Cancer
IN VIRGINIA
ANNUAL REPORT

VIRGINIA Cancer REGISTRY

Overview and
Selected Statistics

2018

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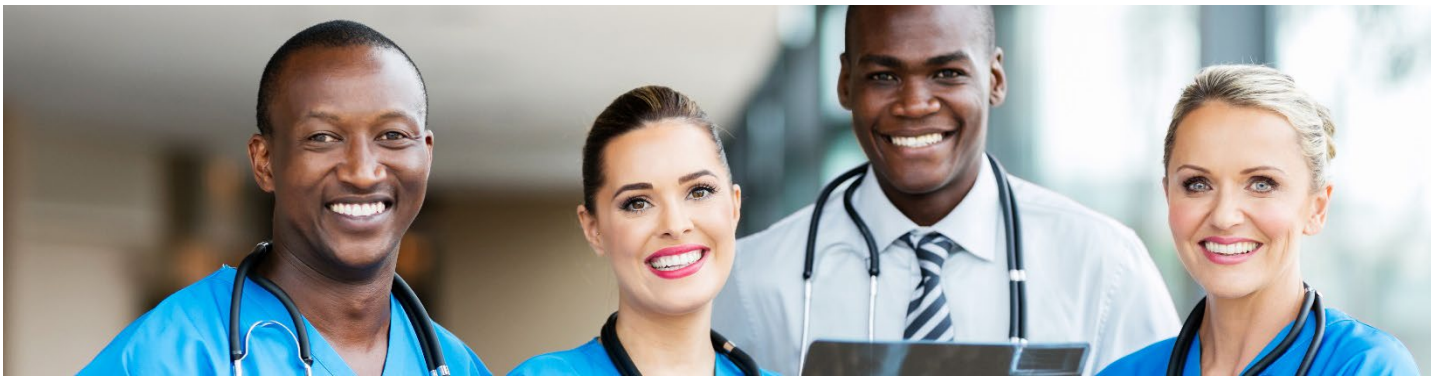


I. Introduction

The Virginia Cancer Registry (VCR) is a population-based cancer incidence registry responsible for the collection of demographic, diagnostic, and treatment information on all cancer patients diagnosed and/or treated at hospitals, laboratories, and other health care facilities in Virginia with reportable cancer. Population-based cancer registries collect information on cancers among the entire population for which they are responsible.

The mission of the VCR is to collect and provide complete, accurate, and timely statewide incidence data for determination of cancer rates and trends in the population. To fulfill this mission, the VCR depends on complete ascertainment of cases and use of the data. Statewide collection and dissemination of data on cancer by the Virginia Department of Health is mandated in the *Code of Virginia* and Virginia Department of Health disease reporting regulations. The state laws include Chapter 2 (§32.1-70 *et seq.)* of Title 32.1*(VCR Manual Appendix A)* According to these statutes, each hospital, clinic, and independent pathology laboratory in the Commonwealth is required to report all cases of cancer, which are diagnosed or treated at the hospital, clinic or laboratory. Physicians are required to report when they know the case has not been reported by a hospital, clinic or in-state laboratory. These cases are submitted in the format prescribed by the VCR. Regulations mandating reporting cancer cases by hospitals, clinics, laboratories, other health care facilities and health care practitioners appear Part VIII of the State Board of Health publication *Regulations for Disease Reporting and Control*. *(VCR Manual Appendix B)*

This document demonstrates the burden of cancer incidence and mortality in Virginia. The report covers the years 2011-2015 for both incidence and mortality statistics of the following cancers: cervix, colorectal, female breast, lung, melanoma of the skin, oral, ovarian, and prostate. The information includes an overview of incidence by sex, race, and stage at diagnosis, and of mortality by sex and race. Case counts, rates, and percentages appear throughout the report. Charts display incidence and mortality trends by year, and the accompanying text explains these trends in more detail. Each section has maps displaying incidence and mortality by health district areas.

The cancers represented in this report are some of the most common cancers. They were selected because they occur often or are targets for screening and control for prevention. A section on childhood cancer, thyroid cancer, and endometrial cancer was added to bring focus to emerging cancer burden and clarity of frequently requested information. For most cancers, large differences exist between White and Black rates and between female and male rates. Disparities and inequities highlight the need for targeted prevention and control strategies. National organizations along with government at all levels review and update screening guidelines for cancer as needed and incidence rates can be affected by this. The tables included rank Virginia and national cancer incidence and mortality by rate, which is the number of cases per 100,000 population. The rates are age-adjusted, which allows populations to be compared when age profiles are different. The tables rank cancers selected for this report against other common cancer types. The tables also rank gender-specific cancers separately.

The VCR seeks data-driven approaches from organizations and agencies working to prevent and reduce the cancer burden in Virginia. For more information about the VCR, visit: http://www.vdh.virginia.gov/virginia-cancer-registry/.

Table 1.1: Selected Cancer Sites Incidence Data for Virginia and U.S.

	Virginia Incidence (2011-2015)[1]								U.S. Incidence (2011-2015)[2]				
	Male			Female			All		Male		Female		All
Cancer Sites	Rate	Count	Rank	Rate	Count	Rank	Rate	Count	Rate	Rank	Rate	Rank	Rate
All Sites	449.2	93,768		398.2	96,803		417.9	190,571	483.0		409.9		439.2
Female Breast	-	-	-	127.9	31,088	16	-	-	-	-	126.0	16	-
Cervix Uteri	-	-	-	6.2	1,367	6	-	-	-	-	7.4	6	-
Ovary	-	-	-	10.8	2,628	9	-	-	-	-	11.6	10	-
Brain and Other Nervous System	6.8	1,396	3	5.3	1,236	4	6.0	2,632	7.5	3	5.4	4	6.4
Colon and Rectum	40.3	8,306	12	32.3	7,917	14	36.0	16,223	45.2	12	34.5	14	39.4
Hodgkin Lymphoma	2.6	537	1	2.3	480	1	2.4	1,017	2.9	1	2.2	1	2.5
Kidney and Renal Pelvis	20.1	4,297	10	10.3	2,506	8	14.8	6,803	21.7	9	10.9	8	15.9
Leukemia	12.5	2,459	6	7.8	1,870	7	9.8	4,329	17.6	8	10.8	7	13.8
Liver and Intrahepatic Bile Duct	10.3	2,311	5	3.6	918	2	6.7	3,229	13.6	5	4.7	2	8.8
Lung and Bronchus	69.9	14,143	13	50.6	12,545	15	58.9	26,688	63.8	13	47.8	15	54.6
Melanoma of the Skin	24.5	4,948	11	15.1	3,560	12	19.0	8,508	29.8	11	17.7	12	22.8
Myeloma	7.6	1,547	4	5.0	1,231	3	6.1	2,778	8.4	4	5.3	3	6.7
Non-Hodgkin Lymphoma	19.9	4,045	9	14.0	3,401	11	16.6	7,446	23.6	10	15.9	11	19.4
Oral Cavity and Pharynx	16.7	3,707	8	6.0	1,466	5	11.0	5,173	17.1	7	6.3	5	11.3
Pancreas	13.8	2,806	7	10.8	2,714	9	12.2	5,520	14.4	6	11.2	9	12.6
Thyroid	6.1	1,300	2	19.8	4,358	13	13.1	5,658	7.3	2	21.4	13	14.5
Prostate	102.8	23,084	14	-	-	-	-	-	112.6	14	-	-	-

Table 1.2: Selected Cancer Sites Mortality Data for Virginia and U.S.

	Virginia Mortality (2011-2015)[1]								U.S. Mortality (2011-2015)[2]				
	Male			Female			All		Male		Female		All
Cancer Sites	Rate	Deaths	Rank	Rate	Deaths	Rank	Rate	Deaths	Rate	Rank	Rate	Rank	Rate
All Sites	197.9	38,086		139.7	34,692		163.8	72,778	196.8		139.6		163.5
Female Breast	-	-		21.8	5,427	15	-	-	-	-	20.9	15	-
Cervix Uteri	-	-		1.8	428	5	-	-	-	-	2.3	5	-
Ovary	-	-		7.3	1,825	12	-	-	-	-	7.2	12	-
Brain and Other Nervous System	4.6	958	6	3.5	864	9	4.0	1,822	5.3	6	3.6	8	4.4
Colon and Rectum	16.7	3,248	12	11.8	2,938	14	14.0	6,186	17.3	12	12.2	14	14.5
Hodgkin Lymphoma	0.4	84	1	0.2	52	1	0.3	136	0.4	1	0.3	1	0.3
Kidney and Renal Pelvis	5.2	1,054	7	2.3	565	6	3.6	1,619	5.6	7	2.4	6	3.8
Leukemia	8.5	1,566	9	4.5	1,094	11	6.2	2,660	9.0	9	5.0	11	6.7
Liver and Intrahepatic Bile Duct	8.6	1,851	10	3.4	868	8	5.8	2,719	9.4	10	3.8	9	6.4
Lung and Bronchus	55.3	10,902	14	35.4	8,790	16	44.0	19,692	53.8	14	35.4	16	43.4
Melanoma of the Skin	4.1	787	4	1.6	397	4	2.7	1,184	3.9	3	1.6	4	2.6
Myeloma	4.5	846	5	2.8	687	7	3.5	1,533	4.2	5	2.7	7	3.3
Non-Hodgkin Lymphoma	7.3	1,348	8	4.4	1,079	10	5.6	2,427	7.4	8	4.5	10	5.7
Oral Cavity and Pharynx	3.7	777	3	1.3	316	3	2.4	1,093	3.9	3	1.3	3	2.5
Pancreas	12.9	2,522	11	9.5	2,385	13	11.0	4,907	12.6	11	9.5	13	10.9
Thyroid	0.5	91	2	0.5	117	2	0.5	208	0.5	2	0.5	2	0.5
Prostate	20.2	3,405	13	-	-		-	-	19.5	13	-	-	-

[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population

[2] Noone AM, Howlader N, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2015, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2015/, based on November 2017 SEER data submission, posted to the SEER web site, April 2018.

Table 1.3: All Sites Cancer Incidence Data by Health Districts, VA 2011-2015[1]

Districts are ranked from favorable (1) to unfavorable (35) for incidence.

	Incidence[3]		
Health District	**Rate (Upper CI, Lower CI)**	**Count**	**Rank**
Alexandria	351.7 (337.2, 366.7)	2,456	3
Alleghany	437.2 (425.2,449.4)	5,445	17
Arlington	370.5 (357.7,383.6)	3,501	7
Central Shenandoah	454.1 (444.1, 464.2)	8,302	24
Central Virginia	421.6 (411.4, 432)	6,789	14
Chesapeake	438.6 (426.4, 451.1)	5,174	18
Chesterfield	450.1 (440.6, 459.7)	9,239	23
Chickahominy	474.1 (459.9, 488.6)	4,533	31
Crater	494.1 (479.6, 508.8)	4,609	35
Cumberland Plateau	328 (314,8, 341,6)	2,502	2
Eastern Shore	479.9 (455.7, 505.2)	1,645	34
Fairfax	354.2 (349.2, 359.3)	20,719	4
Hampton	479 (463.2, 495.2)	3,618	33
Henrico	445.5 (435.5, 455.7)	7,881	19
Lenowisco	304.1 (290, 318.7)	1,847	1
Lord Fairfax	414.1 (403.4, 425.1)	5,900	13
Loudoun	372.1 (361.6, 382.9)	5,352	8
Mount Rogers	365 (354.6, 375.6)	5,047	5
New River	379.1 (366.7, 391.9)	3,654	9
Norfolk	475.3 (461.9, 489)	5,062	32
Peninsula	447.6 (438.2, 457.3)	8,797	21
Piedmont	461.7 (445.2, 478.7)	3,131	25
Pittsylvania-Danville	411.3 (396.3, 426.7)	3,087	11
Portsmouth	467.5 (448.9, 486.7)	2,476	30
Prince William	367.4 (358.4, 376.7)	7,273	6
Rappahannock	464 (453.4, 474.9)	7,699	27
Rappahannock-Rapidan	412.4 (400, 425.2)	4,372	12
Richmond	465.9 (452.6, 479.5)	4,984	28
Roanoke	449.2 (431.7, 467.3)	2,619	22
Southside	428.2 (411.3, 445.6)	2,692	15
Thomas Jefferson	433.2 (422.3, 444.4)	6,248	16
Three Rivers	466.3 (453, 480)	2,692	29
Virginia Beach	463.4 (454.4, 472.6)	10,467	26
West Piedmont	400.4 (387.8, 413.4)	4,163	10
Western Tidewater	446.1 (432, 460.6)	3,965	20
Virginia	**417.9 (416, 19.8)**	**190,571**	

[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population

Table 1.4: All Sites Cancer Mortality Data by Health Districts, VA 2011-2015[1]

Districts are ranked from favorable (1) to unfavorable (35) for mortality.

	Mortality[4]		
Health District	**Rate (Upper CI, Lower CI)**	**Count**	**Rank**
Alexandria	130.8 (121.6, 140.4)	836	4
Alleghany	163.3 (155.6, 171.3)	1,745	7
Arlington	129.3 (121.4, 137.4)	1,110	3
Central Shenandoah	164.1 (158.3, 170.1)	3,111	10
Central Virginia	170.8 (164.5, 177.3)	2,853	17
Chesapeake	177.4 (169.4, 185.7)	1,946	18
Chesterfield	164 (158.2, 170)	3,165	9
Chickahominy	168.9 (160.4, 177.7)	1,565	16
Crater	201.5 (192.3, 211.1)	1,855	32
Cumberland Plateau	201.3 (191.2, 211.9)	1,560	31
Eastern Shore	213.7 (198.5, 229.9)	771	35
Fairfax	121.2 (118.2, 124.3)	6,500	1
Hampton	188.8 (178.9, 199.2)	1,393	27
Henrico	166.8 (160.7, 173.1)	2,931	14
Lenowisco	213.6 (202, 225.8)	1,300	34
Lord Fairfax	180.9 (173.9, 188.2)	2,588	21
Loudoun	125.8 (119.2, 132.7)	1,490	2
Mount Rogers	184.4 (177.3, 191.7)	2,651	25
New River	165 (156.9, 173.5)	1,586	11
Norfolk	189.6 (181.2, 198.4)	1,979	29
Peninsula	165.6 (159.9, 171.5)	3,249	12
Piedmont	189.3 (179,200)	1,308	28
Pittsylvania-Danville	184.3 (174.6, 194.4)	1,429	24
Portsmouth	210.5 (198.1, 223.4)	1,124	33
Prince William	163.7 (157.1, 170.5)	2,400	5
Rappahannock	163.7 (157.1, 170.5)	2,496	8
Rappahannock-Rapidan	168 (160.1, 176.2)	1,756	15
Richmond	183.2 (174.8, 191.9)	1,928	23
Roanoke	192.3 (181, 204.2)	1,134	30
Southside	186.8 (176.1, 198)	1,220	26
Thomas Jefferson	160.7 (154.1, 167.5)	2,317	6
Three Rivers	182.3 (172.1, 188.8)	2,093	22
Virginia Beach	165.7 (154.1, 167.5)	3,590	13
West Piedmont	180.3 (172.1, 188.8)	1,927	20
Western Tidewater	178.7 (169.7, 188.1)	1,538	19
Virginia	**163.8 (162.5, 165)**	**72,778**	

[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population

Table 1.5: Selected Cancers (including In situ) Incidence Percentages by Diagnosis Stage and Gender, VA 2011-2015[1]

	Male				Female				All			
	IS	Local	Regional	Distant	IS	Local	Regional	Distant	IS	Local	Regional	Distant
Oral	2%	26%	50%	17%	3%	40%	36%	13%	2%	30%	46%	16%
Colorectal	5%	35%	32%	21%	4%	36%	32%	20%	4%	36%	32%	20%
Liver	0%	38%	28%	18%	0%	39%	22%	16%	0%	38%	26%	18%
Pancreas	1%	10%	27%	49%	1%	11%	27%	43%	1%	10%	27%	46%
Lung	0%	18%	22%	52%	0%	22%	22%	46%	0%	20%	22%	49%
Melanoma	40%	46%	5%	4%	40%	46%	4%	3%	40%	46%	4%	3%
Breast	15%	44%	31%	8%	22%	50%	21%	4%	-	-	-	-
Cervix	-	-	-	-	0%	40%	37%	13%	-	-	-	-
Ovary	-	-	-	-	0%	13%	21%	55%	-	-	-	-
Prostate	0%	78%	10%	5%	-	-	-	-	-	-	-	-
Bladder	50%	33%	7%	4%	49%	30%	9%	6%	50%	33%	8%	5%
Kidney	2%	66%	14%	14%	2%	68%	13%	11%	2%	67%	14%	13%
Brain and CNS	0%	80%	10%	2%	0%	72%	13%	2%	0%	76%	12%	2%
Thyroid	0%	56%	34%	6%	0%	70%	25%	2%	0%	67%	27%	3%
Hodgkin Lymphoma	0%	13%	35%	45%	0%	16%	45%	34%	0%	14%	40%	40%
Non-Hodgkin Lymphoma	0%	24%	15%	50%	0%	26%	16%	46%	0%	25%	15%	49%
Myeloma	0%	6%	0%	89%	0%	6%	0%	85%	0%	6%	0%	87%
Leukemia	0%	0%	0%	94%	0%	0%	0%	92%	0%	0%	0%	93%
All Sites	8%	42%	17%	24%	12%	41%	20%	19%	10%	41%	19%	21%

The information provided in Virginia Cancer Registry Annual Report is useful and informative in several ways. The text highlights important facts about cancer incidence and mortality among different groups.

- Tables provide rates and counts of newly diagnosed cases and deaths. Tables also show the percent of cases diagnosed at the localized stage.
- Charts display incidence and mortality rate trends over time. Each chart shows if cancer incidence and mortality are declining, increasing, or holding steady.
- The maps, one for incidence and one for mortality, allow readers to compare rates and their differences among Virginia Cities and Counties, as well as Virginia State is compared to US.
- Appendix A is a reference map of Virginia Health Districts. Appendix B lists cities and counties in Virginia Health Districts. Appendix C defines terms used in the report.

[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population

II. Data and Methods

Data Sources

Data were obtained from several sources. Within the Virginia Department of Health, the Virginia Cancer Registry provided incidence data and mortality data. Virginia cancer cost and health care utilization data come from the Virginia Health Information Hospital Discharge Patient-Level Dataset (http://www.vhi.org). Publicly available BRFSS data, compiled by the Centers for Disease Control and Prevention (http://www.cdc.gov/brfss), were used for risk factors and screening comparisons in Virginia and with the United States as a whole.

Statistics

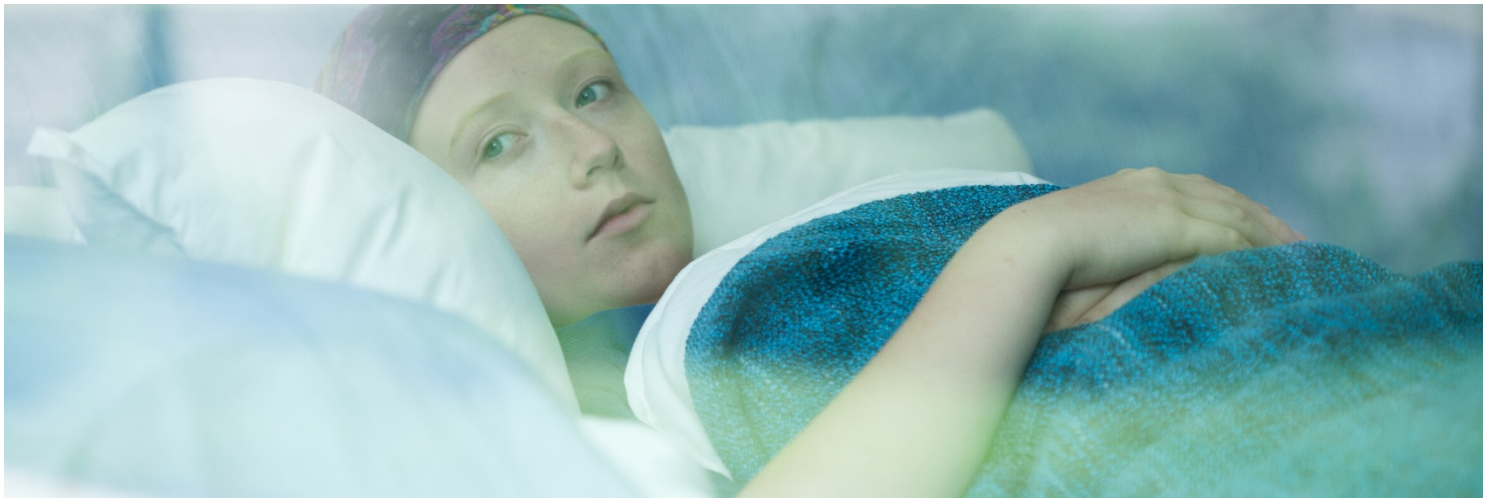
Counts show the number of newly diagnosed (incident) cases and the number of deaths (mortality) for the designated area and period. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population to allow comparisons across populations. Incidence and mortality trends are presented in trend charts, which provide rates year-by-year. Ninety-five percent confidence intervals (95% CIs) surround the point estimate, which is the rate, and represent the reliability of the point estimate. A 95% confidence interval defines the range of values that include the point estimate 95% of the time.

Sub-populations

Stratified analyses are performed to identify disparities or inequities. Geography (health district), gender, race/ethnicity (African-American vs. White), and socioeconomic status (education and income) are the strata employed. Small numbers limit the ability to look at data by county and by additional racial/ethnic groups. African-American and White race categories have sufficient numbers of cases or deaths to allow for stratification, but other races and ethnicities do not. Total columns labeled “State of Virginia” or “Virginia” includes males and females, and all racial/ethnic categories including “Other” and “Unknown.”

Mapping

Appendix A is a reference map displaying Virginia’s 35 health districts by name. Appendix B lists the names of the counties and cities that compose the 35 health districts. The maps display data from the most recent five years available, which is 2011-2015 for incidence and mortality from CDC https://gis.cdc.gov/Cancer/USCS/DataViz.html.



III. All Sites Cancer

All Sites Cancer Overview

- Cancer was the second leading cause of death (after heart disease) in the United States[1], but was first in Virginia in 2013.[1]

- Risk factors for cancer include smoking, eating an unhealthy diet, and physical inactivity. In addition, cancer diagnoses are more common in adults aged 50 and older.[1] Ways to prevent cancer include eating healthy, staying active, maintaining a healthy weight, staying away from tobacco, following sun-safety tips, and receiving cancer screening tests through a physician.[1] Treatment will differ based on cancer type, and stage. Often, treatment may involve more than one specified treatment.[2] Common treatments for cancer include surgery, chemotherapy, radiation therapy, targeted therapy, and immunotherapy.[2]

- Nationwide, men have about a 39.7 percent chance and women about a 37.7 percent chance of developing cancer during their lifetimes.[3]

- In Virginia, there were 22,135 inpatient hospitalizations in 2017 for cancer at a total cost of over $1.8 billion. The average length of stay was 7.2 days and the average charge per stay was $95,909.[4]

- The percentage of people diagnosed with cancer who will not have died from the cancer at 5 years post diagnosis is estimated by the 5-year relative survival. In the United States, the 5-year survival is 66.9%.[5]

- In Virginia, the top comorbidities conditions for all sites cancer are hypertension, hyperlipidemia, and diabetes mellitus.[6]

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[1] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/09/18).

[2] Types of Cancer Treatment. National Cancer Institute. Bethesda, MD, https://www.cancer.gov/about-cancer/treatment/types (Accessed 07/05/2018)

[3] American Cancer Society. Cancer Basics. Lifetime Risk of Developing or Dying From Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/cancer-basics/lifetime-probability-of-developing-or-dying-from-cancer.html (accessed 07/05/18)

[4] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2017.

[5] Noone AM, Howlader N, Krapcho M, Miller D, Brest A, Yu M, Ruhl J, Tatalovich Z, Mariotto A, Lewis DR, Chen HS, Feuer EJ, Cronin KA (eds). SEER Cancer Statistics Review, 1975-2015, National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/csr/1975_2015/ (Accessed 07/08/18)

[6] Virginia Cancer Registry. Based on combined 2010-2014 data.

Chart 3.1: All Sites Cancer Incidence[1] and Mortality Rates by Race and Sex, VA 2011-2015

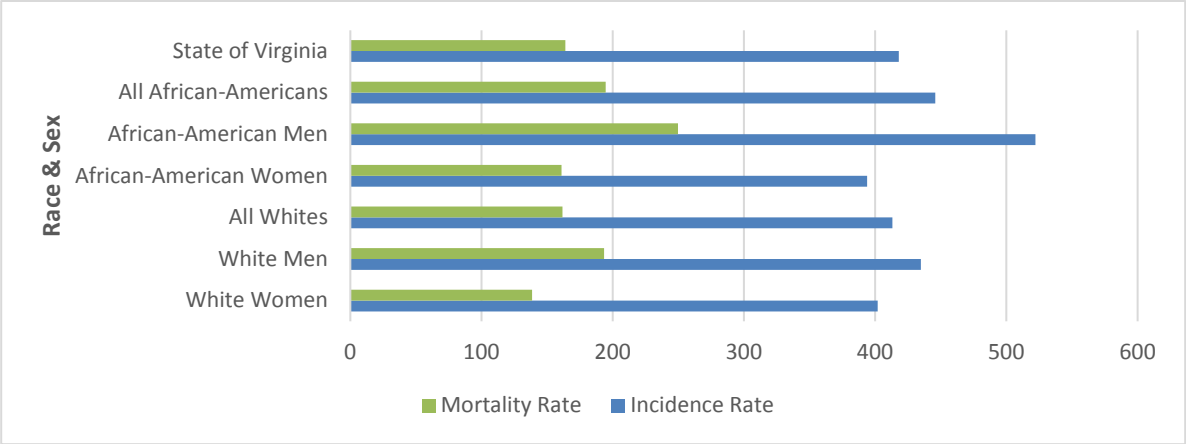
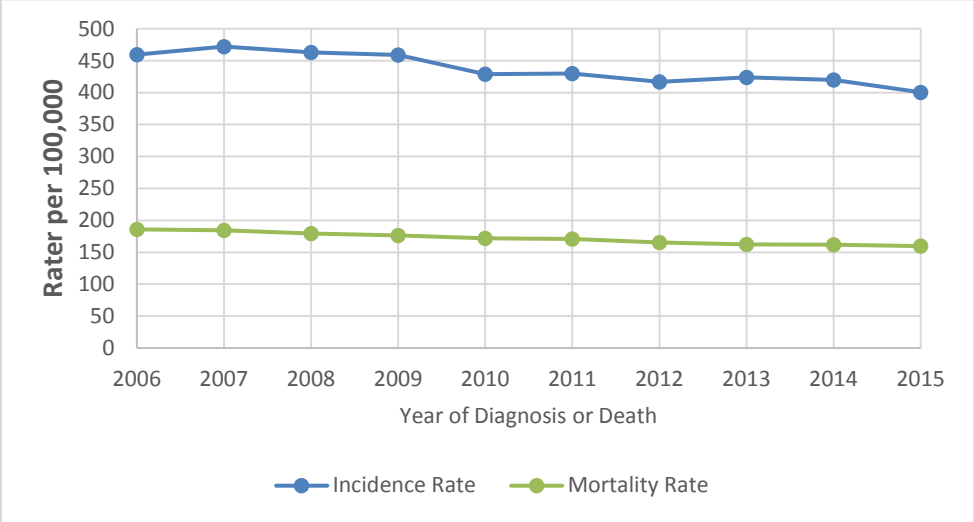


Chart 3.2: All Sites Cancer Incidence and Mortality Rates by Year, VA 2006-2015

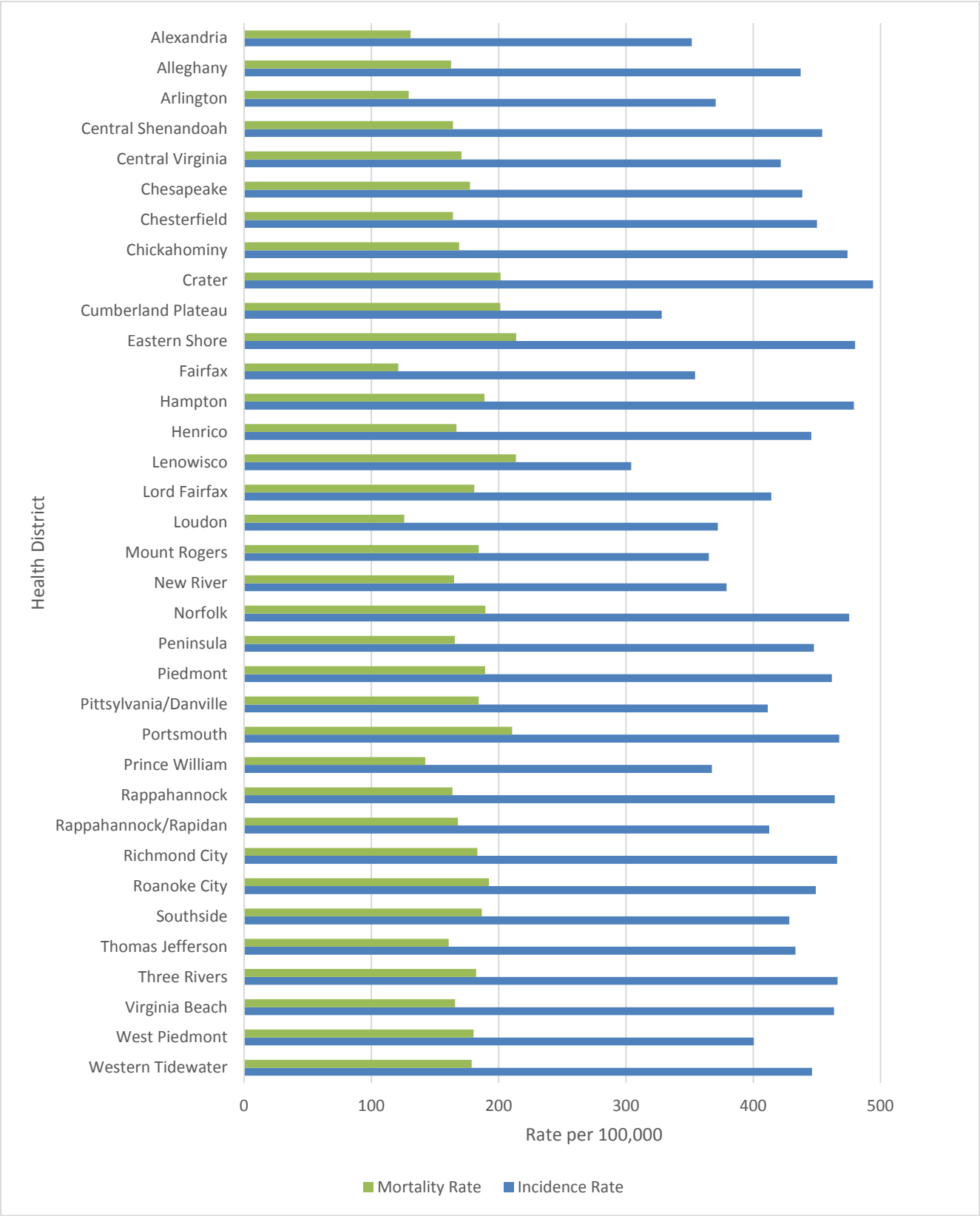


Source: Incidence: Virginia Cancer Registry. Mortality: Division of Health Statistics. Rates are age-adjusted to the US Census standard population.

Year	Incidence Rate	Mortality Rate
2006	459.4	185.8
2007	472.1	184.1
2008	463.0	179.4
2009	458.7	176.4
2010	429.0	171.7
2011	430.0	170.8
2012	416.7	165.2
2013	423.9	162.3
2014	419.9	161.6
2015	400.5	159.6

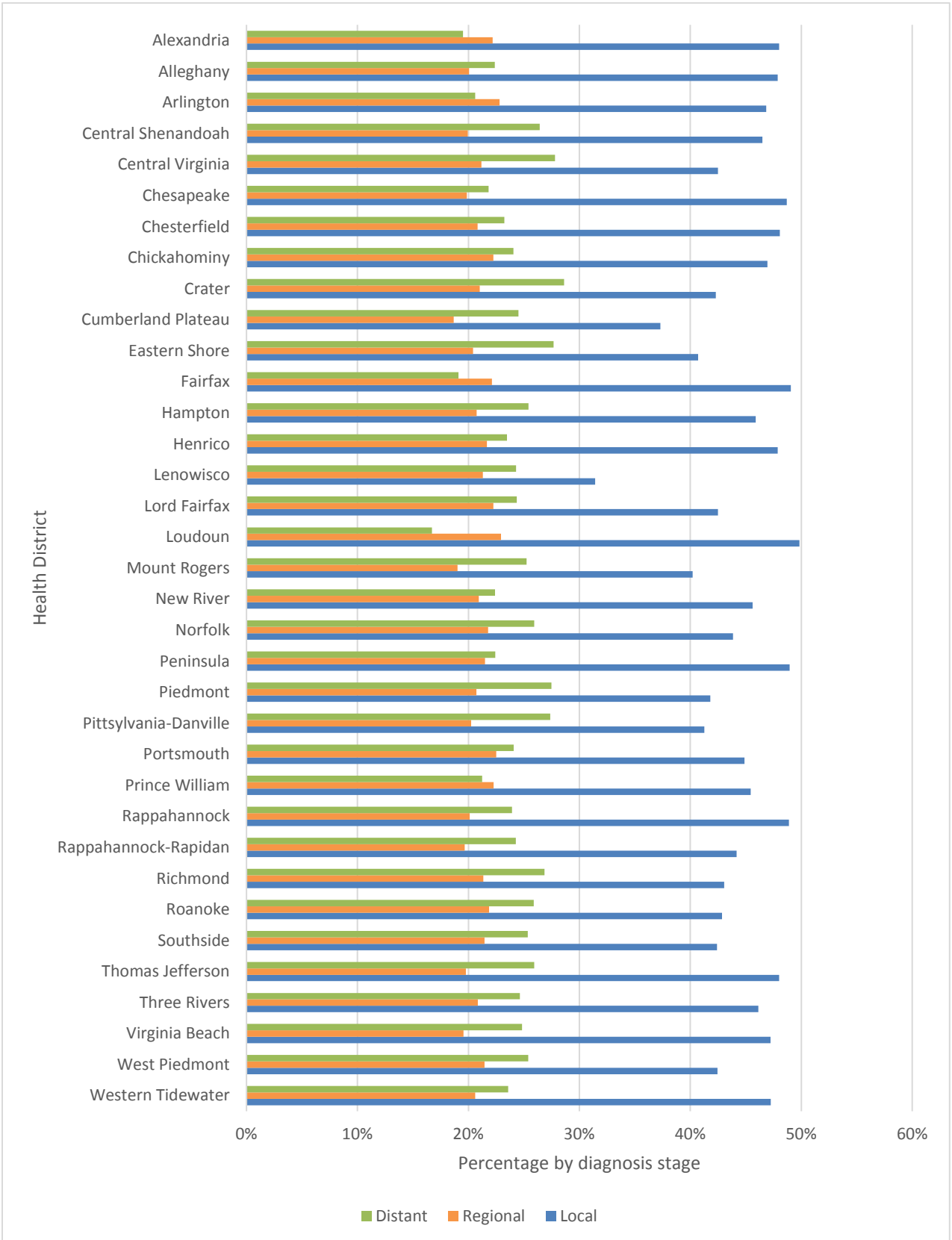
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

Chart 3.3: All Sites Cancer Incidence[1] and Mortality Rates (per 100,000) by Health District, VA 2011-2015



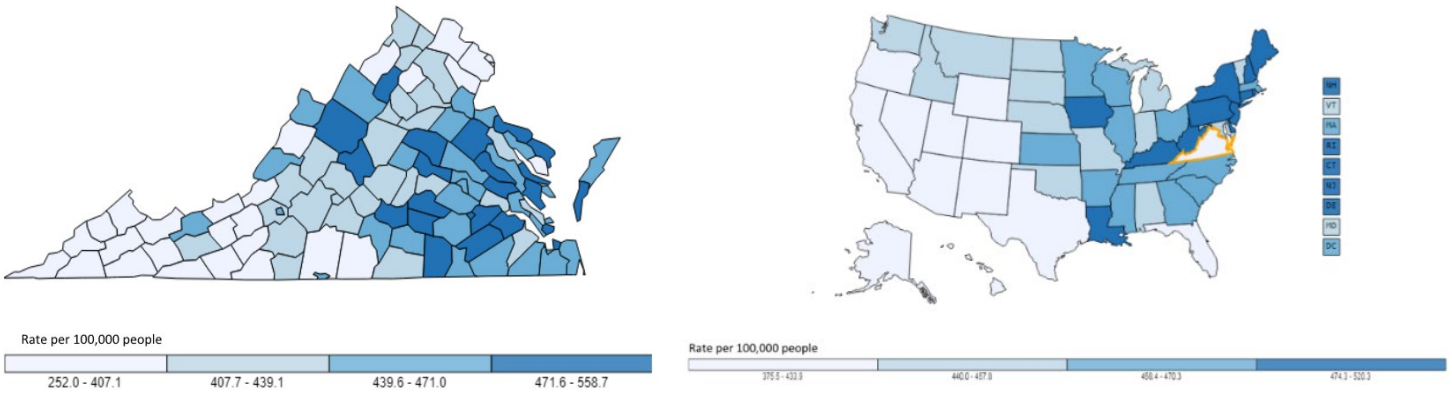
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

Chart 3.4: All Sites Cancer Incidence Percentage by Diagnosis Stage[1], VA 2011-2015

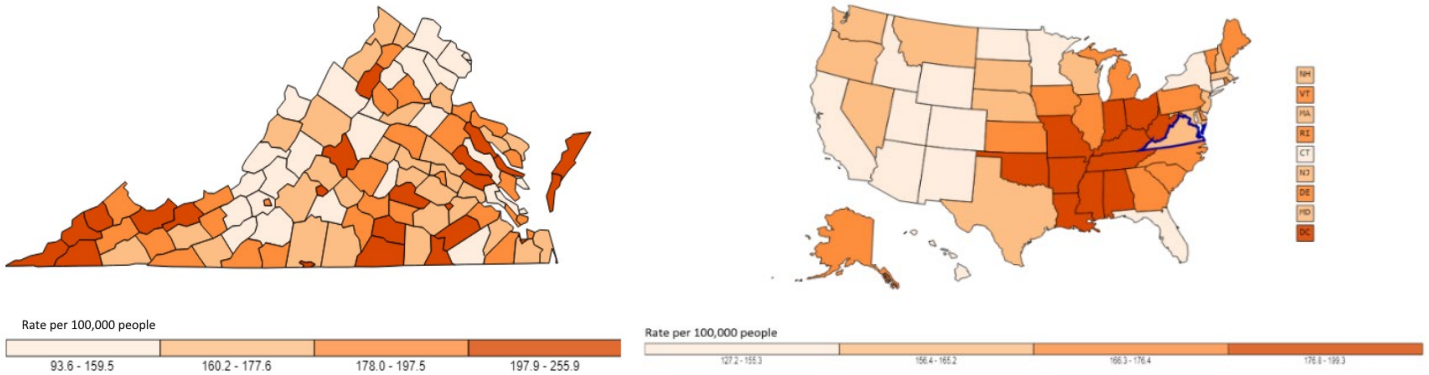


[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population; local stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

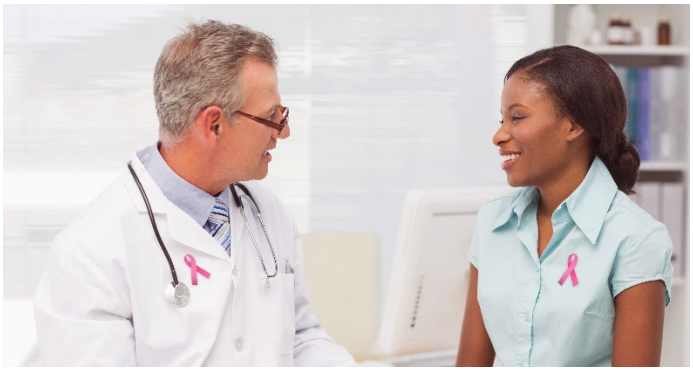
Map 3.1: All Sites Cancer Incidence Rates by City and County Compared to US, VA 2011-2015[1]



Map 3.2: All Sites Cancer Mortality Rate by City and County Compared to US, Virginia 2011-2015[1]



[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.



IV. Breast Cancer (Female)

Breast Cancer (Female) Overview

- Breast cancer is the most frequently diagnosed cancer in women. Breast cancer ranks second as a cause of cancer death in women (after lung cancer) in the United States. One in eight women will be diagnosed with breast cancer during their lifetimes.[1]

- The most common sign of breast cancer is a lump or mass in the breast. Symptoms include thickening, swelling, tenderness, redness, irritation, or nipple abnormalities of the breast.[2] Risk factors include old age, obesity, postmenopausal hormone use, physical inactivity, never having children or having children after the age of 30, and family history.[2] Routine breast cancer screening can help find breast cancer early when it is easier to treat successfully. Treatment for breast cancer includes surgery, radiation, chemotherapy, or a combination of treatments.[2]

- Breast cancer has a five-year relative survival rate of 98.7 percent if diagnosed at its earliest (localized) stage, when it is most curable.[3] From 2011-2015, local stage diagnoses accounted for 64.2 percent of female breast cancers in Virginia.[4]

- In Virginia, there were 874 inpatient hospitalizations in 2017 for female breast cancer; the cost exceeded $70 million. The average length of stay was 3.1 days and the average charge per stay was $80,184.[5]

- According to the 2016 Behavioral Risk Factor Surveillance System (BRFSS) survey data, 75.9 percent of Virginia women 40 years and older reported having had a mammogram in the previous two years (U.S. average, 72.3%).[6] Education and income status affected mammography screening rates. Rates were 66.2% among Virginia women who had not completed high school but 81.5% among college graduates; and 63.1% for Virginia women whose annual income was $15,000 or less but 79.9% among those whose income was $50,000 and above.[6]

- In Virginia, the top comorbidity conditions for breast cancer are hypertension, esophageal reflux, and diabetes mellitus.[7]

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[1] American Cancer Society. How Common is Breast Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/breast-cancer/about/how-common-is-breast-cancer.htmll (accessed 07/05/18)

[2] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/09/18).

[3] Seer Cancer Stat Facts: Female Breast Cancer. National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/statfacts/html/breast.html (accessed 08/05/18)

[4] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population; local stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

[5] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2017.

[6] Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2016.

[7] Virginia Cancer Registry. Based on combined 2010-2014 data.

- The Virginia Department of Health's Every Woman's Life (EWL) program provides free breast and cervical cancer screening and diagnostics to low-income, uninsured Virginia women. Women who are diagnosed with breast or cervical pre-cancer or cancer through EWL may be able to receive treatment services through Medicaid. To find more information about EWL eligibility and to locate a local provider, please visit www.vdh.virginia.gov/every-womans-life/.

Chart 4.1: Female Breast Cancer Incidence and Mortality[1] Rates (per 100,000) by Race, VA 2011-2015

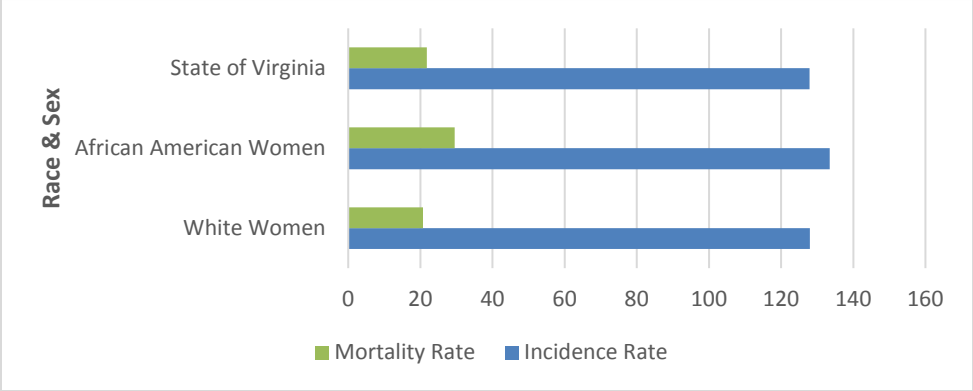
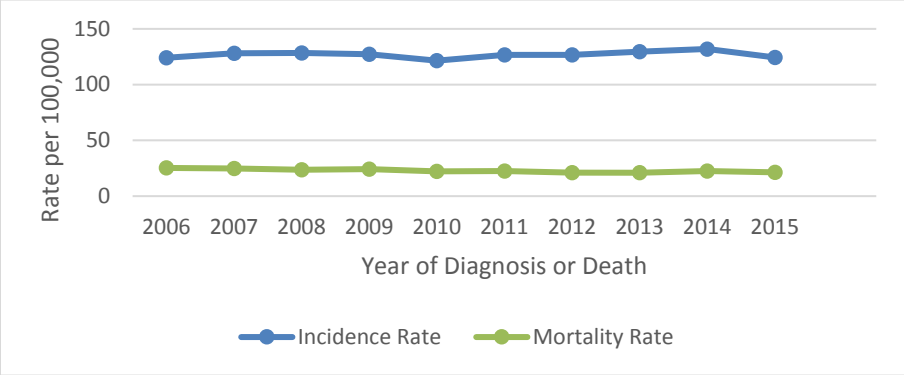


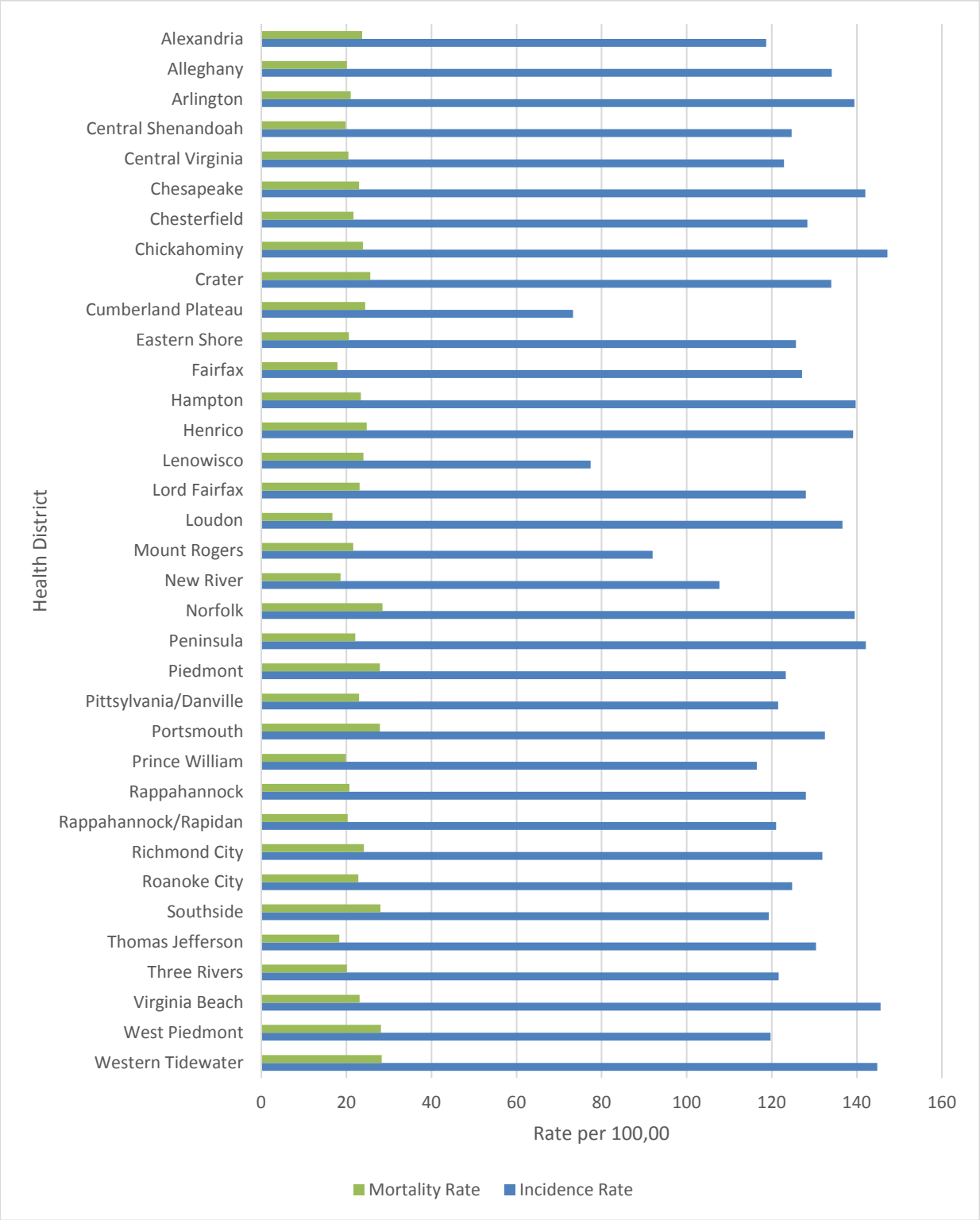
Chart 4.2: Female Breast Cancer Incidence and Mortality Rates (per 100,000) by Year, VA 2006-2015



Year	Incidence Rate	Mortality Rate
2006	124.0	25.3
2007	128.2	24.8
2008	128.3	23.8
2009	127.3	24.2
2010	121.5	22.2
2011	126.6	22.6
2012	126.8	21.2
2013	129.5	21.0
2014	132.0	22.6
2015	124.5	21.3

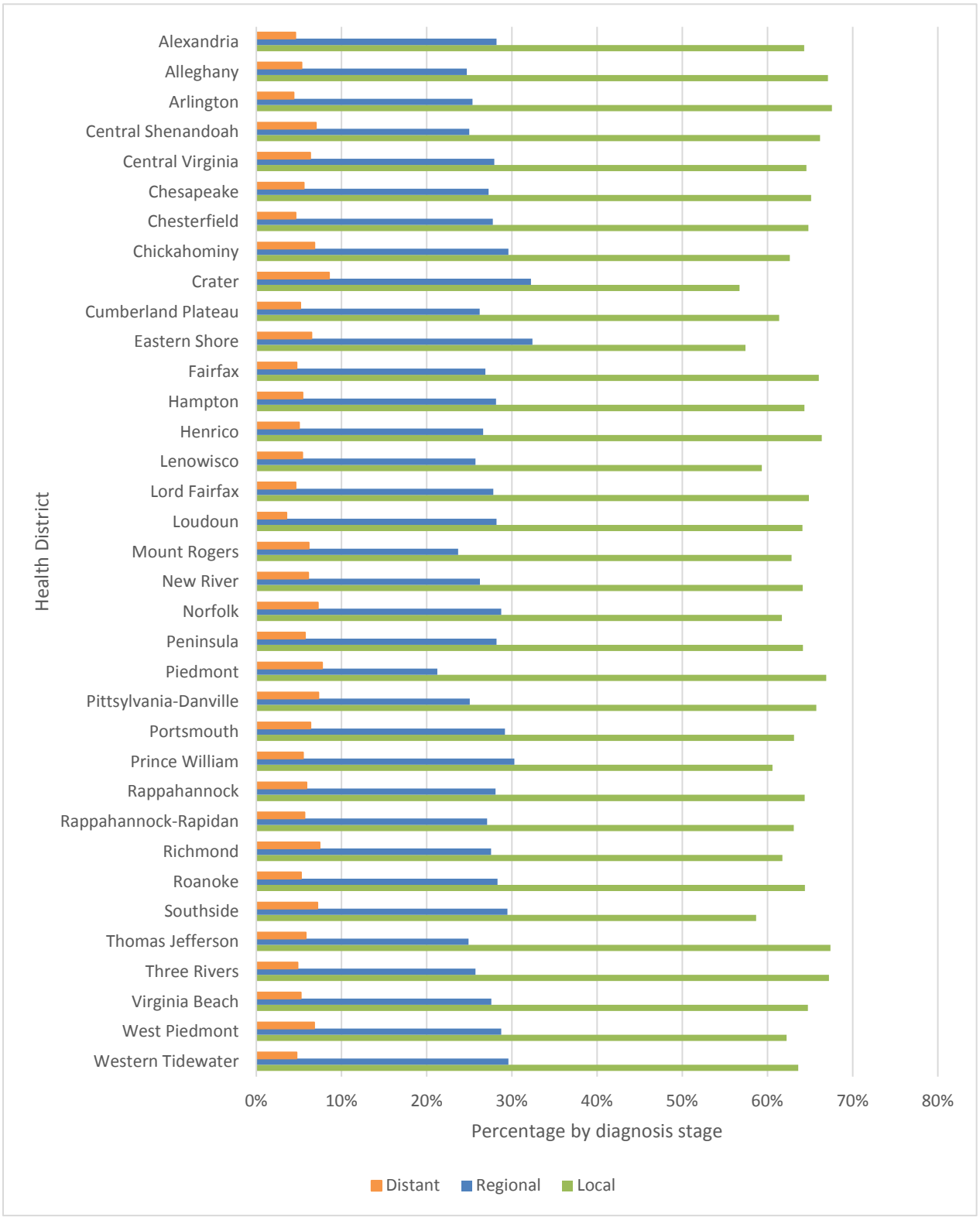
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population.

Chart 4.3: Female Breast Cancer Incidence and Mortality[1] Rates by Health District, VA 2011-2015



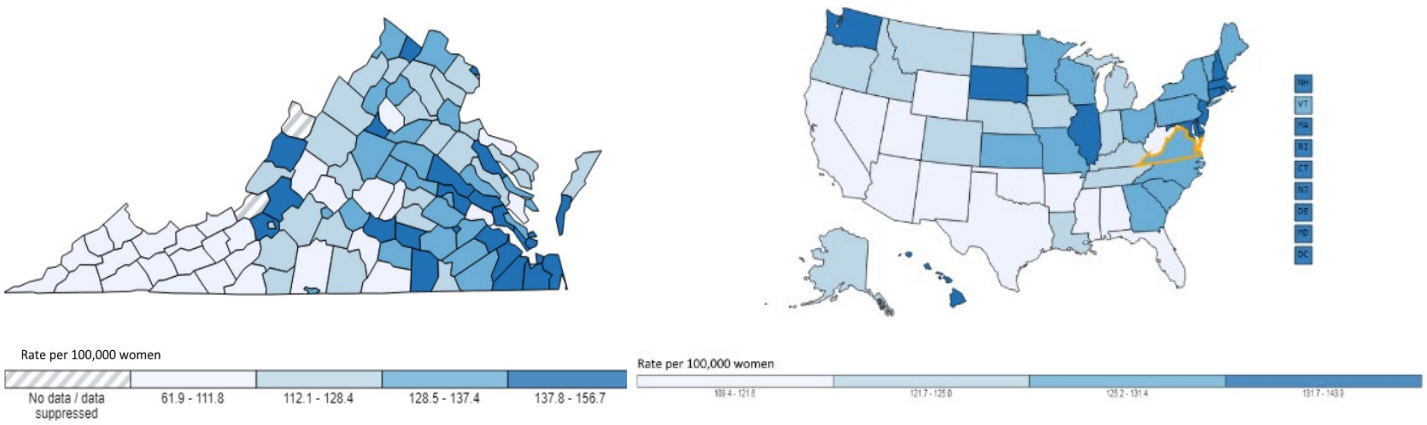
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population.

Chart 4.4: Female Breast Cancer Incidence Percentage by Diagnosis Stage[1], VA 2011-2015

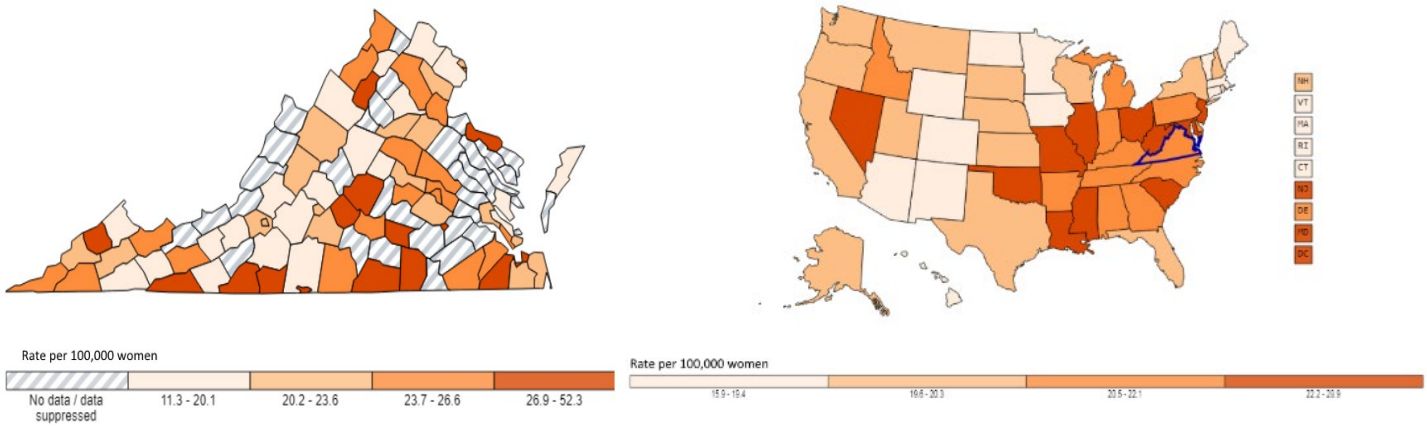


[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

Map 4.1: Female Breast Cancer Incidence Rates by City and County Compared to US, VA 2011-2015[1]



Map 4.2: Female Breast Cancer Mortality Rates by City and County Compared to US, VA 2011-2015[1]



[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

V. Cervical Cancer

Cervical Cancer Overview

- Cervical cancer is not among the top ten cancers diagnosed among women in the United States.[1] Cervical cancer incidence and mortality have fallen substantially over the last several decades due to Papanicolaou test (Pap test) screening. Cervical cancer is also notable because most cases can be prevented through vaccination.[1]

- Signs and symptoms for cervical cancer include abnormal vaginal bleeding, unusual discharge, and pain during sex. [2] Risk factors include HPV infection, smoking, weakened immune system, long-term use of oral contraceptives, intrauterine device use, and family history.[2] Preventive measures for cervical cancer include the human papillomavirus (HPV) vaccine, HPV testing, condom use, and not smoking.[2] Treatment for cervical cancer includes surgery, radiation therapy, chemotherapy, targeted therapy, and immunotherapy.[2]

- Cervical cancer has a five-year relative survival rate of 91.7 percent if diagnosed in its earliest (localized) stage, when it is most curable.[3] From 2011-2015 in Virginia, 39.9 percent of cervical cancers were diagnosed at the localized stage.[4]

- In Virginia, there were 102 inpatient hospitalizations in 2017 for cervical cancer, at a total cost of over $6,988,387. The average length of stay was 4.7 days and the average charge per stay was $68,514.[5]

- According to 2016 BRFSS survey data, 81.6 percent of Virginia women aged 21-65 years reported having had a Pap test in the previous three years (U.S. average, 79.7%).[6]
- Pap test screening rates were lower among women who were less educated (70.5% for less than high school versus 89.6% for college graduate) and had a lower household income (66.7% for $15,000 or less versus 86.9% for $50,000 and above).[7]

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[1] American Cancer Society. Key Statistics for Cervical Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/cervical-cancer/about/key-statistics.html (accessed 07/05/18)

[2] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/09/18).

[3] Seer Cancer Stat Facts: Female Cervical Cancer. National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/statfacts/html/cervix.html (accessed 08/05/18)

[4] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population; local stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

[5] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2017.

[6] Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2016.

[7] Virginia Cancer Registry. Based on combined 2010-2014 data.

Chart 5.1: Cervical Cancer Incidence[1] and Mortality Rates by Race, VA 2011-2015

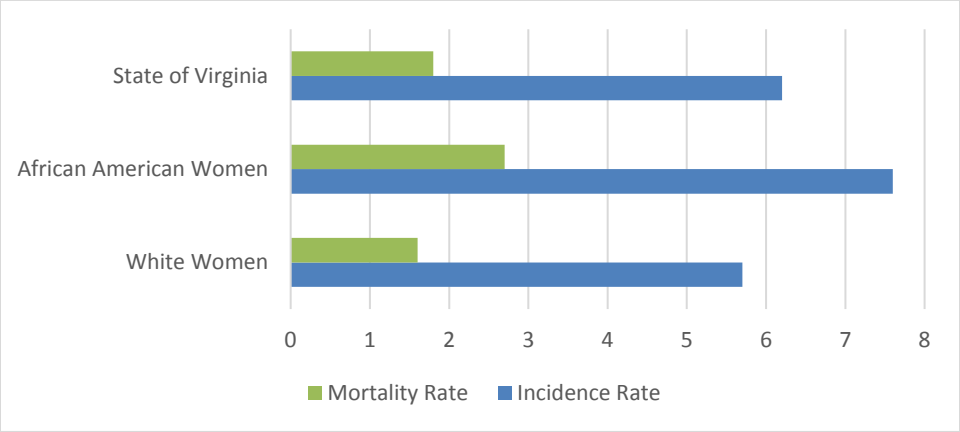
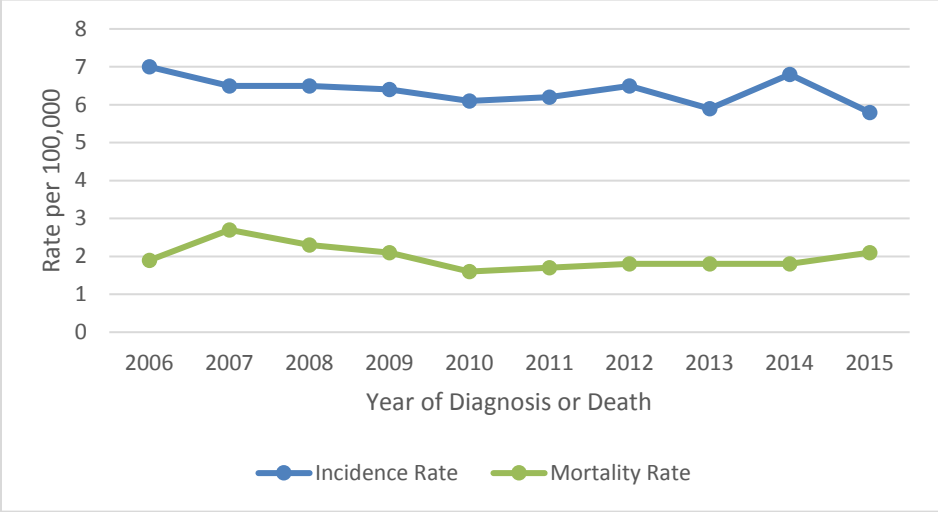


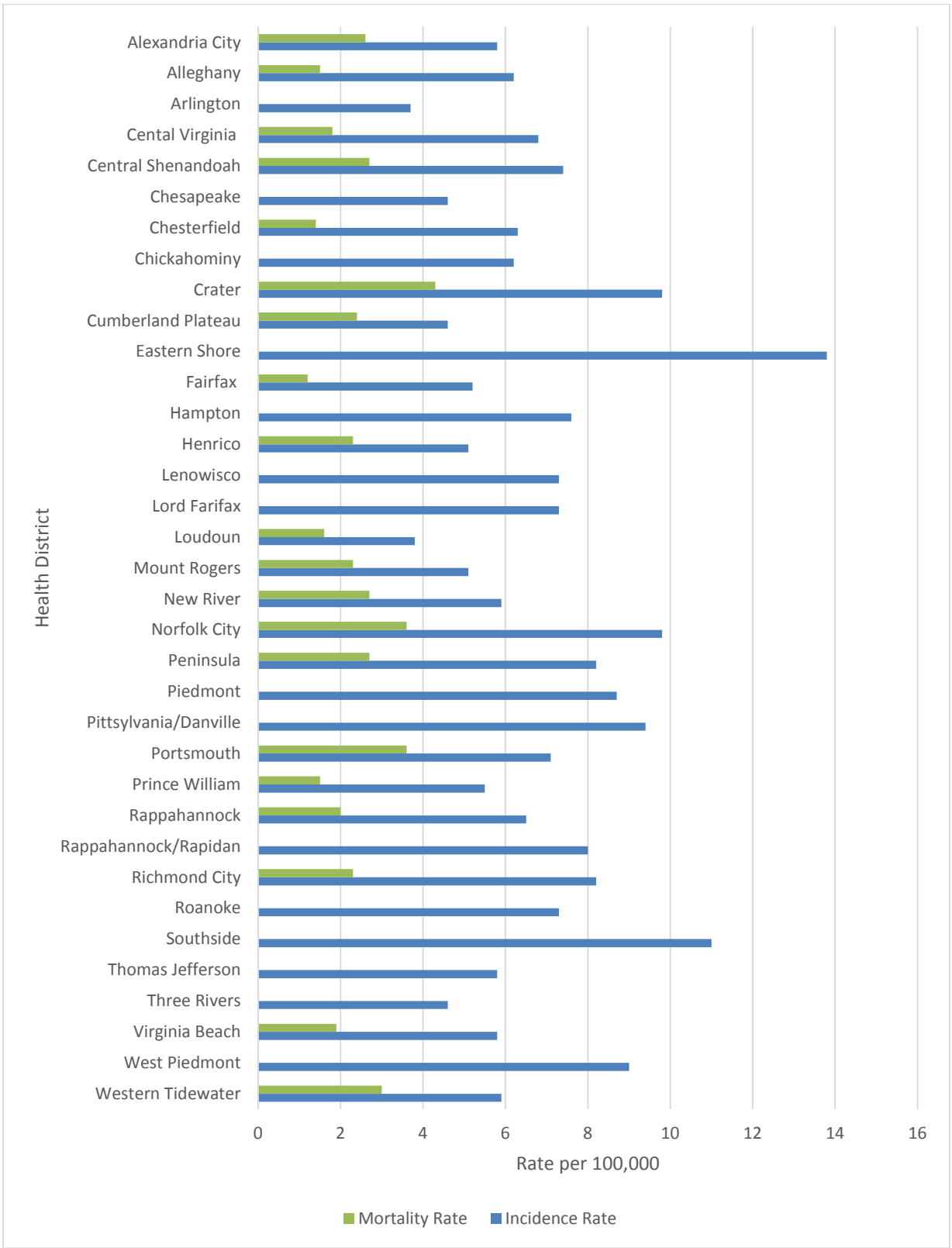
Chart 5.2: Cervical Cancer Incidence and Mortality Rates by Year, VA 2006-2015



Year	Incidence Rate	Mortality Rate
2006	7.0	1.9
2007	6.5	2.7
2008	6.5	2.3
2009	6.4	2.1
2010	6.1	1.6
2011	6.2	1.7
2012	6.5	1.8
2013	5.9	1.8
2014	6.8	1.8
2015	5.8	2.1

[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

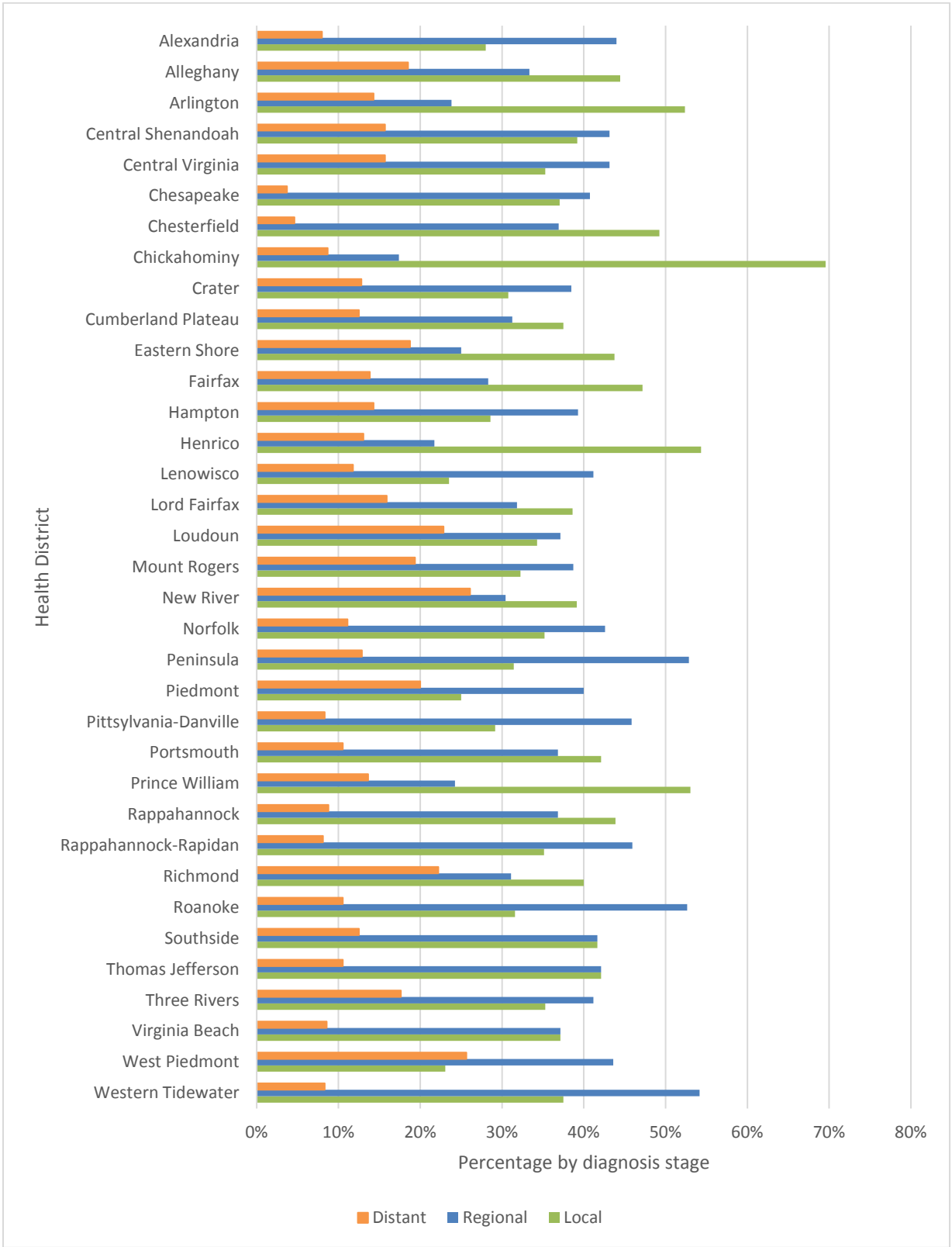
Chart 5.3: Cervical Cancer Incidence[1] and Mortality Rates by Health District, VA 2011-2015



*Statistic not displayed due to fewer than 16 cases

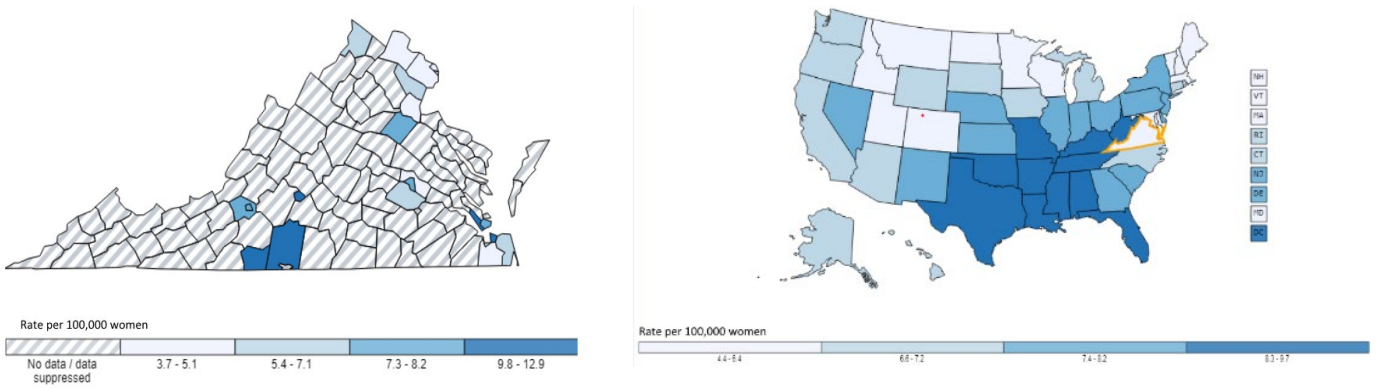
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

Chart 5.4: Cervical Cancer Incidence Percentage by Diagnosis Stage[1] and Health District, VA 2011-2015



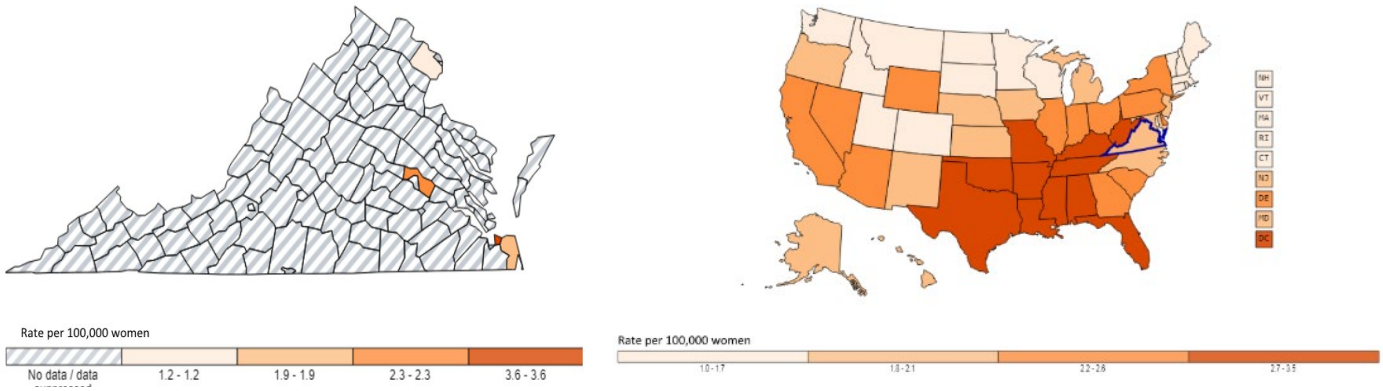
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

Map 5.1: Cervical Cancer Incidence Rates by City and County Compared to US, VA 2011-2015[1]



*Data suppressed: 16 or less is too small to calculate a reliable rate.

Map 5.2: Cervical Cancer Mortality Rates by City and County Compared to US, VA 2011-2015[1]



*Data suppressed: 16 or less is too small to calculate a reliable rate

[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

VI. Colorectal Cancer

Colorectal Cancer Overview

- Colorectal cancer is the third most commonly diagnosed cancer (excluding skin cancers) and the third leading cause of cancer death among men and women in the United States.[1] Almost one in twenty-two men and one in twenty-four women will be diagnosed with colorectal cancer during their lifetimes.[1] National colorectal cancer incidence and mortality rates have fallen over the past several decades.[1]

- Signs and symptoms for colorectal cancer include rectal bleeding, blood in the stool, change in bowel habits, abdominal cramping or pain, decreased appetite, and weight loss.[2] Risk factors include obesity, physical inactivity, smoking, high consumption of red or processed meat, low consumption of fruits and vegetables and fiber. Other factors include family history and chronic inflammatory bowel disease.[2] Preventive measures for colorectal cancer include screening starting at the age of 50.[2] Treatment for colorectal cancer involves surgery, chemotherapy, radiation, immunotherapy, or a combination of treatments.[2]

- Colorectal cancer has a five-year relative survival rate of 89.8 percent if diagnosed in its earliest (localized) stage, when it is most curable.[3] From 2011-2015 in Virginia, 37.2 percent of colorectal cancers diagnosed were at the localized stage.[4]

- In Virginia, there were 2,857 inpatient hospitalizations in 2017 for colorectal cancer, at a total cost of over $223 million. The average length of stay was 6.6 days and the average charge per stay was $78,184.[5]

- According to the 2016 BRFSS survey data, 70.3 percent of Virginia adults aged 50-75 have fully met the USPSTF recommendation.[6] The percent of who have fully met the USPSTF recommendation was lower for the less educated (51.1% for less than high school versus 79.1% for college graduates) and those with a lower household income (51.1% for $15,000 and less and 76.0% for 76.0% and above).[6]
- In Virginia, the top comorbidity conditions for colorectal cancer are hypertension, diabetes mellitus, and hyperlipidemia.[7]

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[1] American Cancer Society. Key Statistics for Colorectal Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/colon-rectal-cancer/about/key-statistics.html (accessed 07/05/18)

[2] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/09/18).

[3] SEER Cancer Statistics Factsheet: Colorectal Cancer. National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/statfacts/html/colorect.html (accessed 08/09/2018).

[4] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population; local stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

[5] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2017.

[6] Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2016.

[7] Virginia Cancer Registry. Based on combined 2010-2014 data.

Chart 6.1: Colorectal Cancer Incidence[1] and Mortality Rates by Race and Sex, VA 2011-2015

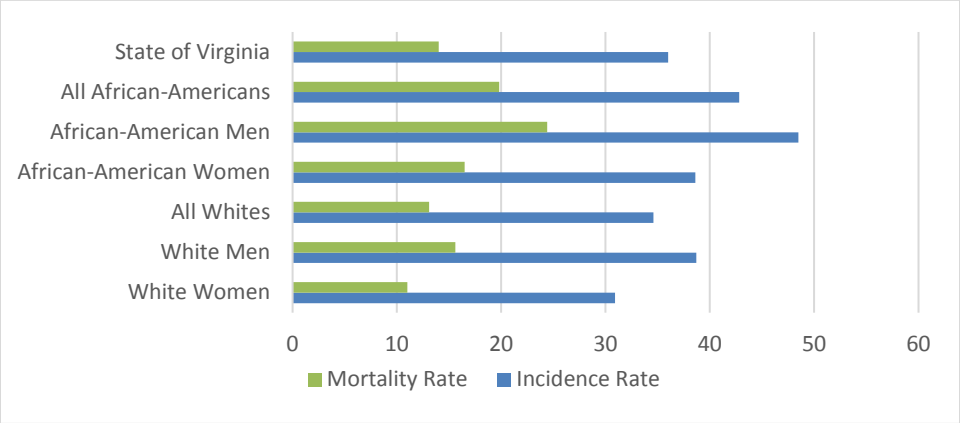
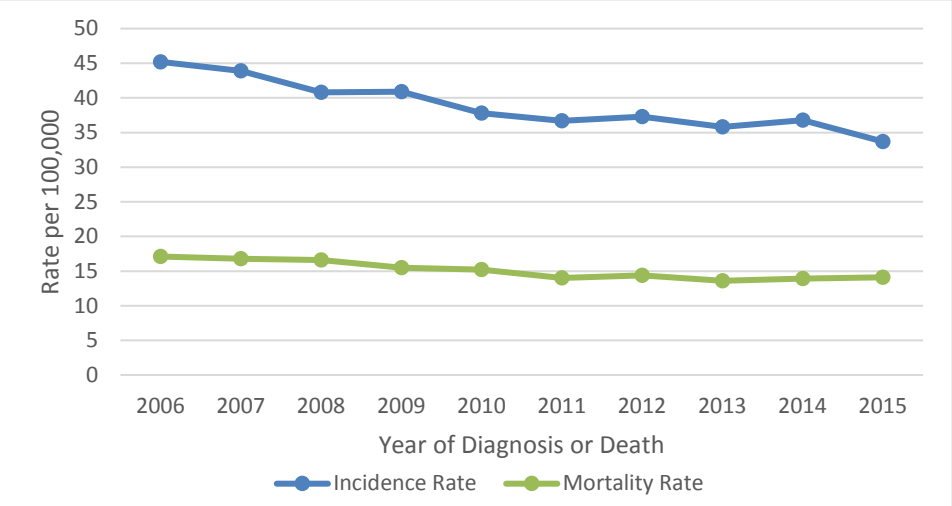


Chart 6.2: Colorectal Cancer Incidence and Mortality Rates by Year, VA 2006-2015

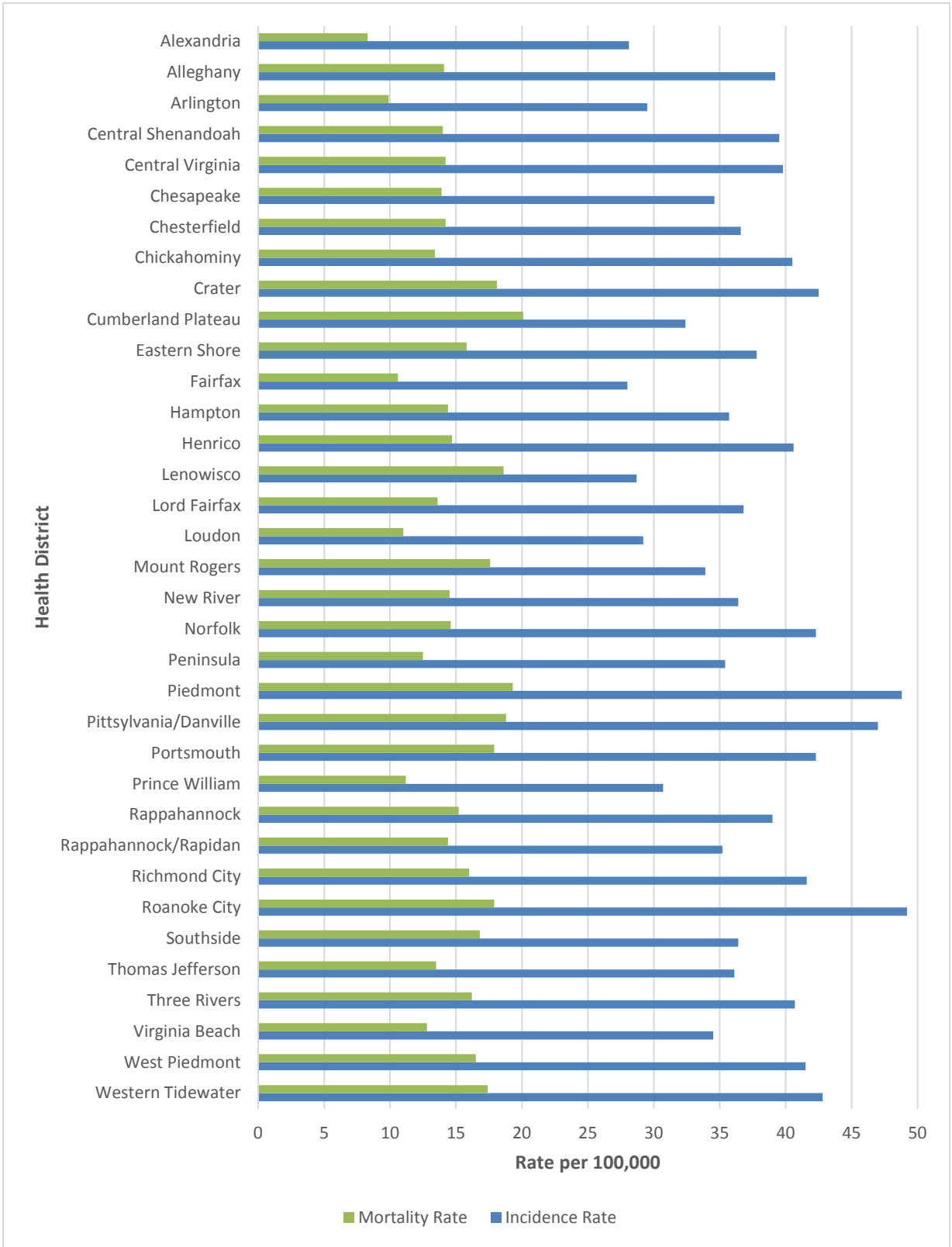


Source: Incidence: Virginia Cancer Registry. Mortality: Division of Health Statistics. Rates are age-adjusted to the US Census standard population

Year	Incidence Rate	Mortality Rate
2006	45.2	17.1
2007	43.9	16.8
2008	40.8	16.6
2009	40.9	15.5
2010	37.8	15.2
2011	36.7	14.0
2012	37.3	14.4
2013	35.8	13.6
2014	36.8	13.9
2015	33.7	14.1

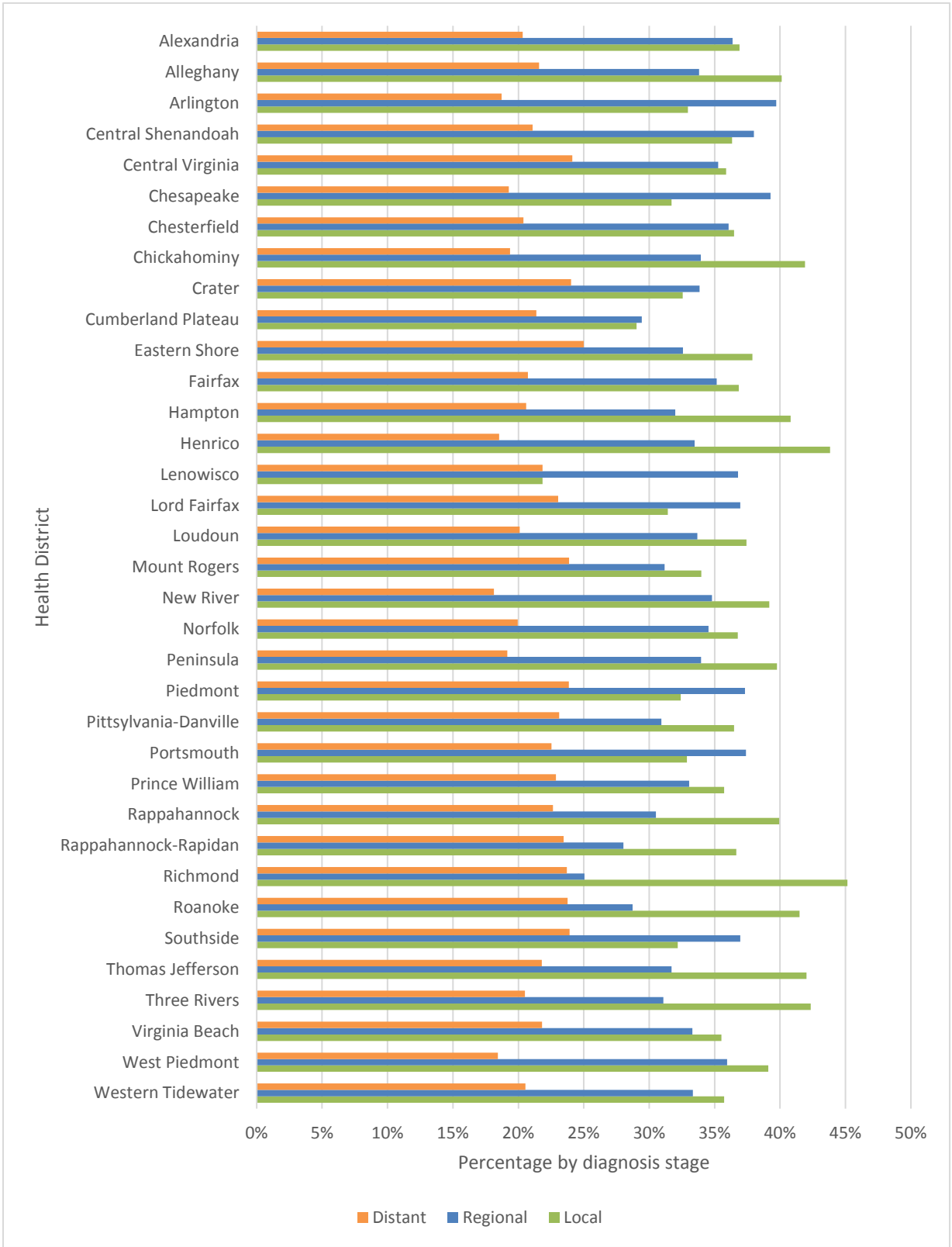
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

Chart 6.3: Colorectal Cancer Incidence and Mortality[1] Rates by Health District, VA 2011-2015



[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population.

Chart 6.4: Colorectal Cancer Incidence Percentage by Diagnosis Stage[1] and Health District, VA 2011-2015

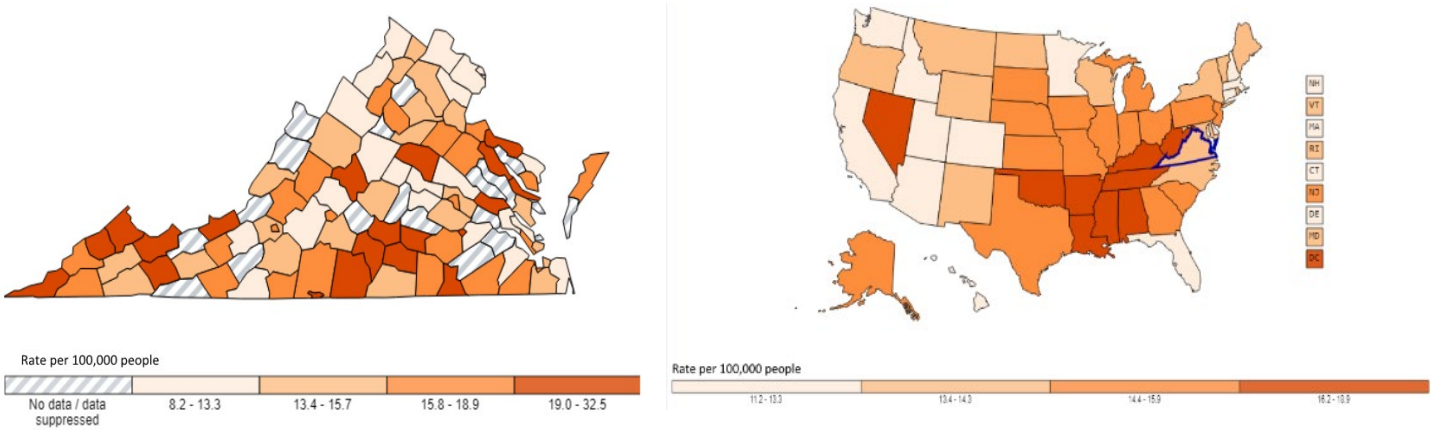


[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

Map 6.1: Colorectal Cancer Incidence Rates by City and County Compared to US, VA 2011-2015[1]

*Data suppressed: 16 or less is too small to calculate a reliable rate

Map 6.2: Colorectal Cancer Mortality Rates by City and County Compared to US, VA 2011-2015[1]



*Data suppressed: 16 or less is too small to calculate a reliable rate

[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

VII. Lung Cancer

Lung Cancer Overview

- Lung cancer is the second most commonly diagnosed cancer (excluding non-melanoma skin cancer) and is the leading cause of cancer death among both men and women in the United States.[1] Close to 6.2 percent of men and women will be diagnosed with lung cancer during their lifetimes.[2]
- Signs and symptoms of lung cancer usually occur once the cancer is advanced. These signs and symptoms include persistent cough, sputum with blood, chest pain, and voice change, shortness of breath, and recurrent pneumonia or bronchitis.[3] Risk factors include smoking, exposure to radon gas, exposure to secondhand smoke, and air pollution.[3] For those at high risk, annual lung cancer screening with a low-dose CAT scan before symptoms start helps lower the risk of dying from lung cancer.[4] Treatment for lung cancer includes surgery, chemotherapy, radiation, targeted drugs, or immunotherapy. The type of treatment depends on the stage and molecular characteristics of the cancer.[3]
- Nationally, lung cancer has a five-year relative survival rate of 56.3 percent if diagnosed in its earliest (localized) stage.[2] In Virginia, only 19.7 percent of lung cancers were diagnosed at the localized stage between 2011 and 2015.[5]
- In Virginia, there were 2,606 inpatient hospitalizations in 2017 for lung cancer, at a total cost of about $174 million. The average length of stay was 5.9 days and the average charge per stay was $66,823.[6]
- According to 2016 BRFSS survey data, 15.3 percent of adults in Virginia were current smokers (U.S. average, 17.0%). Smoking is a significant contributor to developing lung cancer.[7] Prevalence of current smoking was higher among those who were less educated (25.4% for less than high school versus 6.4% for college graduates) and lower income (26.1% among those earning $15,000 or less versus 10.4% for $50,000 and above).[6]
- In Virginia, the top comorbidity conditions for lung cancer are hypertension, chronic airway obstruction, and hyperlipidemia.[8]

[1] American Cancer Society. Key Statistics for Lung Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/non-small-cell-lung-cancer/about/key-statistics.html (accessed 07/13/18).

[2] SEER Cancer Statistics Factsheets: Lung and Bronchus Cancer. National Cancer Institute. Bethesda, MD, https://seer.cancer.gov/statfacts/html/lungb.html (accessed 08/09/18).

[3] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/09/18).

[4] American Cancer Society. Can Lung Cancer be Found Early? Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/lung-cancer/prevention-and-early-detection/early-detection.html (Accessed 10/29/18)

[5] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population; percent of local stage cancers reported using the Derived Summary Staging System.

[6] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2014.

[7] Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2016.

[8] Virginia Cancer Registry. Based on combined 2010-2014 data.

Chart 7.1: Lung Cancer Incidence[1] and Mortality Rates by Race and Sex, VA 2011-2015

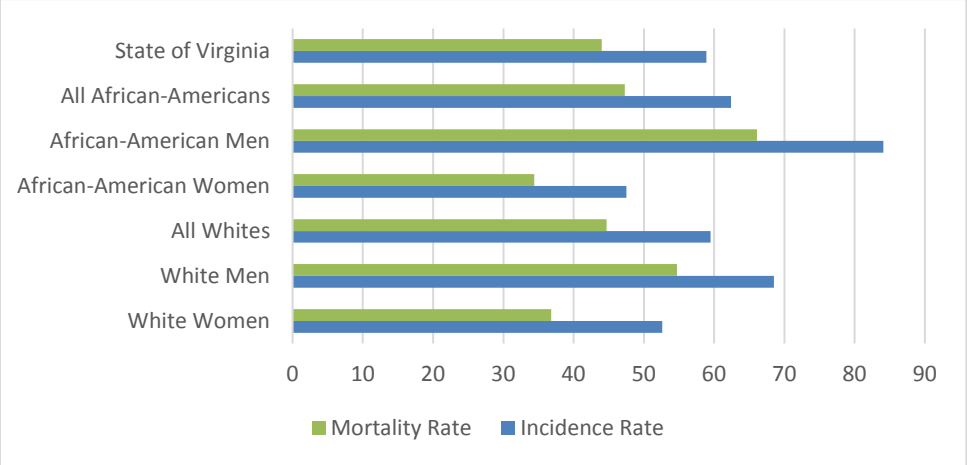
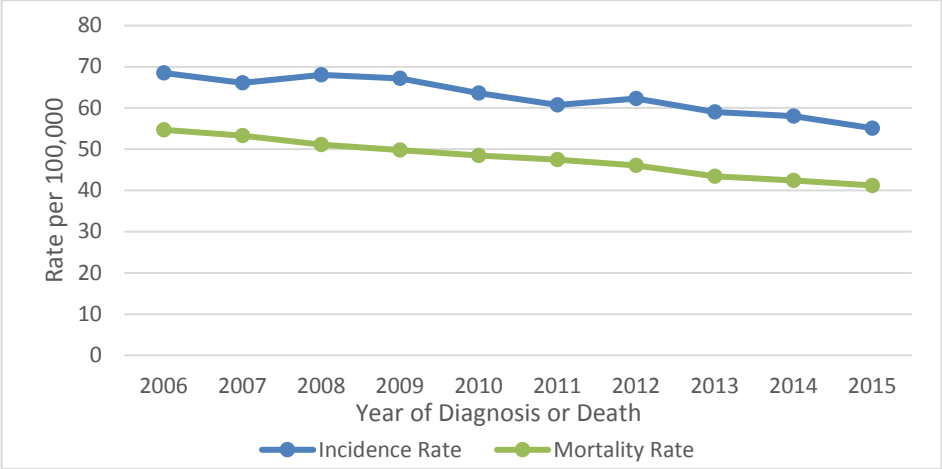


Chart 7.2: Lung Cancer Incidence and Mortality Rates by Year, VA 2006-2015

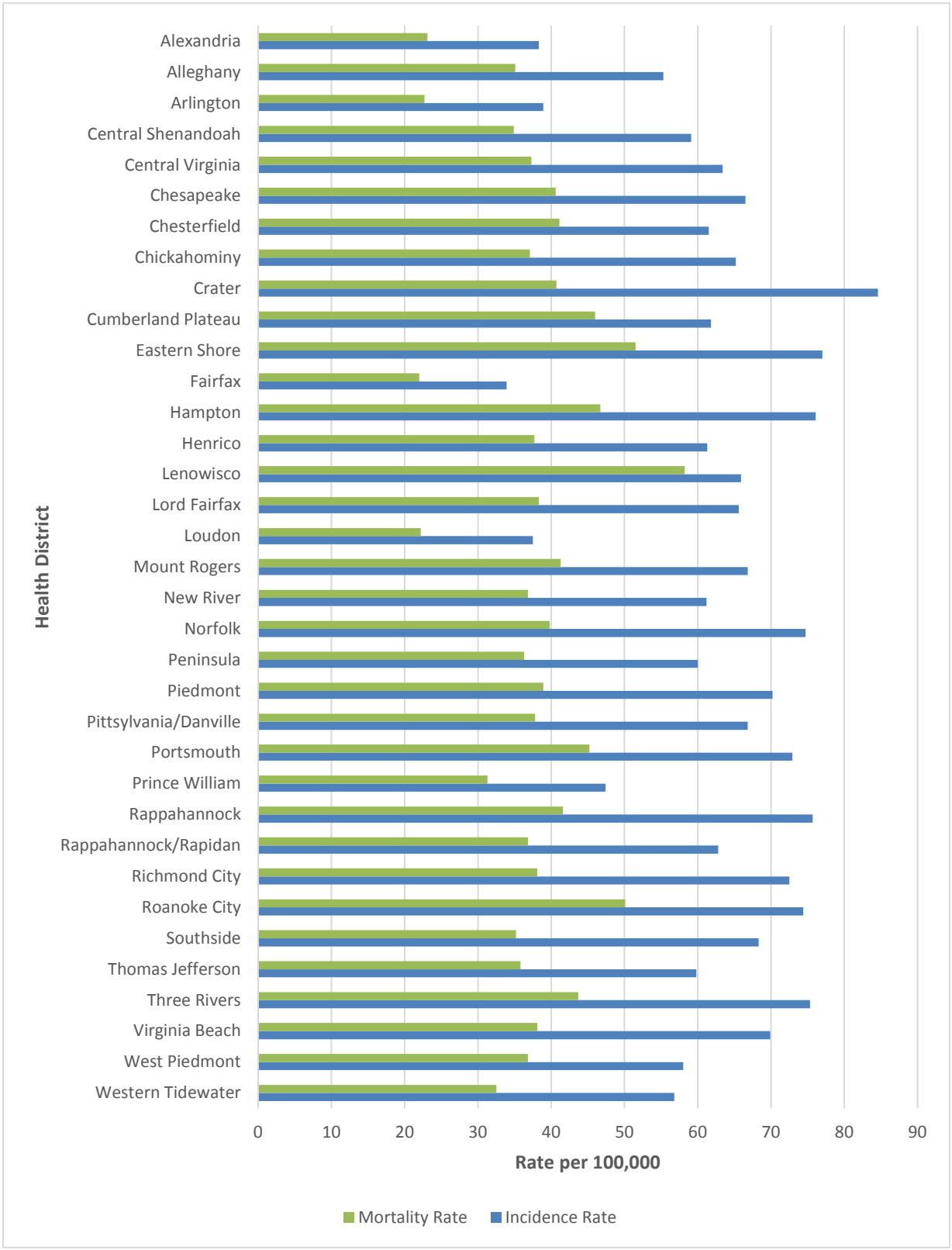


Source: Incidence: Virginia Cancer Registry. Mortality: Division of Health Statistics. Rates are age-adjusted to the US Census standard population.

Year	Incidence Rate	Mortality Rate
2006	68.5	54.7
2007	66.1	53.3
2008	68.0	51.1
2009	67.2	49.8
2010	63.6	48.5
2011	60.7	47.5
2012	62.3	46.1
2013	59.0	43.4
2014	58.0	42.4
2015	55.1	41.2

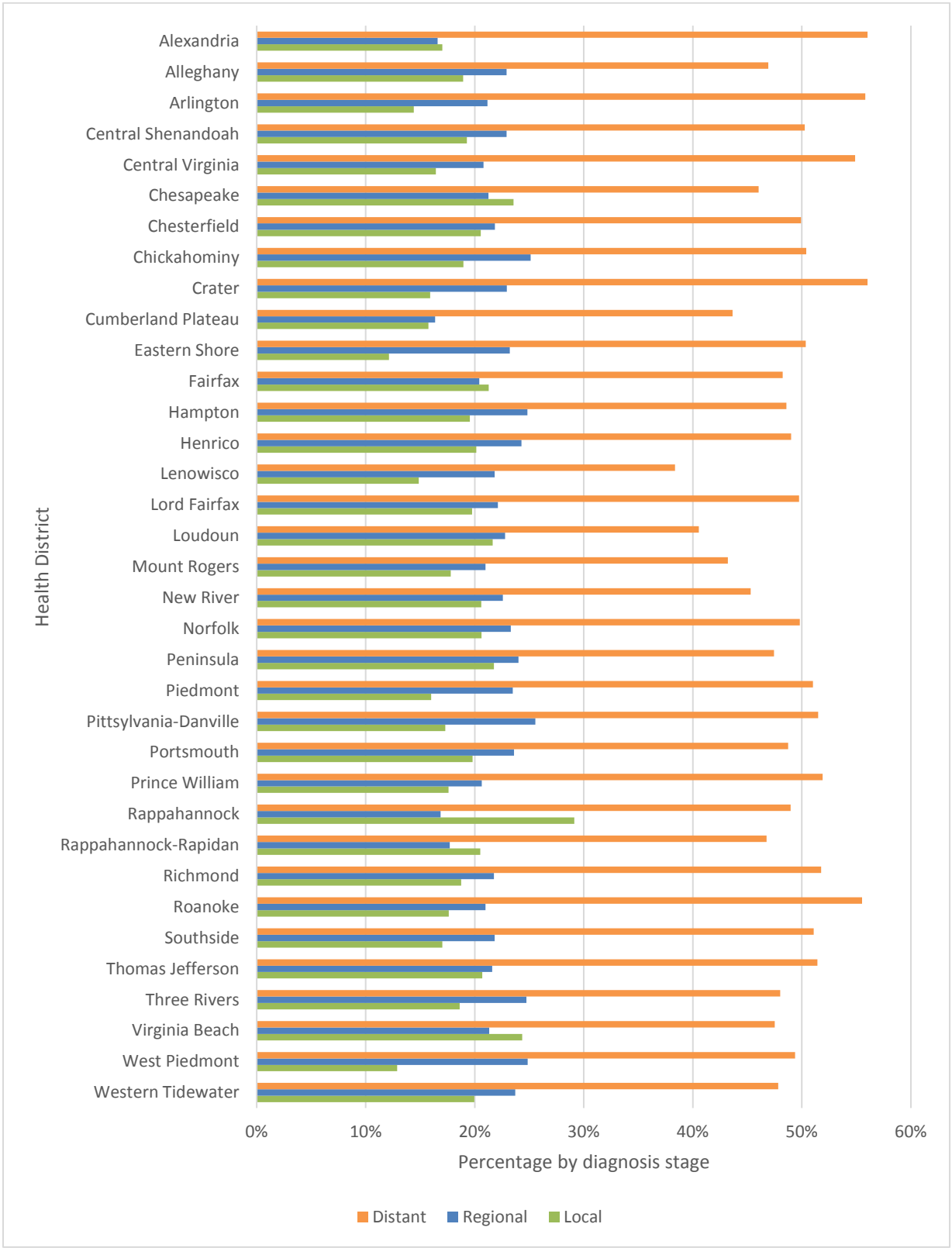
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

Chart 7.3: Lung Cancer Incidence and Mortality[1] Rates by Health District, VA 2011-2015



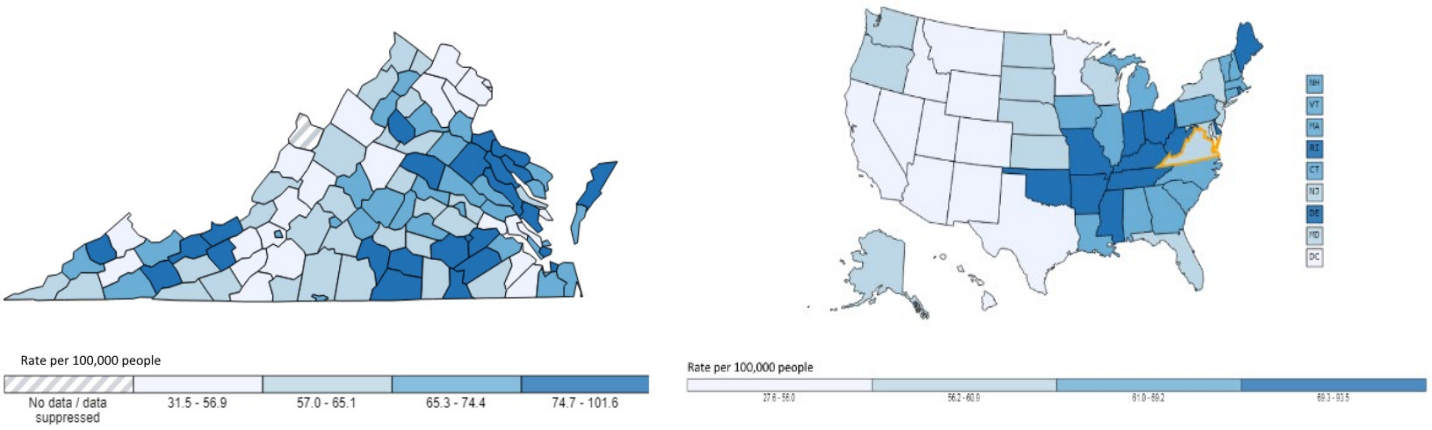
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population.

Chart 7.4: Lung Cancer Incidence Percentage by Diagnosis Stage[1] and Health District, VA 2011-2015



[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

Map 7.1: Lung Cancer Incidence Rates by City and County Compared to US, VA 2011-2015[1]



*Data suppressed: 16 or less is too small to calculate a reliable rate

Map 7.2: Lung Cancer Mortality Rates by City and County Compared to US, VA 2011-2015[1]

*Data suppressed: 16 or less is too small to calculate a reliable rate

[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

VIII. Melanoma

Melanoma Cancer Overview

- Melanoma is the most serious form of skin cancer. Almost 2.3 percent of men and women in the U.S. will be diagnosed with melanoma of the skin during their lifetimes.[1]

- Signs and symptoms for melanoma changes in size, shape, or color of a mole or skin lesion, the appearance of a new growth, or a sore that does not heal.[2] Risk factors include personal or family history and exposure to ultraviolet (UV) radiation.[2] Prevention for melanoma includes a decrease in UV exposure, use of protective clothing, sunglasses, and sunscreen, and avoiding use of tanning beds and sunbathing.[2] Other preventive measures include checking for new or changing skin growths and seeing a physician if any changes are detected.[2] Treatment for melanoma includes removal of the lesion, radiation therapy, immunotherapy, targeted therapy, chemotherapy, surgery, or a combination of treatments.[2]

- Melanoma has a five-year relative survival rate of 98.4 percent if diagnosed at its earliest, localized stage, when it is most curable.[1] In Virginia, 76.8 percent of melanomas were diagnosed at the localized stage between 2011 and 2015.[3]

- In Virginia, there were 30 inpatient hospitalizations in 2017 for melanoma, at a total cost of over $1.4 million. The average length of stay was 4.6 days and the average charge per stay was $45,373.[4]

- In Virginia, the top comorbidity conditions for skin cancer are hypertension, hyperlipidemia, and esophageal reflux.[5]

[1] SEER Cancer Statistics Factsheets: Melanoma of the Skin. National Cancer Institute. Bethesda, MD, http://seer.cancer.gov/statfacts/html/melan.html (accessed 07/17/2018).

[2] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/09/18).

[3] Virginia Cancer Registry. Based on combined 2011-2015 data. Percent of Local Stage cancers reported using the Derived Summary Staging System.

[4] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2017.

[5] Virginia Cancer Registry. Based on combined 2010-2014 data.

Chart 8.1: Melanoma Cancer Incidence[1] and Mortality Rates by Race and Sex, VA 2011-2015

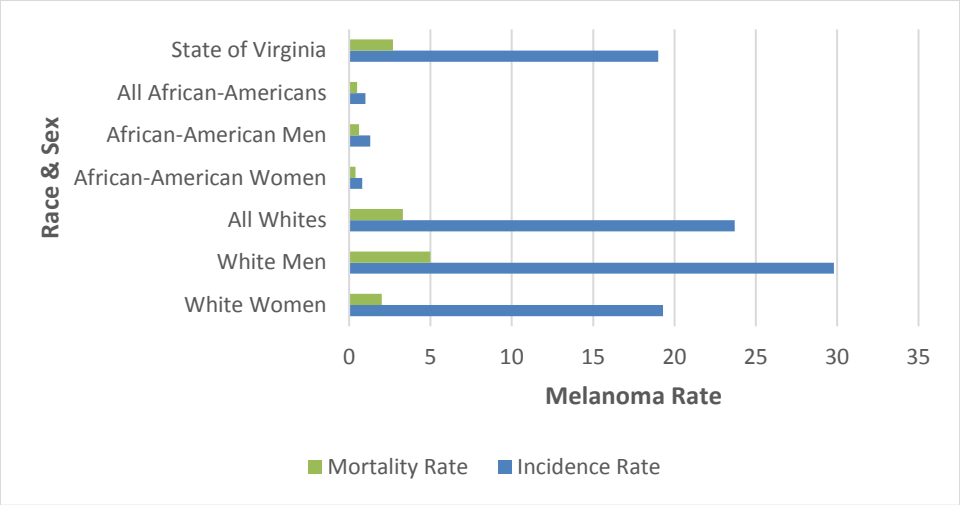
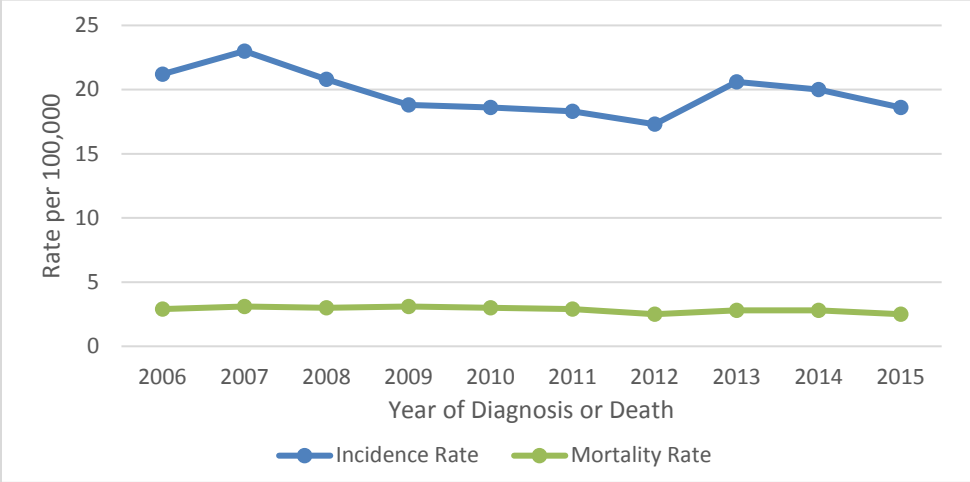


Chart 8.2: Melanoma Cancer Incidence and Mortality Rates by Year, VA 2006-2015

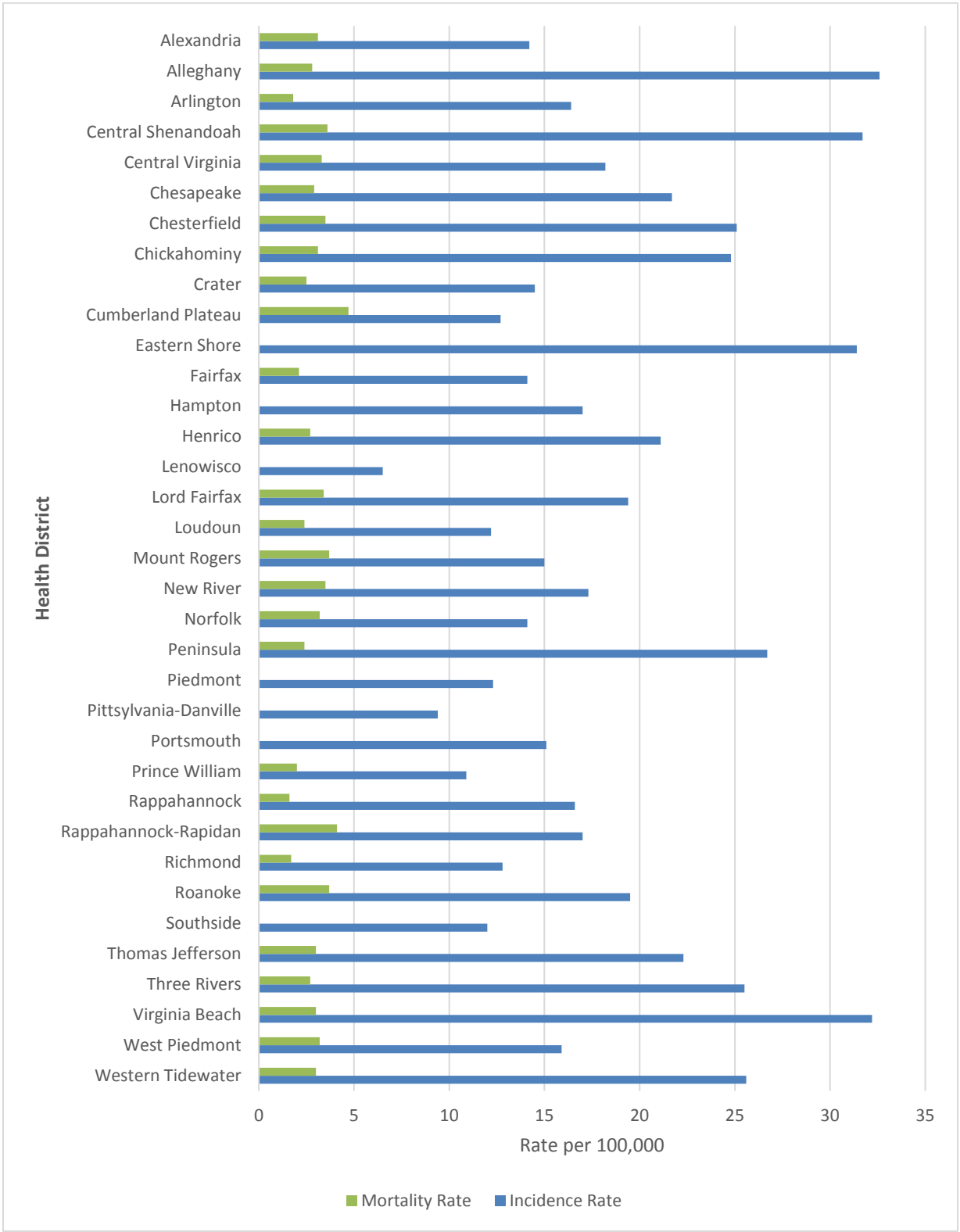


Source: Incidence: Virginia Cancer Registry. Mortality: Division of Health Statistics. Rates are age-adjusted to the US Census standard population.

Year	Incidence Rate	Mortality Rate
2006	21.2	2.9
2007	23.0	3.1
2008	20.8	3.0
2009	18.8	3.1
2010	18.6	3.0
2011	18.3	2.9
2012	17.3	2.5
2013	20.6	2.8
2014	20.0	2.8
2015	18.6	2.5

[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

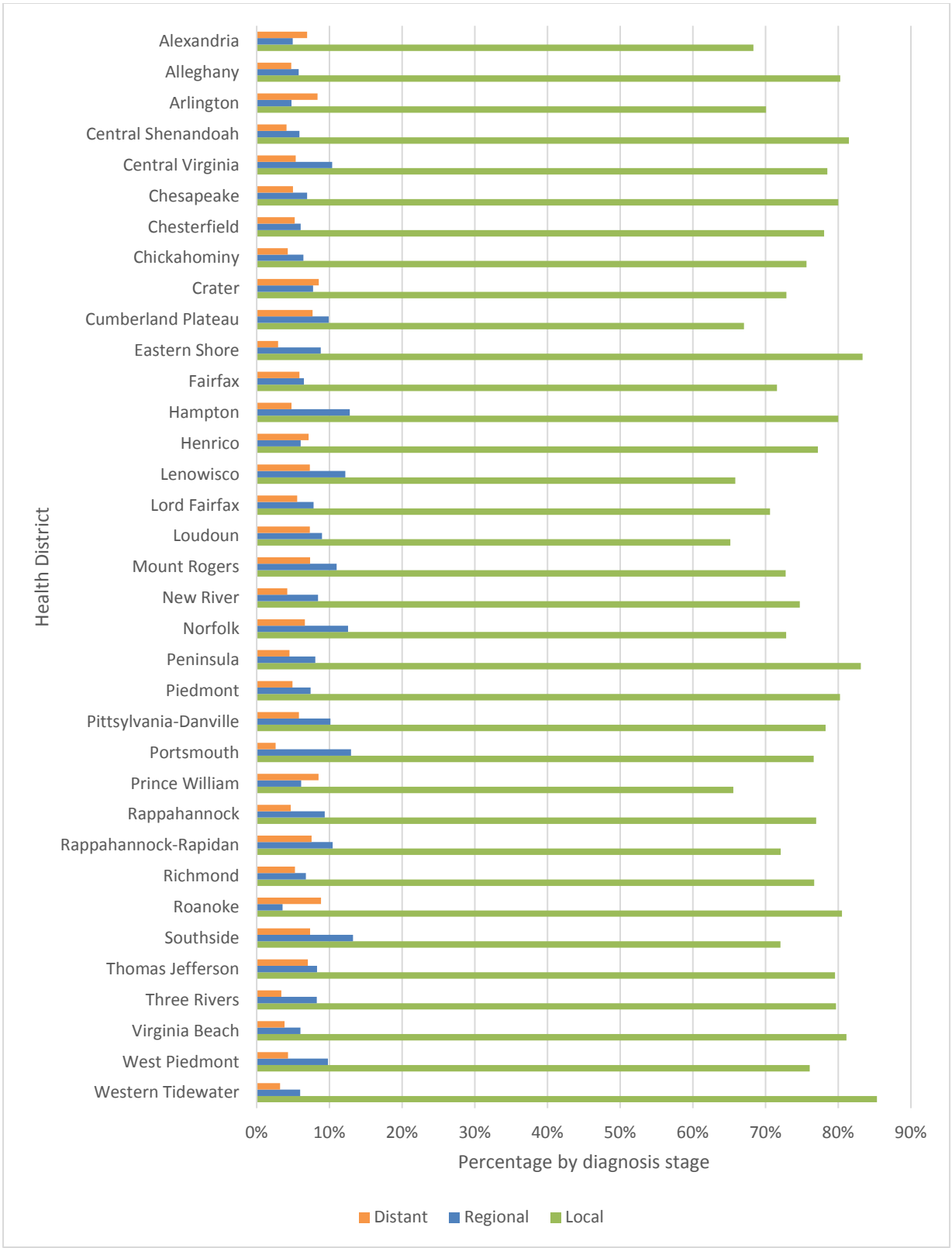
Chart 8.3: Melanoma Cancer Incidence[1] and Mortality Rates by Health District, VA 2011-2015



*Statistic not displayed due to fewer than 16 cases

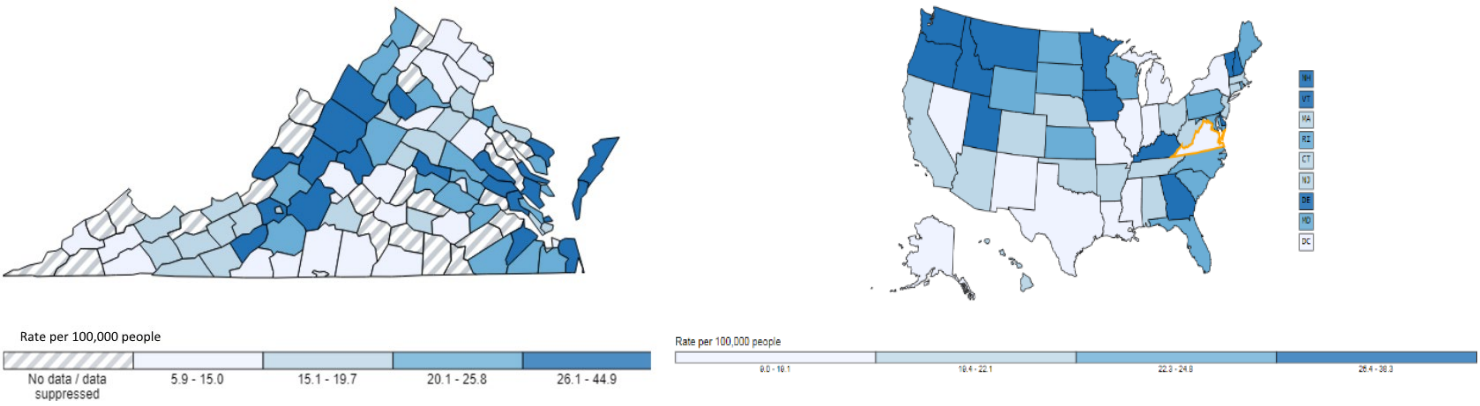
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

Chart 8.4: Melanoma Cancer Incidence Percentage by Diagnosis Stage[1] and Health District, VA 2011-2015



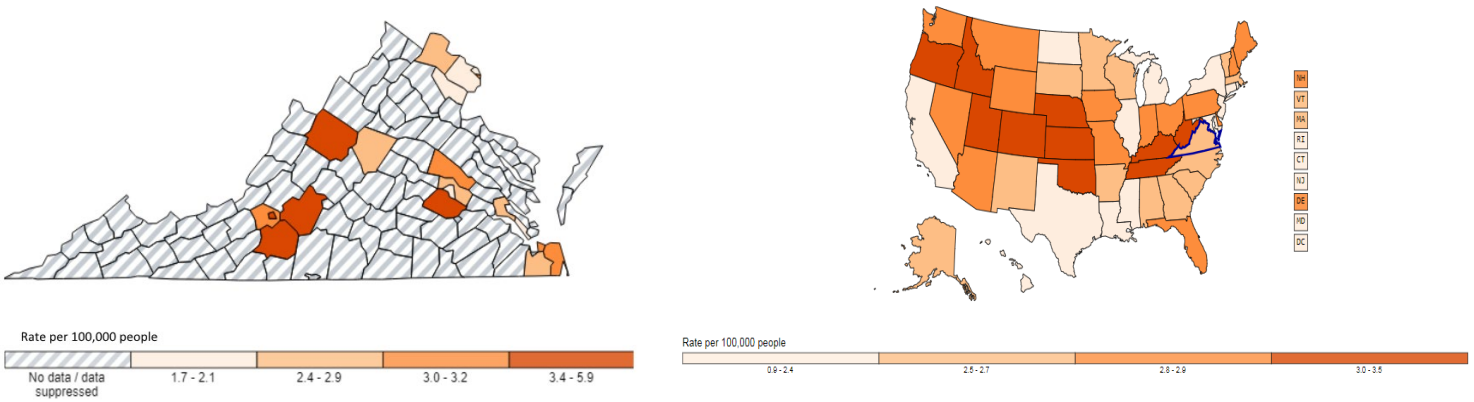
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

Map 8.1: Melanoma Cancer Incidence Rates by City and County Compared to US, VA 2011-2015[1]



*Data suppressed: 16 or less is too small to calculate a reliable rate

Map 8.2: Melanoma Cancer Mortality Rates by City and County Compared to US, VA 2011-2015



*Data suppressed: 16 or less is too small to calculate a reliable rate

[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

IX. Prostate Cancer

Prostate Cancer Overview

- Among men in the United States, prostate cancer is the most commonly diagnosed cancer (excluding non-melanoma skin cancer) and the second leading cause of cancer death[1] One in nine men will be diagnosed with prostate cancer during his lifetime.[1]

- Signs and symptoms of prostate cancer usually occur the advanced stage. These may include weak or interrupted urine flow, difficulty starting or stopping urine flow, need to urinate often, blood in urine, or pain or burning with urination.[2] Risk factors include increasing age, African ancestry, family history, certain genetic conditions, and smoking.[2] Screening for prostate cancer is not always recommended for those at average risk due to high rates of over diagnosis. Men age 50 and older at average risk and men 45 and older at high risk are recommended to discuss screening with a physician.[2] Treatment for prostate cancer includes monitoring progression, surgery, external beam radiation, radioactive seed implants, hormonal therapy, chemotherapy, or a combination of treatments.[2]

- Prostate cancer has a five-year relative survival rate of 100 percent if diagnosed at its earliest, localized stage.[3] In Virginia, 78.3 percent of prostate cancers diagnosed were at the localized stage.[4]

- In Virginia, there were 1,486 inpatient hospitalizations in 2017 for prostate cancer, at a total cost of over $100 million. The average length of stay was 2.0 days and the average charge per stay was $67,497.[5]

- According to the 2016 BRFSS survey data, 40.4 percent of Virginia men 40 years and older reported having had a Prostate-Specific Antigen (PSA) screening test in the previous two years (U.S. average, 39.7%).[6] 31.2 percent of men over age 40 with an annual income of $15,000 or less had a PSA screening in 2014, the lowest percentage among all income groups. The next lowest group, those with income of $15,000 to $24,000, had a 37.4% screening rate.[6] PSA screening rates were lower among adults who were less educated (38.0% for less than high school versus 56.1% for college graduates).[6]

- In Virginia, the top comorbidity conditions for prostate cancer are hypertension, hyperlipidemia, and esophageal reflux.[7]

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[1] American Cancer Society. Key Statistics for Prostate Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/prostate-cancer/about/key-statistics.html (accessed 07/17/18).

[2] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/19/2018).

[3] National Cancer Institute. SEER Stat Fact Sheets: Prostate Cancer. http://seer.cancer.gov/statfacts/html/prost.html (accessed 07/17/2018).

[4] Virginia Cancer Registry. Based on combined 2009-2013 data. Incidence rates are age-adjusted to the 2000 U.S. standard population; local stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

[5] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2014.

[6] Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2016.

[7] Virginia Cancer Registry. Based on combined 2010-2014 data.

Chart 9.1: Prostate Cancer Incidence[1] and Mortality Rates by Race, VA 2011-2015

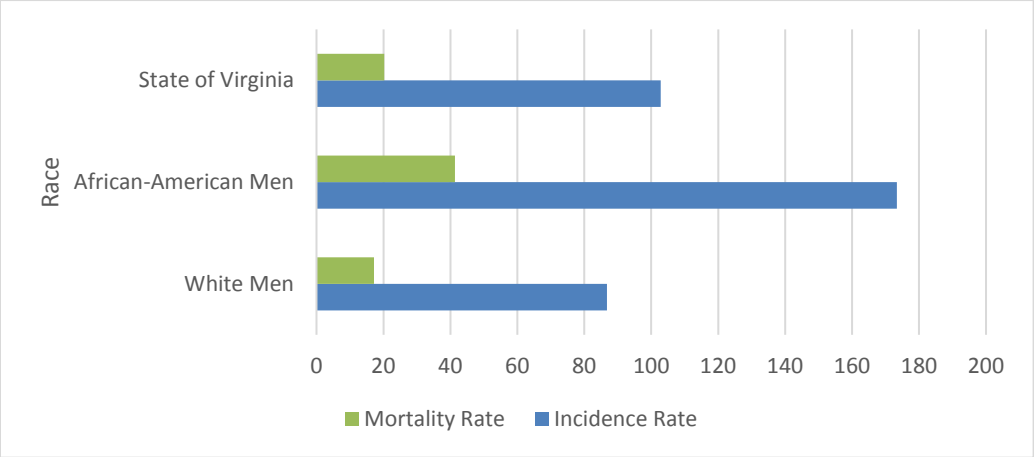
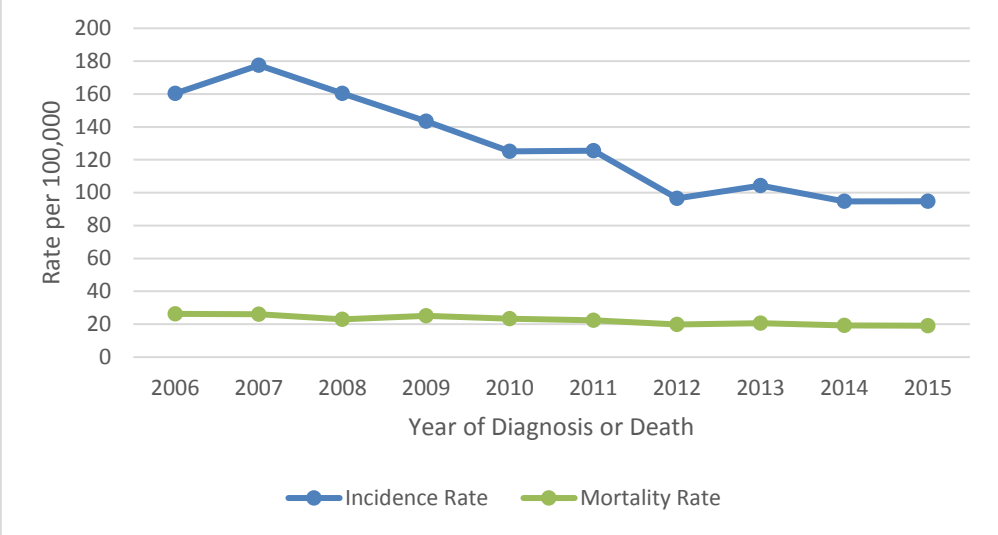


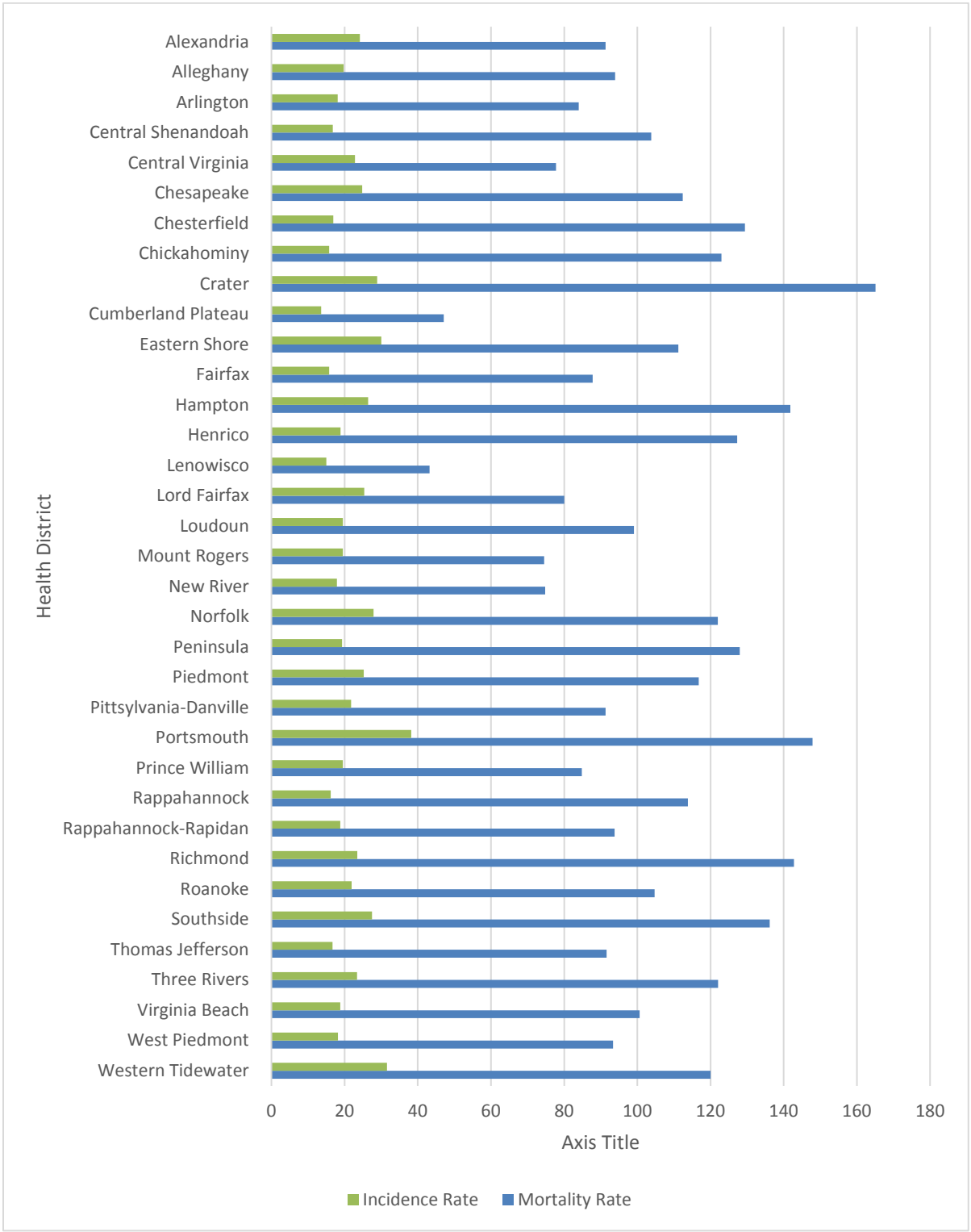
Chart 9.2: Prostate Cancer Incidence and Mortality Rates by Year, VA 2006-2015



Year	Incidence Rate	Mortality Rate
2006	160.4	26.3
2007	177.5	26.1
2008	160.3	22.9
2009	143.4	25.1
2010	125.2	23.3
2011	125.5	22.4
2012	96.5	19.9
2013	104.3	20.7
2014	94.7	19.2
2015	94.8	19.1

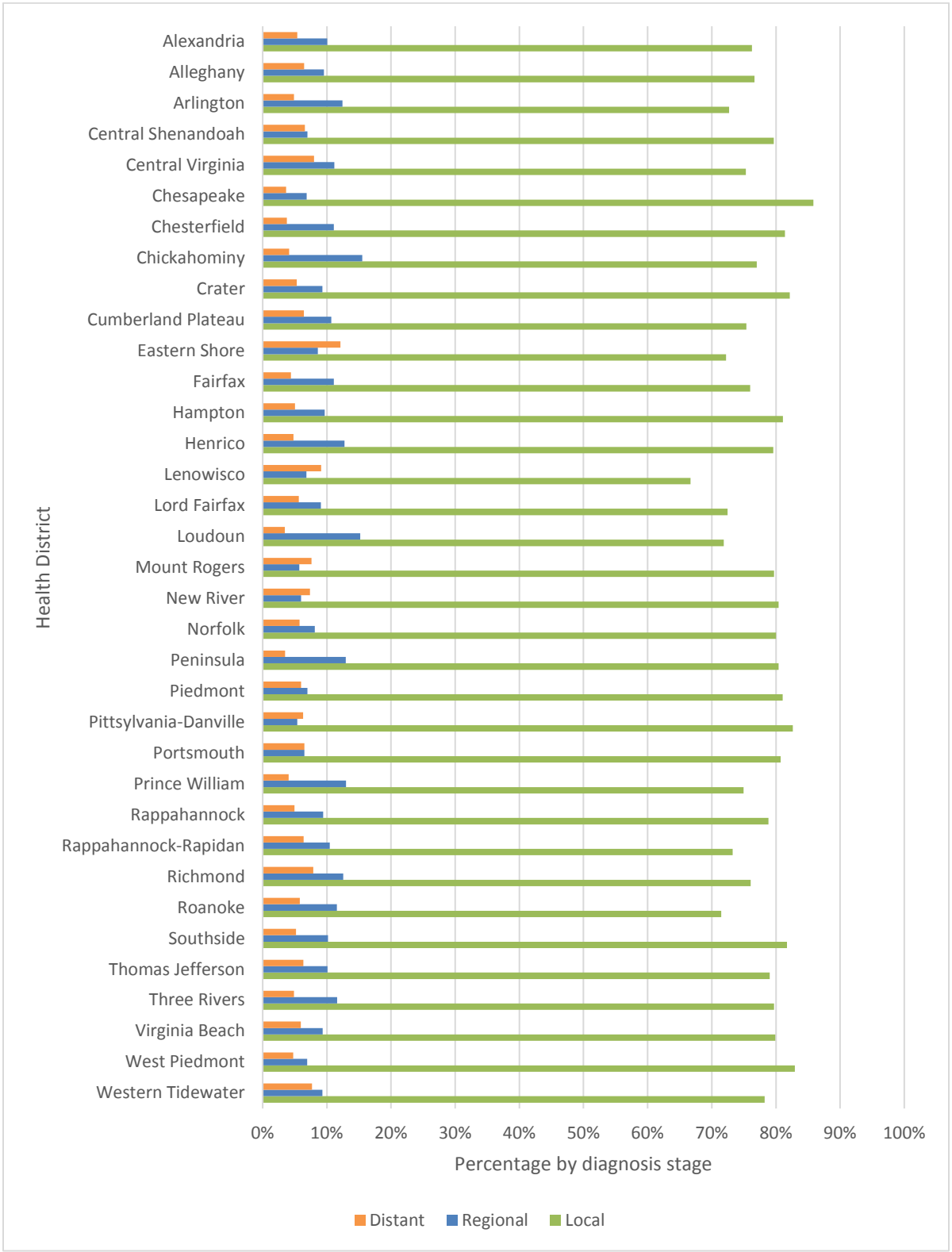
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population.

Chart 9.3: Prostate Cancer Incidence and Mortality[1] Rates by Health District, VA 2011-2015



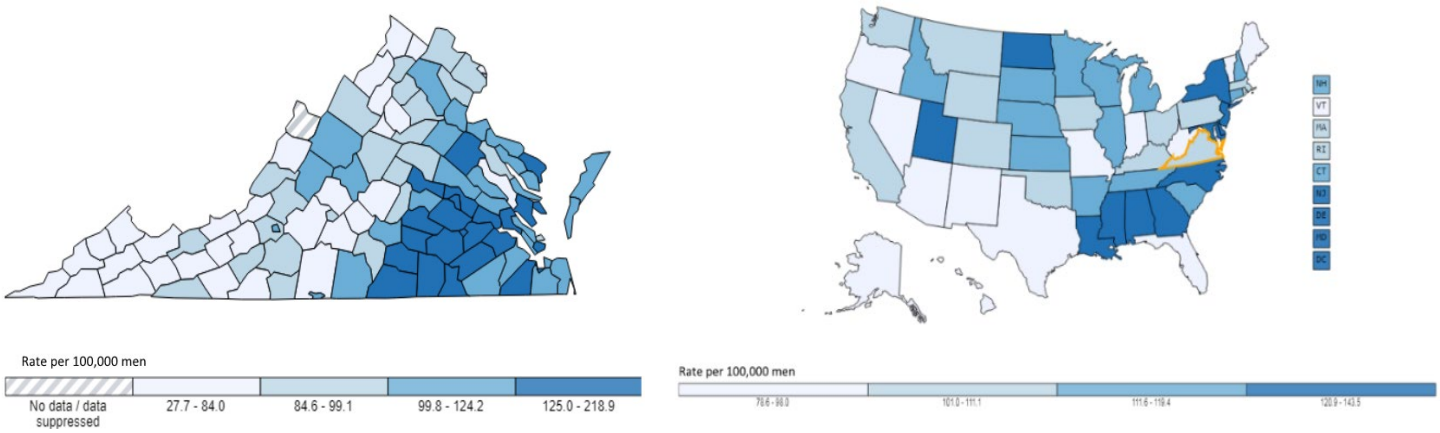
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population.

Chart 9.4: Prostate Cancer Incidence Percentage by Diagnosis Stage[1] and Health District, VA 2011-2015



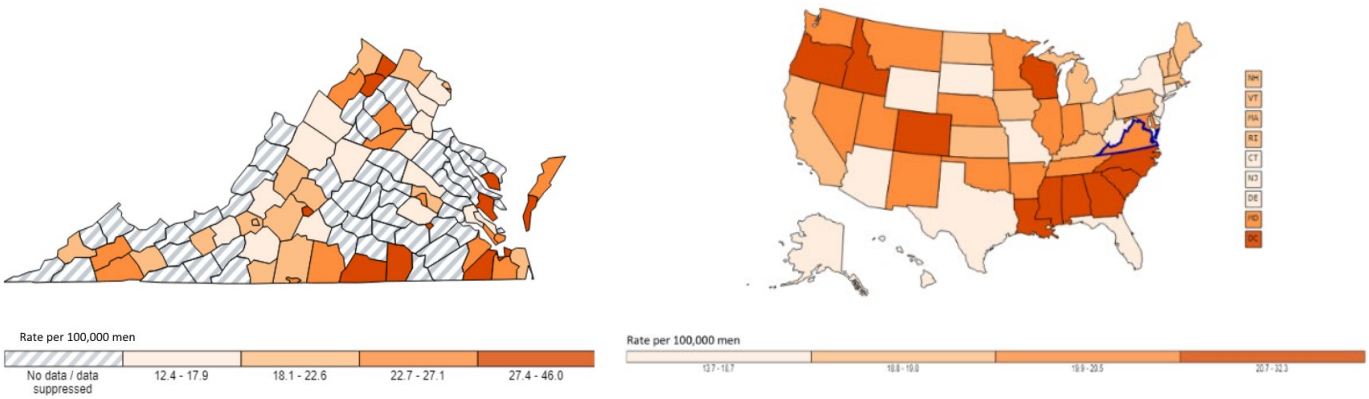
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

Map 9.1: Prostate Cancer Incidence Rates by Health District, VA 2011-2015[1]



*The number of cases (16 or less) is too small to calculate a reliable rate.

Map 9.2: Prostate Cancer Mortality Rates by Health District, VA 2011-2015[1]



*The number of cases (16 or less) is too small to calculate a reliable rate.

[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

X. Childhood Cancer (Age 0-19)

Childhood Cancer Overview

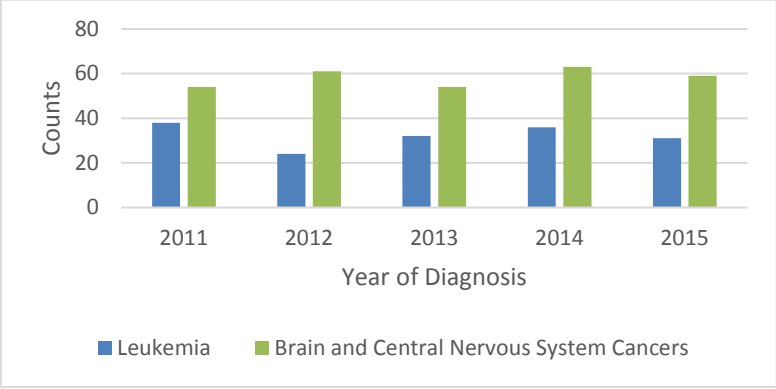
- The most common cancers in children are leukemia and central nervous systems cancers.[1] The most common is leukemia, specifically acute lymphocytic leukemia (ALL). ALL has a five-year survival rate greater than 85.0%.[2]

- Signs and symptoms for childhood cancer include unusual mass or swelling, loss of energy, sudden increase in the tendency to bruise or bleed, persistent pain or limping, frequent headaches, sudden eye or vision changes, and rapid weight loss.[3] Common forms of treatment include surgery, radiation, and chemotherapy. Newer forms of treatment include targeted therapy drugs and immunotherapy.[4]

- Between 2011-2015, childhood cancer incidence was 14.9 cases per 100,000 children less than 20 years of age in Virginia (U.S. incidence rate= 17.9 cases per 100,000).[4]

- Between 2011-2015, childhood cancer mortality was 2.2 deaths per 100,000 children less than 20 years of age in Virginia (U.S. mortality rate= 2.3 deaths per 100,000).[3]

Chart 10.1: Childhood Cancer Incidence Counts by Year, VA 2011-2015[5]



[1] American Cancer Society. Cancers that Develop in Children. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/cancer-in-children/types-of-childhood-cancers.html (accessed 07/17/18).

[2] American Cancer Society. Survival Rates for Childhood Leukemia. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/leukemia-in-children/detection-diagnosis-staging/survival-rates.html (accessed 07/19/18).

[3] American Cancer Society. Cancer Facts & Figures 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/09/18).

[4] National Cancer Institute, State Cancer Profiles: Virginia. https://statecancerprofiles.cancer.gov/quick-profiles/index.php?statename=virginia (accessed 07/17/18).

[5] Virginia Cancer Registry. Based on combined 2011-2015 data.

XI. Hot Spots

A. Thyroid Cancer Overview

- Even though the death rate for thyroid cancer is low compared to other cancers, diagnoses tripled in the past three decades. An increase in diagnoses is a result of increased thyroid testing.[1]

- About 1.2 percent of adults will be diagnosed with thyroid cancer during their lifetime. Thyroid cancer is more prevalent in women with 3 out of 4 cases found in women.[1]
- In Virginia, there were 105 inpatient hospitalizations in 2017 for thyroid cancer, at a total cost of over $7 million. The average length of stay was 4.3 days and the average charge per stay was $75,905.[2]

- Thyroid cancer has a five-year relative survival rate of 99.9 percent if diagnosed at its earliest, localized stage.[3] In Virginia, 66.8 percent of thyroid cancers diagnosed were at the localized stage.[4]

- Signs and symptoms for thyroid cancer include a lump in the neck, tightness or full feeling in the neck, difficulty breathing or swallowing, hoarseness, swollen lymph nodes, consistent pain in neck or throat that does not go away. [5] Risk factors include being female, history of goiter, family history of thyroid cancer, exposure to radiation early in life, and obesity.[4] It is difficult to prevent most cases of thyroid cancer because known risk factors (family history, gender, age) are not common I people diagnosed with the cancer. However, avoiding radiation exposure and undergoing blood tests can lead to prevention. Treatment for thyroid cancer includes surgery, radioactive iodine treatment, thyroid hormone therapy, external beam radiation, chemotherapy, and targeted therapy.[6]

- In Virginia, the top comorbidity conditions in thyroid cancer are hypertension, esophageal reflux, and diabetes mellitus.[7]

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[1] American Cancer Society. About Thyroid Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/thyroid-cancer/about/key-statistics.html (accessed 07/17/18).

[2] VDH Virginia Health Information Hospital Discharge Patient-Level Dataset, 2017.

[3] National Cancer Institute. SEER Stat Fact Sheets: Thyroid Cancer. https://seer.cancer.gov/statfacts/html/thyro.html (accessed 07/17/2018).

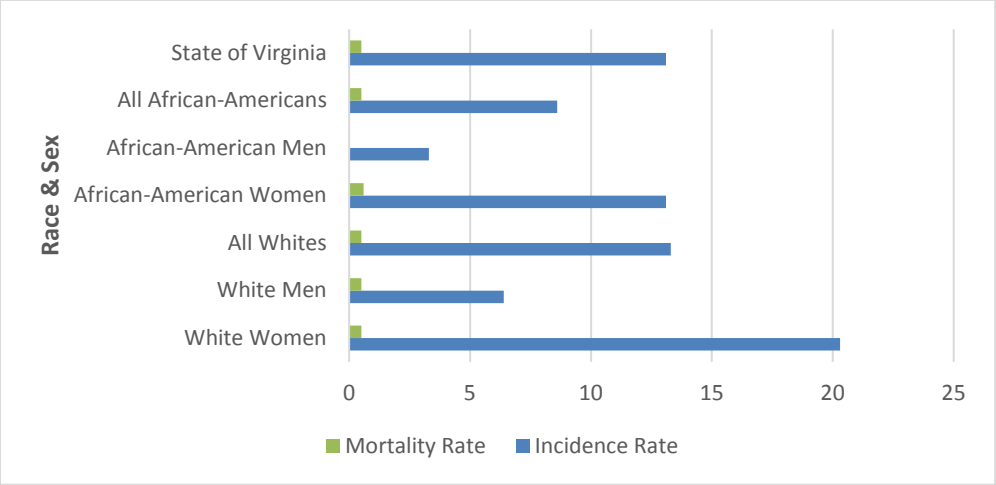
[4] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population; local stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

[5] American Cancer Society. Cancer Facts and Figure 2018. Atlanta: American Cancer Society; 2018. https://www.cancer.org/content/dam/cancer-org/research/cancer-facts-and-statistics/annual-cancer-facts-and-figures/2018/cancer-facts-and-figures-2018.pdf (accessed 08/02/18).

[6] American Cancer Society. Can Thyroid Cancer Be Prevented? Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/thyroid-cancer/causes-risks-prevention/prevention.html (accessed 07/31/2018).

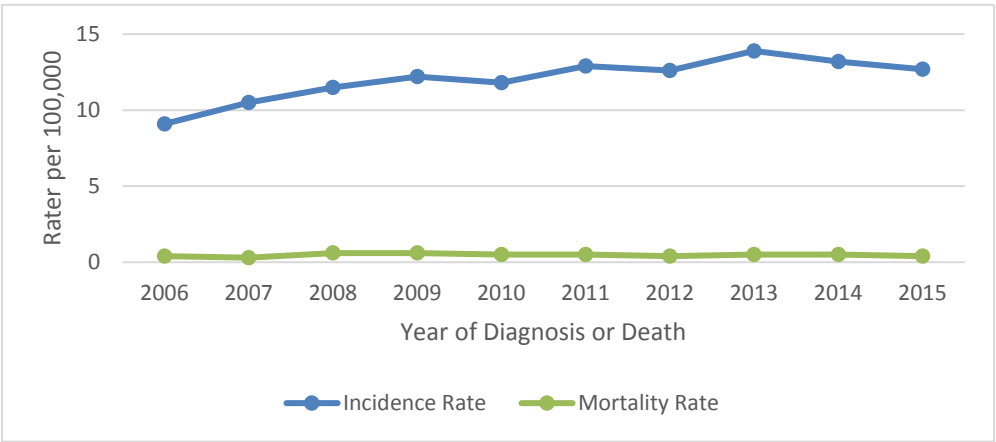
[7] Virginia Cancer Registry. Based on combined 2010-2014 data.

Chart 11.1: Thyroid Cancer Incidence and Mortality[1] Rates by Race and Sex, VA 2011-2015



African American Men Mortality Rate: DSU (data statistically unreliable); the number of cases (25 or less) is too small to calculate a reliable rate

Chart 11.2: Thyroid Cancer Incidence and Mortality Rates by Year, VA 2006-2015

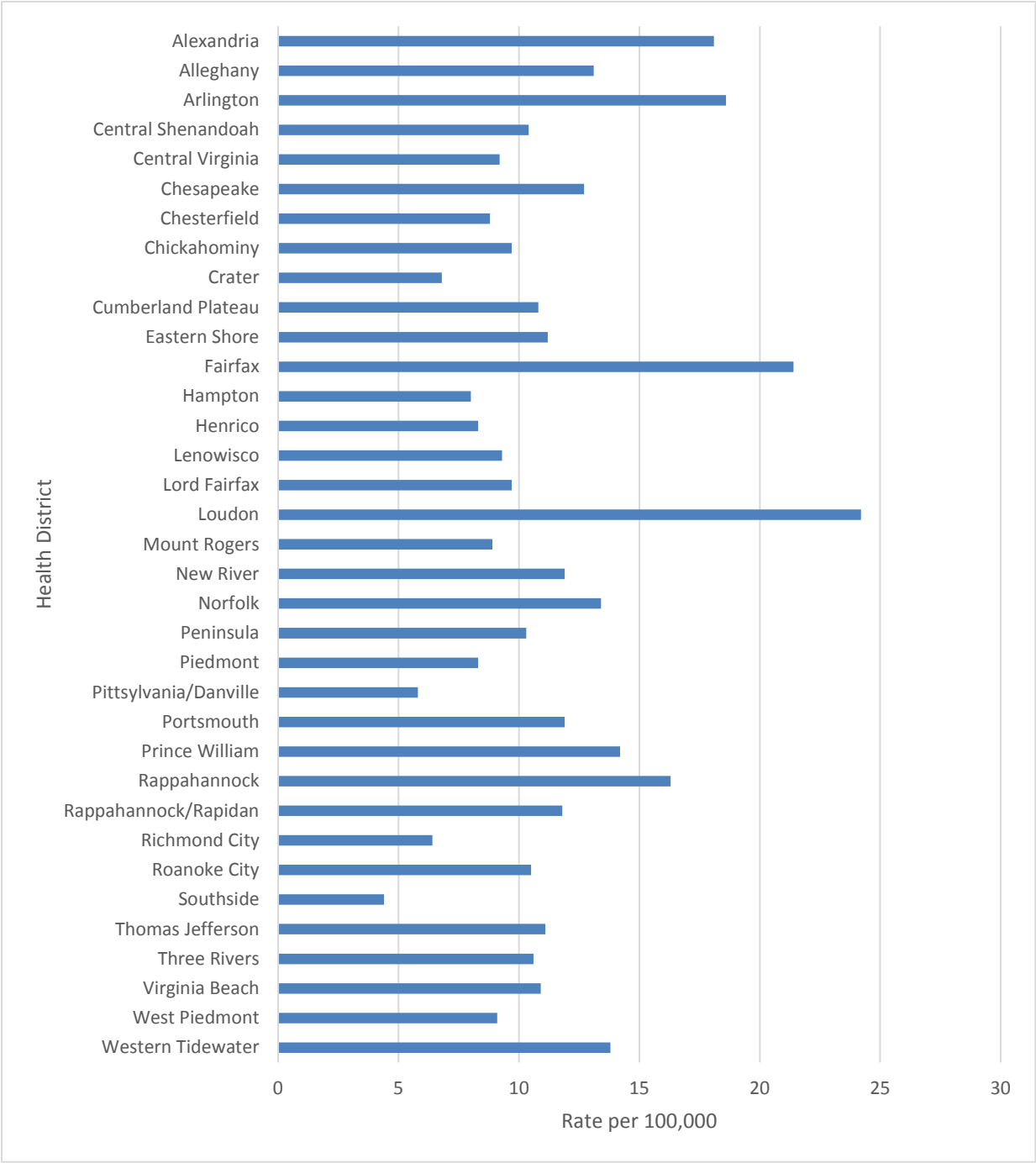


Source: Incidence: Virginia Cancer Registry. Mortality: Division of Health Statistics. Rates are age-adjusted to the US Census standard population.

Year	Incidence Rate	Mortality Rate
2006	9.1	0.4
2007	10.5	0.3
2008	11.5	0.6
2009	12.2	0.6
2010	11.8	0.5
2011	12.9	0.5
2012	12.6	0.4
2013	13.9	0.5
2014	13.2	0.5
2015	12.7	0.4

[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence and mortality rates are age-adjusted to the 2000 U.S. standard population.

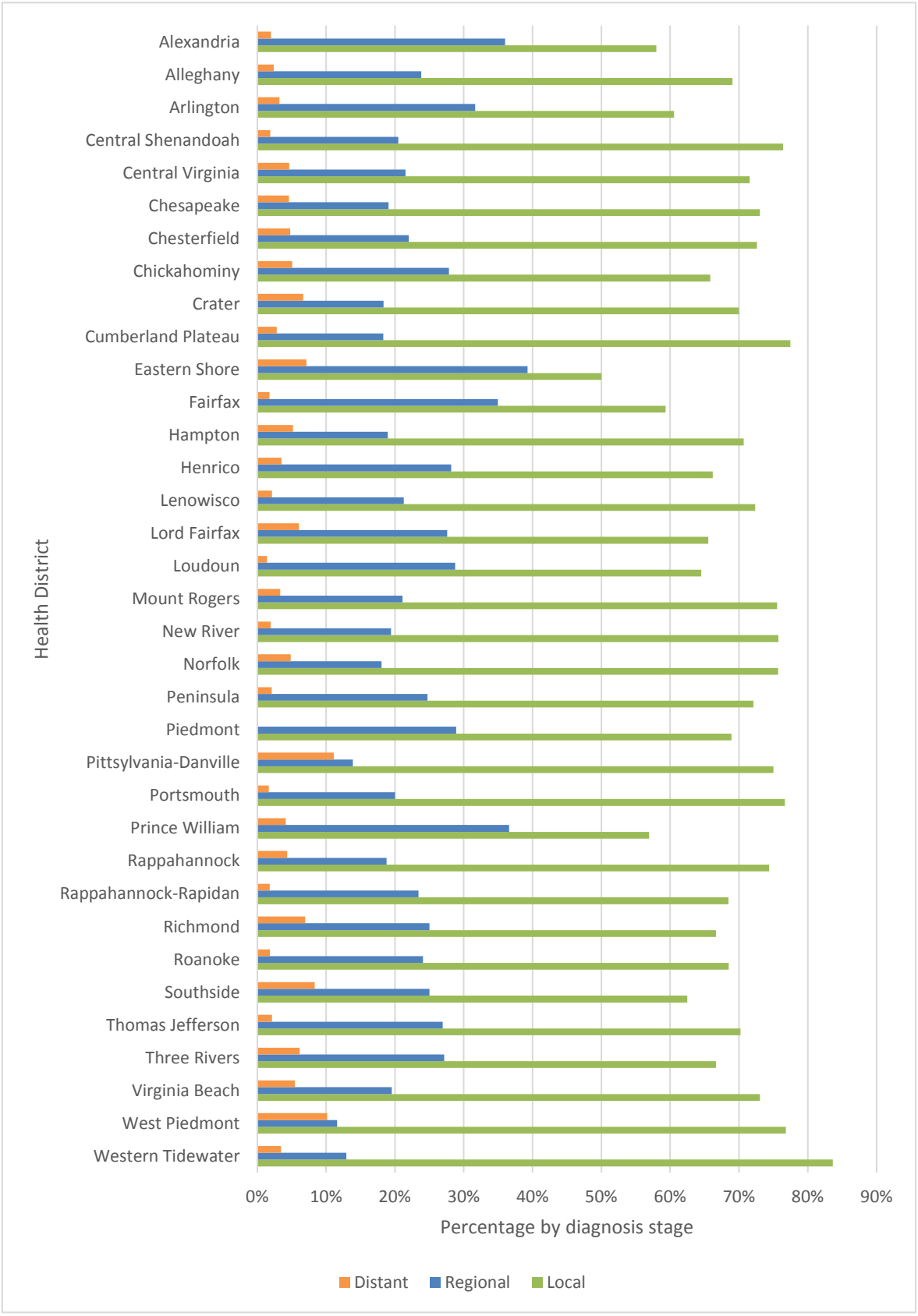
Chart 11.3: Thyroid Cancer Incidence[1] Rates by Health District, VA 2011-2015



*No mortality rate data for the health districts to report because the number of cases (16 or less) is too small to calculate a reliable rate

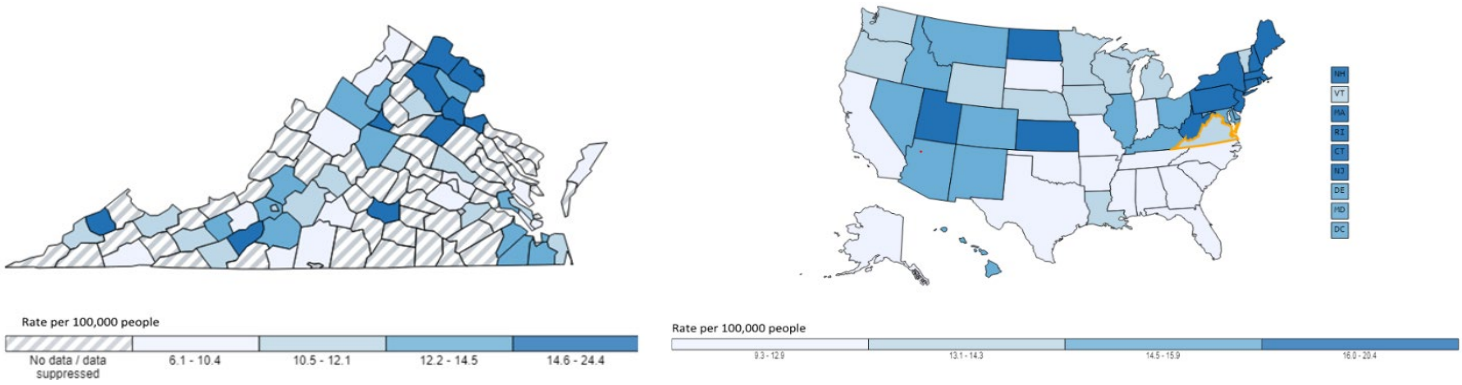
[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

Chart 11.4: Thyroid Cancer Incidence Percentage by Diagnosis Stage[1] & Health District, VA 2011-2015



[1] Virginia Cancer Registry. Based on combined 2011-2015 data. Stage defined using Derived Summary Staging values (http://seer.cancer.gov/tools/ssm/intro.pdf).

Map 11.1: Virginia Thyroid Cancer Incidence Rate by City and County Compared to US, 2011-2015[1]



*The number of cases (16 or less) is too small to calculate a reliable rate.

*No mortality rate data for the health districts to report because the number of cases (16 or less) is too small to calculate a reliable rate.

B. Endometrial Cancer Overview

- Endometrial cancer is the most common cancer of the female reproductive organs. However, it has an average diagnosis age of 60 and mainly affects postmenopausal women.[2]

- Signs and symptoms include unusual vaginal bleeding, spotting, and discharge and pelvic pain.[3] Risk factors for endometrial cancer include things that affect hormone levels, use of intrauterine device, diabetes, family history, and age.[4] Preventive measures for endometrial cancer include discussing hormone therapy with a physician and getting treated for endometrial problems.[4] It is recommended that women at menopause and average risk discuss risks and symptoms with a physician. Women at high risk should see a doctor whenever they experience symptoms.[3] Treatment options include surgery, radiation therapy, chemotherapy, and hormone therapy.[5]

[1] U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on November 2017 submission data (1999-2015): U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; www.cdc.gov/cancer/dataviz, June 2018.

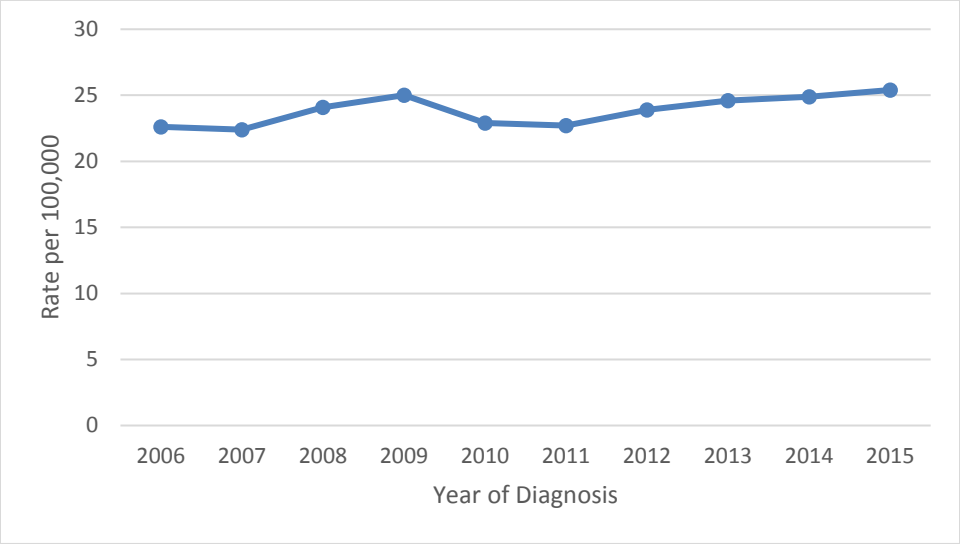
[2] American Cancer Society. Key Statistics for Endometrial Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/endometrial-cancer/about/key-statistics.html (accessed 07/19/18).

[3] American Cancer Society. Early Detection, Diagnosis, and Staging. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/endometrial-cancer/detection-diagnosis-staging.html (accessed 08/09/18).

[4] American Cancer Society. Causes, Risk Factors, and Prevention. Atlanta: American Cancer Society, 2018. https://www.cancer.org/cancer/endometrial-cancer/causes-risks-prevention.html (accessed 08/09/18).

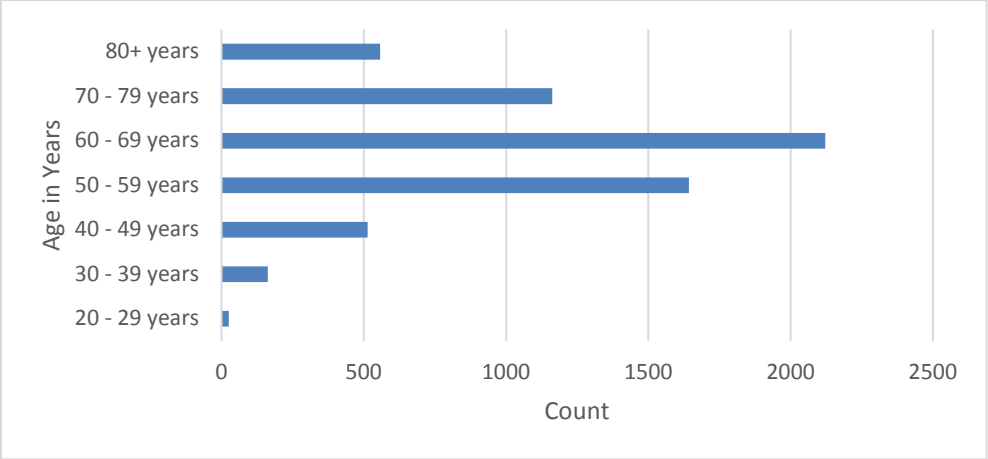
[5] American Cancer Society. Treating Endometrial Cancer. Atlanta: American Cancer Society; 2018. https://www.cancer.org/cancer/endometrial-cancer/treating.html (accessed 07/31/2018).

Chart 11.5: Endometrial Cancer Incidence Rates by Year, VA 2006-2015[1]



Year	Incidence Rate
2006	22.6
2007	22.4
2008	24.1
2009	25.0
2010	22.9
2011	22.7
2012	23.9
2013	24.6
2014	24.9
2015	25.4

Chart 11.6: Endometrial Cancer Incidence Counts by Age Group, VA 2011-2015[2]

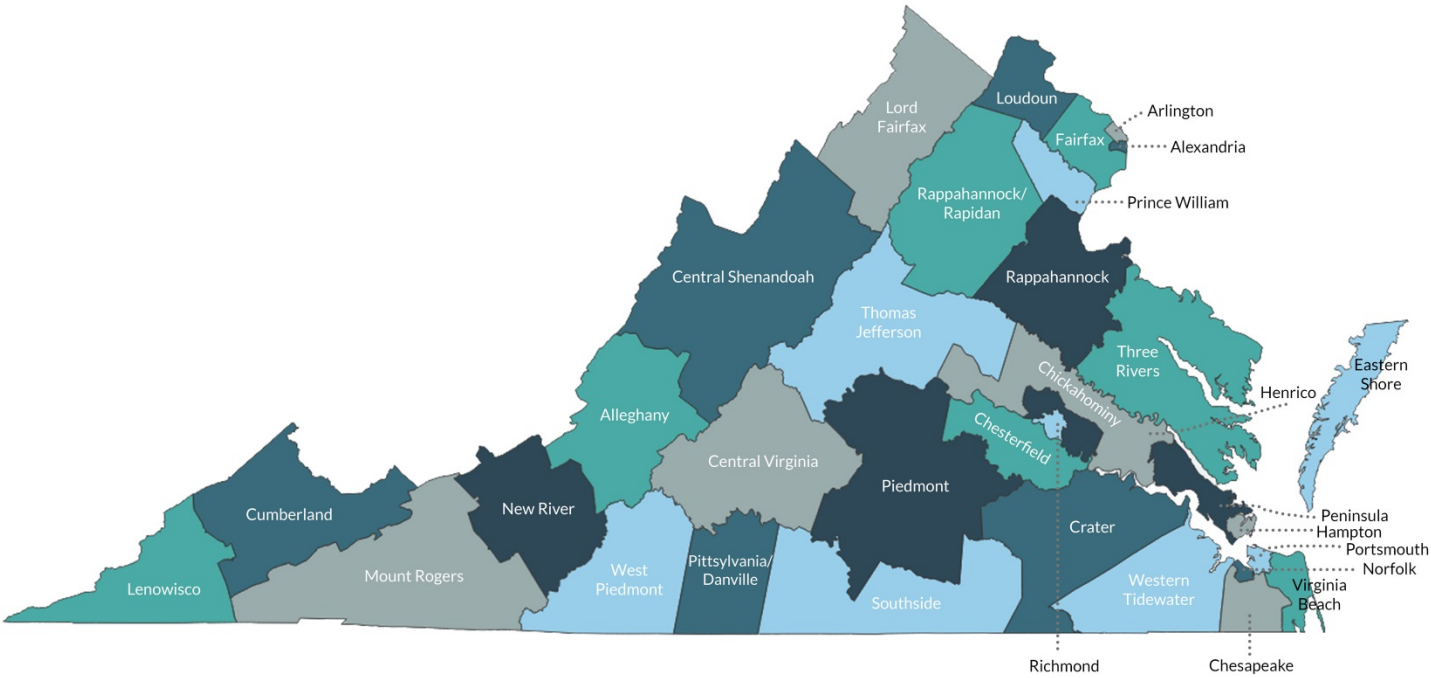


[1] Virginia Cancer Registry. Based on combined 2006-2015 data. Incidence rates are age-adjusted to the 2000 U.S. standard population.

[2] Virginia Cancer Registry. Based on combined 2011-2015 data.

XII. Appendices

Appendix A: Local Health District Map



Appendix B: Localities in Local Health Districts

Alexandria
Alexandria City

Alleghany
Alleghany County
Botetourt County
Covington City
Craig County
Roanoke County
Salem City

Arlington
Arlington County

Central Shenandoah
Augusta County
Bath County
Buena Vista City
Harrisonburg City
Highland County
Lexington City
Rockbridge County
Rockingham County
Staunton City
Waynesboro City

Central Virginia
Amherst County
Appomattox County
Bedford City
Bedford County
Campbell County
Lynchburg City

Chesapeake
Chesapeake City

Chesterfield
Chesterfield County
Colonial Heights City
Powhatan County

Chickahominy
Charles City County
Goochland County
Hanover County
New Kent County

Crater
Dinwiddie County
Emporia City
Greensville County
Hopewell City
Petersburg City
Prince George County
Surry County
Sussex County

Cumberland Plateau
Buchanan County
Dickenson County
Russell County
Tazewell County

Eastern Shore
Accomack County
Northampton County

Fairfax
Fairfax City
Fairfax County
Falls Church City

Hampton
Hampton City

Henrico
Henrico County

Lenowisco
Lee County
Norton City
Scott County
Wise County

Lord Fairfax
Clarke County
Frederick County
Page County
Shenandoah County
Warren County
Winchester City

Loudoun
Loudoun County

Mount Rogers
Bland County
Bristol City
Carroll County
Galax City
Grayson County
Smyth County
Washington County
Wythe County

New River
Floyd County
Giles County
Montgomery County
Pulaski County
Radford City

Norfolk City
Norfolk City

Peninsula
James City County
Newport News City
Poquoson City
Williamsburg City
York County

Piedmont
Amelia County
Buckingham County
Charlotte County
Cumberland County
Lunenburg County
Nottoway County
Prince Edward County

Pittsylvania/Danville
Danville City
Pittsylvania County

Portsmouth
Portsmouth City

Prince William
Manassas City
Manassas Park City
Prince William County

Rappahannock
Caroline County
Fredericksburg City
King George County
Spotsylvania County
Stafford County

Rappahannock/ Rapidan
Culpeper County
Fauquier County
Madison County
Orange County
Rappahannock County

Richmond City
Richmond City

Roanoke City
Roanoke City

Southside
Brunswick County
Halifax County
Mecklenburg County

Thomas Jefferson
Albemarle County
Charlottesville City
Fluvanna County
Greene County
Louisa County
Nelson County

Three Rivers
Essex County
Gloucester County
King William County
King and Queen County
Lancaster County
Mathews County
Middlesex County
Northumberland County
Richmond County
Westmoreland County

Virginia Beach
Virginia Beach City

West Piedmont
Franklin County
Henry County
Martinsville City
Patrick County

Western Tidewater
Franklin City
Isle of Wight County
Southampton County
Suffolk City

Southside
Brunswick County
Halifax County

Appendix C: Glossary

Rate: A number expressing how often something happens during a certain period. In this report, rates are the number of cancer incident cases and deaths during defined intervals. Rates are expressed for 100,000 people. An example is: During one year, 82 new cancer cases were diagnosed. The population is 33,000 people. For that year, the rate is (82 / 33,000) X 100,000 = 0.002485 X 100,000 = 248.5. The incidence rate is 248.5 cases per 100,000 people. (This is a crude rate, not an age-adjusted rate.)

Age-adjusted rate: A rate that allows comparing communities with different age structures. Because cancer occurs more often among older people, localities that have higher percentages of older people differ from areas with higher percentages of younger people. Calculating an age-adjusted rate eliminates the effect of age, thus allowing direct comparisons between communities and other groups.

Case: A countable instance of a cancer tumor. If a person develops two cancers that are not from the same source, the case count is two. An example is: 10 people in a community have cancer. One person develops 2 different cancers and 9 people develop a single cancer. The number of cancer cases is 2 + 9 = 11, and the case count is 11.

Confidence interval: Two numbers, one low and one high, form an interval. A confidence interval is the range that brackets a point estimate of a number in a population. Ninety-five percent confidence intervals (95% CIs) quantify random variability in data. A confidence interval is an estimate of the certainty that a measured number, such as an incidence or mortality rate, actually falls within the interval. The interval defines the range that includes the statistic itself 95% of the time.

Count: The number of cancer cases or deaths that happen. In this report, counts are presented by demographic category (sex, race), disease category (all cancers, lung cancer), geographic category (Virginia, health district), and time interval (2001 – 2010, 2006 – 2010). An example is 28,516 cases of prostate cancer among men in Virginia between 2006 and 2010. Cancer counts in this report are counts of cancers, not counts of patients. A person who develops more than one cancer contributes more than one case to the cancer case count.

Health district: The Virginia Department of Health defines state health districts. A health district may be one county or city (Loudoun, Norfolk) or incorporate multiple counties or cities (Lenowisco, Piedmont). Appendix B lists Virginia health districts and their constituent counties and cities.

Incidence: The number of times an event happens, usually expressed as a count or rate observed during a period of time. Incidence counts refer only to new cases. An example is: 50 people in a population of 100,000 were cancer patients at the end of a year. Among these patients, 5 people were

newly diagnosed in that year; 45 people were diagnosed and counted at some other time. The incidence rate is 5 new cases per 100,000. Incidence is not the same as prevalence.

Mortality: The number of deaths in a defined population during a period of time. Like incidence, mortality may be expressed as a count or a rate. Calculate mortality rates using the method to calculate incidence rates (see Incidence).

Stage, staging: A medical term describing the extent to which a cancer has developed. A local stage cancer is less extensive than a regional stage cancer, and a regional stage cancer is less extensive than a late stage cancer. Patients can more easily manage cancer when it is diagnosed at an earlier stage. Cancer in situ is a group of abnormal cells that remain in the place where they first formed. They have not spread. These abnormal cells may become cancer and spread into nearby normal tissue. Also called stage 0 disease. Doctors and cancer registrars use staging to describe differences between cancers.

Appendix D: Adjusted Rates and Rank by Health Districts

Cancer Incidence Age-Adjusted Rates and Rank by Health District, VA, 2011-2015

Locality	Oral		Colorectal		Lung		Melanoma		Breast		Cervix		Ovary		Prostate	
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
HD_Alexandria	9.7	9	28.1	2	38.3	3	14.2	11	118.7	6	5.8	10	11.7	25	91.3	10
HD_Alleghany	12.2	23	39.2	21	55.3	6	32.6	35	134.1	25	6.2	15	11.2	19	93.9	15
HD_Arlington	8.3	2	29.5	5	38.9	4	16.4	16	139.4	28	3.7	1	9.4	11	84	7
HD_Central Shenandoah	11.3	19	39.5	22	59.1	9	31.7	33	124.7	14	6.8	19	13.1	32	103.8	18
HD_Central Virginia	9.4	7	39.8	23	63.4	17	18.2	21	122.9	12	7.4	24	10.2	14	77.8	5
HD_Chesapeake	8.6	3	34.6	10	66.5	21	21.7	25	142	31	4.6	3	10.3	15	112.4	21
HD_Chesterfield	12.4	24	36.6	17	61.5	14	25.1	28	128.4	20	6.3	17	9.3	10	129.4	30
HD_Chickahominy	12.9	27	40.5	24	65.2	18	24.8	27	147.2	35	6.2	15	12.5	28	123	27
HD_Crater	13.4	31	42.5	31	84.6	35	14.5	12	134	24	9.8	32	9.2	8	165.1	35
HD_Cumberland Plateau	8.9	4	32.4	7	61.8	15	12.7	7	73.3	1	4.6	3	11.2	19	47.1	2
HD_Eastern Shore	10.4	11	37.8	19	77	34	31.4	32	125.7	16	13.8	35	13.6	33	111.2	20
HD_Fairfax	8.2	1	28	1	33.9	1	14.1	9	127.1	17	5.2	8	11.3	21	87.8	9
HD_Hampton	14.2	32	35.7	13	76.1	33	17	18	139.7	30	7.6	25	7.8	3	141.8	32
HD_Henrico	11.9	22	40.6	25	61.3	13	21.1	24	139.1	27	5.1	6	10.3	15	127.3	28
HD_Lenowisco	11.1	15	28.7	3	65.9	20	6.5	1	77.4	2	7.3	21	5.9	1	43.2	1
HD_Lord Fairfax	13	29	36.8	18	65.6	19	19.4	22	128	18	7.3	21	12.5	28	80	6
HD_Loudon	9.3	6	29.2	4	37.5	2	12.2	5	136.6	26	3.8	2	12.8	31	99.1	16
HD_Mount Rogers	9.9	10	33.9	8	66.8	22	15	13	92	3	5.1	6	11.5	23	74.5	3
HD_New River	11.8	21	36.4	15	61.2	12	17.3	20	107.7	4	5.9	13	9.2	8	74.8	4
HD_Norfolk	14.2	32	42.3	29	74.7	30	14.1	9	139.5	29	9.8	32	8	4	122	25
HD_Peninsula	11.7	20	35.4	12	60	11	26.7	31	142.1	32	8.2	27	9.6	13	128	29
HD_Piedmont	14.6	34	48.8	34	70.2	26	12.3	6	123.3	13	8.7	29	13.9	34	116.8	23
HD_Pittsylvania/Danville	11.1	15	47	33	66.8	22	9.4	2	121.5	10	9.4	31	9.5	12	91.3	10
HD_Portsmouth	10.8	14	42.3	29	72.9	28	15.1	14	132.5	23	7.1	20	14.2	35	147.9	34
HD_Prince William	9.2	5	30.7	6	47.4	5	10.9	3	116.5	5	5.5	9	10.3	15	84.8	8
HD_Rappahannock	12.6	25	39	20	75.7	32	16.6	17	128	18	6.5	18	11.4	22	113.8	22
HD_Rappahannock/Rapi	10.4	11	35.2	11	62.8	16	17	18	121	9	8	26	12.7	30	93.8	14
HD_Richmond City	11.1	15	41.6	28	72.5	27	12.8	8	131.9	22	8.2	27	8	4	142.8	33
HD_Roanoke City	12.9	27	49.2	35	74.4	29	19.5	23	124.8	15	7.3	21	8.2	6	104.7	19
HD_Southside	11.2	18	36.4	15	68.3	24	12	4	119.3	7	11	34	7.6	2	136.2	31
HD_Thomas Jefferson	12.7	26	36.1	14	59.8	10	22.3	26	130.4	21	5.8	10	11.6	24	91.6	12
HD_Three Rivers	16.3	35	40.7	26	75.3	31	25.5	29	121.6	11	4.6	3	12	26	122.1	26
HD_Virginia Beach	13	29	34.5	9	69.9	25	32.2	34	145.6	34	5.8	10	12.4	27	100.6	17
HD_West Piedmont	10.6	13	41.5	27	58	8	15.9	15	119.7	8	9	30	10.6	18	93.4	13
HD_Western Tidewater	9.6	8	42.8	32	56.8	7	25.6	30	144.8	33	5.9	13	8.2	6	120	24
Virginia	**11**		**36**		**58.9**		**19**		**127.9**		**6.2**		**10.8**		**102.8**	

Cancer Mortality Age-Adjusted Rates and Rank by Health Districts, VA, 2011-2015

Locality	Oral		Colorectal		Lung		Melanoma		Breast		Cervix		Ovary		Prostate	
	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank	Rate	Rank
Alexandria City	^	-	8.3	1	26.4	3	3.1	16	23.7	23	^	-	9.8	32	24.2	25
Alleghany	2.4	13	14.1	13	43.2	8	2.8	11	20.1	7	^	-	7.9	23	19.7	19
Arlington	^	-	9.9	2	25.9	2	1.8	3	21	13	^	-	6.9	11	18.1	10
Cental Virginia	2.6	15	14.2	14	47.4	15	3.3	20	20.5	10	^	-	7.5	16	22.8	22
Central Shenandoah	2.2	10	14	12	43.4	10	3.6	24	19.8	5	2.7	6	8.7	27	16.8	7
Chesapeake	2.1	9	13.9	11	51.1	23	2.9	12	23	18	^	-	9.1	29	24.8	26
Chesterfield	2	6	14.2	14	46.1	14	3.5	22	21.7	15	^	-	7.7	19	16.9	8
Chickahominy	^	-	13.4	8	49.9	19	3.1	16	23.9	24	^	-	7.1	14	15.8	3
Crater	4.4	29	18.1	31	58.4	31	2.5	8	25.6	29	4.3	9	6.4	5	28.9	32
Cumberland Plateau	3.2	20	20.1	35	64	33	4.7	28	24.4	27	^	-	9.8	32	13.6	1
Eastern Shore	^	-	15.8	22	66.1	34	^	-	20.6	11	^	-	11	34	30	33
Fairfax	1.7	2	10.6	3	24.1	1	2.1	5	17.9	2	1.2	1	6.9	11	15.8	3
Hampton	4	27	14.4	16	51.5	24	^	-	23.4	22	^	-	^	-	26.4	29
Henrico	1.8	3	14.7	20	45.8	13	2.7	9	24.8	28	2.3	5	8.4	26	18.9	14
Lenowisco	3.7	25	18.6	32	71.4	35	^	-	24	25	^	-	6.8	9	15	2
Lord Farifax	3.3	23	13.6	10	50.8	22	3.4	21	23.1	20	^	-	7.7	19	25.4	28
Loudoun	1.3	1	11	4	27.7	4	2.4	6	16.7	1	^	-	7.5	16	19.5	16
Mount Rogers	3.2	20	17.6	28	57.3	29	3.7	25	21.6	14	^	-	6.7	8	19.5	16
New River	3	18	14.5	18	47.4	15	3.5	22	18.6	4	^	-	6.9	11	17.9	9
Norfolk City	4.2	28	14.6	19	50	20	3.2	18	28.5	35	3.6	8	6.4	5	27.9	31
Peninsula	2.2	10	12.5	6	43.3	9	2.4	6	22.1	16	2.7	6	6.3	4	19.3	15
Piedmont	2.6	15	19.3	34	52.7	26	^	-	27.9	30	^	-	5.2	1	25.2	27
Pittsylvania/Danville	2.9	17	18.8	33	52	25	^	-	23	18	^	-	7.5	16	21.8	20
Portsmouth	^	-	17.9	29	57.6	30	^	-	27.9	30	^	-	9.5	31	38.2	35
Prince William	1.9	4	11.2	5	36.7	5	2	4	19.9	6	1.5	2	6	2	19.5	16
Rappahannock	2.2	10	15.2	21	49.1	18	1.6	1	20.7	12	2	4	7.6	19	16.2	5
Rappahannock/Rap	1.9	4	14.4	16	45	11	4.1	27	20.3	9	^	-	9.4	30	18.8	12
Richmond City	2	6	16	23	50.4	21	1.7	2	24.1	26	^	-	6.1	3	23.5	24
Roanoke	3.7	25	17.9	29	60.1	32	3.7	25	22.8	17	^	-	7.3	15	21.9	21
Southside	^	-	16.8	26	53.8	28	^	-	28	32	^	-	7.7	19	27.5	30
Thomas Jefferson	2	6	13.5	9	42.5	7	3	13	18.3	3	^	-	6.8	9	16.7	6
Three Rivers	3.6	24	16.2	24	53.7	27	2.7	9	20.1	7	^	-	8.8	28	23.4	23
Virginia Beach	2.4	13	12.8	7	45	11	3	13	23.1	20	1.9	3	8.3	23	18.8	12
West Piedmont	3.2	20	16.5	25	48.6	17	3.2	18	28.1	33	^	-	8.3	23	18.2	11
Western Tidewater	3.1	19	17.4	27	41.9	6	3	13	28.3	34	^	-	6.5	7	31.6	34
Virginia	**2.4**		**14**		**44**		**2.7**		**21.8**		**1.8**		**7.3**		**20.2**	
Data source: Virginia Cancer Registry, VA, 2011-2015																

Cancer Incidence Local Percentage Rank by Health District, VA, 2011-2015

HD	Breast		Cervix		Colorectal		Lung		Melanoma		Oral		Ovary		Prostate	
	Local %	Rank	Local %	Rank	Local %	Rank	Local %	Rank	Local %	Rank	Local %	Rank	Local %	Rank	Local %	Rank
Alexandria HD	64.3%	16	28.0%	32	36.9%	15	17.0%	26	68.3%	31	42.0%	2	17.4%	6	76.3%	23
Alleghany HD	67.0%	4	44.4%	7	40.1%	8	18.9%	19	80.3%	7	34.8%	9	17.6%	5	76.7%	22
Arlington HD	67.5%	1	52.4%	4	33.0%	27	14.4%	33	70.1%	30	28.4%	25	12.2%	18	72.7%	30
Central Shenandoah HD	65.9%	7	39.2%	14	36.3%	21	19.3%	17	81.5%	4	33.5%	13	14.6%	11	79.7%	14
Central Virginia HD	64.5%	14	35.3%	21	35.9%	22	16.4%	28	78.5%	13	32.7%	15	7.8%	31	75.3%	27
Chesapeake HD	64.8%	10	37.0%	20	31.7%	32	23.6%	3	80.0%	9	24.8%	32	9.0%	28	85.8%	1
Chesterfield HD	64.7%	11	49.2%	5	36.5%	19	20.5%	10	78.1%	15	30.9%	18	21.2%	2	81.4%	6
Chickahominy HD	62.5%	26	69.6%	1	41.9%	5	19.0%	18	75.6%	21	40.6%	3	10.9%	21	77.0%	21
Crater HD	56.7%	35	30.8%	29	32.6%	29	15.9%	30	72.9%	23	26.2%	29	13.0%	16	82.2%	4
Cumberland Plateau HD	61.2%	30	37.5%	17	29.0%	34	15.8%	31	67.0%	32	29.9%	19	10.0%	24	75.4%	26
Eastern Shore HD	57.6%	34	43.8%	9	37.9%	13	12.1%	35	83.3%	2	51.5%	1	13.0%	16	72.2%	32
Fairfax HD	65.9%	7	47.2%	6	36.9%	15	21.3%	6	71.6%	28	29.2%	22	11.7%	19	76.0%	25
Hampton HD	64.1%	18	28.6%	31	40.8%	7	19.5%	16	80.0%	9	31.5%	17	11.4%	20	81.1%	7
Henrico HD	66.3%	6	54.3%	2	43.8%	2	20.1%	12	77.2%	16	28.6%	24	14.9%	9	79.6%	17
Lenowisco HD	59.1%	32	23.5%	34	21.8%	35	14.9%	32	65.9%	33	21.9%	34	5.0%	34	66.7%	35
Lord Fairfax HD	64.7%	11	38.6%	16	31.4%	33	19.8%	14	70.6%	29	26.4%	28	14.4%	13	72.5%	31
Loudoun HD	63.7%	21	34.3%	25	37.4%	14	21.6%	5	65.2%	35	36.3%	6	21.0%	3	71.9%	33
Mount Rogers HD	62.8%	25	32.3%	26	34.0%	26	17.8%	22	72.8%	24	32.6%	16	14.1%	14	79.7%	14
New River HD	64.0%	19	39.1%	15	39.2%	11	20.6%	8	74.7%	22	40.2%	4	16.7%	7	80.4%	10
Norfolk HD	61.4%	29	35.2%	23	36.8%	17	20.6%	8	72.8%	24	24.4%	33	10.2%	23	80.0%	12
Peninsula HD	64.0%	19	31.4%	28	39.8%	10	21.7%	4	83.1%	3	35.3%	8	8.7%	29	80.4%	10
Piedmont HD	66.8%	5	25.0%	33	32.4%	30	16.0%	29	80.2%	8	39.6%	5	7.1%	33	81.1%	7
Pittsylvania-Danville HD	65.6%	9	29.2%	30	36.5%	19	17.3%	25	78.3%	14	25.3%	31	9.5%	27	82.6%	3
Portsmouth HD	63.3%	23	42.1%	10	32.9%	28	19.8%	14	76.6%	19	27.6%	27	4.9%	35	80.7%	9
Prince William HD	60.8%	31	53.0%	3	35.7%	23	17.6%	23	65.6%	34	29.7%	20	16.2%	8	75.0%	28
Rappahannock HD	64.4%	15	43.9%	8	39.9%	9	29.1%	1	77.0%	17	28.1%	26	14.7%	10	78.8%	19
Rappahannock-Rapidan	62.9%	24	35.1%	24	36.7%	18	20.5%	10	72.1%	26	34.8%	9	9.7%	26	73.3%	29
Richmond HD	61.5%	28	40.0%	13	45.1%	1	18.7%	20	76.7%	18	16.8%	35	21.6%	1	76.1%	24
Roanoke HD	64.2%	17	31.6%	27	41.5%	6	17.6%	23	80.5%	6	33.8%	12	18.5%	4	71.5%	34
Southside HD	58.4%	33	41.7%	12	32.2%	31	17.0%	26	72.1%	26	29.6%	21	7.7%	32	81.7%	5
Thomas Jefferson HD	67.4%	2	42.1%	10	42.0%	4	20.7%	7	79.6%	12	34.4%	11	9.9%	25	79.0%	18
Three Rivers HD	67.2%	3	35.3%	21	42.3%	3	18.6%	21	79.7%	11	32.8%	14	8.6%	30	79.7%	14
Virginia Beach HD	64.7%	11	37.1%	19	35.5%	25	24.3%	2	81.1%	5	28.7%	23	10.7%	22	79.9%	13
West Piedmont HD	61.8%	27	23.1%	35	39.1%	12	12.9%	34	76.1%	20	25.7%	30	14.5%	12	82.9%	2
Western Tidewater HD	63.6%	22	37.5%	17	35.7%	23	20.0%	13	85.3%	1	36.0%	7	13.2%	15	78.2%	20
Virginia	**64.2%**		**39.9%**		**37.2%**		**19.7%**		**76.8%**		**30.9%**		**12.9%**		**78.3%**	

Data source: Virginia Cancer Registry, VA, 2011-2015

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