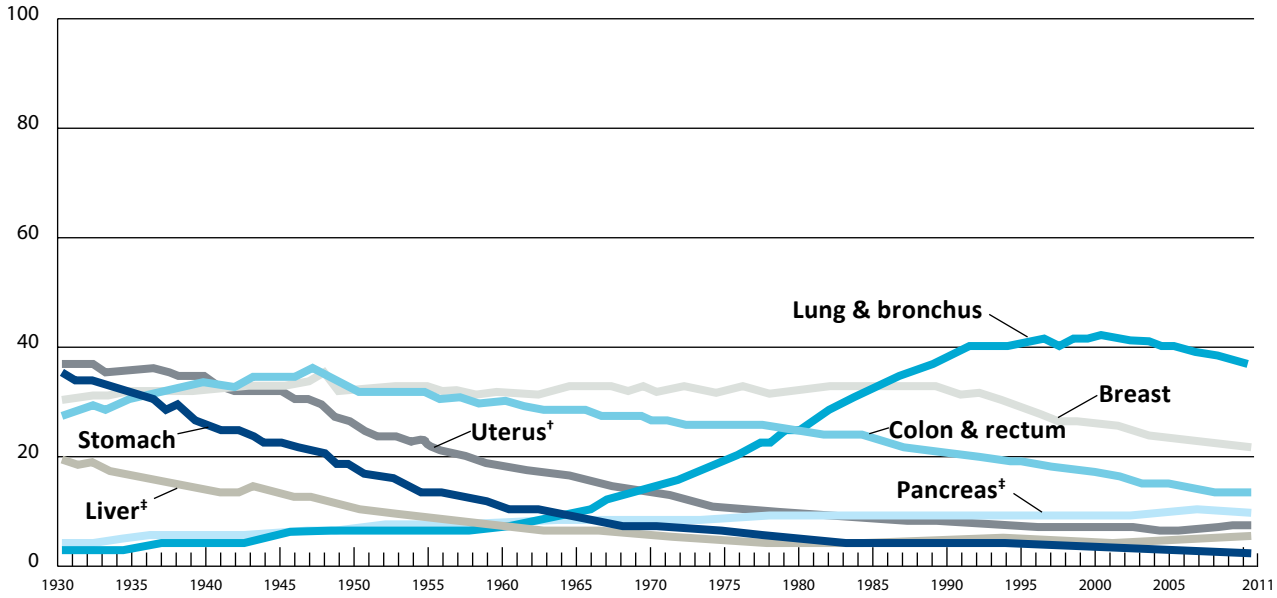
** Per 100,000 age adjusted to the 2000 US standard population.*

† Mortality rates for pancreatic and liver cancers are increasing.

Note: Due to changes in IDC coding, numerator information has changed over time. Rates for cancer of the liver, lung and bronchus, and colon and rectum are affected by these coding changes.

Source: US Mortality Volumes 1930 to 1959 and US Mortality Data 1960 to 2011, National Center for Health Statistics, Centers for Disease Control and Prevention. ©2015, American Cancer Society, Inc., Surveillance Research.

Figure 8. Cancer Mortality (Death) Rates among Females by Site* — US, 1930–2011



** Per 100,000 age adjusted to the 2000 US standard population.*

† Uterus refers to uterine cervix and uterine corpus combined.

‡ Mortality rates for pancreatic and liver cancers are increasing.

Note: Due to changes in IDC coding, numerator information has changed over time. Rates for cancer of the liver, lung and bronchus, and colon and rectum are affected by these coding changes.

Source: US Mortality Volumes 1930 to 1959 and US Mortality Data 1960 to 2011, National Center for Health Statistics, Centers for Disease Control and Prevention. ©2015, American Cancer Society, Inc., Surveillance Research.