

# Introduction Letter

Dear Hoosiers,

The Indiana Cancer Facts and Figures is the fifth iteration of our state's comprehensive report on the burden of cancer. This report provides timely and accurate data for the state of Indiana, covering a wide variety of current cancer issues and trends, including cancer incidence, mortality, and survival statistics as well as information on decreasing the risk of cancer, cancer symptoms, risk factors, early detection, treatment, and survivorship.

The Indiana Cancer Consortium (ICC) is proud to share the collaborative and committed efforts of our cancer community. The Indiana Cancer Facts and Figures Fifth Edition is a nearly 100 percent volunteer effort comprised of ICC members and partner organizations. This demonstrates the willingness and the passion that Hoosiers have to work together to improve and overcome our state's cancer burden. These efforts benefit all Indiana residents and serve as a rallying call to move forward together as a single cancer control alliance.

From the ICC, we thank the Indiana State Department of Health and the American Cancer Society for their organizational partnership in the development of this comprehensive report. We also thank all those who contributed time, resources, and expertise to establish this report as a leading tool for Indiana's cancer prevention and control efforts. Furthermore, we recognize the value of all those who will now take this report and act according to its findings.

Finally, to all Indiana residents, the ICC is committed to convening partners, identifying cancer burdens, and developing and implementing evidence-based interventions that will improve the health of all citizens of Indiana.

Sincerely,

**Paul Halverson, DrPH, FACHE**

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# Table of Contents

Introduction Letter	1
Acknowledgements	2
Collaborating to Conquer Cancer	3
Understanding Cancer Data	5
Common Questions about Cancer	8
Breast Cancer	33
Cervical Cancer	40
Childhood Cancer	46
Colon and Rectum (Colorectal) Cancer	52
Head and Neck Cancer	60
Liver Cancer	66
Lung Cancer	76
Melanoma/ Skin Cancer	83
Prostate Cancer	90
Cancer Facts and Figures for African-Americans	98
Cancer Facts and Figures for Hispanics	106
Survivorship	113
Recommended Cancer Screening Guidelines	118

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# Collaborating to Conquer Cancer

The Comprehensive Cancer Control National Partnership is a movement of states, tribes, territories, US Pacific Island jurisdictions, and local communities working together to reduce the burden of cancer for all people. In the Hoosier state, the Indiana Cancer Consortium (ICC) serves as that comprehensive cancer control vehicle, responsible for developing, implementing, and evaluating a statewide cancer control plan, which addresses cancer from prevention through end of life.

Collaborating to Conquer Cancer is the underlying philosophy, vision, and model that directs the ICC, as well as our partners across the nation. In Indiana, we are proud to say that Collaborating to Conquer Cancer represents the more than 300 organizational and individual members of the ICC who work to bring together Indiana's cancer community, identify disease challenges facing both state and local communities, and develop evidence-based solutions that make a difference.

The ICC membership plans, contributes, and takes advantage of a full range of free services including professional trainings, educational publications, mini-grants, and guidance. By listening to our partners, public health and medical experts, and other interested Hoosiers, we continually evolve to better address the gaps in cancer prevention and control across the state. The larger our coalition grows, the bigger impact we have. Individuals and organizations can join for free at [IndianaCancer.org](http://IndianaCancer.org).

## The Plan

The collaborative process is best understood through the development and implementation of Indiana's current cancer control plan; our roadmap to coordinate cancer control efforts. The Indiana Cancer Control Plan 2018-2020 is comprised of four focus areas: primary prevention, early detection, treatment, and survivorship. Within these four areas, experts in the fields of public health, cancer research, and treatment identified the most important activities that, when implemented, can reduce cancer in Indiana. Day by day, as more partners engage in strategies from this plan, extraordinary accomplishments are made. This is the power of our unique cancer control alliance. Together we are stronger than cancer.

## Key Activities

- Lead the development, implementation, and evaluation of a comprehensive plan to reduce cancer morbidity and mortality in Indiana.
- Recognize excellence in cancer prevention and control.
- Provide guidance on current issues in cancer policy, research, detection, treatment, and survivorship.
- Convene a multi-sectored and diverse membership to discuss cancer-related challenges facing Indiana.
- Strengthen communication, resource sharing, and collaboration to reduce duplication and inefficiency.
- Educate Indiana's public health and health care workforce to implement evidence-based strategies.
- Advocate for strong policy, systems, and environmental changes that decrease cancer risk factors.
- Increase dedicated funding for cancer prevention and control in Indiana.

## Indiana Cancer Facts and Figures Fifth Edition

The Indiana Cancer Facts and Figures Fifth Edition includes timely cancer information and identifies current cancer trends and their potential impact on Indiana residents. This report significantly helps the ICC measure Indiana's progress toward meeting the goals and objectives outlined in the Indiana Cancer Control Plan 2018-2020. This publication is an exemplary application of collaboration in public health. We hope that the sharing of knowledge, resources, and expertise among the many participating organizations that have contributed to the production of this tool will inspire organizations across the state to tackle the cancer burden together.



## 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.

It is important to understand that public-facing cancer data regarding cancer incidence and mortality reflect a two year time-period prior to the current year. This is due to the amount of time required for data collection, consolidation, and quality control at the state and national levels and assures that the cancer data made available from the Indiana State Cancer Registry (ISCR) reflects the most accurate information available regarding the burden of cancer in Indiana and the nation.

The ISCR exercises the highest standard of data collection, consolidation, and quality control in its practices, which both reflect the national standard used throughout the United States and meet the legislative requirements of state law 410 Indiana Administrative Code 21-1-4.

In order to enhance research endeavors, Indiana releases real-time cancer data for approved research studies.

### Incidence (New cases)

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 ISCR. To ensure case completion, according to state law, cancer cases are reported to the ISCR within six months of diagnosis or first encounter. All data must be verified as correct and complete prior to publication; therefore, the most current data available for this report were from 2015. Visit [www.in.gov/isdh/24360.htm](http://www.in.gov/isdh/24360.htm) to see more up-to-date data.

### Mortality (Deaths)

Annual mortality is the number of deaths during a calendar year among those who had a diagnosis of cancer. The death and diagnosis might not occur in the same year. Average annual mortality is the average number of deaths during a specified number of years. Indiana resident mortality data in this report, unless otherwise noted, are from the ISCR, which obtains annual death certificate record information from the Indiana State Department of Health Vital Records Department. Data from 2015 were the most current mortality data available for this report. Visit [www.in.gov/isdh/24360.htm](http://www.in.gov/isdh/24360.htm) to see more up-to-date data.

### Cancer Rates

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 12 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](http://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 aged 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.

## Statistical Significance

When comparing two cancer incidence or mortality rates, either between two counties or between men and women, it is often of interest to determine if the difference in rates is statistically significant. This means that the difference between two rates is unlikely to be the result of chance alone. Statistically significant differences in cancer rates between one county compared to another, or in one group compared to another, can help identify potentially modifiable risk factors for cancer such as health equity disparities, geographic or cultural factors, or challenges in access to care. The term "statistical significance" refers only to the process and results of the statistical calculations and in no way implies any judgment about the importance or significance of cancer.

## Other Common Terms Used and Groups Referenced in this Report

**Adults:** People aged 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 non-governmental health organization dedicated to eliminating cancer. Headquartered in Atlanta, Georgia, the ACS supports six geographic regions with 250 regional offices. Additional information is available at [cancer.org](https://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):** A federal agency that conducts and supports health promotion, prevention, and preparedness activities in the United States (US), with the goal of improving overall public health. Additional information is available at [cdc.gov](https://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 used to predict an individual's survival with cancer.

**Lifetime risk of developing or dying from cancer:** The chance a person has, over the course of his or her lifetime (from birth to death), of being diagnosed with or dying from cancer.

**Malignant tumor:** Cancerous tumor that has the capability of invading neighboring tissues and may be capable of spreading to distant tissues.

**Metastasis:** Cancer that spreads to a different part of the body from where it started.

**Morbidity:** The rate of disease in a population during a specific period of time.

**Mortality:** The rate of death in a population during a specific period of time.

**National Center for Health Statistics (NCHS):** Housed at the CDC, the NCHS is the nation's principal health statistics agency. The organization compiles statistical information to guide actions and policies to improve public health. Additional information is available at [cdc.gov/nchs](https://www.cdc.gov/nchs).

**Prevalence:** The proportion of people with a certain disease or condition at a specific point in 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 [seer.cancer.gov](https://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 Pages 12-13 for additional information).

References are provided at the end of every section in this report, in order to provide readers with access to additional information.

## Common Questions about Cancer

### What is cancer?

Cancer is a group of diseases characterized by the 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 bloodstream or the lymphatic 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?

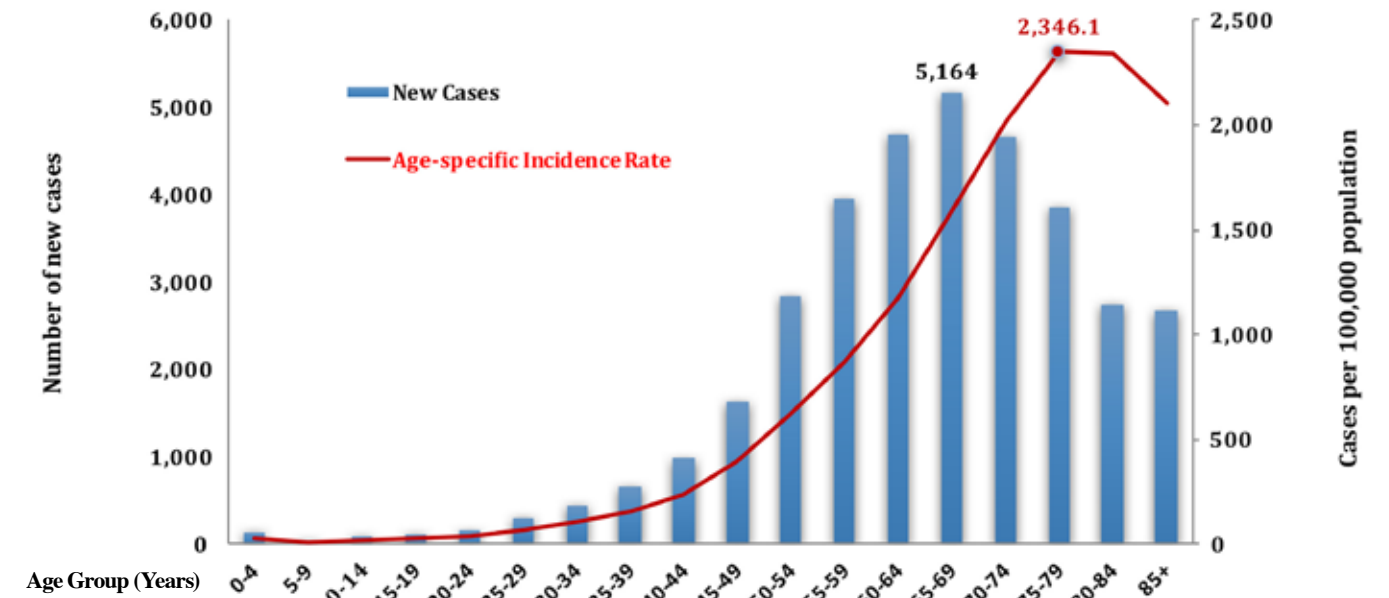
All cancers develop because of damage to or mutation of genes that control cell growth and division. These genetic changes can be caused by exposure to external factors, such as tobacco, poor diet, alcohol, chemicals, sunlight, radiation, or infectious organisms. They can also be caused by internal factors, such as inherited mutations, hormones, or immune conditions. Only about 5 to 10 percent of all cancers are the result of inherited gene mutations.<sup>1</sup>

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. Due to these factors, 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 2015, 71.4 percent of all cancers cases occurred among people aged 55–84 (34.5 percent among people aged 55–64, 39.2 percent among people aged 65–74, and 26.3 percent among people aged 75–84) [Figure 1].

Figure 1. Number and Rate of New Cancer Diagnoses among Residents—Indiana, 2015



Source: Indiana State Cancer Registry..

Individuals who have been exposed to certain external and internal risk factors have an increased risk of developing cancer. As an external example, male smokers are approximately 23 times more likely to develop lung cancer than people who have never smoked.<sup>2</sup> Smoking accounts for approximately 80 percent of all lung cancer deaths. Lung cancer is the leading cause of cancer death in both men and women.<sup>3</sup> As an internal example, 55 to 65 percent of women who inherited the BRCA-1 gene mutation will develop breast cancer by the age of 70.<sup>1</sup>

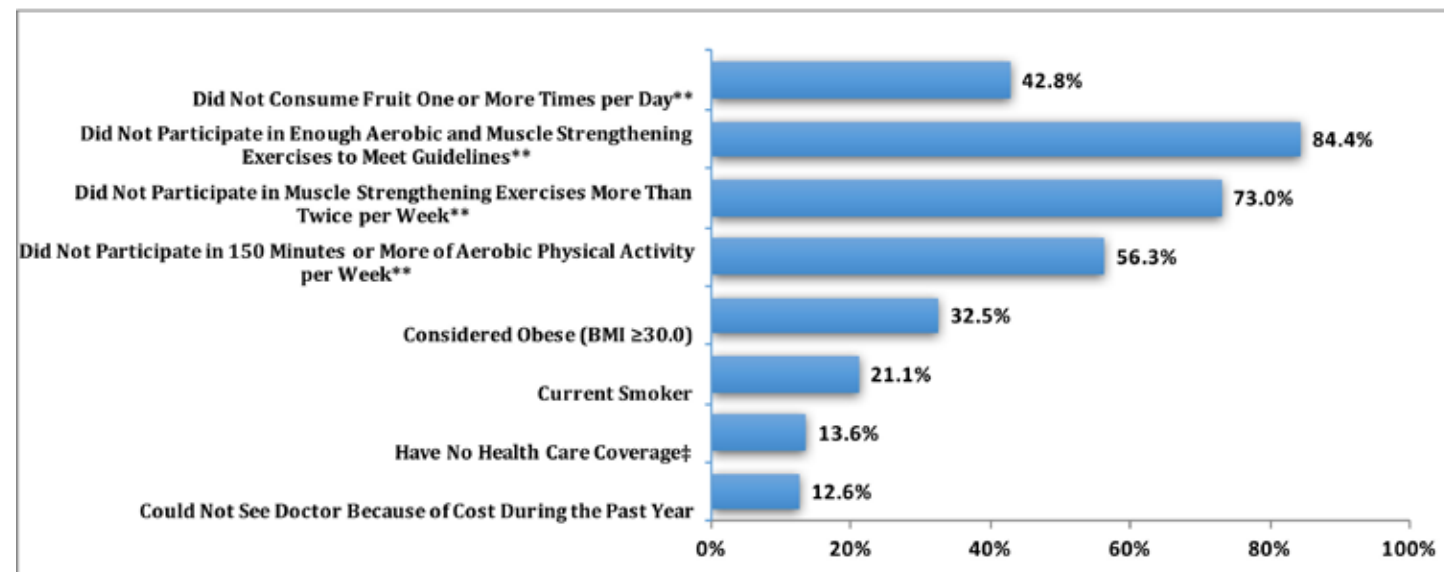


### Can cancer be prevented?

Many cancers can be prevented by modifying external risk factors and making lifestyle changes, such as eliminating tobacco use, improving dietary habits, increasing physical activity, maintaining a healthy weight, taking advantage of cancer preventative vaccinations, and avoiding excessive sun. Additionally, many cancers can be prevented or identified at an early stage if people receive regular medical care and obtain early detection cancer screenings. Screening recommendations specific to each section, as available, are included throughout this publication and are up-to-date as of the time of print.

Figure 2 describes the burden of some lifestyle and external factors among Indiana adults and Figure 3 describes cancer screening rates among Indiana adults.

**Figure 2. Cancer Risk Factors, Behaviors, and Access to Medical Cancer among Adults\* - Indiana, 2016**

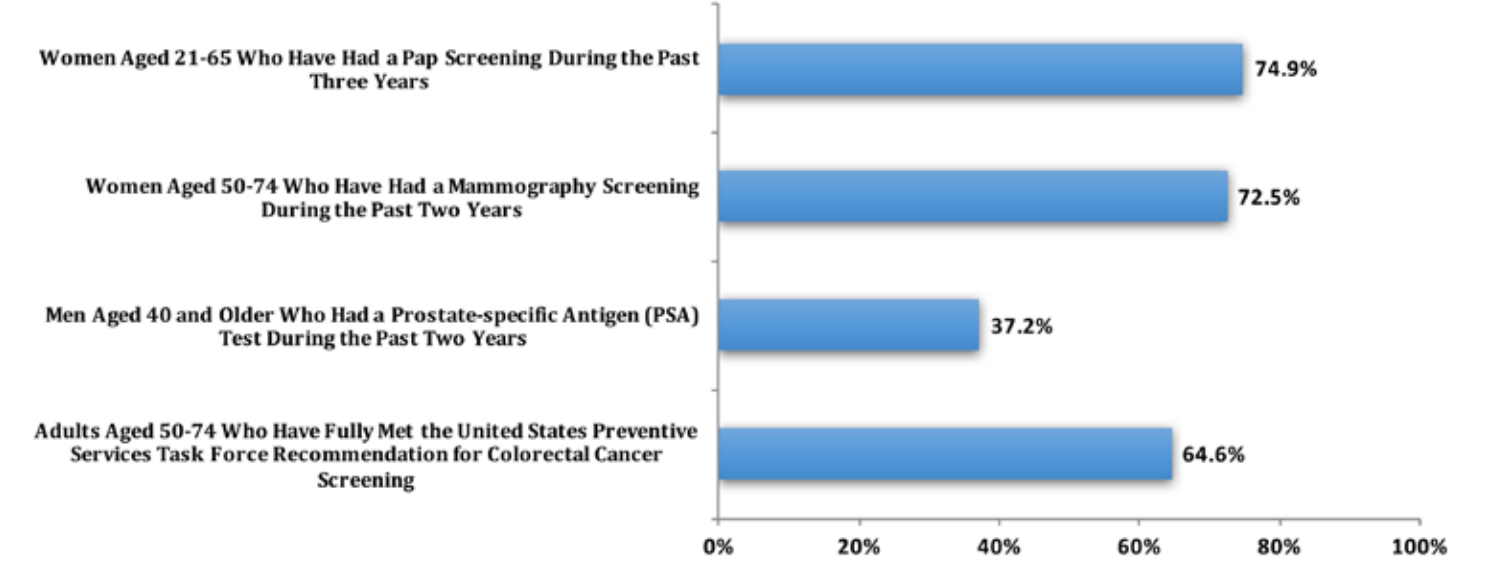


‡Adults aged 18–64

\*\*Data are from 2015

Source: Indiana Behavioral Risk Factor Surveillance System, 2016.

**Figure 3. Cancer Screening Rates—Indiana, 2016**



Source: Indiana Behavioral Risk Factor Surveillance System, 2016.

## Additional information about cancer risk factors include:

- **Tobacco.** The ACS estimates that 32 percent of all cancer deaths are caused by tobacco use.<sup>2</sup> Each of those deaths could have been prevented by not using tobacco products. During 2017, 21.8 percent of Indiana adults were current smokers.<sup>4</sup>
- **Body weight, diet, and physical activity.** According to the CDC, overweight and obesity are associated with 13 types of cancer, which make up approximately 40% of all diagnosed cancers.<sup>5</sup> During 2016, 32.5 percent of Indiana adults were considered obese.<sup>4</sup> Additionally, during 2016, 56.3 percent of Indiana adults did not get the recommended 150 minutes of exercise per week (recommendations available at [cdc.gov/physicalactivity/basics](http://cdc.gov/physicalactivity/basics)).<sup>4</sup> During 2016, 42.8 percent did not consume fruit one or more times per day and 26.7 percent did not consume vegetables one or more times per day.<sup>4</sup> Diets low in animal fat and high in fruits and vegetables could help prevent certain cancers.
- **Infection with Human Papillomavirus (HPV) and other infectious diseases.** HPV is the single greatest risk factor for cervical cancer.<sup>6</sup> The CDC estimates that 21,000 cancer cases each year could potentially be prevented through HPV vaccinations. In all, an estimated 15 to 20 percent of cancers worldwide are related to infectious exposures, such as the hepatitis B virus (HBV), HPV, human immunodeficiency virus (HIV), *Helicobacter pylori* bacteria, and others.<sup>7</sup> Many of these infections can be prevented through behavioral changes or the use of vaccines or antibiotics.<sup>7</sup>
- **Sun exposure.** Excessive exposure to ultraviolet radiation from the sun or other sources, such as 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 have found that exposure to sun lamps or sunbeds is classified as a known human carcinogen, the same classification as tobacco.<sup>8</sup>
- **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. According to the US Census Bureau, approximately 27.3 million Americans, 8.6 percent, were uninsured in 2016 — including 18 percent of Hispanics and 4.5 percent of children (18 years and younger).<sup>9</sup> For Indiana, in 2016, 8.1 percent of Indiana residents were uninsured, including 19.8 percent of Hispanics and 10.8 percent of Indiana residents aged 18 to 64 years of age were uninsured.<sup>4</sup>
- **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, prostate, rectum, skin, and testicular cancers.

### How is cancer staged?

A cancer's stage is based on the primary tumor 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. In a clinical setting, the TNM staging is most often used. In a population health setting, the summary staging system is used.

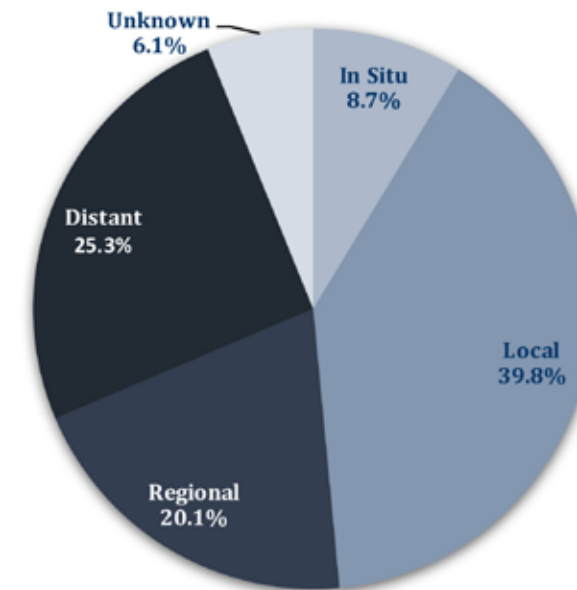
The TNM staging system assesses tumors in three ways: extent of the primary tumor (T), absence or presence of regional lymph node involvement (N), and absence or presence of distant metastases (M). Once the T, N, and M are determined, a stage is assigned. Stages are given numbers (I, II, III, IV) and 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, is used for population health reporting, and thus emphasized 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 lymphatic 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].

**Figure 4. Percent of Cancer Cases Diagnosed During Each Stage\*—Indiana, 2011–2015**



During 2011–2015, of the 179,189 Indiana residents who received an in situ or invasive cancer diagnosis, 86,911 (48.5%) were diagnosed in the in situ or local stage, 81,279 (45.4%) were diagnosed in the regional or distant stage, and 10,999 (6.1%) had unknown staging.

\*Includes all reportable *in situ* and invasive cancers  
Source: Indiana State Cancer Registry..



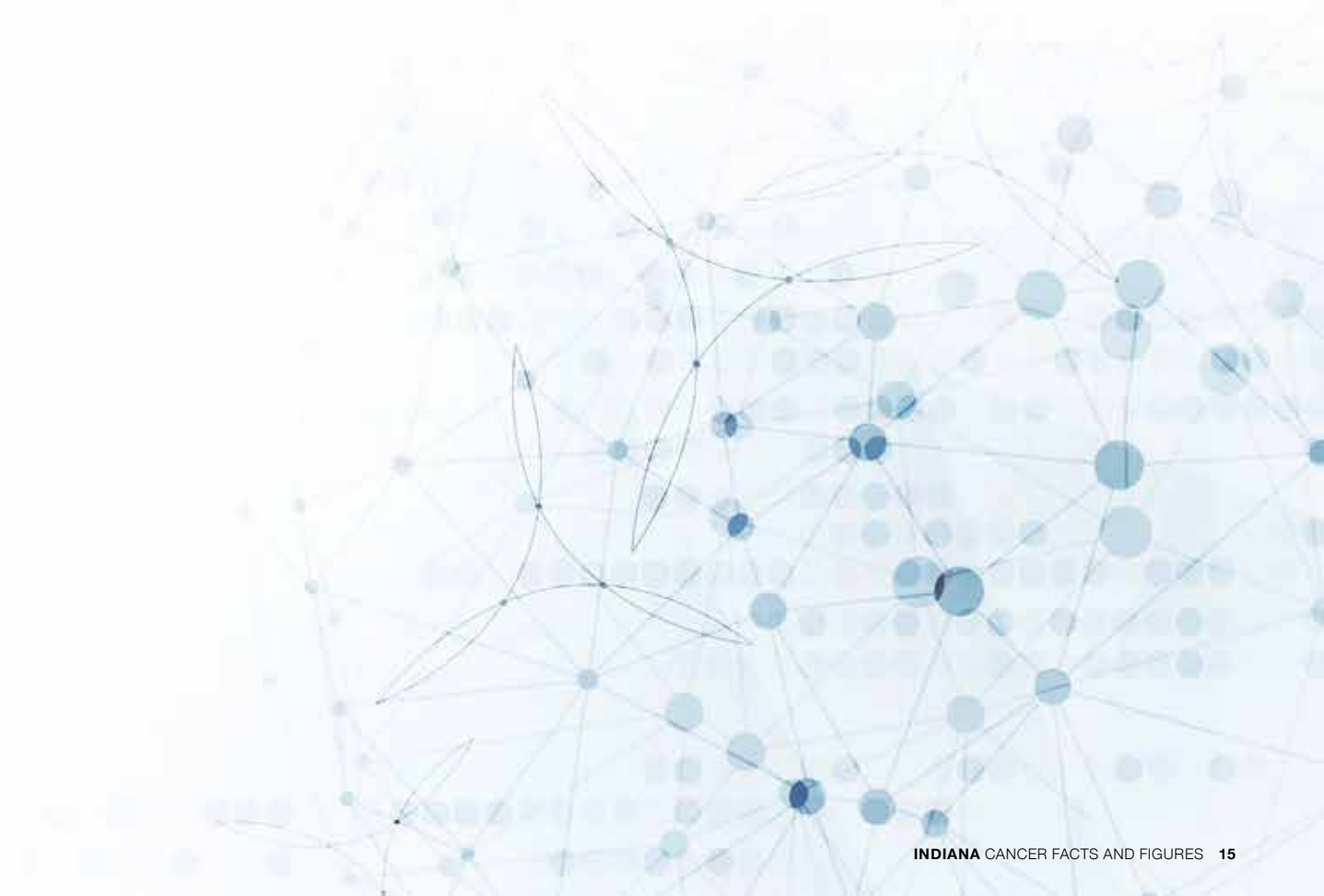
## How is cancer treated?

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.** Mostly used for localized tumors, this removes the tumor by removing the cancerous mass.
- **Chemotherapy.** Used with the intention of curing or inducing remission in cancers in early stages, this uses either intravenous or oral drugs to destroy cancer cells.
- **Hormone therapy.** This may be given to block the body's natural hormones and to slow or stop the growth of certain cancers.
- **Immunotherapy or biologic therapies.** These therapies are used to stimulate and strengthen a person's own immune system to destroy the cancer cells.
- **Radiation or radiotherapy.** Used with the intention of curing some cancers or to relieve symptoms associated with the disease, this uses high-energy rays to destroy or slow the growth of cancer cells.

## 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 person 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, such as pancreatic, eight to 10 years must pass before the person is considered cured.





## What are the most common cancers?

Indiana mirrors the nation when it comes to the top four most common cancers. 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].

**Table 1. Leading Sites of New Cancer Cases and Deaths among Indiana Residents by Sex, 2015**  
Number (%) of New Cases

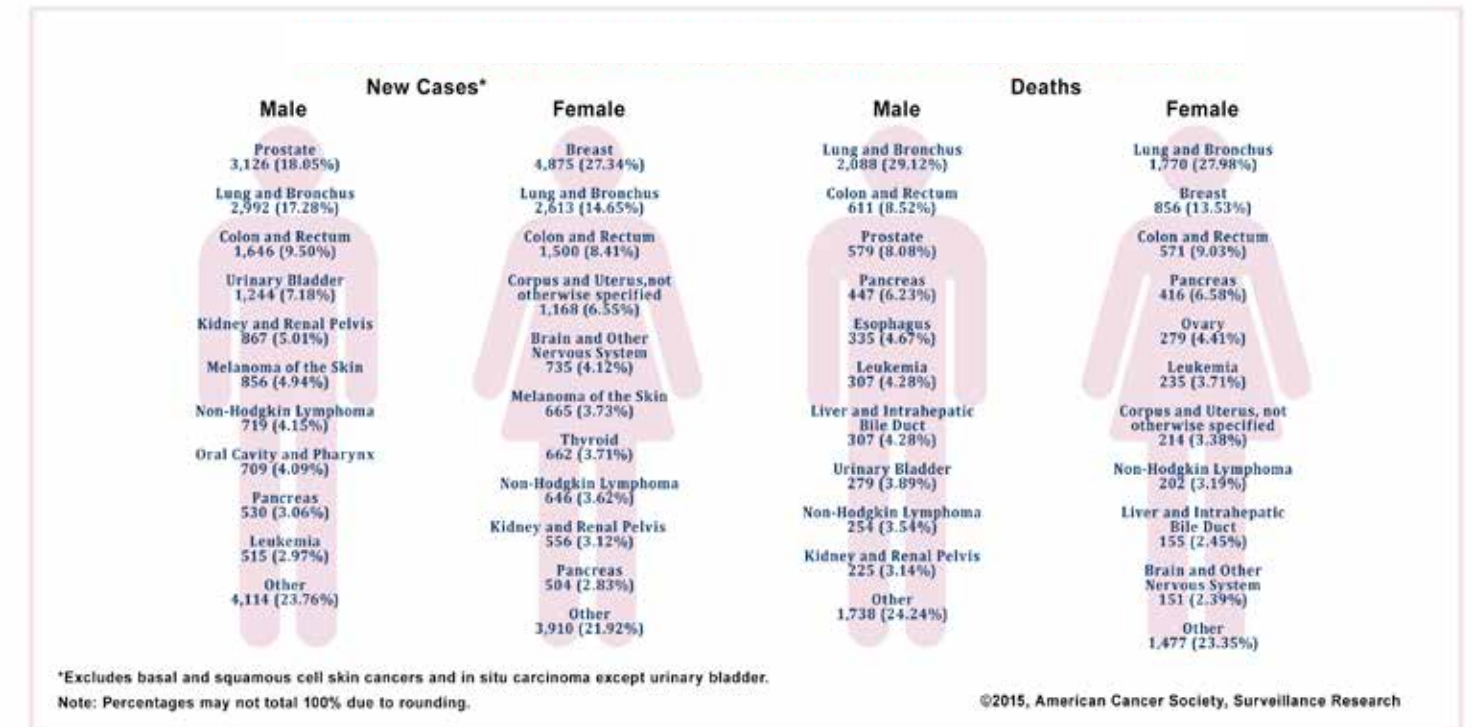
Males			Females		
Prostate	3,126	18.05%	Breast	4,875	27.34%
Lung and Bronchus	2,992	17.28%	Lung and Bronchus	2,613	14.65%
Colon and Rectum	1,646	9.50%	Colon and Rectum	1,500	8.41%
Urinary Bladder	1,244	7.18%	Corpus and Uterus, not otherwise specified	1,168	6.55%
Kidney and Renal Pelvis	867	5.01%	Brain and Other Nervous System	735	4.12%
Melanoma of the Skin	856	4.94%	Melanoma of the Skin	665	3.73%
Non-Hodgkin Lymphoma	719	4.15%	Thyroid	662	3.71%
Oral Cavity and Pharynx	709	4.09%	Non-Hodgkin Lymphoma	646	3.62%
Pancreas	530	3.06%	Kidney and Renal Pelvis	556	3.12%
Leukemia	515	2.97%	Pancreas	504	2.83%
Other	4,114	23.76%	Other	3,910	21.92%
<b>All Sites</b>	<b>17,318</b>		<b>All Sites</b>	<b>17,834</b>	

### Number (%) of Deaths

Males			Females		
Lung and Bronchus	2,088	29.12%	Lung and Bronchus	1,770	27.98%
Colon and Rectum	611	8.52%	Breast	856	13.53%
Prostate	579	8.08%	Colon and Rectum	571	9.03%
Pancreas	447	6.23%	Pancreas	416	6.58%
Esophagus	335	4.67%	Ovary	279	4.41%
Leukemia	307	4.28%	Leukemia	235	3.71%
Liver and Intrahepatic Bile Duct	307	4.28%	Corpus and Uterus, not otherwise specified	214	3.38%
Urinary Bladder	279	3.89%	Non-Hodgkin Lymphoma	202	3.19%
Non-Hodgkin Lymphoma	254	3.54%	Liver and Intrahepatic Bile Duct	155	2.45%
Kidney and Renal Pelvis	225	3.14%	Brain and Other Nervous System	151	2.39%
Other	1,738	24.24%	Other	1,477	23.35%
<b>All Sites</b>	<b>7,170</b>		<b>All Sites</b>	<b>6,326</b>	

Source: Indiana State Cancer Registry..

**Figure 5. Leading Sites of New Cancer Cases and Deaths among Indiana Residents, 2015**



Source: Indiana State Cancer Registry..

### How many people alive today will get cancer?

About 2.4 million Hoosiers, or approximately two in five people now living in Indiana, will eventually develop cancer. Nationally, four in 10 men will develop cancer in their lifetime; while 3.8 in 10 women will develop cancer in their lifetime.<sup>2</sup>

### How many people alive today have ever had cancer?

The ACS estimated that approximately 15.5 million Americans with a history of cancer were alive on January 1, 2016.<sup>2</sup> 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 37,250 Indiana residents will be diagnosed with cancer in 2018, amounting to more than four new cases of cancer diagnosed every hour of every day.<sup>2</sup> Nationally, an estimated 1.7 million new cancer cases were expected in 2018.<sup>2</sup> 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?

Approximately 13,820 Indiana residents were expected to die of cancer in 2018, which translates to approximately 38 people every day.<sup>2</sup> Cancer is the second leading cause of death in Indiana following heart disease. Among children aged five to 14 years, cancer is the second leading cause of death following accidental injury.

## Additional information about cancer risk factors include:

### How many people today survive cancer?

Using data from the SEER registry, the five-year survival rate from 1975 to 2012 from the 18 SEER geographic areas was 66 percent.<sup>10</sup> 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.<sup>11</sup> The Milken Institute estimated that, should current trends continue, Indiana residents would spend \$2.76 billion on direct costs for cancer care in 2023.<sup>11</sup>

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

Indiana's age-adjusted cancer incidence rate during 2010 to 2014 was 452.2 per 100,000 people. This was higher than, but very similar to, the national rate of 451.7 per 100,000 people (less than 1 percent difference) [Table 2; Figure 6].

However, during the same period, Indiana's age-adjusted cancer mortality rate was almost 10 percent higher than the national rate (183.2 versus 166.1 deaths per 100,000 people). This included being almost 12 percent higher among Indiana males (225.0 versus 200.5 deaths per 100,000 males) and about 8 percent higher among Indiana females (153.8 versus 141.5 deaths per 100,000 females) [Table 2; Figure 7].

Lung cancer had the largest differences between the Indiana and US incidence and mortality rates, as the incidence rate among Indiana residents was almost 16 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 2016, Indiana had the 10th highest adult smoking rate in the country at 21.1 percent.<sup>4</sup>

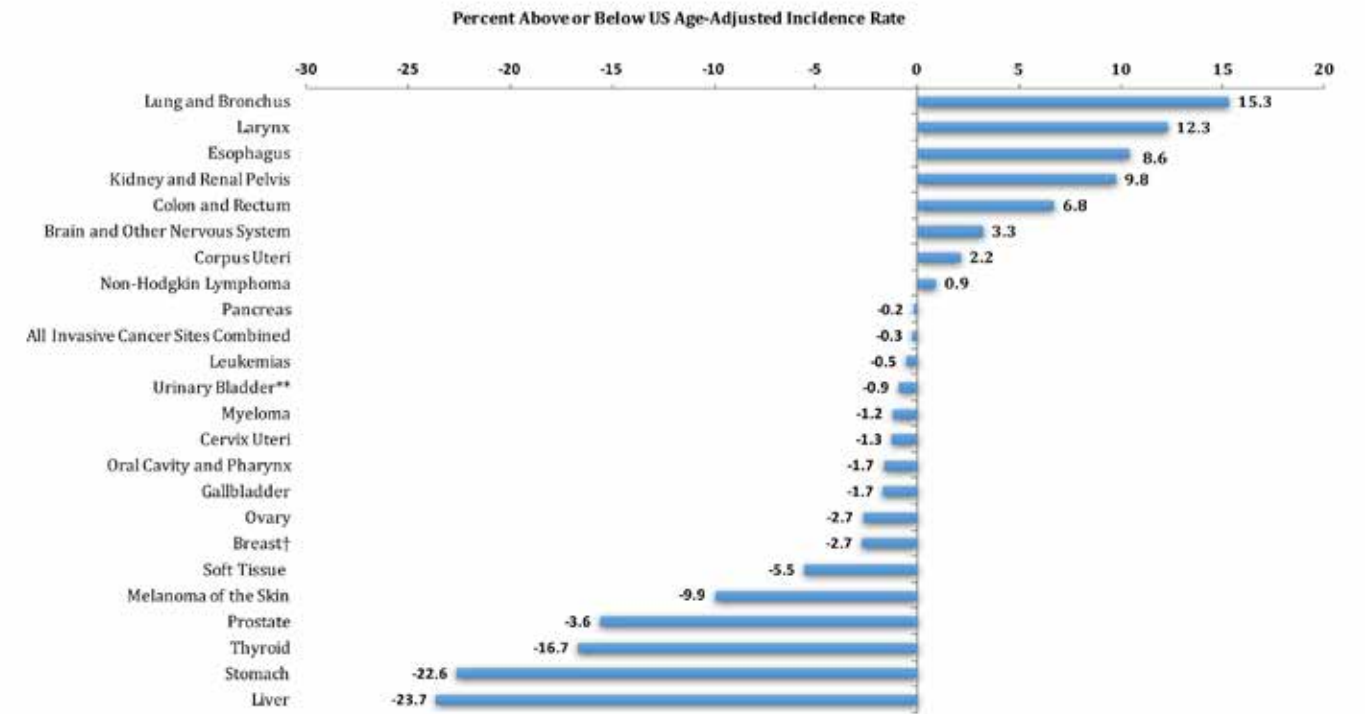
**Table 2. Cancer Incidence and Mortality (Death) Rate Comparisons between Indiana and the US, by Sex and Race, 2010-2014\***

	Incidence rate per 100,000 people (2010-2014)			Mortality rate per 100,000 people (2010-2014)		
	Indiana	US	Difference (%)	Indiana	US	Difference(%)
<b>Total</b>	452.2	451.7	0.1%	183.2	166.1	9.8%
<b>Males</b>	494.4	448.2	9.8%	225.0	200.5	11.5%
<b>Females</b>	452.5	501.1	10.2%	153.8	141.5	8.3%
<b>Whites</b>	464.4	468.5	0.9%	182.2	166.2	9.2%
<b>African-Americans</b>	479.2	477.3	0.4%	217.1	194.2	11.1%

\*Age-adjusted to the US 2000 Standard Population.

Source: United States Cancer Statistics: 1999 - 2014 Mortality, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention; 2016. Accessed at <http://wonder.cdc.gov/CancerMort-v2014.html> on March 2, 2018.

**Figure 6. How Do Indiana Cancer Incidence Rates Compare to US Rates?\* (1999–2014)**



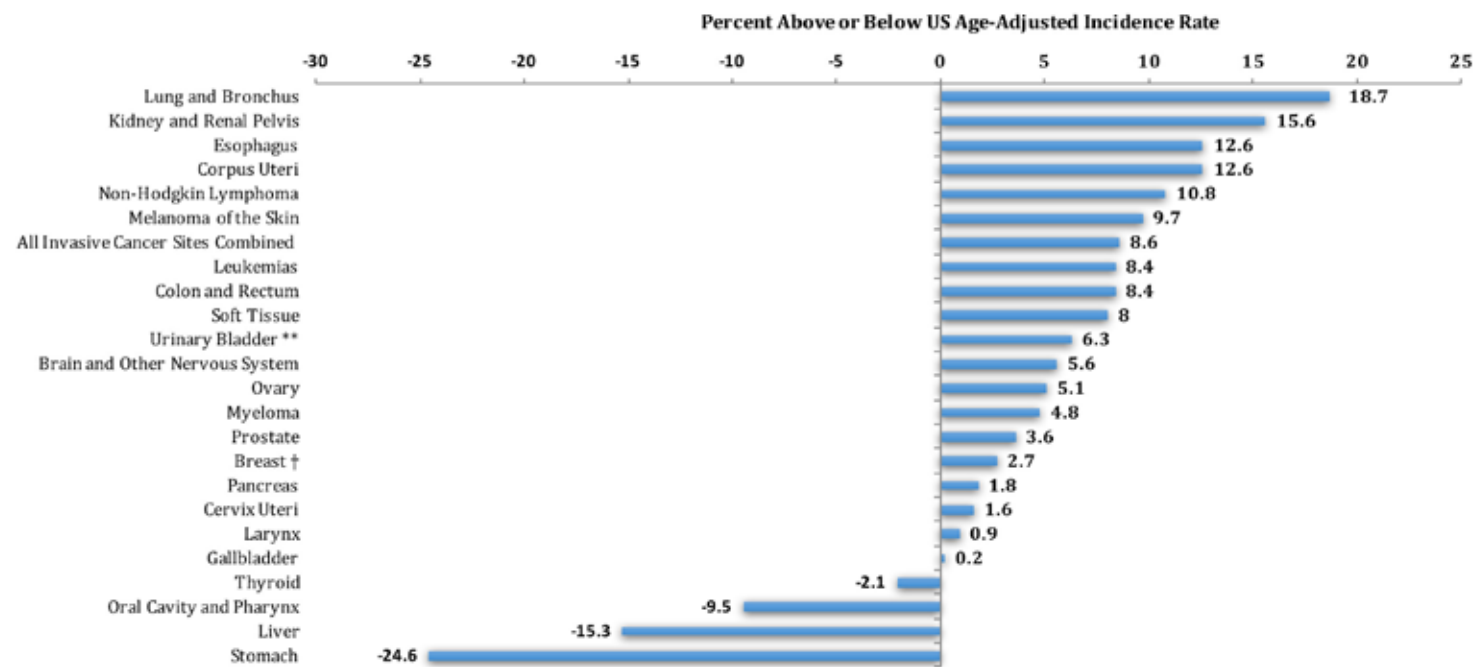
\*Age-adjusted to the US 2000 Standard Population.

\*\* Urinary Bladder includes invasive and *in situ*.

†Female breast cancers only.

Source: Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2016. Accessed at <http://wonder.cdc.gov/cancer-v2014.html> on January 29, 2018.

Figure 7. How Do Indiana Cancer Mortality (Death) Rates Compare to US Rates?\* (1999–2014)



\*Age-adjusted to the US 2000 Standard Population.

\*\*Urinary Bladder includes invasive and *in situ*.

†Female breast cancers only.

Source: Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2016. Accessed at <http://wonder.cdc.gov/cancer-v2014.html> on January 29, 2018.

### 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 8 and 9]. 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 2006 to 2015, the age-adjusted incidence rates for all cancers combined decreased 7.4 percent from 502.3 to 465.0 cases per 100,000 people. Likewise, the age-adjusted mortality rates decreased 10.8 percent from 197.5 to 176.2 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 requires continued and increasingly targeted cancer control efforts.

Figure 8. Cancer Mortality (Death) Rates among Males by Site\*—US, 1930–2015

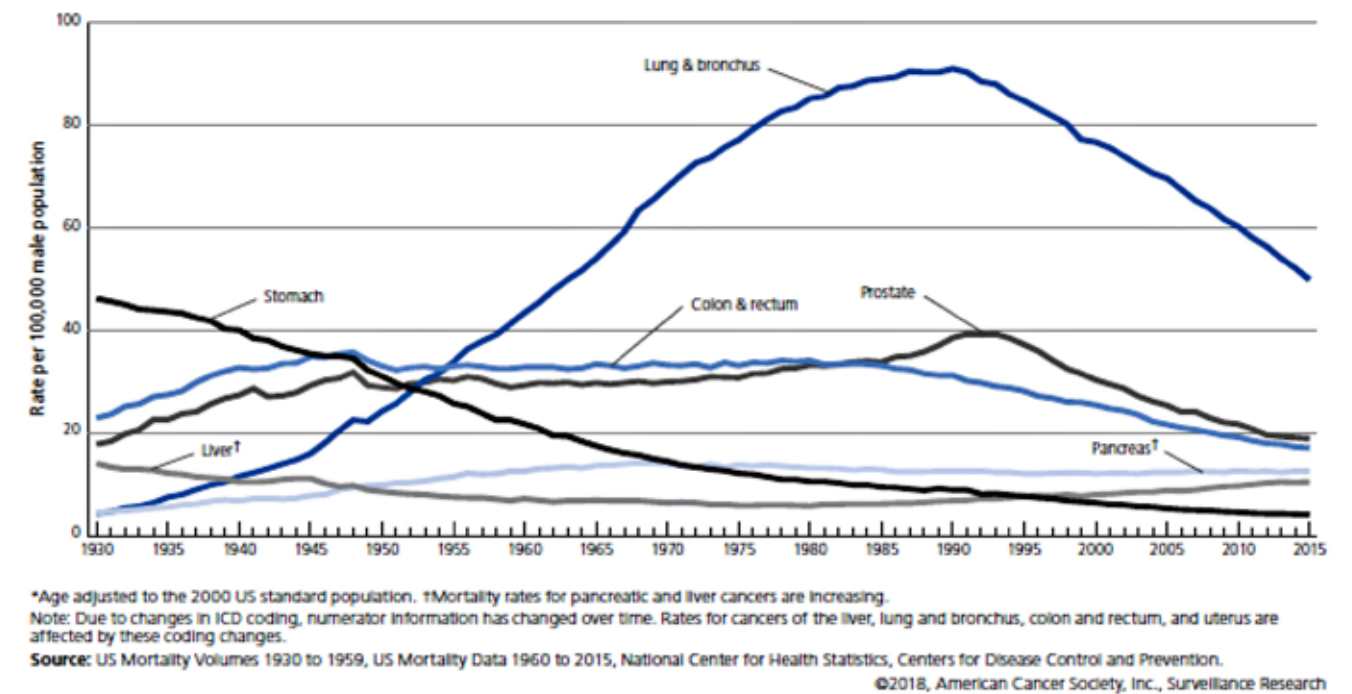
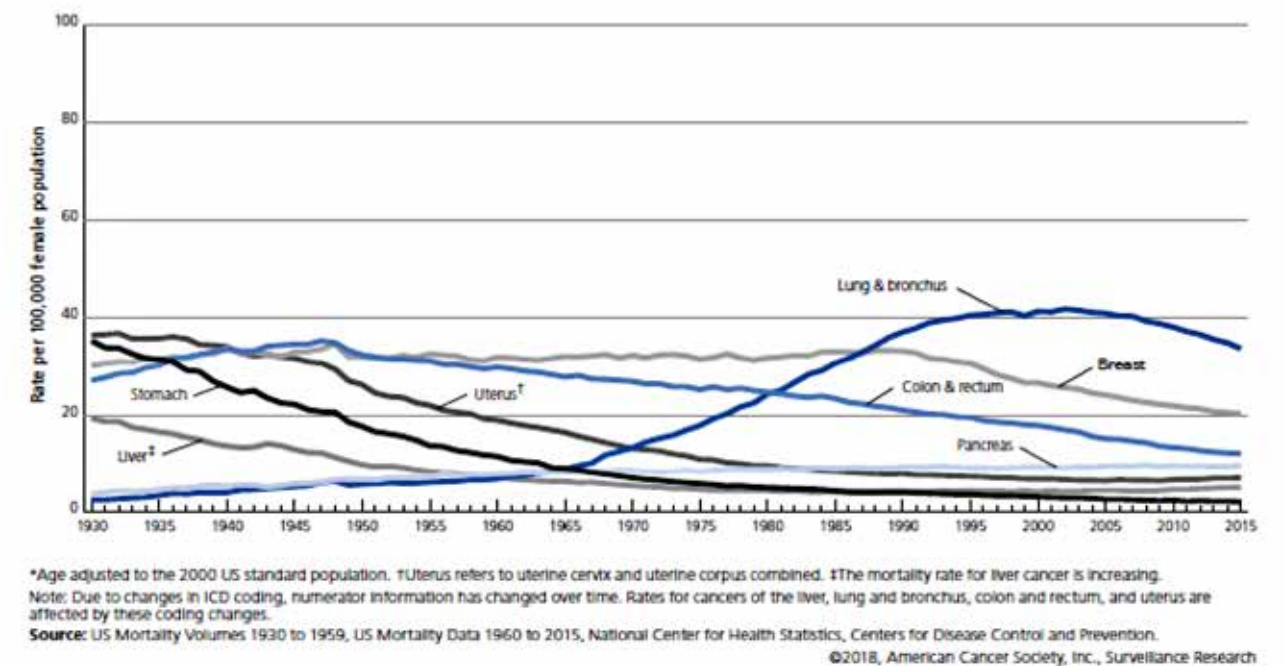


Figure 9. Cancer Mortality (Death) Rates among Females by Site\*—US, 1930–2015

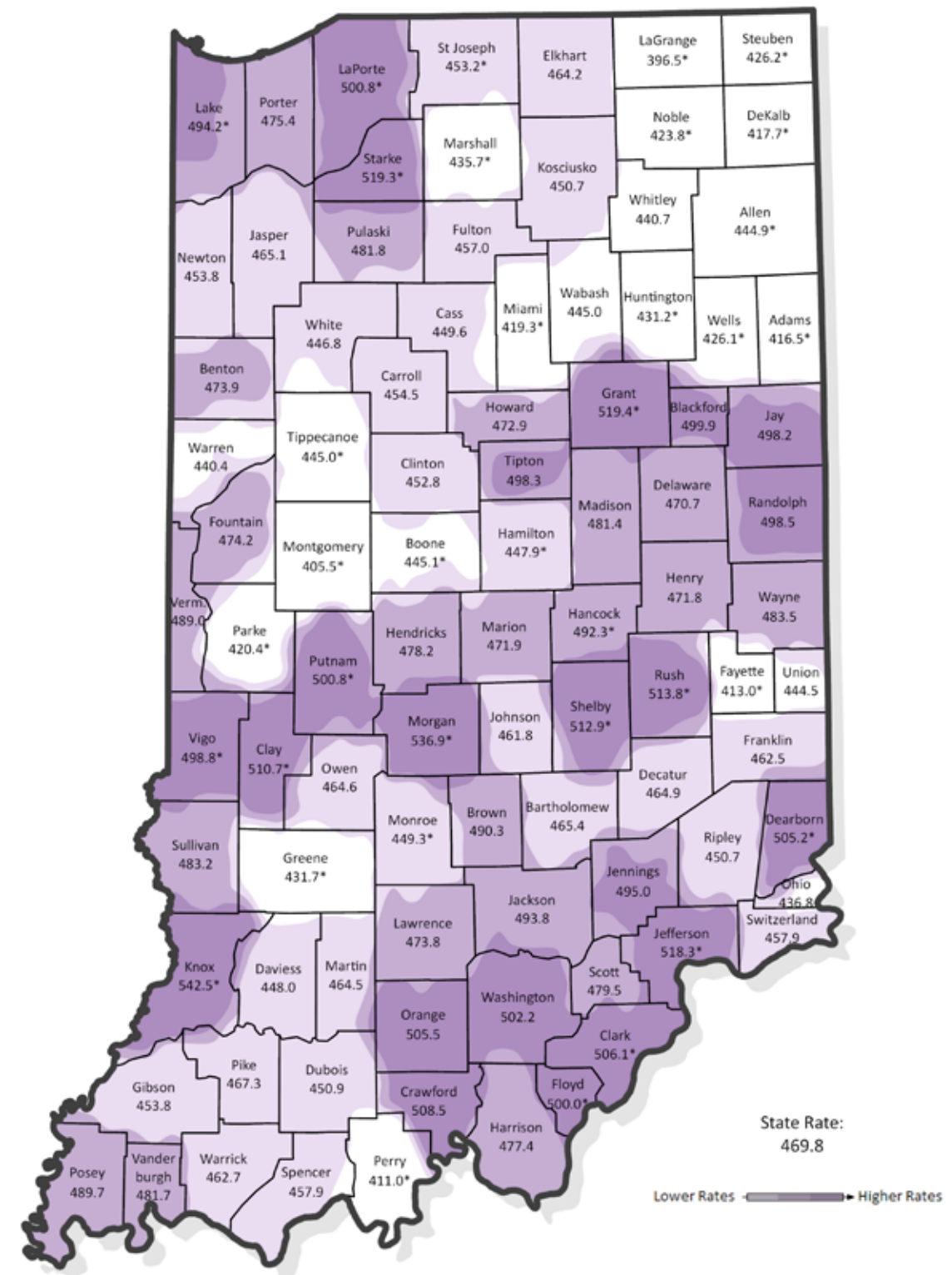








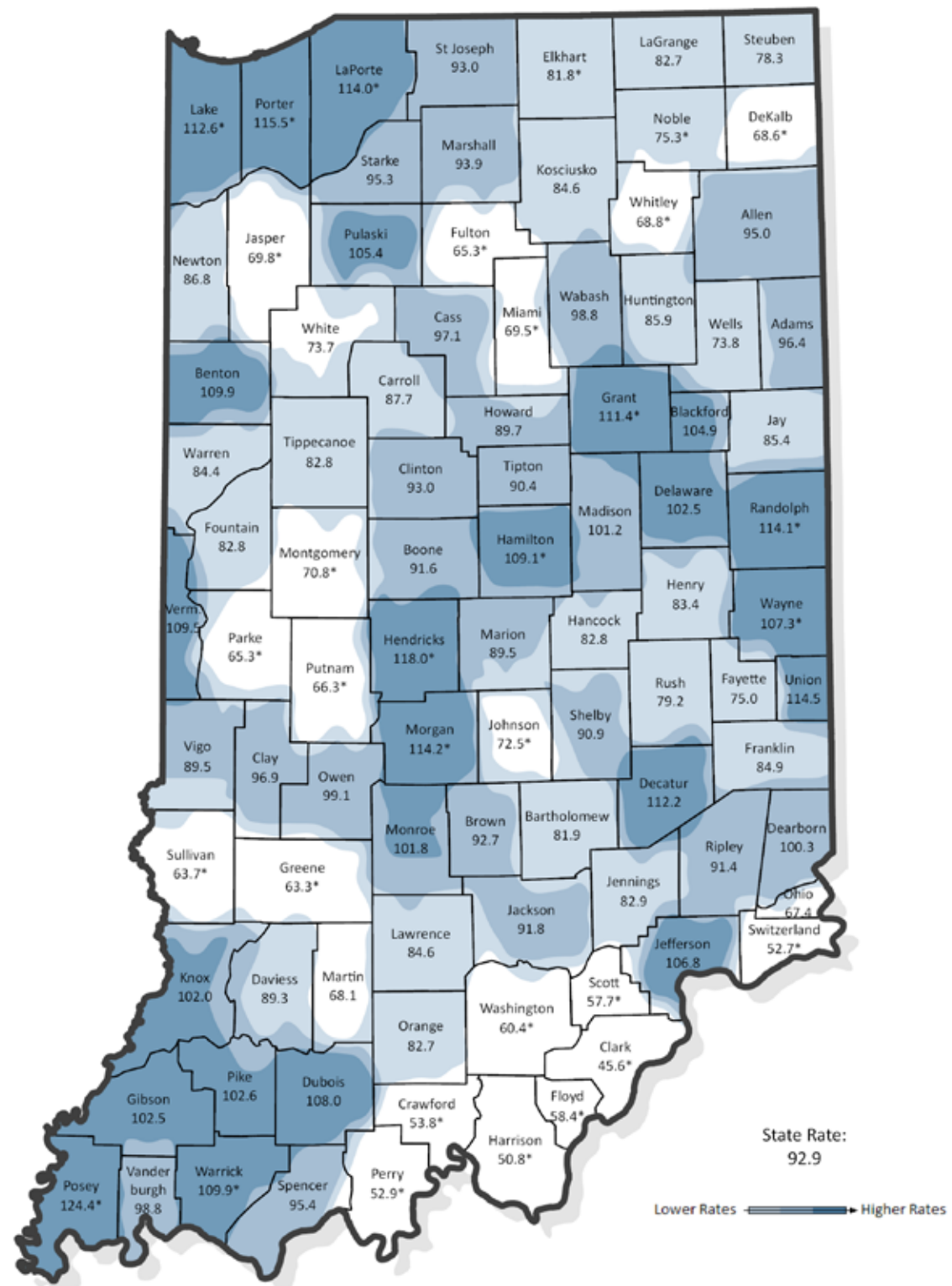
**Map 1. Incidence Rates for All Cancers Combined by County – Indiana, 2011-2015**



\*Significantly different (higher or lower) than the state rate (P < .05)  
 Technical Note: This map presents age-adjusted county incidence rates using a smoothed interpolated surface and is intended to provide a generalized depiction of rate variability throughout the state.

Source: Indiana State Cancer Registry

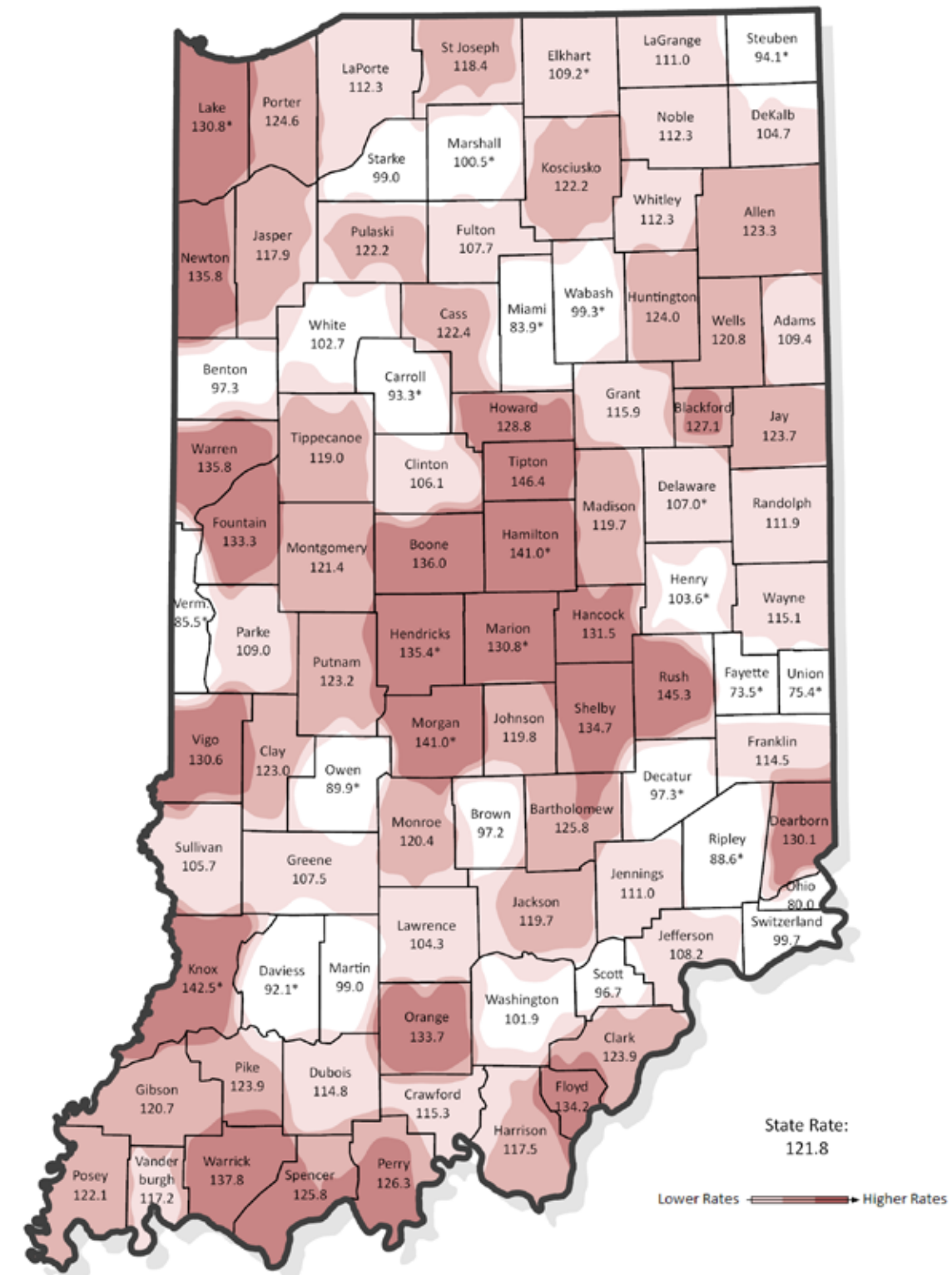
Map 2. Incidence Rates for Prostate Cancer by County – Indiana, 2011-2015



\*Significantly different (higher or lower) than the state rate ( $P < .05$ )  
 Technical Note: This map presents age-adjusted county incidence rates using a smoothed interpolated surface and is intended to provide a generalized depiction of rate variability throughout the state.

Source: Indiana State Cancer Registry

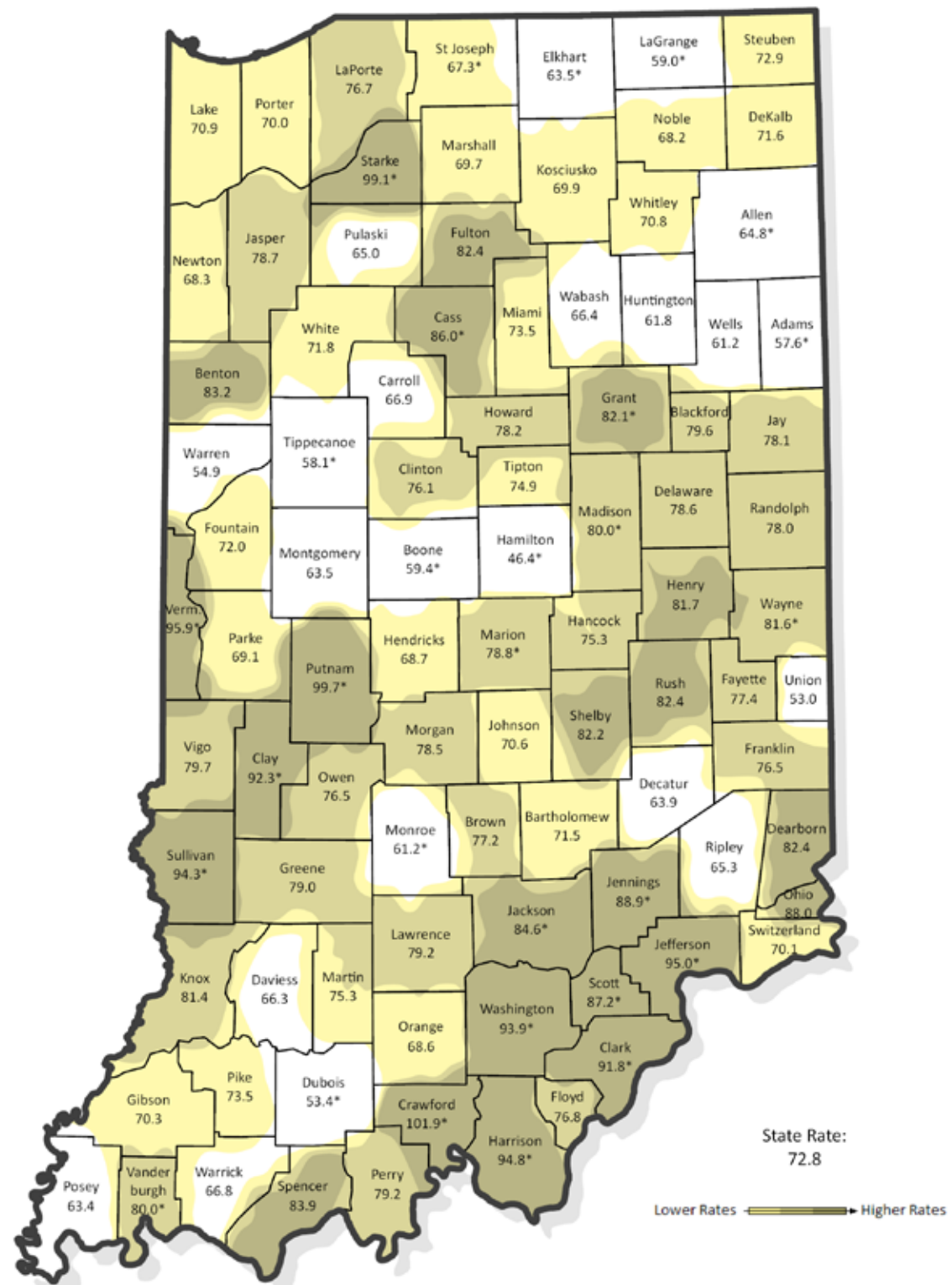
Map 3. Incidence Rates for Breast Cancer by County – Indiana, 2011-2015



\*Significantly different (higher or lower) than the state rate ( $P < .05$ )  
 Technical Note: This map presents age-adjusted county incidence rates using a smoothed interpolated surface and is intended to provide a generalized depiction of rate variability throughout the state.

Source: Indiana State Cancer Registry

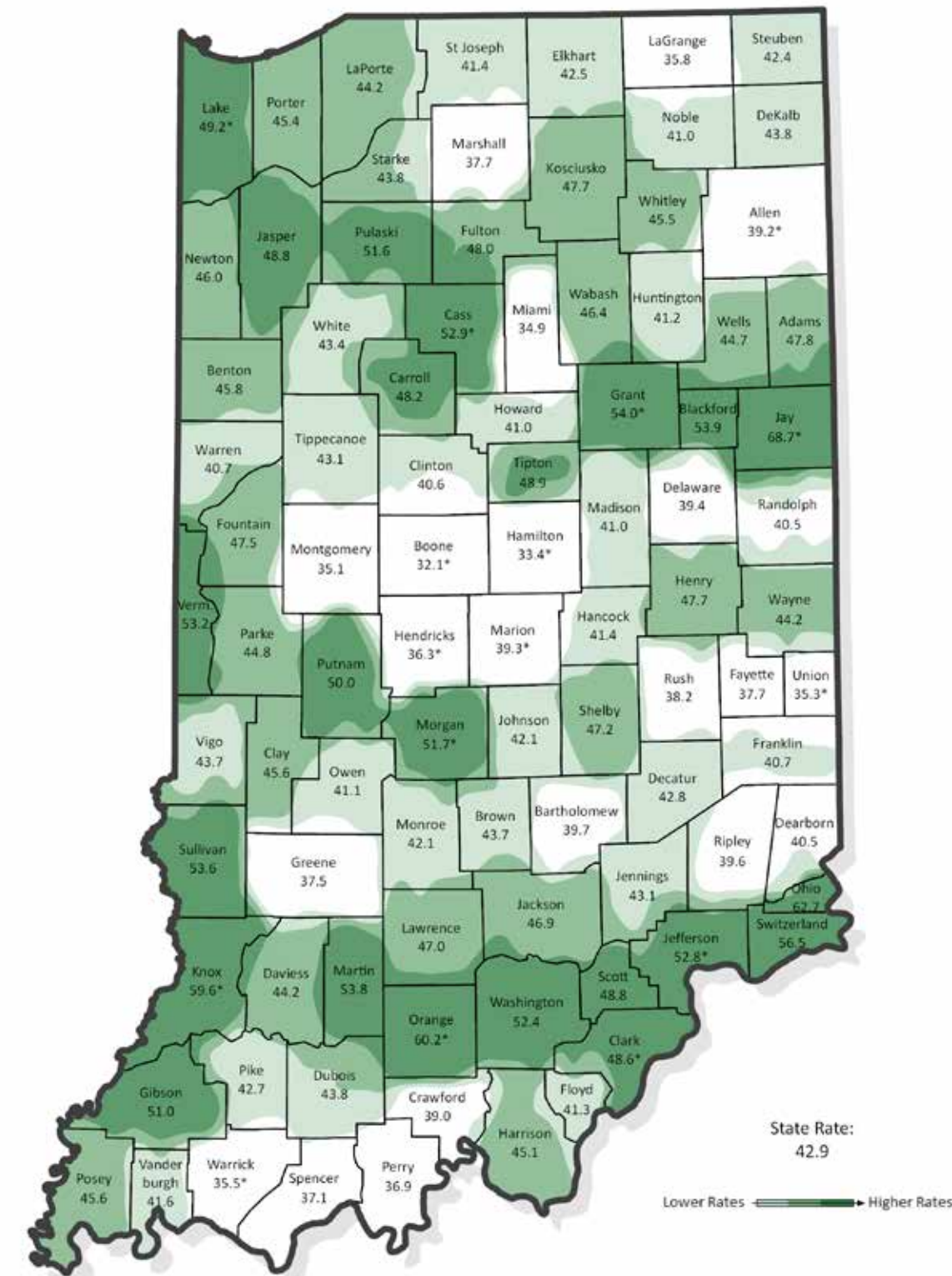
Map 4. Incidence Rates for Lung Cancer by County – Indiana, 2011-2015



\*Significantly different (higher or lower) than the state rate ( $P < .05$ )  
 Technical Note: This map presents age-adjusted county incidence rates using a smoothed interpolated surface and is intended to provide a generalized depiction of rate variability throughout the state.

Source: Indiana State Cancer Registry

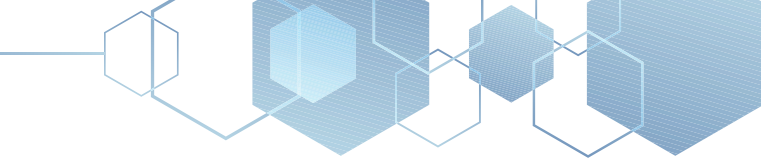
Map 5. Incidence Rates for Colon Cancer by County – Indiana, 2011-2015



\*Significantly different (higher or lower) than the state rate ( $P < .05$ )  
 Technical Note: This map presents age-adjusted county incidence rates using a smoothed interpolated surface and is intended to provide a generalized depiction of rate variability throughout the state.

Source: Indiana State Cancer Registry





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## Breast Cancer

### Bottom Line

Breast cancer is the second leading cause of cancer death and, excluding skin cancers, the most frequently diagnosed cancer among females in the US.<sup>1</sup> The lifetime risk of developing breast cancer among females is one in eight.<sup>1</sup> Breast cancer is typically diagnosed during a screening examination. An estimated 266,120 new cases of invasive breast cancer and 40,920 breast cancer-related deaths were expected to occur among females nationally in 2018.<sup>1</sup> At the state level, in 2018, an estimated 5,630 new cases of female breast cancer and 860 deaths were expected to occur.<sup>1</sup> At the state level, in 2018, an estimated 5,630 new cases of female breast cancer and 860 deaths are expected to occur.<sup>1</sup> White and African-American females have similar incidence rates; however, African-American females have higher mortality rates.<sup>2</sup> This may be, in part, because of late diagnosis, diagnosis in younger individuals, more aggressive breast cancers diagnosed in African-American women, and barriers to health care access.<sup>2</sup> Today, there are 3 million US females who are breast cancer survivors.<sup>1</sup> Females should have frequent conversations with their health care providers about their risks for breast cancer and how often they should be screened. Breast cancer is rare among males, as 2,550 cases were estimated to occur among US males in 2018.<sup>1</sup> However, because males are prone to ignoring warning signs, they are often diagnosed at later stages and have poorer prognoses. During 2018, it was estimated that 480 men were expected to die from breast cancer.<sup>1</sup>

## What is the Impact on Indiana Residents?

**Table 5. Burden of Invasive Female Breast Cancer\*—Indiana, 2011-2015**

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	4,739	121.8	4,875	121.8
<b>Indiana Deaths</b>	870	21.3	855	20.6

Note: Excludes *in situ*  
 \*Age-adjusted to the US 2000 Standard Population.  
 Source: Indiana State Cancer Registry.

## Who Gets Breast Cancer?

**Sex and age** are the two greatest risk factors for developing breast cancer. Females have a much greater risk of developing breast cancer (>99 percent of Indiana cases occur among females), and that risk increases with age. Overall, in Indiana from 2011-2015, 82 percent of all breast cancer incidence, and 89 percent of breast cancer deaths, occur in females over the age of 50.

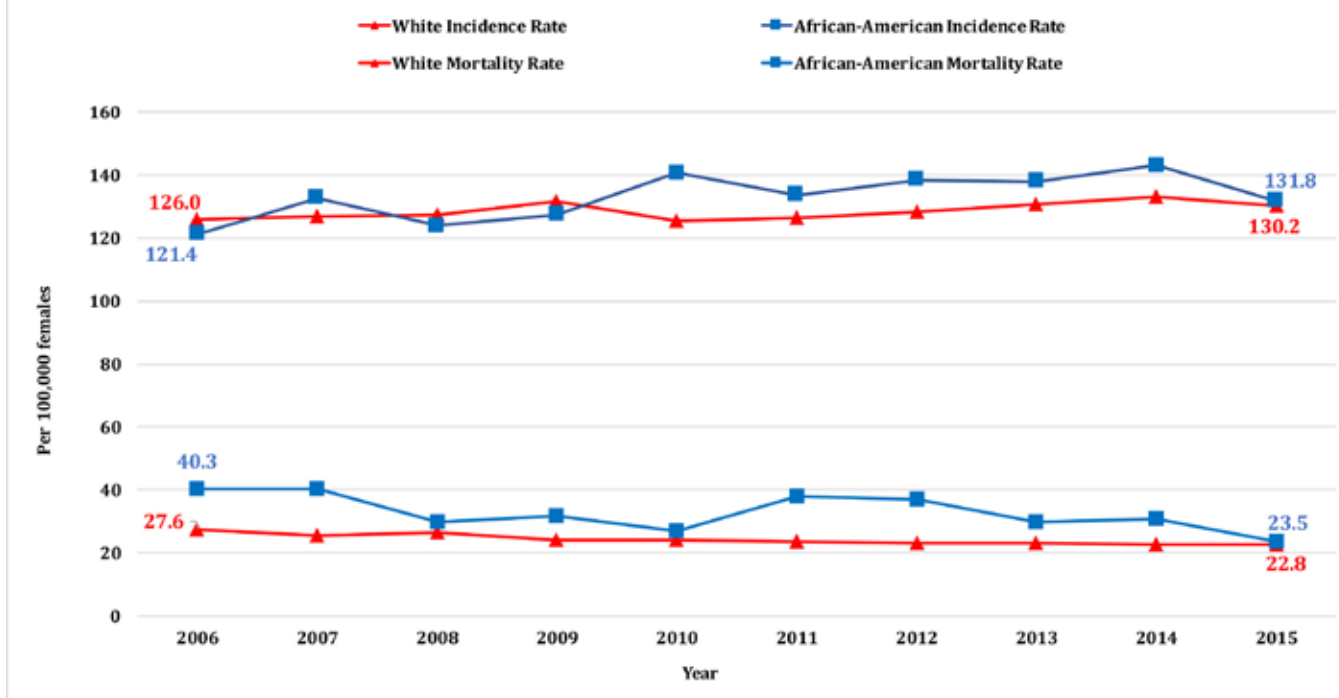
### Risk factors:

Factors associated with increased breast cancer risk include weight gain after the age of 18, being overweight or obese, use of menopausal hormone therapy, physical inactivity, and daily alcohol consumption of more than one drink per day.<sup>1</sup> Research also indicates that long-term, heavy smoking increases breast cancer risk, particularly among females who start smoking before their first pregnancy.

- **Family history.** People who have had one or more first-degree relatives who have been diagnosed with breast cancer have an increased risk. Additionally, according to the American Cancer Society (ACS), breast cancer risk increases if a person has a family member who carries the breast cancer susceptibility genes, known as BRCA 1 or BRCA 2, which account for 5 to 10 percent of all female breast cancers. BRCA mutations also account for 5 to 20 percent of all male breast cancers, and 15 to 20 percent of familial breast cancers.<sup>1</sup>
- **Race.** In Indiana, during 2011-2015, the breast cancer incidence rates for African-American and white females were similar, but the mortality rate for African-American females was 31.7 percent higher than for whites.
- **Reproductive factors.** Females may have an increased risk if they have a long menstrual history (menstrual periods that start early and/or end later in life), have recently used hormonal birth control, have never had children, or had their first child after the age of 30.<sup>1</sup>
- **Certain medical findings.** High breast tissue density, high bone mineral density, type 2 diabetes, certain benign breast conditions, and lobular carcinoma in situ may increase risk for developing breast cancer. In addition, high dose radiation to the chest for cancer treatment increases risk.<sup>1</sup>

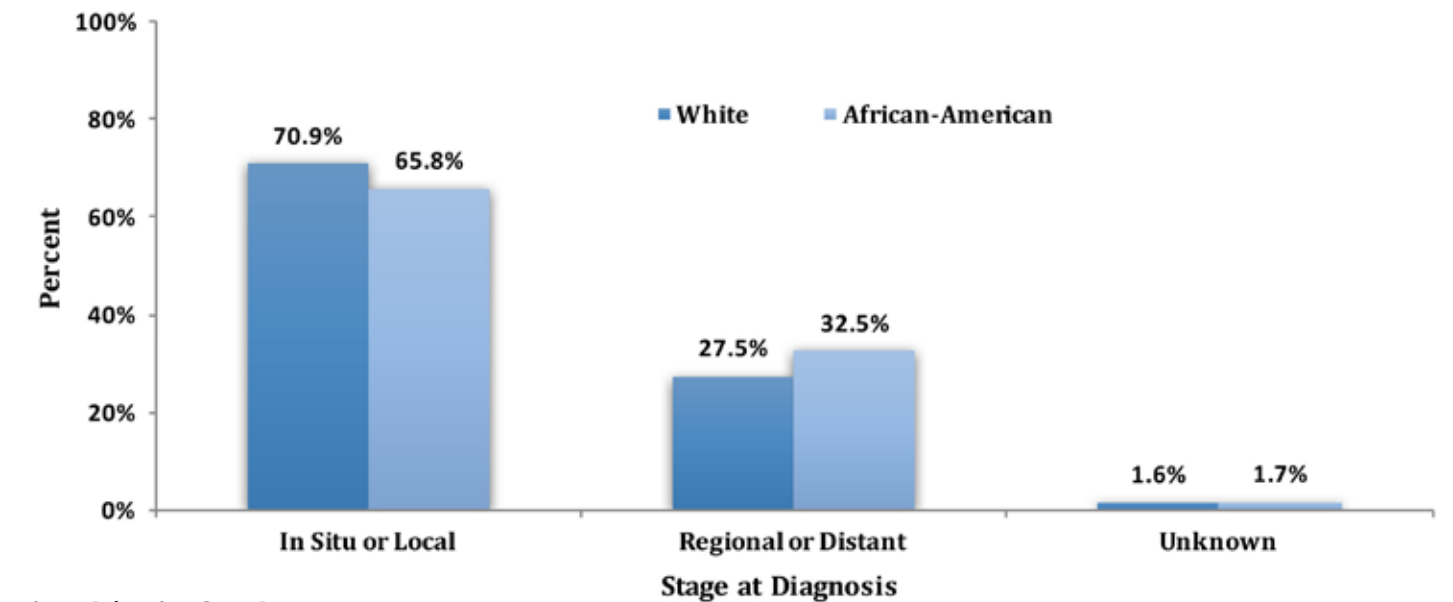
Factors associated with a decreased risk of breast cancer include breastfeeding, regular moderate or vigorous physical activity, and maintaining a healthy body weight. Two medications – tamoxifen and raloxifene – have been approved to reduce breast cancer risk in females at high risk.<sup>1</sup>

**Figure 10. Female Breast Cancer Incidence and Mortality (Death) Rates Trends by Race\*—Indiana, 2006–2015**



Note: Excludes *in situ*  
 \*Age-adjusted to the US 2000 Standard Population.  
 Source: Indiana State Cancer Registry.

**Figure 11. Percent of Female Breast Cancer Cases by Stage of Diagnosis and Race—Indiana, 2006–2015**



Source: Indiana State Cancer Registry.

### Can Breast Cancer Be Detected Early?—see the “Be Aware” box for additional information.

Females should have frequent conversations with their health care providers about their risks for breast cancer and how often they should be screened. In general, females should follow these recommendations:

- **Breast self-awareness.** Females in their 20s should be aware of the normal look and feel of their breasts, so that they can identify potentially dangerous changes. These changes may include a lump, hard knot, or thickening inside the breast or underarm area; swelling, warmth, redness, or darkening of the breast; change in the size or shape of the breast; dimpling or puckering of the skin; itchy, scaly sore or rash on the nipple; pulling in of the nipple or other parts of the breast; nipple discharge that starts suddenly; and new pain in one spot that does not go away.
- **Screening mammograms.** The United States Preventive Services Task Force (USPSTF) recommends a screening mammogram every two years for females aged 50 to 74, which helps detect cancers before a lump can be felt. Females between the ages of 40 to 49, especially those with a family history of breast cancer, should discuss the risks and benefits of mammography with their health provider to determine if it is right for them.
- **Clinical breast exams.** According to the ACS, research has not shown a clear benefit of regular physical breast exams done by either a health professional or through self breast exams. Women should be familiar with how their breasts normally look and feel and immediately report any changes to a health care provider.

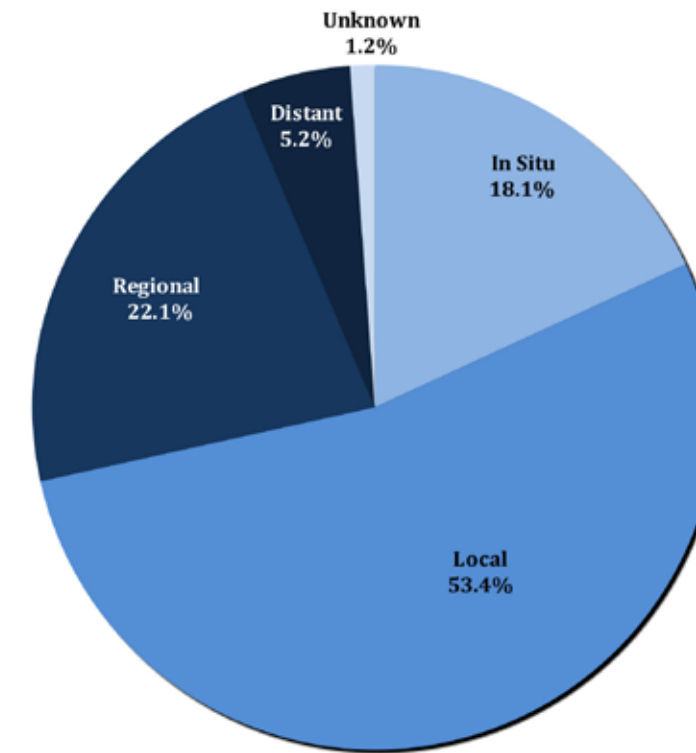
According to the State Cancer Profiles, only 72.5 percent of females aged 50 to 74 years and older had a mammogram during the past two years, with Indiana ranking 44th (rank of 1st = best).<sup>3</sup> The Affordable Care Act requires preventive screening services to be included in most insurance policies. Often, these services are paid in full. Individuals should check with their individual insurance providers for specific plan information.

### What Factors Influence Breast Cancer Survival?

Staging of breast cancer takes into account the number of lymph nodes involved and whether the cancer has moved to a secondary location [Figure 12]. When breast cancer is detected early, before it can be felt, the five-year survival rate is 99 percent.<sup>1</sup> During 2011 to 2015, in Indiana, 18.1 percent of breast cancer cases were diagnosed in situ (the earliest stage possible for diagnosis). Only 53.4 percent of breast cancer cases were diagnosed at the local stage. During this same time, 27.3 percent of Indiana’s breast cancer cases were diagnosed in the regional or distant stages.

According to the ACS, there are multiple treatment options available for breast cancer patients. Surgical treatment options include mastectomy (the medical term for the surgical removal of one or both breasts, either partially or completely) and lumpectomy (the removal of only the cancerous area of the breast). Local radiation can be used to treat the tumor without affecting the rest of the body. Other treatments include chemotherapy, hormone therapy, and targeted therapy. These can be given orally or intravenously in order to reach cancer cells anywhere in the body. An individual’s treatment plan is personalized and based both on medical and personal choices. Individuals should partner with their medical providers and be active participants in the development of a treatment and care plan.

Figure 12. Percent of Female Breast Cancer Cases Diagnosed During Each Stage\*—Indiana, 2011–2015



During 2011-2015, of the 28,941 female Indiana residents who received a breast cancer diagnosis, 20,701 (71.5%) were diagnosed in the in situ or local stage, 7,905 (27.3%) were diagnosed in the regional or distant stage, and 335 (1.2%) had unknown staging.

\*Includes all *in situ* and invasive cases  
Source: Indiana State Cancer Registry.



# Be Aware!

## Common Signs and Symptoms of Breast Cancer

The most common symptom of breast cancer is a new lump or mass. It is important to have anything new or unusual checked by a doctor.

### Other symptoms of breast cancer may include\*:

- Hard knots or thickening
- Swelling, warmth, redness, or darkening
- Change in size or shape
- Dimpling or puckering of the skin
- Itchy, scaly sore, or rash on the nipple
- Pulling in of the nipple or other parts of the breast
- Nipple discharge that starts suddenly
- New pain in one spot that doesn't go away

*\*Although these symptoms can be caused by things other than breast cancer, it is important to have them checked out by your doctor.*

# Take Charge!

## What You Can Do to Help Prevent Breast Cancer

- Know your risk! Talk to your doctor about your personal and family history, and screening.
- Get screened regularly.
- Be smoke free! Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free, evidence-based smoking cessation assistance.
- Maintain a healthy weight.
- Adopt a physically active lifestyle.
- Limit alcohol consumption.
- Limit postmenopausal hormone use. When evaluating treatment options for menopausal symptoms, consider the increased risk of breast cancer associated with the use of estrogen and progestin and discuss this with your physician.
- Breastfeed, if you can. Studies suggest that breastfeeding for one year or more slightly reduces a woman's overall risk of breast cancer.

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## Cervical Cancer

### Bottom Line

Cervical cancer is almost 100 percent preventable through regular screening, avoidance of controllable risk factors, and vaccination against the human papillomavirus (HPV). Nationally, in 2018, there were an estimated 13,240 cases of cervical cancer diagnosed and 4,170 deaths due to cervical cancer.<sup>1</sup> Widespread implementation of Pap testing led to large declines in cervical cancer incidence, but there has been little reduction in cervical cancer rates over the past several years. In Indiana, approximately 262 new cases of cervical cancer and 89 cervical cancer-related deaths occur annually [Table 6].

### What is the Impact on Indiana Residents?

**Table 6. Burden of Invasive Cervical Cancer\*—Indiana, 2011–2015**

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	262	7.9	289	8.7
<b>Indiana Deaths</b>	89	2.6	94	2.2

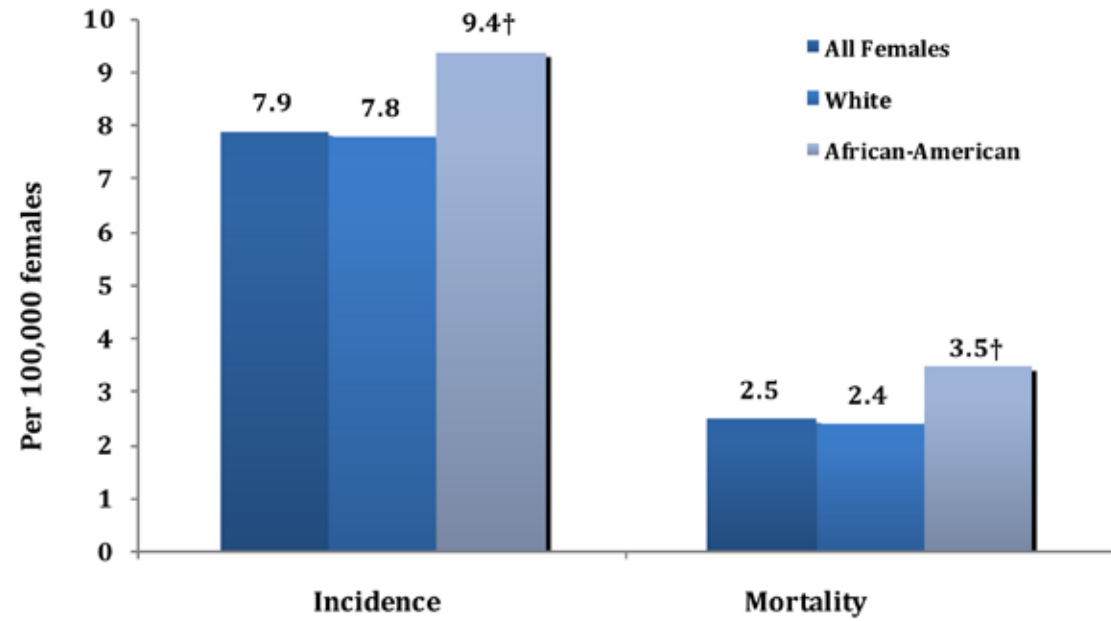
\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

### Who Gets Cervical Cancer?

- Infection with HPV is the single greatest risk factor for cervical cancer as most cervical cancers are caused by persistent infection with certain types of HPV. The Centers for Disease Control and Prevention (CDC) estimates that at least 91 percent of cervical cancer cases are caused by HPV each year.<sup>2</sup> Other risk factors for cervical cancer include a compromised immune system and smoking.<sup>1</sup>
- HPV is passed person-to-person through skin-to-skin sexual contact. Risk of transmission can be reduced by delaying first sexual activity, limiting the number of sexual partners, and using condoms.
- HPV vaccination is the best method of prevention. Currently, there is one vaccine available in the US, Gardasil-9. It is FDA-approved for both males and females, aged nine to 45 years. HPV vaccination is routinely recommended for girls aged 11 and 12 years and for females 13 through 26 years of age who did not get any or all required doses when they were younger. HPV vaccination is routinely recommended for boys aged 11 and 12 years and for males 13 through 21 years of age who did not get any or all required doses when they were younger. Vaccination is routinely recommended for immunocompromised persons, for males aged 22-26 years who have sex with males, and for transgender persons.<sup>3</sup> HPV vaccination can be administered to both boys and girls starting at age nine. If the first dose is administered before age 15, only two doses are required, six to 12 months apart. If the first dose is administered at age 15 or older, three doses are required, with the second dose administered one to two months after the first dose, and the third dose administered approximately three to four months after the second dose.<sup>4</sup>
- In 2017, only 40.8 percent of adolescents aged 13 through 17 in Indiana were up-to-date on receiving their shots for the HPV vaccine.<sup>5</sup>
- Indiana females are most often diagnosed with cervical cancer during their middle adult years. During 2015, 82 percent of cervical cancer cases occurred among Indiana females less than 65 years of age, comprised of 41 percent of cases occurring among females aged 25 to 44 years and 41 percent among females aged 45 to 64 years.
- During 2006 to 2015, African-American females in Indiana, compared to white females, had a 19 percent higher cervical cancer incidence rate (9.4 versus 7.9 cases per 100,000 females, respectively) and a 40 percent higher mortality rate (3.5 versus 2.5 deaths per 100,000 females, respectively) [Figure 13]. While many factors impact this disparity, one issue is that African-American females tend to be diagnosed at a non-localized stage [Figure 14]. Furthermore, national data suggests that, after excluding women who have had hysterectomies, the race-based disparities in cervical cancer mortality are even greater.<sup>6</sup>

**Figure 13. Cervical Cancer Incidence and Mortality (Death) Rates by Race\*—Indiana, 2006–2015**

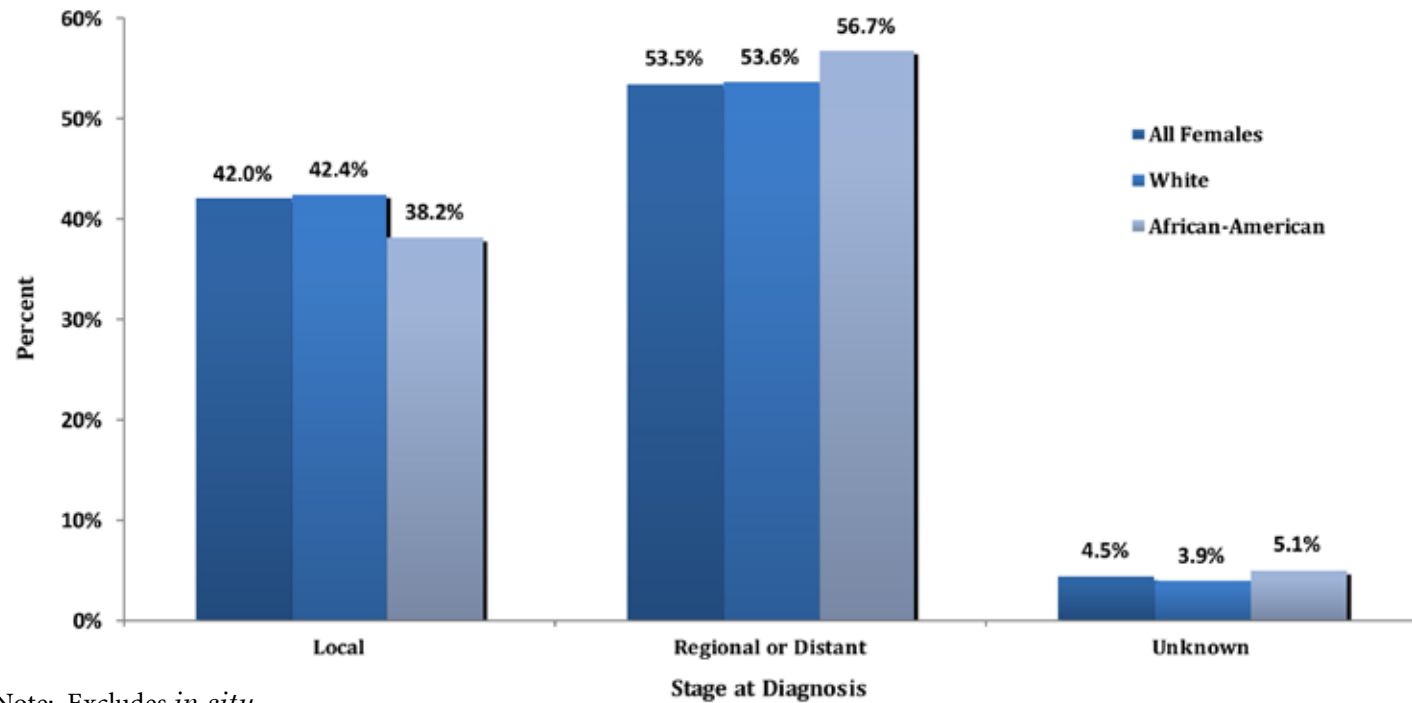


\*Age-adjusted to the US 2000 Standard Population.

†Rate among African-American females is significantly higher ( $P < .05$ ) than the rate among white females

Source: Indiana State Cancer Registry.

**Figure 14. Percent of Invasive Cervical Cancer Cases by Stage of Diagnosis and Race—Indiana, 2006–2015**



Note: Excludes *in situ*

Source: Indiana State Cancer Registry.

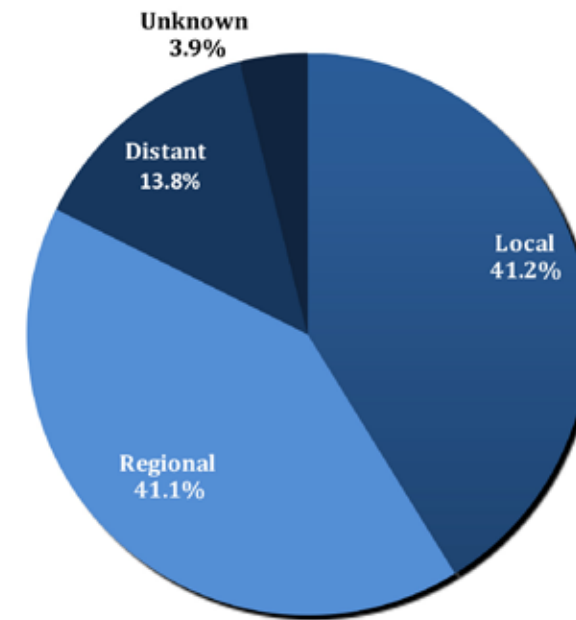
**Can Cervical Cancer Be Detected Early?**

- In the US, the cervical cancer death rate declined by over 70 percent between 1955, when cervical cancer screening was first introduced, and 1992, mainly because of the effectiveness of the Pap smear screening test.<sup>7</sup> Pap screenings allow for early identification and treatment of abnormal cervical cells before they become cancerous. This is important because, typically, the pre-cancerous conditions do not cause pain or other symptoms and are only detected through Pap screenings.
- The American Cancer Society (ACS), in collaboration with the American Society for Colposcopy and Cervical Pathology and the American Society for Clinical Pathology, recommend all average-risk females, aged 21 to 65 years receive a routine Pap screening every three years. The preferred screening method for females aged 30 to 65 years is Pap and HPV testing (co-testing) every five years.<sup>8</sup>
- According to the Indiana Behavioral Risk Factor Surveillance System, in 2016, 74.9 percent of Hoosier females aged 21 to 65 years reported having had a Pap screening during the past three years. The prevalence rates for white and African-American women were similar (75.3 vs. 74.5 percent, respectively).<sup>9</sup>

**What Factors Influence Cervical Cancer Survival?**

- Figure 15 provides the percent of Indiana females diagnosed during each stage of cervical cancer during 2011 to 2015. The five-year survival rate for patients diagnosed with cervical cancer at the local stage is 92 percent.<sup>1</sup>
- In Indiana, from 2006-2010 to 2011-2015, the incidence of cervical cancer and the mortality rate remained fairly constant [Figure 16].

**Figure 15. Percent of Cervical Cancer Cases Diagnosed During Each Stage—Indiana, 2011–2015**

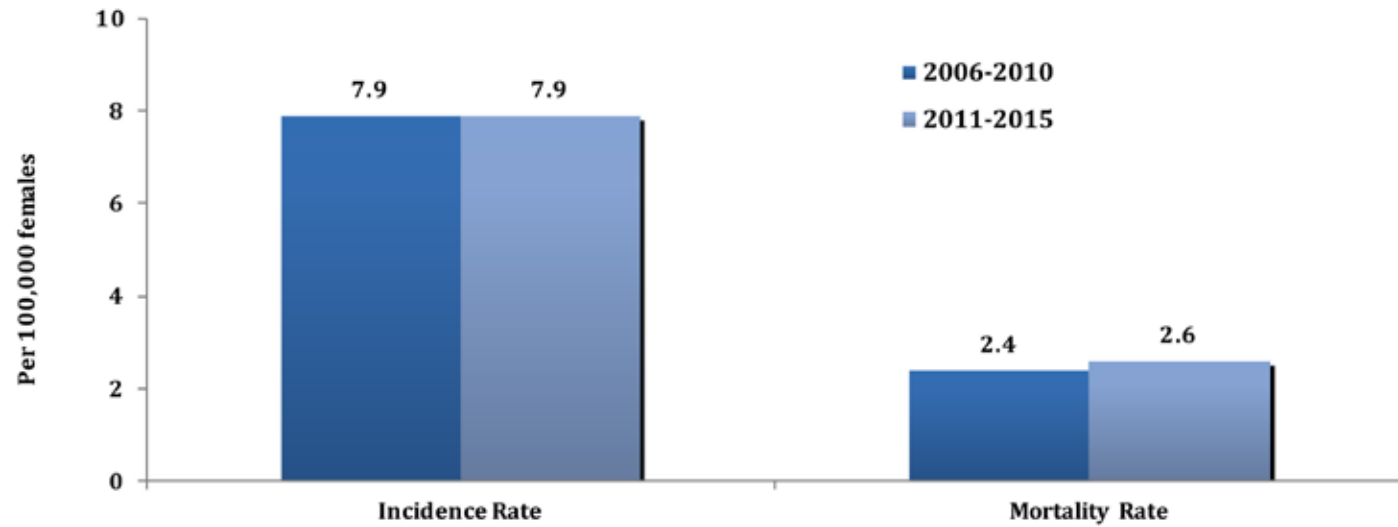


During 2011-2015, of the 1,308 Indiana females who received a diagnosis of invasive cervical cancer, 539 (41.2%) were diagnosed at the local stage, 718 (54.9%) were diagnosed in the regional or distant stages combined, and 51 (3.9%) had unknown staging.

Note: Excludes *in situ*

Source: Indiana State Cancer Registry.

**Figure 16. Changes in Cervical Cancer Incidence and Mortality (Death) Rates among Indiana Females between the Five-year Periods of 2006–2010 and 2011–2015\***



\*Age-adjusted to the US 2000 Standard Population.  
Source: Indiana State Cancer Registry.

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# Take Charge!

## What You Can Do to Help Prevent Cervical Cancer

- Get vaccinated—Protecting yourself from HPV decreases your risk for cervical and other cancers.
- Practice safe sex.
- Be smoke-free—Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free smoking cessation assistance.
- Have routine Pap screenings.
- Ask for the HPV test with your Pap screening if you are aged 30 years or older.
- Watch for abnormal vaginal discharge and bleeding.

## Childhood Cancer

### Bottom Line

Childhood cancer is rare, representing approximately 1 percent of all new cancer diagnoses in the US.<sup>1</sup> Although uncommon, cancer is the second leading cause of death among children aged one to 14 years, exceeded only by accidents.<sup>2</sup> On average, from 2011 to 2015, 370 cases of cancer and 44 cancer-related deaths occurred each year among Indiana children aged zero to 19 years [Table 7]. In general, childhood cancer trends in Indiana are similar to what is seen nationwide. For most cases of childhood cancer, the cause is unknown.

### What is the Impact on Indiana Residents?

**Table 7. Burden of Cancer among Children Aged Zero to 19 Years\*—Indiana, 2011-2015**

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	370	20.8	379	21.5
<b>Indiana Deaths</b>	44	2.5	51	2.9

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

The incidence rate of cancer among Indiana children aged zero to 19 years from 2011 to 2015 was 20.8 cases per 100,000 children, which was similar to the national rate of 18.0 cases per 100,000 children for 2013, the most recent year for which national data is available.<sup>3</sup> In Indiana, the childhood cancer mortality rate was 2.5 deaths per 100,000 children, compared to the US mortality rate of 2.3 deaths per 100,000 children.<sup>3</sup>

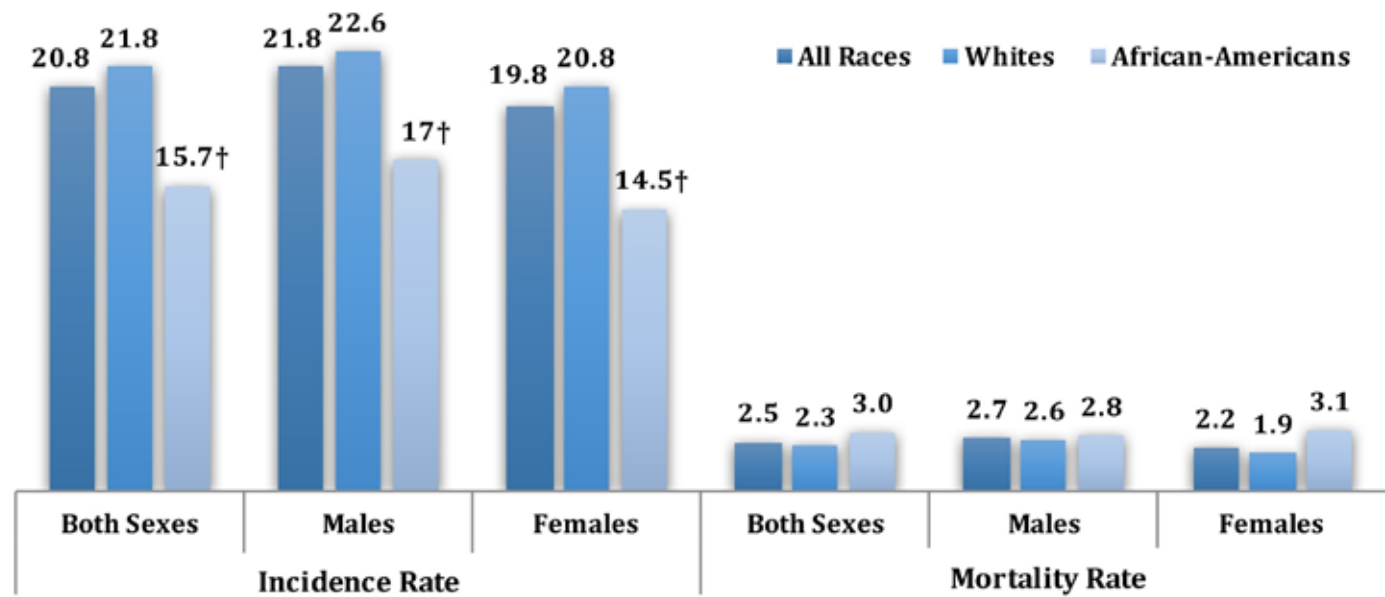
Using the International Classification of Childhood Cancer system, the most common cancer types diagnosed among Indiana children aged zero to 14 years were leukemias and brain tumors. In children aged 15 to 19 years, the most common cancer types were lymphomas and a group of cancers that include epithelial cancers (cancers that develop from the cellular covering of internal and external body surfaces or related tissues in the skin, hollow viscera and other organs) and melanoma.

### Who Most Often Gets Childhood Cancer?

- White children. During 2011 to 2015, in Indiana, white children had a significantly higher incidence rate than African-American children (21.8 versus 15.7 per 100,000 children, respectively) [Figure 17]. This difference in rates between races is also seen nationally. The reasons for these differences are unknown.<sup>1</sup>
- Children born with certain genetic disorders or familial syndromes. Children with a familial cancer predisposition syndrome, inherited immunodeficiency, certain genetic syndromes, and chromosomal abnormalities are at greater risk for developing various types of childhood cancers.<sup>4</sup>
- Males born with undescended testes are at greater risk for testicular cancer.<sup>4</sup>
- Additional risk factors include:<sup>4</sup>
  - Radiation exposure, especially prenatally (including x-rays).
  - Tanning bed or sun exposure increases the risk of melanoma, one of the more common cancers among teenagers.
  - Prior chemotherapy with certain agents.
  - Infection with the Epstein-Barr virus is associated with certain types of lymphoma.



**Figure 17. Incidence and Mortality (Death) Rates Among Children Aged Zero to 19 Years by Sex and Race\*—Indiana, 2011–2015**



\*Age-adjusted to the US 2000 Standard Population.

†Rate is significantly lower (P<.05) among African-Americans than among whites.

Source: Indiana State Cancer Registry.

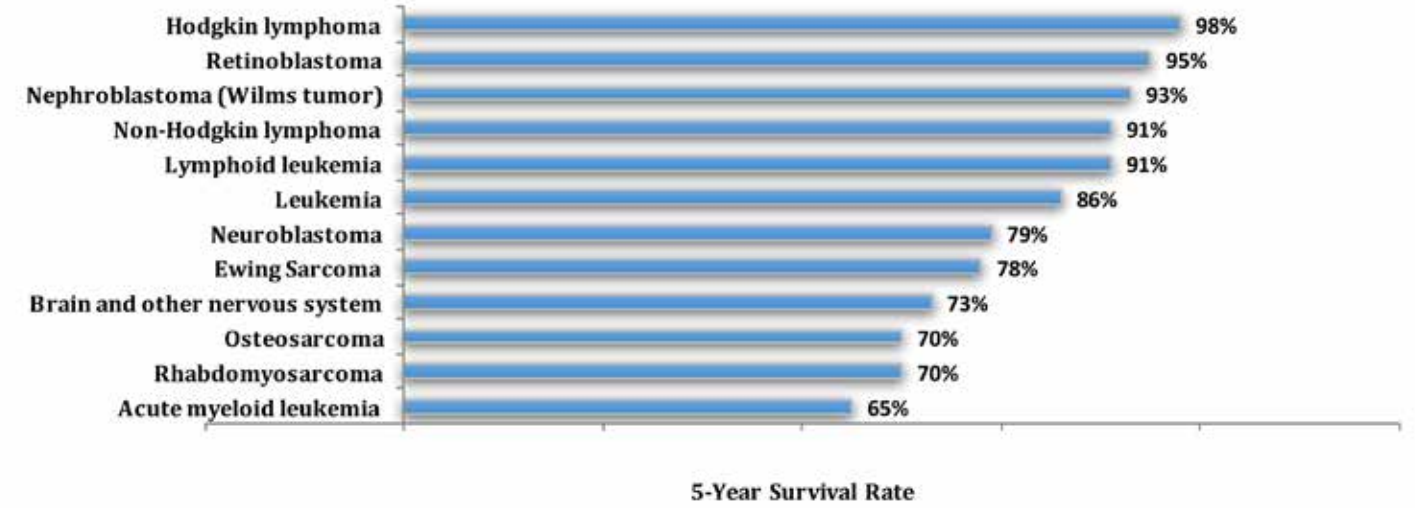
**Can Childhood Cancer Be Detected Early?** –see the “Be Aware” box for additional information.

Early symptoms are usually nonspecific. Parents should ensure that children have regular medical checkups and should be aware of any unusual symptoms that persist.

**What Factors Influence Childhood Cancer Survival?**

According to the National Cancer Institute, overall, US childhood deaths due to cancer have dropped more than 50 percent since 1975 due to improved treatment options.<sup>5</sup> The five-year survival rate for childhood cancers is now 83 percent.<sup>2</sup> However, rates vary considerably depending on cancer type; moreover, within the major categories, cancer subtypes might vary in response to treatment or survival characteristics [Figure 18].

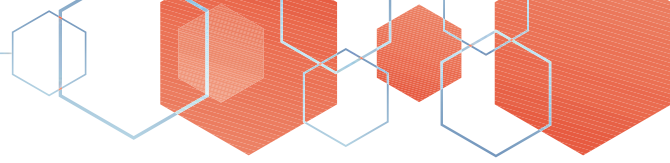
**Figure 18. Five-year Survival Rates for the Most Common Childhood Cancers—United States, 2007-2013**



Source: American Cancer Society. Cancer Facts and Figures 2018. PDF. Atlanta, GA. 2018.

The earlier a cancer is diagnosed and treated, the better. Childhood cancers can be treated by a combination of therapies (surgery, radiation, and chemotherapy) chosen based on the type and stage of cancer. Treatment is coordinated by a team of experts, including pediatric oncologists, pediatric nurses, social workers, psychologists, and others. Because these cancers are uncommon, outcomes are more successful when treatment is managed by a children’s cancer center.<sup>1</sup>

Survivors of childhood cancer might experience treatment-related side effects. Information for survivors of childhood cancer is available at [www.survivorshipguidelines.org](http://www.survivorshipguidelines.org).



# Be Aware!

## Common Signs and Symptoms of Childhood Cancer

Childhood cancer is rare, but your child should be examined by a health care provider if you notice any of these potential cancer-related signs and symptoms:

**C**ontinued, unexplained weight loss

**H**eadaches, often with early morning vomiting

**I**ncreased swelling or persistent pain in bones, joints, back, or legs

**L**ump or mass, especially in the abdomen, neck, chest, pelvis, or armpits

**D**evelopment of excessive bruising, bleeding, or rash

**C**onstant infections

**A** whitish color behind the pupil

**N**ausea which persists or vomiting without nausea

**C**onstant tiredness or noticeable paleness

**E**ye or vision changes which occur suddenly and persist

**R**ecurrent or persistent fevers of unknown origin

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## Colon and Rectum (Colorectal)

### Bottom Line

Colorectal cancer includes all cancers of the colon and rectum. Colorectal cancer is the third-most commonly diagnosed cancer among both males and females in Indiana, as well as the United States overall. It is the second leading cause of cancer-related death among males, and the third leading cause of cancer-related death among females in Indiana. The American Cancer Society (ACS) estimated that 3,190 Indiana residents were expected to be diagnosed with colorectal cancer and 1,110 were expected to die because of the disease during 2018.<sup>1</sup> The lifetime risk of developing colorectal cancer is one in 24 for females and one in 22 for males.<sup>1</sup> In Indiana, African-Americans have higher colorectal cancer incidence and mortality rates than whites, and males have higher rates than females. Despite the ongoing decrease in incidence and mortality, there is a concerning trend towards increased incidence in young individuals.

### What is the Impact on Indiana Residents?

Table 8. Burden of Invasive Colorectal Cancer\*—Indiana, 2011–2015

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
Indiana Incidence	3,152	42.9	3,146	41.8
Indiana Deaths	1,173	15.9	1,182	15.3

Note: Excludes *in situ*

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

### Who Gets Colorectal Cancer?

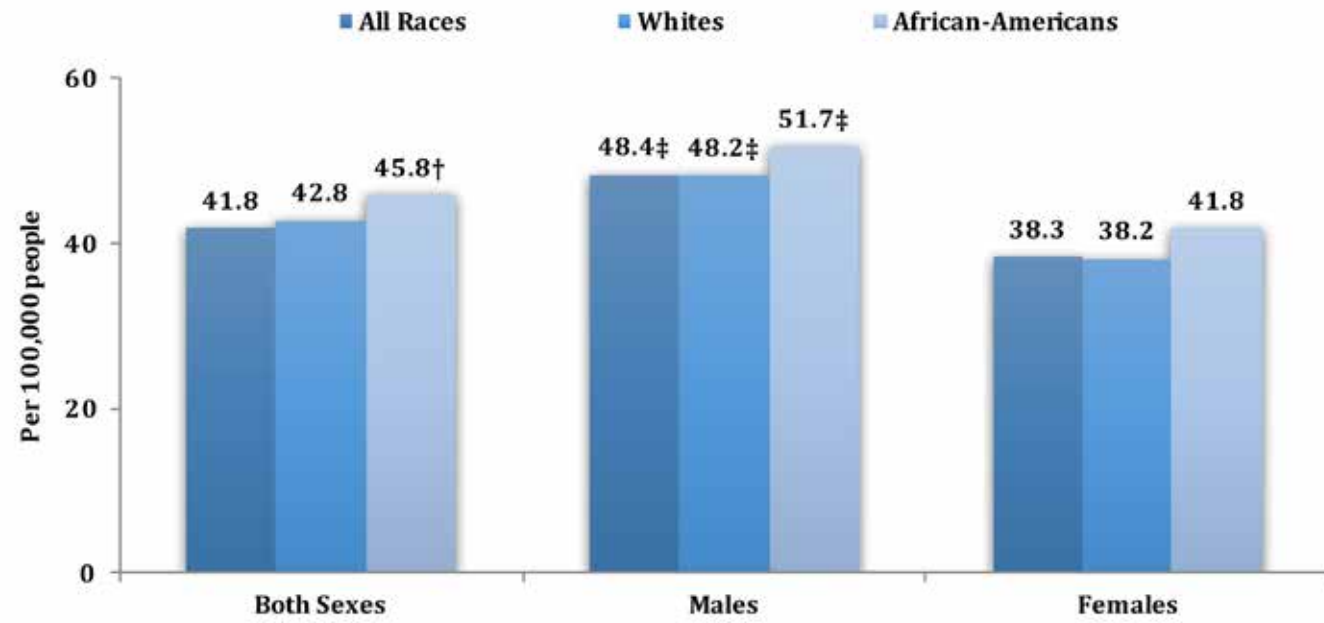
Getting older and being male are the two greatest risk factors for developing colorectal cancer. During 2015, 89 percent of Indiana residents diagnosed with colorectal cancer were age 50 and older. In addition, during 2011 to 2015, colorectal cancer incidence rates were 23.3 percent higher among Indiana males compared to females (48.4 versus 38.3 cases per 100,000 people, respectively) [Figure 19].

### Additional risk factors for colorectal cancer include:

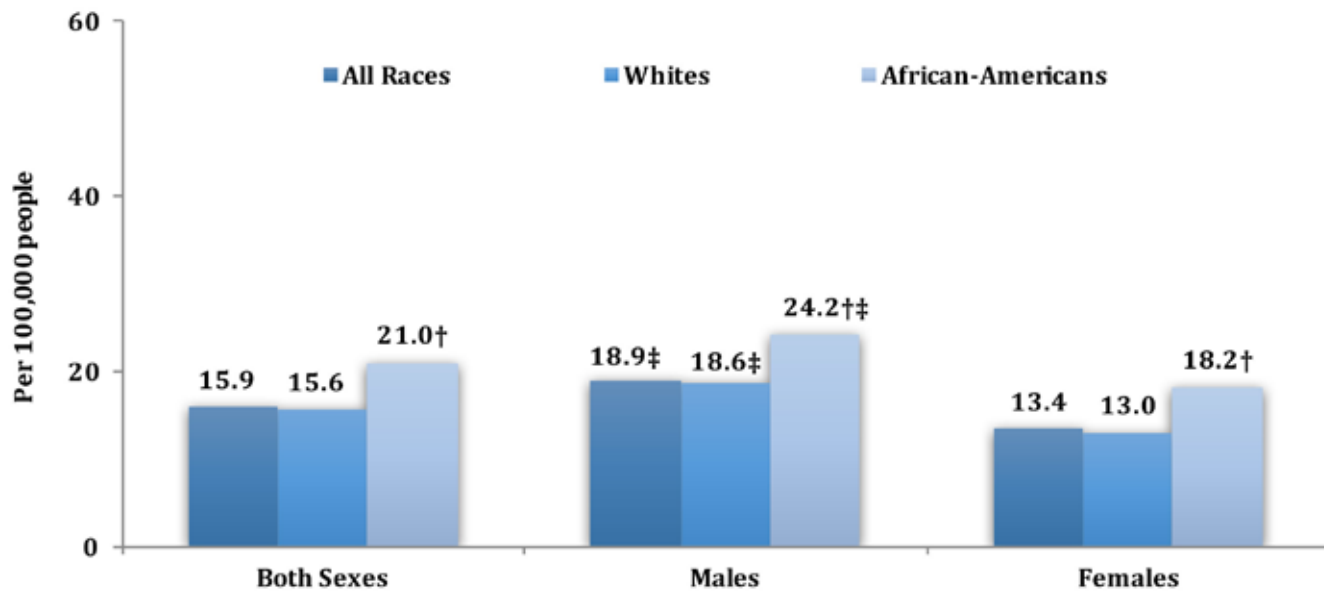
- **Race.** In Indiana, during 2011 to 2015, African-Americans had 6.8 percent higher incidence rate (45.8 versus 42.8 cases per 100,000 people) and a 29.5 percent higher mortality rate (21.0 versus 15.6 deaths per 100,000 people, respectively) when compared with whites [Figure 19].
- **Personal or family history.** Risk is increased by having a personal or family history of colorectal cancer or polyps, a personal history of chronic inflammatory bowel disease, or certain inherited genetic conditions (e.g., Lynch syndrome, also known as hereditary nonpolyposis colorectal cancer, and familial adenomatous polyposis [FAP]).<sup>2</sup>
- **Diabetes.** Studies have found that individuals with type 2 diabetes are at higher risk for colorectal cancer.<sup>2</sup> Although diabetes and colorectal cancer share similar risk factors, this increased risk remains even after shared risk factors are taken into consideration.<sup>2</sup> Studies also suggest that the relationship may be stronger in males than in females. Research indicates that some diabetic medications independently affect colorectal cancer risk. In general, colorectal cancer patients with diabetes appear to have slightly lower survival rates than non-diabetic patients.<sup>2</sup>
- **Modifiable risk factors.** Cigarette smoking, alcohol consumption, being overweight or obese, physical inactivity, and a diet high in red or processed meat have been found to increase colorectal cancer risk.<sup>2</sup> There are some factors that may help lower the risk of, or even prevent, colorectal cancer:
  - **Diet.** Daily fruit and vegetable intake has been shown to decrease colorectal cancer risk. In addition, calcium consumption from dairy products and higher blood levels of vitamin D appear to decrease colorectal cancer risk.<sup>2</sup> Intake of dietary folate, fiber, and whole grains is also associated with reduced risk.<sup>2</sup>
  - **Medication.** Studies suggest that long-term, regular use of non-steroidal anti-inflammatory drugs, such as aspirin, may reduce colorectal cancer risk. Earlier studies that attributed a decreased risk to the use of hormones or oral contraceptives have not been validated in recent years.<sup>2</sup>
  - **Smoking.** According to the Surgeon General's Report, The Health Consequences of Smoking – 50 Years of Progress, smoking is a known cause of colorectal cancer. In addition, smoking increases the failure rates of treatment for all cancers.
  - **Alcohol.** Moderate and heavy alcohol consumption increases the risk for colorectal cancer. A 20 percent risk increase is linked to a lifetime average of two to three drinks per day, while more than three drinks are associated with a 40 percent risk increase.<sup>2</sup>

**Figure 19. Colorectal Cancer Incidence (a) and Mortality (Death) (b) Rates by Sex and Race\*—Indiana, 2011–2015**

**a. Incidence**



**b. Mortality**



Note: Excludes *in situ*

\*Age-adjusted to the US 2000 Standard Population.

†Rate among African-Americans is significantly higher ( $P < .05$ ) than rate among whites

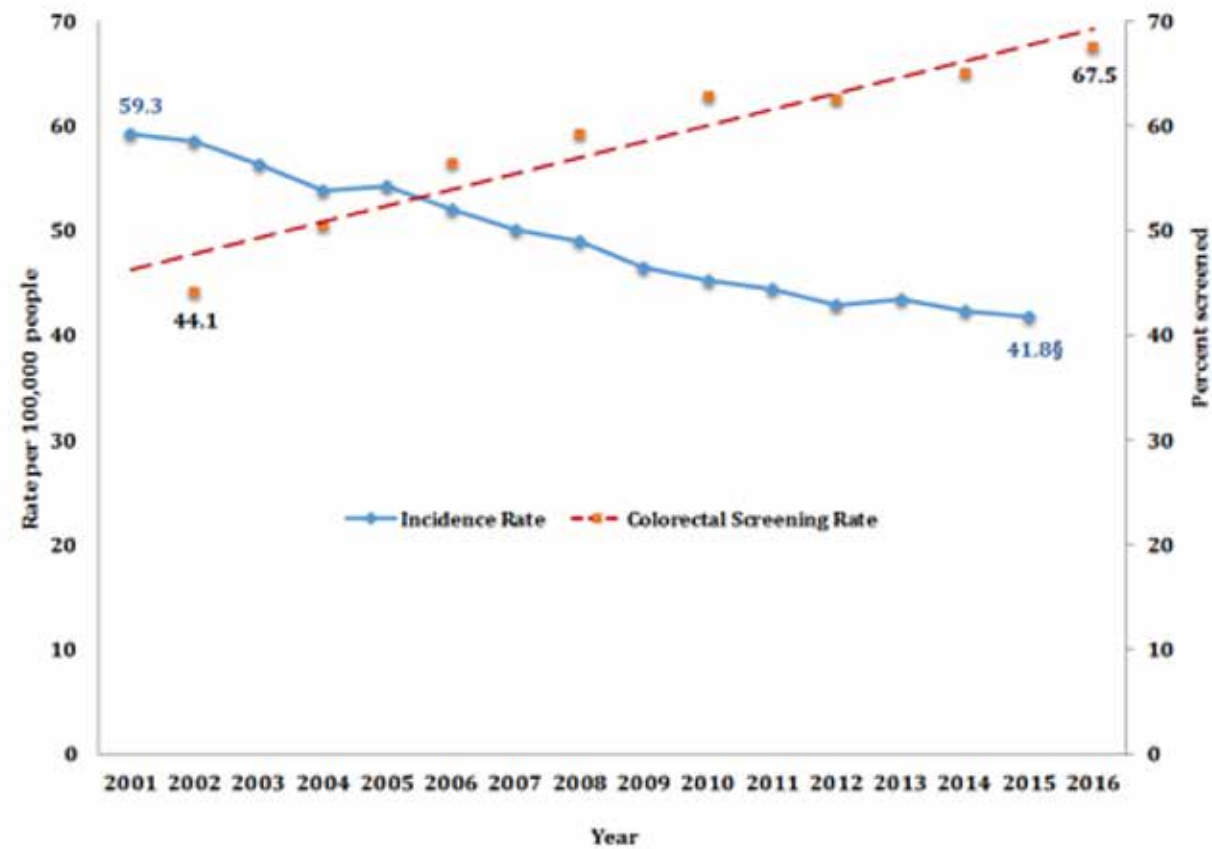
‡Rate among males is significantly higher ( $P < .05$ ) than rate among females

Source: Indiana State Cancer Registry.

**Can Colorectal Cancer Be Detected Early? –see the “Be Aware” box for additional information.**

- Colorectal cancer incidence rates increased from 1975 through the mid-1980s, but have been decreasing for the past two decades in the US.<sup>2</sup> Declines have accelerated during the past few years. From 2005 to 2014, incidence rates decreased from 58.1 to 44.0 for males and from 43.1 to 33.7 for females. The incidence rates in men are higher compared to women.<sup>2</sup> These declines are largely attributed to decreases in smoking and increases in the use of colorectal cancer screening tests that allow the detection and removal of colorectal polyps before they progress to cancer.<sup>2</sup> A similar trend has been seen in Indiana [Figure 20]. Of note, the greatest decrease in incidence rates has been observed in individuals 65 years of age or older at 14.8 percent from 2011 to 2015; during the same time, there was an incidence rate increase of 0.3 percent for individuals aged 50 to 64 years, and an incidence increase of 12.2 percent for those younger than 50.
- Symptoms of advanced disease include rectal bleeding, blood in the stool, dark or black stools, a change in bowel habits, cramping pain in the lower abdomen, and an urge to have a bowel movement when the bowel is empty. In some cases, blood loss from cancer leads to anemia (low number of red blood cells), causing symptoms such as weakness and fatigue.
- When any of these symptoms or signs are encountered, further testing is recommended and will usually include a colonoscopy. Due to the recent increase in colorectal cancer incidence among younger adults, timely evaluation of any symptoms consistent with colorectal cancer in adults under age 50 is particularly important.
- Screening for colorectal cancer in individuals without any symptoms may vary. Beginning at age 50, both males and females who have none of the risk factors previously discussed should follow one of these testing schedules:
  - The US Preventive Services Task Force recommends colorectal cancer screening using:
    - A guaiac-fecal occult blood test (gFOBT) or a fecal immunochemical test (FIT) once a year,
    - A multi-targeted stool DNA test (FIT-DNA) once a year or every three years,
    - A flexible sigmoidoscopy every five years or every 10 years when done in combination with an annual FIT,
    - A CT colonography (virtual colonoscopy) every five years, or
    - A colonoscopy every 10 years.
  - Screening should continue through age 75. The decision to screen after age 75 should be discussed with a health care provider.
  - Individuals who have an increased risk should talk to their health care provider about whether they should be screened at a younger age, more frequently, or with a colonoscopy.
- According to the Indiana Behavioral Risk Factor Surveillance System (IN-BRFSS), in 2016, 67.5 percent of Hoosier residents 50 years of age or older had undergone fecal (stool) blood testing or sigmoidoscopy within the past five years, or colonoscopy within the past 10 years. This compares to other states whose screening rates range from 43.8 percent to 76.3 percent and likely reflects limited use of colorectal cancer screening options. The National Colorectal Cancer Roundtable established a goal to screen 80 percent of the US population.<sup>2</sup>

Figure 20. Trends in Colorectal Cancer Incidence\* and Screening Rates†—Indiana, 2001-2016



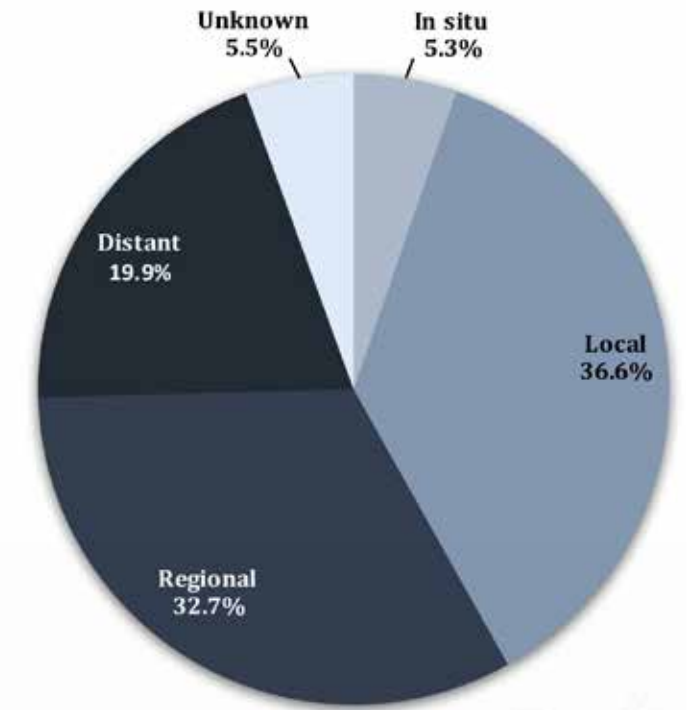
\*Incidence rates are age-adjusted to the US 2000 Standard Population. Data are available through 2015.  
 †Persons ages 50 and older who have ever had a sigmoidoscopy or colonoscopy. Starting in 2002, these data have been collected every two years. A trend line is provided.  
 §Incidence rate in 2015 is significantly lower ( $P < .05$ ) than the rate in 2001.  
 Due to a change in methodology and the inclusion of cell phones, results from the (IN-BRFSS) from 2011 and forward are not directly comparable with previous years.  
 Sources: Indiana State Cancer Registry. (Incidence data); IN-BRFSS (Screening data)

What Factors Influence Colorectal Cancer Survival?

- Nationally, mortality rates for colorectal cancer have declined in both males and females over the past two decades.<sup>1</sup> In Indiana, mortality rates decreased by 31 percent from 2001 to 2015 from 22.3 to 15.3 deaths per 100,000 people. This included a 35 percent decrease among males (from 27.6 to 18.0 deaths per 100,000) and a 31 percent decrease among females (from 18.7 to 13.0 deaths per 100,000).
- In the US, the five-year relative survival rate is 64 percent for colon cancer and 67 percent for rectal cancer. Only 39 percent of colorectal cancer patients are diagnosed with localized disease, for which five-year survival is 90 percent.<sup>1</sup>
- In Indiana, during 2011 to 2015, 41.9 percent of colorectal cancers were identified early, in the in situ or local stage [Figure 21]. For colorectal cancers that are diagnosed at a late stage, after it has spread to a distant site (metastasized), the five-year survival rate is only 11 percent.<sup>1</sup>
- Surgical removal is the most common treatment for localized colorectal cancer. Chemotherapy is given before or after surgery to patients whose cancer has deeply penetrated the bowel wall or spread to lymph nodes. Radiation therapy, usually in conjunction with chemotherapy, is administered to patients with locally advanced or lower rectal cancers.

Figure 21. Percent of Colorectal Cancer Cases Diagnosed During Each Stage\*—Indiana, 2011–2015

During 2011-2015, of the 16,642 Indiana residents who received a diagnosis of in situ or invasive colorectal cancer, 6,968 (41.9%) were diagnosed in the in situ or local stage, 8,751 (52.6%) were diagnosed in the regional or distant stage, and 923 (5.5%) had unknown staging.



\*Includes all *in situ* and invasive cases  
 Source: Indiana State Cancer Registry.

# Be Aware!

## Common Signs and Symptoms of Colorectal Cancer

- Early Stage: No symptoms
- Late Stage:
  - Bleeding from the rectum
  - Blood in stool or toilet after bowel movement
  - Change in bowel habits or shape of stool
  - Cramping or discomfort in the lower abdomen
  - Urge to have bowel movement when bowel is empty
  - Constipation or diarrhea that lasts more than a few days
  - Decreased appetite
  - Unintentional weight loss
  - Dark or black stools

*Although these symptoms can be caused by things other than colorectal cancer, it is important to have them checked out by your doctor.*

# Take Charge!

## What You Can Do to Help Prevent Colorectal Cancer

- Get screened regularly.
- Maintain a healthy weight.
- Adopt a physically active lifestyle.
- Be smoke-free—Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free smoking cessation assistance.
- Limit consumption of alcohol.
- Consume a healthy diet that:
  - Emphasizes plant sources
  - Supports a healthy weight
  - Includes a variety of vegetables and fruits each day
  - Includes whole grains rather than processed (refined) grains
  - Limits processed and red meats

### References

- 1 American Cancer Society. Cancer Facts & Figures 2018. Atlanta, GA. 2018.
- 2 American Cancer Society. Colorectal Cancer Facts & Figures 2017-2019. Atlanta, GA. 2017.

## Head and Neck Cancer

### Bottom Line

Cancers of the head and neck consist of the oral cavity and pharynx (lip, tongue, salivary gland, floor of mouth, gum and other mouth, nasopharynx, tonsil, oropharynx, hypopharynx, and other oral cavity and pharynx) and larynx. These are also referred to as oral cavity and oropharyngeal cancers. According to the American Cancer Society (ACS), approximately 51,540 people were affected by a head and neck cancer in 2018.<sup>1</sup> It requires a complex combination of surgery, chemotherapy, and radiation therapy to provide the best cure rate while trying to maintain function and a good cosmetic result.

### What is the Impact on Indiana Residents?

**Table 9. Burden of Invasive Head and Neck Cancer\*—Indiana, 2011-2015**

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	1,212	16.0	1,263	16.2
<b>Indiana Deaths</b>	265	3.5	270	3.5

Note: Excludes *in situ*

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

### Who Gets Head and Neck Cancer?

Incidence and mortality trends for cancers of the oral cavity have varied by race and sex. Among both African-American men and women, incidence and mortality have steadily declined from 2000 to 2014. For white men, incidence has increased while mortality has remained level. Among white women, incidence has remained constant, while mortality has declined.<sup>2</sup> It is thought that the disparities in cancer mortality and incidence may reflect differences in smoking, alcohol consumption, diet, obesity, and levels of physical activity.<sup>3</sup>

### Additional risk factors for colorectal cancer include:

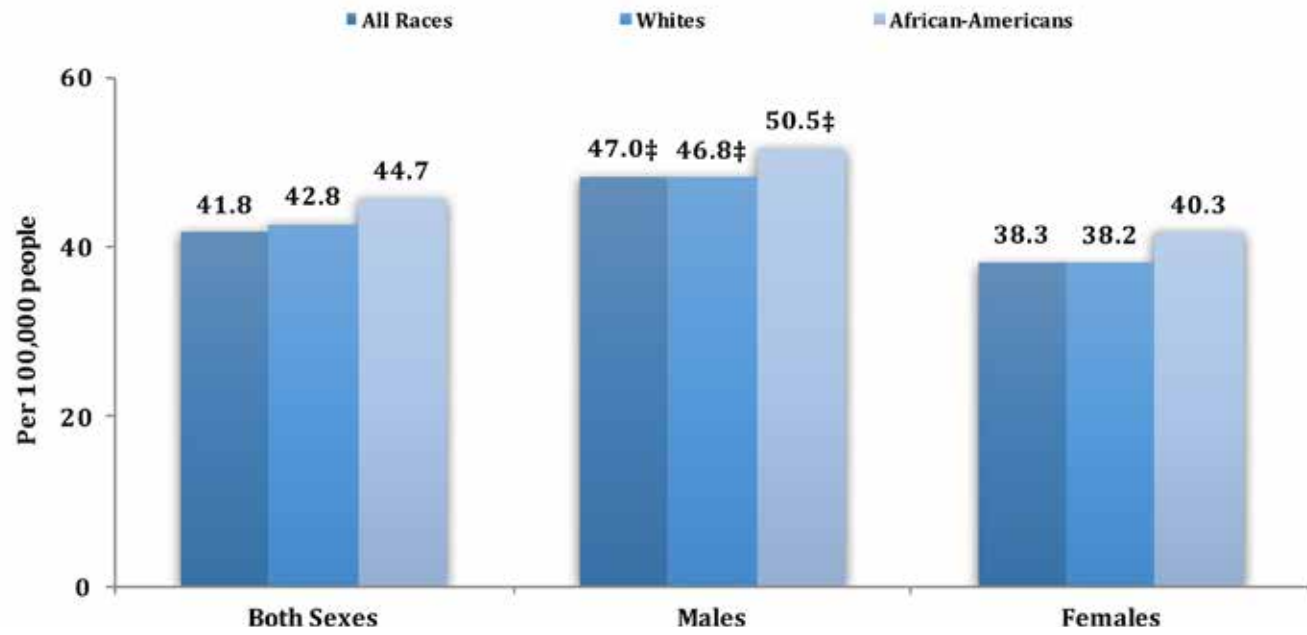
- **Being male.** Men are more than twice as likely as women to be diagnosed.<sup>1</sup>
- **Human papillomavirus (HPV), particularly types 16 and 18.** These strains now account for more than half of the cancers of the oropharynx, a subset of the oral cavity. The prevalence of oral HPV is approximately 10 percent for adult men and 3.6 percent for women, for an overall average of 6.9 percent.<sup>4</sup> Most men clear the infection within one year, with a median duration of infection of 6.9 months.<sup>5</sup> The current HPV vaccine could potentially reduce most cancers caused by HPV, with the 9-valent vaccine offering a small potential increased benefit.<sup>6</sup>
- **Modifiable risk factors.** Tobacco and alcohol use are two of the highest risk factors for head and neck cancers. According to the ACS, tobacco users have an increased risk of developing these cancers, which is related to how much and how long they smoked or chewed. However, due to a decrease in smoking prevalence in the US, there has been a trend towards a decrease in the incidence of tobacco-related cancers.<sup>7</sup> Drinking alcohol also increases the risk of developing head and neck cancers. Approximately seven out of 10 patients with oral cancer are heavy drinkers.<sup>1</sup>

### Can Head and Neck Cancer be Detected Early? –see the “Be Aware” box for additional information.

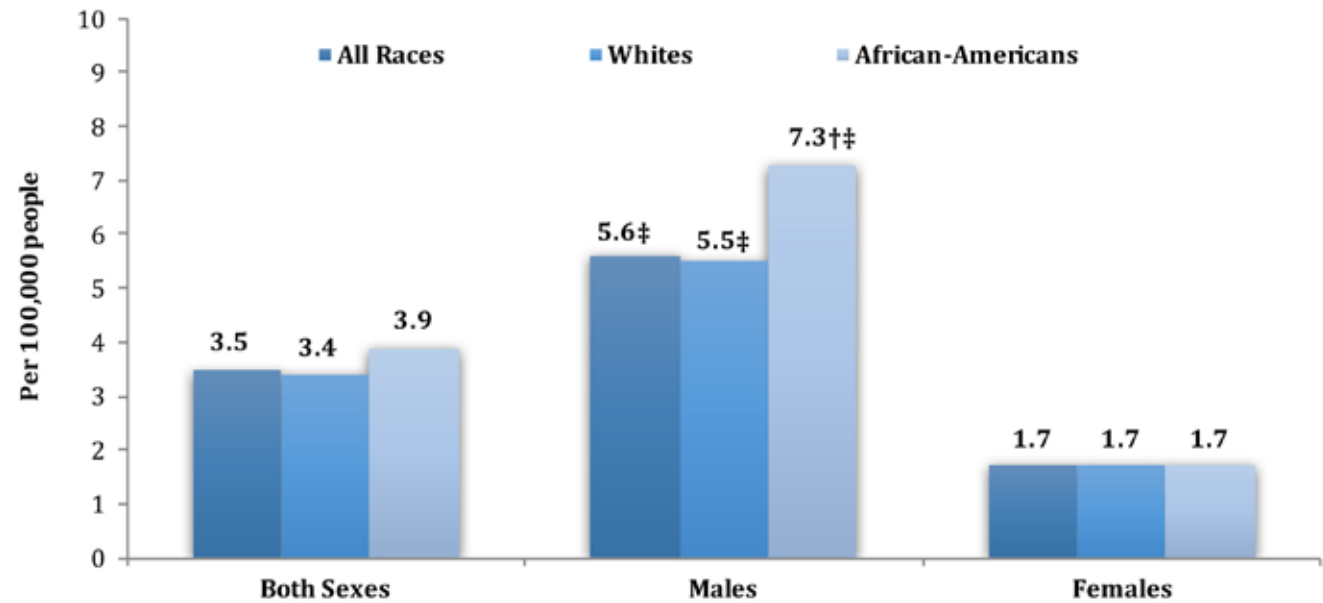
- There are no standard screening tests for head and neck cancer. The sooner a person notices potential symptoms and brings their symptoms to the attention of their doctor, the greater the likelihood of diagnosing cancer at an earlier stage.
- Cancers of the oral cavity are often detected by a dentist. The dentist may see a cancer developing on the tongue, gums, cheeks, or the floor of the mouth at the time the patient comes to have their teeth cleaned. Early cancer detection is one advantage of routine dental care.

**Figure 22. Head and Neck Cancer Incidence (a) and Mortality (Death) (b) Rates by Sex and Race\*—Indiana, 2011–2015**

**a. Incidence**



**b. Mortality**



Note: Excludes *in situ*

\*Age-adjusted to the US 2000 Standard Population.

‡Rate among African-Americans is significantly higher ( $P < .05$ ) than rate among whites.

‡‡Rate among males is significantly higher ( $P < .05$ ) than rate among females.

Source: Indiana State Cancer Registry.

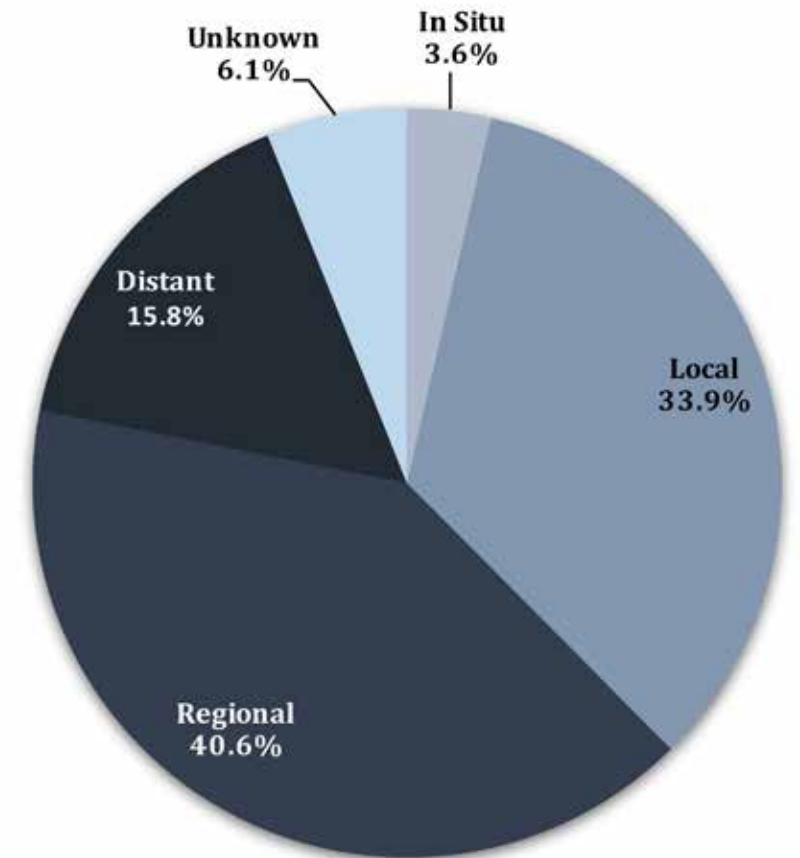
**What Factors Influence Head and Neck Cancer Survival?**

Each of the different major groups of the head and neck has its own treatment strategy based on the cancer site of origin and the tumor extent. The earlier the stage of diagnosis, the higher the five-year survival rate.

According to the Indiana State Cancer Registry, there were 6,286 patients who were diagnosed in Indiana with cancers of the head and neck between 2011 and 2015, including *in situ*. Of these, 3.6 percent of cases were *in situ*, 33.9 percent were local, 40.6 percent were regional, 15.8 percent were distant, and 6.1 percent were of unknown extent at the time of diagnosis. During this time, 1,324 patients died who had a history of cancers of the head and neck, of which 1,206 (91.1 percent) were white, 103 (7.8 percent) were African-American, and 15 (1.1 percent) were of other racial groups. Of this total, 967 (73 percent) were males and 357 (27 percent) were females.

**Figure 23. Percent of Head and Neck Cancer Cases Diagnosed During Each Stage\*—Indiana, 2011–2015**

During 2011-2015, of the 6,286 Indiana residents who received a diagnosis of *in situ* or invasive head and neck cancer, 2,361 (37.5%) were diagnosed in the *in situ* or local stage, 3,543 (56.4%) were diagnosed in the regional or distant stage, and 382 (6.2%) had unknown staging.



\*Includes all *in situ* and invasive cases  
Source: Indiana State Cancer Registry.

These early stage cancers are primarily treated with surgery. More advanced cancers require radiation therapy and chemotherapy, as well. Many patients with head and neck cancer are diagnosed at a stage in which there are a variety of options, so it is best if they are evaluated at a center that can provide a full spectrum of treatment opportunities. Some patients require highly specialized care and may be best served by referral to a high-volume center offering particular surgical expertise.

New drugs are being developed and patients may be offered the opportunity to participate in clinical trials. Personalized cancer therapy typically involves identifying a gene in the patient's tumor for which there is an existing drug available to treat the cancer. Another emerging form of treatment is immunotherapy, which uses medications to boost the body's immune system to attack the cancer.



# Be Aware!

## Common Signs and Symptoms of Head and Neck Cancer

- An area that doesn't heal completely
- Poorly fitting dentures
- Persistent pain in the throat, tongue, ear, or jaw
- Persistent sore throat or hoarseness
- Changes in voice quality or clarity
- Problems swallowing
- Bleeding
- Persistent lump in the neck
- Blocked sinuses or chronic sinus infections that do not respond to treatment

*Although each of these symptoms and signs can be caused by things other than cancer, it is important to bring them to the attention of your doctor.*

# Take Charge!

## What You Can Do to Help Prevent Head and Neck Cancer

- Be smoke-free—Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free smoking cessation assistance.
- Reduce alcohol intake.
- Have routine dental care. Your dentist might discover a cancer at an early stage.
- Be aware of the typical symptoms of head and neck cancer. Notify your doctor for an evaluation if any of these occur.
- Adolescents and young adults may wish to consider getting the HPV vaccine to reduce their risk of oropharyngeal cancer.

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## Liver Cancer

### Bottom Line

Liver cancer is one of the few cancer types for which the death rate for both males and females is increasing within the United States. There were an estimated 42,220 new cases of liver cancer, including intrahepatic bile duct cancer (IHCC), in the US in 2018, comprising 30,610 males and 11,610 females. For the same year, 30,200 deaths were estimated to occur, 20,540 in males and 9,660 in females.<sup>1</sup> These estimates place liver cancer into tenth position of most common cancer sites in males, fifth position of most common causes for cancer death in males, and eighth most common causes of cancer death in females.<sup>2</sup> In Indiana, 770 new cases and 550 deaths due to liver cancer were expected for 2018.<sup>1</sup> Both incidence and mortality rates in Indiana are greater in males than females, and are also greater in African-Americans than whites.

Seventy-five percent of cases represent liver cell cancers, or hepatocellular carcinoma (HCC), with IHCCs representing most of the remaining cancer types.<sup>3</sup>

### What is the Impact on Indiana Residents?

Table 10. Burden of Invasive Liver Cancer and IHCC\*—Indiana, 2011-2015

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
Indiana Incidence	530	6.8	544	6.7
Indiana Deaths	443	5.8	462	5.7

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

### Who Gets Liver Cancer?

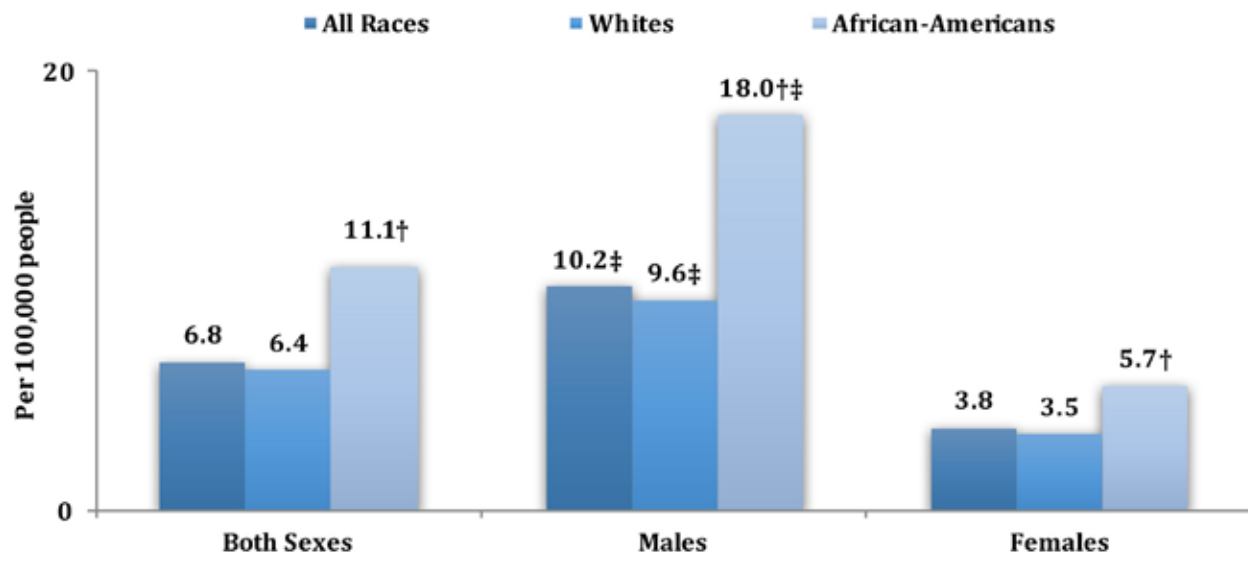
- **Those infected with hepatitis B virus (HBV) and hepatitis C virus (HCV).** The most common risk factor for liver cancer is chronic infection with HBV or HCV. These infections can lead to cirrhosis of the liver, which makes liver cancer highly common across many parts of the world. HBV and HCV can spread person to person through sharing contaminated needles, unprotected sex, or childbirth, and can also be passed through blood transfusions. However, this is less likely in the US since the beginning of blood product testing for these viruses. Most people exposed to HBV recover within a few months and only a small percentage of adults become chronic carriers. Infants and children who become infected have a higher risk of becoming lifetime carriers. Most people with HCV develop chronic infections, which is more likely to lead to liver damage or cancer. Baby boomers are more likely to have been afflicted with viral hepatitis and other chronic liver disorders, and thus are at increased risk for liver cancer.<sup>4</sup>
- **People with cirrhosis.** People living with cirrhosis of the liver are at a higher risk of developing liver cancer. Cirrhosis of the liver is a disease in which liver cells become damaged and replaced by scar tissue. Most people who develop liver cancer have evidence of cirrhosis. There are several possible causes of cirrhosis. Most cases occur in people who abuse alcohol or have chronic HBV or HCV infections. Individuals with the following diseases might go on to develop cirrhosis: non-alcoholic fatty liver disease, primary biliary cirrhosis, and inherited metabolic diseases.<sup>4</sup>
- **Heavy alcohol users.** Heavy alcohol use is the leading cause of cirrhosis in the US, which in turn is linked to an increased risk of liver cancer.<sup>4</sup>
- **Those who are overweight or obese.** Being overweight or obese increases the risk of developing liver cancer. This is likely because it can result from fatty liver disease and cirrhosis.<sup>4</sup>
- **People affected with these rare diseases.** Tyrosinemia, alpha-1 antitrypsin deficiency, porphyria cutanea tarda, glycogen storage diseases, and Wilson disease.<sup>4</sup>
- **Those who have had long-term exposure to aflatoxins.** These cancer-causing substances are made by a fungus that contaminates peanuts, wheat, soybeans, ground nuts, corn, and rice. The fungus grows in a moist, warm environment, and is more common in tropical and warmer climate countries. Long-term exposure to these substances is a major risk factor for liver cancer. The risk is increased even more in people with HBV or HVC.<sup>4</sup>
- **Those who have been exposed to vinyl chloride and thorium dioxide.** Exposure to these chemicals increases the risk of angiosarcoma of the liver and also increases the risk of developing cholangiocarcinoma and hepatocellular cancer.<sup>4</sup>
- **Those who have been exposed to arsenic.** Drinking water contaminated with naturally occurring arsenic, such as well water, over a long period of time increases the risk of some types of liver cancer.<sup>4</sup>
- **Tobacco users.** Smoking increases the risk of liver cancer. Former smokers have a lower risk than current smokers, but both groups have a higher risk than those who never smoked.<sup>4</sup>
- **Differences in race and ethnicity.** Asian-Americans and Pacific Islanders have the highest rates of liver cancer. This is followed by American Indians/Alaska Natives, Hispanics/Latinos, African-Americans, and whites.<sup>4</sup>
- **Gender differences.** HCC, the primary type of liver cancer, is much more common in males than in females.<sup>4</sup>

**Risk Factors**

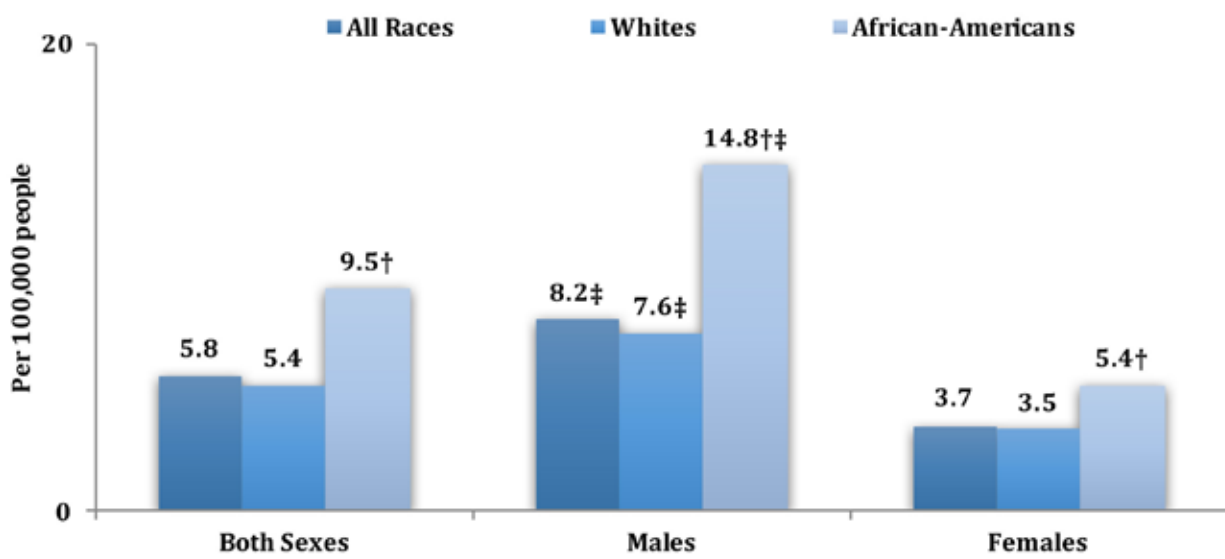
Chronic liver disease is the dominant risk factor for the development of HCC.<sup>5,6</sup> In most cases, chronic hepatitis and cirrhosis lead to long-term damage that increases risk over time. In the US, the most common underlying causes are chronic infection with HBV or HCV, alcohol-related liver damage, obesity, or diabetes. Another form of chronic liver disorder is non-alcoholic steatohepatitis (NASH) that is linked to obesity and other metabolic diseases. In the case of HBV infection, liver cancer can form with or without the presence of liver cirrhosis. Other rare causes of cirrhosis that increase risk include hemochromatosis and Wilson disease. Tobacco smoking has also been associated with an increased liver cancer risk. Up to 10 percent of liver cancers occur spontaneously, without known underlying risk factors such as cirrhosis or hepatitis.<sup>1</sup>

**Figure 24. Liver and IHCC Incidence (a) and Mortality (Death) (b) Rates by Race and Sex\*—Indiana, 2011–2015**

**a. Incidence**



**b. Mortality**



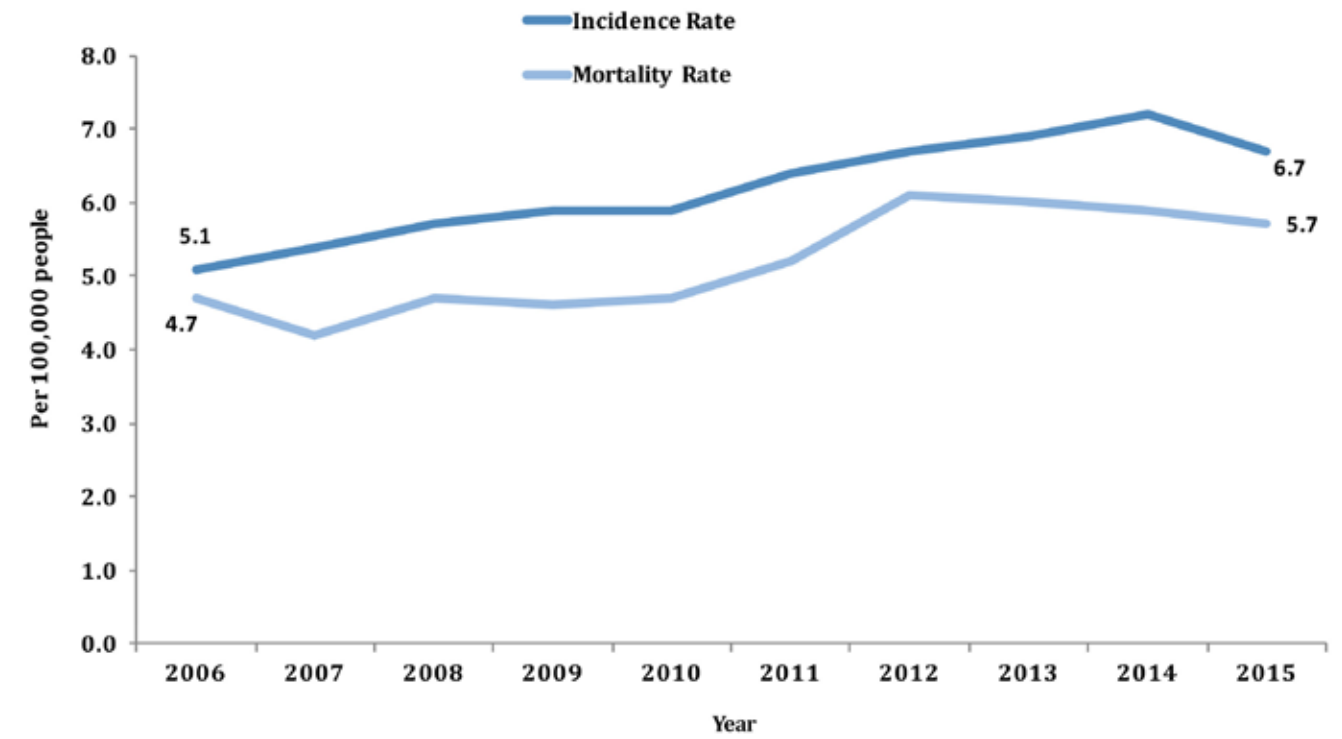
\*Age-adjusted to the US 2000 Standard Population.

†Rate among African-Americans is significantly higher (P<.05) than rate among whites.

‡Rate among males is significantly higher (P<.05) than rate among females of the same race.

Source: Indiana State Cancer Registry.

**Figure 25. Liver and IHCC Incidence and Mortality (Death) Rates\*—Indiana, 2006–2015**



\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

**Can Liver Cancer Be Detected Early?** –see the “Be Aware” box for additional information.

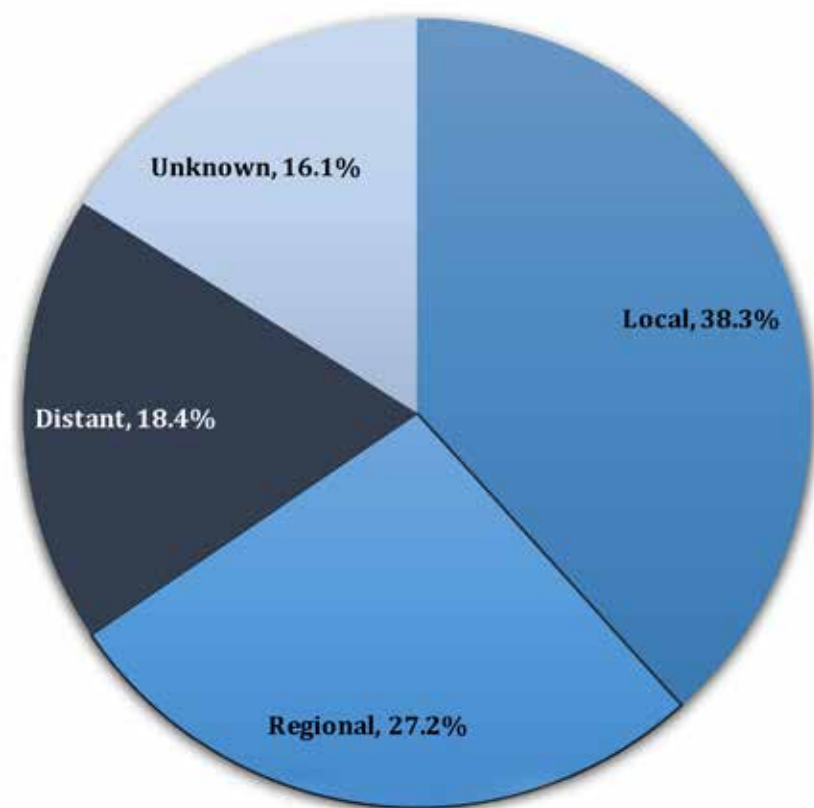
Possible signs and symptoms for liver cancer can be subtle and often reflect damage from underlying liver disease or the extent to which a tumor has spread. Jaundice development can be a symptom for either problem. Abdominal distension due to liver enlargement or as a result of fluid accumulation within the abdomen also tends to occur in late stages. Loss of appetite, weight loss, or pain indicate advanced disease and are seldom encountered with early-stage liver cancer.<sup>7</sup>

Due to the limited ability to detect liver cancer based on symptoms, prevention and early detection through screening for several types of hepatitis, when indicated, are paramount. Prevention measures focus on preventing chronic liver disease and cirrhosis, which in turn reduces liver cancer risk. For individuals with an increased risk of HBV, vaccination is available. There is currently no approved HCV vaccine, but antiviral treatments are effective in controlling viral hepatitis and have the potential to reduce cirrhosis and liver cancer risk. One-time testing for chronic HCV has been recommended for individuals born between 1945 and 1965.<sup>8</sup> Other important aspects to reduce hepatitis include testing of blood products and organ donations, infection control measures in medical or dental procedures, needle-exchange programs for intravenous drug users, and safe sex practices.

The possible impact of screening for liver cancer remains unclear, as reduction in mortality due to screening has not been convincingly demonstrated so far. However, individuals at risk for liver cancer based on chronic hepatitis or cirrhosis are often recommended to undergo blood tests and imaging studies.<sup>5</sup>

**Figure 26. Percent of Liver and IHCC Cases Diagnosed During Each Stage—Indiana, 2011–2015**

During 2011-2015, of the 2,649 Indiana residents who received a diagnosis of in situ or invasive head and neck cancer, 1,014 (38.3%) were diagnosed in the in situ or local stage, 1,209 (45.6%) were diagnosed in the regional or distant stage, and 426 (16.1%) had unknown staging.



Note: Excludes *in situ*  
Source: Indiana State Cancer Registry.

**What Factors Influence Liver Cancer Survival?**

Survival outlook for liver cancer depends not only on the extent or stage of the liver cancer, but also on the course of the underlying liver disease.<sup>6</sup> In this case, it is important to assess not only the tumor stage based on staging criteria, but also to determine the underlying functional ability of the liver. Surgical resection, localized ablation (tumor destruction without removal), or embolization therapy are most commonly used for treatment of localized disease.<sup>9</sup> Patients with normal liver function and isolated tumors should undergo surgical resection if possible. Patients with up to three nodules and beginning impairment of liver function should be considered for liver transplantation, and if not transplantable, can undergo other procedures as recommended. Traditional chemotherapy is not effective for liver cell cancer, but has a role for advanced IHCCs. Progression of advanced liver cell cancer with moderate liver function impairment can be delayed with biologic therapy, while patients with terminal disease and severe liver dysfunction should receive supportive care. There are several biologic agents that have recently shown benefit to slow HCC growth, including several therapeutics that block blood-vessel growth and one immune system-enhancing therapy.<sup>10</sup>

# Be Aware!

## Common Signs and Symptoms of Liver Cancer

- Early stage: No specific symptoms
- Late stage:
  - Jaundice or yellowing of the skin or eyes
  - Collection of fluid in the abdomen
  - Weight loss
  - Weakness, fatigue
  - Easy bruising or bleeding

*Although each of these symptoms and signs can be caused by things other than cancer, it is important to bring them to the attention of your doctor.*

# Take Charge!

## What You Can Do to Help Prevent Liver Cancer

- If born between 1945 and 1965, consider a HCV test.
- Ask your doctor about the HBV vaccine.
- Maintain a healthy weight.
- Live a physically active life.
- Be smoke-free—Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free smoking cessation assistance.
- Consume a healthy diet.
- If you have known liver cirrhosis, fatty liver or chronic hepatitis, talk to your doctor about screening tests including:
  - Regular blood tests for liver functions
  - Yearly liver ultrasound exam
  - Yearly liver MRI scan
- Limit alcohol consumption
  - Not more than one drink per day
  - No alcohol whatsoever in case of liver cirrhosis

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## Lung Cancer

### Bottom Line

Lung cancer is the most common cause of cancer deaths for both men and women in the United States, accounting for an estimated one in four cancer deaths.<sup>1</sup> According to the American Cancer Society (ACS), in 2018, approximately 154,050 individuals were expected to die of lung cancer in the US.<sup>2</sup> Lung cancer is the second-most commonly diagnosed cancer in men and women in the US with approximately 234,030 new cases expected to occur in 2018.<sup>2</sup> This accounts for about 25 percent of all new cancer diagnoses. In Indiana, during 2018, approximately 5,840 residents were expected to be diagnosed with lung cancer and 3,960 were expected to die as a result of the disease.<sup>2</sup> This accounts for about 25 percent of all new cancer diagnoses. Cigarette smoking is overwhelmingly the primary cause of lung cancer, as 80 percent of lung cancer deaths in the US are related to smoking. According to the Indiana Behavioral Risk Factor Surveillance System (IN-BRFSS), over 1 million adults in Indiana still smoke and Indiana's adult smoking rate of 21.1 percent remains above the national median adult smoking rate in the US of 17.1 percent in 2016. Due to the decline in smoking rates, lung cancer death rates have also decreased in recent years.<sup>2</sup> However, there is still much to be done to reduce the burden of lung cancer.

### What is the Impact on Indiana Residents?

Table 11. Burden of Invasive Lung Cancer\*—Indiana, 2011-2015

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	5,425	72.8	5,605	72.4
<b>Indiana Deaths</b>	3,948	53.3	3,858	50.1

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

### Who Gets Lung Cancer?

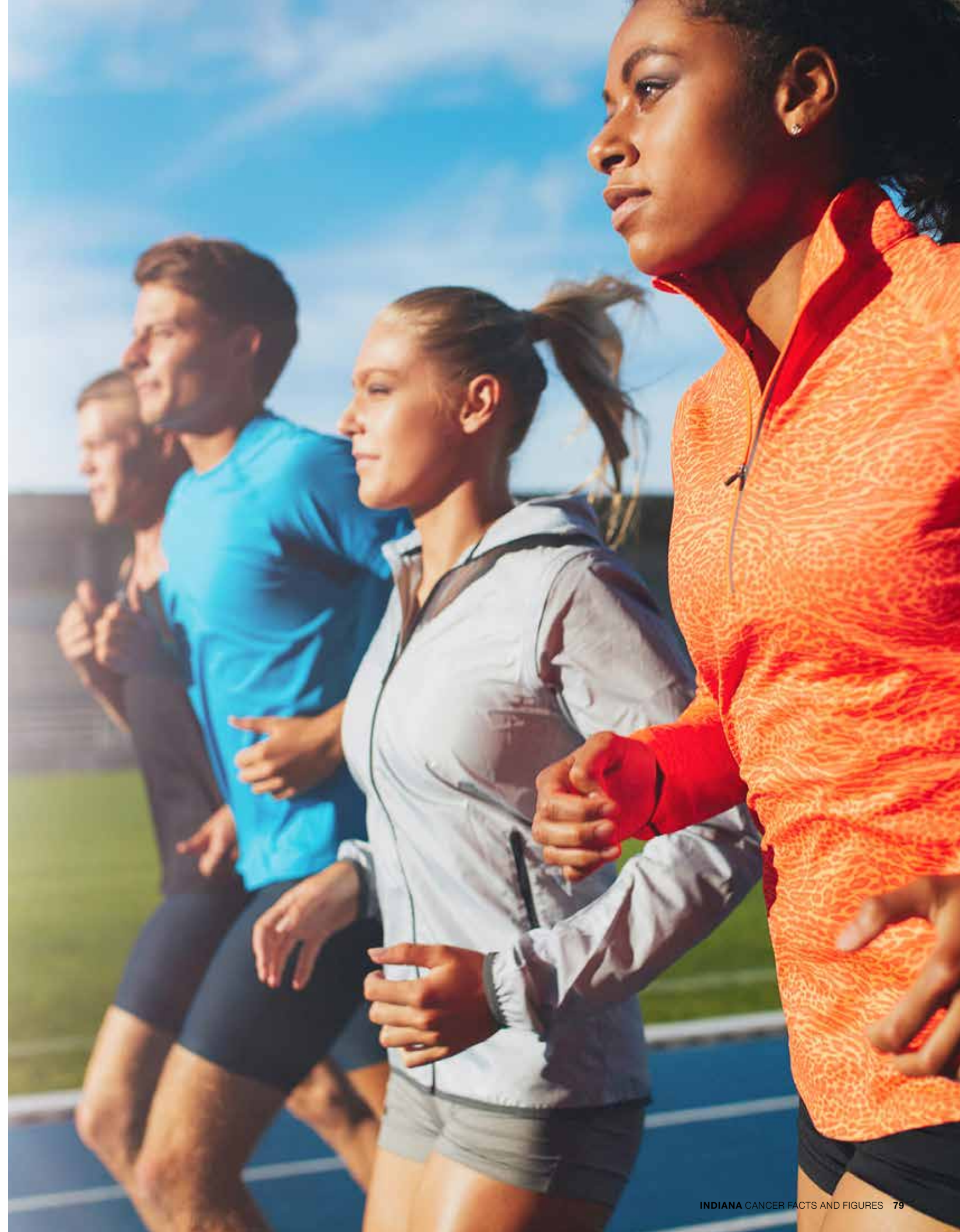
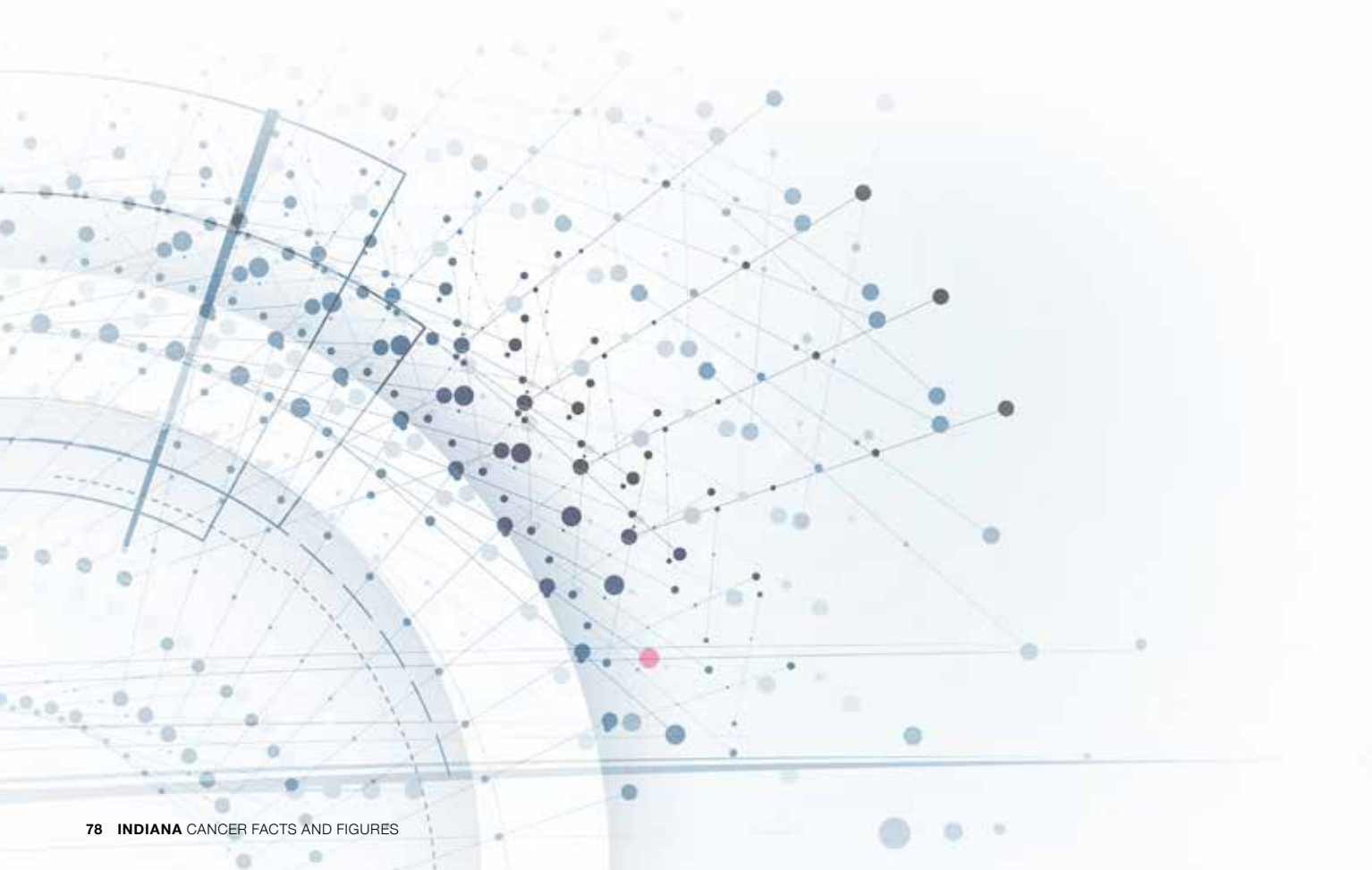
- **Smokers.** Approximately 80 percent of lung cancer deaths are related to smoking. An individual's risk for lung cancer increases as the duration of smoking and quantity of cigarettes smoked increase.<sup>2</sup> In the US, in 2016, approximately 38 million adults, or 17.1 percent of the population, smoked. The IN-BRFSS estimates that in 2016, 21.1 percent of adults in Indiana were current smokers.
- **Individuals exposed to secondhand smoke.** Tobacco smoke can harm all people—even those who do not smoke. Nonsmokers may come in contact with smoke in homes, cars, and public places such as bars or restaurants. There is no safe level of exposure to secondhand smoke. It is estimated that about 3,000 lung cancer deaths each year in the US are a result of secondhand smoke exposure.<sup>3</sup> In 2014, an estimated 5,840 nonsmoking adults were diagnosed with lung cancer as a result of secondhand smoke.<sup>4</sup> In Indiana, approximately 1,337 adults, children, and infants died in 2014 from diseases definitively tied to secondhand smoke.<sup>4</sup>
- **Individuals exposed to other cancer-causing agents.** A number of other factors are related to lung cancer, including exposure to radon, asbestos, chromium, cadmium, arsenic, radiation, air pollution, and diesel exhaust. Individuals who have occupational exposure in the fields of rubber manufacturing, painting, paving, and roofing are also at increased risk. Radon, which is released from soil and building materials, is the second-leading cause of lung cancer deaths.<sup>2</sup> People are usually exposed to radon when it seeps through cracks and gaps in buildings or homes; therefore, home radon testing is important in order to reduce the risk of exposure.<sup>5</sup>
- **Those with lower socioeconomic status.** The prevalence of smoking is higher in people of lower socioeconomic status, largely because marketing campaigns target this population. Furthermore, individuals of lower socioeconomic status are more at risk for workplace and environmental exposure to known carcinogens.<sup>2</sup>
- **Those living in certain geographic areas of the US.** Of all types of cancer, lung cancer has the widest range of death rates by state. For example, death rates were three times higher in Kentucky than in Utah. This is due to varied smoking rates between states. In 2016, 24.5 percent of adults in Kentucky smoked compared to 8.8 percent in Utah.<sup>2</sup> About 21.1 percent of adults in Indiana are current smokers.<sup>6</sup> Some of these differences also reflect variations in state tobacco control regulations.<sup>2</sup>
- **Men, especially African-American Men.** Men are more likely to develop lung cancer than women. Furthermore, African-American men are 20 percent more likely to develop lung cancer than their white, male counterparts.<sup>1</sup>

**Can Lung Cancer Be Detected Early?**—see the “Be Aware” box for additional information.

The ACS recommends that individuals aged 55 to 74, have a minimum 30-pack-year smoking history, and who currently smoke or have quit within 15 years, should consider annual lung screening.<sup>2</sup> As indicated by the National Cancer Institute’s National Lung Screening Trial, low-dose computed tomography (CT) screening can reduce the risk of death from lung cancer by 20 percent when compared to screening using standard chest x-rays. Certain types of lung cancers, such as adenocarcinomas and squamous cell carcinomas, can be detected at earlier stages with low-dose CT screening than with a chest x-ray.<sup>7</sup>

**What Factors Influence Lung Cancer Survival?**

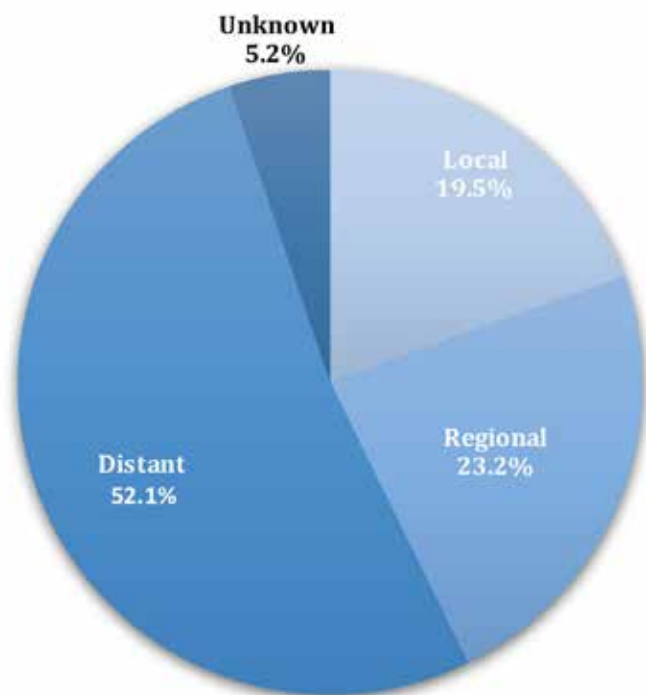
- Symptoms of lung cancer often do not arise until the cancer reaches an advanced, non-curable stage.<sup>2</sup> This negatively impacts a person’s likelihood of surviving.
- Five-year survival rates are highest (56 percent) for lung cancer when the cancer is localized in the lungs. However, only 16 percent of lung cancer cases in the US and 19.5 percent in Indiana are diagnosed at this early stage. More than half of people with lung cancer die within one year of their initial diagnosis.<sup>8</sup>
- Treatment options for lung cancer are dependent on the type of lung cancer. Small cell lung cancer is typically very aggressive, but less common, and accounts for about 13 percent of cases.<sup>7</sup> Non-small cell lung cancer makes up about 84 percent of cases. Depending on the type and stage of lung cancer, treatment can include surgery, radiation, chemotherapy, immunotherapy, and/or targeted therapy. Access to timely treatment is crucial in improving survival.<sup>2</sup>





**Figure 27. Percent of Lung Cancer Cases Diagnosed During Each Stage—Indiana, 2011–2015**

During 2011-2015, of the 27,125 Indiana residents who received a diagnosis of lung cancer, 5,283 (19.5%) were diagnosed in the local stage, 20,424 (75.3%) were diagnosed in the regional or distant stage, and 1,418 (5.2%) had unknown staging.



Note: Excludes *in situ*  
Source: Indiana State Cancer Registry.

## Be Aware!

### Common Signs and Symptoms of Lung Cancer

- Ongoing or worsening cough
- Blood in spit or phlegm
- Chest pain associated with coughing or deep breathing
- Hoarseness or voice changes
- Weight loss or decreased appetite
- Shortness of breath
- Fatigue
- Recurring infections, such as pneumonia or bronchitis<sup>1</sup>

*Although these symptoms can be caused by things other than lung cancer, it is important to have them checked out by your doctor.*

## Take Charge!

### What You Can Do to Help Prevent Lung Cancer

- Be smoke-free—Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free smoking cessation assistance.
- The lungs can gradually repair themselves if an individual stops smoking before cancer develops. Regardless of how long a person has smoked, quitting can help lower the risk for cancer and a multitude of other diseases.
- Reduce exposure to secondhand smoke.
- Have your home tested and treated for radon.
- Avoid exposure to cancer-causing chemicals.
- Eat a healthy diet, including fresh fruits and vegetables.<sup>2</sup>

### What the Community Can Do to Help Prevent Lung Cancer

- Promote smoke-free policies, smoke-free workplaces, and higher taxes on tobacco products.
- Support individuals in their efforts to quit smoking.
- Support efforts to reduce exposure to carcinogens known to cause lung cancer.
- Educate community members about lung cancer screening programs.
- Reduce barriers to health care access, such as those related to finances, transportation, health literacy, provider access, and insurance.



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## Melanoma/Skin Cancer

### Bottom Line

Skin cancer is the most prevalent cancer in the United States. There are two general types of skin cancer: melanoma and non-melanoma skin cancers (NMSC), which include basal cell and squamous cell carcinomas. Skin cancer is an uncontrolled growth and spread of cells or lesions in the epidermis, the outer layer of skin. Excessive exposure to ultraviolet (UV) radiation from the sun or other sources, like tanning beds, is the greatest risk factor for developing skin cancer. Overall, skin cancers affect more people than lung, breast, colon, and prostate cancers combined.<sup>1</sup>

According to the American Cancer Society (ACS), invasive melanoma accounts for 1 percent of all skin cancer cases, but causes the most skin cancer deaths. Nationally, in 2018, 91,270 new cases were expected to be diagnosed.<sup>1</sup> Additionally, one American dies of melanoma every hour. Overall, the lifetime risk of developing melanoma is approximately one in 38 for whites, one in 1,000 for African-Americans, and one in 172 for Hispanics.<sup>2</sup>

The number of NMSC cases is difficult to estimate because these cases are not required to be reported to state cancer registries. According to the ACS, a recent study estimated 5.4 million NMSC cases occurred among US residents in 2012.<sup>1</sup> Due to the limitations of the NMSC data, most of the data reported in this section is specific to melanoma.

## What is the Impact on Indiana Residents?

**Table 12. Burden of Melanoma\*—Indiana, 2011-2015**

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	1,330	18.6	1,521	20.7
<b>Indiana Deaths</b>	210	2.9	203	2.7

Note: Excludes *in situ*

\*Age-adjusted to the US 2000 Standard Population.

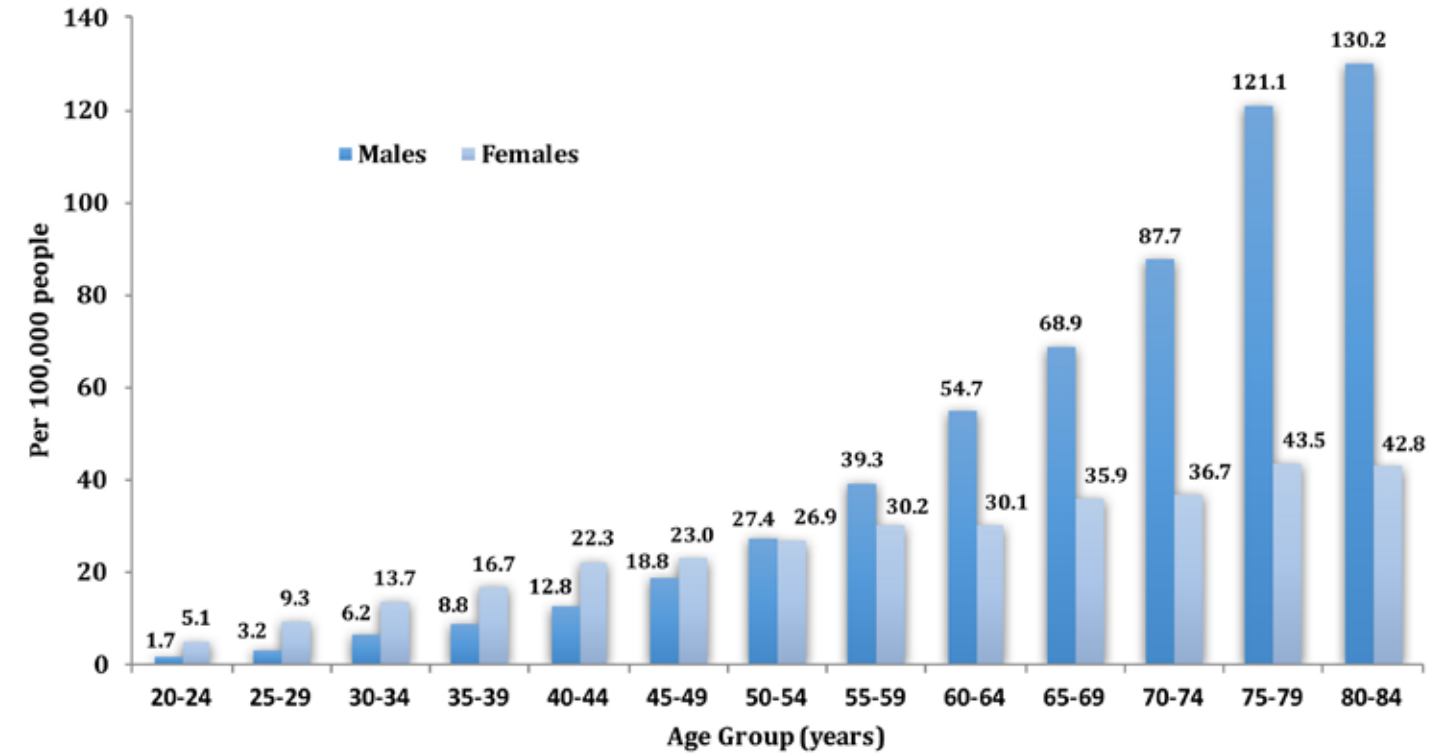
Source: Indiana State Cancer Registry.

## Who Gets Melanoma/Skin Cancer?

Everyone has some level of risk for developing skin cancer no matter their age, race or ethnicity. Some risk factors include:

- **Age.** During 2011 to 2015, 77 percent of melanoma cases occurred among Indiana residents aged 50 and older. However, nationally, melanoma is on the rise among younger people.
- **Sex.** Overall, during 2011 to 2015, the age-specific incidence rate for melanoma among Indiana males was 29 percent higher than among females. However, from ages 20 to 39, the incidence rate for females was higher than the rate for males. Among people aged 50 and older, males had higher rates than females.
- **Race.** During 2011 to 2015, the risk of melanoma was almost 28 times higher for whites in Indiana than for African-Americans; however, anyone can develop the disease.
- **Fair- to light-skinned complexion.** Freckles are an indicator of sun sensitivity and sun damage.
- **Hair and eye color.** People with natural blonde or red hair and people with blue or green eyes are more susceptible to a higher risk of developing melanoma.
- **Multiple or atypical nevi (moles).** People who have a large number of moles (more than 50) often have a higher risk of developing melanoma.
- **Family history.** The risk for developing melanoma is greater for someone who has had one or more close relatives diagnosed with the disease.
- **Excessive exposure to UV radiation from the sun and tanning beds.** The US Department of Health and Human Services and the International Agency of Research on Cancer panel has found that exposure to sun lamps or sunbeds is known to be a human carcinogen based on sufficient evidence of carcinogenicity from studies in humans.<sup>3</sup>
- **History of sunburn.** A sunburn at an early age can increase a person's risk for developing melanoma and other skin cancers with age.
- **Diseases that suppress the immune system.** People who have a weakened immune system or who are being treated with immunosuppressive medicines have an increased risk for melanoma.<sup>2</sup>
- **Those with history of basal cell or squamous cell skin cancers.**
- **Occupational exposure to coal tar, pitch, creosote, arsenic compounds, radium, or some pesticides.**

**Figure 28. Incidence of Melanoma Skin Cancer by Age Group and Sex\*—Indiana, 2011–2015**



Note: Excludes *in situ*

\*Age-specific rates

Source: Indiana State Cancer Registry.

## Can Skin Cancer be Detected Early?—see the “Be Aware” box for additional information.

The best way to detect skin cancer early is to recognize changes in skin growths or the appearance of new growths. Adults should thoroughly examine their skin each month. New or unusual lesions, or a progressive change in a lesion's appearance (size, shape, or color, for example), should be evaluated promptly by a trained health care provider.

Melanomas often start as small, mole-like growths that increase in size and may change color. Basal cell carcinoma might appear as growths that are flat or as small, raised pink or red, translucent, shiny areas that might bleed following minor injury. Squamous cell carcinoma may appear as growing lumps, often with a rough surface, or as flat, reddish patches that grow slowly.

## What Factors Influence Survival?

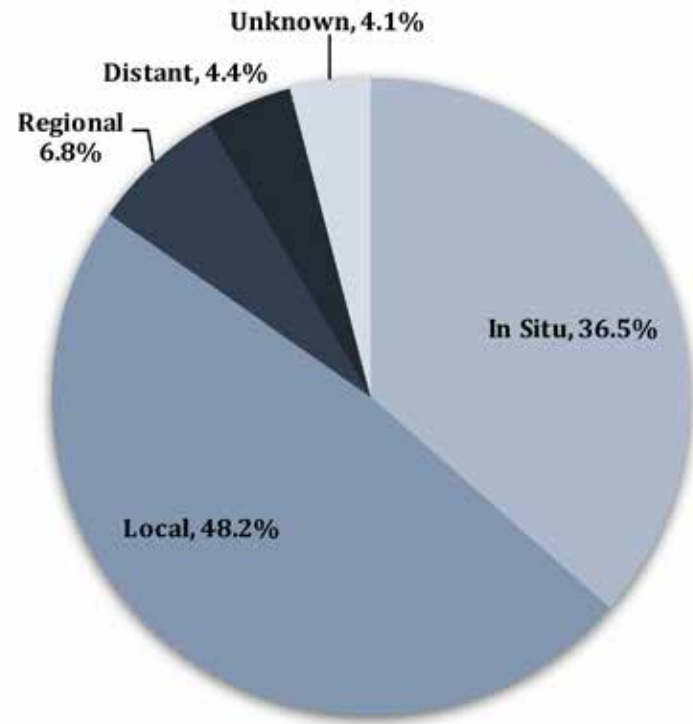
Most basal and squamous cell carcinomas can be cured, especially if the cancer is detected and treated in early stages. They may be removed in most cases by one of several methods including surgical excision, electrodesiccation and curettage (tissue destruction by electric current and removed by scraping with a curette), or cryosurgery (tissue destruction by freezing). Radiation therapy and certain topical medications may be used in some cases. Both basal and squamous cell carcinomas may spread throughout the body if left undetected and untreated.

Melanoma may be curable if detected and treated in its earliest stages (i.e. *in situ* or local). Treatment involves removing the primary growth and surrounding normal tissue. Sometimes a sentinel lymph node is biopsied to determine stage.<sup>1</sup> Additionally, extensive lymph node surgery may be needed if lymph node metastases are present. Treatment for advanced cases of melanoma includes palliative surgery, newer targeted or immunotherapy drugs, and sometimes chemotherapy and/or radiation therapy. The treatment of advanced melanoma has favorably changed with the use of targeted and immunotherapy drugs.

Melanoma is more likely than other skin cancers to spread internally and also to distant organs (i.e. lung, bones, liver, and brain). According to the ACS, for localized melanoma that has not spread, the five-year US survival rate is 99 percent. When melanoma has spread regionally, the five-year survival rate is 63 percent. When melanoma has spread distantly, the five-year survival rate declines to just 20 percent.<sup>1</sup> See Figure 29 for melanoma diagnosis by stage.

**Figure 29. Percent of Melanoma Cases Diagnosed During Each Stage\*—Indiana, 2011–2015**

During 2011-2015, of the 10,476 Indiana residents who received a diagnosis of in situ or invasive melanoma 8,873 (84.7%) were diagnosed in the in situ or local stage combined, 1,175 (11.2%) were diagnosed in the regional or distant stage combined, and 428 (4.1%) had unknown staging.



\*Includes invasive and *in situ* cases  
Source: Indiana State Cancer Registry.

## Be Aware!

### Common Signs and Symptoms of Melanoma

A simple ABCDE rule outlines some general warning signs of melanoma:

- **A** = Asymmetry: One half of the mole (or lesion) does not match the other half.
- **B** = Border: Border irregularity where the edges are ragged, notched or blurred.
- **C** = Color: The pigmentation is not uniform, with variable degrees of tan, brown, or black.
- **D** = Diameter: The diameter of a mole or skin lesion is greater than six millimeters (or the size of a pencil eraser).
- **E** = Evolution: When existing moles change in shape, size, or color. Any sudden increase in size of an existing mole should be checked.

**NOTE:** Melanoma might appear differently than what is described in the ABCDE rule, so discuss any changes to existing moles or new growths on the skin with your health care provider. Melanoma may also present itself as a nodule under the skin.

# Take Charge!

## What You Can Do to Help Prevent Skin Cancer

- Limit or avoid exposure to the sun during peak hours (10 a.m. to 4 p.m.).
- Wear sunscreen with a Sun Protection Factor (SPF) of 30 or higher that protects you from both UVA and UVB rays. These are called broad spectrum sunscreens.
- Make sure that the sunscreen is not expired. It should be used 15 to 20 minutes before going outdoors so that it may absorb into the skin.
- The average adult should use sunscreen on all exposed skin and reapply every two hours or more if you are swimming or sweating.
- Wear clothing that has built-in SPF in the fabric or wear protective clothing, such as long sleeves and long pants (tightly woven dark fabrics protect your skin better than lightly colored, loosely woven fabrics).
- Wear a hat that protects your scalp and shades your face, neck, and ears.
- Avoid use of tanning beds and sun lamps.
- Wear sunglasses to protect your eyes from ocular melanoma (melanoma of the eye).
- ALWAYS protect your skin. Your skin is still exposed to UV rays on cloudy days and during the winter months. Use extra caution around water, snow, and sand as they reflect the sun's UV rays.

## Always Remember: Protect Your Skin. Protect Yourself. Protect Your Life.

Learn more through Outrun the Sun, Inc. ([www.outrunthesun.org](http://www.outrunthesun.org)), Indiana's only nonprofit organization dedicated to supporting skin cancer education and melanoma research.

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## Prostate Cancer

### Bottom Line

The prostate is an exocrine gland in the male reproductive system. Excluding all types of skin cancer, prostate cancer is the most commonly diagnosed cancer among men in the United States, and is the second leading cause of cancer death. Approximately one in seven men in the US will be diagnosed with prostate cancer and one in 39 will die from it.<sup>1</sup> Most prostate cancers are adenocarcinomas, or cancers that arise in cells that make and release mucus or fluids. Prostate cancer tends to grow slowly, and most men with prostate cancer are aged 65 years or older and do not die from prostate cancer.<sup>2</sup> It is important for men to talk with their health care providers about the risks and benefits of screening tests for prostate cancer.<sup>3</sup>

### What is the Impact on Indiana Residents?

Table 13. Burden of Invasive Prostate Cancer\*—Indiana, 2011-2015

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	3,321	83.8	3,126	75.5
<b>Indiana Deaths</b>	587	15.5	579	14.7

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

### Who Gets Prostate Cancer?

- **Age.** The chance of developing prostate cancer rises rapidly after age 50, with two out of three new diagnoses occurring among men over age 65.<sup>4</sup> About 57 percent of all prostate cancer cases are diagnosed in men 65 years of age and older, and 97 percent occur in men 50 and older.<sup>1</sup>
- **Race and ethnicity.** African-American men are 74 percent more likely to develop prostate cancer [Table 14] than any other racial or ethnic group, and they are more than twice as likely to die from the disease compared to white men.<sup>1</sup> However, in Indiana, this disparity between African-American and white males appears to be decreasing [Figure 30].
- **Family history.** Men who have a first-degree relative (father, brother, son) with a history of prostate cancer are two to three times more likely to develop the disease.<sup>1</sup> Risk increases if more family members are diagnosed with prostate cancer.<sup>5</sup>

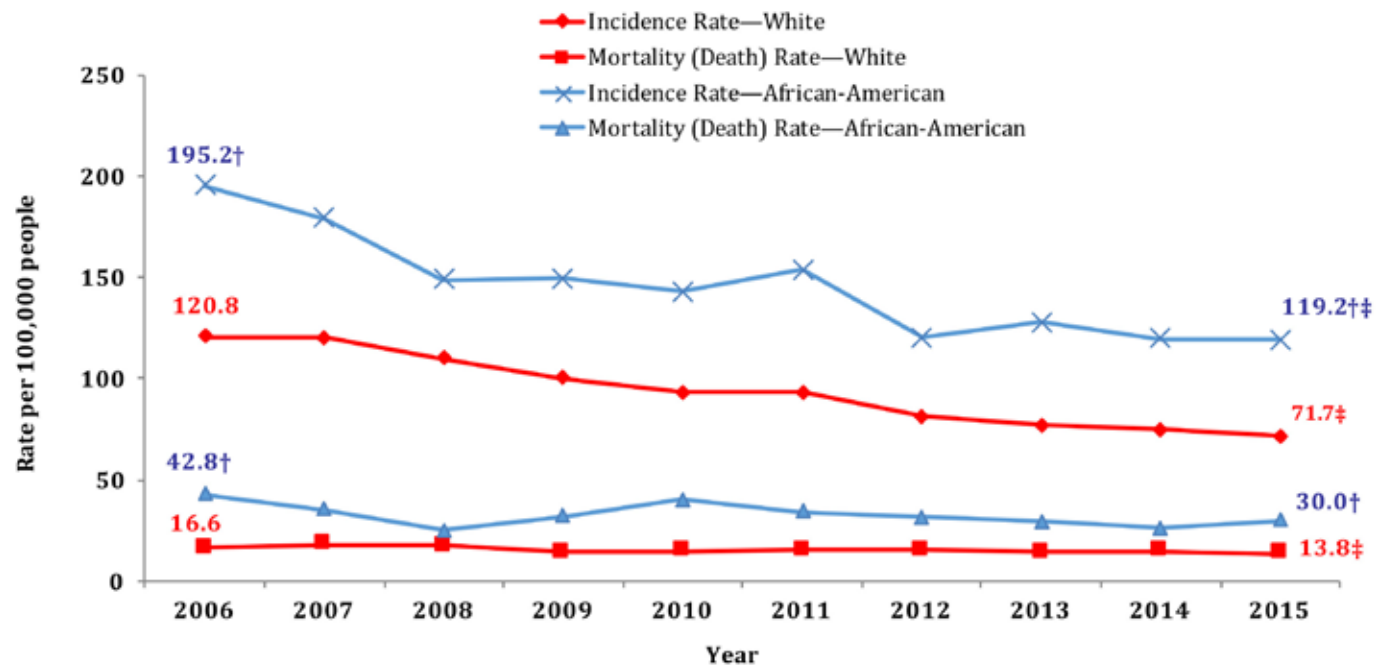
Table 14. Probability of Developing Prostate Cancer Over Selected Age Intervals by Race\*—United States, 2010–2012

Age	White	African-American
30 to 39	0.01 (1 in 12,288)	0.03 (1 in 4,000)
40 to 49	0.27 (1 in 390)	0.70 (1 in 138)
50 to 59	1.93 (1 in 51)	3.70 (1 in 25)
60 to 69	5.52 (1 in 18)	8.94 (1 in 11)
70 to 79	6.48 (1 in 15)	9.64 (1 in 10)
Lifetime risk	13.15 (1 in 7)	18.15 (1 in 5)

\*For people free of cancer at beginning of age interval. Percentages and “1 in” numbers might not be equivalent because of rounding.

Source: SEER Cancer Statistics Review, 1975-2014. Lifetime Risk Tables. Accessed at [https://seer.cancer.gov/archive/csr/1975\\_2012/results\\_merged/topic\\_lifetime\\_risk.pdf](https://seer.cancer.gov/archive/csr/1975_2012/results_merged/topic_lifetime_risk.pdf) on May 25, 2017.

**Figure 30. Prostate Cancer Incidence and Mortality (Death) Rates by Race\*—Indiana, 2006–2015**



\*Age-adjusted to the US 2000 Standard Population.

†Significantly elevated (P<.05) compared to whites.

‡Significantly lower (P<.05) compared to 2006.

Source: Indiana State Cancer Registry.

**Can Prostate Cancer be Detected Early?—see the “Be Aware” box for additional information.**

Tests commonly used to screen for prostate cancer include:<sup>4</sup>

- Digital Rectal Exam (DRE). A health care provider inserts a gloved, lubricated finger into the rectum to feel the prostate. This allows the examiner to estimate the size of the prostate and feel for any lumps or other abnormalities.
- Prostate Specific Antigen (PSA) test. This is a blood test that measures levels of PSA, a substance made by the prostate. High PSA levels may indicate the presence of prostate cancer, but may also indicate other non-cancerous conditions.
- The American Cancer Society (ACS) recommends that beginning at the age of 50, men who are at average risk of prostate cancer and have a life expectancy of at least 10 years have a conversation with their health care provider about the benefits, limitations, risks, and uncertainties of prostate cancer screening.<sup>6</sup>
- Men should have an opportunity to make an informed decision about whether or not to be tested based on their personal values and preferences.
- Men at high risk of developing prostate cancer, such as African-American men or men with a close relative diagnosed with prostate cancer prior to age of 65, should have this discussion with their health care provider beginning at age 45.
- Men at even higher risk (men with one or more first-degree relatives diagnosed with prostate cancer at an early age) should have this discussion with their health care provider at age 40.

**Risks and Benefits of Prostate Cancer Screening**

Making decisions about screening tests can be difficult and not all medical experts agree that screening for prostate cancer will save lives. Men should discuss the benefits and risks of prostate cancer screening with their health care providers.

- Potential benefits of prostate cancer screening include:
  - Early detection
  - Increased treatment effectiveness
- Potential risks of prostate cancer screening include:
  - False-positive test results indicating that a man has prostate cancer when he does not. This can potentially lead to unnecessary tests and anxiety.
  - False-negative test results indicating there is no cancer when there really is. This may cause a man to delay seeking medical care even if he has symptoms.
  - Over-diagnosis. Some prostate cancers may never cause symptoms and may never become life threatening. Not all forms of prostate cancer need treatment. Finding these types of cancer is called over-diagnosis because it is not clear whether early detection and treatment of these types of cancers will help a man live longer than if no treatment were given.
  - Some treatments for prostate cancer, such as radical prostatectomy and radiation therapy, can have long-term side effects such as urinary incontinence (inability to control the flow of urine, resulting in leakage) and erectile dysfunction (inability to keep an erection).<sup>7</sup>
  - There is evidence that statins, a class of drugs often prescribed by doctors to help lower cholesterol, may lower PSA levels.<sup>8</sup> This could lead to false-negative test results and complicate prostate cancer detection. Men taking statins should discuss the potential impact of these medications on PSA test results with their health care providers.

**Prostate Cancer Screening Considerations**

- Given the potential risks linked to prostate cancer screening, it is important for men to talk with their health care providers to become informed decision makers. Each man should:
  - Understand his risk of prostate cancer
  - Understand the risks, benefits, and alternatives to screening
  - Participate in the decision of whether to be screened or not
  - Make a decision consistent with his preferences and values

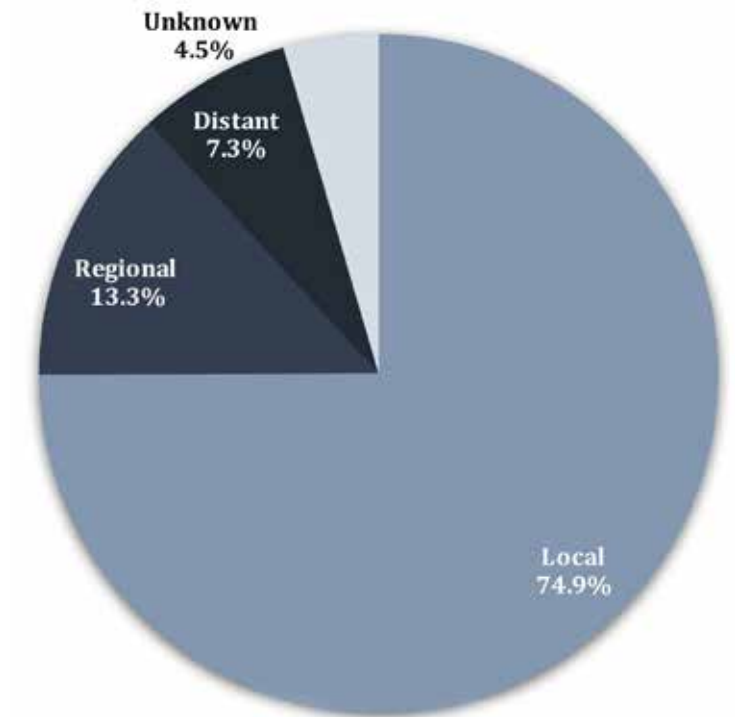
## What Factors Influence Prostate Cancer Survival?

- **Stage of diagnosis.** After prostate cancer has been diagnosed, tests are performed to determine whether the cancer cells are confined within the prostate (localized disease) or have spread to other parts of the body (regional or distant disease). The grade assigned to the tumor, typically called the Gleason Score, indicates the likely aggressiveness of the cancer.
- **Treatment options** vary depending on a man's age, stage, and grade of cancer, and might include:<sup>7</sup>
  - **Active surveillance (watchful waiting).** Prostate cancer is closely monitored by performing the PSA and DRE tests regularly. Treatment occurs only if and when the prostate cancer causes symptoms or shows signs of growing. This can be more appropriate for men with less aggressive tumors and older men.
  - **Surgery (radical prostatectomy).** Radical prostatectomy is surgery to remove the prostate completely, as well as the surrounding tissue.
  - **Radiation therapy.** Radiation destroys cancer cells, or prevents them from growing, by directing high-energy X-rays (radiation) at the prostate. There are two types of radiation therapy:
    - **External radiation therapy.** A machine outside the body directs radiation at the cancer cells.
    - **Internal radiation therapy (brachytherapy).** Radioactive seeds or pellets are surgically placed into or near the cancer to destroy the cancer cells.
  - **Hormone therapy.** This treatment, called androgen deprivation therapy (ADT), alters the effects of male hormones on the prostate through medical or surgical castration (elimination of testicular function) or administration of antiandrogen medications.
  - **Cryotherapy.** This treatment involves the controlled freezing of the prostate gland in order to destroy cancerous cells.
- **Overall survival.** The majority (88.3 percent) of prostate cancers are discovered at local or regional stages.<sup>1</sup> In the US, the five-year relative survival rate for local or regional prostate cancers is close to 100 percent, and is 28 percent for distant-stage disease.<sup>1</sup>

Figure 31. Percent of Prostate Cases Diagnosed During Each Stage\*—Indiana, 2011-2015

During 2011-2015, of the 16,604 Indiana residents who received an invasive prostate cancer diagnosis, 12,443 (74.9%) were diagnosed in the local stage, 3,409 (20.6%) were diagnosed in the regional or distant stage, and 752 (4.5%) had unknown staging.

\*Only includes invasive cases; *in situ* cases are not reportable  
Source: Indiana State Cancer Registry.





# Be Aware!

## Common Signs and Symptoms of Prostate Cancer

- According to the ACS, in early stages, prostate cancer may not cause symptoms, and some men may have no symptoms at all. In advanced stages, prostate cancer may cause men to urinate more frequently or have a weaker flow of urine, but these symptoms can also be caused by benign prostate conditions.
- According to the ACS, more advanced prostate cancers may cause symptoms such as:<sup>9</sup>
  - Trouble urinating, including a weak urine flow, burning, or pain while urinating
  - Frequent urination, especially at night
  - Inability to empty the bladder completely
  - Blood in the urine or semen
  - Painful ejaculation
  - Trouble having an erection
  - Pain in the back, hips, pelvis, chest, or other areas from cancer that has spread to the bones

# Take Charge!

## What You Can Do to Help Prevent Prostate Cancer

- Avoiding cancer risk factors in general, such as smoking, being overweight, and not getting enough exercise, may help prevent prostate cancer. It is important to:
  - Maintain a healthy overall diet and healthy body weight.
  - Meet recommended levels of physical activity. (<http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html>)

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## Cancer Facts and Figures for African-Americans

### Bottom Line

With 39.7 million Americans identifying as non-Hispanic black or African-American, they are the second largest racial and ethnic minority group in the United States. It is estimated that in 2016, African-Americans accounted for 13.3 percent of the total US population and 9.7 percent of Indiana's population.<sup>1</sup> Of all racial and ethnic groups in the US, African-Americans have the highest death and shortest survival rates for most cancers. These racial disparities are not attributable to biological differences or one specific cause; rather, the complex interplay of social determinants of health, including socioeconomic status, income, housing, education, access to health care, insurance, treatment, screening, and early detection—create these significant differences.<sup>2</sup>

## What is the Impact of Cancer on African-Americans in Indiana?

Table 15. Burden of Cancer among African-Americans\* —Indiana, 2011–2015

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	2,524	475.3	2,514	448.1
<b>Indiana Deaths</b>	1,034	209.4	998	189.2

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

Table 16. Leading Sites of New Cancer Cases and Deaths among African-American Indiana Residents by Sex, 2015

### Number (%) of New Cases

Males			Females		
Prostate	319	27.17%	Breast	387	28.88%
Lung and Bronchus	168	14.31%	Lung and Bronchus	199	14.85%
Colon and Rectum	118	10.05%	Colon and Rectum	112	8.36%
Kidney and Renal Pelvis	66	5.62%	Corpus and Uterus, Not Otherwise Specified	89	6.64%
Liver and Intrahepatic Bile Duct	45	3.83%	Brain and Other Nervous System	62	4.63%
Urinary Bladder	42	3.58%	Pancreas	45	3.36%
Non-Hodgkin Lymphoma	41	3.49%	Kidney and Renal Pelvis	42	3.13%
Brain and Other Nervous System	40	3.41%	Thyroid	40	2.99%
Pancreas	34	2.90%	Non-Hodgkin Lymphoma	39	2.91%
Myeloma	33	2.81%	Myeloma	35	2.61%
Other	268	22.83%	Other	290	21.64%
All Sites	1,174		All Sites	1,340	

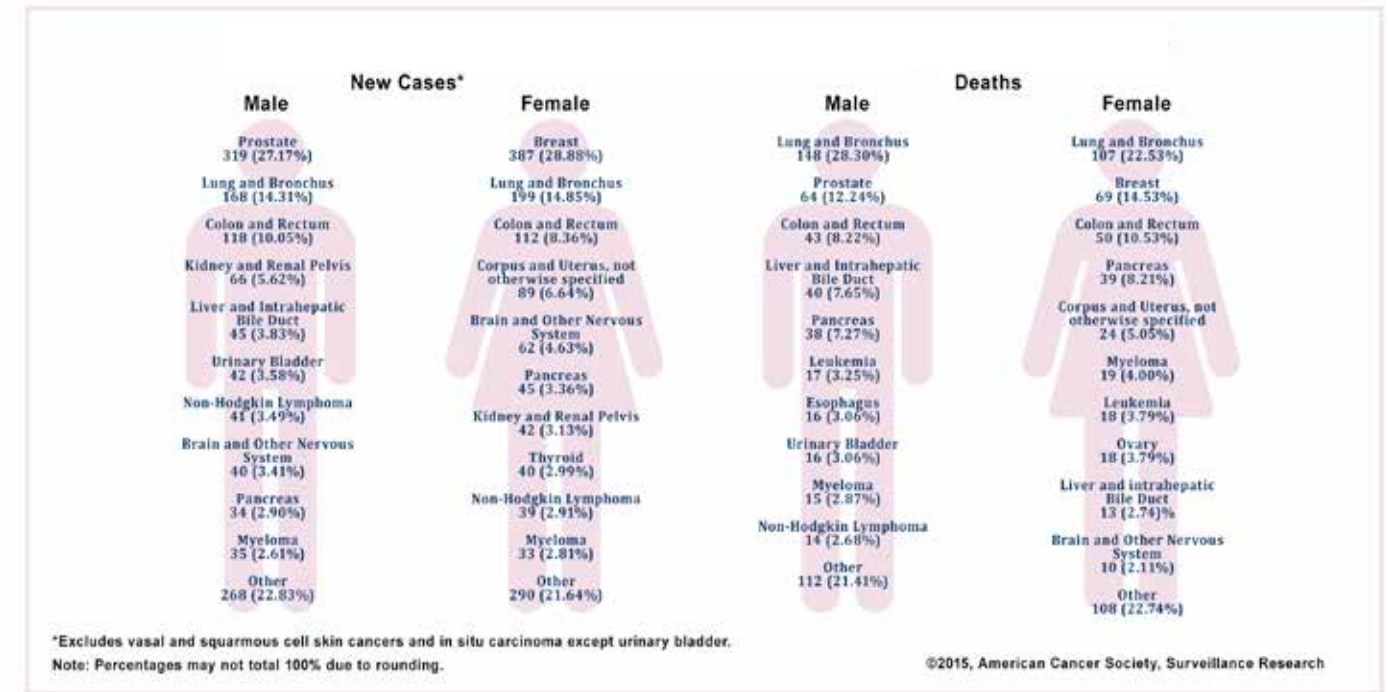
**Table 16. Leading Sites of New Cancer Cases and Deaths among African-American Indiana Residents by Sex, 2015 (continued)**

**Number (%) of New Cases**

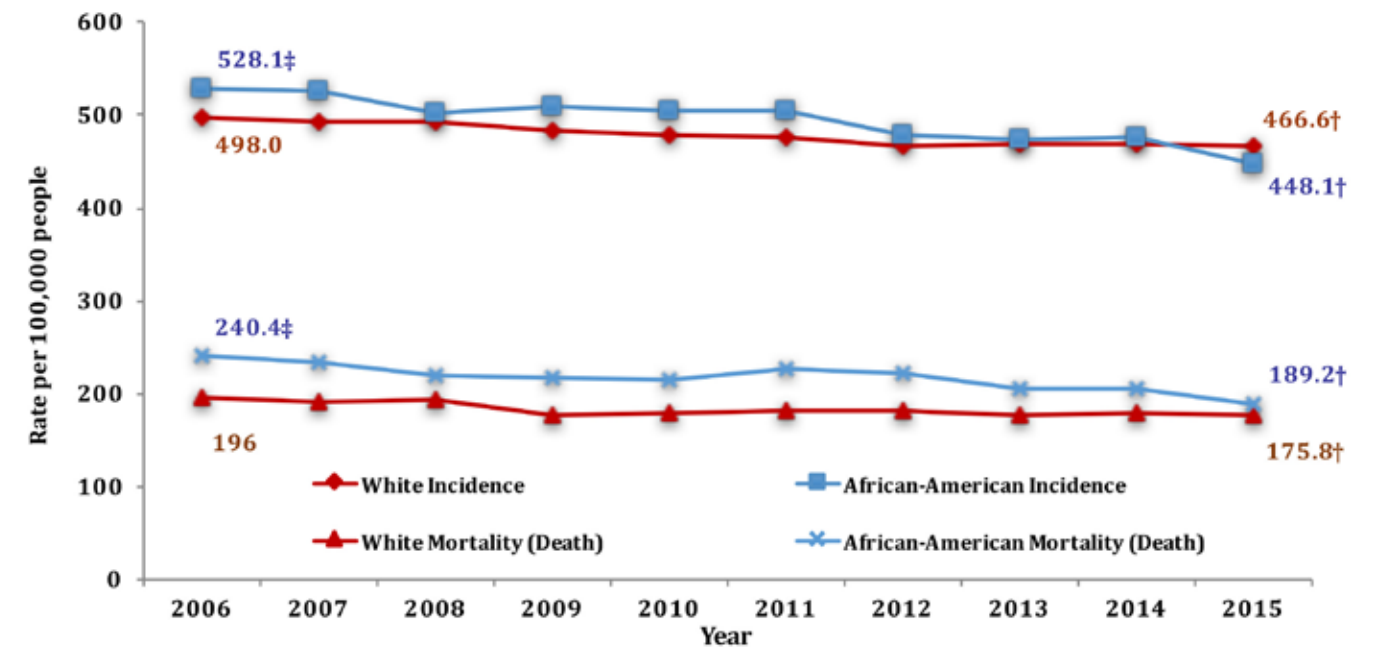
Males			Females		
Lung and Bronchus	148	28.30%	Lung and Bronchus	107	22.53%
Prostate	64	12.24%	Breast	69	14.53%
Colon and Rectum	43	8.22%	Colon and Rectum	50	10.53%
Liver and Intrahepatic Bile Duct	40	7.65%	Pancreas	39	8.21%
Pancreas	38	7.27%	Corpus and Uterus, Not Otherwise Specified	24	5.05%
Leukemia	17	3.25%	Myeloma	19	4.00%
Esophagus	16	3.06%	Leukemia	18	3.79%
Urinary Bladder	16	3.06%	Ovary	18	3.79%
Myeloma	15	2.87%	Liver and Intrahepatic Bile Duct	13	2.74%
Non-Hodgkin Lymphoma	14	2.68%	Brain and Other Nervous System	10	2.11%
Other	112	21.41%	Other	108	22.74%
<b>All Sites</b>	<b>523</b>		<b>All Sites</b>	<b>475</b>	

Source: Indiana State Cancer Registry.

**Figure 32. Leading Sites of New Cancer Cases and Deaths among African-Americans, 2015**



**Figure 33. Cancer Incidence and Mortality (Death) Rates by Race\*—Indiana, 2006-2015**



\*Age-adjusted to the US 2000 Standard Population.

†Rate is significantly lower than in 2006.

‡African-American rate is significantly higher (P<.05) than the white rate.

Source: Indiana State Cancer Registry.

## What Types of Cancer Impact the African-American Community the Most?

According to the American Cancer Society (ACS), prostate cancer is the most common cancer diagnosis for African-American men, followed by lung and colorectal cancers. The three most prevalent cancer diagnoses for African-American women are breast, lung, and colorectal cancers, respectively. Overall, the four most common cancers, breast, prostate, colorectal, and lung, make up more than half of all cancer cases in the African-American population. In terms of cancer-related deaths, African-Americans experience the highest mortality from lung cancer compared to other ethnic groups. Prostate and breast cancer are the second-leading causes of cancer deaths for African-American men and women, respectively. Colorectal cancer is the third-most common cause of cancer death for both sexes.<sup>2</sup>

## What are the Cancer Disparities in Indiana Relating to Race and Ethnicity?

The following data were collected from the Indiana State Cancer Registry and the Centers for Disease Control and Prevention Wonder US Cancer Statistics Database for state and national rates, respectively.

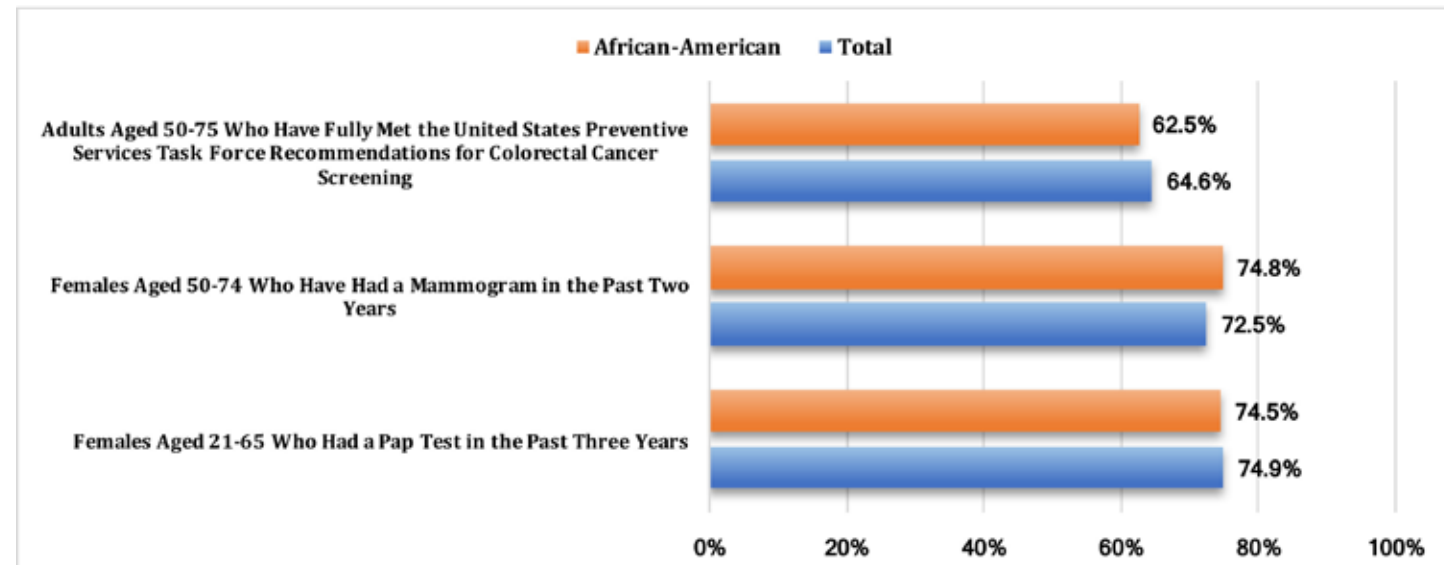
- **Colon and rectum (Colorectal).** In Indiana, during 2010–2014, the incidence rate among African-Americans was higher than the national rate (48.4 versus 46.7 cases per 100,000 people, respectively). During that same time period, the mortality rate in Indiana was higher than the national rate (21.4 versus 20.0 deaths per 100,000 people, respectively). In Indiana, during 2011 to 2015, African-Americans compared to whites had a 6.8 percent higher incidence rate (45.8 versus 42.8 cases per 100,000 people, respectively) and a 29.5 percent higher mortality rate for colorectal cancer (21.0 deaths versus 15.6 deaths per 100,000 people, respectively).
- **Lung.** In Indiana, during 2010 to 2014, the incidence rate among African-Americans was higher than the national rate (76.7 versus 63.9 cases per 100,000 people, respectively). During that same time period, the mortality rate in Indiana was higher than the national rate (60.2 versus 48.0 deaths per 100,000 people, respectively). In Indiana, during 2011 to 2015, African-Americans compared to whites had a 0.7 percent higher incidence rate (73.9 versus 73.4 cases per 100,000 people, respectively) and a 6.7 percent higher mortality rate for lung cancer (57.2 versus 53.5 deaths per 100,000 people, respectively).
- **Prostate.** In Indiana, during 2010–2014, the incidence rate among African-Americans was lower than the national rate (132.6 versus 183.0 cases per 100,000 males, respectively). During that same time period, the mortality rate in Indiana was lower than the national rate (32.2 versus 42.0 deaths per 100,000 males, respectively). In Indiana, during 2011–2015, African-Americans compared to whites had a 46.7 percent higher incidence rate (127.8 versus 79.4 cases per 100,000 people, respectively) and a 69.3 percent higher mortality rate for prostate cancer (30.3 deaths versus 14.7 deaths per 100,000 people, respectively).
- **Female breast.** In Indiana, during 2010 to 2014, the incidence rate among African-Americans was higher than the national rate (138.9 versus 122.8 cases per 100,000 females, respectively). During that same time period, the mortality rate in Indiana was higher than the national rate (32.6 versus 29.2 deaths per 100,000 females, respectively). In Indiana, during 2011 to 2015, African-Americans compared to whites had a 5.5 percent higher incidence rate (137.1 versus 129.8 cases per 100,000 people, respectively) and a 31.7 percent higher mortality rate for breast cancer (31.8 deaths versus 23.1 deaths per 100,000 people, respectively).
- **Underrepresentation in research and clinical trials.** A disconnection exists between the burden of disease and representation in research;<sup>3</sup> many of the same racial and ethnic groups who experience cancer disparities in cancer incidence and mortality are also underrepresented in cancer research clinical trials.<sup>4</sup> Study participants representative of the larger US population help researchers to better understand the combination of genetic influences, environmental exposures, and social factors that all racial and ethnic groups experience.<sup>3</sup>
- **Disparities in hospice and palliative care.** Studies show that minorities receive lower-quality palliative care indicated by decreased satisfaction, communication, and pain management. Evidence suggests that the stated preferences for care among African-Americans with advanced-staged cancers are not consistently matched to the treatment they receive. Factors contributing to these disparities may include gaps in the understanding of palliative care among racial and ethnic minorities. Additionally, African-Americans may be wary of the health care system due to past injustices in medical research. Research investigating disparities in racial and ethnic minorities for hospice and palliative care is essential.<sup>5</sup>

## Can Cancer be Prevented?

- **Body weight, diet, and physical activity.** Being overweight or obese is a major risk factor for developing cancer. In the US, the obesity epidemic accounts for 15 to 20 percent of total cancer deaths.<sup>3</sup> According to the ACS, increased body weight is associated with cancers of the breast, colon and rectum, endometrium, kidney, pancreas, adenocarcinoma of the esophagus, liver, cervix, prostate, ovary, gallbladder, non-Hodgkin lymphoma, and multiple myeloma. African-American women have the highest body mass index (BMI) of all sex-racial/ethnic groups in Indiana. When compared to white women, African-American women have similar rates of being overweight, however, African-American women have a higher prevalence of obesity than white women (50.8 and 31 percent, respectively). The prevalence of being overweight and obese for African-American and white men is similar. In 2014, 26 percent of African-Americans were living below the federal poverty level, as compared with 10 percent of non-Hispanic whites.<sup>2</sup> People of lower socioeconomic status are less likely to have opportunities to engage in physical activity and are less likely to have access to fresh fruits and vegetables, which are factors that reduce cancer risk.
- **Tobacco.** Smoking persists as the most preventable cause of death and accounts for approximately 40 percent of all cancers diagnosed in the US.<sup>6</sup> Smoking puts a person at increased risk for developing cancers of the oral cavity, pharynx, larynx, lung, esophagus, pancreas, uterine cervix, kidney, bladder, stomach, colon and rectum, and liver, as well as acute myeloid leukemia.<sup>2</sup> In 2016, 27.7 percent of African-American men and 14 percent of African-American women were current cigarette smokers compared to 20 percent of white men and 18 percent of white women.<sup>2</sup>
- **Health care access.** According to the ACS, access to health care is key to cancer prevention, screening, treatment, and survival. Lower socioeconomic status is a major barrier to health care, as individuals may lack adequate health insurance, lack access to preventive or treatment services, and have reduced health literacy to understand essential health information. People with no health insurance or Medicaid coverage are more likely to be diagnosed with cancer at later stages and are more likely to die of cancer compared to their counterparts with private health insurance. African-Americans bear a disproportionate burden of lacking health insurance, as the percentage of uninsured for those aged 18 to 64 years in 2016 was 13.2 percent of non-Hispanic African-Americans compared to 9.9 percent of non-Hispanic whites aged 18 to 64 years.<sup>2</sup>
- **Infectious diseases.** There are racial disparities in infectious diseases which in turn impact cancer disparities. Hepatitis B (HBV) and hepatitis C (HCV) are more common among non-Hispanic African-Americans than people of other racial and ethnic groups. Although African-Americans comprise 12 percent of the total US population, they experience 44 percent of all new Human Immunodeficiency Virus (HIV) infections.<sup>2</sup> As of 2015, in Indiana, African-Americans account for 36.8 percent of persons living with HIV.<sup>7</sup>

## Can Cancer Be Detected Early?

Figure 34. Cancer Screening Prevalence for African-Americans\*—Indiana, 2016



Source: 2016 Indiana Behavioral Risk Factor Surveillance System

## What Factors Influence Cancer Survival?

African-Americans have lower five-year survival rates than whites for most cancer sites at all stages of diagnosis. These differences may be attributed to barriers that prevent access to timely, quality medical care, such as delayed diagnosis after screenings and disparities in treatment.

# Take Charge!

- Maintain a healthy body weight.
- Engage in physical activity.
- Eat a healthy diet, including fresh fruits and vegetables.
- Be smoke-free—Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free smoking cessation assistance.
- Find and engage with a primary health care provider and regularly talk about cancer screening options and risk-reduction.
- Seek treatment early and avoid delaying care, if diagnosed with cancer.

# Take Charge!

## What the Community Can Do to Help Prevent Cancer and Improve Care Among African-Americans

- Become informed about racial disparities and social determinants of health.
- Promote cultural competency among health care providers, and support the development of culturally relevant resources. If you are a health care provider, participate in cultural competency education.
- Support increased opportunities for health care providers who are members of minority racial and ethnic groups.
- Encourage and/or conduct research that includes and addresses the needs of all racial and ethnic groups.
- Implement culturally-competent patient navigator programs, which help guide patients and their caregivers through their cancer journey and aim to eliminate barriers to timely cancer detection, diagnosis, and treatment within the health care system.

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## Cancer Facts and Figures for Hispanics

### Bottom Line

As of 2015, there were 56 million Americans who identified as Hispanic, making up 17.6 percent of the total US population.<sup>1</sup> In Indiana, in 2016, there were an estimated 429,522 Hispanic residents, making up 6.5 percent of the population.<sup>2</sup> According to the American Cancer Society (ACS), it is estimated that one in three Hispanics will be diagnosed with cancer in their lifetime. The lifetime probability of dying from cancer is approximately one in five for Hispanic men and one in six for Hispanic women.<sup>1</sup> Cancer was the cause of 19 percent of deaths of Hispanics in Indiana in 2016, making it the leading cause of death.<sup>1</sup>

The following Indiana State Cancer Registry data reflect the population in Indiana based on those who chose to self-identify as Hispanic at the time of medical intake.

## What is the Impact of Cancer among Hispanics in Indiana?

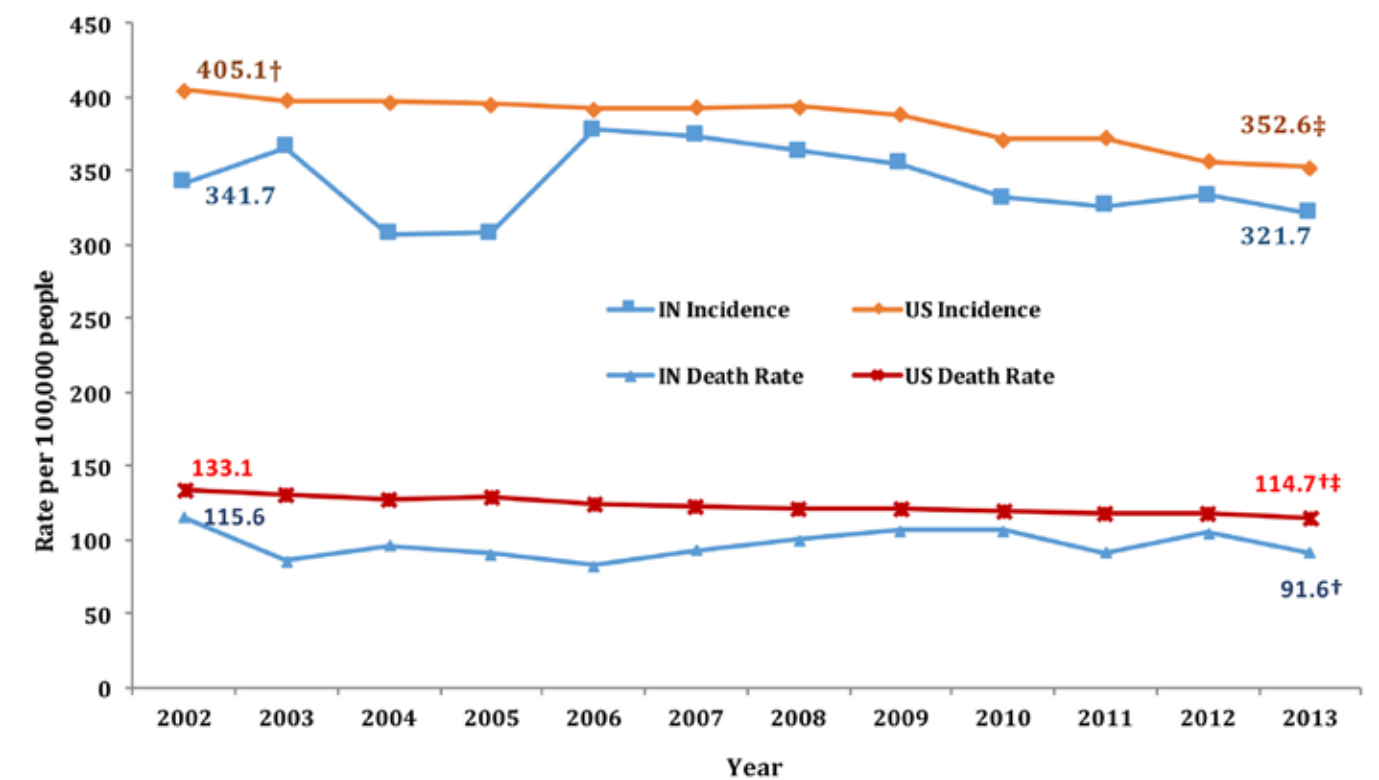
Table 16. Burden of Cancer among Hispanics\* –Indiana, 2011–2015

	Average number of cases per year (2011-2015)	Rate per 100,000 people (2011-2015)	Number of cases (2015)	Rate per 100,000 people (2015)
<b>Indiana Incidence</b>	515	229.0	567	225.7
<b>Indiana Deaths</b>	163	82.3	198	88.5

\*Age-adjusted to the US 2000 Standard Population.

Source: Indiana State Cancer Registry.

Figure 35. Cancer Incidence and Mortality (Death) Rates for Hispanics\* – Indiana and US, 2002-2013



\*Age-adjusted to the US 2000 Standard Population.

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

‡Rate is significantly lower than in 2002.

Source: United States Cancer Statistics: 1999 - 2013 Incidence, WONDER Online Database. United States Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; 2016. Accessed at <http://wonder.cdc.gov/cancer-v2013.html> on July 20, 2017.

## What are the Cancer Disparities in Indiana Relating to Race and Ethnicity?

The following data were collected from the Indiana State Cancer Registry and the Centers for Disease Control and Prevention WONDER US Cancer Statistics Database for state and national rates, respectively. In Indiana, for 2011 through 2015, the cancer incidence rate for Hispanics was lower than the incidence rate for whites (253.5 versus 469.8 per 100,000, respectively). The cancer mortality rate for Indiana Hispanics was also lower than the mortality rate for whites (96.3 versus 178.8 deaths per 100,000 people, respectively).

- **Colon and rectum (Colorectal).** Colorectal cancer is the second-most common cancer diagnosis and the third-leading cause of cancer related death for Hispanic men and women in the US.<sup>1</sup> However, Hispanics have lower incidence rates for colon cancer than non-Hispanic whites— 6 percent lower for Hispanic men and 15 percent lower for Hispanic women.<sup>1</sup> Hispanics in the US often have a higher incidence rate of colorectal cancer than those in South and Central America.<sup>1</sup> Hispanics are also more likely to have diabetes, which is associated with increased risk of colorectal cancer.<sup>1</sup> Nationally, Hispanics are diagnosed less often with colorectal cancer in a localized stage because of reduced screening rates and reduced access to timely follow-up and treatment.<sup>1</sup> According to the 2016 Indiana Behavioral Risk Factor Surveillance System (IN-BRFSS), the proportion of Indiana Hispanic adults aged 50 to 75 years (62.2 percent) participating in colorectal screening was similar to African-American (62.3 percent) adults, but lower than non-Hispanic white (65.3 percent). In Indiana, during 2010 to 2014, the incidence rate among Hispanics was lower than the national rate (26.0 versus 34.9 cases per 100,000 people, respectively). During that same time period, the mortality rate in Indiana was lower than the national rate (8.3 versus 11.7 deaths per 100,000 people, respectively). Between 2011 to 2015, Indiana Hispanics compared to whites had a 47.8 percent lower incidence rate (26.3 versus 42.8 cases per 100,000 people, respectively) and a 57.9 percent lower mortality rate for colorectal cancer (8.6 versus 15.6 deaths per 100,000 people, respectively).
- **Lung.** Nationally, the ACS states lung cancer is the third-most common cancer diagnosis and the leading cause of cancer death for Hispanic men. For Hispanic women, lung cancer is the fifth most common cancer diagnosis and the second-most common cause of cancer related death. Due to lower rates of smoking, lung cancer incidence rates for Hispanics are approximately half the rate of non-Hispanic whites.<sup>1</sup> While most lung cancers are diagnosed at a late stage in the general population, approximately 85 percent of Hispanics are diagnosed with late stage lung cancer compared to 72 percent of non-Hispanic whites.<sup>1</sup> According to the IN-BRFSS, Hispanic adults had a smoking prevalence (17.8 percent) that was lower to non-Hispanic white (21.0 percent) and African-American (23.0 percent) adults in 2016. In Indiana, during 2010 to 2014, the incidence rate among Indiana Hispanics was lower than the national rate (24.5 versus 31.8 cases per 100,000 people, respectively). During that same time period, the mortality rate in Indiana was lower than the national rate (14.3 versus 19.3 deaths per 100,000 people, respectively). Between 2011 and 2015, Indiana Hispanics compared to whites had a 100.8 percent lower incidence rate (24.2 versus 73.4 cases per 100,000 people, respectively) and a 118.5 percent lower mortality rate for lung cancer (13.7 versus 53.5 deaths per 100,000 people, respectively).
- **Prostate.** Prostate cancer is the most common cancer diagnosis for Hispanic men and the fourth-leading cause of cancer-related death. Based on data from the Indiana State Cancer Registry and Centers for Disease Control and Prevention Wonder US Cancer Statistics Database, respectively, during 2010 to 2014, the prostate cancer incidence rate among Hispanics in the US was about 15 percent lower than the rate among non-Hispanic whites. In Indiana, during 2010 to 2014, the incidence rate among Hispanics was lower than the national rate (54.1 versus 96.7 cases per 100,000 males, respectively). During that same time period, the mortality rate in Indiana was lower than the national rate (9.6 versus 16.5 deaths per 100,000 males, respectively). Between 2011 and 2015, Hispanics compared to whites had a 39.2 percent lower incidence rate (53.4 versus 79.4 cases per 100,000 people, respectively) and a 43 percent lower mortality rate for prostate cancer (53.4 versus 79.4 deaths per 100,000 people, respectively).
- **Female breast.** According to the ACS, breast cancer is the most common cancer and also the leading cause of cancer death for Hispanic women. Overall, the incidence rate of breast cancer is 28 percent lower for Hispanic women than non-Hispanic whites.<sup>1</sup> Hispanic women who are born in other countries have an even lower risk for breast cancer than their Hispanic, US-born counterparts.<sup>1</sup> The difference in breast cancer rates is likely due to variations in risk factors that are associated with a lower risk of breast cancer. For example, Hispanic women are more likely to have more children and also have their first child at a younger age than white women. Breastfeeding is a more common practice in Hispanic populations than in non-Hispanic white populations. Nationally, Hispanic women also have lower utilization of menopausal hormonal therapy as well as mammography screening for breast cancer.<sup>1</sup> In 2016, 84.6 percent of Indiana Hispanic females aged 50 to 74 had a mammogram in the past two years, which is higher than white non-Hispanic females (72.1

percent) and African-American (74.8 percent) aged 50 to 74. However, Hispanic women are less likely to be diagnosed with breast cancer when the disease is at a local stage. From 2011 to 2015, 48 percent of Hispanic women with breast cancer were diagnosed at a local stage compared to 54 percent of non-Hispanic white women. Hispanic women are more likely to have difficult-to-treat tumors that are larger and also hormone receptor negative. Furthermore, Hispanic women are less likely to have timely follow-up on abnormal mammography screenings and treatment for diagnosed breast cancer.<sup>1</sup> In Indiana, during 2010 to 2014, the incidence rate among Hispanics was lower than the national rate (63.6 versus 92.3 cases per 100,000 females, respectively). During that same time period, the mortality rate in Indiana was higher than the national rate (16.9 versus 14.4 deaths per 100,000 females, respectively). Between 2011 to 2015, Indiana Hispanics compared to whites had a 63.8 percent lower incidence rate (67 versus 129.8 cases per 100,000 females, respectively) and a 33.3 percent lower mortality rate for breast cancer (16.5 versus 23.1 deaths per 100,000 females, respectively).

- **Sites with higher rates for Hispanics.** According to the ACS, despite the fact that Hispanics have relatively low rates of the most common cancers, Hispanics bear a disproportionate burden of certain kinds of cancer.
  - Gallbladder cancer, as well as cancers linked to infectious diseases, such as liver and bile duct, stomach, and uterine cervix cancers, are more prevalent among Hispanics.<sup>1</sup> A reason for this is that individuals living in developing countries are more prone to cancers linked to infectious disease. For example, in Central and South America, one in six new cancers is linked to infectious disease as compared to one in 25 in North America.<sup>1</sup> Gallbladder cancer is commonly seen in Hispanic women, who have the second highest incidence rates after American Indian/Alaska Native women. Hispanic women have twice the rate of gallbladder cancer compared with Hispanic men and non-Hispanic white women. Symptoms of gallbladder cancer are generally nonspecific, making it difficult to diagnose early and therefore survive. The causal factors for high rates of gallbladder cancer in Hispanics is not well understood, but may include genetic factors, diabetes, obesity, chronic inflammation of the biliary tract, and use of hormone replacement therapy.<sup>1</sup>
  - Liver cancer incidence in the US is twice as high for Hispanics as non-Hispanic whites. Most liver cancer cases are associated with chronic hepatitis B virus (HBV) or hepatitis C virus (HCV). Other risk factors for liver cancer include obesity, alcohol consumption, and smoking.<sup>1</sup>
  - Stomach cancer incidence rates are 73 percent higher for Hispanic men and more than 50 percent higher for Hispanic women than non-Hispanic whites in the US.<sup>1</sup> This is due to the major risk factor for stomach cancer being chronic infection with *Helicobacter pylori* (*H. pylori*), which is more prevalent in countries and individuals of lower socioeconomic status. Other risk factors for stomach cancer include smoking, alcohol consumption, gastric reflux, and diets high in salted meat and fish, pickled vegetables, and smoked foods.
  - The cervical cancer incidence rate for Hispanic women in the US is 44 percent higher than non-Hispanic white women.<sup>1</sup> The greatest risk factor for cervical cancer is infection with human papillomavirus (HPV), which is preventable through vaccination. The higher mortality rates from cervical cancer seen in Hispanic women are likely attributable to lower rates of screening, and lack of timely follow-up with abnormal test results, often due to barriers to health care. Concerning HPV vaccination, Hispanic and non-Hispanic white boys and girls have similar completion rates.
  - Hispanics experience an increased burden of human immunodeficiency virus (HIV). In 2013, the number of new HIV cases was approximately three times higher for Hispanics versus non-Hispanic whites.<sup>1</sup>
- **Underrepresentation in research and clinical trials.** There is a disconnect between the burden of disease and underrepresentation of minorities in cancer research and cancer clinical trial enrollment;<sup>3</sup> many of the same racial and ethnic groups who experience astounding cancer disparities in cancer incidence and mortality are also underrepresented in cancer research clinical trials.<sup>4</sup> Study subjects representative of the larger US population help researchers to better understand the combination of genetic influences, environmental exposures, and social factors that all racial and ethnic groups experience.<sup>3</sup>

- **Disparities in hospice and palliative care.** Research shows consistently lower rates of hospice use for racial and ethnic minorities than for non-Hispanic white adults across diagnoses and geographic location.<sup>4</sup> Studies also show that minorities receive lower-quality palliative care indicated by decreased satisfaction, communication, and pain management. Factors contributing to these disparities may include lack of familiarity, as studies indicate disproportionate gaps in understanding of palliative care among ethnic and racial minorities. Minority populations may also be wary of the health care system due to a lack of cultural competence in practice. Cultural beliefs and differences, such as challenges among Hispanics regarding disclosure of terminal illness, or language differences among Spanish-speaking countries, may also be a barrier to effective palliative care. Research that investigates disparities in racial and ethnic minorities for hospice and palliative care is essential.<sup>4</sup>

#### Can Cancer Be Prevented?

- **Body weight, diet, and physical activity.** Being overweight or obese is a major risk factor for developing cancer for all populations. In 2016, the prevalence of obesity in male Hispanics was 27.2 percent.<sup>1</sup> The prevalence of obesity for Hispanic women was 26.5 percent.
- **Tobacco.** As of 2014, Hispanics were less likely to be cigarette smokers than non-Hispanic whites or African-Americans. There is a significant gender gap in smoking prevalence among Hispanics, as 9.9 percent of Hispanic women were current smokers in 2016 compared to 26.4 percent of Hispanic men. It is important to note that Hispanic smokers are less likely to receive smoking cessation assistance than non-Hispanic whites.<sup>1</sup>
- **Health care access.** Access to health care is key in cancer prevention, screening, treatment, and survival. Many Hispanics face structural barriers to health care, such as poor geographical access and lack of transportation. Hispanics also face cultural and language barriers, in addition to discrimination, health care provider bias, and a lack of cultural competency. Those with no health insurance or Medicaid coverage are more likely to be diagnosed with cancer at later stages and are more likely to die of cancer compared to their counterparts with private health insurance. Of all racial and ethnic groups, Hispanics are the least likely to have health insurance. According to the IN-BRFSS, in Indiana in 2016, approximately 39 percent of Hispanics aged 18-64 were uninsured as compared to 10.8 percent of non-Hispanic whites. Part of this issue stems from the fact that Hispanics are more likely than whites to be employed in fields that do not offer employer-based health insurance, namely agriculture, construction, domestic service, and food services.<sup>1</sup> Hispanics are more than twice as likely to not have a primary care provider than non-Hispanic whites.

#### Can Cancer Be Detected Early?

Even though Hispanics tend to have lower incidence and mortality rates for most common cancers when compared to non-Hispanic whites, Hispanics are less likely to be diagnosed with cancer at a localized stage. This is an especially prominent trend for melanoma and breast cancers, impacting treatment options and ultimately survival outcomes.<sup>3</sup>

#### What Factors Influence Cancer Survival?

In general, the further a cancer has spread, the less likely that treatment will be effective. Although Hispanics have lower incidence and death rates than non-Hispanic whites for the most common cancers, they are more likely to be diagnosed with a more advanced stage of disease. Overall, the lifetime probability of dying from cancer among Hispanics is one in five for males and about one in six for females.<sup>1</sup>

## Take Charge!

- Maintain a healthy body weight.
- Engage in physical activity.
- Eat a healthy diet, including fresh fruits and vegetables.
- Be smoke-free—Visit [www.in.gov/quitline](http://www.in.gov/quitline) for free smoking cessation assistance.
- Find and engage with a primary health care provider and regularly talk about cancer screening options and risk-reduction.
- Seek treatment early and avoid delaying care, if diagnosed with cancer.

### What You Can Do To Help Prevent Cancer and Improve Care Among African-Americans

- Become informed about racial disparities and social determinants of health.
- Promote cultural competency among health care providers and support the development of culturally relevant resources. If you are a health care provider, participate in cultural competency education.
- Explore social determinants of health, such as socioeconomic justice, education, employment, housing, nutrition, physical environment, and health care access.
- Support increased opportunities for health care providers who are members of minority racial/ethnic groups.
- Encourage and/or conduct research that includes and addresses the needs of all racial/ethnic groups.
- Implement culturally-competent patient navigator programs, which help guide patients and their caregivers through their cancer journey and aim to eliminate barriers to timely cancer detection, diagnosis, and treatment within the health care system.





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## Survivorship

### Bottom Line

Due to advances in treatment and earlier screenings, more people are living after a cancer diagnosis. The American Cancer Society (ACS) defines a cancer survivor as any person who has been diagnosed with cancer, from the time of diagnosis through the balance of life. Survivorship, like cancer itself, is complex and can be difficult to navigate.

There are three phases of cancer survival – the time from diagnosis to the end of initial treatment, the transition from treatment to extended survival, and long term survival.<sup>1</sup> More often than not, the terms “survivor” and “survivorship” are associated with the transitional period after treatment ends. However, survivorship includes a wide range of cancer experiences and paths, including:<sup>2</sup>

- Living cancer-free for the remainder of life;
- Living cancer-free for many years, but experiencing one or more serious, late complications of treatment;
- Living cancer-free for many years, but dying after a late recurrence;
- Living cancer-free after the first cancer is treated, but developing a second cancer;
- Living with intermittent periods of active disease requiring treatment; and
- Living with cancer continuously without a disease-free period.

The preferred path for most cancer patients is to receive treatment and be “cured”. This is the primary goal of all cancer treatment when possible. For many cancer patients, the initial course of treatment is successful and the cancer does not return.

Many survivors must still cope with the mid- and long-term effects of treatment, as well as any psychological effects – such as fear of returning disease.<sup>2</sup> It is important that cancer patients, caregivers, and survivors have the information and support needed to help minimize these effects and improve quality of life and treatment.

## Life After Treatment

Transitioning into post-treatment or the survivorship phase of care can be one of the hardest times for cancer patients. Patients often have anxiety related to cancer recurrences after their treatment is over. There is often physical and psychosocial challenges patients experience as they transition into the survivorship phase of care. At the same time, patients are managing ongoing cancer symptoms and side effects from treatment that can last months to years after the completion of treatment.

Survivorship care plans have been implemented by numerous organizations throughout the past few years. These plans can be utilized to assist patients with what to expect over the next five years after they complete primary treatment. The plans are patient-specific and include information such as:

- Personal information
- Medical care team
- Information on the patient’s specific cancer diagnosis
- Surgical history
- Radiation therapy history
- Chemotherapy/biotherapy/hormone therapy history
- Information on clinical trials
- Family history of cancer
- After-treatment care
- Potential late and long-term side effects of treatment
- Follow-up tests and appointments
- Recommendations for healthy living

## Survivorship by the Numbers

An estimated 15.5 million Americans with a history of cancer were alive on January 1, 2016, according to the ACS. This estimate does not include carcinoma *in situ* (non-invasive cancer) of any site, except urinary bladder, and does not include basal and squamous cell carcinomas. If current estimates continue, by January 1, 2026, the population of cancer survivors will increase to almost 20.3 million nationwide.<sup>2</sup>

According to the Indiana State Cancer Registry, which began collecting cancer cases January 1, 1987, as of December 31, 2015, there were an estimated 329,986 cancer survivors for all cancers combined [Table 18]. The four highest-burden cancers for the state (lung, breast, colorectal and prostate) account for approximately 54 percent of these survivors. Improvement in survival is a result of the combination of earlier diagnosis and improvements in treatments.

**Table 18. Indiana Cancer Survivor Counts\***

### Cancer Type Counts

Female Breast	71,931
Cervical	4,638
Colorectal	33,456
Lung	20,324
Melanoma	18,247
Prostate	51,748

**All Types** 329,986

\*Survivors (anyone treated for an invasive cancer, and still living) as of December 31, 2015

## Female Breast

Breast cancer is the second leading cause of cancer death, and, excluding skin cancers, the most frequently diagnosed cancer among female Hoosiers, with about 4,739 cases diagnosed each year, according to the Indiana State Cancer Registry. Sex and age are the two greatest risk factors for developing breast cancer. Women have a much greater risk of developing breast cancer than do males, and that risk increases with age. [See the breast cancer section of this report for more information.]

The overall five-year relative survival rate for female breast cancer patients is 89 percent.<sup>2</sup> For the most part, this is attributed to improvements in treatment and increased use of mammography screening.<sup>3</sup>

According to the ACS, the five-year relative survival rate varies depending on the cancer stage. When breast cancer is detected early, in the local stage, the five-year survival rate is 99 percent.<sup>2</sup> Other factors, such as tumor grade, hormone receptor status, and increased human epidermal growth factor receptor 2 (HER2) protein made by the cancer cells, can influence survival rates.

A common side effect of breast cancer surgery and radiation therapy is lymphedema of the arm. Lymphedema is a buildup of lymph fluid in the tissue under the skin caused by the removal or damage of the lymph nodes under the arm (called the axillary lymph nodes). It can develop soon after treatment, or even several years later. Lymphedema risk can be reduced when only the first lymph nodes to which cancer is likely spread are removed, rather than removing many lymph nodes to determine whether or not the cancer has spread. For patients with lymphedema, there are a number of effective therapies that can be used. Some evidence also suggests that upper-body exercise and physical therapy may reduce the severity and risk of developing this condition.<sup>4</sup>

Other long-term local effects of surgery or radiation treatment include numbness or tightness and pulling or stretching in the chest wall, arms or shoulders. In addition, women diagnosed and treated for breast cancer at a younger age may experience impaired fertility and premature menopause, and are at increased risk of osteoporosis. Aromatase inhibitor treatment can cause muscle pain, joint stiffness and/or pain, and sometimes osteoporosis.

## Colorectal Cancer

Colorectal cancer is the third-most commonly diagnosed cancer among both males and females in Indiana, as well as the United States overall. It is the second leading cause of cancer-related death among males, and the third leading cause of cancer-related death among females in Indiana. In 2018, the ACS estimates that 3,190 Hoosiers would be diagnosed with colorectal cancer, and 1,110 would die as a result of the disease. The lifetime risk of developing colorectal cancer is about 5 percent for both men and women in the United States. Sex and age are the two greatest risk factors. In addition, the The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General indicates that smoking causes colorectal cancer and increases the failure rate of treatment for all cancers. In Indiana, African-Americans have higher colorectal cancer incidence and mortality rates than whites, and men have higher rates than women. [See the colorectal cancer section of this report for more information.]

The ACS reports that the five-year survival rate for colorectal cancer is 65 percent, while the 10-year survival rate decreases to 58 percent. When colorectal cancer is detected early (in the local stage), the five-year survival rate is 90 percent.<sup>2</sup>

While most long-term survivors report a high quality of life, some are troubled by bowel dysfunction and other health-related issues. For those with a permanent colostomy (a surgical procedure that brings one end of the large intestine out through the abdominal wall), some issues such as problems around intimacy and sexuality, embarrassment, social inhibition, and body-image disturbances may occur.

## Lung Cancer

Lung cancer is not a single disease; rather, it is a group of cancers that originate in the lung and associated tissues. Lung cancer is the leading cause of preventable and premature cancer deaths in Indiana and the US, killing an estimated 3,960 Indiana residents every year.<sup>5</sup> Smoking accounts for 80 percent of lung cancer deaths and at least 30 percent of all cancer deaths.<sup>6</sup> However, in Indiana, 21.1 percent of adults continue to smoke cigarettes, placing them at greater risk for developing lung and other types of cancer.<sup>7</sup> The five-year relative survival rate for lung cancer is 17 percent.<sup>6</sup> [See the lung cancer section of this report for more information.]

Lung cancer survivors often have impaired lung function, especially if surgery is part of treatment. Respiratory therapy and medications can improve the ability to resume normal daily activities and improve fitness. Lung cancer survivors who continue to smoke should be encouraged to quit. The utilization of low-dose computed tomography (CT) scans in screening high-risk patient populations has been shown to be effective in decreasing mortality from lung cancer. Individuals at high-risk are defined as those aged 55 to 74 who have a 30-pack-per-year tobacco smoking history, those who have quit smoking in the last 15 years, and those who currently smoke.<sup>8</sup> Survivors of smoking-related cancers are at an increased risk for additional smoking-related cancers, especially in the head, neck and urinary tract. Some survivors may feel stigmatized because of the connection between smoking and lung cancer. This can be especially difficult for lung cancer survivors who never smoked.

### Prostate Cancer

Prostate cancer is an uncontrolled growth and spread of cells in the prostate, an exocrine gland in the male reproductive system. Excluding all types of skin cancer, prostate cancer is the most commonly diagnosed cancer and the third leading cause of cancer death among Hoosier men. There were 3,126 new cases of prostate cancer diagnosed in Indiana during 2015, and, there were 579 deaths due to prostate cancer during that same year. The ACS estimates there will be about 166,690 new cases of prostate cancer diagnosed in the United States in 2018.<sup>5</sup> Older men, African-American men, and men with a family history of prostate cancer have a higher risk of being diagnosed. [See the prostate cancer section of this report for more information.]

The five-year survival rate of prostate cancer is almost 100 percent when discovered in the local or regional stages. According to the most recent data, the 10- and 15-year survival rates are 98 percent and 95 percent, respectively.<sup>2</sup>

Many prostate cancer survivors who have been treated with surgery or radiation therapy experience side effects from treatment. These include incontinence, erectile dysfunction, and bowel complications. Patients who received hormonal treatment may experience symptoms similar to menopause in women such as loss of libido, hot flashes, night sweats, irritability, and osteoporosis. One of the long-term side effects of hormone therapy is the increased risk of developing diabetes, cardiovascular disease, and/or obesity.<sup>9</sup>

### How can cancer survivors stay healthy after treatment?

Routine yearly visits to primary care providers play a significant role in leading a healthy lifestyle and ensuring the appropriate age-related screenings are being discussed and completed. In some cases, many cancers can be identified at early stages or prevented via preventative screenings. Primary care providers can ensure patients are up-to-date on vaccinations, complete recommended screenings, remain physically active, utilize sunscreen, and eat a healthy diet.

### Resources

The **National Cancer Survivorship Resource Center** is a collaboration between the ACS and the George Washington Cancer Institute, funded by the Centers for Disease Control and Prevention. Its goal is to shape the future of post-treatment cancer survivorship care, and to improve the quality of life for cancer survivors. Staff and more than 100 volunteer survivorship experts nationwide developed tools for cancer survivors, caregivers, health care professionals, and policy and advocacy efforts. For more information, visit [www.cancer.org/survivorshipcenter](http://www.cancer.org/survivorshipcenter).

**Cancer Support Community** offers support services through a network of professionally led, community-based centers, hospitals, community oncology practices, and online. The organization focuses on providing essential, but often overlooked, services including support groups, counseling, education, and healthy lifestyle programs. For more information, visit [www.cancersupportcommunity.org](http://www.cancersupportcommunity.org).

The **Little Red Door Cancer Agency** provides support to cancer patients and their families throughout their cancer journey. They offer services for cancer patients, resources for those in need and information on cancer prevention. For more information, visit [www.littlereddoor.org](http://www.littlereddoor.org).

The **National Coalition for Cancer Survivorship** offers free publications and resources that empower people to become strong advocates for their own care, or the care of others. The coalition's Cancer Survival Toolbox is a self-learning audio series developed by leading cancer organizations to help people develop crucial skills to understand and meet the challenges of their illness. For more information, visit [www.canceradvocacy.org](http://www.canceradvocacy.org).

The **Patient Advocate Foundation** is a national nonprofit organization that seeks to safeguard patients through effective mediation assuring access to care, maintenance of employment, and preservation of financial stability. The foundation serves as an active liaison between patients and their insurer, employer and/or creditors to resolve insurance, job retention and debt crisis matters relative to their diagnosis through professional cancer managers, doctors and health care attorneys. For more information, visit [www.patientadvocate.org](http://www.patientadvocate.org).

Due to continual changes in recommendations as scientific updates are developed, visit [www.uspreventiveservicestaskforce.org](http://www.uspreventiveservicestaskforce.org) for the most up-to-date screening guidelines and recommendations.

Visit the Indiana Cancer Consortium website at [IndianaCancer.org](http://IndianaCancer.org) to learn more about local resources in your area.

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## Recommended Cancer Screening Guidelines

### Breast Risk Factors

Sex and age are the two greatest risk factors for developing breast cancer. Females have a much greater risk of developing breast cancer, and that risk increases with age. Factors associated with increased breast cancer risk include being overweight or obese, use of menopausal hormone therapy, physical inactivity, and alcohol consumption. Research also indicates that long-term, heavy smoking increases breast cancer risk, particularly among females who start smoking before their first pregnancy. Additional risk factors may include: having one or more first degree relatives who have been diagnosed with breast cancer; having a family member who carries the breast cancer susceptibility genes (BRCA) 1 or 2; being African-American; having a long menstrual history (menstrual periods that start early and/or end later in life); having recently used oral contraceptives or Depo-Provera; having never had children, or had the first child after the age of 30; and certain medical findings such as high breast tissue density, high bone mineral density, Type 2 diabetes, certain benign breast conditions, and lobular carcinoma in situ. In addition, high dose radiation to the chest for cancer treatment increases risk. Factors associated with a decreased risk of breast cancer include breastfeeding, regular moderate or vigorous physical activity, and maintaining a healthy body weight.

### Early Detection

Women should have frequent conversations with their health care provider about risks for breast cancer and how often they should be screened. In general, women should be aware of the look and feel of their breasts and receive mammograms appropriately.

### Signs and Symptoms

The most common symptom of breast cancer is a new lump or mass. It's important to have anything new or unusual checked by a doctor. Other symptoms of breast cancer may include: hard knots, or thickening; swelling, warmth, redness, or darkening; change in size or shape; dimpling or puckering of the skin; itchy, scaly sore, or rash on the nipple; pulling in of the nipple or other parts of the breast; nipple discharge that starts suddenly; or new pain in one spot that doesn't go away. Although these symptoms can be caused by things other than breast cancer, it is important to have them checked out by your doctor.

### Prevention

Individuals can take charge of their health by knowing their risk and talking to their doctor about personal and family history; getting screened regularly; avoiding tobacco use; maintaining a healthy weight; getting the recommended levels of moderate or vigorous physical activity; limiting alcohol consumption; limiting postmenopausal hormone use; and breastfeeding.

### United States Preventive Services Task Force (USPSTF) Screening Guidelines

The USPSTF recommends biennial mammography for women ages 50-74. In addition, women should talk to their doctors about whether or not earlier screenings are needed.

### American Cancer Society (ACS) Screening Guidelines

The ACS recommends women 45 to 54 should get mammograms every year. Women 55 and older can switch to a mammogram every other year, or they can choose to continue yearly mammograms. Screening should continue as long as a woman is in good health and is expected to live 10 more years or longer. Research has not shown a clear benefit of regular physical breast exams done by either a health professional or through self breast exams. Women should be familiar with how their breasts normally look and feel and immediately report any changes to a health care provider.

## Recommended Cancer Screening Guidelines

### Cervical Risk Factors

Infection with human papillomavirus (HPV) is the single greatest risk factor for cervical cancer.

### Early Detection

Average-risk women, ages 21 to 65, should receive a routine Pap test every three years. For women ages 30 and over, who want to extend the time periods between tests, a Pap smear combined with HPV co-testing can be done every five years.

### Signs and Symptoms

Early stage cervical cancer often has no symptoms. The most common symptom is irregular vaginal bleeding (bleeding that starts and stops between periods, or after intercourse). Bleeding after menopause or increased vaginal discharge may also be symptoms. These signs and symptoms can also be caused by conditions other than cervical cancer, so if you experience any of these symptoms, see a health care professional right away.

### Prevention

Individuals can help prevent cervical cancer by getting the HPV vaccination, practicing safe sex, avoiding tobacco, getting routine screenings, getting HPV and Pap co-testing (women over the age of 30); and watching for abnormal vaginal discharge or bleeding.

### USPSTF Screening Guidelines

The USPSTF recommends screening for cervical cancer every three years with cervical cytology alone in women aged 21 to 29 years. For women aged 30 to 65 years, the USPSTF recommends screening every three years with cervical cytology alone, every five years with high-risk human papillomavirus (hrHPV) testing alone, or every five years with hrHPV testing in combination with cytology (cotesting).

### ACS Screening Guidelines

The ACS recommends Pap test screening for women ages 21-29. For women ages 30-65, screening should be done every five years with both the HPV test and the Pap test (preferred), or every three years with the Pap test alone (acceptable).

## Recommended Cancer Screening Guidelines

### Colon and Rectum (Colorectal)

#### Risk Factors

Indiana residents may have an increased risk if they are age 50 or over; male; African-American; have a personal history of cigarette smoking; have a personal or family history of colorectal cancer, inflammatory bowel disease, or certain inherited genetic conditions; have diabetes; are obese; are physically inactive; eat a diet high in red or processed meat and/or low in whole-grain fiber, fruits and vegetables; and have heavy alcohol consumption.

#### Early Detection

Beginning at age 50, both men and women with average risk for colorectal cancer should follow one of these schedules: 1) Tests that find polyps and cancer, such as a colonoscopy every 10 years or a flexible sigmoidoscopy, double-contrast barium enema, or computed tomography colonography every five years. Or, 2) Tests that mostly find cancer such as yearly fecal occult blood test (FOBT) or fecal immunochemical test (FIT).

#### Signs and Symptoms

Early stage colorectal cancer typically has no symptoms. Later stage colorectal cancer symptoms include rectal bleeding, blood in stool, change in bowel habits, cramping pain in lower abdomen, decreased appetite or weight loss, weakness, and extreme fatigue.

#### Prevention

Individuals can take charge of their health by getting regular, routine screenings, maintaining a healthy weight, adopting a physically active lifestyle, avoiding tobacco products, limiting alcohol consumption, and consuming a healthy diet that emphasizes plant sources, supports a healthy weight, includes at least two and a half cups of a variety of vegetables and fruits each day, includes whole grains and limits processed and red meats.

#### USPSTF Screening Guidelines

The USPSTF recommends screening for colorectal cancer starting at age 50 years and continuing until age 75. Go to the USPSTF website for specific recommendations.

#### ACS Screening Guidelines

The ACS recommends screening for men and women at average risk beginning at age 45 using a FOBT or FIT every year, a stool DNA test every three years, a flexible sigmoidoscopy every five years, a colonoscopy every 10 years, or a CT colonography every five years.

## Recommended Cancer Screening Guidelines

### Lung

#### Risk Factors

Smoking is the greatest risk factor for lung cancer. In addition, individuals at increased risk include those exposed to second-hand smoke; those exposed to other cancer-causing agents (such as asbestos, radon, arsenic, talc, vinyl chloride, coal products, and radioactive ores); males; and African-Americans.

#### Early Detection

Findings from the National Cancer Institute's National Lung Screening Trial established screening with the use of low-dose computed tomography (LDCT) in specific high-risk groups aged between 55-74 has been shown to be effective in reducing mortality.

#### Signs and Symptoms

Lung cancer symptoms do not usually occur until the cancer is advanced. Common signs and symptoms of lung cancer include a persistent cough, sputum streaked with blood, chest pain, voice changes, and recurrent pneumonia or bronchitis.

#### Prevention

Individuals can help prevent lung cancer by being tobacco free and avoiding exposure to second-hand smoke.

#### USPSTF Screening Guidelines

The USPSTF recommends annual screening for lung cancer with LDCT in adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit within the past 15 years. Screening should be discontinued once a person has not smoked for 15 years or develops a health problem that substantially limits life expectancy or the ability or willingness to have curative lung surgery.

#### ACS Screening Guidelines

The ACS recommends LDCT for current smokers, or former smokers (who have quit within the past 15 years), ages 55-74 with at least a 30 pack-per-year history.

## Recommended Cancer Screening Guidelines

### Melanoma/ Skin Cancer

#### Risk Factors

People of all ages, races and ethnicities are subject to developing skin cancer. Indiana residents may have increased risk if they are aged 50 or older; male; white; have fair to light skinned complexions; have natural blond or red hair; have blue or green eyes; have a large number of moles (more than 50); have a family history of melanoma; have excessive exposure to UV radiation from the sun or tanning beds; have a history of sunburn at an early age; have a weakened immune system or are being treated with immune-suppressing medicines; have a past history of basal or squamous cell skin cancers; and have an occupational exposure to coal tar, pitch, creosote, arsenic compounds, radium or some pesticides.

#### Early Detection

Indiana residents should be aware of any changes in skin growths or the appearance of new growths. Adult should thoroughly examine their skin regularly, preferably once a month. New or unusual lesions or a progressive change in a lesion's appearance (size, shape, or color for example) should be evaluated promptly by a health care provider.

#### Signs and Symptoms

A simple ABCDE rule outlines some warning signs of melanoma: A for Asymmetry (one half of the mole or lesion does not match the other half); B for Border (border irregularity, edges that are ragged, notched or blurred); C for Color (the pigmentation is not uniform, with variable degrees of tan, brown or black); D for Diameter (if the diameter is greater than 6 millimeters - or the size of a pencil eraser); and E for Evolution (moles that change in shape, size or color).

#### Prevention

Individuals can take charge of their health by limiting or avoiding exposure to the sun during peak hours (10 a.m. to 4 p.m.); wearing sunscreen with a SPF of 30 or higher that protects from both UVA and UVB rays; wearing clothing that has built-in SPF in the fabric, or wearing protective clothing such as long sleeves and long pants; wearing a hat that protects your scalp and shades your face, neck and ears; avoiding use of tanning beds and sun lamps; wearing sunglasses to protect your eyes; and always protecting skin. In addition, any new or unusual lesions or a progressive change in a lesion's appearance should be evaluated by a physician.

#### USPSTF Screening Guidelines

The USPSTF recommends counseling children, adolescents, and young adults aged 10 to 24 years who have fair skin about minimizing their exposure to ultraviolet radiation to reduce risk for skin cancer.

#### ACS Screening Guidelines

The most important warning sign of melanoma is a new spot on the skin or a spot that's changing in size, shape, or color. Another important sign is a spot that looks different from all of the other spots on your skin. If you have any of these warning signs, have your skin checked by a doctor.

## Recommended Cancer Screening Guidelines

### Prostate

#### Risk Factors

Indiana males may have an increased risk for prostate cancer if they are over the age of 50; African-American; or if they have a first-degree relative (a father, brother or son) with a history of prostate cancer.

#### Early Detection

Not all experts agree that screening for prostate cancer will save lives. The controversy focuses on the cost of screening, the age groups to be screened, and the potential for serious side effects associated with treatment after diagnosis. Not all forms of prostate cancer need treatment.

#### Signs and Symptoms

In the early stage, prostate cancer may not cause symptoms. It is important to know that some men have no symptoms at all. Other symptoms can include difficulty starting urination; weak or interrupted flow of urine; frequent urination (especially at night); inability to empty the bladder completely; pain or burning during urination; blood in the urine or semen; painful ejaculation; trouble having an erection; pain in the back, hips, or pelvis that doesn't go away.

#### Prevention

Individuals can help prevent prostate cancer by eating a healthy diet; limiting their intake of red and processed meats; avoiding excessive consumption of dairy products; including lycopene and vitamin E in the diet; and meeting recommended levels of physical activity.

#### USPSTF Screening Guidelines

For men aged 55 to 69 years, the decision to undergo periodic prostate-specific antigen (PSA)-based screening for prostate cancer should be an individual one. Before deciding whether to be screened, men should have an opportunity to discuss the potential benefits and harms of screening with their clinician and to incorporate their values and preferences in the decision. Screening offers a small potential benefit of reducing the chance of death from prostate cancer in some men. However, many men will experience potential harms of screening, including false-positive results that require additional testing and possible prostate biopsy; overdiagnosis and overtreatment; and treatment complications, such as incontinence and erectile dysfunction. In determining whether this service is appropriate in individual cases, patients and clinicians should consider the balance of benefits and harms on the basis of family history, race/ethnicity, comorbid medical conditions, patient values about the benefits and harms of screening and treatment-specific outcomes, and other health needs. Clinicians should not screen men who do not express a preference for screening.

#### ACS Screening Guidelines

Beginning at age 50, men should talk to a health care provider about the pros and cons of testing so they can decide if testing is the right choice for them. Men at high risk should have this discussion with their health care provider beginning at age 45.

