

**2022**

**West Virginia  
Cancer Burden Report**





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**West Virginia Cancer Registry**

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

This report is made possible thanks to the efforts of the WVCR staff, personnel at reporting facilities that see cancer patients throughout West Virginia, and the employees at other state central cancer registries who provided incidence data for this report.

[www.cancerregistry.wv.gov](http://www.cancerregistry.wv.gov)

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# Table of Contents

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Preface .....	1
Overview of West Virginia Cancer Registry .....	3
Questions to Ask When Diagnosed with Cancer .....	5
Frequently Asked Questions .....	7
Trends in Cancer Incidence .....	12
Five-Year Incidence Rate Changes for Select Cancers .....	12
Percent Distribution of New Cancers, 2015-2019 .....	13
All Sites Cancer Incidence Trends by Sex .....	14
Cancer Incidence Rates by Sex.....	15
Top 10 Sites—Men and Women.....	15
Top 10 Sites—Men.....	16
Top 10 Sites—Women .....	17
Cancer Incidence Rates, and 5-Year Counts by Select Sites, Sex, and Race .....	18
Pediatric Cancers.....	21
Trends in Cancer Mortality .....	23
Five-Year Mortality Rate Changes for Select Cancers.....	23
All Sites Cancer Mortality Trends by Sex .....	24
Cancer Mortality Rates by Sex .....	25
Top 10 Sites—Men and Women.....	25
Top 10 Sites—Men.....	26
Top 10 Sites—Women .....	27
Highlighted Cancers and Data Visualizations.....	28*
Female Breast Cancer .....	29*
Female Breast Cancer Summary.....	29*
Female Breast Cancer Data Visualizations.....	30
Cervical Cancer.....	31*
Cervical Cancer Summary .....	31*
Cervical Cancer Statistics and Screening Guidelines.....	32
Colon and Rectum Cancer.....	33*
Colon and Rectum Cancer Summary .....	33*
Colon and Rectum Cancer Data Visualizations .....	34
Lung and Bronchus Cancer .....	35*
Lung and Bronchus Cancer Summary .....	35*
Lung and Bronchus Cancer Data Visualizations .....	36



## Table of Contents (cont'd)

Prostate Cancer .....	37*
Prostate Cancer Summary .....	37*
Prostate Cancer Data Visualizations .....	38
HPV-Associated Cancers .....	39*
HPV-Associated Cancers Summary .....	39*
HPV-Associated Cancers Data Visualizations and Other Information .....	40
Tobacco-Associated Cancers.....	41*
Tobacco-Associated Cancers Summary.....	41*
Tobacco-Associated Data Visualizations and Other Information .....	42
Obesity-Associated Cancers.....	43*
Obesity-Associated Cancers Summary.....	43*
Obesity-Associated Cancers Data Visualizations and Other Information .....	44
Appendices .....	45
A. How to Read These Tables .....	46
B. County, State, and US Cancer Incidence Rates by Select Sites .....	47
All Sites.....	47
Breast (Female).....	49
Colon and Rectum .....	50
Corpus and Uterus, NOS .....	52
Kidney and Renal Pelvis .....	54
Lung and Bronchus .....	56
Melanomas of the Skin .....	58
Non-Hodgkin Lymphoma .....	60
Prostate.....	62
Thyroid.....	64
Urinary Bladder.....	66

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# Preface

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The 2022 West Virginia Cancer Burden Report exhibits the burden of cancer incidence and mortality in West Virginia, providing details on cancer data by sex, race, age group, stage at diagnosis, county, and primary site reported between 2015 and 2019. This edition also contains pages dedicated to five different cancers in which screening can be performed (female breast, cervical, colon and rectum, lung and bronchus, and prostate cancers) and cancers associated with certain risk factors, such as Human Papillomavirus (or HPV), tobacco use, and obesity. These pages give a more in-depth look at these preventable cancers. In addition to this, we have included a Frequently Asked Questions section that defines confusing terms, and a “Questions to Ask When Diagnosed with Cancer” section for those that have been recently diagnosed with cancer or have a loved one recently diagnosed.

This report provides updated statewide, age-adjusted incidence rates and counts for cancers diagnosed among West Virginia residents from 2015 to 2019. The purpose of the report is to provide WV cancer data to cancer prevention and control partners, researchers, policy makers, and the public.

From 2015 to 2019, 61,082 new cases (approximately 12,217 cases annually) of invasive (and in situ bladder) cancer were diagnosed among WV residents. During this time, 31,203 cases (51%) were diagnosed among males and 29,879 cases (49%) were diagnosed among females.

From 2015 to 2019, the most common cancers reported among WV residents were lung and bronchus (10,438), female breast (7,684), prostate (6,464), and colon and rectum (5,647). These four cancer sites accounted for almost half of West Virginia’s cancer burden. Other cancers commonly reported in our state included urinary bladder (2,872), melanomas of the skin (2,638), kidney and renal pelvis (2,574), non-Hodgkin lymphoma (2,488), corpus and uterus (2,224), leukemia (1,875), oral cavity and pharynx (1,743), and thyroid (1,678). A more in-depth percent distribution of these cancers can be found on page 13. Prostate cancer was the most commonly diagnosed cancer in men and accounted for over one-fifth (20.7%) of all cancers diagnosed among WV men. Breast cancer continues to be the most commonly diagnosed cancer among females accounting for just over a quarter (25.7%) of all cancers diagnosed in WV women. Lung and bronchus cancer and colon and rectum cancer were the second and third most commonly diagnosed cancers in both sexes but have higher mortality rates.



Over the past five years there have been increasing and decreasing trends for certain kinds of cancers. Incidence and mortality trends are illustrated on pages 12 and 23, respectively.

Cancer can occur at any age but is primarily a disease of aging. For most cancer sites, the risk of developing cancer increases with age, from birth through ages 75-84. Cancer risk then decreases slightly among those aged 85 and older. However, this is not true for all cancers. Thyroid and testicular cancer, for example, peak at much younger ages. There are also cancers that affect children, and data for pediatric cancers in WV can be found on page 21 of this report.

Statewide geographic differences in incidence rates were noted for specific cancer types. There are a variety of reasons why cancer incidence rates vary by county. These reflect random variation, differences in exposure to risk factors (e.g., smoking, diet, physical inactivity, environmental influences), genetics, and cancer screening practices. Appendix B includes county level data for 10 different cancers.

We hope that you find this information helpful and easy to read. We encourage you to use the data and infographic pages for presentations, reports, and grant applications. We truly enjoyed the process of developing this resource and hope the citizens of the Mountain State find it useful and informative.

Sincerely in service,

*Markie P. McCoy, MPH*

Epidemiologist

Division of Cancer Epidemiology

WV Department of Health and Human Resources

Bureau for Public Health

Office of Epidemiology and Prevention Services



# Overview of West Virginia Cancer Registry

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The West Virginia Cancer Registry (WVCR) was established by the West Virginia Department of Health and Human Resources in 1991 as a breast and cervical cancer registry. In 1993, the WVCR became an all-site registry, collecting data on all cancers except basal and squamous cell carcinoma of the skin and in situ cervical cancer. In 2002, the WVCR began collecting data on non-malignant brain and other central nervous system (CNS) tumors. WVCR is supported by both state and federal funding with the latter administered through a cooperative agreement with the Centers for Disease Control and Prevention's National Program of Cancer Registries. Chapter 16-5A-2a of the West Virginia Code and Title 64, West Virginia Code of State Rules, Division of Health, Cancer Registry, Series 68, provide the legal basis of the WVCR.

The mission of the WVCR is to collect and analyze cancer data to determine incidence rates by anatomical site, sex, race, geographic location, and other factors. Registry staff also monitor trends in cancer incidence among WV residents.

The WVCR collects information on all cancers diagnosed and/or treated in the state of WV and, through lawful, reciprocal data sharing agreements, cancers diagnosed and/or treated among WV residents by health care providers outside the state. A WV resident is defined as a person reporting a WV address at the time of their cancer diagnosis.

The WVCR's reference date (the date after which reportable cancer cases must be included in the Registry) is January 1, 1993, for most cancer sites. The reference date for benign brain and CNS neoplasms is January 1, 2002.

The WVCR is subject to certification by the North American Association of Central Cancer Registries (NAACCR). Certification is based on timeliness, completeness, and quality of data. WVCR was certified at the "silver" level for diagnosis years 1997 and 1998 and at the "gold" (highest) level for diagnosis years 1999 through 2021 (the most recent year for which certification results were available at the time of this writing). In addition, WVCR data met the 24-month standards of the National Program of Cancer Registries.



The WVCR is committed to the use of cancer incidence data as a critical component of cancer control and publishes this annual report on cancer incidence in West Virginia to be used by community-based, state, regional, and national cancer control groups. The WVCR provides de-identified data to the Centers for Disease Control and Prevention for the publication of the *United States Cancer Statistics* and to the North American Association of Central Cancer Registries for the *Cancer in North America (CINA)* publications. Researchers may obtain access to case level data under strict controls including approval by the relevant Institutional Review Board and the WV Cancer Advisory Committee.

## West Virginia Cancer Advisory Committee

<b>Pamela Alderman, EdD, MSN, RN</b> West Virginia Nurses Association	<b>Chaste Truman Barclay</b> American Lung Association of West Virginia	<b>Steven E. Blankenship, MS</b> DHHR, Bureau for Public Health
<b>Lisa D. Casto</b> DHHR, Bureau for Public Health	<b>Jaunita Conaway</b> DHHR, Bureau for Public Health	<b>Phyllis Edwards, RHIT, CTR</b> Cabell Huntington Hospital
<b>Myra Fernatt</b> DHHR, Bureau for Public Health	<b>Tony J. Gregory</b> West Virginia Hospital Association	<b>Steven Jubelirer, MD, Committee Chair</b> CAMC Cancer Center
<b>Markie McCoy, MPH</b> DHHR, Bureau for Public Health	<b>Mary Ellen Conn, MS</b> Mountains of Hope Cancer Coalition	<b>Birgit Shanholtzer</b> WV Health Statistics Center
<b>Stephenie K. Kennedy-Rea, EdD, MA</b> WVU Cancer Institute	<b>Shauna Shafer</b> American Cancer Society	

# Questions to Ask When Diagnosed with Cancer<sup>1</sup>

A new cancer diagnosis can be shocking and very overwhelming at first. When you meet with your doctor, you will hear a lot of new information. It can be helpful to prepare some questions prior to your appointment. Below are some questions that can help you navigate your doctor appointments, and understand your diagnosis better. Remember, ask your doctor questions, and don't be afraid to speak up if you are confused or don't understand!

## Your Cancer and What to Expect

- What type of cancer do I have?
- What is the stage of my cancer?
- Has it spread to other areas of my body?
- Will I need more tests before treatment begins? Which ones?
- Will I need a specialist(s) for my cancer treatment?
- Will you help me find a doctor to give me another opinion on the best treatment plan for me?
- How serious is my cancer?
- What are my chances of survival?

## Cancer Treatment

- What are the ways to treat my type and stage of cancer?
- What are the benefits and risks of each of these treatments?
- What treatment do you recommend? Why do you think it is best for me?
- When will I need to start treatment?
- Will I need to be in the hospital for treatment? If so, for how long?
- What is my chance of recovery with this treatment?
- How will we know if the treatment is working?
- Would clinical trial (research study) be right for me?
- How do I find out about studies for my type and stage of cancer?

## Side Effects

- What are the possible side effects of the treatment?
- What side effects may happen during or between my treatment sessions?
- Are there any side effects that I should call you about right away?
- Are there any lasting effects of the treatment?
- Will this treatment affect my ability to have children?
- How can I prevent or treat side effects?

## Types of Treatment

- Where will I go for treatment?
- How is the treatment given?
- How long will each treatment session take?
- How many treatment sessions will I have?
- Should a family member or friend come with me to my treatment sessions?

## Other Questions to Ask

- Will my insurance pay for this treatment? If not, is there a resource I can look into that might help me pay for treatment?
- How will treatment affect my daily life? Will I still be able to work? Can I still exercise?
- Do I need to tell you about the medicines I am taking now?
- Should I tell you about dietary supplements (such as vitamins, minerals, herbs, or fish oil) that I am taking?
- Could any drugs or supplements change the way that cancer treatment works?



# Frequently Asked Questions

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## 1. What is cancer?

Cancer is a group of more than 100 diseases that develop when cells in the body grow and divide uncontrollably. If the growth and spread is not controlled, it can result in death. Uncontrolled cell growth is nearly the only common feature of different types of cancer. Lung cancer, liver cancer, breast cancer, and leukemia, for example, all have very different causes, symptoms, treatments, and after-care requirements.

## 2. What causes cancer?

Cancer is a complex disease, and, unfortunately, we do not currently know the cause of most cancers. We know that some cancers are associated with behaviors and environmental factors. For example, lung cancer is often associated with smoking. Liver cancer can often be tied to exposure to hepatitis or to alcohol abuse. Cervical cancer is associated with the human papillomavirus. In most cases, however, we do not know the cause of a particular cancer. Identifying causes of cancer is made more difficult by the fact that cancer often does not appear until decades after exposure to a cancer-causing agent.

## 3. Who is at risk of developing cancer?

Anyone can develop cancer, but risk increases with age. In the United States, men have about a 1 in 2 lifetime risk of developing invasive cancer, while women have about 1 in 3 lifetime risk of developing invasive cancer.

## 4. What is a cancer registry?

A cancer registry is an information system for the collection, management, and analysis of data on people diagnosed with cancer. The registry collects detailed information about cancer patients and the treatments they receive, and stores it in a secure computer database. This information comes from patients' medical records. All names and data that could identify a patient are kept confidential. For every cancer case, the registry identifies:

- When the cancer was diagnosed,
- Where the cancer occurred in the body,
- How far advanced the cancer was when it was found,
- The specific type of cancer,
- The type of treatment the patient received, and
- Demographics like age, race, gender, and county of residence.

## 5. How will this report be used?

Public health professionals, researchers, the medical community, and policy makers need information about the number of newly diagnosed cancer cases (called **incidence**) and deaths from cancer (called **mortality**) to understand and address the nation's cancer burden.

Cancer registry information is used to:

- Monitor cancer trends over time,
- Show cancer patterns in various populations and identify high-risk groups,
- Guide planning and evaluation of cancer control programs,
- Help set priorities for allocating health resources, and
- Advance clinical, epidemiologic, and health services research

## 6. How are the data obtained?

The data are extracted exclusively from medical records and reported directly to the West Virginia Cancer Registry (WVCR). This report includes cases reported to the WVCR as of November 1, 2021. Data included in this report may change in future editions since missed cases are added to the WVCR database as they are received.



7. What is a cancer incidence rate?

A cancer incidence rate is defined as the number of new cancer cases that occur for a specified population at risk for developing the disease during a specified time period. Cancer rates are most commonly expressed as the number of cancers per 100,000 population. For example, if your county has a population of 50,000 people, with an incidence rate of 100.0 per 100,000, your county would have a case count of 50. Similarly, if your county has a population of 200,000, with the same incidence rate of 100 per 100,000, your county would have a case count of 200. Rates allow us to compare groups of different population sizes.

8. What are age-adjusted rates?

An age-adjusted rate is statistically modified to account for the different age distributions among populations. Age-adjustment is important when looking at cancer rates because cancer is usually a disease of aging; areas with a more elderly population generally have more cases of cancer, and age-adjustment accounts for this. The rates in this report are age-adjusted using the 2000 U.S. standard population, and are expressed as the rate per 100,000 unless otherwise noted.

9. What is a confidence interval?

A confidence interval is a range of values for a variable of interest (such as a rate) that has a specified probability of containing the true population value. The 95% confidence interval is one of the most common levels of confidence reported. Year-to-year fluctuations in case counts make the exact rate difficult to determine. With a 95% confidence interval, we can be 95% sure that the true rate lies within that range.

10. What are case counts?

Case counts are the number of people who have been diagnosed with an illness in a particular calendar year or span of years. State and county data are presented as total counts for the 5-year period (2015-2019) unless otherwise noted. For an average annual count, divide the 5-year count by 5. Counts were suppressed (indicated by ^) in the tables if the number of cases was less than four, or if incidence rates were not available. An important reason for suppressing counts is to protect the confidentiality of individuals whose data are included in the report.

11. How is the location of a reported cancer case determined?

Cancer cases are counted based on the patient's place of residence at the time of their cancer diagnosis, as shown on their medical record.

12. How were the data analyzed?

SEER\*Stat software (version 8.4.0.1) was used to calculate all cancer incidence rates and counts presented in this report. All rates were expressed as the number of cases per 100,000 population except for pediatric cancers which are shown as the number of cases per million population. Age-adjusted rates were standardized to the 2000 U.S. standard population (19 age groups).

13. How are the data explained and displayed?

Most of the data in this report are shown as rates per 100,000 people to allow for "apples to apples" comparisons of areas with different population sizes. Ninety-five percent confidence intervals are shown to allow for statistical comparisons. Average annual rates over a 5-year period are shown to provide a more stable estimate of incidence than would be possible with yearly incidence rates. Five-year case counts are provided to show the volume of cases diagnosed and treated each year.



# Frequently Asked Questions (cont'd)

## 14. What are the different stages of cancer?

For the purpose of this document, we discuss cancer diagnosed at the **local**, **regional**, and **distant stages**. Cancer diagnosed at the **local stage**, otherwise known as a localized tumor, describes a tumor limited to only the tissue or organ where it began. Cancer diagnosed at the **regional stage** describes a tumor that has spread beyond the original tissue or organ into surrounding tissue, organs, or regional lymph nodes. Cancer diagnosed at the **distant stage** describes a tumor whose cells have broken away and traveled from the primary tumor to areas of the body distant from that primary tumor. The earlier a tumor is found, the easier it is to treat, and survival rates are usually higher. This demonstrates the importance of regular screening for these dangerous diseases.

## 15. What is Mountains of Hope?

Mountains of Hope WV Cancer Coalition (MOH) is dedicated to reducing the human and economic impact of cancer in our state. The founding members of the Coalition include the American Cancer Society, WV Breast and Cervical Cancer Screening Program, WV Comprehensive Cancer Program, and the WVU Cancer Institute.

Part of the Centers for Disease Control and Prevention's National Comprehensive Cancer Control Program, MOH Coalition members meet face-to-face to pool resources and collaborate to address the goals and priorities of the WV Cancer Plan. The WV Cancer Plan is the State's ambitious comprehensive cancer plan that serves as a blueprint to address the needs of the State to improve the overall health equity of all affected by cancer. It is designed to be used by communities, organizations, universities, and legislators who want to decrease the impact of cancer on WV residents.

Coalition members include health care professionals, volunteers, cancer survivors and community advocates representing over 125 community-based organizations, research and academic institutions, public and private agencies, coalitions, voluntary associations, patient advocacy groups, and other cancer-related organizations from West Virginia. Learn more about MOH by visiting [www.moh.wv.gov](http://www.moh.wv.gov).

Members of the Coalition participate in one of three subcommittees (prevention, early detection, and quality of life) based on their area of interest. Each committee focuses on policy, system, and environmental change efforts; education and outreach; and addressing social determinants of health.

## 16. Where can I find information about clinical trials for cancer patients in West Virginia?

Clinical trials are research studies that involve people that test new ways to:

- Treat cancer,
- Find and diagnose cancer,
- Prevent cancer, and
- Manage symptoms of cancer and side effects from its treatment.

Cancer clinical trials information can be found from a variety of credible sources including the following:

- WVU Cancer Institute Clinical Research Unit— [www.hsc.wvu.edu/ctru/current-clinical-trials](http://www.hsc.wvu.edu/ctru/current-clinical-trials)
- CAMC Institute for Academic Medicine— [www.camcmedicine.edu/clinical-trials](http://www.camcmedicine.edu/clinical-trials)
- National Cancer Institute— [www.cancer.gov/about-cancer/treatment/clinical-trials](http://www.cancer.gov/about-cancer/treatment/clinical-trials)
- Find an NCI-Supported Clinical Trial— [www.cancer.gov/about-cancer/treatment/clinical-trials/search](http://www.cancer.gov/about-cancer/treatment/clinical-trials/search).

17. Where can I find additional information on cancer?

Cancer information is available from a variety of credible sources including the following:

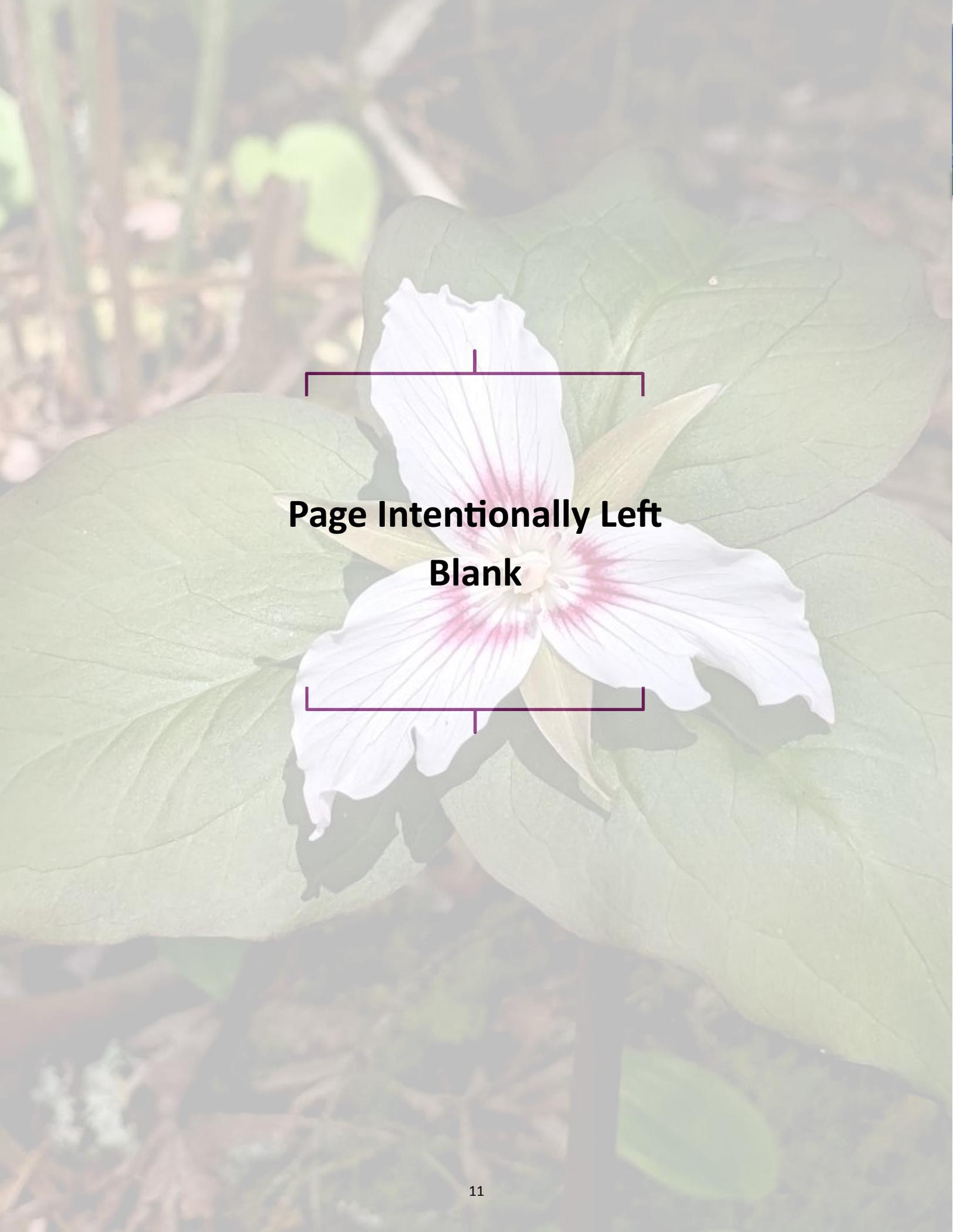
- Centers for Disease Control and Prevention—<https://www.cdc.gov/cancer/>
- National Cancer Institute—<https://www.cancer.gov/about-cancer>
- American Cancer Society—<http://www.cancer.org/cancer/index>
- WVU Cancer Institute—<http://wvucancer.org/>

18. Where can I direct my questions or suggestions about the WV Cancer Burden Report?

Questions or suggestions regarding data in the 2022 West Virginia Cancer Burden Report may be directed to (304) 558-5358.

**References**

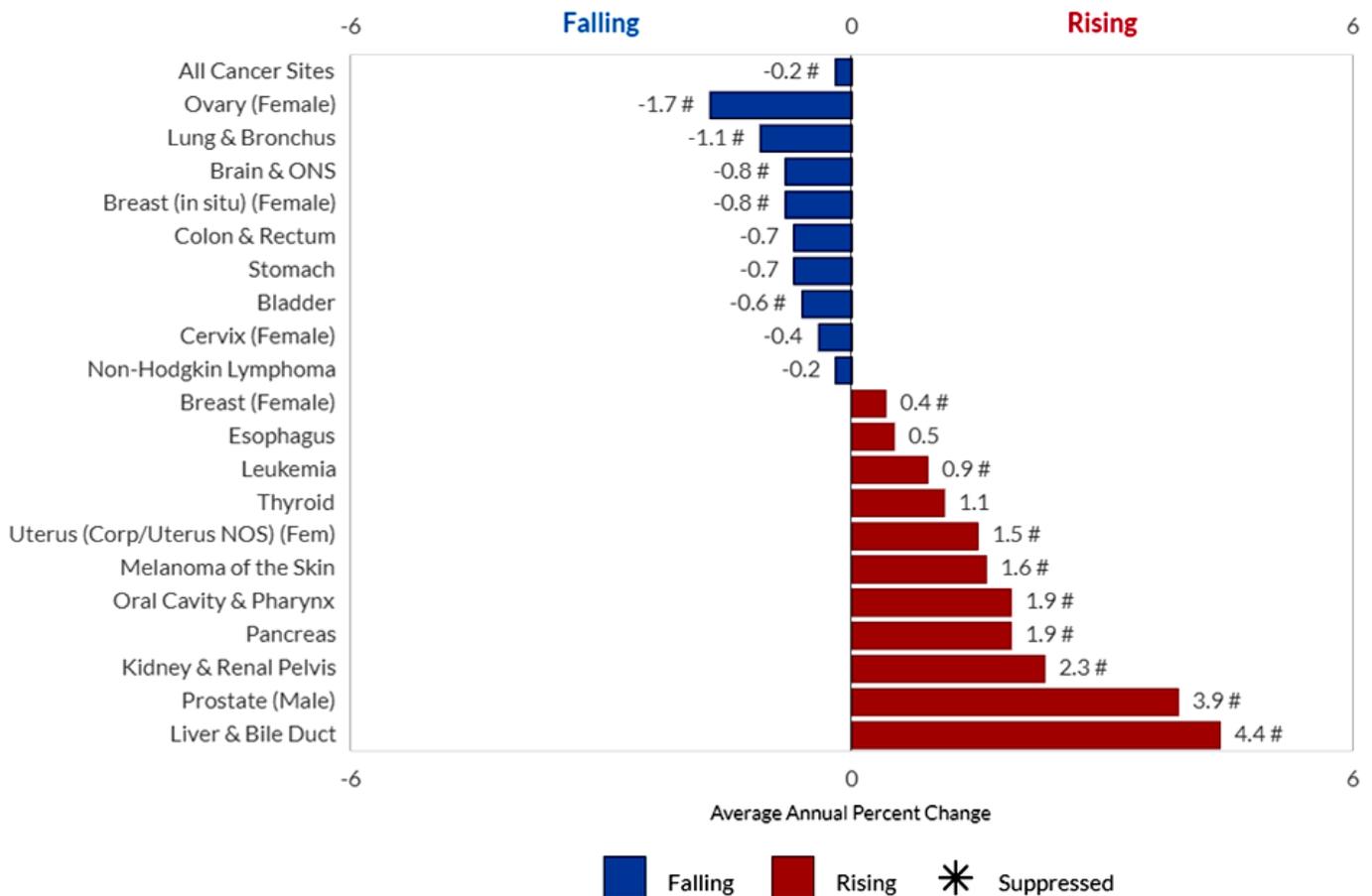
- American Cancer Society—<http://www.cancer.org/cancer/index>
- Centers for Disease Control and Prevention—<https://www.cdc.gov/cancer/>
- Mountains of Hope WV Cancer Coalition—<http://www.moh.wv.gov>
- National Cancer Institute—<https://www.cancer.gov/about-cancer>
- West Virginia Cancer Registry—<https://oeeps.wv.gov/>



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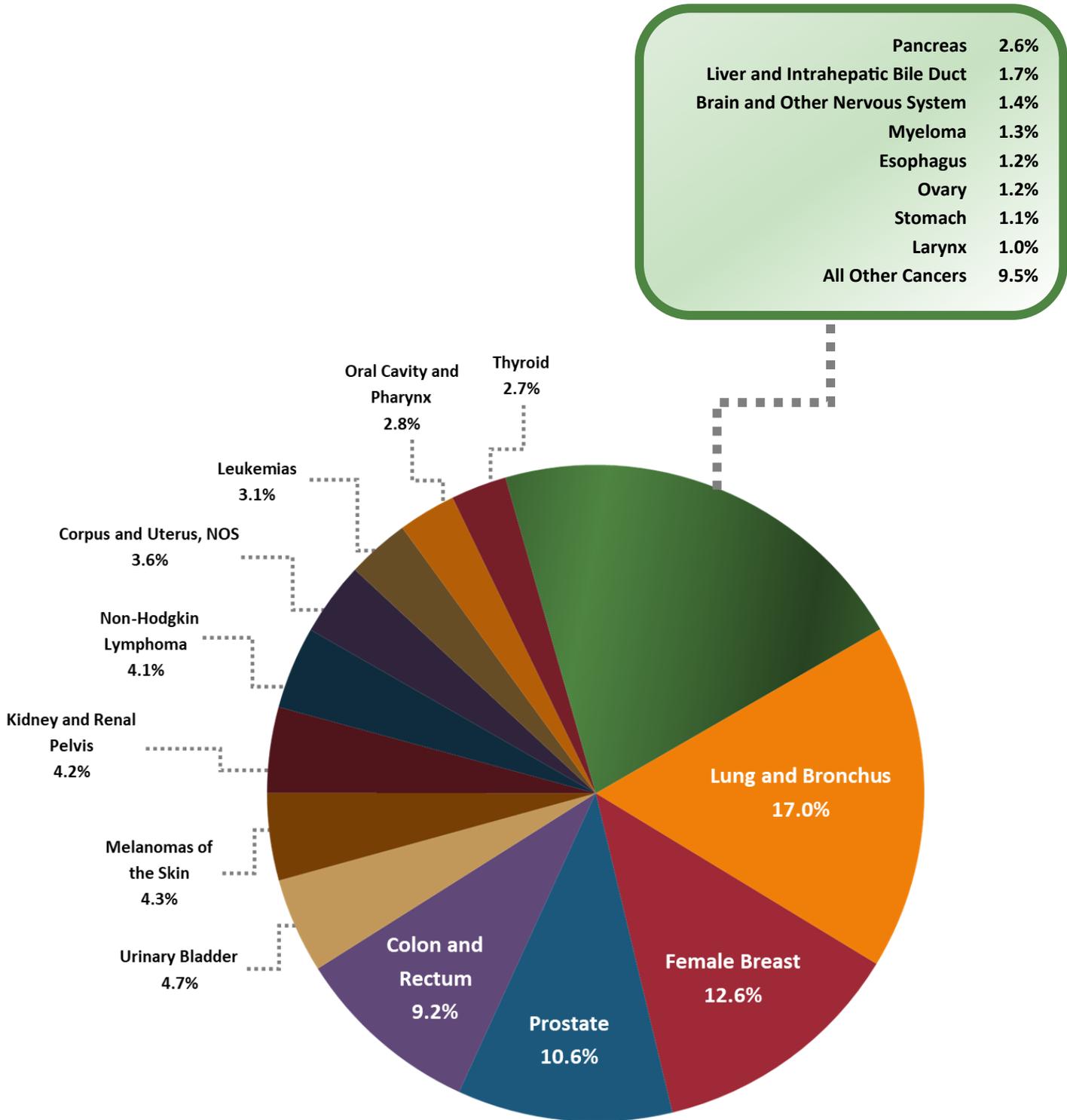
# Trends in Cancer Incidence

## 5-Year Rate Changes for Select Cancers — Incidence, West Virginia, 2015-2019



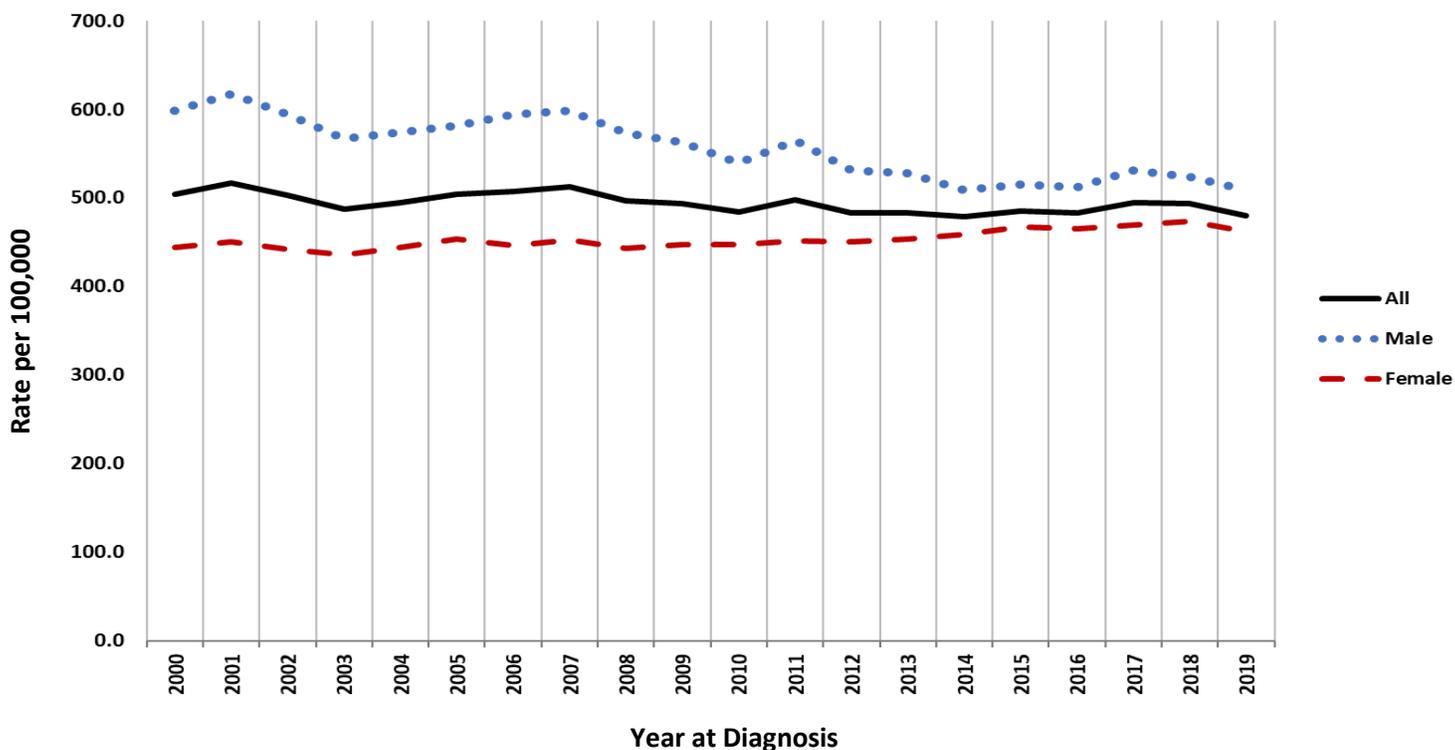
# — The annual percent change is significantly different from zero ( $p < 0.05$ ).

# Percent Distribution of New Cancer Cases, West Virginia, 2015-2019



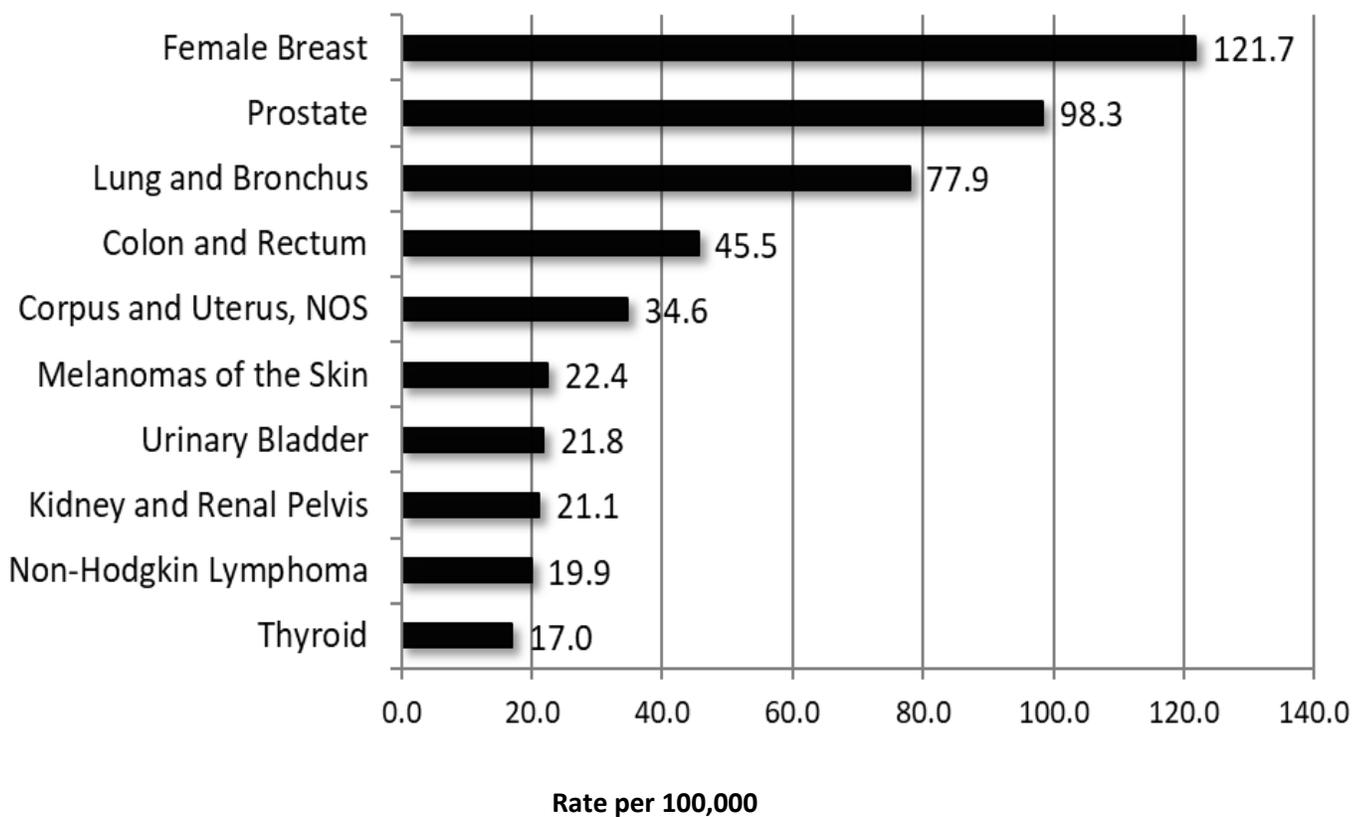
# Average Annual Age-Adjusted All Sites Cancer Incidence Rates (per 100,000), by Sex, West Virginia, 2000-2019

Year	All	Males	Females
2000	504.0	598.5	444.7
2001	517.2	617.4	450.9
2002	503.0	594.1	442.0
2003	487.2	567.3	435.4
2004	494.7	574.8	443.7
2005	504.7	581.8	454.1
2006	506.9	593.9	446.0
2007	512.9	598.7	453.0
2008	496.7	573.2	443.3
2009	494.1	562.2	447.8
2010	483.8	539.1	447.4
2011	498.3	564.9	451.9
2012	483.1	531.0	450.0
2013	482.8	527.7	453.7
2014	478.5	509.3	459.0
2015	485.3	514.8	466.9
2016	483.1	512.1	465.1
2017	494.3	530.8	469.5
2018	493.8	523.3	473.4
2019	480.5	508.9	462.0



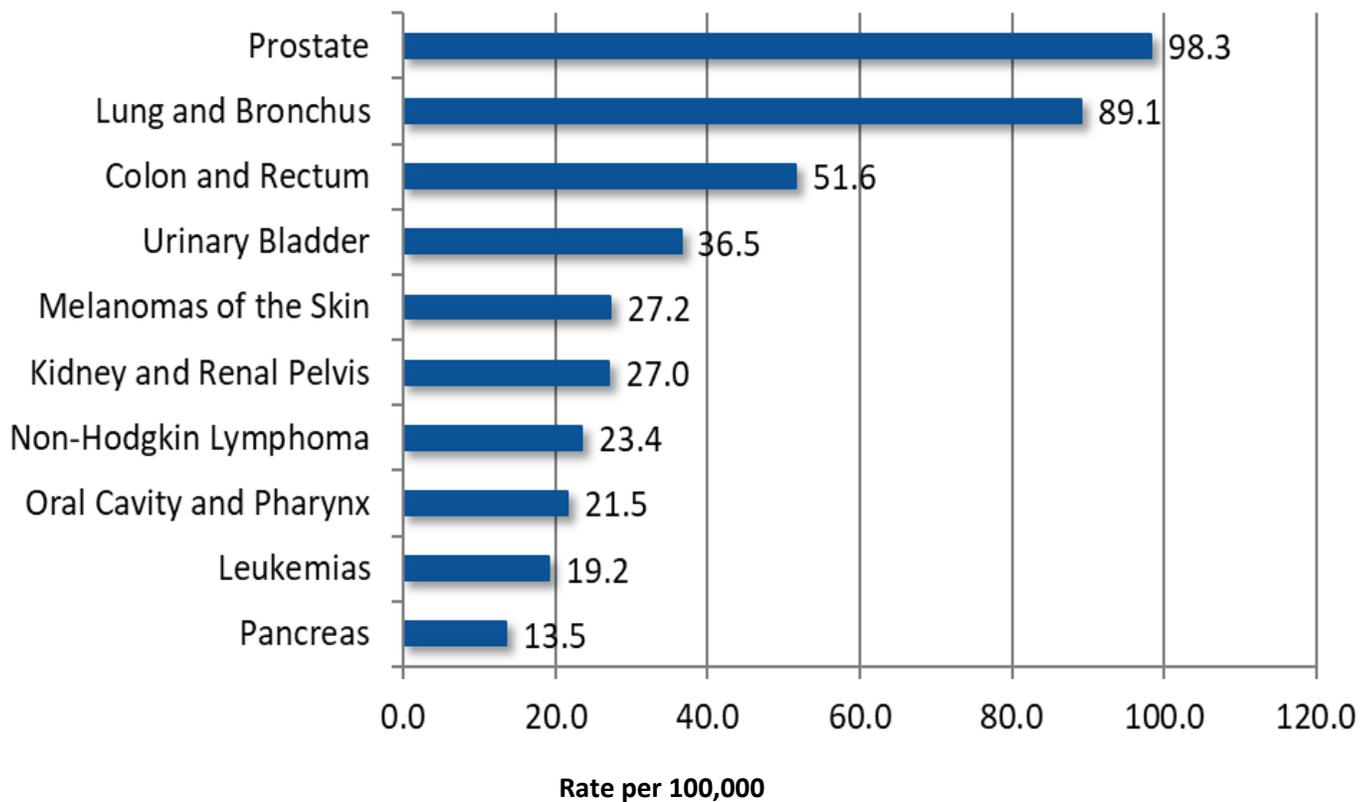
## Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000) Top 10 Sites Among Men and Women, West Virginia, 2015-2019

Primary Site	Age-Adjusted Incidence Rate
Female Breast	121.7
Prostate	98.3
Lung and Bronchus	77.9
Colon and Rectum	45.5
Corpus and Uterus, NOS	34.6
Melanomas of the Skin	22.4
Urinary Bladder	21.8
Kidney and Renal Pelvis	21.1
Non-Hodgkin Lymphoma	19.9
Thyroid	17.0



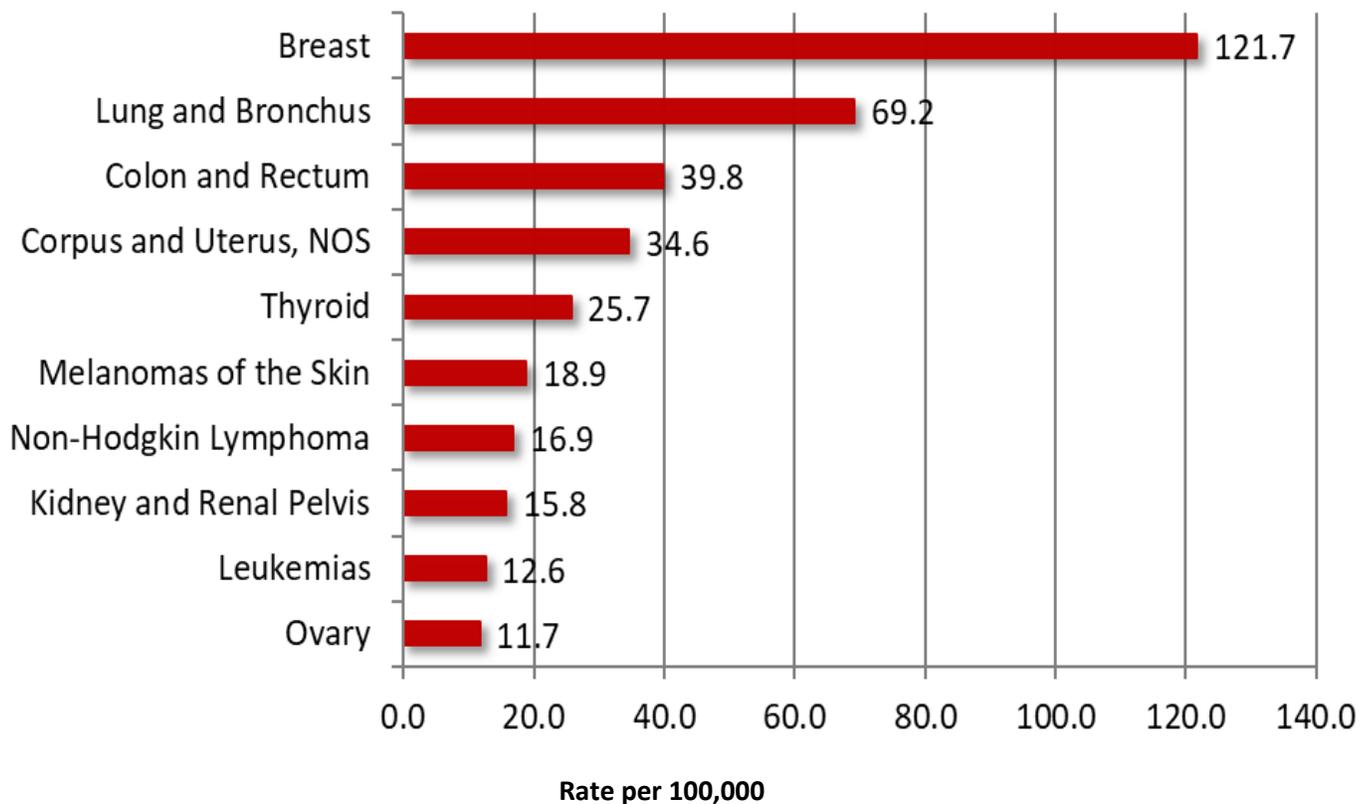
## Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000) Top 10 Sites Among Men, West Virginia, 2015-2019

Primary Site	Age-Adjusted Incidence Rate
Prostate	98.3
Lung and Bronchus	89.1
Colon and Rectum	51.6
Urinary Bladder	36.5
Melanomas of the Skin	27.2
Kidney and Renal Pelvis	27.0
Non-Hodgkin Lymphoma	23.4
Oral Cavity and Pharynx	21.5
Leukemias	19.2
Pancreas	13.5



## Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000) Top 10 Sites Among Women, West Virginia, 2015-2019

Primary Site	Age-Adjusted Incidence Rate (per 100,000)
Breast	121.7
Lung and Bronchus	69.2
Colon and Rectum	39.8
Corpus and Uterus, NOS	34.6
Thyroid	25.7
Melanomas of the Skin	18.9
Non-Hodgkin Lymphoma	16.9
Kidney and Renal Pelvis	15.8
Leukemias	12.6
Ovary	11.7



## Average Annual Age-Adjusted Cancer Incidence Rates, 95% Confidence Intervals, and 5-Year Counts by Select Cancer Sites and Sex, West Virginia, 2015-2019

Cancer Site	Male and Female			Males			Females					
	Rate	Lower CI	Upper CI	Count	Rate	Lower CI	Upper CI	Count	Rate	Lower CI	Upper CI	Count
	All Sites	487.4	483.4	491.4	61,082	517.7	511.8	523.7	31,203	467.4	461.9	473.1
Oral Cavity and Pharynx	14.0	13.3	14.7	1,743	21.5	20.3	22.7	1,284	7.1	6.4	7.8	459
Esophagus	5.8	5.4	6.2	767	10.1	9.3	11.0	625	2.0	1.7	2.4	142
Stomach	5.4	5.0	5.8	695	7.5	6.8	8.2	444	3.6	3.2	4.1	251
Small Intestine	2.4	2.2	2.8	296	2.6	2.2	3.1	149	2.3	2.0	2.8	147
Colon and Rectum	45.5	44.3	46.7	5,647	51.6	49.7	53.6	3,007	39.8	38.2	41.4	2,640
Liver and Intrahepatic Bile Duct	7.8	7.3	8.3	1,049	11.4	10.6	12.3	728	4.5	4.0	5.1	321
Gallbladder	0.8	0.6	0.9	100	0.5	0.3	0.7	28	1.0	0.8	1.3	72
Pancreas	12.5	11.9	13.2	1,622	13.5	12.6	14.5	815	11.6	10.8	12.5	807
Larynx	4.7	4.3	5.1	611	7.4	6.7	8.2	467	2.3	1.9	2.7	144
Lung and Bronchus	77.9	76.4	79.5	10,438	89.1	86.7	91.5	5,562	69.2	67.2	71.2	4,876
Bones and Joints	1.0	0.8	1.2	94	1.1	0.8	1.4	48	1.0	0.7	1.3	46
Soft Tissues including Heart	3.3	3.0	3.7	360	3.9	3.4	4.5	207	2.8	2.3	3.3	153
Melanomas of the Skin	22.4	21.5	23.4	2,638	27.2	25.8	28.6	1,562	18.9	17.7	20.2	1,076
Breast	64.0	62.6	65.6	7,755	1.2	0.9	1.5	71	121.7	118.8	124.6	7,684
Cervix Uteri									9.4	8.5	10.3	448
Corpus and Uterus, NOS									34.6	33.1	36.1	2,224
Ovary									11.7	10.8	12.6	732
Prostate					98.3	95.9	100.8	6,464				
Testis					5.7	4.9	6.4	235				
Urinary Bladder	21.8	21.0	22.6	2,872	36.5	34.9	38.1	2,202	9.7	8.9	10.5	670
Kidney and Renal Pelvis	21.1	20.3	22.0	2,574	27.0	25.6	28.5	1,561	15.8	14.8	16.9	1,013
Brain and Other Nervous System	7.0	6.4	7.5	754	7.8	7.0	8.6	412	6.2	5.5	6.9	342
Thyroid	17.0	16.1	17.8	1,678	8.2	7.4	9.1	420	25.7	24.3	27.3	1,258
Hodgkin Lymphoma	2.4	2.1	2.8	227	2.9	2.5	3.5	138	1.9	1.5	2.4	89
Non-Hodgkin Lymphoma	19.9	19.1	20.7	2,488	23.4	22.2	24.8	1,360	16.9	15.9	18.0	1,128
Myeloma	5.9	5.5	6.4	780	7.3	6.6	8.1	444	4.7	4.2	5.3	336
Leukemia	15.7	14.9	16.4	1,875	19.2	18.0	20.4	1,083	12.6	11.7	13.6	792

## Average Annual Age-Adjusted Cancer Incidence Rates, 95% Confidence Intervals, and 5-Year Counts by Select Cancer Sites and Sex for Whites, West Virginia, 2015-2019

Cancer Site	Male and Female			Males			Females					
	Rate	Lower CI	Upper CI	Count	Rate	Lower CI	Upper CI	Count	Rate	Lower CI	Upper CI	Count
All Sites	488.3	484.1	492.4	58,849	516.7	510.7	522.9	29,954	469.7	464.0	475.5	28,895
Oral Cavity and Pharynx	14.1	13.4	14.8	1,692	21.7	20.5	23.0	1,250	7.0	6.3	7.7	442
Esophagus	5.9	5.5	6.4	751	10.3	9.5	11.2	614	2.0	1.7	2.4	137
Stomach	5.3	4.9	5.7	661	7.5	6.8	8.3	429	3.5	3.0	4.0	232
Small Intestine	2.4	2.1	2.7	277	2.5	2.1	3.0	139	2.3	1.9	2.7	138
Colon and Rectum	45.6	44.3	46.8	5,443	51.7	49.8	53.7	2,896	39.9	38.3	41.5	2,547
Liver and Intrahepatic Bile Duct	7.7	7.2	8.2	992	11.3	10.4	12.2	686	4.5	4.0	5.1	306
Gallbladder	0.8	0.6	0.9	95	0.5	0.3	0.7	27	1.0	0.8	1.3	68
Pancreas	12.5	11.8	13.1	1,554	13.4	12.4	14.4	777	11.6	10.8	12.5	777
Larynx	4.8	4.4	5.2	597	7.6	6.9	8.4	458	2.3	1.9	2.7	139
Lung and Bronchus	78.6	77.0	80.1	10,141	89.6	87.1	92.1	5,392	69.9	67.9	72.0	4,749
Bones and Joints	1.0	0.8	1.2	86	1.0	0.7	1.4	42	1.0	0.7	1.3	44
Soft Tissues including Heart	3.3	2.9	3.7	343	3.9	3.3	4.5	195	2.8	2.3	3.3	148
Melanoma of the Skin	22.7	21.8	23.6	2,563	27.6	26.2	29.1	1,525	19.0	17.7	20.2	1,038
Breast	64.1	62.6	65.7	7,469	1.2	1.0	1.6	70	121.6	118.7	124.6	7,399
Cervix Uteri									9.4	8.4	10.4	427
Corpus and Uterus, NOS									35.1	33.5	36.7	2,162
Ovary									11.8	10.9	12.8	712
Prostate					95.2	92.7	97.7	6,033				
Testis					6.0	5.2	6.8	232				
Urinary Bladder	22.1	21.3	23.0	2,815	37.1	35.6	38.8	2,164	9.8	9.0	10.6	651
Kidney and Renal Pelvis	21.4	20.5	22.3	2,501	27.3	25.9	28.8	1,510	16.1	15.0	17.2	991
Brain and Other Nervous System	7.0	6.5	7.6	731	7.9	7.1	8.7	399	6.2	5.5	7.0	332
Thyroid	17.2	16.3	18.1	1,624	8.3	7.5	9.2	406	26.1	24.5	27.7	1,218
Hodgkin Lymphoma	2.5	2.1	2.8	217	3.0	2.5	3.5	132	2.0	1.6	2.5	85
Non-Hodgkin Lymphoma	20.1	19.3	21.0	2,418	23.6	22.3	25.0	1,318	17.1	16.0	18.2	1,100
Myeloma	5.8	5.3	6.2	732	7.1	6.4	7.9	417	4.6	4.1	5.2	315
Leukemia	15.6	14.8	16.4	1,795	19.0	17.8	20.3	1,033	12.6	11.7	13.6	762

## Average Annual Age-Adjusted Cancer Incidence Rates, 95% Confidence Intervals, and 5-Year Counts by Select Cancer Sites and Sex for Blacks, West Virginia, 2015-2019

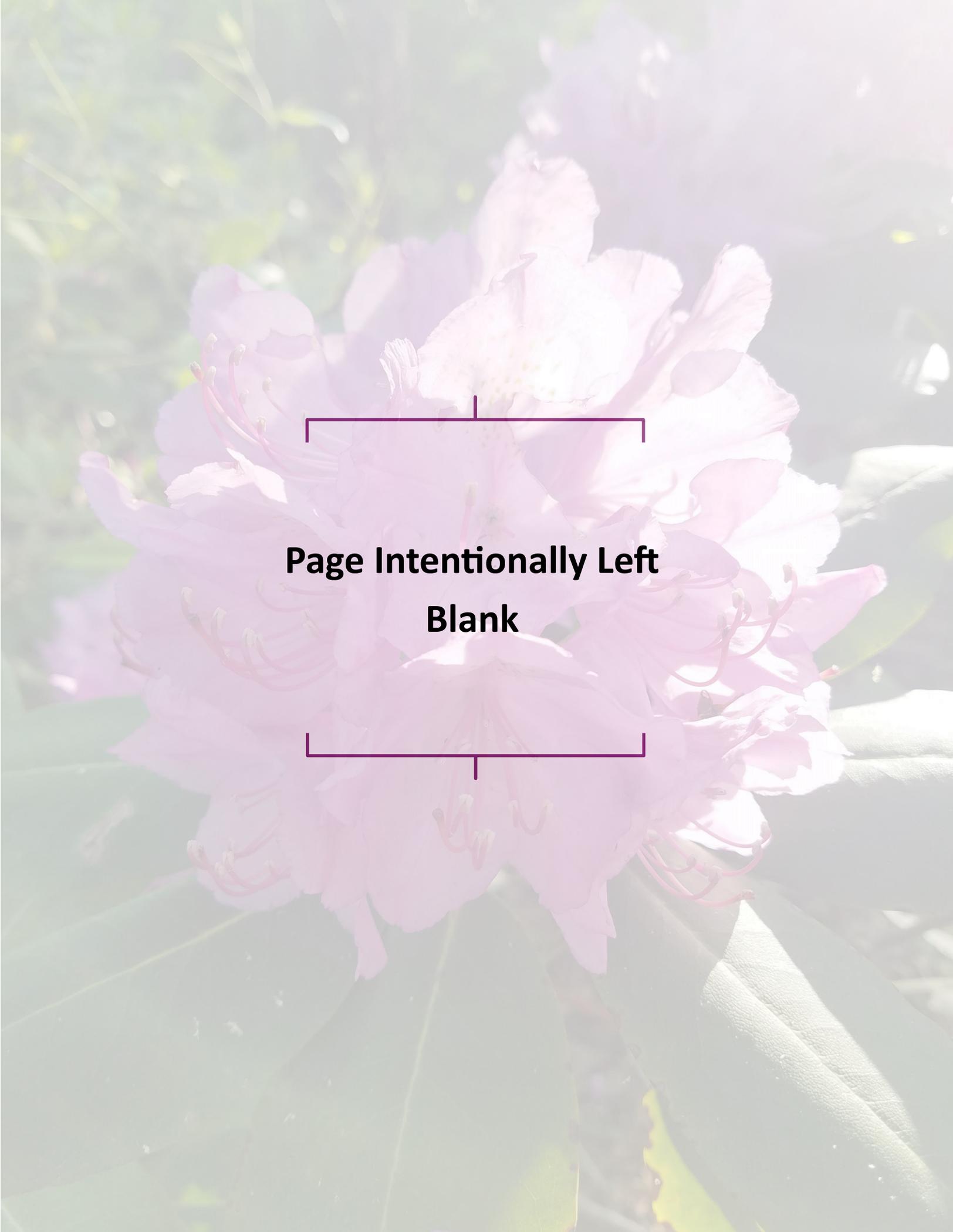
Cancer Site	Male and Female			Males			Females					
	Rate	Lower CI	Upper CI	Count	Rate	Upper CI	Lower CI	Count	Rate	Upper CI	Lower CI	Count
	All Sites	442.9	420.7	465.9	1,621	523.4	487.6	561.0	944	377.4	348.6	408.0
Oral Cavity and Pharynx	11.2	7.8	15.5	38	16.5	10.4	24.7	26	7.3	3.6	13.1	12
Esophagus	3.6	1.9	6.3	13	5.8	2.7	10.9	10	1.4	0.3	4.6	^
Stomach	6.0	3.7	9.3	21	6.6	3.1	12.2	11	5.3	2.5	10.0	10
Small Intestine	5.7	3.3	9.1	18	7.2	3.3	13.3	10	4.7	2.0	9.4	8
Colon and Rectum	42.6	35.9	50.2	154	45.1	35.3	56.8	83	38.9	30.1	49.4	71
Liver and Intrahepatic Bile Duct	10.2	7.4	13.7	47	15.4	10.8	21.6	37	4.4	2.1	8.4	10
Gallbladder	1.2	0.4	3.0	5	0.7	0.0	3.6	^	1.8	0.5	5.0	4
Pancreas	16.1	12.0	21.2	55	20.3	13.1	29.7	30	13.4	8.5	20.0	25
Larynx	3.0	1.5	5.3	12	4.1	1.6	8.7	8	2.2	0.6	5.8	4
Lung and Bronchus	67.0	58.5	76.4	242	83.6	69.0	100.3	139	54.1	43.9	66.0	103
Bones and Joints	2.4	1.0	4.7	8	3.9	1.3	8.9	6	1.2	0.1	4.5	^
Soft Tissues including Heart	3.8	1.9	6.6	12	5.2	2.2	10.3	9	2.2	0.5	6.2	^
Melanoma of the Skin	0.9	0.2	2.4	4	1.1	0.2	3.9	^	0.7	0.0	3.5	^
Breast	60.0	51.9	69.0	210	0.4	0.0	2.8	^	120.8	104.4	139.0	209
Cervix Uteri												
Corpus and Uterus, NOS												
Ovary												
Prostate					180.9	160.9	202.6	349				
Testis					1.7	0.3	5.2	^				
Urinary Bladder	11.2	8.0	15.4	41	15.9	10.1	23.5	28	6.5	3.4	11.3	13
Kidney and Renal Pelvis	15.5	11.5	20.3	55	19.9	13.7	28.0	37	10.9	6.3	17.3	18
Brain and Other Nervous System	2.9	1.4	5.3	11	3.2	1.1	7.2	6	2.6	0.8	6.2	5
Thyroid	9.0	6.0	12.8	32	5.4	2.5	10.4	10	13.7	8.4	20.9	22
Hodgkin Lymphoma	2.6	1.2	4.8	10	2.7	1.0	6.4	6	2.2	0.5	5.9	4
Non-Hodgkin Lymphoma	12.4	9.0	16.7	47	15.7	10.1	23.1	29	9.5	5.5	15.2	18
Myeloma	10.4	7.2	14.4	38	13.1	7.9	20.3	23	7.7	4.2	13.0	15
Leukemia	13.3	9.6	18.0	45	19.8	12.8	28.9	30	9.2	5.0	15.3	15

^ Data Suppressed

Average Annual Age-Adjusted Pediatric Cancer (Ages 0-19)  
 Incidence Rates and 5-Year Counts,  
 West Virginia and United States, 2015-2019

International Classification of Childhood Cancer Grouping	West Virginia		United States	
	Rate per Million	5-Year Count	Rate per Million	5-Year Count
<b>All Pediatric Invasive Cancer Sites</b>	189.7	394	190.4	77,612
<b>Leukemias, myeloproliferative and myelodysplastic diseases</b>	38.2	79	48.7	19,811
<b>Lymphomas and reticuloendothelial neoplasms</b>	29.6	62	29.9	12,223
<b>Central nervous system and miscellaneous intracranial and intraspinal neoplasms</b>	37.9	78	30.1	12,216
<b>Neuroblastoma and other peripheral nervous cell tumors</b>	8.4	17	8.9	3,614
<b>Retinoblastomas</b>	^	^	3.2	1,286
<b>Renal tumors</b>	12.2	25	7.0	2,844
<b>Hepatic tumors</b>	^	^	2.7	1,078
<b>Malignant bone tumors</b>	^	^	9.5	3,866
<b>Soft tissue and other extraosseous sarcomas</b>	12.5	26	12.4	5,061
<b>Germ cell and trophoblastic tumors, and neoplasms of gonads</b>	^	^	11.1	4,550
<b>Other malignant epithelial neoplasms and melanomas</b>	32.0	68	24.4	10,051
<b>Other and unspecified malignant melanomas</b>	^	^	1.0	391
<b>Not classified by International Classification of Childhood Cancer, or in situ</b>	^	^	1.5	621

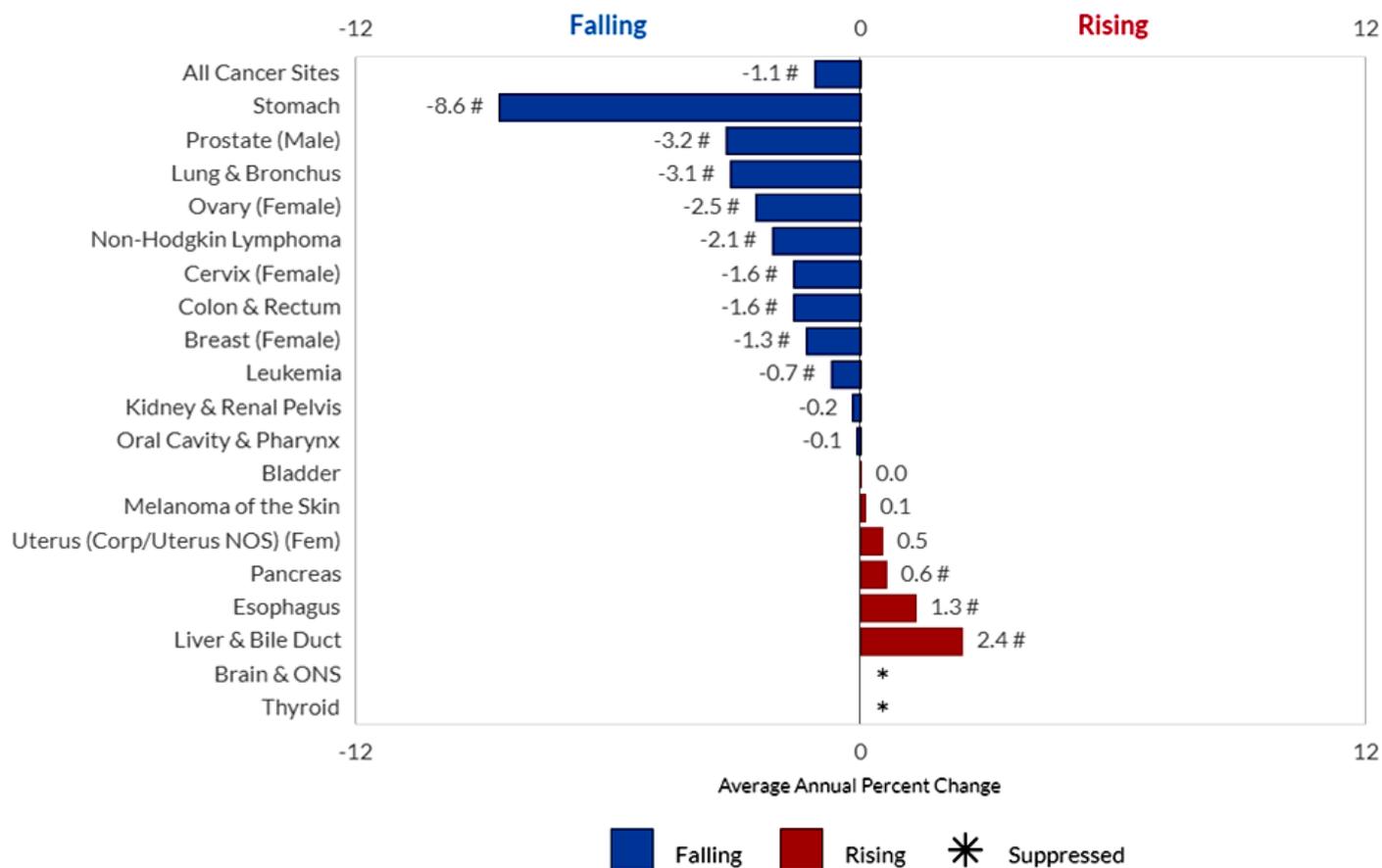
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# Trends in Cancer Mortality

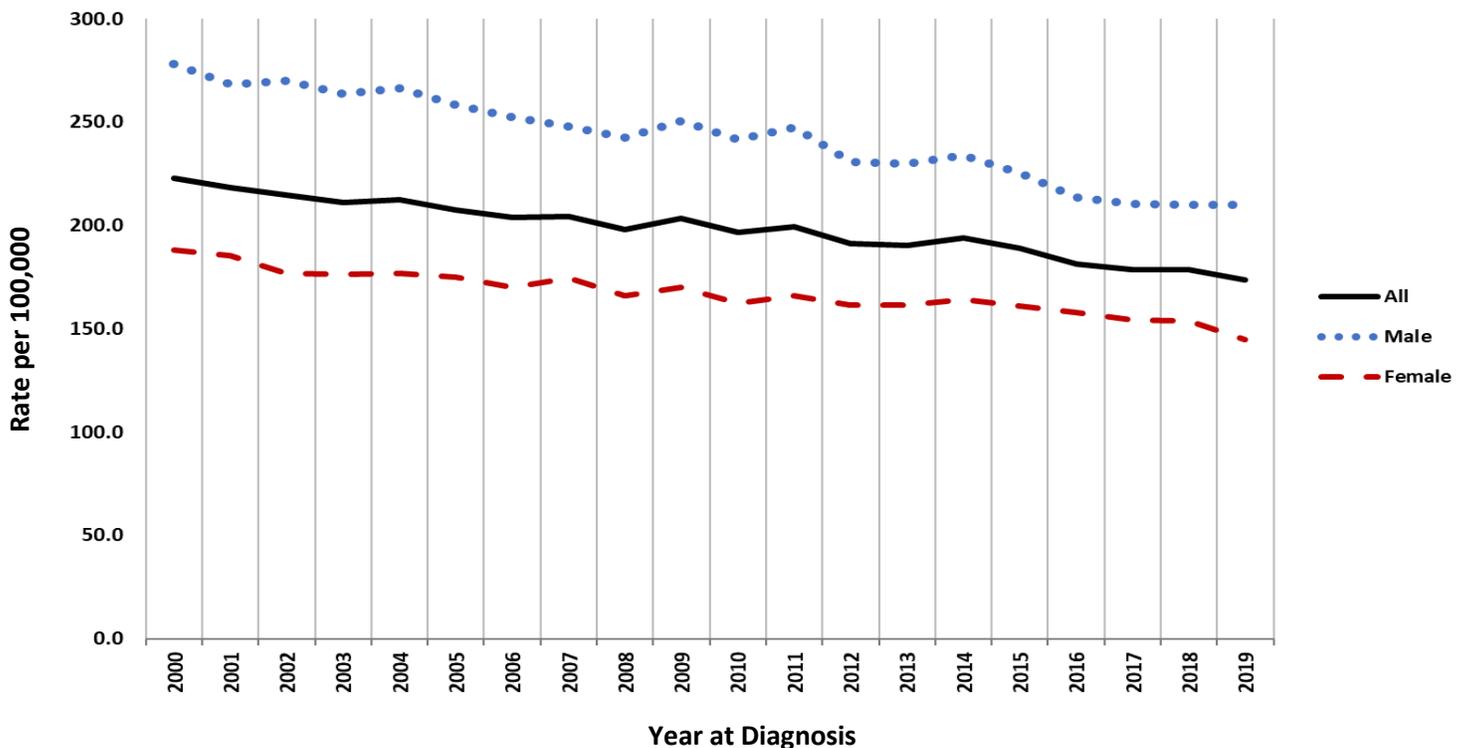
## 5-Year Rate Changes for Select Cancers — Mortality, West Virginia, 2015-2019



# — The annual percent change is significantly different from zero ( $p < 0.05$ ).

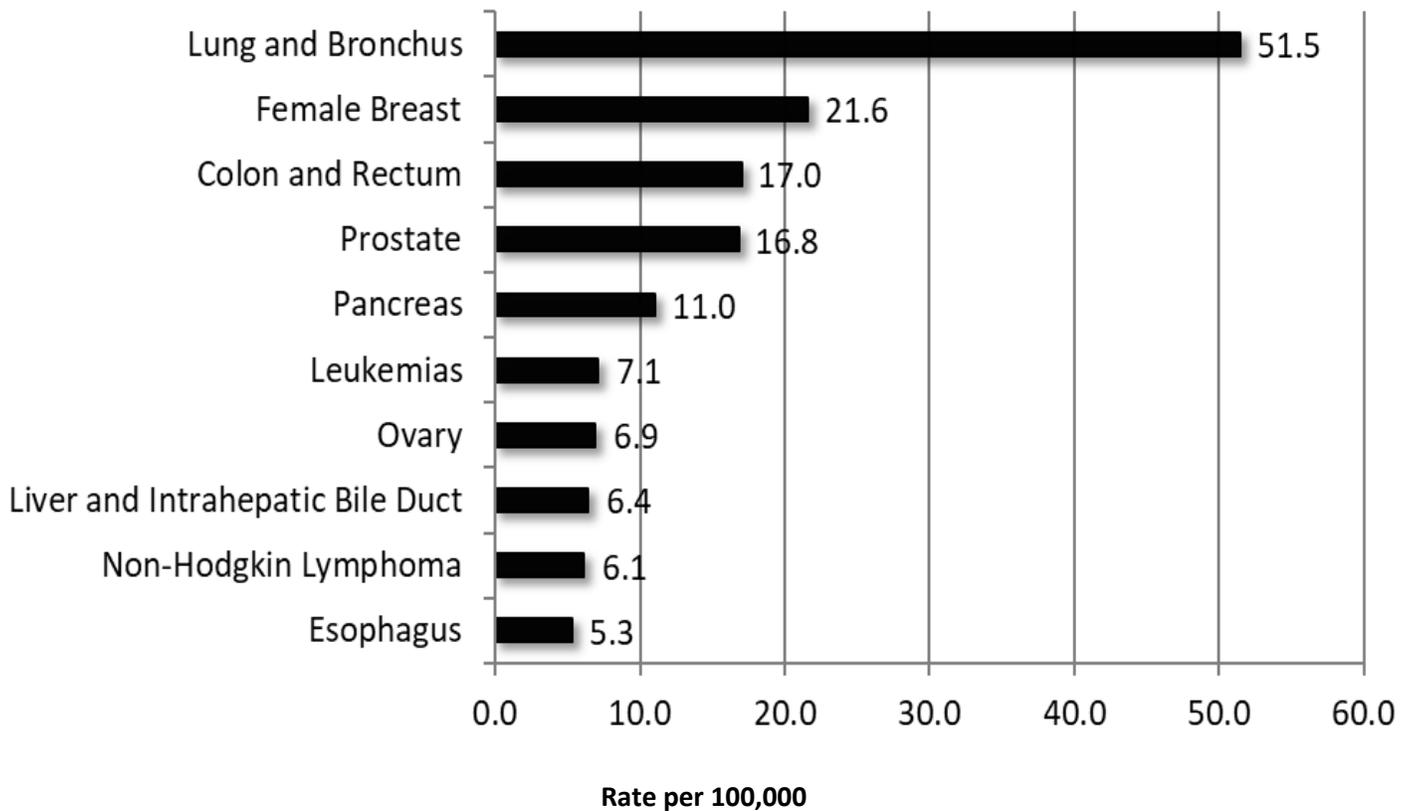
# Average Annual Age-Adjusted All Sites Cancer Mortality Rates (per 100,000), by Sex, West Virginia, 2000-2019

Year	All	Males	Females
2000	222.7	278.1	188.3
2001	218.5	268.4	185.6
2002	214.7	270.1	177.0
2003	211.2	263.7	176.2
2004	212.3	266.3	176.6
2005	207.6	258.1	175.1
2006	204.0	252.3	170.0
2007	204.3	248.0	174.6
2008	197.9	242.7	165.8
2009	203.3	250.6	170.2
2010	196.5	241.4	162.5
2011	199.4	247.3	165.8
2012	191.1	230.7	161.6
2013	190.3	229.7	161.4
2014	194.1	233.9	164.2
2015	189.1	225.2	161.1
2016	181.5	213.6	157.9
2017	178.4	210.4	154.3
2018	178.4	209.9	153.6
2019	173.7	210.0	144.8



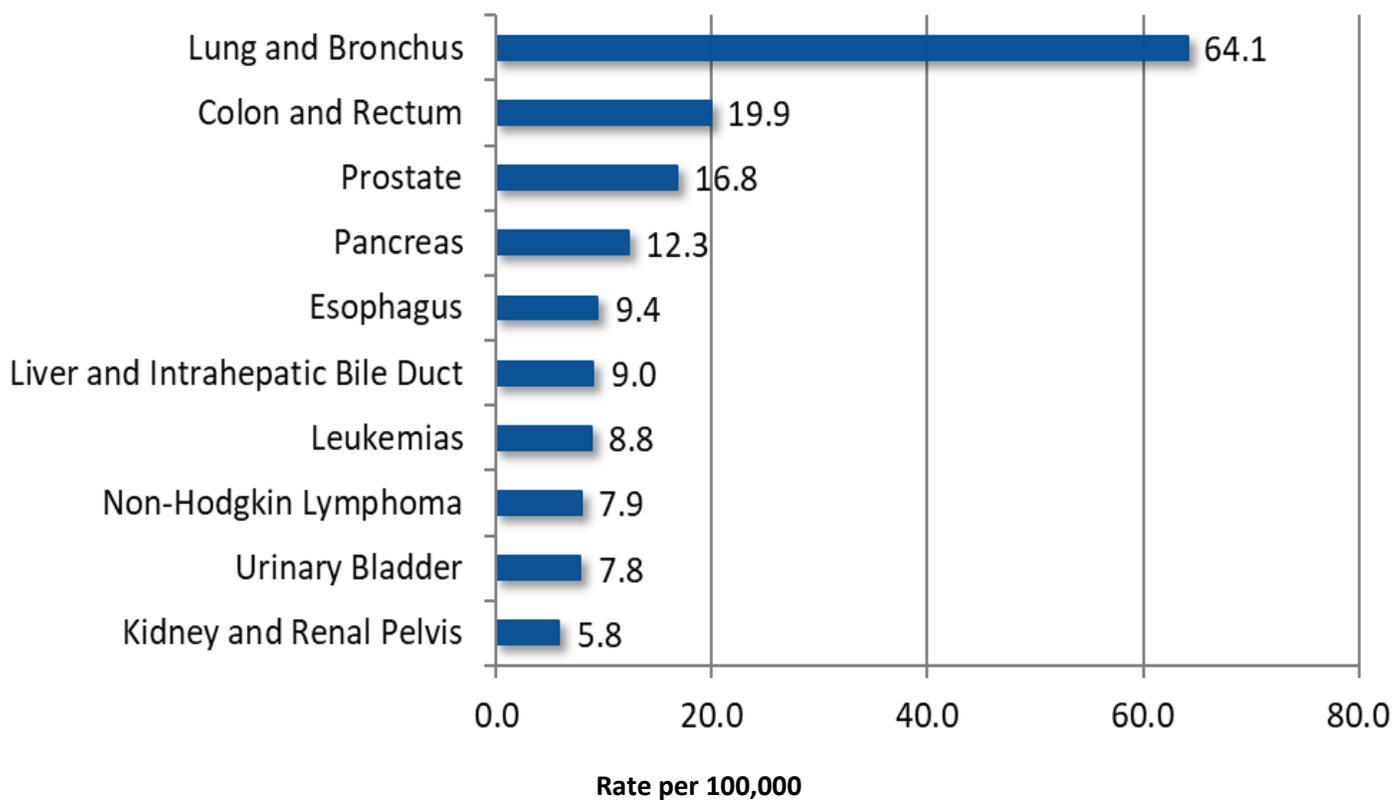
Average Annual Age-Adjusted Cancer Mortality Rates (per 100,000)  
 Top 10 Sites Among Men and Women, West Virginia, 2015-2019

Primary Site	Age-Adjusted Incidence Rate (per 100,000)
Lung and Bronchus	51.5
Female Breast	21.6
Colon and Rectum	17.0
Prostate	16.8
Pancreas	11.0
Leukemias	7.1
Ovary	6.9
Liver and Intrahepatic Bile Duct	6.4
Non-Hodgkin Lymphoma	6.1
Esophagus	5.3



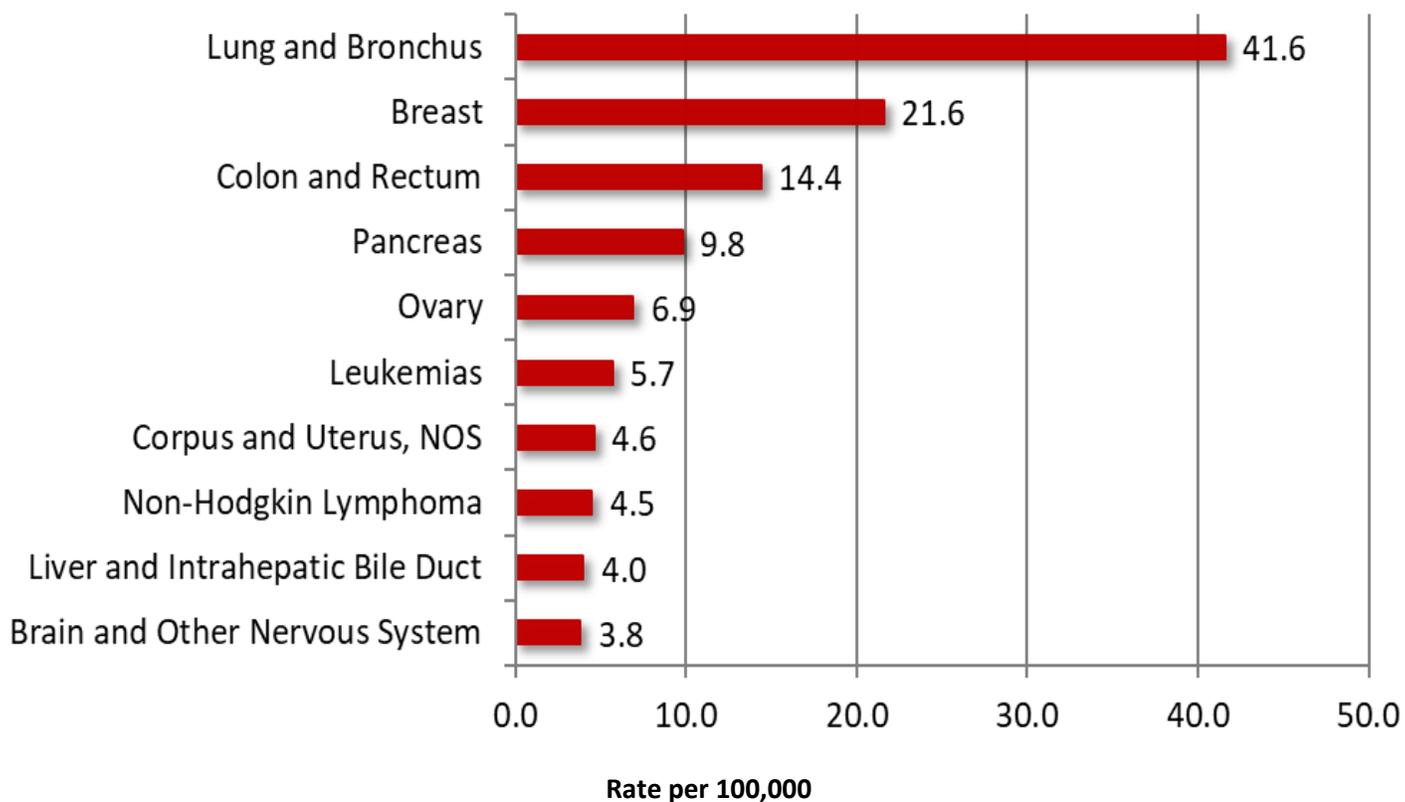
## Average Annual Age-Adjusted Cancer Mortality Rates (per 100,000) Top 10 Sites Among Men, West Virginia, 2015-2019

Primary Site	Age-Adjusted Incidence Rate (per 100,000)
Lung and Bronchus	64.1
Colon and Rectum	19.9
Prostate	16.8
Pancreas	12.3
Esophagus	9.4
Liver and Intrahepatic Bile Duct	9.0
Leukemias	8.8
Non-Hodgkin Lymphoma	7.9
Urinary Bladder	7.8
Kidney and Renal Pelvis	5.8



## Average Annual Age-Adjusted Cancer Mortality Rates (per 100,000) Top 10 Sites Among Women, West Virginia, 2015-2019

Primary Site	Age-Adjusted Incidence Rate (per 100,000)
Lung and Bronchus	41.6
Breast	21.6
Colon and Rectum	14.4
Pancreas	9.8
Ovary	6.9
Leukemias	5.7
Corpus and Uterus, NOS	4.6
Non-Hodgkin Lymphoma	4.5
Liver and Intrahepatic Bile Duct	4.0
Brain and Other Nervous System	3.8





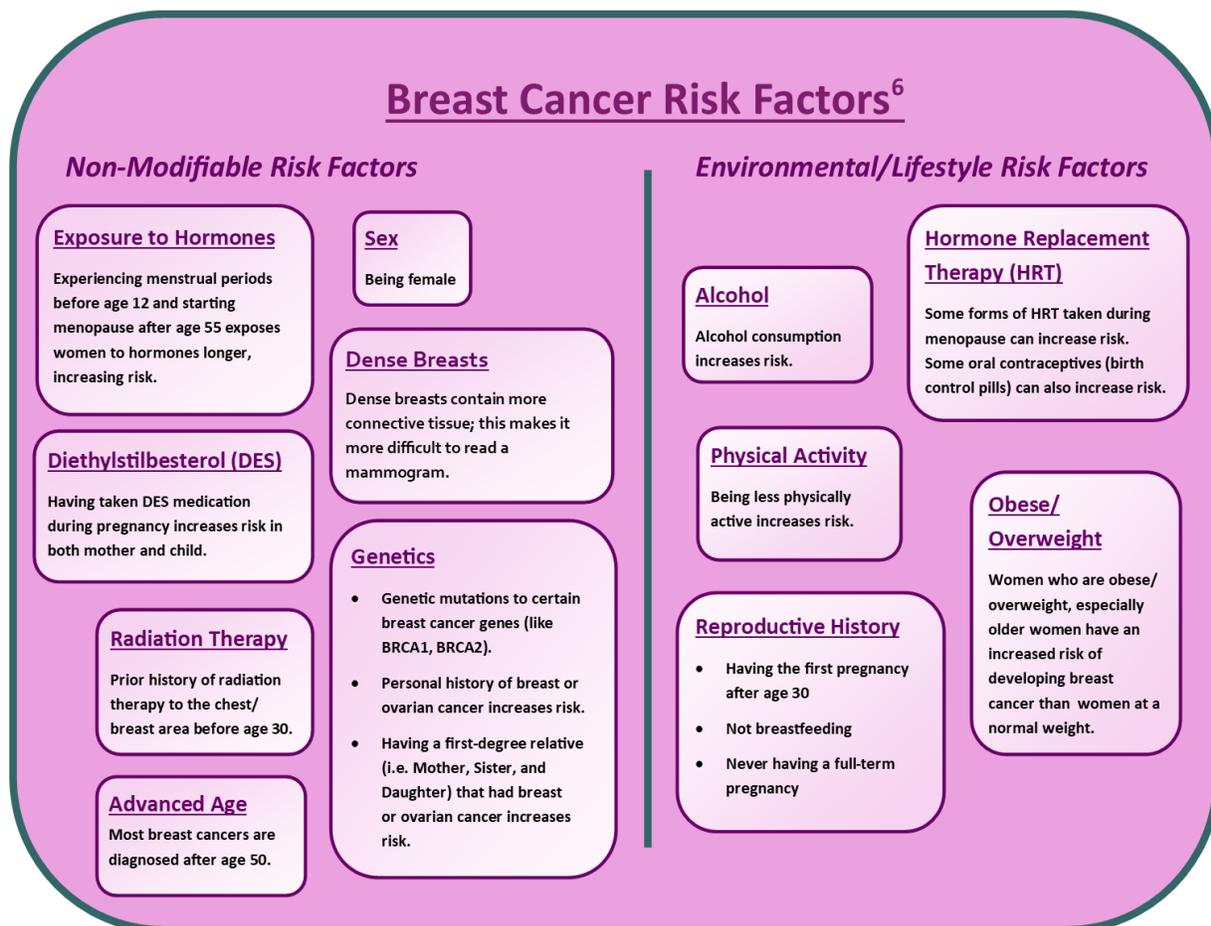
**Highlighted Cancers  
and  
Data Visualizations**

# Female Breast Cancer

Breast cancer is the most commonly diagnosed cancer and the second most common cancer-related cause of death among women in WV and the US.<sup>1</sup> Although it is rare, men are also susceptible to breast cancer.<sup>2</sup> On average, approximately 1,536 women were diagnosed with breast cancer, while about 290 women died of the disease in WV between 2015-2019.<sup>1</sup> Breast cancer rates vary slightly between white and black West Virginia women: both groups are equally likely to be diagnosed with breast cancer, but Black West Virginia women are more likely to die from the disease.<sup>1</sup> Breast cancer is more common in women ages 65-69 years old in WV than any other age group.<sup>3</sup>

Over half (56%) of women with breast cancer in WV were diagnosed with localized breast cancer, while 21% and 6% were diagnosed with regional and distant breast cancer, respectively.<sup>3</sup> As with other cancers, the earlier breast cancer is detected, the better the chance of survival. Currently, the best way to detect breast cancer when it is still in its early stages, and, thus, more easily treatable, is through yearly or biennial mammograms.<sup>4</sup> The U.S. Preventive Services Task Force provides specific recommendations for women aged 40-49 years old and 50-74 years old. Women aged 40-49 should speak with their primary healthcare provider to determine the best course of action, and women aged 50-74 should screen with mammography once every two years.<sup>5</sup>

There are several factors that can influence a person's chance of developing breast cancer. Some of these risk factors are shown below:

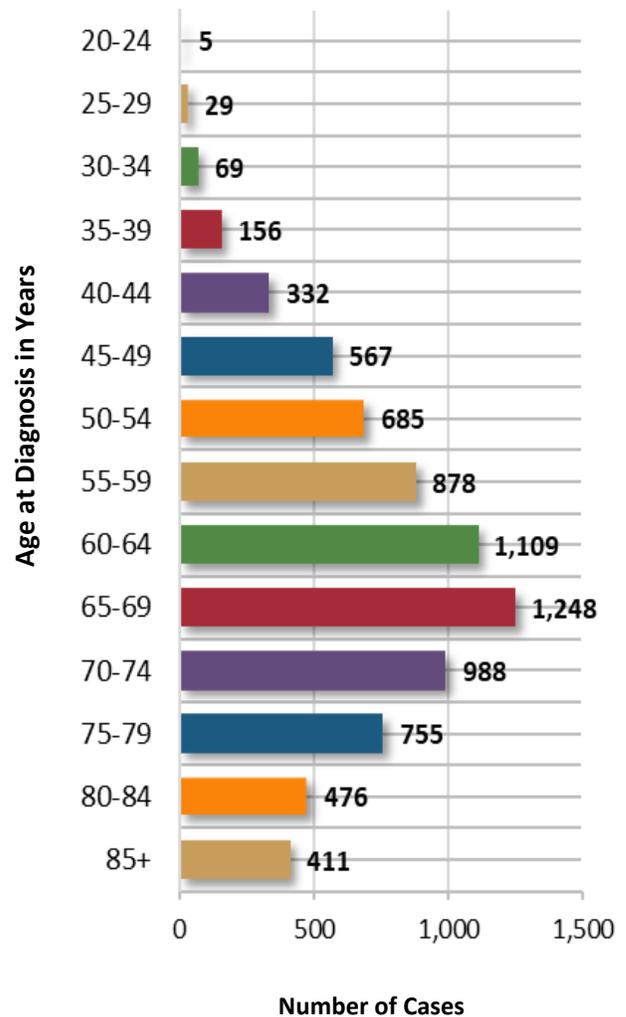


- 1) U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
- 2) American Cancer Society. Accessed at <http://www.cancer.org/cancer/breastcancer/detailedguide/breast-cancer-what-is-breast-cancer> on 8/31/2022 at 1:00 PM.
- 3) West Virginia Cancer Registry
- 4) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/breast/basic\\_info/screening.htm](https://www.cdc.gov/cancer/breast/basic_info/screening.htm) on 8/31/2022 at 9:15 PM
- 5) U.S. Preventive Services Task Force. Accessed at <https://www.uspreventiveservicestaskforce.org/uspstf/recommendation/breast-cancer-screening> on 9/21/2022 at 11:30 AM
- 6) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/breast/basic\\_info/risk\\_factors.htm](https://www.cdc.gov/cancer/breast/basic_info/risk_factors.htm) on 8/31/2022 at 9:30 AM

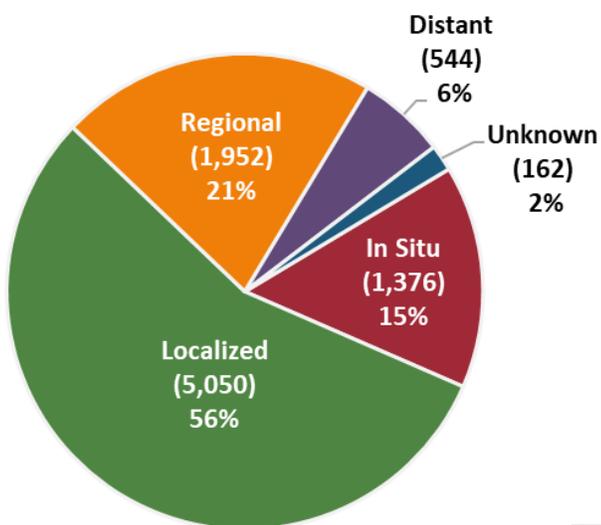
Female Breast Cancer Incidence and Mortality Rate (per 100,000) and Counts, West Virginia, 2015-2019

	Incidence		Mortality	
	Rate	Cases	Rate	Deaths
Females	121.7	7,684	21.6	1,451

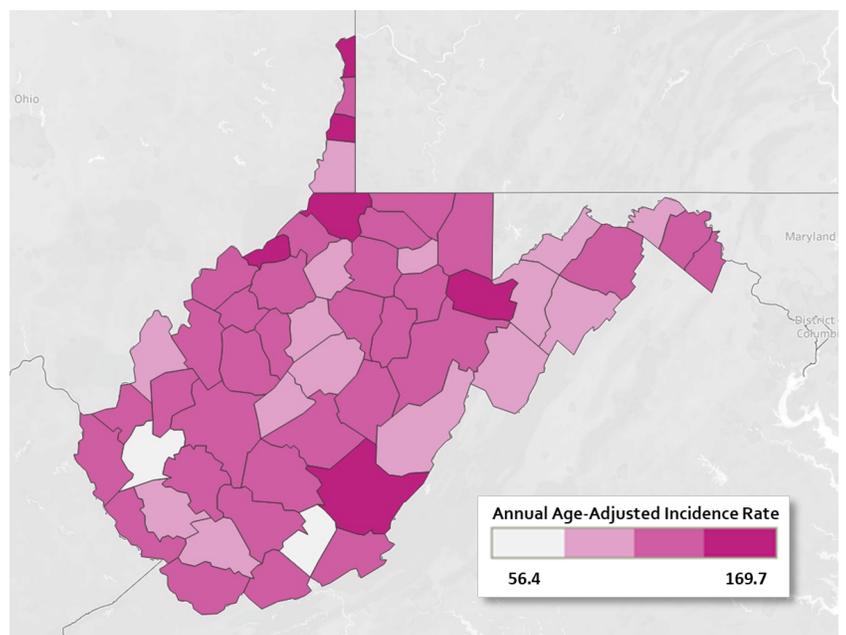
Female Breast Cancer Incidence Counts by Age Group, West Virginia 2015-2019



Percentage of Female Breast Cancer Cases by Stage at Diagnosis, West Virginia, 2015-2019



Average Annual Age-Adjusted Female Breast Cancer Incidence Rates by County, West Virginia, 2015-2019



# Cervical Cancer

The cervix is a part of the female reproduction system that acts as a gateway between the end of the birth canal (vagina) and the opening of the uterus.<sup>1</sup> Cervical cancer can begin when otherwise healthy cells lining the cervix gradually develop unusual changes, called ‘pre-cancers’, over a period of years. For most women, these pre-cancerous cells go away without any treatment. However, these pre-cancers may eventually turn into true (invasive) cancers.<sup>1</sup> When this cancer is detected early, it is highly treatable and associated with long survival and good quality of life.<sup>2</sup>

Regular cervical cancer screening is the best way to find pre-cancerous cells or cancer early when it is easier to treat and cure.<sup>3</sup> The two tests that are used in screening are the Pap test and the Human Papillomavirus (HPV) test. Another way to prevent cervical cancer is to get the HPV vaccine (for more information on HPV, the vaccine, and the cancers associated with it, see page 37). The recommended HPV vaccination guidelines are shown below, and the age recommendations for Pap tests<sup>3</sup> can be found on the following page.

On average between 2015-2019, about 89 WV women were diagnosed with cervical cancer, while about 32 women died from the disease.<sup>5</sup> These numbers may seem small, but West Virginia usually ranks within the top ten in both incidence and mortality when compared to other states.<sup>4</sup> Almost half (49%) of all cervical cancer diagnoses in WV were found to be Regional or Distant (i.e. Late-stage).<sup>5</sup>

There are some risk factors that can increase your chances of developing cervical cancer. The most important risk factor is HPV infection; HPV can be sexually transmitted, or transmitted through skin-to-skin contact.<sup>6</sup> Other risk factors include becoming sexually active at a young age and/or having multiple sexual partners, smoking, having a weakened immune system, having a family history of cervical cancer, Chlamydia infection, long-term use of oral contraceptives (i.e. birth control), having three or more full-term pregnancies, carrying a full-term pregnancy before age 20, not eating enough fruits and vegetables, and low economic status.<sup>6</sup>

## Recommended HPV Vaccination Guidelines by Age Group<sup>7</sup>

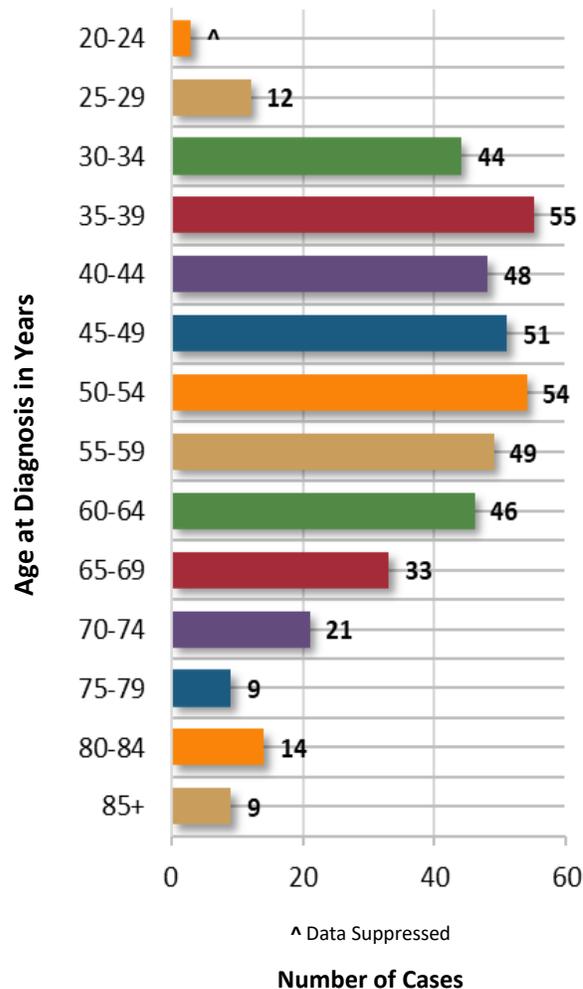
<b>9*-14 years</b>	<b>2 doses;</b> 2nd dose administered <b>6-12 months</b> after first dose OR <b>3 doses**;</b> Only for those that received 2 doses less than <b>5 months</b> apart
<b>15-26 years</b>	<b>3 doses;</b> Three dose schedule is <b>0, 1-2, and 6 months</b>
<b>27-45 years</b>	While approved for those up to 45, it is not recommended
* HPV Vaccination is recommended at age 11 or 12 years old but can be started as early as 9 years old	
** 3 doses are also recommended for immunocompromised persons 9-26 years old	

- 1) American Cancer Society. Accessed at <http://www.cancer.org/cancer/cervicalcancer/detailedguide/cervical-cancer-what-is-cervical-cancer> on 9/1/22 at 2:30 PM
- 2) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/cervical/basic\\_info/index.htm](https://www.cdc.gov/cancer/cervical/basic_info/index.htm) on 9/1/22 at 1:45 PM.
- 3) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/cervical/basic\\_info/screening.htm](https://www.cdc.gov/cancer/cervical/basic_info/screening.htm) on 9/1/22 at 11:20 AM
- 4) U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2020 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
- 5) West Virginia Cancer Registry
- 6) American Cancer Society. Accessed at <https://www.cancer.org/cancer/cervical-cancer/causes-risks-prevention/risk-factors.html> on 9/1/22 at 11:19 AM
- 7) Centers for Disease Control and Prevention. Accessed at <https://www.cdc.gov/vaccines/vpd/hpv/hcp/recommendations.html> on 9/1/22 at 3:00 PM

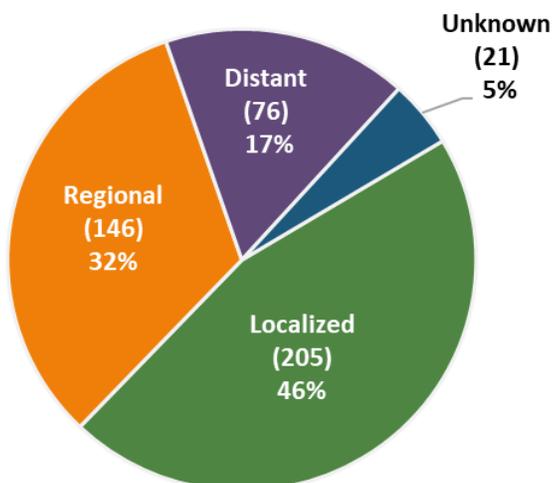
## Cervical Cancer Incidence and Mortality Rate (per 100,000) and Counts, West Virginia, 2015-2019

	Incidence		Mortality	
	Rate	Cases	Rate	Deaths
Females	9.4	448	2.9	162

## Cervical Cancer Case Counts by Age Group, West Virginia, 2015-2019



## Percentage of Cervical Cancer Cases by Stage at Diagnosis, West Virginia, 2015-2019



## Pap Smear Screening Guidelines<sup>3</sup> by Age Group (2021)

<b>21-29 years</b>	Women should begin receiving Pap tests at age 21; these tests can be administered once every 3 years, if your results are normal
<b>30-65 years</b>	Speak with your healthcare provider to determine which testing option is right for you: <ul style="list-style-type: none"> <li>• Pap Test Only – Every 3 years, if results are normal</li> <li>• HPV Test Only – Every 5 years, if results are normal</li> <li>• HPV Test + Pap Test – This is called co-testing; every 5 years, if results are normal</li> </ul>
<b>66+ years</b>	Your healthcare provider may tell you that you do not need to be screened anymore if: <ul style="list-style-type: none"> <li>• You have had normal screening test results for several years, or</li> <li>• You have had your cervix removed as part of a total hysterectomy.</li> </ul>

# Colon and Rectum Cancer

Colon and rectum cancer (or 'Colorectal' cancer) is a cancer that develops in the large intestine and rectum, both components of the lower Gastrointestinal (GI) tract. Most colorectal cancers start as polyps, or growths that form on the inner lining of the colon and rectum. Pre-cancerous polyps are usually adenomatous polyps, or adenomas.<sup>1</sup>

Screening tests can find these polyps before they develop into cancer.<sup>2</sup> All men and women between the ages of 45 and 75 should receive regular colorectal cancer screenings. There are two primary types of screening: stool-based tests and direct visualization tests.<sup>3</sup> Many patients prefer the stool-based tests because they can be performed at home and are less invasive than a typical colonoscopy. However, these tests do need to be performed more frequently, and if an abnormality is found, you will still need a colonoscopy. Visual (or structural) exams are tests that examine the inside of the colon for polyps or other abnormalities. These tests require some preparation prior to the procedure (such as drug or dietary restrictions) and present some risks that are not found in stool-based tests. However, visual exams can be performed less frequently than the stool-based tests.<sup>3</sup>

The current screening types and guidelines are shown below<sup>4</sup>:

Test Type	Screening Method	Frequency
<b>Stool-based Tests</b>	Fecal Immunochemical Test (FIT)	Every Year
	Guaiac Fecal Occult Blood Test (gFOBT)	Every Year
	Multi-Targeted Stool DNA Test (mt-sDNA)	Every 3 years
<b>Direct Visualization Tests</b>	Colonoscopy	Every 10 years
	CT Colonography	Every 5 years
	Flexible Sigmoidoscopy	Every 5 years
	Flexible Sigmoidoscopy with FIT	Flexible Sigmoidoscopy every 10 years + FIT every year

Between 2015-2019, 1,129 WV men and women were diagnosed with colorectal cancer, while 435 died from the disease on average every year. Over half (53%) of the colorectal cancer cases diagnosed during this time were diagnosed as late-stage.<sup>5</sup>

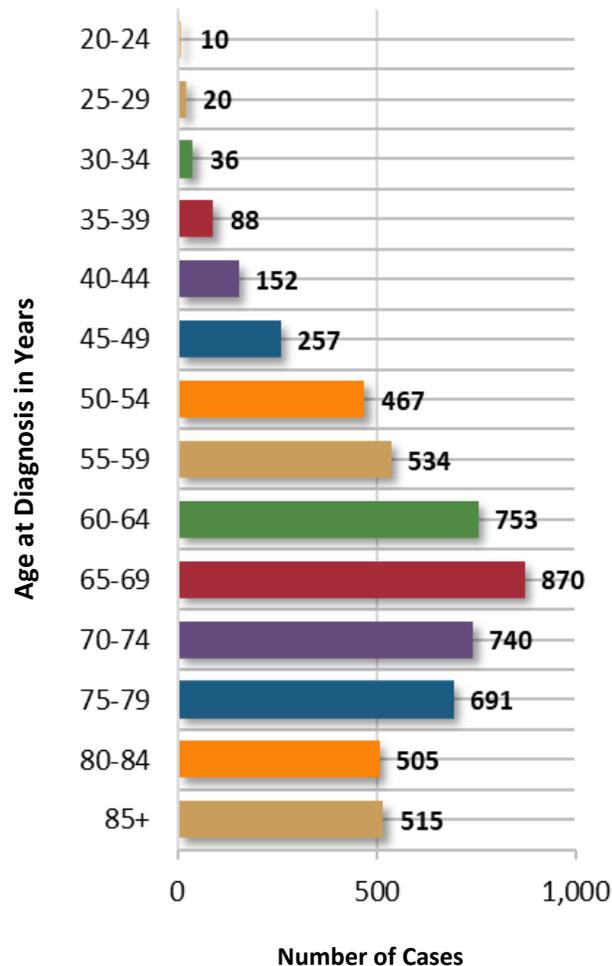
Men and women are equally likely to be diagnosed with or die of colorectal cancer in the US and West Virginia.<sup>6</sup> Most (over 90%) of colorectal cancer diagnoses are made in WV were in individuals over the age of 50.<sup>5</sup> However, there has been a growing trend of young adults (ages 20-45 years) in the United States being diagnosed with colorectal cancer since the 1990's, despite rates decreasing in older (50+ years) adults.<sup>7</sup> Besides age, other risk factors include: being overweight or obese, not being physically active, a diet with too much red meat and/or processed meat, smoking, heavy alcohol use, a personal and/or family history of colorectal polyps or cancer, a personal history of inflammatory bowel disease, or having an inherited syndrome (like Lynch syndrome, or familial adenomatous polyposis).

- 1) American Cancer Society. Accessed at <https://www.cancer.org/cancer/colon-rectal-cancer/about/what-is-colorectal-cancer.html> on 9/5/22 at 11:20 AM
- 2) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/colorectal/basic\\_info/what-is-colorectal-cancer.htm](https://www.cdc.gov/cancer/colorectal/basic_info/what-is-colorectal-cancer.htm) on 9/5/22 at 1:40 PM
- 3) American Cancer Society. Accessed at <https://www.cancer.org/cancer/colon-rectal-cancer/detection-diagnosis-staging/screening-tests-used.html> on 9/6/22 at 2:20 PM
- 4) United States Preventative Services Task Force 2016 Colorectal Cancer Screening Guidelines. Accessed at <https://www.uspreventiveservicestaskforce.org/uspstf/document/RecommendationStatementFinal/colorectal-cancer-screening#tab> on 9/5/22 at 2:15 PM
- 5) U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
- 6) West Virginia Cancer Registry
- 7) American Cancer Society. Accessed at <https://www.cancer.gov/news-events/cancer-currents-blog/2020/colorectal-cancer-rising-younger-adults> on 9/7/22 at 12:15 PM

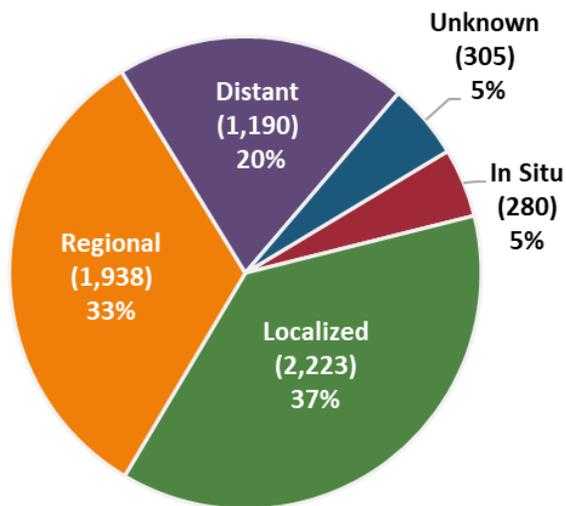
Colorectal Cancer Incidence and Mortality Rate (per 100,000) and Counts, West Virginia, 2015-2019

	Incidence		Mortality	
	Rate	Cases	Rate	Deaths
Both	45.5	5,647	17.0	2,179
Males	51.6	3,007	19.9	1,154
Females	39.8	2,640	14.4	1,025

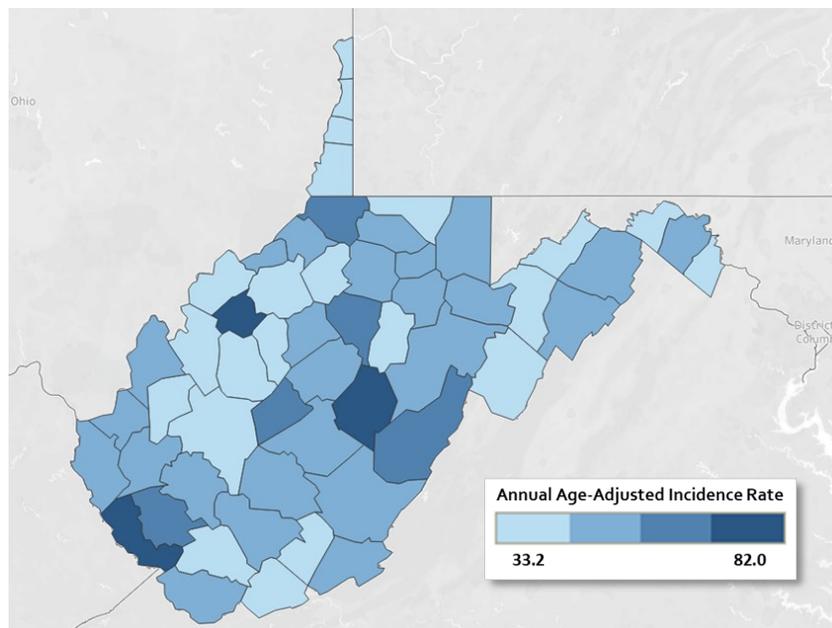
Colorectal Cancer Case Counts by Age Group, West Virginia, 2015-2019



Percentage of Colorectal Cancer Cases by Stage at Diagnosis, West Virginia, 2015-2019



Average Annual Age-Adjusted Colorectal Cancer Incidence Rates by County, West Virginia, 2015-2019



# Lung and Bronchus Cancer

The lungs are two sponge-like organs located in your chest cavity. When you inhale, air enters the mouth or nose and flows into the lungs through the trachea (i.e. windpipe). The trachea then divides into smaller tubes called bronchi, then divides into even smaller tubes called bronchioles. At the end of the bronchioles are small air sacs called alveoli, which absorb the inhaled oxygen and remove carbon dioxide from your blood. Lung cancer usually starts in the cells lining the bronchi, the bronchioles, or alveoli.<sup>1</sup>

There are two primary forms of lung cancer: Non-small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). Even though both occur in the lungs, each grow very differently and are treated very differently. Non-small cell lung cancer is the most common of the two, with several subtypes including adenocarcinoma, squamous cell carcinoma, and large cell carcinoma.<sup>1</sup> Small cell lung cancer is much less common than non-small cell lung cancer but tends to grow and spread much faster than NSCLC. About 70% of SCLC cases usually have already metastasized (i.e. has spread) by the time they are diagnosed.<sup>1</sup>

Currently, the only recommended screening test for lung cancer is low-dose computed tomography (i.e. low-dose CT scan). A low-dose CT scan involves an x-ray scanning the body with low doses of radiation to make detailed images of the lungs. The United States Preventive Services Task Force recommends this screening test for individuals that meet the following guidelines<sup>2</sup>:

- Between the ages of **50 and 80 years old**, *and*
- **Smoke now or have quit within the last 15 years**, *and*
- Have a **20 pack-year\*** or more smoking history.

**\*Pack-year:** the number of packs of cigarettes smoked per day multiplied by the number of years smoked:

2 packs a day x 10 years = 20 pack years  
1 pack a day x 20 years = 20 pack years  
1/2 pack a day x 40 years = 20 pack years

In West Virginia, lung and bronchus cancer is the second most commonly diagnosed cancer for both sexes, and is the leading cause of cancer related mortality in the state.<sup>4</sup> Between 2015 and 2019, 10,438 people were diagnosed with lung and bronchus cancer, which is about 2,087 cases a year.<sup>3</sup> The total number of lung cancer deaths (6,897) is over 50% greater than the number of deaths due to female breast, colorectal, and prostate cancer combined.<sup>3,4</sup> Also, 71% of all lung cancer cases in this period were diagnosed as late-stage, showing a need for lung cancer screening.<sup>3</sup>

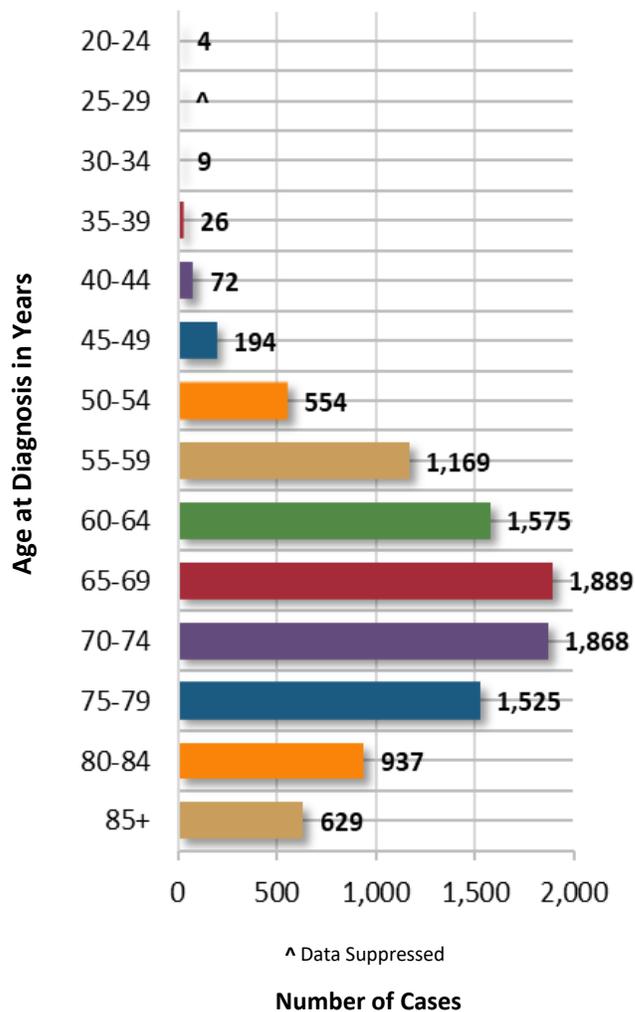
Cigarette smoking is the primary risk factor for lung cancer, with about 80% to 90% of all lung cancer cases being linked to smoking. Other risk factors include secondhand smoke, radon exposure, exposure to certain substances and pollutants (namely asbestos, arsenic, diesel exhaust, and some forms of silica and chromium), personal family history of lung cancer, previous radiation therapy to the chest, and possibly diet.<sup>5</sup>

- 1) American Cancer Society. Accessed at <https://www.cancer.org/cancer/lung-cancer/about/what-is.html> on 1/17/22 at 12:30 PM.
- 2) U.S. Preventive Services Task Force. Accessed at <https://www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/lung-cancer-screening> on 1/17/22 at 1:15 PM.
- 3) West Virginia Cancer Registry
- 4) U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
- 5) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/lung/basic\\_info/risk\\_factors.htm](https://www.cdc.gov/cancer/lung/basic_info/risk_factors.htm) on 1/17/21 at 2:30 PM.

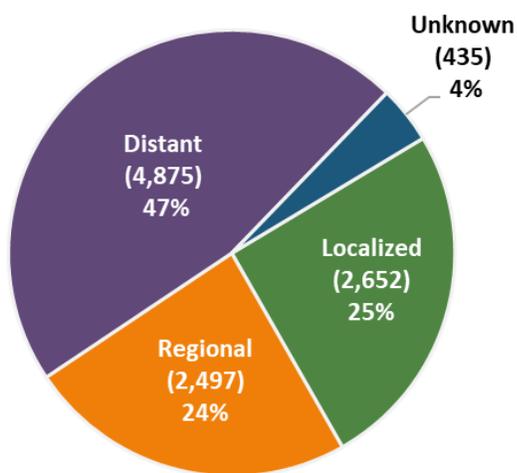
### Lung and Bronchus Cancer Incidence and Mortality Rate (per 100,000) and Counts, West Virginia, 2015-2019

	Incidence		Mortality	
	Rate	Cases	Rate	Deaths
Both	77.9	10,438	51.5	6,897
Males	89.1	5,562	64.1	3,917
Females	69.2	4,876	41.6	2,980

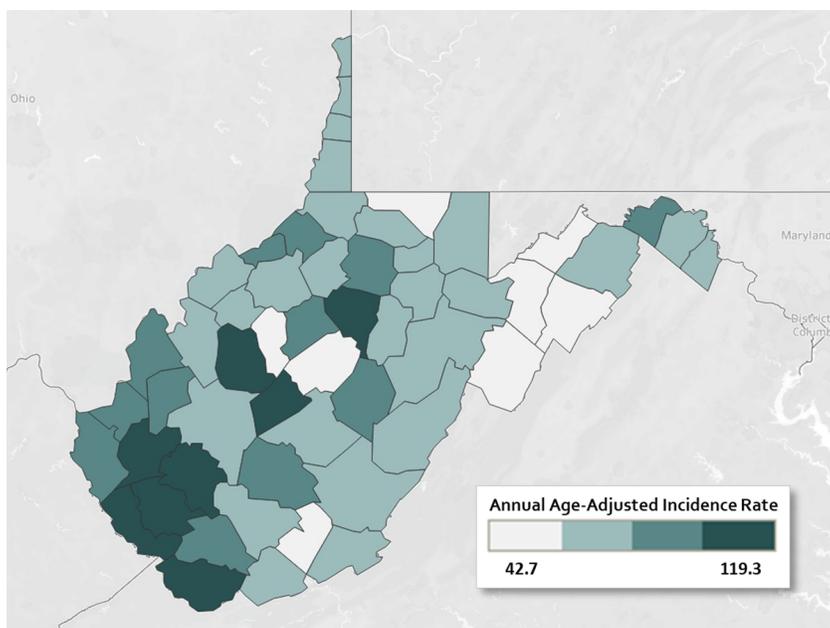
### Lung and Bronchus Cancer Case Counts by Age Group, West Virginia, 2015-2019



### Percentage of Lung and Bronchus Cancer Cases by Stage at Diagnosis, West Virginia, 2015-2019



### Average Annual Age-Adjusted Lung and Bronchus Cancer Incidence Rates by County West Virginia, 2015-2019



# Prostate Cancer

The prostate is a walnut-sized gland that is part of the male reproductive system. It is located just below the bladder, in front of the rectum, and surrounds the urethra, or the tube that empties urine from the bladder. Men can experience changes in their prostate as they age that are not cancer related. One condition, called prostatic hyperplasia, arises when the prostate enlarges, narrowing and decreasing the flow of urine from the bladder. Prostate cancer occurs when cells in the prostate gland begin to grow out of control.<sup>1</sup> Most prostate cancers grow slowly and may not cause any health problems throughout the remainder of a man's life.<sup>2</sup> However, some prostate cancers are more aggressive and require early treatment. Prostate cancer screening can detect these tumors when they are still small and easily treatable.<sup>2</sup>

The primary screening test for prostate cancer is the Prostate-specific antigen (PSA) blood test. PSA is a protein made by cells (both normal and cancerous) in the prostate gland. The chance of having prostate cancer increases as PSA levels increase: most men without prostate cancer have PSA levels under 4 nanograms per milliliter (ng/mL), while those that have a PSA over 10 ng/mL have a greater chance (over 50%) of having prostate cancer.<sup>3</sup> An abnormal result may be followed by a second PSA test some time later, and/or a prostate biopsy.

There are some caveats to consider prior to prostate cancer screening. This test can find high-risk prostate cancers (i.e. those that spread quickly) before they become difficult to treat, and some men prefer to know if they have prostate cancer. However, there is a chance of receiving a false positive test result, meaning a man may have an abnormal PSA test result without having prostate cancer. False positive tests can lead to unnecessary testing, like prostate biopsies, and may cause unnecessary worry and stress for the patient in question.<sup>4</sup> Due to this, men between the ages of 55 and 69 should make their own decision about prostate cancer screening and discuss with their primary care provider if prostate cancer screening is right for them. Risk factors that should be considered and discussed include having a family history of prostate cancer, being African American, and other medical conditions that would make prostate cancer treatment difficult or impossible.<sup>5</sup>

About 1 in 8 men will be diagnosed with prostate cancer during his lifetime.<sup>6</sup> Prostate cancer is rare in men under 40, but risk increases greatly after age 50<sup>7</sup> with an average age at diagnosis being 66 years old.<sup>6</sup> Between 2015-2019, West Virginia reported 6,464 prostate cases, and 920 prostate deaths.<sup>8</sup> 78% of all prostate cancers reported during this time were diagnosed as Localized, showing how important prostate cancer screening is.<sup>8</sup>

1) American Cancer Society. Accessed at <https://www.cancer.org/cancer/prostate-cancer.html> on 2/2/2022 at 2:21 PM

2) Centers for Disease Control and Prevention. Accessed at <https://www.cdc.gov/cancer/prostate/prostate-cancer-health-tip-sheet.htm> on 2/2/22 at 2:02 PM

3) American Cancer Society. Accessed at <https://www.cancer.org/cancer/prostate-cancer/detection-diagnosis-staging/tests.html> on 2/1/22 at 12:20 PM

4) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/prostate/basic\\_info/benefits-harms.htm](https://www.cdc.gov/cancer/prostate/basic_info/benefits-harms.htm) on 2/2/22 at 3:00 PM

5) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/prostate/basic\\_info/get-screened.htm](https://www.cdc.gov/cancer/prostate/basic_info/get-screened.htm) on 2/2/22 at 2:45 PM

6) American Cancer Society. Accessed at <https://www.cancer.org/cancer/prostate-cancer/about/key-statistics.html#:~:text=About%201%20man%20in%208,at%20diagnosis%20is%20about%2066> on 2/1/22 at 1:15 PM

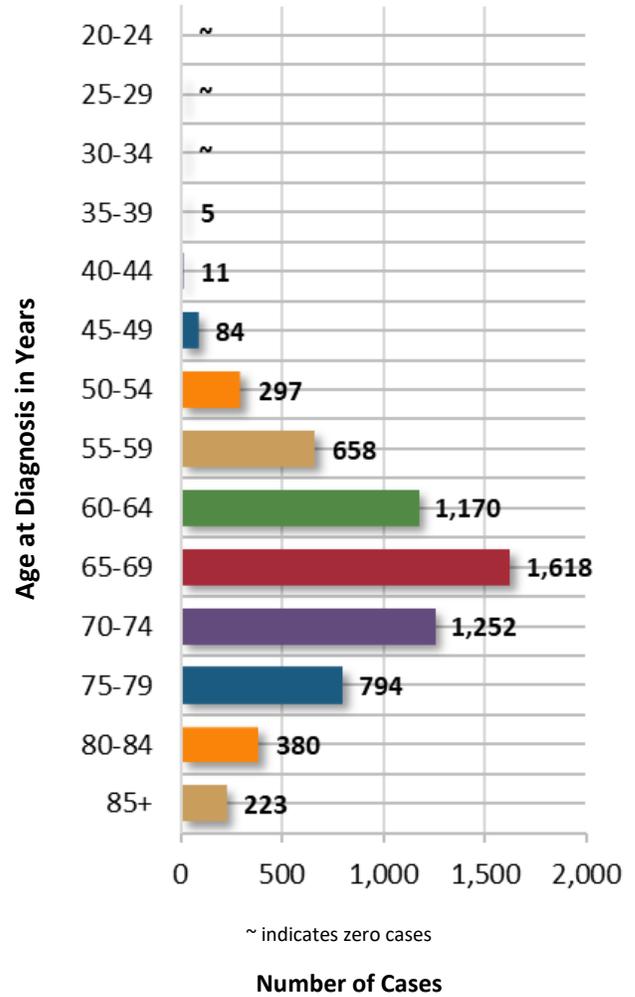
7) American Cancer Society. Accessed at <https://www.cancer.org/cancer/prostate-cancer/causes-risks-prevention/risk-factors.html> on 2/2/22 at 2:31 PM

8) WV Cancer Registry

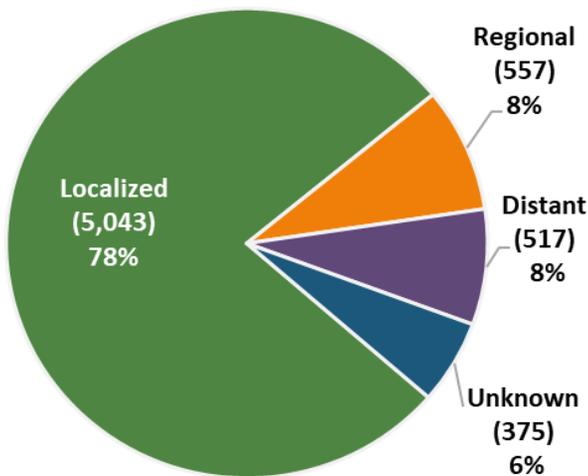
Prostate Cancer Incidence and Mortality Rate (per 100,000) and Counts, West Virginia, 2015-2019

	Incidence		Mortality	
	Rate	Cases	Rate	Deaths
Males	98.3	6,464	16.8	920

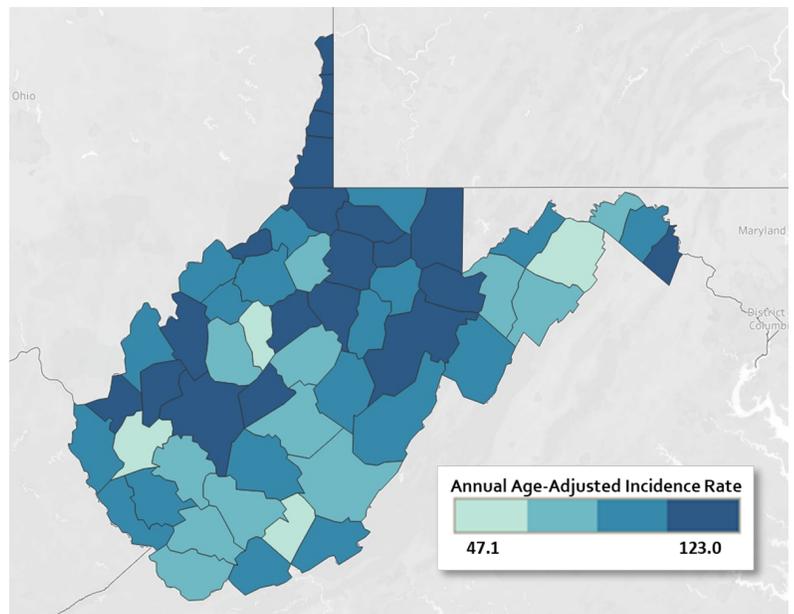
Prostate Cancer Case Counts by Age Group, West Virginia, 2015-2019



Percentage of Prostate Cancer Cases by Stage at Diagnosis, West Virginia, 2015-2019



Average Annual Age-Adjusted Prostate Cancer Incidence Rates by County West Virginia, 2015-2019



# HPV-Associated Cancers

HPV, or human papillomavirus, is the most common sexually transmitted infection (STI) in the United States.<sup>1</sup> HPV is a group of more than 200 related viruses, each having their own number, which is called an HPV type.<sup>2</sup> HPV is primarily spread through skin-to-skin contact, and vaginal, anal, or oral sex.<sup>3</sup> Most HPV types cause warts on the skin, such as the arms, chest, hands, or feet. Other types of HPV, called genital HPV, is found on mucous membranes that line the organs and parts of the body that are exposed to the outside, like the vagina, anus, mouth, and throat.<sup>2</sup>

HPV can be broken down into two types: low-risk and high-risk. Low risk HPVs usually do not cause disease, but a few of these types can cause warts on or around the genitals, anus, mouth, or throat. High-risk HPVs can cause several forms of cancers. Of the high-risk HPV types, HPV16 and HPV18 are responsible for most HPV-related cancers.<sup>3</sup>

HPV infection is very common<sup>2</sup>; nearly all sexually active people, regardless of sex, are infected with HPV within months to a few years of becoming sexually active.<sup>3</sup> In most cases, these infections show no symptoms, and the body can clear the infection on its own. However, if a high-risk HPV infection persists for many years, it can lead to abnormal changes that may become cancer if left untreated.<sup>3</sup>

There is currently no treatment for HPV itself. Individuals with a cervix may receive an HPV test to look for infections by high-risk HPVs (see page 29), but there are no approved tests to screen for HPV on other body parts (i.e. vulva, anus, mouth, throat). HPV infection can be prevented: using condoms during sexual intercourse provides some protection against HPV and limiting sexual partners can lower your risk of exposure.<sup>4</sup>

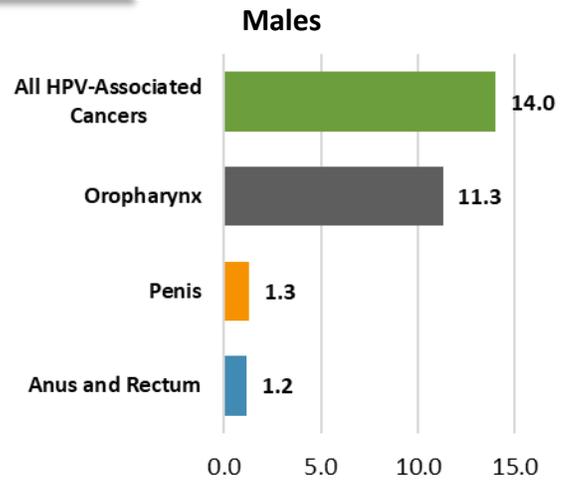
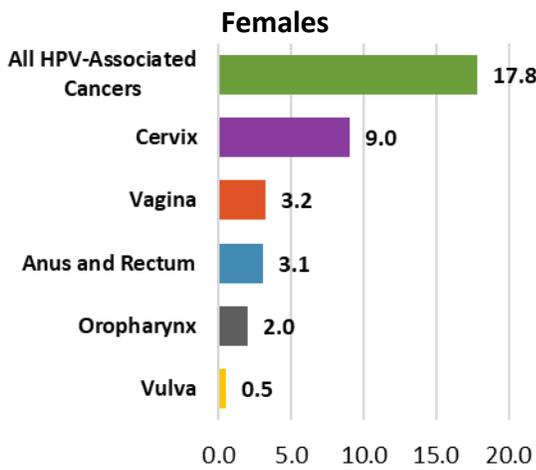
Gardasil 9 is currently the only HPV vaccination available for use in the United States. This vaccine is FDA-approved to prevent infection from nine types of HPV that most often cause genital warts, certain precancerous conditions, and cancers of the cervix, vagina, vulva, anus, and head and neck.<sup>5</sup> However, the vaccine is not capable of curing current HPV infections or treating abnormal results of a Pap test.<sup>5</sup> The current recommendations for HPV vaccination are shown on the following page.<sup>5,6</sup>

Between 2015-2019, about 47,199 HPV-associated cancers were diagnosed in the United States each year: about 26,177 among women, and 21,022 among men.<sup>7</sup> Cervical cancer is the most common HPV-associated cancer in women, and oropharyngeal cancers are the most common in men. The true number of HPV-associated cancer cases is not available because cancer registries do not routinely collect data on whether HPV is in the cancer tissue.<sup>7</sup> Generally, HPV is thought to cause about 90% of anal and cervical cancers, about 70% of vaginal and vulvar cancers, and more than 60% of penile cancers. Oropharyngeal cancers were originally thought to be mostly caused by tobacco and alcohol consumption, but newer studies indicate that about 70% of oropharyngeal cancers are caused by HPV.<sup>8</sup>

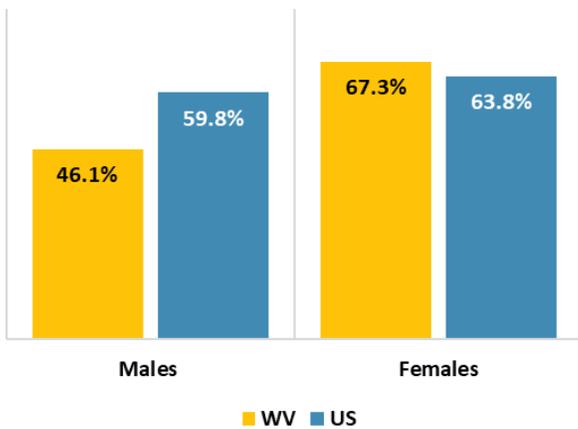
- 1) Centers for Disease Control and Prevention. Accessed at [https://www.cdc.gov/cancer/hpv/basic\\_info/](https://www.cdc.gov/cancer/hpv/basic_info/) at 12:45 pm on 1/30/2022
- 2) American Cancer Society. Accessed at <https://www.cancer.org/cancer/cancer-causes/infectious-agents/hpv/hpv-and-cancer-info.html> at 9:18 am on 1/30/2022
- 3) National Cancer Institute. Accessed at <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-and-cancer> at 10:30 am on 2/1/2022
- 4) Cancer.Net. Accessed at <https://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/hpv-and-cancer> at 10:45 am on 1/28/2022
- 5) National Cancer Institute. Accessed at <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-vaccine-fact-sheet#:~:text=HPV%20vaccination%20is%20routinely%20recommended,ages%2027%20through%2045%20years> at 11:30 am on 2/2/2022
- 6) Centers for Disease Control and Prevention. Accessed at <https://www.cancer.gov/about-cancer/causes-prevention/risk/infectious-agents/hpv-vaccine-fact-sheet#:~:text=HPV%20vaccination%20is%20routinely%20recommended,ages%2027%20through%2045%20years> at 11:45 am on 2/2/2022
- 7) U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019); U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
- 8) Centers for Disease Control and Prevention. Accessed at <https://www.cdc.gov/cancer/hpv/statistics/index.htm>
- 9) Kreimer AR, Clifford GM, Boyle P, Franceschi S. Human papillomavirus types in head and neck squamous cell carcinomas worldwide: a systematic review. *Cancer Epidemiol Biomarkers Prev.* 2005;14(2):467-475. doi:10.1158/1055-9965.EPI-04-0551
- 10) Centers for Disease Control and Prevention. Accessed at <https://www.cdc.gov/vaccines/vpd/hpv/hcp/recommendations.html> at 3:14 pm on 2/1/2022

Average Annual Age-Adjusted Incidence Rates (per 100,000) of New HPV-Associated Cancers by Cancer Type\*, Males and Females, West Virginia, 2015-2019<sup>7</sup>

\* Includes Cervical Carcinoma, and Squamous Cell Carcinoma of the Anus, Oropharynx, Penis, Vagina, and Vulva.



Percentage of Adolescents Aged 13-17 Who Received All Recommended Doses of HPV Vaccine, West Virginia, 2021<sup>7</sup>



Classification of HPV Types<sup>9</sup>

Classification	HPV Type
Low Risk	1-15, 17, 19, 20-25, 27-29, 36-38, 40-44, 46-50, 54, 60-65, 70, 72, 75, 76, 82
High Risk	<b>16, 18</b> , 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 66, 68, 73
Probably High Risk	26, 53, 81
Undetermined	7, 30, 32, 34, 55, 57, 67, 69, 71, 74, 77

Recommended HPV Vaccination Guidelines by Age Group<sup>10</sup>

<b>9*-14 years</b>	<b>2 doses</b> ; 2nd dose administered <b>6-12 months</b> after first dose OR <b>3 doses**</b> ; Only for those that received 2 doses less than <b>5 months</b> apart
<b>15-26 years</b>	<b>3 doses</b> ; Three dose schedule is <b>0, 1-2, and 6 months</b>
<b>27-45 years</b>	While approved for those up to 45, it is not recommended

\* HPV Vaccination is recommended at age 11 or 12 years old but can be started as early as 9 years old

\*\* 3 doses are also recommended for immunocompromised persons 9-26 years old

# Tobacco-Associated Cancers

The relationship we know today between tobacco use and cancer began over 70 years ago. In the 1950s, various revolutionary studies suggested that cigarette smoking caused lung cancer and other lung diseases. By 1964, the US Surgeon General released a report that confirmed the link between tobacco use and lung cancer. Since then, tobacco use has been causally linked to twelve other cancers, including oral cavity (mouth) and pharynx (throat), larynx (voice box), esophagus, lung and bronchus, liver and intrahepatic bile duct, stomach, pancreas, kidney and renal pelvis, urinary bladder, colon and rectum, uterine cervix, and acute myeloid leukemia.<sup>1</sup>

Presently, tobacco use is the leading preventable cause of cancer and death from cancer in the US, causing about 1 in 5 deaths per year. Additionally, about 80% of lung cancers and lung cancer deaths are due to smoking. Besides cancer, tobacco use can cause other serious lung diseases, like chronic obstructive pulmonary disease (COPD), increase risk of lung infections, like pneumonia and tuberculosis, worsen existing lung diseases, like asthma, and cause other health problems, like coronary heart disease, high blood pressure, heart attacks, and strokes.<sup>2</sup> Even those that do not smoke themselves, but are exposed to second-hand smoking, can develop some of these illnesses.<sup>3</sup>

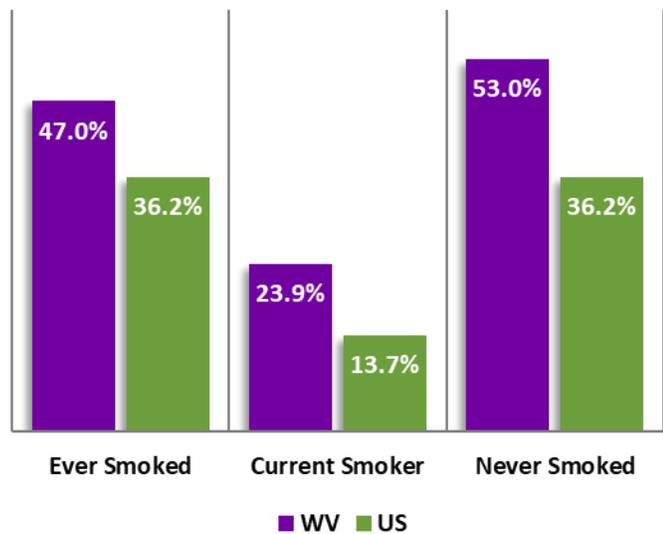
West Virginia currently has the highest prevalence of smokers in the nation, with almost one-fourth of all West Virginia adults being smokers.<sup>4</sup> There are also clear health disparities related to tobacco use in West Virginia; those that had less than a high school education had the highest percent of smokers, while college graduates had the lowest percentage. Similarly, those with a household income less than \$15,000 a year showed the highest percentage of smoking, while those with a household income of over \$75,000 showed the lowest percentage of smoking.<sup>5</sup>

While we usually associate cigarettes with tobacco use, there are several different forms of tobacco. These include other smoked items, like cigars, bidis, and kreteks, and chewed, or 'smokeless', products like chewing tobacco, snuff (which can also be sniffed), dip, and snus.<sup>3</sup> In addition to these, electronic cigarettes, or 'e-cigarettes', deliver nicotine with flavorings and other chemicals to the lungs through an aerosol, powered by a battery-operated device, or vaporizer. These devices have become the most commonly used form of nicotine among youth in the US, due to their easy availability, tempting advertisements, various e-liquid flavors, and the belief that they are safer than cigarettes. This is especially concerning, because the long-term effects of these products are still largely unknown<sup>6</sup>, and studies have shown that teens that use e-cigarettes are more likely to start smoking cigarettes in the future.<sup>7</sup>

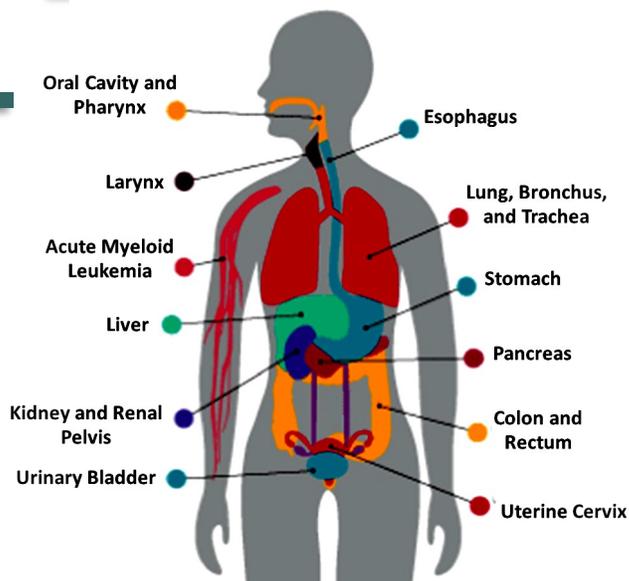
The best way to avoid health risks associated with tobacco use is to quit, or not start at all. However, many people find it quite difficult to quit, due to the highly addictive chemical found in tobacco, nicotine. However, there are various treatments that can help people quit. These include behavioral treatments (like self-help materials or counseling), nicotine replacement therapies (in the form of chewing gum, transdermal patches, nasal sprays, inhalers, and lozenges), and prescription medication (such as bupropion and varenicline).<sup>3</sup> Ultimately, no matter how old you are or how long you've used tobacco, it's never too late to quit.

- 1) U.S. Department of Health and Human Services. The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General. In: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, Atlanta, Georgia; 2014
- 2) American Cancer Society. Accessed at <https://www.cancer.org/healthy/stay-away-from-tobacco/health-risks-of-tobacco/health-risks-of-smoking-tobacco.html> on 8/18/22 at 9:30 AM
- 3) National Institute on Drug Abuse. Accessed at <https://nida.nih.gov/publications/drugfacts/cigarettes-other-tobacco-products#:~:text=People%20can%20smoke%2C%20chew%2C%20or,snuff%20can%20also%20be%20sniffed> on 8/18/22 at 9:50 AM
- 4) U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
- 5) WV Department of Health and Human Resources, Health Statistics Center. (2020). West Virginia Behavioral Risk Factor Surveillance System Report, 2018.
- 6) National Institute on Drug Abuse. Accessed at <https://nida.nih.gov/publications/drugfacts/cigarettes-other-tobacco-products#:~:text=People%20can%20smoke%2C%20chew%2C%20or,snuff%20can%20also%20be%20sniffed> on 8/18/22 at 10:05 AM
- 7) Bold KW, Kong G, Camenga DR, et al. Trajectories of e-cigarette and conventional cigarette use among youth. *Pediatrics*. December 2017:e20171832. doi:10.1542/peds.2017-1832

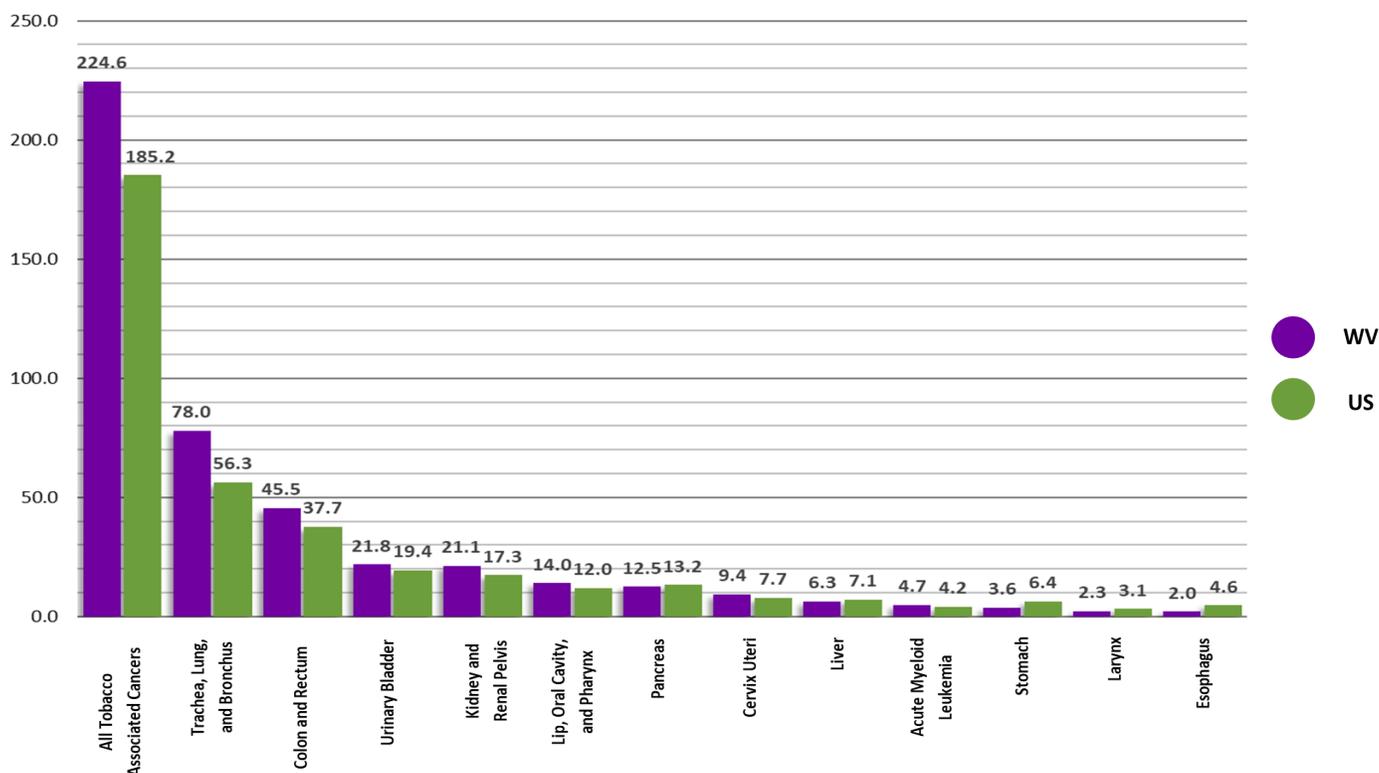
Smoking Prevalence in Adults aged 18+ years  
(percentage, Age-Adjusted Prevalence), BRFSS 2021,  
All Races and Ethnicities, Male and Female,  
West Virginia and United States<sup>4</sup>



Tobacco-Associated Cancers



Average Annual Age-Adjusted Incidence Rates (per 100,000)  
Tobacco-Associated Cancers, Males and Females,  
West Virginia and United States, 2015-2019<sup>4</sup>



# Obesity-Associated Cancers

Obesity is a chronic health problem defined by an unhealthy amount and/or distribution of body fat in people. Compared to individuals at a healthy body weight, obese or overweight individuals have a greater risk of developing certain diseases, like diabetes, high blood pressure, cardiovascular disease, and stroke.<sup>1</sup> Obesity has also been linked with a higher risk of developing 13 different cancers, including postmenopausal breast, colorectal, endometrium, kidney, thyroid, pancreatic, ovarian, liver, multiple myeloma, esophageal adenocarcinoma, gastric cardia (or upper stomach), gallbladder, and meningioma (or the membranes that line the brain and spinal cord).<sup>1,2</sup>

Obesity is a major public health concern in both the United States and West Virginia. In 2021, the prevalence of obesity in the United States was 33.0%. During this same time, West Virginia reported an obesity prevalence of 40.7%. Not only does West Virginia have a higher obesity prevalence than the United States, but West Virginia also has the second highest prevalence in the nation.<sup>3</sup> Between 2015-2019, the most common obesity associated cancers in West Virginia included post-menopausal breast (6,532), colon and rectum (5,647), and kidney and renal pelvis (2,456).<sup>4</sup>

The relationship between overweight/obesity and cancer risk is complicated and can vary with different cancer types. However, some mechanisms have been suggested to explain this cancer risk. One suggests that fat tissue (also called adipose tissue) produces excess amounts of estrogen, which can increase the risk of developing cancers of the breast, endometrium, and ovary.<sup>5</sup> Also, people with obesity often have higher levels of insulin and insulin-like growth factor-1 (IGF-1) than those at a healthy weight. High levels of insulin, called hyperinsulinemia, precedes the development of type 2 diabetes, and can increase the likelihood of developing colon, kidney, prostate, and endometrial cancers.<sup>1</sup> Another suggests that overweight/obese individuals are more likely to have chronic inflammation than those at a normal body weight. Over time, chronic inflammation can cause damage to DNA, which leads to cancer. Chronic inflammation in obesity can appear in forms like gastroesophageal reflux disease, gallstones, chronic ulcerative colitis, and other inflammatory bowel diseases.<sup>6</sup>

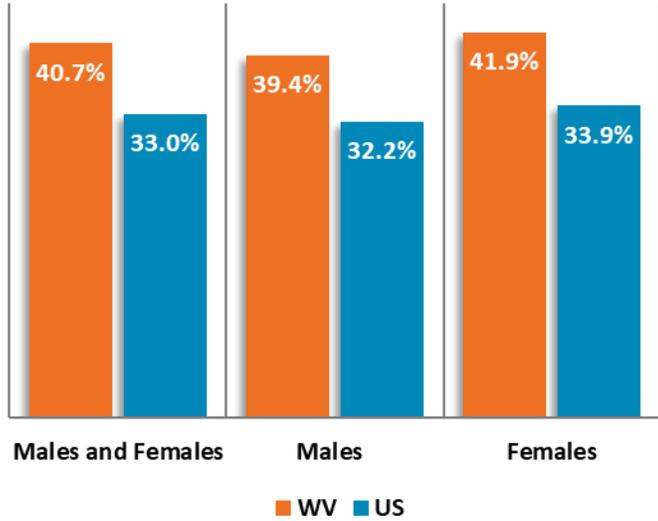
To determine if a person is obese, doctors utilize 'body mass index', or BMI, which is based on the person's weight and height. BMI is used often in research to help understand how weight is related to cancer, but it does not predict future health outcomes.<sup>7</sup> The standard weight categories based on BMI for adults (20 years and older) and children (19 years and younger) are shown below. Ultimately, eating well and being physically active are the optimal ways to improve health in those that are overweight or obese.

## Weight Categories Based on BMI (Body Mass Index) for Adults and Children/Teens<sup>1</sup>

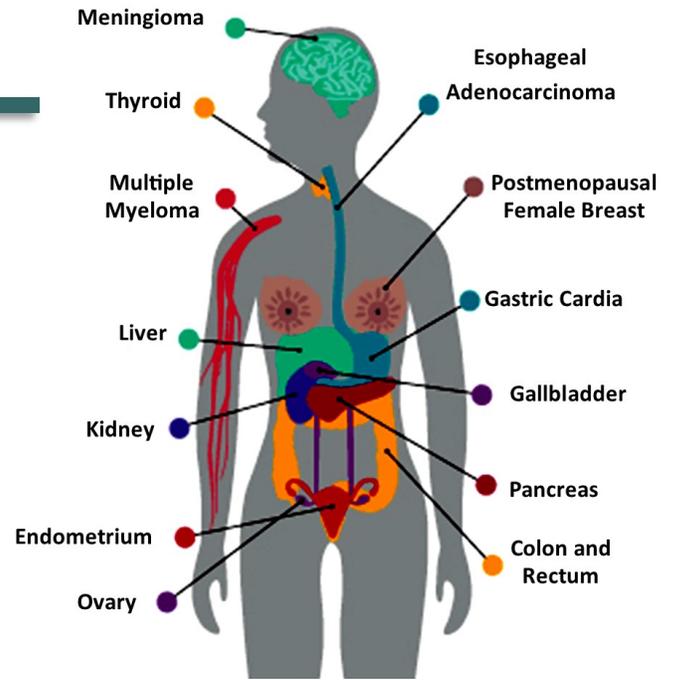
Adult BMI (kg/m <sup>2</sup> )	Classification	Child/Teen BMI
<18.5	<b>Underweight</b>	Less than the 5th percentile
18.5 - 24.9	<b>Healthy</b>	5th percentile to less than the 85th percentile
25.0 - 29.9	<b>Overweight</b>	85th to less than 95th percentile
30.0 - 39.9	<b>Obese</b>	Equal to or greater than the 95th percentile
40.0+	<b>Severely Obese</b>	Equal to or greater than 120% of the 95th percentile

- 1) National Institutes of Health. Accessed at <https://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet> on 8/29/22 at 12:15 PM
- 2) Centers for Disease Control and Prevention. Accessed at <https://www.cdc.gov/cancer/obesity/index.htm> on 8/29/22 at 1:30 PM
- 3) U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
- 4) West Virginia Cancer Registry
- 5) National Cancer Institute. Accessed at <https://www.cancer.gov/about-cancer/causes-prevention/risk/obesity/obesity-fact-sheet> on 8/29/22 at 2:00 PM
- 6) National Cancer Institute. Accessed at <https://www.cancer.gov/about-cancer/causes-prevention/risk/chronic-inflammation> on 8/30/22 at 9:30 AM
- 7) American Society of Clinical Oncology. Accessed at <https://www.cancer.net/navigating-cancer-care/prevention-and-healthy-living/body-weight-and-cancer-risk> on 8/30/22 at 12:15 PM

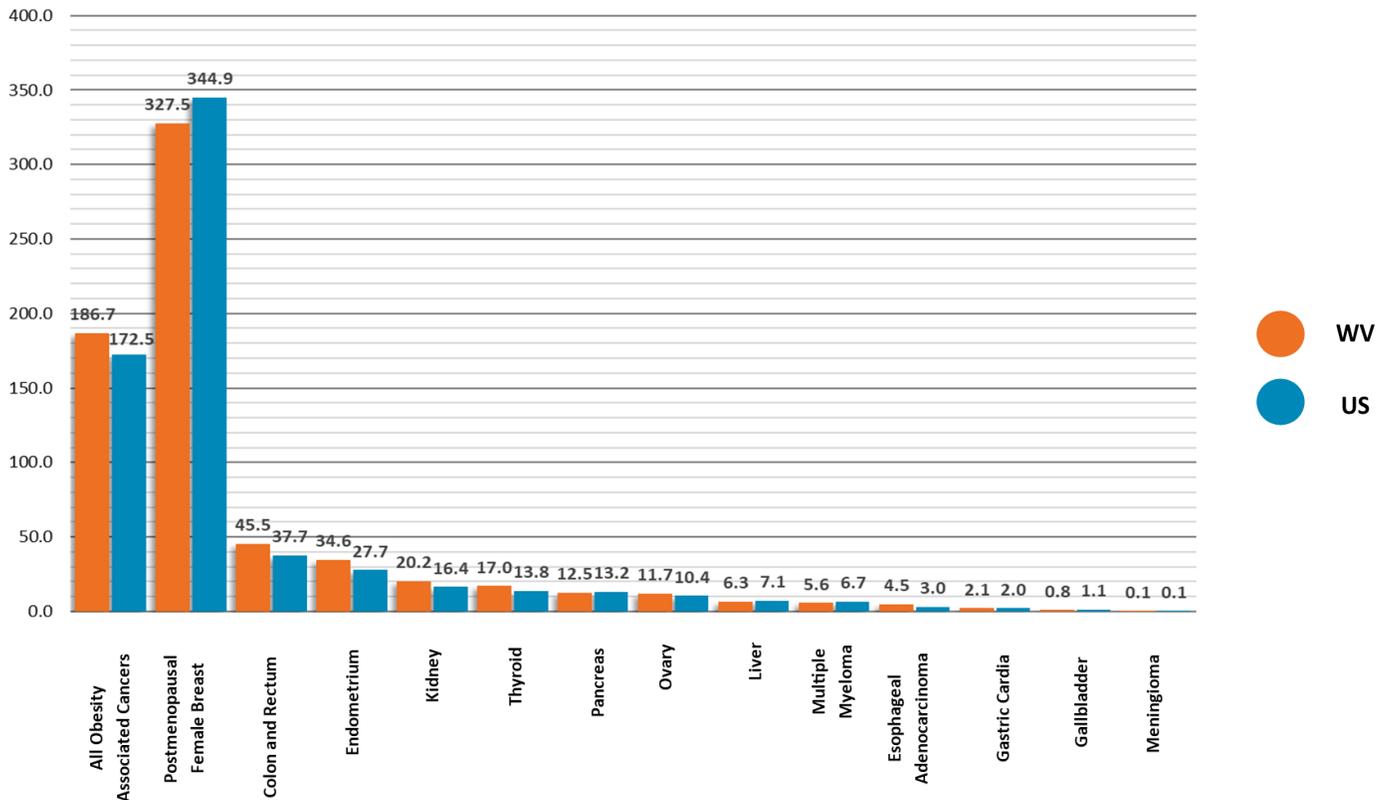
Obesity Prevalence in Adults aged 18+ years  
(percentage, Age-Adjusted Prevalence), BRFSS 2021,  
All Races and Ethnicities, Male and Female,  
West Virginia and United States<sup>3</sup>



Obesity-Associated Cancers



Average Annual Age-Adjusted Incidence Rates (per 100,000)  
Obesity-Associated Cancers, Males and Females,  
West Virginia and United States, 2015-2019



# Appendices

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A. How to Read These Tables .....	46
B. Incidence Rates for Select Cancers by County	
All Sites .....	47
Breast (Female) .....	49
Colon and Rectum .....	51
Corpus and Uterus, NOS .....	53
Kidney and Renal Pelvis.....	55
Lung and Bronchus.....	57
Melanomas of the Skin .....	59
Non-Hodgkin Lymphoma .....	61
Prostate .....	63
Thyroid .....	65
Urinary Bladder .....	67

# How to Read These Tables

The county-level graphs on the following pages, arranged in alphabetical order by primary site, are packed with information. With a quick glance at these graphs, you can answer such questions as:

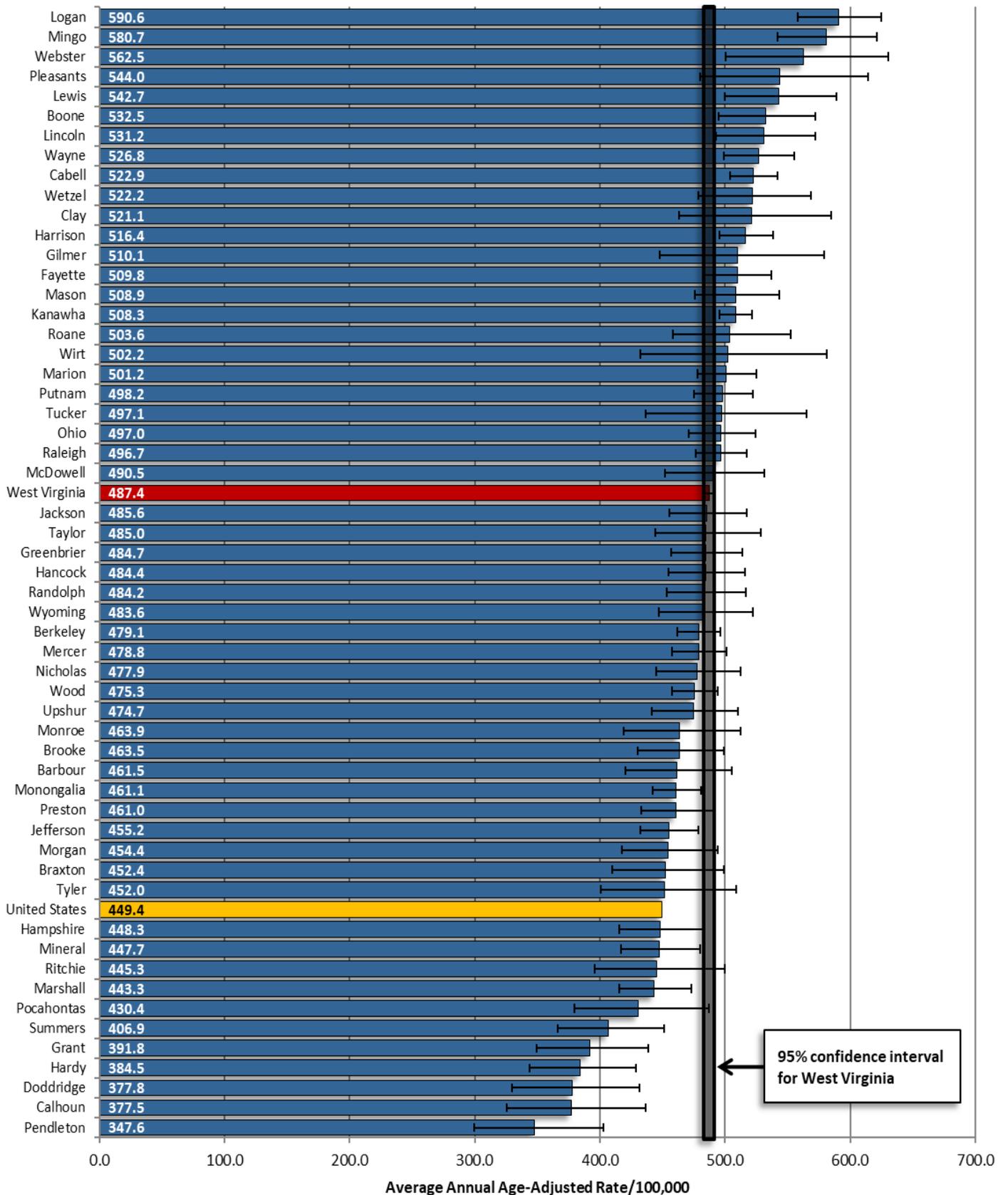
- **What is the lung and bronchus cancer incidence rate for Mingo County?**
  - The average annual incidence rate for each county is shown at the left margin of each bar. On page 58, you can see that Mingo County, at the top of the graph, has an annual average incidence rate of 119.3.
- **Which 5 counties have the highest breast cancer incidence rate?**
  - Each graph is arranged in order from the county with the highest average annual incidence rate to the lowest. On page 49, you can see that the 5 counties with the highest breast cancer incidence rates are Pleasants, Wetzel, Hancock, Ohio, and Tucker.
- **Is the melanoma skin cancer incidence rate for Putnam County significantly higher than the West Virginia average?**
  - The thin black lines extending from each bar are called “error bars,” and show the 95% confidence interval for each county’s average annual estimate. If the error bars for any two counties do not touch or overlap, then we can be 95% certain that the two average annual estimates are statistically different. The 95% confidence interval for West Virginia appears as a gray vertical bar to allow easy comparisons with any given county. On page 60, you can see that the average annual melanoma skin cancer rate for Putnam County (second from the top) is 31.9, compared to 22.4 for West Virginia (the red bar). Are they significantly different? Look at the left edge of the thin black error bar for Putnam County, and you can see that it does not overlap or touch the gray vertical bar. This means that the rate for Putnam County is significantly higher than the state average.
- **Is West Virginia higher or lower than the national average in lung and bronchus cancer incidence?**
  - The average annual incidence rate for West Virginia is shown as a red bar on the graphs. The average annual incidence rate for the United States is shown as a yellow bar. On page 58, you can see that the West Virginia rate for lung and bronchus cancer (77.9) is higher than the United States rate (56.3).
- **How can I easily find rates for my county?**
  - For convenience, we have included a data table for each site that shows the average annual rates and 95% confidence intervals for each county arranged in alphabetical order. Your county will appear on the same line in each of the tables. The West Virginia average annual rate is shown as the first entry at the top left of each table.

**All Sites — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)**  
 95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	<b>487.4</b>	<b>483.3</b>	<b>491.4</b>	<b>61,082</b>
Barbour	461.5	420.6	505.5	512
Berkeley	479.1	462.1	496.6	3,202
Boone	532.5	494.9	572.3	830
Braxton	452.4	409.7	498.8	470
Brooke	463.5	430.1	499.1	812
Cabell	522.9	504.2	542.1	3,180
Calhoun	377.5	325.5	436.5	219
Clay	521.1	463.2	584.8	324
Doddridge	377.8	329.8	431.9	239
Fayette	509.8	483.7	537.1	1,578
Gilmer	510.1	448.0	579.1	256
Grant	391.8	349.3	438.6	351
Greenbrier	484.7	456.9	514.0	1,286
Hampshire	448.3	415.3	483.4	779
Hancock	484.4	454.6	515.9	1,106
Hardy	384.5	344.0	428.9	367
Harrison	516.4	495.3	538.2	2,419
Jackson	485.6	455.3	517.7	1,018
Jefferson	455.2	432.6	478.8	1,614
Kanawha	508.3	495.5	521.4	6,567
Lewis	542.7	499.6	588.9	629
Lincoln	531.2	492.6	572.2	760
Logan	590.6	558.0	624.7	1,359
Marion	501.2	477.9	525.4	1,878
Marshall	443.3	415.2	473.0	1,040
Mason	508.9	476.1	543.6	984
McDowell	490.5	452.2	531.4	684

County	Rate	Lower CI	Upper CI	Count
Mercer	478.8	457.4	501.1	2,085
Mineral	447.7	416.7	480.5	861
Mingo	580.7	542.1	621.4	935
Monongalia	461.1	442.0	480.8	2,329
Monroe	463.9	419.2	512.5	468
Morgan	454.4	417.5	494.2	634
Nicholas	477.9	445.1	512.8	883
Ohio	497.0	470.7	524.5	1,518
Pendleton	347.6	299.3	403.0	220
Pleasants	544.0	480.2	614.7	278
Pocahontas	430.4	379.7	487.2	307
Preston	461.0	433.1	490.5	1,088
Putnam	498.2	475.1	522.2	1,850
Raleigh	496.7	476.9	517.1	2,611
Randolph	484.2	453.4	516.7	1,018
Ritchie	445.3	395.9	499.8	336
Roane	503.6	458.5	552.3	515
Summers	406.9	366.1	451.6	418
Taylor	485.0	444.4	528.7	570
Tucker	497.1	436.6	565.0	286
Tyler	452.0	400.6	509.1	314
Upshur	474.7	441.3	510.2	812
Wayne	526.8	499.4	555.5	1,513
Webster	562.5	500.8	630.5	350
Wetzel	522.2	478.8	568.9	607
Wirt	502.2	432.3	581.2	209
Wood	475.3	457.4	493.9	2,861
Wyoming	483.6	447.4	522.2	740

## All Sites - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



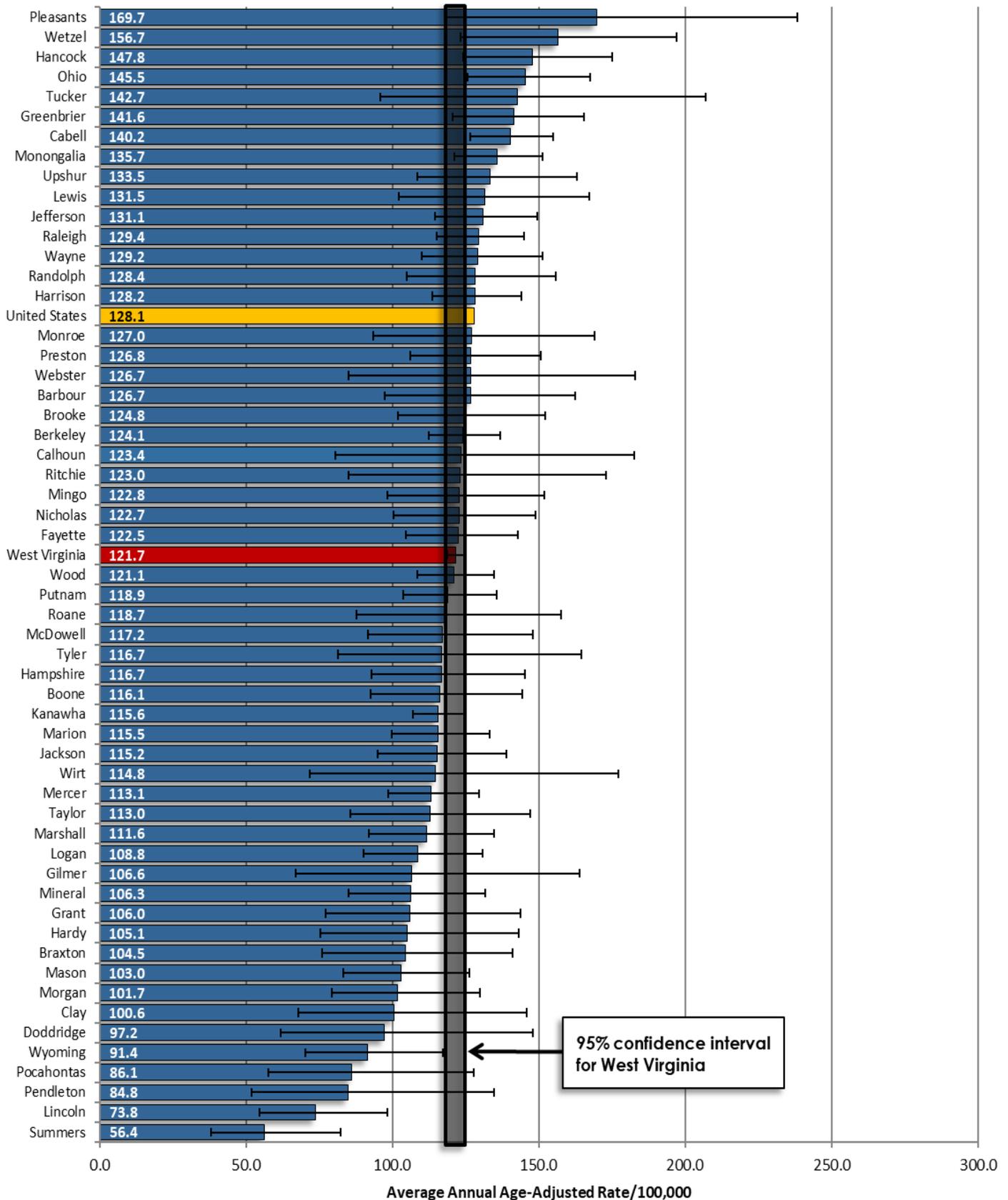
U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

**Breast (Female) — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)**  
 95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	121.7	118.8	124.6	7,684
Barbour	126.7	97.5	162.5	71
Berkeley	124.1	112.3	136.8	431
Boone	116.1	92.5	144.5	91
Braxton	104.5	76.0	141.1	52
Brooke	124.8	101.9	152.2	121
Cabell	140.2	126.6	154.9	438
Calhoun	123.4	80.6	182.7	32
Clay	100.6	67.8	145.8	32
Doddridge	97.2	61.8	148.0	27
Fayette	122.5	104.5	142.9	190
Gilmer	106.6	67.0	164.0	25
Grant	106.0	77.2	143.8	49
Greenbrier	141.6	120.7	165.4	188
Hampshire	116.7	93.0	145.2	96
Hancock	147.8	124.2	175.0	163
Hardy	105.1	75.3	143.3	47
Harrison	128.2	113.7	144.1	311
Jackson	115.2	95.0	138.8	124
Jefferson	131.1	114.5	149.5	240
Kanawha	115.6	107.0	124.7	774
Lewis	131.5	102.2	167.3	75
Lincoln	73.8	54.5	98.3	53
Logan	108.8	90.1	130.7	133
Marion	115.5	99.9	133.1	220
Marshall	111.6	92.0	134.6	132
Mason	103.0	83.3	126.4	105
McDowell	117.2	91.8	148.1	83

County	Rate	Lower CI	Upper CI	Count
Mercer	113.1	98.5	129.5	249
Mineral	106.3	85.0	131.6	100
Mingo	122.8	98.3	152.0	96
Monongalia	135.7	121.2	151.4	342
Monroe	127.0	93.6	169.2	61
Morgan	101.7	79.3	129.8	77
Nicholas	122.7	100.4	149.0	117
Ohio	145.5	125.7	167.6	232
Pendleton	84.8	51.8	134.8	26
Pleasants	169.7	117.9	238.2	38
Pocahontas	86.1	57.6	127.7	33
Preston	126.8	106.0	150.8	145
Putnam	118.9	103.8	135.7	238
Raleigh	129.4	115.3	145.0	344
Randolph	128.4	105.0	155.9	125
Ritchie	123.0	85.0	173.1	40
Roane	118.7	87.9	157.6	57
Summers	56.4	38.2	82.3	33
Taylor	113.0	85.5	147.2	64
Tucker	142.7	95.9	207.0	36
Tyler	116.7	81.3	164.6	41
Upshur	133.5	108.4	162.9	111
Wayne	129.2	109.9	151.2	178
Webster	126.7	85.0	182.8	34
Wetzel	156.7	123.4	197.0	90
Wirt	114.8	71.9	177.3	24
Wood	121.1	108.5	134.8	379
Wyoming	91.4	70.4	117.4	71

## Breast (Female) - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



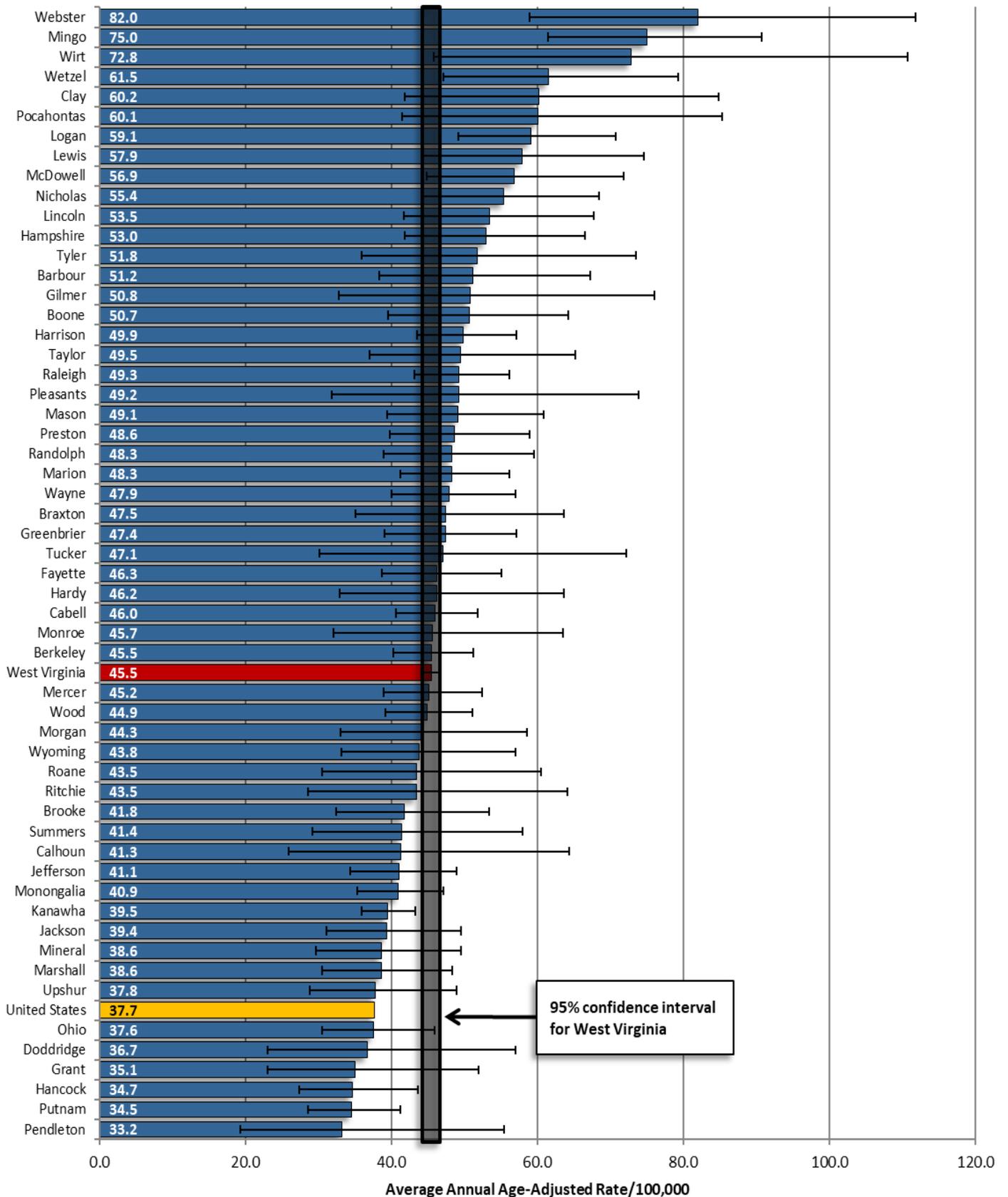
U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

## Colon and Rectum — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000) 95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	45.5	44.3	46.7	5,647
Barbour	51.2	38.4	67.3	57
Berkeley	45.5	40.3	51.2	297
Boone	50.7	39.5	64.2	77
Braxton	47.5	35.1	63.7	53
Brooke	41.8	32.5	53.4	76
Cabell	46.0	40.7	51.9	286
Calhoun	41.3	25.9	64.4	24
Clay	60.2	41.8	84.8	38
Doddridge	36.7	23.0	57.0	23
Fayette	46.3	38.7	55.1	143
Gilmer	50.8	32.8	76.0	26
Grant	35.1	23.0	52.0	30
Greenbrier	47.4	39.1	57.1	129
Hampshire	53.0	41.8	66.5	88
Hancock	34.7	27.4	43.7	84
Hardy	46.2	32.9	63.6	43
Harrison	49.9	43.5	57.1	232
Jackson	39.4	31.1	49.6	82
Jefferson	41.1	34.4	48.9	139
Kanawha	39.5	36.0	43.3	510
Lewis	57.9	44.4	74.6	67
Lincoln	53.5	41.7	67.7	76
Logan	59.1	49.2	70.7	135
Marion	48.3	41.3	56.2	182
Marshall	38.6	30.5	48.3	85
Mason	49.1	39.4	60.9	94
McDowell	56.9	44.8	71.8	81

County	Rate	Lower CI	Upper CI	Count
Mercer	45.2	38.9	52.4	200
Mineral	38.6	29.7	49.5	72
Mingo	75.0	61.5	90.7	119
Monongalia	40.9	35.4	47.2	205
Monroe	45.7	32.1	63.5	44
Morgan	44.3	33.0	58.6	58
Nicholas	55.4	44.4	68.5	98
Ohio	37.6	30.5	46.0	111
Pendleton	33.2	19.3	55.4	21
Pleasants	49.2	31.9	73.9	26
Pocahontas	60.1	41.5	85.3	41
Preston	48.6	39.8	59.0	113
Putnam	34.5	28.6	41.3	127
Raleigh	49.3	43.2	56.2	255
Randolph	48.3	38.9	59.6	101
Ritchie	43.5	28.6	64.1	31
Roane	43.5	30.5	60.5	41
Summers	41.4	29.2	58.0	44
Taylor	49.5	37.0	65.2	57
Tucker	47.1	30.2	72.2	27
Tyler	51.8	36.0	73.5	36
Upshur	37.8	28.8	49.0	62
Wayne	47.9	40.0	57.0	140
Webster	82.0	59.0	111.8	48
Wetzel	61.5	47.1	79.3	71
Wirt	72.8	45.8	110.7	26
Wood	44.9	39.2	51.1	251
Wyoming	43.8	33.2	57.0	65

## Colon and Rectum - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



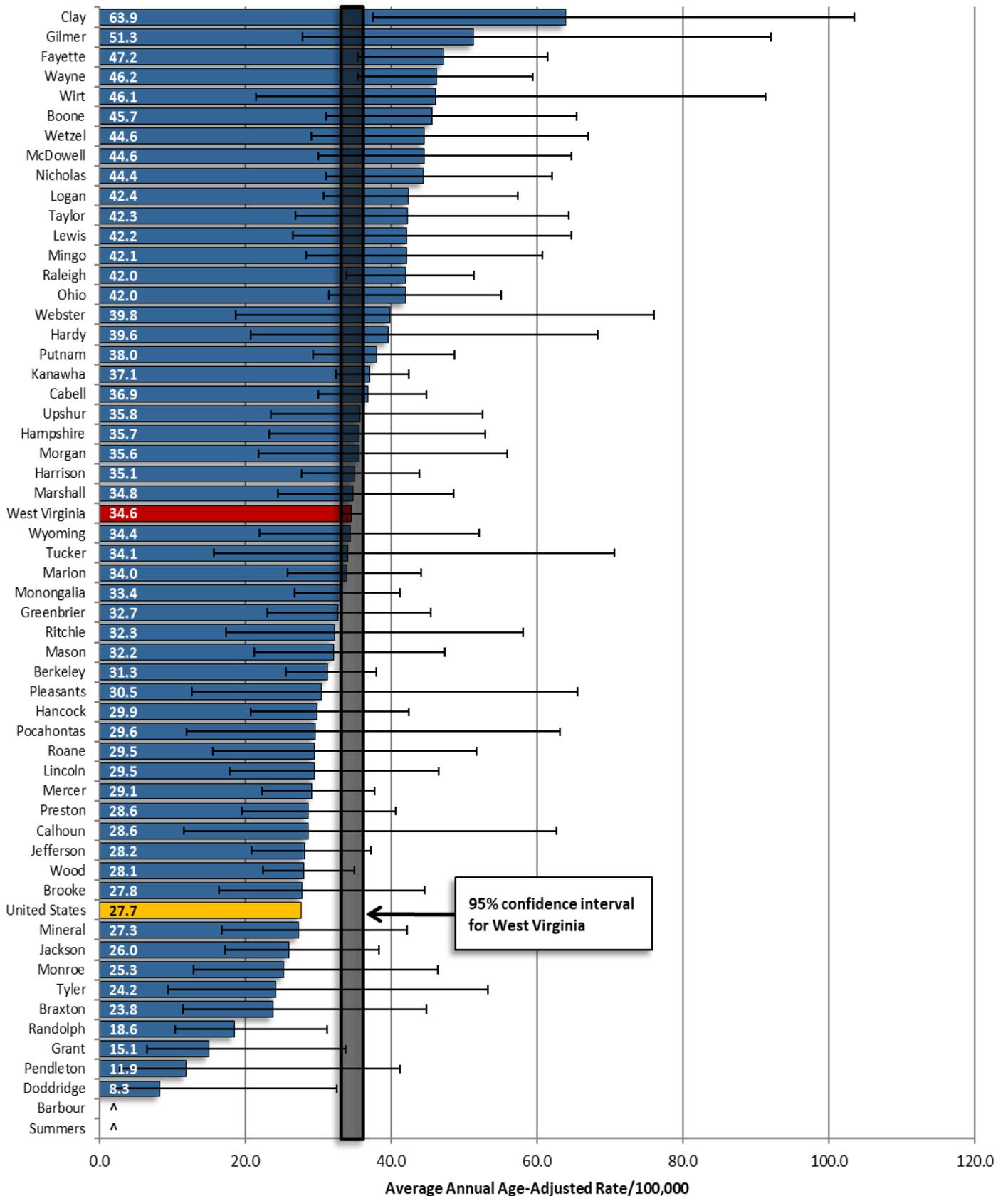
U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

**Corpus and Uterus, NOS — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)**  
 95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	34.6	33.1	36.1	2,224
Barbour	^	^	^	^
Berkeley	31.3	25.6	38.0	112
Boone	45.7	31.1	65.4	36
Braxton	23.8	11.5	44.8	12
Brooke	27.8	16.4	44.6	22
Cabell	36.9	30.1	44.8	116
Calhoun	28.6	11.6	62.7	8
Clay	63.9	37.5	103.5	19
Doddridge	8.3	1.7	32.6	^
Fayette	47.2	35.5	61.5	64
Gilmer	51.3	27.9	92.1	14
Grant	15.1	6.5	33.8	8
Greenbrier	32.7	23.1	45.5	44
Hampshire	35.7	23.3	52.9	30
Hancock	29.9	20.8	42.5	39
Hardy	39.6	20.8	68.3	15
Harrison	35.1	27.7	43.9	86
Jackson	26.0	17.3	38.3	30
Jefferson	28.2	20.9	37.3	54
Kanawha	37.1	32.4	42.4	253
Lewis	42.2	26.5	64.7	25
Lincoln	29.5	17.9	46.6	22
Logan	42.4	30.8	57.4	51
Marion	34.0	25.8	44.1	65
Marshall	34.8	24.5	48.6	44
Mason	32.2	21.2	47.4	31
McDowell	44.6	30.1	64.7	34

County	Rate	Lower CI	Upper CI	Count
Mercer	29.1	22.3	37.7	71
Mineral	27.3	16.8	42.2	24
Mingo	42.1	28.3	60.7	34
Monongalia	33.4	26.8	41.2	93
Monroe	25.3	13.0	46.4	13
Morgan	35.6	21.9	55.9	24
Nicholas	44.4	31.1	62.1	41
Ohio	42.0	31.5	55.1	64
Pendleton	11.9	2.8	41.2	4
Pleasants	30.5	12.7	65.6	8
Pocahontas	29.6	12.0	63.2	9
Preston	28.6	19.6	40.7	36
Putnam	38.0	29.3	48.7	70
Raleigh	42.0	33.9	51.4	108
Randolph	18.6	10.4	31.2	18
Ritchie	32.3	17.4	58.1	14
Roane	29.5	15.6	51.7	15
Summers	^	^	^	^
Taylor	42.3	26.9	64.4	26
Tucker	34.1	15.7	70.6	10
Tyler	24.2	9.4	53.3	8
Upshur	35.8	23.5	52.6	30
Wayne	46.2	35.5	59.4	70
Webster	39.8	18.7	76.0	12
Wetzel	44.6	29.1	67.0	29
Wirt	46.1	21.5	91.4	10
Wood	28.1	22.4	35.0	92
Wyoming	34.4	22.0	52.1	27

## Corpus and Uterus, NOS - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



^ Data Suppressed

U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

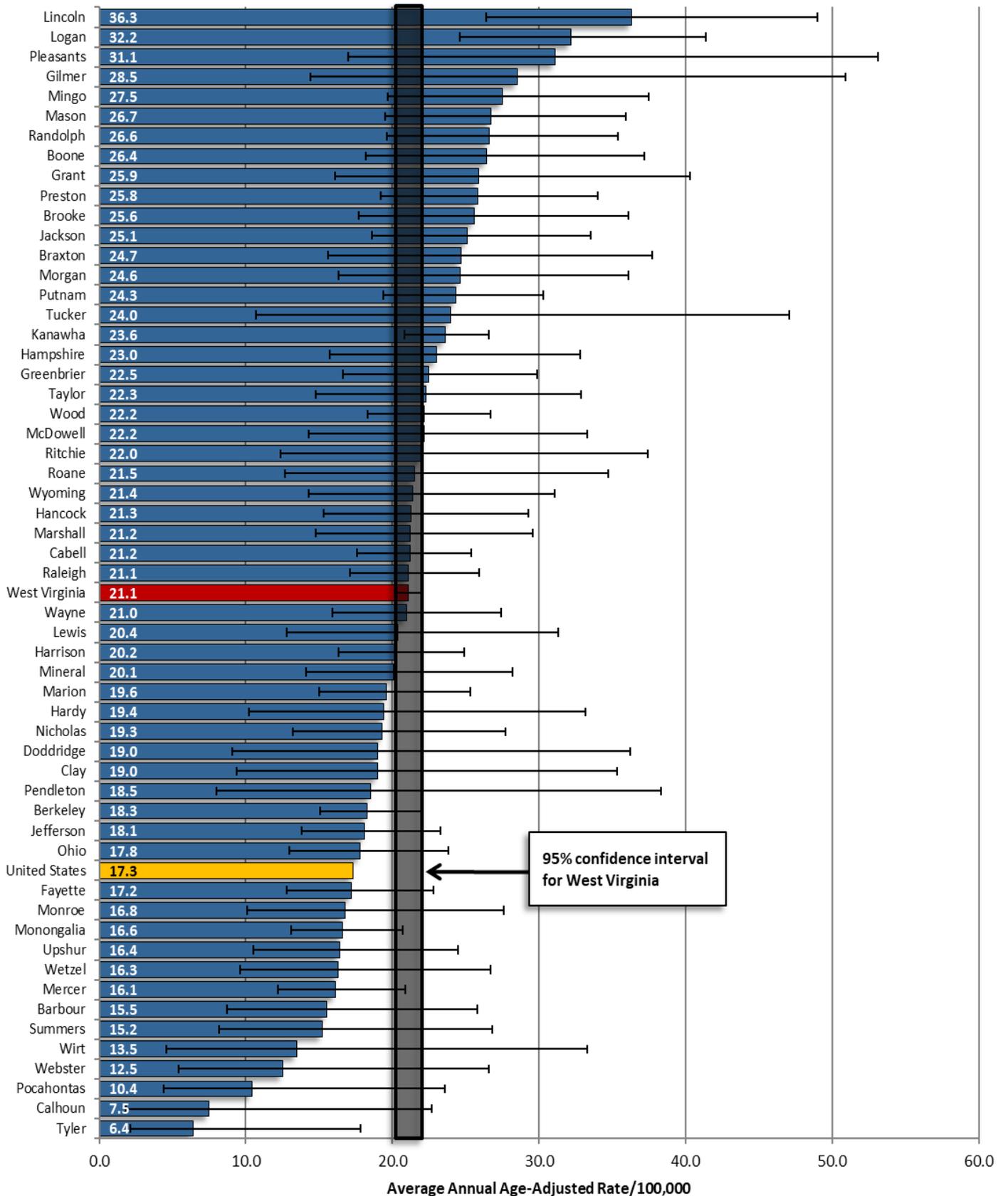
## Kidney and Renal Pelvis — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)

95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	21.1	20.3	22.0	2,574
Barbour	15.5	8.7	25.8	17
Berkeley	18.3	15.1	22.1	119
Boone	26.4	18.2	37.2	38
Braxton	24.7	15.6	37.7	26
Brooke	25.6	17.7	36.1	39
Cabell	21.2	17.6	25.4	130
Calhoun	7.5	1.8	22.7	4
Clay	19.0	9.4	35.3	12
Doddridge	19.0	9.1	36.2	11
Fayette	17.2	12.8	22.8	56
Gilmer	28.5	14.4	50.9	13
Grant	25.9	16.1	40.3	24
Greenbrier	22.5	16.6	29.9	57
Hampshire	23.0	15.7	32.8	39
Hancock	21.3	15.3	29.3	45
Hardy	19.4	10.2	33.2	15
Harrison	20.2	16.3	24.9	100
Jackson	25.1	18.6	33.5	52
Jefferson	18.1	13.8	23.3	66
Kanawha	23.6	20.8	26.6	292
Lewis	20.4	12.8	31.3	24
Lincoln	36.3	26.4	49.0	48
Logan	32.2	24.6	41.4	69
Marion	19.6	15.0	25.3	67
Marshall	21.2	14.8	29.6	41
Mason	26.7	19.5	35.9	51
McDowell	22.2	14.3	33.3	28

County	Rate	Lower CI	Upper CI	Count
Mercer	16.1	12.2	20.9	65
Mineral	20.1	14.1	28.2	40
Mingo	27.5	19.7	37.5	46
Monongalia	16.6	13.1	20.7	83
Monroe	16.8	10.1	27.6	20
Morgan	24.6	16.3	36.1	32
Nicholas	19.3	13.2	27.7	35
Ohio	17.8	13.0	23.8	53
Pendleton	18.5	8.0	38.3	10
Pleasants	31.1	17.0	53.1	15
Pocahontas	10.4	4.4	23.6	8
Preston	25.8	19.2	34.0	57
Putnam	24.3	19.4	30.3	88
Raleigh	21.1	17.1	25.9	106
Randolph	26.6	19.6	35.4	54
Ritchie	22.0	12.4	37.4	17
Roane	21.5	12.7	34.7	20
Summers	15.2	8.2	26.8	16
Taylor	22.3	14.8	32.9	29
Tucker	24.0	10.7	47.1	11
Tyler	6.4	2.1	17.8	5
Upshur	16.4	10.5	24.5	27
Wayne	21.0	15.9	27.4	61
Webster	12.5	5.4	26.6	9
Wetzel	16.3	9.6	26.7	20
Wirt	13.5	4.6	33.3	6
Wood	22.2	18.3	26.7	125
Wyoming	21.4	14.3	31.1	33

## Kidney and Renal Pelvis - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



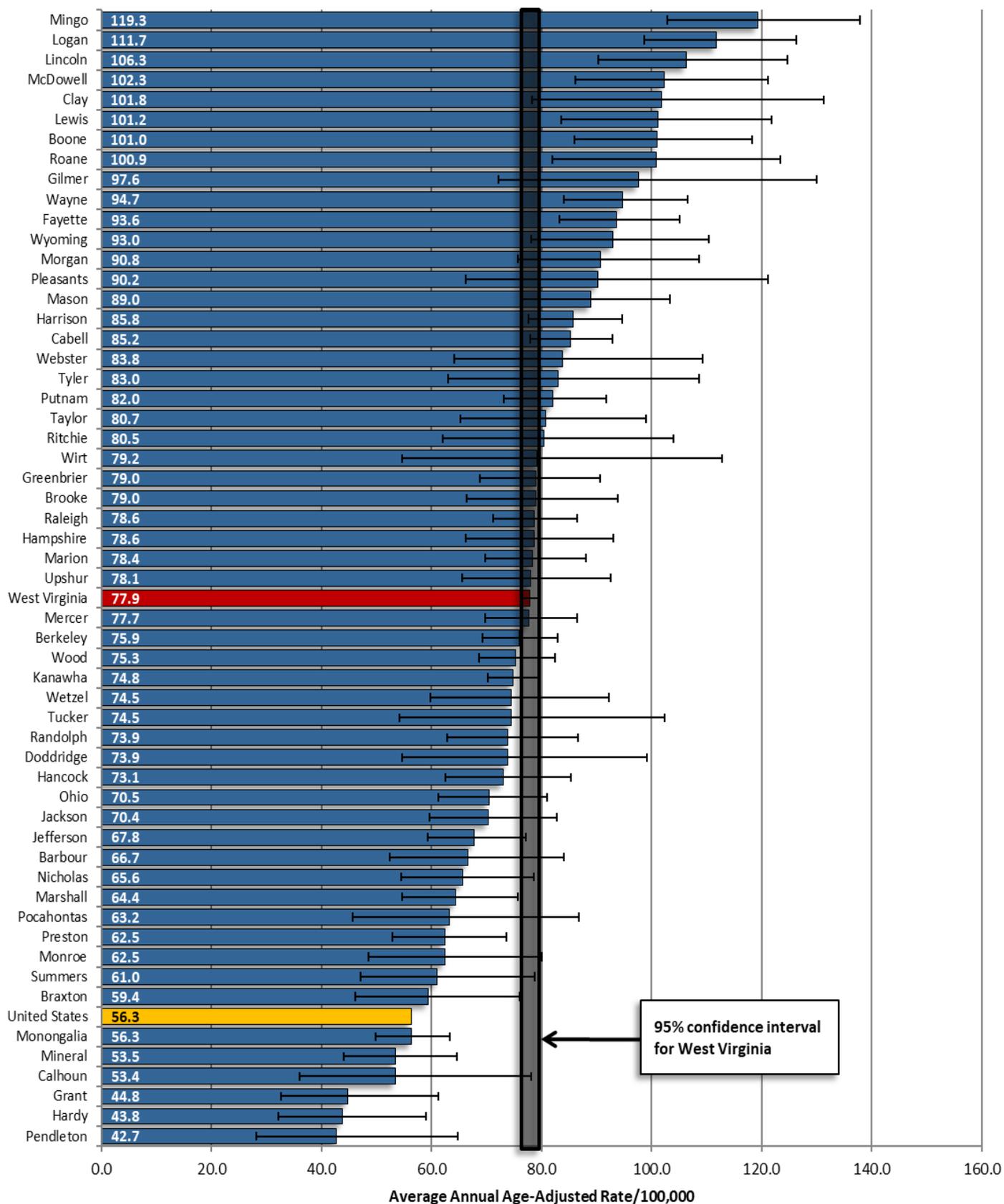
U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

## Lung and Bronchus — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000) 95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	77.9	76.4	79.5	10,438
Barbour	66.7	52.5	84.0	80
Berkeley	75.9	69.3	82.9	526
Boone	101.0	86.0	118.2	172
Braxton	59.4	46.1	76.0	71
Brooke	79.0	66.4	93.9	146
Cabell	85.2	78.0	92.9	543
Calhoun	53.4	36.0	78.1	33
Clay	101.8	78.2	131.3	67
Doddridge	73.9	54.7	99.2	50
Fayette	93.6	83.3	105.1	313
Gilmer	97.6	72.2	130.0	50
Grant	44.8	32.6	61.2	46
Greenbrier	79.0	68.8	90.6	228
Hampshire	78.6	66.2	93.1	150
Hancock	73.1	62.5	85.4	178
Hardy	43.8	32.2	59.0	49
Harrison	85.8	77.7	94.6	425
Jackson	70.4	59.7	82.8	157
Jefferson	67.8	59.4	77.2	247
Kanawha	74.8	70.2	79.6	1,038
Lewis	101.2	83.6	121.8	122
Lincoln	106.3	90.3	124.7	164
Logan	111.7	98.6	126.3	282
Marion	78.4	69.8	88.0	313
Marshall	64.4	54.6	75.7	164
Mason	89.0	76.4	103.3	187
McDowell	102.3	86.1	121.1	153

County	Rate	Lower CI	Upper CI	Count
Mercer	77.7	69.7	86.5	365
Mineral	53.5	44.1	64.7	117
Mingo	119.3	102.9	137.9	204
Monongalia	56.3	49.9	63.3	295
Monroe	62.5	48.5	80.1	72
Morgan	90.8	75.7	108.7	135
Nicholas	65.6	54.5	78.6	132
Ohio	70.5	61.2	81.0	227
Pendleton	42.7	28.1	64.8	28
Pleasants	90.2	66.3	121.2	49
Pocahontas	63.2	45.7	86.8	48
Preston	62.5	52.9	73.7	155
Putnam	82.0	73.1	91.8	317
Raleigh	78.6	71.2	86.5	443
Randolph	73.9	62.8	86.7	165
Ritchie	80.5	62.0	103.9	68
Roane	100.9	82.0	123.4	109
Summers	61.0	47.1	78.8	70
Taylor	80.7	65.3	99.0	101
Tucker	74.5	54.2	102.3	48
Tyler	83.0	63.0	108.7	61
Upshur	78.1	65.6	92.5	143
Wayne	94.7	84.0	106.6	297
Webster	83.8	64.2	109.2	65
Wetzel	74.5	59.8	92.3	94
Wirt	79.2	54.7	112.8	36
Wood	75.3	68.6	82.5	488
Wyoming	93.0	78.1	110.4	151

## Lung and Bronchus - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

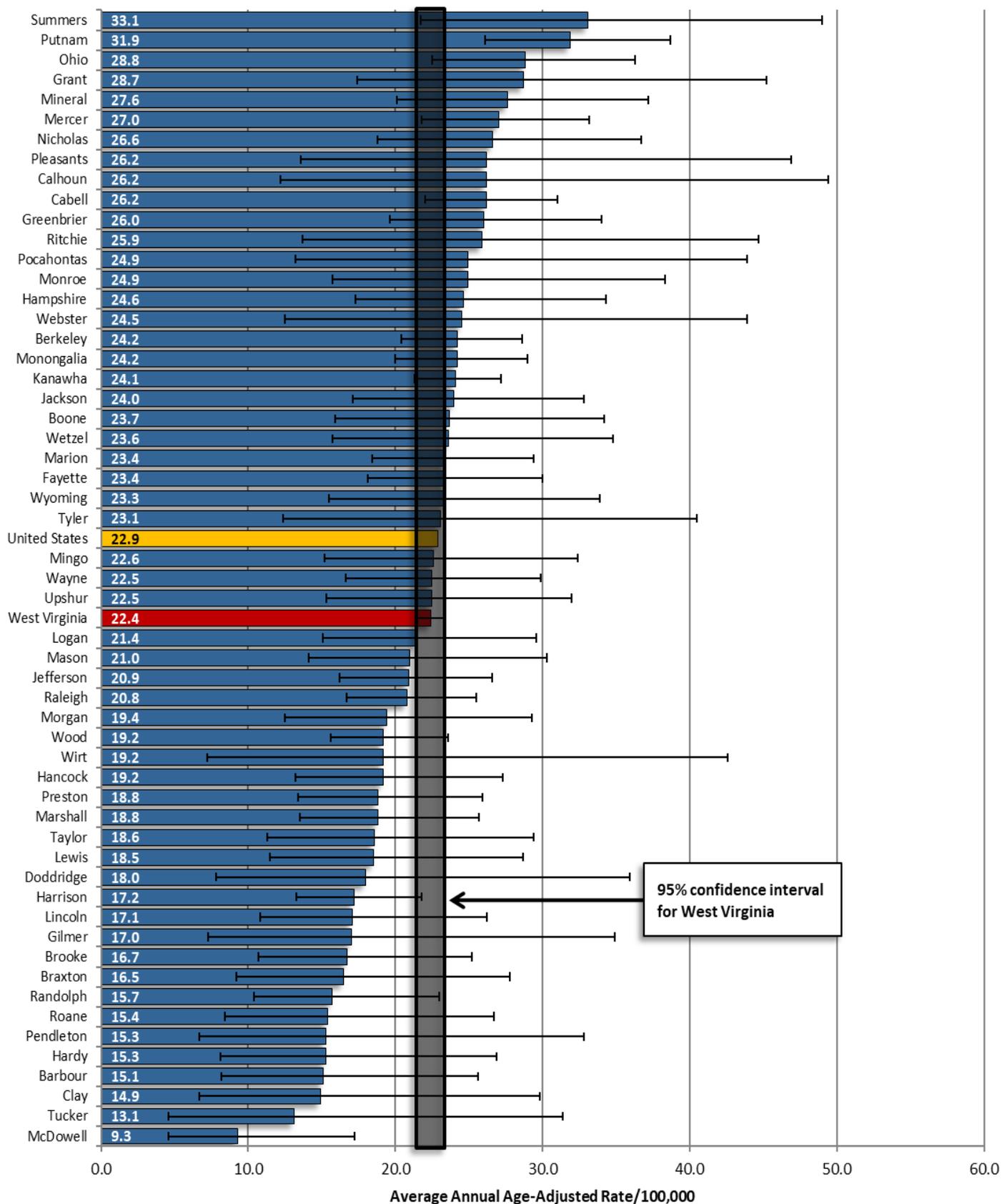
## Melanomas of the Skin — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)

95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	22.4	21.5	23.4	2,638
Barbour	15.1	8.2	25.6	16
Berkeley	24.2	20.4	28.6	153
Boone	23.7	15.9	34.2	33
Braxton	16.5	9.2	27.8	17
Brooke	16.7	10.7	25.2	28
Cabell	26.2	22.0	31.0	150
Calhoun	26.2	12.2	49.4	11
Clay	14.9	6.7	29.8	10
Doddridge	18.0	7.8	35.9	9
Fayette	23.4	18.1	30.0	72
Gilmer	17.0	7.3	34.9	8
Grant	28.7	17.4	45.2	23
Greenbrier	26.0	19.6	34.0	64
Hampshire	24.6	17.3	34.3	42
Hancock	19.2	13.2	27.3	38
Hardy	15.3	8.1	26.9	14
Harrison	17.2	13.3	21.8	75
Jackson	24.0	17.1	32.8	45
Jefferson	20.9	16.2	26.6	71
Kanawha	24.1	21.3	27.2	297
Lewis	18.5	11.5	28.7	23
Lincoln	17.1	10.8	26.2	24
Logan	21.4	15.1	29.6	41
Marion	23.4	18.4	29.4	82
Marshall	18.8	13.5	25.7	44
Mason	21.0	14.1	30.3	33
McDowell	9.3	4.6	17.2	12

County	Rate	Lower CI	Upper CI	Count
Mercer	27.0	21.8	33.2	108
Mineral	27.6	20.1	37.2	50
Mingo	22.6	15.2	32.4	33
Monongalia	24.2	20.0	29.0	124
Monroe	24.9	15.7	38.3	26
Morgan	19.4	12.5	29.3	27
Nicholas	26.6	18.8	36.7	43
Ohio	28.8	22.5	36.3	82
Pendleton	15.3	6.7	32.8	10
Pleasants	26.2	13.6	46.9	13
Pocahontas	24.9	13.2	43.9	16
Preston	18.8	13.4	25.9	42
Putnam	31.9	26.1	38.7	111
Raleigh	20.8	16.7	25.5	104
Randolph	15.7	10.4	23.0	31
Ritchie	25.9	13.7	44.7	15
Roane	15.4	8.4	26.7	16
Summers	33.1	21.7	49.0	30
Taylor	18.6	11.3	29.4	21
Tucker	13.1	4.6	31.4	7
Tyler	23.1	12.4	40.5	15
Upshur	22.5	15.3	32.0	36
Wayne	22.5	16.6	29.9	56
Webster	24.5	12.5	43.9	13
Wetzel	23.6	15.7	34.8	30
Wirt	19.2	7.2	42.6	7
Wood	19.2	15.6	23.6	105
Wyoming	23.3	15.5	33.9	32

## Melanomas of the Skin - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

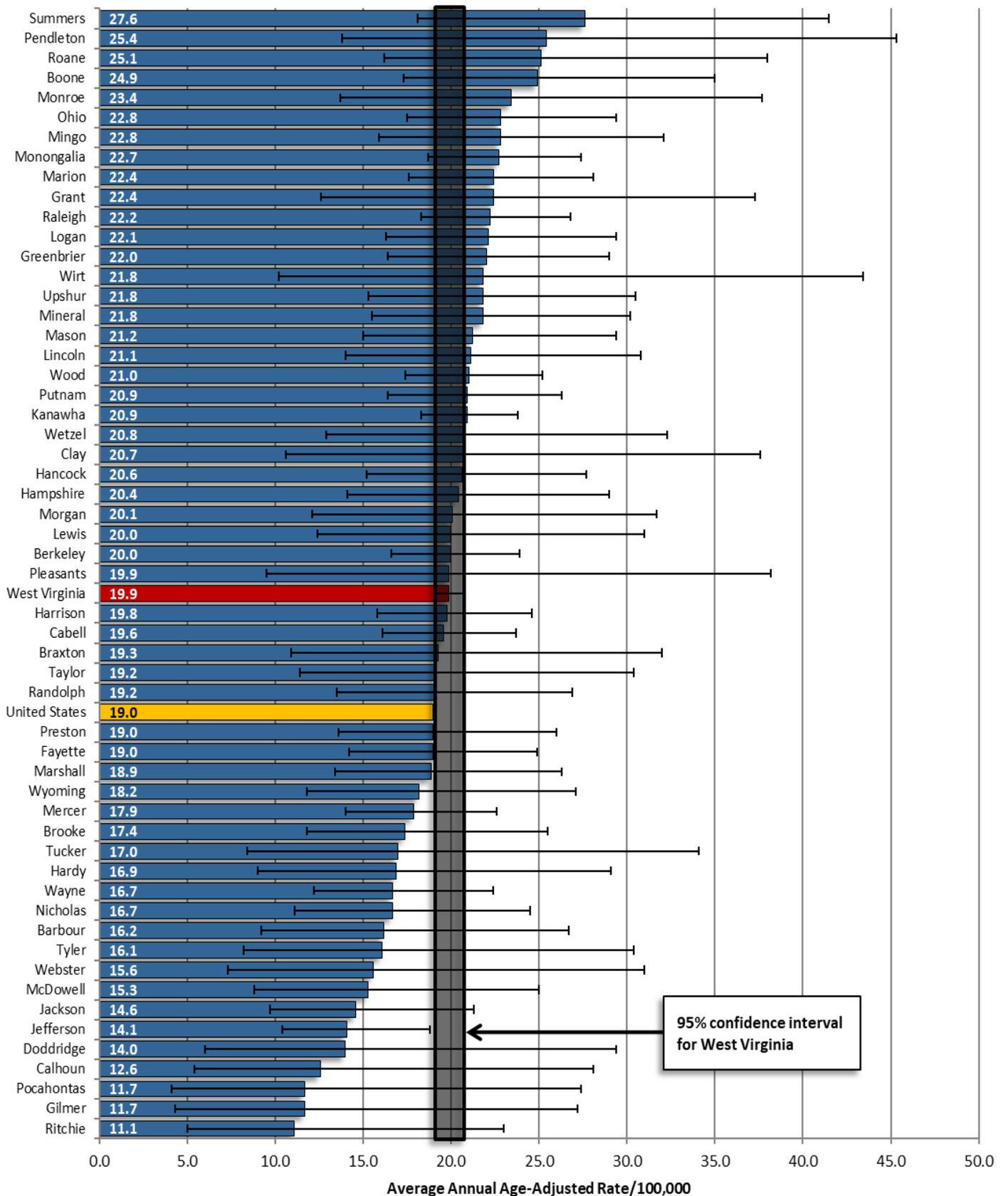
## Non-Hodgkin Lymphoma — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)

95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	19.9	19.1	20.7	2,488
Barbour	16.2	9.2	26.7	17
Berkeley	20.0	16.6	23.9	129
Boone	24.9	17.3	35.0	39
Braxton	19.3	10.9	32.0	18
Brooke	17.4	11.8	25.5	33
Cabell	19.6	16.1	23.7	116
Calhoun	12.6	5.4	28.1	8
Clay	20.7	10.6	37.6	13
Doddridge	14.0	6.0	29.4	8
Fayette	19.0	14.2	24.9	59
Gilmer	11.7	4.3	27.2	6
Grant	22.4	12.6	37.3	19
Greenbrier	22.0	16.4	29.0	60
Hampshire	20.4	14.1	29.0	37
Hancock	20.6	15.2	27.7	52
Hardy	16.9	9.0	29.1	15
Harrison	19.8	15.8	24.6	91
Jackson	14.6	9.7	21.3	31
Jefferson	14.1	10.4	18.8	52
Kanawha	20.9	18.3	23.8	261
Lewis	20.0	12.4	31.0	23
Lincoln	21.1	14.0	30.8	30
Logan	22.1	16.3	29.4	54
Marion	22.4	17.6	28.1	82
Marshall	18.9	13.4	26.3	43
Mason	21.2	15.0	29.4	42
McDowell	15.3	8.8	25.0	19

County	Rate	Lower CI	Upper CI	Count
Mercer	17.9	14.0	22.6	80
Mineral	21.8	15.5	30.2	43
Mingo	22.8	15.9	32.1	38
Monongalia	22.7	18.7	27.4	115
Monroe	23.4	13.7	37.7	21
Morgan	20.1	12.1	31.7	23
Nicholas	16.7	11.1	24.5	32
Ohio	22.8	17.5	29.4	69
Pendleton	25.4	13.8	45.3	16
Pleasants	19.9	9.5	38.2	10
Pocahontas	11.7	4.1	27.4	7
Preston	19.0	13.6	26.0	44
Putnam	20.9	16.4	26.3	77
Raleigh	22.2	18.3	26.8	120
Randolph	19.2	13.5	26.9	39
Ritchie	11.1	5.0	23.0	9
Roane	25.1	16.2	38.0	26
Summers	27.6	18.1	41.5	29
Taylor	19.2	11.4	30.4	20
Tucker	17.0	8.4	34.1	11
Tyler	16.1	8.2	30.4	12
Upshur	21.8	15.3	30.5	39
Wayne	16.7	12.2	22.4	50
Webster	15.6	7.3	31.0	11
Wetzel	20.8	12.9	32.3	24
Wirt	21.8	10.2	43.4	10
Wood	21.0	17.4	25.2	128
Wyoming	18.2	11.8	27.1	28

## Non-Hodgkin Lymphoma - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



95% confidence interval  
for West Virginia

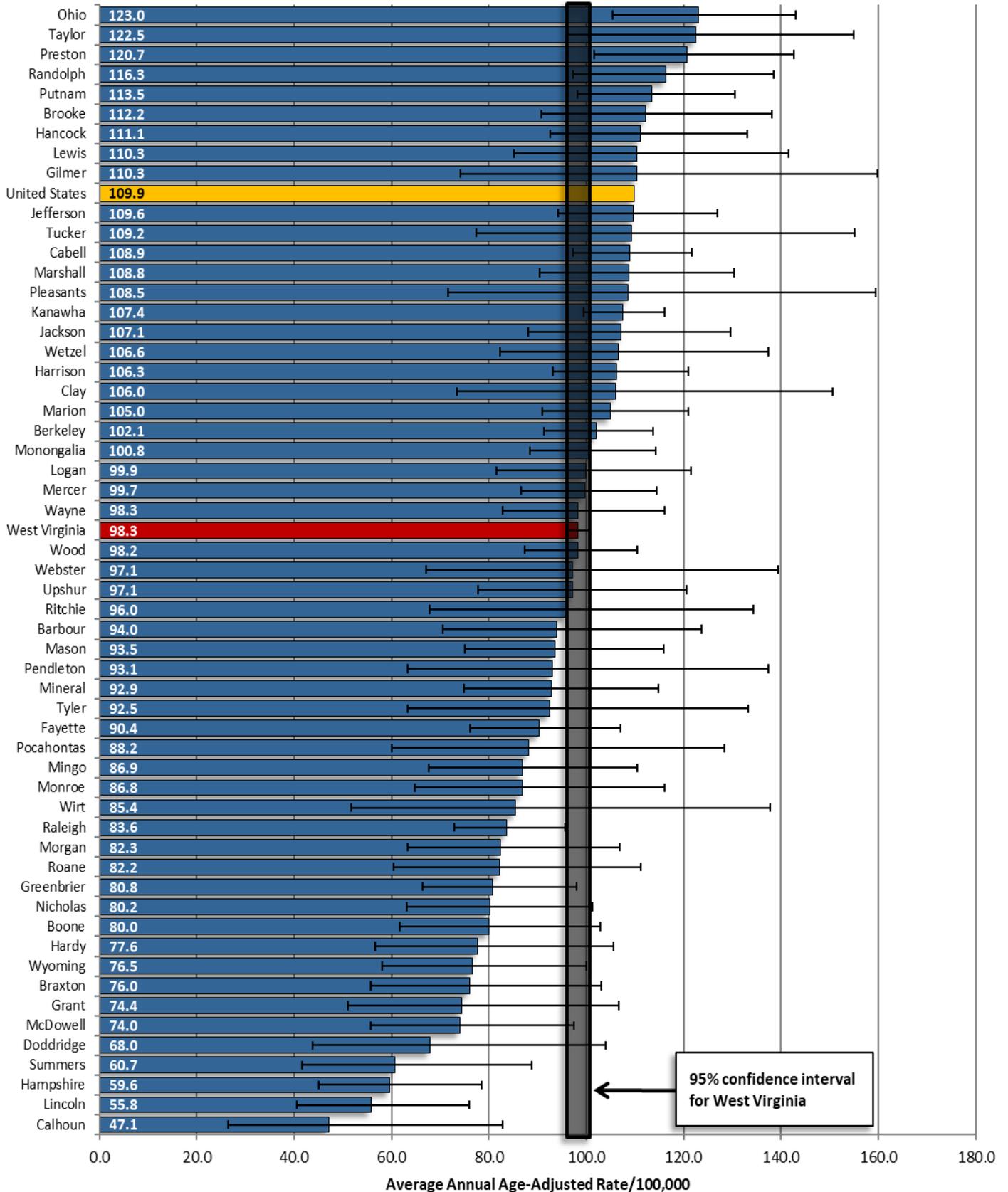
U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

**Prostate — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)**  
 95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	98.3	95.9	100.8	6,464
Barbour	94.0	70.6	123.7	57
Berkeley	102.1	91.4	113.8	359
Boone	80.0	61.6	102.9	69
Braxton	76.0	55.7	103.1	48
Brooke	112.2	90.7	138.1	101
Cabell	108.9	97.2	121.7	329
Calhoun	47.1	26.5	82.8	16
Clay	106.0	73.4	150.6	36
Doddridge	68.0	43.8	103.9	25
Fayette	90.4	76.1	107.1	151
Gilmer	110.3	74.1	159.8	30
Grant	74.4	51.0	106.7	34
Greenbrier	80.8	66.4	98.0	116
Hampshire	59.6	45.1	78.4	60
Hancock	111.1	92.5	133.0	133
Hardy	77.6	56.6	105.6	46
Harrison	106.3	93.2	120.9	248
Jackson	107.1	88.0	129.6	114
Jefferson	109.6	94.2	126.9	198
Kanawha	107.4	99.4	116.0	699
Lewis	110.3	85.2	141.6	68
Lincoln	55.8	40.6	75.9	46
Logan	99.9	81.5	121.5	114
Marion	105.0	90.9	120.9	208
Marshall	108.8	90.4	130.4	133
Mason	93.5	75.0	115.8	93
McDowell	74.0	55.7	97.5	59

County	Rate	Lower CI	Upper CI	Count
Mercer	99.7	86.6	114.4	222
Mineral	92.9	74.8	114.8	95
Mingo	86.9	67.6	110.5	76
Monongalia	100.8	88.5	114.3	262
Monroe	86.8	64.8	116.0	53
Morgan	82.3	63.3	106.8	66
Nicholas	80.2	63.2	101.2	83
Ohio	123.0	105.4	142.9	189
Pendleton	93.1	63.3	137.3	32
Pleasants	108.5	71.6	159.5	29
Pocahontas	88.2	60.0	128.4	34
Preston	120.7	101.7	142.6	150
Putnam	113.5	98.2	130.6	211
Raleigh	83.6	72.8	95.7	231
Randolph	116.3	97.3	138.4	137
Ritchie	96.0	67.9	134.4	40
Roane	82.2	60.5	111.1	49
Summers	60.7	41.6	88.7	35
Taylor	122.5	96.0	154.9	77
Tucker	109.2	77.4	155.1	39
Tyler	92.5	63.4	133.3	34
Upshur	97.1	77.7	120.6	90
Wayne	98.3	82.9	116.1	149
Webster	97.1	67.1	139.3	36
Wetzel	106.6	82.2	137.4	67
Wirt	85.4	51.7	137.7	21
Wood	98.2	87.3	110.4	303
Wyoming	76.5	58.0	100.0	63

## Prostate - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

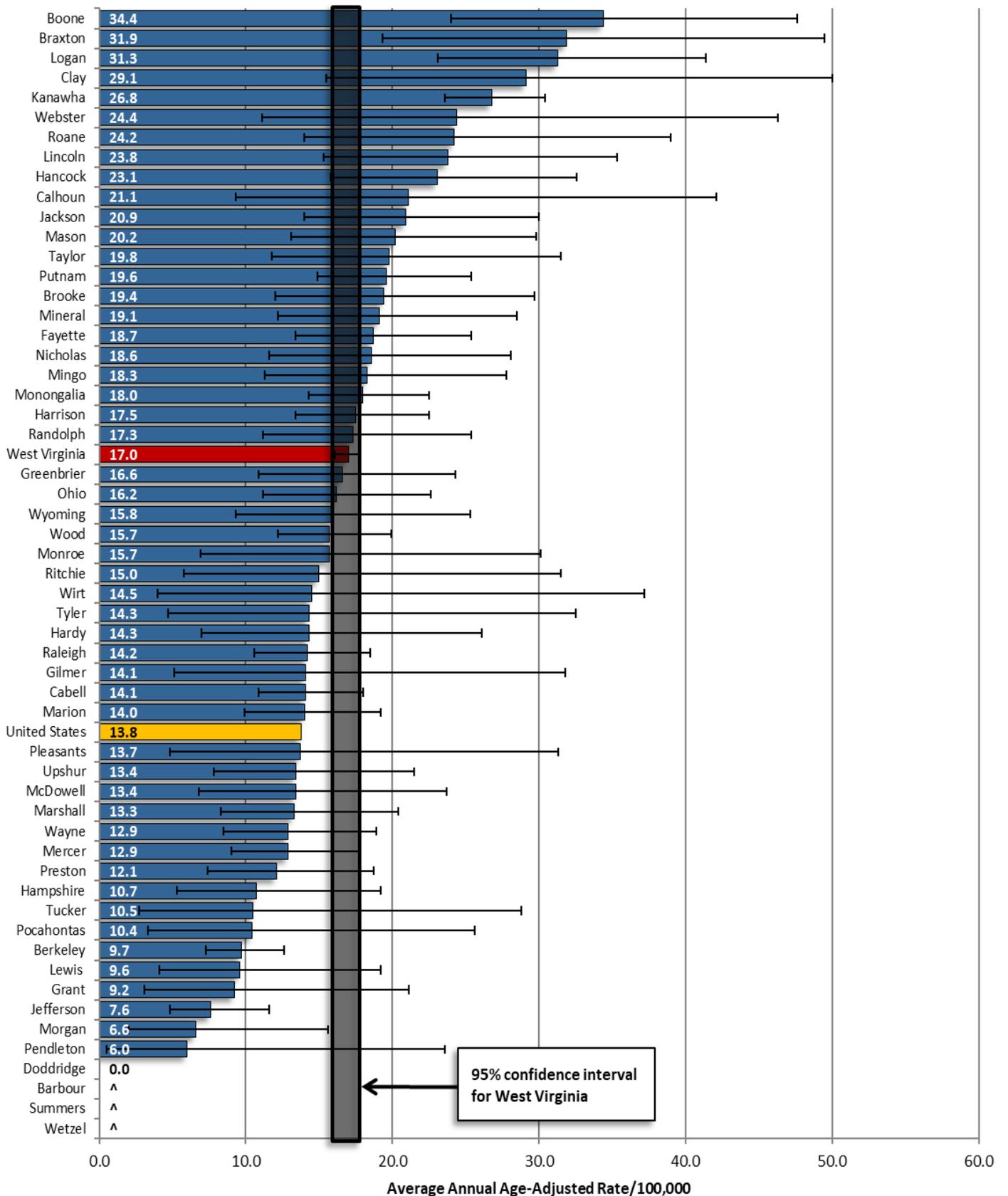
## Thyroid — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000) 95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	17.0	16.1	17.8	1,678
Barbour	^	^	^	^
Berkeley	9.7	7.3	12.6	57
Boone	34.4	24.0	47.6	39
Braxton	31.9	19.3	49.5	22
Brooke	19.4	12.0	29.7	25
Cabell	14.1	10.9	18.0	70
Calhoun	21.1	9.3	42.1	11
Clay	29.1	15.5	50.0	15
Doddridge	0.0	0.0		0
Fayette	18.7	13.4	25.4	45
Gilmer	14.1	5.1	31.8	6
Grant	9.2	3.1	21.1	6
Greenbrier	16.6	10.9	24.3	30
Hampshire	10.7	5.3	19.2	13
Hancock	23.1	15.8	32.6	37
Hardy	14.3	7.0	26.1	12
Harrison	17.5	13.4	22.5	68
Jackson	20.9	14.0	30.0	32
Jefferson	7.6	4.8	11.6	24
Kanawha	26.8	23.6	30.4	276
Lewis	9.6	4.1	19.2	9
Lincoln	23.8	15.3	35.3	27
Logan	31.3	23.1	41.4	55
Marion	14.0	9.9	19.2	41
Marshall	13.3	8.3	20.4	26
Mason	20.2	13.1	29.8	27
McDowell	13.4	6.8	23.7	13

^ Data Suppressed

County	Rate	Lower CI	Upper CI	Count
Mercer	12.9	9.0	17.7	43
Mineral	19.1	12.2	28.5	27
Mingo	18.3	11.3	27.8	24
Monongalia	18.0	14.3	22.5	86
Monroe	15.7	6.9	30.1	9
Morgan	6.6	2.0	15.6	5
Nicholas	18.6	11.6	28.1	26
Ohio	16.2	11.2	22.6	40
Pendleton	6.0	0.5	23.6	^
Pleasants	13.7	4.8	31.3	6
Pocahontas	10.4	3.3	25.6	6
Preston	12.1	7.4	18.7	22
Putnam	19.6	14.9	25.4	62
Raleigh	14.2	10.6	18.5	58
Randolph	17.3	11.2	25.4	29
Ritchie	15.0	5.8	31.5	7
Roane	24.2	14.0	39.0	20
Summers	^	^	^	^
Taylor	19.8	11.8	31.5	20
Tucker	10.5	2.7	28.8	4
Tyler	14.3	4.7	32.5	6
Upshur	13.4	7.8	21.5	19
Wayne	12.9	8.5	18.9	29
Webster	24.4	11.1	46.3	10
Wetzel	^	^	^	^
Wirt	14.5	4.0	37.2	5
Wood	15.7	12.2	19.9	75
Wyoming	15.8	9.3	25.3	21

## Thyroid - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



^ Data Suppressed

U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.

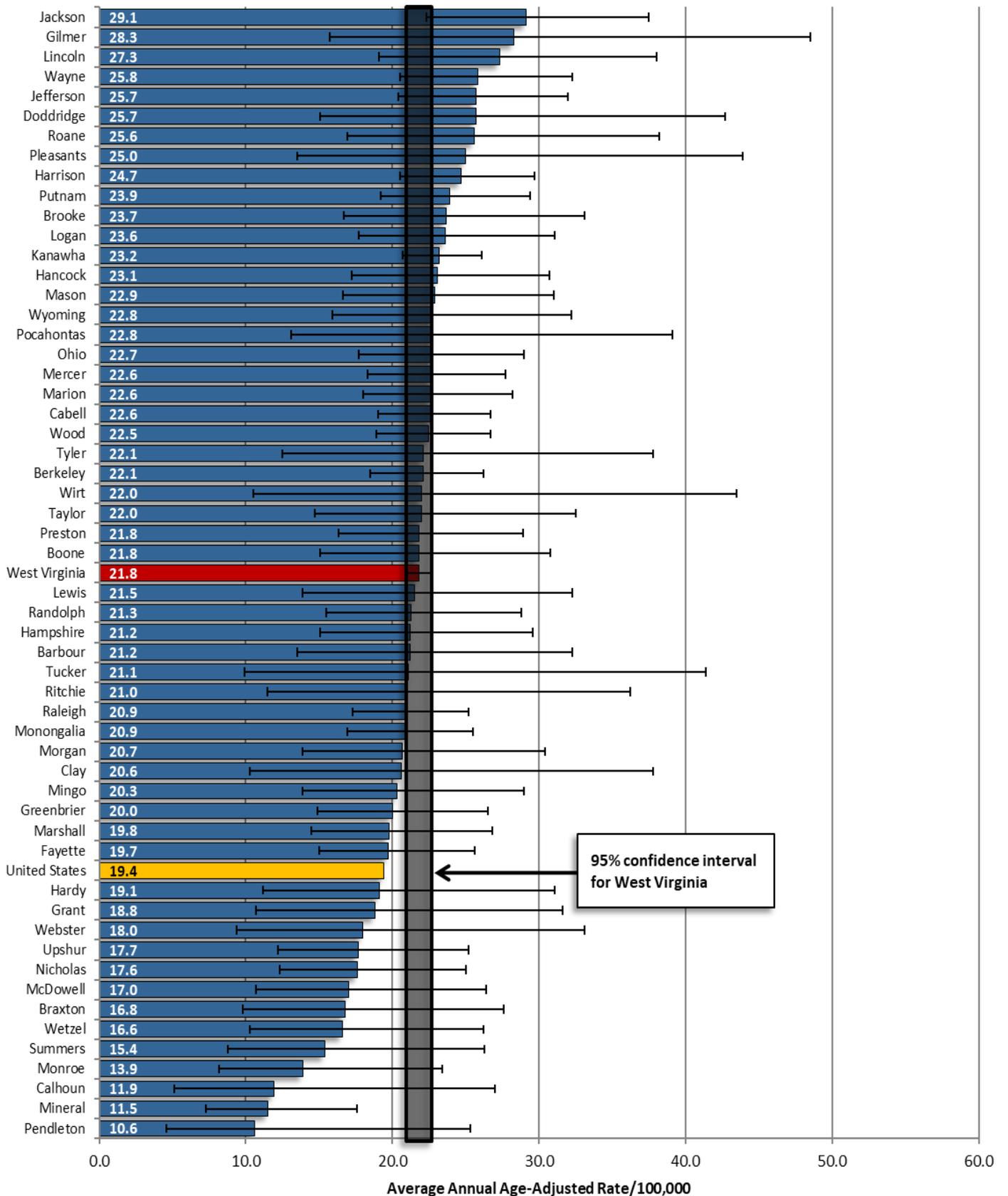
## Urinary Bladder — Average Annual Age-Adjusted Cancer Incidence Rates (per 100,000)

95% Confidence Intervals and 5-Year Counts by County, West Virginia, 2015-2019

County	Rate	Lower CI	Upper CI	Count
West Virginia	21.8	21.0	22.6	2,872
Barbour	21.2	13.5	32.3	25
Berkeley	22.1	18.5	26.2	144
Boone	21.8	15.1	30.8	37
Braxton	16.8	9.8	27.6	18
Brooke	23.7	16.7	33.1	41
Cabell	22.6	19.0	26.7	145
Calhoun	11.9	5.1	27.0	8
Clay	20.6	10.3	37.8	12
Doddridge	25.7	15.1	42.7	18
Fayette	19.7	15.0	25.6	63
Gilmer	28.3	15.7	48.5	15
Grant	18.8	10.7	31.6	18
Greenbrier	20.0	14.9	26.5	56
Hampshire	21.2	15.1	29.6	41
Hancock	23.1	17.2	30.7	54
Hardy	19.1	11.2	31.1	19
Harrison	24.7	20.5	29.7	123
Jackson	29.1	22.3	37.5	64
Jefferson	25.7	20.4	32.0	87
Kanawha	23.2	20.7	26.1	316
Lewis	21.5	13.9	32.3	26
Lincoln	27.3	19.1	38.0	39
Logan	23.6	17.7	31.1	57
Marion	22.6	18.0	28.2	87
Marshall	19.8	14.5	26.8	48
Mason	22.9	16.6	31.0	47
McDowell	17.0	10.7	26.4	25

County	Rate	Lower CI	Upper CI	Count
Mercer	22.6	18.3	27.7	102
Mineral	11.5	7.3	17.6	24
Mingo	20.3	13.9	29.0	34
Monongalia	20.9	16.9	25.5	102
Monroe	13.9	8.2	23.4	18
Morgan	20.7	13.9	30.4	31
Nicholas	17.6	12.3	25.0	36
Ohio	22.7	17.7	29.0	75
Pendleton	10.6	4.6	25.3	8
Pleasants	25.0	13.5	43.9	14
Pocahontas	22.8	13.1	39.1	17
Preston	21.8	16.3	28.9	54
Putnam	23.9	19.2	29.4	94
Raleigh	20.9	17.3	25.2	123
Randolph	21.3	15.5	28.8	47
Ritchie	21.0	11.5	36.2	16
Roane	25.6	16.9	38.2	29
Summers	15.4	8.8	26.3	17
Taylor	22.0	14.7	32.5	29
Tucker	21.1	9.9	41.4	11
Tyler	22.1	12.5	37.8	16
Upshur	17.7	12.2	25.2	34
Wayne	25.8	20.5	32.3	83
Webster	18.0	9.4	33.1	13
Wetzel	16.6	10.3	26.2	22
Wirt	22.0	10.5	43.5	10
Wood	22.5	18.9	26.7	142
Wyoming	22.8	15.9	32.2	38

## Urinary Bladder - Average Annual Age-Adjusted Cancer Incidence Rates and 95% Confidence Intervals by County, West Virginia, 2015-2019



95% confidence interval  
for West Virginia

U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.