West Virginia Cancer Registry
2011 Annual Report

Cancer Incidence in West Virginia, 1993-2008
2009 Provisional Data

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Chapter

1

The West Virginia Cancer Registry

History

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, two years prior to the Federal mandate, the WVCR began collecting data on non-malignant brain and other central nervous system tumors. WVCR is funded 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 Administrative Rules, Division of Health, Cancer Registry, Series 68, which provide the legal basis for WVCR, appear in Appendix B.

Mission

The West Virginia Cancer Registry will collect and analyze cancer data to determine incidence rates by anatomical site, sex, race, geographic location, and other factors and monitor trends in cancer incidence among West Virginia residents.

Geographic Coverage

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

Temporal Coverage

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

Confidentiality

All West Virginia Cancer Registry employees sign a confidentiality pledge that meets the requirements of applicable state laws as well as the requirements of the Health Insurance Portability and Accountability Act (HIPAA). West Virginia Code protects the confidentiality of both patient and health care provider. Legal analysis of the applicable state laws concerning the establishment and operation of the West Virginia Cancer Registry found that the West Virginia laws were, with one exception (specification of de-identification methodology), more stringent than HIPAA. Relevant materials from the United States Department of Health and Human Services are provided in Appendix C.

Release of Identified Information

West Virginia Code permits release of identified data **ONLY** under these circumstances:

1. Data provided by a facility or reporter may be provided back to that facility or reporter as a failsafe in the event of catastrophic data loss. However, ONLY data provided by the facility or reporter may be provided. Additional information provided by other sources may NOT be disclosed.
2. When a lawful reciprocal data sharing agreement exists, WVCR may provide identified data about another state or territory's residents or tribal entity's members diagnosed and/or treated in West Virginia back to the state/territory/tribal entity, which, in turn, is to provide WVCR with identified data on West Virginia residents.
3. Upon written consent signed by the patient or the patient's legal representative and specifying the cancer registry, identified data may be provided to researchers whose study protocols have met the prevailing institutional review board standards and whose protocols have been reviewed and approved by the West Virginia Cancer Registry Advisory Committee.

Funding

The West Virginia Cancer Registry is funded by appropriations made by the State of West Virginia and by the Centers for Disease Control and Prevention's (CDC) National Program of Cancer Registries (NPCR). Additional information about the NPCR is available from the CDC website (http://www.cdc.gov/cancer/npcr/index.htm).

Certification

The West Virginia Cancer Registry is subject to certification by the North American Association of Central Cancer Registries (NAACCR). Certification is based on timeliness, completeness and data quality. WVCR was certified at the "silver" level for diagnosis years 1997 and 1998 and at the "gold" (highest) level for diagnosis years 1999 through 2008 (the most recent year for which certification results were available at the time of this writing). In addition, West Virginia Cancer Registry data meet the 24-month standards of the National Program of Cancer Registries.

Use of West Virginia Cancer Registry Data

The West Virginia Cancer Registry 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 state, community-based, regional and national cancer control groups. WVCR also provides de-identified summary data (rates and distributions of stage at diagnosis) for use by the American Cancer Society and provides de-identified data to the Centers for Disease Control and Prevention for the publication United States Cancer Statistics (US Cancer Statistics Working Group, 2010) and to the North American Association of Central Cancer Registries for the Cancer in North America (CINA) publications (North American Association of Central Cancer Registries, 2011). Bona fide researchers may obtain access to **de-identified case level data** under strict controls including approval by the relevant institutional review board and the WVCR Cancer Advisory Committee.

General Comments on the 2011 Report

In keeping with the National Program of Cancer Registries standards regarding annual reports, WVCR will use United States Cancer Statistics (USCS) data (US Cancer Statistics Working Group, 2010) for national comparisons. USCS data, which are provided by SEER and NPCR registries and must meet standards for completeness (at least 90% complete based on the North American Association of Central Cancer Registries methods for estimating completeness of ascertainment and less than 5% of the cases ascertained solely on the basis of death certificates) and quality (less than 3% of the cases are missing information on age; less than 3% of the cases are missing information on sex; less than 5% of cases are missing information on race; 97% of the cases pass standard single field and inter-field computerized edits), include 98% of the US population. Note that because USCS has not, as of this writing, provided five-year average annual rates for the time period covered in this report, certain comparisons, such as age-specific rates and race-specific rates, which must be aggregated over five years to provide acceptable stability for West Virginia rates, are not possible, nor are USCS comparisons to county-level rates possible.

Chapter

2

All Site

Risk Factors

Cancer is a broad term used to describe a complex group of more than 100 diseases characterized by uncontrolled growth and spread of abnormal cells. Cancer is caused by changes in genes that control the life cycle of cells. Certain lifestyle and environmental factors can change the genes and increase risk of cancer. These include tobacco use, exposure to ultraviolet radiation from the sun, having certain types of human papillomavirus (HPV) or being exposed to certain chemicals in the workplace or environment. Some inherited gene alterations also increase risk of cancer. People can reduce their cancer risk by eliminating harmful environmental exposures and choosing the right health behaviors, such as by avoiding tobacco use, maintaining a healthy body weight and avoiding exposure to the sun (National Cancer Institute, 2010).

Screening and Early Detection

For certain types of cancer, screening has been found to improve survival by increasing the likelihood of early detection. These types include female breast cancer, cervical cancer and colorectal cancer (National Cancer Institute, 2010). The effectiveness of other types of screening, such as prostate-specific antigen (PSA) to detect prostate cancer, is less clear (National Cancer Institute, 2010).

Rates

Age-adjusted rates for all cancer sites combined are greater among West Virginia men and women than those for US men and women as a whole (Table 2-1). Cancer incidence increases with age until around age 85 (see Table 2-2). This pattern is also seen in the US as a whole (US Cancer Statistics Working Group, 2010).

Table 2-1. Age-Adjusted (2000 Standard) All Site Invasive Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	556.8 (540.5-573.0)	396.2 (384.3-408.0)	NA	NA
1994	553.0 (536.9-569.0)	405.0 (393.1-417.0)	NA	NA
1995	546.0 (530.1-561.8)	414.9 (402.9-426.9)	NA	NA
1996	557.0 (541.1-572.9)	424.8 (412.6-437.0)	NA	NA
1997	592.8 (576.5-609.1)	442.4 (430.1-454.8)	NA	NA
1998	595.3 (579.0-611.6)	436.6 (424.4-448.8)	NA	NA
1999	590.6 (574.5-606.6)	447.1 (434.8-459.5)	573.0 (571.6-574.5)	422.2 (421.2-423.3)
2000	595.6 (579.5-611.7)	441.5 (429.2-453.7)	574.5 (573.0-575.9)	421.5 (420.4-422.6)
2001	614.6 (598.4-630.8)	446.2 (433.9-458.5)	582.2 (580.8-583.6)	426.3 (425.3-427.4)
2002	592.3 (576.5-608.0)	437.9 (425.7-450.1)	578.1 (576.7-579.5)	422.5 (421.4-423.5)
2003	568.8 (553.4-584.1)	431.9 (419.8-444.0)	562.4 (561.0-563.7)	415.5 (414.5-416.6)
2004	575.0 (559.6-590.4)	440.3 (428.1-452.5)	556.5 (555.2-557.8)	414.6 (413.6-415.6)
2005	583.3 (567.9-598.6)	449.1 (436.8-461.5)	549.5 (548.3-550.8)	415.4 (414.4-416.3)
2006	597.3 (581.9-612.8)	442.2 (429.9-454.4)	550.7 (549.5-552.0)	414.5 (413.5-415.5)
2007	599.3 (583.9-614.6)	447.0 (434.7-459.3)	543.2 (542.0-544.5)	409.4 (408.5-410.4)
2008	556.8 (542.1-571.5)	431.9 (419.8-444.0)	NA	NA

Note: USCS data are available only for 1999 through 2007. All Sites excludes basal and squamous cell skin cancers, and in situ cancers except urinary bladder.

Table 2-2. Age-Specific Average Annual (2004 to 2008)
All Site Invasive Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	24.9
5 to 9	11.2
10 to 14	10.8
15 to 19	21.1
20 to 24	38.0
25 to 29	61.8
30 to 34	95.9
35 to 39	148.8
40 to 44	254.5
45 to 49	394.8
50 to 54	616.6
55 to 59	908.5
60 to 64	1423.0
65 to 69	1916.4
70 to 74	2275.4
75 to 79	2518.7
80 to 84	2516.5
85 and older	2098.3

Note: All Sites excludes basal and squamous cell skin cancers, and in situ cancers except urinary bladder.

In West Virginia, as in the US as a whole (US Cancer Statistics Working Group, 2010), cancer incidence rates are higher for African American men than for white men, although not statistically significantly so (Table 2-3). Conversely, in West Virginia and the US as a whole, rates for African American women are statistically significantly less than those of white women (Table 2-3) (US Cancer Statistics Working Group, 2010).

Table 2-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) All Site Invasive Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	629.4 (582.9-675.9)	587.8 (580.8-594.8)
Women	375.9 (345.1-406.7)	447.5 (441.9-453.2)

Note: All Sites excludes basal and squamous cell skin cancers, and in situ cancers except urinary bladder.

The table (Table 2-4) on the following pages summarizes county-level information on all site cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive cancer for all sites except bladder, which includes both in situ and invasive cases.
- The average annual age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval. The National Cancer Institute defines a confidence interval as the "range of values that has a specified probability of containing a rate." It is customary to use a 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia. The 95% confidence intervals were used to determine whether the county incidence rates differed from the state rate.

In order to provide rates that are reasonably stable, WVCR uses five-year average annual incidence rates. This is the customary period used by cancer epidemiologists and others who work with population data.

All site cancer incidence rates in Cabell, Fayette, Hampshire, Hancock, Kanawha, Lincoln, Logan, Mingo, Ohio and Wirt counties are statistically higher than the state rate (Table 2-4). All site cancer incidence rates in Braxton, Brooke, Doddridge, Grant, Hardy, Jefferson, Marshall, Mason, Morgan, Pendleton, Raleigh, Summers, Taylor, Tyler, and Wayne counties are significantly lower than the West Virginia rate (Table 2-4). There are many reasons counties may have elevated rates of all cancers. However, because different types of cancer have different causes, these elevated rates are best understood by looking at the site-specific rates (e.g., lung, colorectal, etc.) in the following chapters.

Table 2-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
All Site Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	54926	496.5	500.8	505.0	
Barbour	476	457.1	502.8	548.5	NO
Berkeley	2346	486.3	507.2	528.0	NO
Boone	716	456.1	492.9	529.6	NO
Braxton	389	379.9	422.5	465.1	LOWER
Brooke	709	395.6	427.9	460.3	LOWER
Cabell	3327	564.8	584.9	605.1	HIGHER
Calhoun	229	420.2	484.2	548.1	NO
Clay	318	488.2	549.3	610.4	NO
Doddridge	151	296.5	354.1	411.8	LOWER
Fayette	1567	516.7	544.0	571.3	HIGHER
Gilmer	208	433.8	503.8	573.7	NO
Grant	298	328.7	372.0	415.3	LOWER
Greenbrier	1224	497.8	528.0	558.2	NO
Hampshire	779	558.6	601.3	644.1	HIGHER
Hancock	1232	540.5	573.2	605.9	HIGHER
Hardy	341	375.5	420.9	466.3	LOWER
Harrison	2181	496.7	518.7	540.8	NO
Jackson	923	486.0	520.0	553.9	NO
Jefferson	1106	422.1	449.3	476.6	LOWER
Kanawha	6485	516.5	529.6	542.7	HIGHER
Lewis	580	482.1	525.4	568.7	NO
Lincoln	709	510.8	551.9	593.0	HIGHER
Logan	1155	514.9	547.1	579.2	HIGHER
McDowell	744	456.1	492.2	528.3	NO
Marion	1774	472.8	496.4	520.0	NO
Marshall	996	425.5	454.2	482.8	LOWER
Mason	743	423.2	456.5	489.8	LOWER
Mercer	2093	502.1	525.0	548.0	NO
Mineral	824	482.9	518.9	554.8	NO
Mingo	828	514.4	552.7	591.1	HIGHER
Monongalia	1820	456.8	479.1	501.4	NO
Monroe	419	419.1	464.4	509.7	NO
Morgan	436	383.6	423.8	464.1	LOWER
Nicholas	784	442.7	476.6	510.5	NO
Ohio	1699	535.1	562.6	590.2	HIGHER

Table 2-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) All Site Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	54926	496.5	500.8	505.0	
Pendleton	211	322.9	374.8	426.6	LOWER
Pleasants	216	431.2	498.6	566.1	NO
Pocahontas	275	411.3	467.8	524.4	NO
Preston	862	443.6	475.8	507.9	NO
Putnam	1428	452.3	477.4	502.6	NO
Raleigh	2212	434.4	453.6	472.7	LOWER
Randolph	856	461.8	495.4	529.0	NO
Ritchie	301	411.0	464.2	517.3	NO
Roane	431	412.4	456.2	499.9	NO
Summers	385	373.5	415.6	457.7	LOWER
Taylor	426	392.8	434.5	476.2	LOWER
Tucker	235	404.7	466.0	527.4	NO
Tyler	258	366.4	418.2	470.0	LOWER
Upshur	700	460.7	498.2	535.7	NO
Wayne	976	368.6	393.6	418.7	LOWER
Webster	302	449.6	508.0	566.4	NO
Wetzel	593	488.1	531.9	575.7	NO
Wirt	210	531.2	615.9	700.6	HIGHER
Wood	2725	486.8	506.1	525.4	NO
Wyoming	715	455.4	492.4	529.4	NO

Chapter

3

Head and Neck

Risk Factors

According to the American Cancer Society, risk factors for head and neck cancer include tobacco use, alcohol use, human papillomavirus infection, gender (men are at greater risk than women, but this difference may be a result of men being more likely to use tobacco and alcohol), diet low in fruits and vegetables, and health conditions such as immune suppression and graft-versus-host-disease (American Cancer Society, 2011).

Screening

According to the American Cancer Society, regular dental checkups that include examination of the entire mouth play an important role in finding head and neck cancers (American Cancer Society, 2011). The American Cancer Society also recommends that doctors examine the head and neck as a part of routine cancer-related checkups.

Rates

Age-adjusted rates of head and neck cancer are higher for men than women in West Virginia and the US as a whole (Table 3-1). As with many other cancers, the rates of head and neck cancers increase with age (Table 3-2). There is no racial predominance of head and neck cancer in West Virginia (Table 3-3).

Table 3-1. Age-Adjusted (2000 Standard) Invasive Head and Neck Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	17.6 (14.7-20.5)	5.9 (4.5-7.4)	NA	NA
1994	14.9 (12.4-17.5)	7.2 (5.6-8.9)	NA	NA
1995	17.5 (14.7-20.3)	5.8 (4.4-7.2)	NA	NA
1996	16.0 (13.4-18.6)	5.4 (4.1-6.8)	NA	NA
1997	15.9 (13.3-18.5)	4.2 (3.0-5.4)	NA	NA
1998	16.3 (13.6-18.9)	6.4 (4.9-7.9)	NA	NA
1999	15.9 (13.3-18.4)	5.9 (4.5-7.3)	16.2 (16.0-16.4)	6.3 (6.2-6.5)
2000	15.8 (13.2-18.4)	7.2 (5.6-8.8)	16.3 (16.0-16.5)	6.2 (6.1-6.3)
2001	17.6 (14.9-20.4)	3.7 (2.6-4.8)	16.0 (15.8-16.2)	6.2 (6.1-6.4)
2002	15.5 (13.0-18.0)	6.0 (4.6-7.4)	16.1 (15.9-16.4)	6.2 (6.0-6.3)
2003	16.7 (14.1-19.3)	6.3 (4.9-7.8)	16.3 (16.1-16.5)	6.1 (5.9-6.2)
2004	15.4 (12.9-17.8)	5.9 (4.5-7.3)	16.2 (16.0-16.4)	6.0 (5.9 -6.1)
2005	18.3 (15.6-21.0)	5.5 (4.1-7.0)	15.9 (15.7-16.1)	6.1 (6.0-6.2)
2006	16.3 (13.8-18.9)	6.0 (4.6-7.5)	15.8 (15.6-16.0)	6.2 (6.1-6.3)
2007	19.0 (16.4-21.7)	5.8 (4.4-7.1)	16.1 (15.9-16.3)	6.0 (5.9-6.1)
2008	18.1 (15.5-20.7)	7.7 (6.1-9.3)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 3-2. Age-Specific Average Annual (2004 to 2008) Invasive Head and Neck Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	~
10 to 14	~
15 to 19	~
20 to 24	0.7
25 to 29	1.5
30 to 34	1.6
35 to 39	3.7
40 to 44	8.4
45 to 49	16.8
50 to 54	23.0
55 to 59	28.5
60 to 64	41.8
65 to 69	37.4
70 to 74	37.9
75 to 79	34.5
80 to 84	29.5
85 and older	34.9

~ Fewer than 4 cases reported during the entire period.

Table 3-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Head and Neck Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	14.6 (7.7-21.4)	17.7 (16.5-18.8)
Women	4.3 (0.8-7.8)	6.4 (5.7-7.0)

The table (Table 3-4) on the following pages summarizes county-level information on invasive head and neck cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive head and neck cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Head and neck cancer incidence rates in Fayette, Hampshire, and Lincoln counties are statistically higher than the state rate (Table 3-4). Wyoming County has a significantly lower head and neck cancer incidence rate than the West Virginia rate (Table 3-4).

Table 3-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Head and Neck Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1260	10.8	11.5	12.1	
Barbour	12	5.2	12.0	18.8	NO
Berkeley	46	6.6	9.3	12.1	NO
Boone	16	5.7	11.4	17.0	NO
Braxton	9	3.2	9.3	15.5	NO
Brooke	15	4.5	9.3	14.2	NO
Cabell	58	7.8	10.5	13.3	NO
Calhoun	10	8.6	24.1	39.7	NO
Clay	7	2.9	11.4	20.0	NO
Doddridge	5	1.1	10.7	20.2	NO
Fayette	54	14.0	19.2	24.5	HIGHER
Gilmer	6	2.7	13.9	25.1	NO
Grant	7	2.2	8.6	15.1	NO
Greenbrier	22	5.6	9.7	13.8	NO
Hampshire	28	14.2	22.7	31.2	HIGHER
Hancock	32	10.1	15.7	21.2	NO
Hardy	5	0.7	6.3	11.8	NO
Harrison	46	8.1	11.5	14.9	NO
Jackson	17	5.3	10.3	15.3	NO
Jefferson	24	5.8	9.8	13.8	NO
Kanawha	151	10.2	12.2	14.1	NO
Lewis	8	2.0	6.6	11.2	NO
Lincoln	27	13.1	21.1	29.2	HIGHER
Logan	36	11.6	17.5	23.3	NO
McDowell	13	3.8	8.7	13.6	NO
Marion	45	9.3	13.2	17.1	NO
Marshall	24	6.8	11.5	16.3	NO
Mason	23	7.8	13.2	18.6	NO
Mercer	39	7.2	10.7	14.2	NO
Mineral	19	6.0	11.1	16.2	NO
Mingo	20	7.1	12.8	18.5	NO
Monongalia	35	6.1	9.1	12.2	NO
Monroe	13	6.6	14.6	22.7	NO
Morgan	13	5.3	11.6	18.0	NO
Nicholas	16	4.5	8.9	13.3	NO
Ohio	39	8.3	12.2	16.1	NO

~ Fewer than 4 cases reported during the entire period.

Table 3-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Head and Neck Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1260	10.8	11.5	12.1	
Pendleton	~				
Pleasants	6	2.6	13.4	24.2	NO
Pocahontas	7	2.8	11.2	19.5	NO
Preston	20	6.1	10.9	15.7	NO
Putnam	33	6.4	9.9	13.3	NO
Raleigh	51	7.4	10.3	13.2	NO
Randolph	17	5.1	9.8	14.6	NO
Ritchie	~				
Roane	11	5.0	12.6	20.3	NO
Summers	11	4.7	11.5	18.4	NO
Taylor	14	6.6	13.9	21.3	NO
Tucker	8	4.8	17.4	29.9	NO
Tyler	9	4.9	14.4	23.8	NO
Upshur	12	3.9	9.3	14.8	NO
Wayne	23	5.3	9.0	12.8	NO
Webster	6	1.7	9.0	16.3	NO
Wetzel	14	5.6	11.9	18.3	NO
Wirt	8	6.3	21.7	37.1	NO
Wood	59	8.0	10.8	13.6	NO
Wyoming	8	1.6	5.7	9.7	LOWER

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, about one-third of head and neck cancers are diagnosed at the in situ or local stage, before the disease has spread (Table 3-5).

Table 3.5 Stage at Diagnosis, Head and Neck Cancers, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	1.7
Local	28.2
Regional	45.5
Distant	16.9
Unknown	7.7

Table 3-6. Early Diagnosis of Head and Neck Cancers by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	32.0
≥ 50	29.4
RACE	
White	30.0
African American	23.1
SEX	
Male	26.1
Female	39.3

Table 3-7. Early Diagnosis of Head and Neck Cancers by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	35.9
1999-2003	34.5
2004-2008	29.9

Chapter

4

Esophagus

Risk Factors

According to the American Cancer Society, risk factors for esophageal cancer include increasing age, gender (men have a greater risk than women), tobacco use, long-term heavy alcohol use, obesity, diets low in fruits and vegetables, certain medical conditions (i.e., gastroesophageal reflux, Barrett esophagus, Plummer-Vinson syndrome, achalasia and tylosis), ingestion of lye, and occupational exposures to solvents used in dry cleaning (American Cancer Society, 2011).

Screening

There are currently no esophageal cancer screening tests recommended for use with the general population. People at high risk of developing esophageal cancer (e.g., persons with Barrett esophagus) should follow the recommendations of their health care providers (American Cancer Society, 2011).

Rates

Rates for West Virginia men tend to be higher than those for US men as a whole, but the difference is statistically significant only in 2003 (Table 4-1). Esophageal cancer incidence increases with age (Table 4-2). There is no racial predominance of esophageal cancer in West Virginia (Table 4-3).

Table 4-1. Age-Adjusted (2000 Standard) Invasive Esophageal Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	8.3 (6.3-10.2)	1.4 (0.7-2.0)	NA	NA
1994	8.3 (6.4-10.2)	1.7 (1.0-2.4)	NA	NA
1995	7.8 (5.9-9.7)	1.4 (0.7-2.0)	NA	NA
1996	6.8 (5.0-8.5)	2.1 (1.3-2.9)	NA	NA
1997	9.4 (7.3-11.4)	2.0 (1.2-2.8)	NA	NA
1998	9.4 (7.4-11.5)	1.8 (1.0-2.5)	NA	NA
1999	8.1 (6.2-10.0)	2.2 (1.3-3.0)	8.7 (8.6-8.9)	2.1 (2.0-2.2)
2000	10.0 (7.9-12.1)	1.2 (0.6-1.8)	8.6 (8.4-8.8)	2.2 (2.1-2.2)
2001	8.6 (6.6-10.5)	2.7 (1.8-3.6)	8.7 (8.5-8.8)	2.1 (2.0-2.2)
2002	9.5 (7.5-11.5)	1.7 (1.0-2.5)	8.5 (8.3-8.7)	2.0 (2.0-2.1)
2003	11.4 (9.2-13.5)	2.5 (1.6-3.4)	8.7 (8.6-8.9)	2.0 (2.0-2.1)
2004	8.5 (6.7-10.4)	2.1 (1.3-3.0)	8.9 (8.7-9.1)	2.1 (2.0-2.2)
2005	8.3 (6.5-10.1)	2.0 (1.2-2.8)	8.7 (8.6-8.9)	2.0 (1.9-2.1)
2006	10.0 (8.0-11.9)	1.6 (0.9-2.3)	8.7 (8.6-8.9)	2.0 (1.9-2.1)
2007	9.4 (7.5-11.3)	2.1 (1.3-2.8)	8.4 (8.3-8.6)	1.9 (1.8-1.9)
2008	9.8 (7.9-11.7)	1.1 (0.6-1.7)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 4-2. Age-Specific Average Annual (2004 to 2008) Invasive Esophageal Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	~
30 to 34	0.0
35 to 39	~
40 to 44	1.9
45 to 49	4.2
50 to 54	7.4
55 to 59	13.5
60 to 64	20.1
65 to 69	24.4
70 to 74	15.1
75 to 79	21.8
80 to 84	27.6
85 and older	24.4

~ Fewer than 4 cases reported during the entire period.

Table 4-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Esophageal Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	6.6 (1.6-11.5)	9.4 (8.5-10.3)
Women	2.1 (0.0-4.2)	1.8 (1.4-2.1)

The table (Table 4-4) on the following pages summarizes county-level information on esophageal cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive esophageal cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Esophageal cancer incidence rates in Harrison and Wood counties are statistically lower than the state rate (Table 4-4).

Table 4-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Esophageal Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	590	4.8	5.2	5.6	
Barbour	6	1.2	6.2	11.2	NO
Berkeley	39	5.4	7.9	10.4	NO
Boone	10	2.4	6.3	10.3	NO
Braxton	4	0.1	3.8	7.6	NO
Brooke	5	0.3	2.7	5.1	NO
Cabell	36	4.3	6.4	8.5	NO
Calhoun	~				
Clay	6	2.0	10.2	18.3	NO
Doddridge	0				
Fayette	24	4.7	7.8	11.0	NO
Gilmer	~				
Grant	4	0.1	4.3	8.6	NO
Greenbrier	14	2.8	6.0	9.2	NO
Hampshire	11	3.5	8.6	13.8	NO
Hancock	11	2.1	5.2	8.2	NO
Hardy	~				
Harrison	11	1.1	2.7	4.4	LOWER
Jackson	10	2.1	5.6	9.0	NO
Jefferson	10	1.3	3.5	5.8	NO
Kanawha	66	3.8	5.1	6.3	NO
Lewis	8	2.1	6.8	11.5	NO
Lincoln	10	3.0	8.1	13.2	NO
Logan	12	2.3	5.5	8.7	NO
McDowell	7	1.1	4.6	8.2	NO
Marion	19	2.6	4.9	7.1	NO
Marshall	16	3.6	7.2	10.7	NO
Mason	~				
Mercer	20	2.6	4.6	6.6	NO
Mineral	10	2.4	6.3	10.3	NO
Mingo	7	1.1	4.4	7.7	NO
Monongalia	15	1.7	3.5	5.3	NO
Monroe	4	0.1	4.3	8.6	NO
Morgan	7	1.6	6.4	11.1	NO
Nicholas	~				
Ohio	23	4.4	7.6	10.7	NO

~ Fewer than 4 cases reported during the entire period.

Table 4-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Esophageal Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	590	4.8	5.2	5.6	
Pendleton	0				
Pleasants	0				
Pocahontas	~				
Preston	15	4.1	8.3	12.6	NO
Putnam	23	4.5	7.7	10.9	NO
Raleigh	23	2.8	4.8	6.8	NO
Randolph	5	0.3	2.7	5.1	NO
Ritchie	7	2.5	10.0	17.4	NO
Roane	5	0.7	5.7	10.7	NO
Summers	4	0.0	4.0	7.9	NO
Taylor	4	0.1	3.8	7.5	NO
Tucker	~				
Tyler	~				
Upshur	8	1.6	5.2	8.8	NO
Wayne	16	3.0	6.0	8.9	NO
Webster	~				
Wetzel	6	1.0	5.4	9.7	NO
Wirt	~				
Wood	18	1.6	2.9	4.3	LOWER
Wyoming	9	2.0	6.0	10.1	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, about one-quarter of esophageal cancers are diagnosed at the in situ or local stage, before the disease has spread (Table 4-5).

Table 4.5 Stage at Diagnosis, Esophageal Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	1.7
Local	22.8
Regional	27.0
Distant	30.2
Unknown	18.3

Table 4-6. Early Diagnosis of Esophageal Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	24.4
≥ 50	24.5
RACE	
White	24.6
African American	~
SEX	
Male	22.4
Female	33.3

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 4-7. Early Diagnosis of Esophageal Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	23.4
1999-2003	25.5
2004-2008	24.5

Chapter 5

Stomach

Risk Factors

Risk factors for stomach cancer include age (persons 60 and older are at greater risk), gender (men are at greater risk), race and ethnicity (African Americans and Hispanics are at greater risk than non-Hispanic whites), family history of stomach cancer, *Helicobacter pylori (H. pylori)* infection, history of pernicious anemia, personal history of Menetrier disease, tobacco use, obesity, and diets that have large amounts of smoked foods, salted fish and meat, and pickled vegetables.

Screening

There are currently no recommended stomach cancer screening tests for the general population in the United States. Persons who are at higher risk of stomach cancer should consult their health care practitioner about screening (American Cancer Society, 2011).

Rates

Stomach cancer rates in West Virginia tend to be lower than those for the US as a whole (Table 5-1). Stomach cancer incidence rates are higher among men than women (Table 5-1). The incidence of invasive stomach cancer increases with age, particularly after age 59 (Table 5-2). In West Virginia, stomach cancer is more common in African Americans than in whites, although the increased risk is not statistically significant (Table 5-3).

Table 5-1. Age-Adjusted (2000 Standard) Invasive Stomach Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	10.6 (8.2-12.9)	3.7 (2.7-4.8)	NA	NA
1994	10.0 (7.8-12.3)	3.6 (2.5-4.6)	NA	NA
1995	11.2 (8.8-13.5)	4.9 (3.7-6.2)	NA	NA
1996	11.1 (8.8-13.4)	5.0 (3.7-6.3)	NA	NA
1997	9.6 (7.4-11.7)	4.9 (3.6-6.1)	NA	NA
1998	8.5 (6.5-10.5)	3.6 (2.5-4.6)	NA	NA
1999	7.7 (5.8-9.6)	3.5 (2.4-4.6)	11.1 (10.9-11.3)	5.1 (5.0-5.3)
2000	8.9 (6.9-10.8)	3.1 (2.2-4.1)	10.7 (10.5-10.9)	5.1 (5.0-5.2)
2001	9.1 (7.1-11.2)	4.4 (3.2-5.6)	10.5 (10.3-10.7)	4.9 (4.8-5.0)
2002	9.4 (7.3-11.5)	3.6 (2.5-4.6)	10.3 (10.1-10.5)	4.9 (4.8-5.1)
2003	7.8 (6.0-9.7)	5.7 (4.4-7.1)	10.2 (10.0-10.4)	5.0 (4.9-5.1)
2004	9.7 (7.6-11.7)	4.9 (3.7-6.2)	10.0 (9.8-10.1)	4.9 (4.8-5.0)
2005	8.6 (6.7-10.5)	3.7 (2.6-4.8)	9.6 (9.4-9.8)	4.7 (4.6-4.8)
2006	6.1 (4.5-7.6)	4.4 (3.2-5.5)	9.4 (9.2-9.5)	4.7 (4.6-4.8)
2007	8.4 (6.6-10.2)	3.3 (2.3-4.3)	9.2 (9.0-9.3)	4.6 (4.5-4.7)
2008	7.7 (5.9-9.4)	4.0 (2.9-5.2)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 5-2. Age-Specific Average Annual (2004 to 2008)
Invasive Stomach Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	~
20 to 24	~
25 to 29	0.7
30 to 34	0.7
35 to 39	1.5
40 to 44	1.6
45 to 49	3.0
50 to 54	6.7
55 to 59	10.0
60 to 64	18.6
65 to 69	24.4
70 to 74	24.3
75 to 79	25.0
80 to 84	42.4
85 and older	36.6

~ Fewer than 4 cases reported during the entire period.

Table 5-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Stomach Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	16.5 (8.7-24.2)	8.0 (7.2-8.8)
Women	6.4 (2.5-10.3)	4.0 (3.5-4.5)

The table (Table 5-4) on the following pages summarizes county-level information on invasive stomach cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive stomach cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Stomach cancer incidence rates in Mason and Monongalia counties are statistically lower than the state rate (Table 5-4).

Table 5-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Stomach Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	652	5.4	5.8	6.3	
Barbour	9	3.5	10.5	17.4	NO
Berkeley	39	2.8	4.9	7.0	NO
Boone	7	1.2	5.0	8.9	NO
Braxton	11	4.5	11.0	17.6	NO
Brooke	13	3.4	7.5	11.6	NO
Cabell	33	3.6	5.5	7.4	NO
Calhoun	~				
Clay	6	2.0	10.2	18.3	NO
Doddridge	~				
Fayette	24	4.9	8.3	11.6	NO
Gilmer	5	1.4	11.4	21.4	NO
Grant	7	2.1	8.2	14.3	NO
Greenbrier	17	3.7	7.3	10.8	NO
Hampshire	4	0.0	2.8	5.6	NO
Hancock	15	3.2	6.4	9.7	NO
Hardy	8	3.0	10.2	17.4	NO
Harrison	29	4.2	6.7	9.2	NO
Jackson	11	2.4	5.9	9.4	NO
Jefferson	16	3.2	6.4	9.6	NO
Kanawha	81	5.0	6.4	7.8	NO
Lewis	5	0.5	4.3	8.0	NO
Lincoln	10	3.2	8.6	14.0	NO
Logan	14	3.0	6.3	9.7	NO
McDowell	14	4.3	9.4	14.5	NO
Marion	27	4.5	7.2	10.0	NO
Marshall	13	2.7	5.9	9.1	NO
Mason	4	0.0	2.4	4.7	LOWER
Mercer	28	4.2	6.7	9.2	NO
Mineral	7	1.0	4.1	7.2	NO
Mingo	9	2.0	5.7	9.5	NO
Monongalia	13	1.5	3.4	5.3	LOWER
Monroe	5	0.6	5.3	10.1	NO
Morgan	~				
Nicholas	7	1.1	4.3	7.5	NO
Ohio	15	2.2	4.8	7.3	NO

~ Fewer than 4 cases reported during the entire period.

Table 5-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Stomach Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	652	5.4	5.8	6.3	
Pendleton	~				
Pleasants	~				
Pocahontas	~				
Preston	7	0.9	3.6	6.4	NO
Putnam	15	2.3	4.7	7.1	NO
Raleigh	20	2.3	4.1	5.9	NO
Randolph	12	2.9	6.9	10.9	NO
Ritchie	8	4.7	13.8	22.9	NO
Roane	5	0.6	5.1	9.7	NO
Summers	8	2.5	8.5	14.5	NO
Taylor	6	1.1	5.8	10.5	NO
Tucker	~				
Tyler	4	0.1	6.7	13.3	NO
Upshur	10	2.8	7.8	12.7	NO
Wayne	9	1.2	3.7	6.1	NO
Webster	~				
Wetzel	5	0.5	4.4	8.4	NO
Wirt	~				
Wood	27	3.0	4.9	6.8	NO
Wyoming	10	2.6	7.2	11.7	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately one-quarter of stomach cancers are diagnosed at the in situ or local stage, and approximately one-quarter are diagnosed at the distant stage (Table 5-5).

Table 5-5. Stage at Diagnosis, Stomach Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	1.5
Local	24.9
Regional	30.1
Distant	28.1
Unknown	15.4

Table 5-6. Early Diagnosis of Stomach Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	18.0
≥ 50	27.1
RACE	
White	27.0
African American	17.2
SEX	
Male	24.0
Female	30.4

Table 5-7. Early Diagnosis of Stomach Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	20.4
1999-2003	22.6
2004-2008	26.4

Chapter

6

Small Intestine

Risk Factors

Risk factors for developing cancer of the small intestine include increasing age, gender (men are at higher risk than women), and tobacco and alcohol use (American Cancer Society, 2011). Certain health conditions such as Crohn's disease, familial adenomatous polyposis, hereditary nonpolyposis colorectal cancer, and Peutz-Jehgers syndrome also increase risk (American Cancer Society, 2011).

Screening

Persons with health conditions that increase their risk of small intestine cancer should discuss screening options with their health care providers (American Cancer Society, 2011).

Rates

Cancer of the small intestine occurs slightly more often in men than in women, though for most years reported, this difference is not statistically significant (Table 6-1). Risk increases with age (Table 6-2). In West Virginia, the rate of invasive cancer of the small intestine is significantly higher in African American men as compared to white men (Table 6-3). The rate is higher in African American women as compared to white women; however, this difference is not statistically significant (Table 6-3).

Table 6-1. Age-Adjusted (2000 Standard) Invasive Small Intestine Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	1.4 (0.6-2.2)	1.0 (0.4-1.5)	NA	NA
1994	1.3 (0.5-2.0)	1.5 (0.8-2.2)	NA	NA
1995	1.0 (0.3-1.6)	1.0 (0.4-1.5)	NA	NA
1996	1.1 (0.4-1.8)	1.0 (0.4-1.6)	NA	NA
1997	2.0 (1.0-2.9)	1.0 (0.5-1.6)	NA	NA
1998	0.9 (0.3-1.5)	1.1 (0.5-1.7)	NA	NA
1999	2.1 (1.1-3.0)	1.0 (0.4-1.5)	2.0 (2.0-2.1)	1.4 (1.4-1.5)
2000	1.5 (0.8-2.3)	1.3 (0.6-1.9)	2.0 (1.9-2.1)	1.4 (1.4-1.5)
2001	1.0 (0.4-1.7)	1.6 (0.9-2.4)	2.1 (2.0-2.2)	1.5 (1.4-1.6)
2002	1.5 (0.7-2.2)	1.6 (0.8-2.3)	2.2 (2.1-2.3)	1.5 (1.5-1.6)
2003	1.8 (0.9-2.7)	1.8 (1.0-2.5)	2.2 (2.1-2.3)	1.6 (1.5-1.6)
2004	2.0 (1.1-2.9)	1.3 (0.7-1.9)	2.3 (2.2-2.4)	1.6 (1.6-1.7)
2005	1.7 (0.9-2.6)	1.4 (0.7-2.0)	2.3 (2.2-2.4)	1.7 (1.6-1.7)
2006	2.4 (1.4-3.4)	1.7 (1.0-2.5)	2.4 (2.3-2.5)	1.7 (1.7-1.8)
2007	2.3 (1.3-3.3)	1.6 (0.9-2.4)	2.4 (2.3-2.5)	1.8 (1.7-1.8)
2008	2.9 (1.9-4.0)	1.7 (0.9-2.4)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 6-2. Age-Specific Average Annual (2004 to 2008)
Invasive Small Intestine Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	~
30 to 34	0
35 to 39	1.0
40 to 44	~
45 to 49	0.9
50 to 54	3.0
55 to 59	4.7
60 to 64	5.4
65 to 69	6.9
70 to 74	5.2
75 to 79	8.8
80 to 84	13.8
85 and older	11.6

~ Fewer than 4 cases reported during the entire period.

Table 6-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Small Intestine Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	8.9 (3.2-14.7)	2.1 (1.7-2.6)
Women	2.7 (0.3-5.0)	1.5 (1.2-1.8)

County Rates

The table (Table 6-4) on the following pages summarizes county-level information on invasive small intestine cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive small intestine cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Small intestine cancer rates did not differ between individual counties and the state as a whole (Table 6-4).

Table 6-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Small Intestine Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	212	1.6	1.9	2.1	
Barbour	~				
Berkeley	10	0.8	2.0	3.3	NO
Boone	4	0.0	2.7	5.4	NO
Braxton	~				
Brooke	~				
Cabell	8	0.4	1.5	2.7	NO
Calhoun	~				
Clay	~				
Doddridge	~				
Fayette	6	0.4	1.9	3.4	NO
Gilmer	~				
Grant	0				
Greenbrier	9	1.2	3.6	5.9	NO
Hampshire	~				
Hancock	5	0.3	2.4	4.5	NO
Hardy	~				
Harrison	4	0.0	0.9	1.7	NO
Jackson	5	0.3	2.6	4.9	NO
Jefferson	~				
Kanawha	25	1.1	1.9	2.6	NO
Lewis	~				
Lincoln	~				
Logan	~				
McDowell	5	0.3	3.0	5.6	NO
Marion	15	1.9	4.0	6.1	NO
Marshall	5	0.3	2.4	4.5	NO
Mason	4	0.0	2.6	5.3	NO
Mercer	9	0.7	2.0	3.4	NO
Mineral	5	0.3	2.9	5.5	NO
Mingo	~				
Monongalia	6	0.3	1.5	2.7	NO
Monroe	4	0.1	4.1	8.1	NO
Morgan	~				
Nicholas	~				
Ohio	5	0.2	1.5	2.7	NO

~ Fewer than 4 cases reported during the entire period.

Table 6-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Small Intestine Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	212	1.6	1.9	2.1	
Pendleton	~				
Pleasants	~				
Pocahontas	~				
Preston	~				
Putnam	5	0.2	1.7	3.3	NO
Raleigh	~				
Randolph	~				
Ritchie	~				
Roane	~				
Summers	0				
Taylor	~				
Tucker	0				
Tyler	~				
Upshur	~				
Wayne	~				
Webster	~				
Wetzel	4	0.0	3.7	7.3	NO
Wirt	0				
Wood	13	1.0	2.3	3.6	NO
Wyoming	~				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately one-third of small intestine cancers are diagnosed at the in situ or local stage, before the disease has spread (Table 6-5).

Table 6.5 Stage at Diagnosis, Small Intestine Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	1.8
Local	34.3
Regional	35.2
Distant	19.4
Unknown	9.3

Table 6-6. Early Diagnosis of Small Intestine Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	53.3
≥ 50	34.8
RACE	
White	35.7
African American	43.8
SEX	
Male	38.5
Female	33.3

Table 6-7. Early Diagnosis of Small Intestine Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	26.4
1999-2003	29.4
2004-2008	36.1

Chapter

7

Colon and Rectum

Risk Factors

Risk factors for colorectal cancer include increasing age, race (African Americans have higher rates than other racial groups), obesity, diet high in red meats, smoking, heavy alcohol use, physical inactivity, family history of colorectal cancer, and personal history of colorectal polyps and inflammatory bowel disease (American Cancer Society, 2011).

Screening

The American Cancer Society recommends that beginning at age 50, men and women at *average risk* for developing colorectal cancer should use one of the screening tests:

Tests that find polyps and cancer

- Flexible sigmoidoscopy every five years, or
- Colonoscopy every ten years, or
- Double-contrast barium enema every five years, or
- CT colonography (virtual colonoscopy) every five years

Tests that primarily find cancer

- Fecal occult blood test (FOBT) every year, or
- Fecal immunochemical test (FIT) every year, or
- Stool DNA test (sDNA), interval uncertain

Recommendations for persons at *higher risk* for developing colorectal cancer are summarized in Table 7-1.

Rates

West Virginia rates of invasive colorectal cancer are significantly higher than US rates for men and women (Table 7-2). Risk is greater among men (Table 7-2) and increases with age (Table 7-3). In West Virginia, the age-adjusted rates of colorectal cancer are not significantly greater for African Americans as compared to whites (Table 7-4).

Table 7-1. American Cancer Society Guidelines on Screening and Surveillance for the Early Detection of Colorectal Adenomas and Cancer in People at Increased Risk or at High Risk			
Risk Category	**Age to Begin**	**Recommendation**	**Comment**
Increased Risk – Patients With a History of Polyps on Prior Colonoscopy			
People with small rectal hyperplastic polyps	Same as those at average risk	Colonoscopy, or other screening options at same intervals as for those at average risk	Those with hyperplastic polyposis syndrome are at increased risk for adenomatous polyps and cancer and should have more intensive follow-up.
People with 1 or 2 small (less than 1 cm) tubular adenomas with low-grade dysplasia	5 to 10 years after the polyps are removed	Colonoscopy	Time between tests should be based on other factors such as prior colonoscopy findings, family history, and patient and doctor preferences.
People with 3 to 10 adenomas, or a large (1 cm +) adenoma, or any adenomas with high-grade dysplasia or villous features	3 years after the polyps are removed	Colonoscopy	Adenomas must have been completely removed. If colonoscopy is normal or shows only 1 or 2 small tubular adenomas with low-grade dysplasia, future colonoscopies can be done every 5 years.
People with more than 10 adenomas on a single exam	Within 3 years after the polyps are removed	Colonoscopy	Doctor should consider possibility of genetic syndrome (such as FAP or HNPCC).
People with sessile adenomas that are removed in pieces	2 to 6 months after adenoma removal	Colonoscopy	If entire adenoma has been removed, further testing should be based on doctor's judgment.

Table 7-1. Continued			
Risk Category	**Age to Begin**	**Recommendation**	**Comment**
Increased Risk – Patients With Colorectal Cancer			
People diagnosed with colon or rectal cancer	At time of colorectal surgery, or can be 3 to 6 months later if person doesn't have cancer spread that can't be removed	Colonoscopy to view entire colon and remove all polyps	If the tumor presses on the colon/rectum and prevents colonoscopy, CT colonoscopy (with IV contrast) or DCBE may be done to look at the rest of the colon.
People who have had colon or rectal cancer removed by surgery	Within 1 year after cancer resection (or 1 year after colonoscopy to make sure the rest of the colon/rectum was clear)	Colonoscopy	If normal, repeat exam in 3 years. If normal then, repeat exam every 5 years. Time between tests may be shorter if polyps are found or there is reason to suspect HNPCC. After low anterior resection for rectal cancer, exams of the rectum may be done every 3 to 6 months for the first 2 to 3 years to look for signs of recurrence.
Increased Risk – Patients With a Family History			
Colorectal cancer or adenomatous polyps in any first-degree relative before age 60, or in 2 or more first-degree relatives at any age (if not hereditary syndrome).	Age 40, or 10 years before youngest case in the immediate family, whichever is earlier	Colonoscopy	Every 5 years.
Colorectal cancer or adenomatous polyps in a first-degree relative aged 60 or older, or in at least 2 second-degree relatives at any age	Age 40	Same options as for those at average risk.	Same intervals as for those at average risk.

Table 7-1. Continued			
Risk Category	**Age to Begin**	**Recommendation**	**Comment**
High Risk			
Familial adenomatous polyposis (FAP) diagnosed by genetic testing, or suspected FAP without genetic testing	Age 10 to 12	Yearly flexible sigmoidoscopy to look for signs of FAP; counseling to consider genetic testing if it hasn't been done	If genetic test is positive, removal of colon (colectomy) should be considered.
Hereditary non-polyposis colon cancer (HNPCC), or at increased risk of HNPCC based on family history without genetic testing	Age 20 to 25 years, or 10 years before the youngest case in the immediate family	Colonoscopy every 1 to 2 years; counseling to consider genetic testing if it hasn't been done	Genetic testing should be offered to first-degree relatives of people found to have HNPCC mutations by genetic tests. It should also be offered if 1 of the first 3 of the modified Bethesda criteria is met.
Inflammatory bowel disease: -Chronic ulcerative colitis -Crohn's disease	Cancer risk begins to be significant 8 years after the onset of pancolitis (involvement of entire large intestine), or 12-15 years after the onset of left-sided colitis	Colonoscopy every 1 to 2 years with biopsies for dysplasia	These people are best referred to a center with experience in the surveillance and management of inflammatory bowel disease.

Table 7-2. Age-Adjusted (2000 Standard) Invasive Colorectal Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	66.0 (60.3-71.7)	50.6 (46.5-54.7)	NA	NA
1994	64.0 (58.5-69.5)	50.3 (46.2-54.4)	NA	NA
1995	63.9 (58.5-69.4)	49.9 (45.9-54.0)	NA	NA
1996	65.6 (60.0-71.1)	50.9 (46.9-55.0)	NA	NA
1997	71.1 (65.3-76.8)	56.3 (52.1-60.6)	NA	NA
1998	74.6 (68.8-80.4)	49.4 (45.4-53.3)	NA	NA
1999	74.0 (68.2-79.8)	53.7 (49.5-57.8)	67.4 (66.9-67.9)	48.3 (48.0-48.7)
2000	73.4 (67.7-79.1)	53.3 (49.2-57.5)	66.6 (66.1-67.1)	47.9 (47.5-48.2)
2001	73.1 (67.5-78.8)	55.6 (51.4-59.8)	64.9 (64.4-65.4)	47.2 (46.8-47.5)
2002	72.0 (66.5-77.6)	56.6 (52.3-60.8)	63.2 (62.7-63.6)	46.0 (45.7-46.3)
2003	75.0 (69.4-80.6)	53.8 (49.6-57.9)	61.8 (61.3-62.2)	45.0 (44.7-45.4)
2004	71.6 (66.2-77.1)	51.4 (47.3-55.4)	59.5 (59.1-59.9)	43.6 (43.3-44.0)
2005	68.0 (62.7-73.3)	44.8 (41.1-48.6)	57.3 (56.9-57.8)	42.5 (42.2-42.8)
2006	63.5 (58.4-68.5)	48.2 (44.3-52.2)	54.8 (54.4-55.2)	41.5 (41.2-41.8)
2007	63.3 (58.3-68.4)	45.7 (41.8-49.5)	52.7 (52.3-53.1)	39.7 (39.4-40.0)
2008	57.2 (52.4-61.9)	47.0 (43.2-50.9)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 7-3. Age-Specific Average Annual (2004 to 2008) Invasive Colorectal Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	~
20 to 24	0.9
25 to 29	3.5
30 to 34	5.9
35 to 39	10.0
40 to 44	21.4
45 to 49	35.3
50 to 54	65.4
55 to 59	85.0
60 to 64	134.4
65 to 69	204.2
70 to 74	262.9
75 to 79	319.0
80 to 84	377.6
85 and older	333.6

~ Fewer than 4 cases reported during the entire period.

Table 7-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Colorectal Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	70.7 (55.1-86.3)	65.2 (62.9-67.6)
Women	53.5 (42.1-64.9)	47.8 (46.0-49.6)

County Rates

The table (Table 7-5) on the following pages summarizes county-level information on colorectal cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive colorectal cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Age-adjusted average annual invasive colorectal cancer incidence rates were statistically significantly higher in Cabell, Fayette, Randolph, and Wirt counties and significantly lower in Morgan, Putnam and Wayne counties in comparison to the overall West Virginia rate (Table 7-5).

Table 7-5. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Colorectal Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	6114	53.8	55.2	56.5	
Barbour	60	46.7	62.7	78.6	NO
Berkeley	252	48.8	55.9	62.9	NO
Boone	81	43.3	55.7	68.1	NO
Braxton	49	38.1	53.2	68.3	NO
Brooke	76	34.9	45.3	55.8	NO
Cabell	383	58.4	65.0	71.6	HIGHER
Calhoun	26	31.5	51.3	71.2	NO
Clay	26	27.1	44.1	61.2	NO
Doddridge	21	27.5	48.5	69.5	NO
Fayette	204	58.8	68.3	77.7	HIGHER
Gilmer	26	36.5	59.5	82.5	NO
Grant	37	30.2	44.9	59.6	NO
Greenbrier	142	50.0	60.0	70.0	NO
Hampshire	83	49.3	62.9	76.6	NO
Hancock	134	49.7	60.0	70.3	NO
Hardy	46	40.1	56.7	73.4	NO
Harrison	260	52.6	60.0	67.4	NO
Jackson	82	35.7	45.6	55.6	NO
Jefferson	132	45.5	55.1	64.8	NO
Kanawha	657	48.3	52.4	56.4	NO
Lewis	73	49.8	64.8	79.8	NO
Lincoln	77	47.7	61.6	75.5	NO
Logan	130	51.1	62.0	72.8	NO
McDowell	80	42.0	54.1	66.1	NO
Marion	187	44.1	51.7	59.2	NO
Marshall	118	43.6	53.3	63.1	NO
Mason	78	36.7	47.2	57.8	NO
Mercer	259	55.4	63.2	71.0	NO
Mineral	98	48.7	60.9	73.1	NO
Mingo	94	50.2	63.3	76.3	NO
Monongalia	188	43.4	50.7	58.0	NO
Monroe	46	35.5	50.1	64.8	NO
Morgan	41	26.8	38.8	50.7	LOWER
Nicholas	80	37.7	48.5	59.2	NO
Ohio	160	43.3	51.5	59.7	NO

~ Fewer than 4 cases reported during the entire period.

Table 7-5. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Colorectal Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	6114	53.8	55.2	56.5	
Pendleton	24	25.3	42.9	60.5	NO
Pleasants	26	37.6	61.5	85.4	NO
Pocahontas	28	29.9	47.8	65.7	NO
Preston	108	48.5	59.9	71.3	NO
Putnam	113	32.4	39.8	47.3	LOWER
Raleigh	285	50.8	57.6	64.3	NO
Randolph	124	58.5	71.2	83.8	HIGHER
Ritchie	38	39.7	58.6	77.6	NO
Roane	42	31.1	44.7	58.3	NO
Summers	43	30.6	43.8	56.9	NO
Taylor	50	36.0	50.0	64.0	NO
Tucker	34	43.8	66.8	89.7	NO
Tyler	24	23.7	39.8	55.9	NO
Upshur	90	49.8	63.0	76.1	NO
Wayne	112	36.5	44.9	53.4	LOWER
Webster	30	33.3	52.4	71.6	NO
Wetzel	74	51.5	67.2	82.9	NO
Wirt	31	60.5	94.2	127.9	HIGHER
Wood	270	43.9	49.9	55.9	NO
Wyoming	82	44.3	56.8	69.4	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, nearly half of colorectal cancers are diagnosed at the in situ or local stage, before the cancer has spread.

Table 7.6. Stage at Diagnosis, Colorectal Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	5.4
Local	41.0
Regional	30.5
Distant	16.0
Unknown	7.1

Table 7-7. Early Diagnosis of Colorectal Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	36.0
≥ 50	47.4
RACE	
White	46.6
African American	42.9
SEX	
Male	46.1
Female	46.9

Table 7-8. Early Diagnosis of Colorectal Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	36.7
1999-2003	42.0
2004-2008	46.5

Chapter

8

Liver and Intrahepatic Bile Duct

Risk Factors

Certain types of hepatitis, including long-term infection with hepatitis B or hepatitis C, cirrhosis, certain metabolic diseases (e.g., hemochromatosis, alpha1-antitrypsin deficiency, porphyria cutanea tarda, glycogen storage diseases, and Wilson's disease), diabetes, obesity, long-term exposure to aflatoxins (fungus that may grow on peanuts, wheat, soybeans, ground nuts, corn, and rice), use of anabolic steroids, occupational exposure to vinyl chloride and chronic exposure to high levels of naturally-occurring arsenic in drinking water increase risk of liver cancer (American Cancer Society, 2011). Chronic inflammation of bile ducts, ulcerative colitis, aging, obesity, viral hepatitis, non-viral cirrhosis of the liver, and family history of bile duct cancer increase the risk of bile duct cancer (American Cancer Society, 2011).

Screening

There are no recommended screening tests in people who are not at increased risk for developing liver cancer or bile duct cancer. Persons with known risk factors for liver and/or bile duct cancer should consult their health care providers about screening options (American Cancer Society, 2011).

Rates

Liver and intrahepatic bile duct age-adjusted cancer rates are higher among men than for women in the US and West Virginia (Table 8-1). Among men, liver and intrahepatic bile duct rates tend to be higher in the US than in West Virginia (Table 8-1). In West Virginia, the rate of liver and intrahepatic bile duct cancer did not differ by race (Table 8-3).

Table 8-1. Age-Adjusted (2000 Standard) Invasive Liver and Intrahepatic Bile Duct Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	3.1 (1.9-4.3)	2.2 (1.3-3.0)	NA	NA
1994	4.1 (2.7-5.4)	3.0 (2.0-4.1)	NA	NA
1995	4.5 (3.1-5.9)	2.8 (1.8-3.7)	NA	NA
1996	5.5 (3.9-7.1)	2.8 (1.8-3.7)	NA	NA
1997	7.4 (5.6-9.3)	2.6 (1.7-3.6)	NA	NA
1998	6.4 (4.7-8.1)	2.9 (1.9-3.9)	NA	NA
1999	5.6 (4.0-7.2)	2.8 (1.8-3.7)	7.5 (7.3-7.6)	3.0 (2.9-3.0)
2000	6.1 (4.5-7.7)	2.2 (1.3-3.0)	8.0 (7.8-8.2)	3.0 (2.9-3.1)
2001	5.7 (4.2-7.3)	2.4 (1.5-3.3)	7.9 (7.8-8.1)	2.8 (2.7-2.9)
2002	6.4 (4.7-8.1)	2.8 (1.8-3.8)	8.2 (8.1-8.4)	3.0 (2.9-3.1)
2003	6.2 (4.6-7.8)	2.5 (1.6-3.3)	8.6 (8.4-8.7)	3.1 (3.0-3.1)
2004	6.2 (4.6-7.7)	3.3 (2.3-4.3)	9.0 (8.9-9.2)	3.1 (3.0-3.2)
2005	5.6 (4.1-7.1)	2.0 (1.2-2.8)	9.3 (9.2-9.5)	3.1 (3.1-3.2)
2006	6.1 (4.6-7.6)	3.1 (2.1-4.1)	9.6 (9.4-9.8)	3.3 (3.2-3.4)
2007	8.1 (6.3-9.9)	3.7 (2.6-4.8)	9.9 (9.8-10.1)	3.2 (3.1-3.3)
2008	8.2 (6.4-10.0)	2.7 (1.8-3.6)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 8-2. Age-Specific Average Annual (2004 to 2008) Invasive Liver and Intrahepatic Bile Duct Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	1.0
5 to 9	~
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	0
30 to 34	~
35 to 39	~
40 to 44	1.3
45 to 49	4.2
50 to 54	7.8
55 to 59	8.3
60 to 64	14.0
65 to 69	15.8
70 to 74	20.3
75 to 79	25.3
80 to 84	31.4
85 and older	23.8

~ Fewer than 4 cases reported during the entire period.

Table 8-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Liver and Intrahepatic Bile Duct Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	11.2 (5.3-17.1)	6.7 (6.0-7.5)
Women	5.3 (1.8-8.9)	2.9 (2.5-3.3)

County Rates

The table (Table 8-4) on the following pages summarizes county-level information on invasive liver and intrahepatic bile duct cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive liver and intrahepatic bile duct cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Preston and Putnam counties have significantly lower rates of liver and intrahepatic bile duct cancer in comparison to the rate for West Virginia as a whole (Table 8-4).

Table 8-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Liver and Intrahepatic Bile Duct Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	534	4.4	4.8	5.2	
Barbour	~				
Berkeley	33	4.7	7.2	9.8	NO
Boone	4	0.0	2.8	5.6	NO
Braxton	~				
Brooke	5	0.3	3.3	6.3	NO
Cabell	36	4.2	6.2	8.3	NO
Calhoun	~				
Clay	~				
Doddridge	~				
Fayette	14	2.1	4.4	6.7	NO
Gilmer	4	0.0	10.7	21.8	NO
Grant	4	0.0	5.8	11.7	NO
Greenbrier	10	1.5	3.9	6.4	NO
Hampshire	14	5.1	10.8	16.4	NO
Hancock	14	2.9	6.1	9.4	NO
Hardy	~				
Harrison	21	2.8	4.9	7.0	NO
Jackson	7	1.0	4.2	7.3	NO
Jefferson	12	2.0	4.7	7.5	NO
Kanawha	65	3.9	5.2	6.5	NO
Lewis	0				
Lincoln	8	1.9	6.2	10.5	NO
Logan	7	0.9	3.4	5.9	NO
McDowell	9	1.9	5.4	9.0	NO
Marion	16	2.3	4.6	6.9	NO
Marshall	15	3.4	7.0	10.6	NO
Mason	8	1.5	4.8	8.1	NO
Mercer	17	2.1	4.0	5.9	NO
Mineral	7	1.1	4.5	7.9	NO
Mingo	10	2.4	6.4	10.4	NO
Monongalia	16	2.1	4.2	6.2	NO
Monroe	~				
Morgan	5	0.6	5.3	9.9	NO
Nicholas	7	1.0	4.0	7.0	NO
Ohio	25	4.8	8.0	11.3	NO

~ Fewer than 4 cases reported during the entire period.

Table 8-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Liver and Intrahepatic Bile Duct Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	534	4.4	4.8	5.2	
Pendleton	5	0.7	9.7	18.7	NO
Pleasants	~				
Pocahontas	~				
Preston	4	0.0	1.9	3.8	LOWER
Putnam	5	0.2	1.7	3.2	LOWER
Raleigh	29	3.9	6.1	8.4	NO
Randolph	7	1.1	4.3	7.4	NO
Ritchie	~				
Roane	4	0.1	3.6	7.1	NO
Summers	5	0.6	5.4	10.2	NO
Taylor	4	0.0	3.9	7.8	NO
Tucker	0				
Tyler	0				
Upshur	8	1.6	5.3	9.0	NO
Wayne	13	2.4	5.3	8.2	NO
Webster	~				
Wetzel	6	1.1	5.5	9.9	NO
Wirt	~				
Wood	24	2.5	4.3	6.0	NO
Wyoming	6	0.8	4.7	8.5	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, about one-third of liver and intrahepatic bile duct cancers are diagnosed at the in situ or local stage, before the disease has spread (American Cancer Society, 2011).

Table 8-5. Stage at Diagnosis, Liver and Intrahepatic Bile Duct Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ and Local	32.4
Regional	19.3
Distant	15.4
Unknown	33.0

Table 8-6. Early Diagnosis of Liver and Intrahepatic Bile Duct Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	26.5
≥ 50	33.0
RACE	
White	32.0
African American	29.2
SEX	
Male	32.1
Female	33.0

Table 8-7. Early Diagnosis of Liver and Intrahepatic Bile Duct Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	22.5
1999-2003	25.6
2004-2008	32.4

Chapter

9

Gallbladder

Risk Factors

Certain health conditions including having large gallstones and chronic inflammation of the gallbladder, “porcelain” gallbladder (calcium deposits on the gallbladder wall), chronic infection with typhoid, gallbladder polyps, family history of gallbladder cancer, older age, obesity, and occupational exposures in rubber and metal fabricating plants may increase risk of gallbladder cancer (American Cancer Society, 2011). Women, persons of Mexican heritage and Native Americans are also at increased risk (American Cancer Society, 2011).

Screening

According to the American Cancer Society, there are currently no tests that can reliably detect gallbladder cancer early enough to be useful as screening tests (American Cancer Society, 2011).

Rates

The age-adjusted incidence rate of invasive gallbladder cancer for West Virginia is not statistically different than the rate of the US as a whole (Table 9-1). Gallbladder cancer occurs more often in women (Table 9-1). Risk increases slightly with age (Table 9-2).

Table 9-1. Age-Adjusted (2000 Standard) Invasive Gallbladder Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	0.9 (0.1-1.6)	1.6 (0.8-2.3)	NA	NA
1994	1.2 (0.3-2.0)	0.8 (0.3-1.3)	NA	NA
1995	0.6 (0.1-1.1)	1.6 (0.9-2.3)	NA	NA
1996	0.7 (0.1-1.3)	1.4 (0.7-2.1)	NA	NA
1997	0.2 (0.0-0.5)	1.7 (1.0-2.4)	NA	NA
1998	0.5 (0.0-1.0)	1.0 (0.4-1.5)	NA	NA
1999	1.0 (0.3-1.7)	1.3 (0.6-1.9)	0.9 (0.8-0.9)	1.5 (1.5-1.6)
2000	0.7 (0.2-1.3)	1.1 (0.5-1.7)	0.8 (0.7-0.8)	1.5 (1.4-1.5)
2001	0.0	1.3 (0.7-1.9)	0.8 (0.8-0.9)	1.5 (1.4-1.5)
2002	0.3 (0.0-0.7)	0.7 (0.2-1.1)	0.8 (0.8-0.9)	1.3 (1.3-1.4)
2003	0.7 (0.1-1.2)	1.4 (0.7-2.0)	0.8 (0.8-0.9)	1.4 (1.3-1.4)
2004	0.6 (0.1-1.1)	1.7 (1.0-2.5)	0.8 (0.8-0.9)	1.4 (1.3-1.4)
2005	0.8 (0.2-1.4)	1.9 (1.1-2.7)	0.8 (0.7-0.8)	1.4 (1.3-1.5)
2006	1.0 (0.3-1.6)	1.9 (1.1-2.6)	0.8 (0.8-0.9)	1.4 (1.3-1.4)
2007	0.6 (0.1-1.1)	1.8 (1.0-2.5)	0.8 (0.7-0.8)	1.3 (1.3-1.4)
2008	0.3 (0.0-0.7)	1.1 (0.5-1.7)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 9-2. Age-Specific Average Annual (2004 to 2008) Invasive Gallbladder Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	0
30 to 34	~
35 to 39	0
40 to 44	~
45 to 49	0.7
50 to 54	0.7
55 to 59	1.2
60 to 64	2.3
65 to 69	4.1
70 to 74	7.1
75 to 79	8.4
80 to 84	9.0
85 and older	11.1

~ Fewer than 4 cases reported during the entire period.

Table 9-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Gallbladder Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	~	0.6 (0.4-0.9)
Women	~	1.7 (1.4-2.0)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 9-4) on the following pages summarizes county-level information on invasive gallbladder cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive gallbladder cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of gallbladder cancer were observed for any of the counties in comparison with the state as a whole (Table 9-4).

Table 9-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Gallbladder Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	136	1.0	1.2	1.4	
Barbour	4	0.1	4.3	8.5	NO
Berkeley	8	0.5	1.9	3.2	NO
Boone	5	0.5	3.8	7.1	NO
Braxton	~				
Brooke	~				
Cabell	4	0.0	0.7	1.4	NO
Calhoun	0				
Clay	0				
Doddridge	0				
Fayette	~				
Gilmer	0				
Grant	0				
Greenbrier	~				
Hampshire	~				
Hancock	~				
Hardy	0				
Harrison	6	0.2	1.2	2.2	NO
Jackson	~				
Jefferson	4	0.0	2.0	3.9	NO
Kanawha	16	0.6	1.3	1.9	NO
Lewis	~				
Lincoln	~				
Logan	~				
McDowell	~				
Marion	4	0.0	1.2	2.4	NO
Marshall	~				
Mason	~				
Mercer	8	0.5	1.7	2.9	NO
Mineral	4	0.0	2.3	4.6	NO
Mingo	~				
Monongalia	6	0.3	1.5	2.7	NO
Monroe	0				
Morgan	0				
Nicholas	~				
Ohio	4	0.0	1.2	2.3	NO

~ Fewer than 4 cases reported during the entire period.

Table 9-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Gallbladder Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	136	1.0	1.2	1.4	
Pendleton	0				
Pleasants	0				
Pocahontas	0				
Preston	~				
Putnam	5	0.2	1.8	3.3	NO
Raleigh	4	0.0	0.9	1.7	NO
Randolph	~				
Ritchie	~				
Roane	~				
Summers	~				
Taylor	~				
Tucker	0				
Tyler	~				
Upshur	~				
Wayne	~				
Webster	~				
Wetzel	~				
Wirt	0				
Wood	7	0.3	1.3	2.2	NO
Wyoming	~				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately 15% of gallbladder cancers are diagnosed at the in situ or local stages (Table 9-5).

Table 9-5. Stage at Diagnosis, Gallbladder Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	3.5
Local	12.8
Regional	38.3
Distant	36.9
Unknown	8.5

Table 9-6. Early Diagnosis of Gallbladder Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	~
≥ 50	16.8
RACE	
White	16.3
African American	~
SEX	
Male	18.2
Female	15.7

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 9-7. Early Diagnosis of Gallbladder Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	28.7
1999-2003	27.8
2004-2008	16.3

Chapter

10

Pancreas

Risk Factors

Risk factors for pancreatic cancer include increasing age, gender (males are at increased risk), being African American, family history of pancreatic cancer, smoking cigarettes, having a diet high in red meat, pork and processed meat, obesity, physically inactive, having type 2 diabetes or chronic pancreatitis, infection with *Helicobacter pylori (H. pylori),* and heavy occupational exposure to certain pesticides, dyes or chemicals used in metal refining (American Cancer Society, 2011).

Screening

According to the American Cancer Society, there are currently no blood tests or easily available screening tests that can reliably detect pancreatic cancer early enough to be useful as screening tests (American Cancer Society, 2011).

Rates

The rate of developing pancreatic cancer is slightly higher for men than women (Table 10-1). In West Virginia, the pancreatic cancer rate for males is similar to the rate of pancreatic cancer for US males as a whole (Table 10-1). The pancreatic cancer rate for West Virginia women is lower than for US women with statistically significant differences for multiple years (Table 10-1). The risk of pancreatic cancer increases with age (Table 10-2). In West Virginia, African American and white pancreatic cancer incidence rates are not statistically different (Table 10-3).

Table 10-1. Age-Adjusted (2000 Standard) Invasive Pancreatic Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	8.9 (6.9-10.9)	8.3 (6.6-9.9)	NA	NA
1994	10.6 (8.4-12.9)	8.8 (7.1-10.4)	NA	NA
1995	11.3 (9.0-13.6)	9.4 (7.7-11.1)	NA	NA
1996	11.1 (8.8-13.4)	6.8 (5.4-8.3)	NA	NA
1997	13.4 (10.9-16.0)	9.4 (7.7-11.2)	NA	NA
1998	12.8 (10.3-15.2)	7.2 (5.7-8.8)	NA	NA
1999	10.7 (8.5-12.9)	7.1 (5.6-8.6)	12.6 (12.4-12.9)	9.8 (9.6-9.9)
2000	12.1 (9.8-14.4)	8.2 (6.7-9.8)	12.8 (12.6-13.0)	9.9 (9.7-10.1)
2001	12.7 (10.4-15.0)	8.3 (6.7-9.9)	12.8 (12.6-13.1)	9.9 (9.7-10.0)
2002	10.9 (8.7-13.1)	7.9 (6.4-9.5)	12.7 (12.5-12.9)	9.9 (9.7-10.0)
2003	10.7 (8.6-12.8)	8.3 (6.7-9.9)	13.0 (12.8-13.3)	10.1 (10.0-10.3)
2004	11.9 (9.7-14.1)	10.6 (8.7-12.4)	13.2 (13.0-13.4)	10.1 (9.9-10.2)
2005	11.5 (9.4-13.7)	8.1 (6.6-9.7)	13.2 (13.0-13.4)	10.3 (10.2-10.5)
2006	13.9 (11.5-16.2)	9.0 (7.3-10.7)	13.5 (13.3-13.7)	10.5 (10.3-10.6)
2007	13.9 (11.6-16.3)	7.8 (6.2-9.3)	13.2 (13.0-13.4)	10.2 (10.0-10.3)
2008	11.4 (9.3-13.5)	9.0 (7.3-10.7)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 10-2. Age-Specific Average Annual (2004 to 2008)
Invasive Pancreatic Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	~
30 to 34	0.7
35 to 39	0.7
40 to 44	2.7
45 to 49	6.6
50 to 54	9.9
55 to 59	21.5
60 to 64	27.4
65 to 69	37.9
70 to 74	45.6
75 to 79	67.5
80 to 84	79.0
85 and older	66.5

~ Fewer than 4 cases reported during the entire period.

Table 10-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Pancreatic Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	11.0 (5.0-16.9)	12.7 (11.6-13.7)
Women	11.2 (6.0-16.5)	8.9 (8.2-9.7)

County Rates

The table (Table 10-4) on the following pages summarizes county-level information on invasive pancreatic cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive pancreatic cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of pancreatic cancer were observed for any of the counties in comparison with the state as a whole (Table 10-4).

Table 10-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Pancreatic Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1188	9.9	10.5	11.2	
Barbour	13	6.2	13.8	21.3	NO
Berkeley	52	8.4	11.6	14.8	NO
Boone	15	5.0	10.3	15.6	NO
Braxton	6	1.4	7.2	13.0	NO
Brooke	13	3.3	7.4	11.5	NO
Cabell	79	10.3	13.2	16.2	NO
Calhoun	4	0.1	7.6	15.1	NO
Clay	4	0.1	6.8	13.5	NO
Doddridge	6	2.4	12.2	22.1	NO
Fayette	32	7.0	10.8	14.6	NO
Gilmer	6	2.7	14.0	25.3	NO
Grant	~				
Greenbrier	27	6.6	10.6	14.6	NO
Hampshire	17	6.7	13.0	19.2	NO
Hancock	35	10.0	15.0	19.9	NO
Hardy	7	2.3	9.2	16.1	NO
Harrison	40	6.2	9.0	11.8	NO
Jackson	17	4.9	9.3	13.7	NO
Jefferson	20	4.5	8.1	11.8	NO
Kanawha	140	9.2	11.0	12.9	NO
Lewis	14	5.7	12.0	18.3	NO
Lincoln	11	3.5	8.7	13.9	NO
Logan	22	5.7	9.9	14.1	NO
McDowell	13	3.8	8.3	12.9	NO
Marion	43	8.0	11.5	15.0	NO
Marshall	19	4.5	8.2	11.9	NO
Mason	17	5.7	11.1	16.4	NO
Mercer	57	10.2	13.8	17.5	NO
Mineral	19	6.5	11.9	17.3	NO
Mingo	18	6.3	11.8	17.3	NO
Monongalia	43	7.9	11.4	14.8	NO
Monroe	9	3.2	9.4	15.5	NO
Morgan	11	4.0	9.9	15.8	NO
Nicholas	15	4.4	8.9	13.4	NO
Ohio	42	8.6	12.5	16.4	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Table 10-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Pancreatic Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1188	9.9	10.5	11.2	
Pendleton	~				
Pleasants	4	0.2	9.1	18.0	NO
Pocahontas	5	1.0	8.5	16.1	NO
Preston	16	4.5	8.9	13.2	NO
Putnam	28	5.9	9.4	13.0	NO
Raleigh	47	6.6	9.2	11.9	NO
Randolph	12	3.0	7.0	11.1	NO
Ritchie	5	0.8	7.1	13.5	NO
Roane	6	1.2	6.2	11.2	NO
Summers	7	2.0	7.5	13.1	NO
Taylor	11	4.7	11.6	18.6	NO
Tucker	9	5.5	16.1	26.8	NO
Tyler	8	3.8	12.6	21.5	NO
Upshur	13	4.2	9.4	14.6	NO
Wayne	25	6.2	10.2	14.3	NO
Webster	6	2.1	11.5	20.8	NO
Wetzel	10	3.2	9.0	14.8	NO
Wirt	6	3.1	16.9	30.6	NO
Wood	60	7.9	10.5	13.2	NO
Wyoming	17	5.9	11.3	16.8	NO

. ~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). Less than 10% of pancreatic cancers are diagnosed at an early stage (i.e. in situ or local) (Table 10-5). Nearly half of all pancreatic cancers diagnosed in West Virginia were diagnosed after the cancer had metastasized or spread to another location (Table 10-5).

Table 10-5. Stage at Diagnosis, Pancreatic Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ or local	9.0
Regional	22.1
Distant	48.4
Unknown	20.5

Table 10-6 Early Diagnosis of Pancreatic Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	~
≥ 50	9.4
RACE	
White	9.1
African American	~
SEX	
Male	7.2
Female	10.9

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 10-7. Early Diagnosis of Pancreatic Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	9.2
1999-2003	8.8
2004-2008	9.0

Chapter 11

Larynx

Risk Factors

Risk factors for laryngeal cancer include gender (males are at increased risk), increasing age, race (African Americans are at increased risk), tobacco use, heavy alcohol use, an immune system weakened through acquired immunodeficiency syndrome (AIDS), congenital immunodeficiencies or the use of medications that weaken the immune system, and prolonged occupational exposures to wood dust, paint fumes, and certain chemicals used in the metalworking, petroleum, plastics, and textile industries (American Cancer Society, 2011).

Screening

There is no simple screening procedure to diagnose laryngeal cancer. Because this cancer is not common, the American Cancer Society does not recommend screening for laryngeal cancer (American Cancer Society, 2011).

Rates

Laryngeal cancer rates for West Virginia men tend to be higher than those for US men, with statistically significant differences for multiple years (Table 11-1). Rates for West Virginia women are slightly higher than those for US women, but are significantly different only for 2003 (Table 11-1). Males have higher rates of laryngeal cancer than females (Table 11-1). In West Virginia, risk increases until about age 69 and then declines (Table 11-2).

Table 11-1. Age-Adjusted (2000 Standard) Invasive Laryngeal Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	9.9 (7.8-12.0)	1.6 (0.8-2.4)	NA	NA
1994	11.8 (9.5-14.2)	2.2 (1.3-3.1)	NA	NA
1995	9.4 (7.3-11.4)	3.2 (2.2-4.2)	NA	NA
1996	10.1 (8.0-12.3)	2.4 (1.5-3.4)	NA	NA
1997	10.9 (8.7-13.1)	1.9 (1.1-2.8)	NA	NA
1998	11.0 (8.8-13.1)	1.8 (1.0-2.5)	NA	NA
1999	10.8 (8.7-12.9)	2.4 (1.4-3.3)	8.2 (8.0-8.3)	1.8 (1.7-1.8)
2000	9.9 (7.8-11.9)	2.7 (1.7-3.7)	8.0 (7.8-8.1)	1.7 (1.6-1.7)
2001	10.4 (8.3-12.4)	2.2 (1.3-3.1)	7.8 (7.6-7.9)	1.6 (1.5-1.7)
2002	9.7 (7.8-11.7)	2.3 (1.4-3.2)	7.4 (7.3-7.6)	1.5 (1.5-1.6)
2003	8.3 (6.5-10.0)	3.1 (2.0-4.1)	7.3 (7.1-7.4)	1.6 (1.5-1.6)
2004	8.0 (6.2-9.7)	2.2 (1.3-3.0)	7.3 (7.2-7.5)	1.6 (1.5-1.7)
2005	9.9 (7.9-11.8)	1.9 (1.1-2.7)	7.1 (6.9-7.2)	1.5 (1.5-1.6)
2006	8.4 (6.6-10.2)	2.2 (1.3-3.0)	6.9 (6.8-7.1)	1.5 (1.4-1.6)
2007	9.1 (7.2-10.9)	2.4 (1.5-3.3)	6.7 (6.5-6.8)	1.4 (1.4-1.5)
2008	9.2 (7.3-11.0)	2.3 (1.5-3.2)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 11-2. Age-Specific Average Annual (2004 to 2008) Invasive Laryngeal Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	0
30 to 34	0
35 to 39	0.7
40 to 44	2.1
45 to 49	7.6
50 to 54	8.7
55 to 59	12.6
60 to 64	21.9
65 to 69	24.4
70 to 74	21.0
75 to 79	22.5
80 to 84	15.2
85 and older	7.8

~ Fewer than 4 cases reported during the entire period.

Table 11-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Laryngeal Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	9.5 (4.3-14.7)	9.0 (8.1-9.8)
Women	~	2.3 (1.9-2.7)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 11-4) on the following pages summarizes county-level information on invasive laryngeal cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive laryngeal cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Age-adjusted average annual invasive laryngeal cancer incidence rates were statistically significantly higher in Boone and Logan counties and significantly lower in Mineral County in comparison to the rate of West Virginia as a whole (Table 11-4).

Table 11-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Laryngeal Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	592	4.9	5.3	5.7	
Barbour	5	0.6	5.3	9.9	NO
Berkeley	22	2.6	4.6	6.5	NO
Boone	17	5.8	11.2	16.7	HIGHER
Braxton	6	1.3	7.2	13.0	NO
Brooke	6	0.6	3.3	5.9	NO
Cabell	40	4.9	7.2	9.4	NO
Calhoun	~				
Clay	8	4.1	13.8	23.5	NO
Doddridge	0				
Fayette	16	2.9	5.8	8.6	NO
Gilmer	~				
Grant	0				
Greenbrier	12	2.1	4.9	7.7	NO
Hampshire	9	2.3	6.6	10.9	NO
Hancock	12	2.3	5.3	8.3	NO
Hardy	4	0.1	4.9	9.8	NO
Harrison	20	2.6	4.7	6.8	NO
Jackson	12	2.8	6.4	10.0	NO
Jefferson	9	1.2	3.6	6.1	NO
Kanawha	61	3.7	4.9	6.1	NO
Lewis	6	1.0	5.2	9.3	NO
Lincoln	13	4.3	9.5	14.8	NO
Logan	26	7.1	11.6	16.1	HIGHER
McDowell	13	3.6	8.0	12.4	NO
Marion	14	1.8	3.9	6.0	NO
Marshall	10	1.6	4.3	6.9	NO
Mason	11	2.7	6.9	11.0	NO
Mercer	18	2.4	4.7	6.9	NO
Mineral	4	0.0	2.2	4.3	LOWER
Mingo	17	5.3	10.2	15.2	NO
Monongalia	15	1.9	3.8	5.7	NO
Monroe	7	2.0	8.3	14.6	NO
Morgan	4	0.1	4.2	8.4	NO
Nicholas	9	1.9	5.5	9.1	NO
Ohio	14	2.2	4.6	7.0	NO

~ Fewer than 4 cases reported during the entire period.

Table 11-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Laryngeal Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	592	4.9	5.3	5.7	
Pendleton	4	0.1	6.4	12.6	NO
Pleasants	5	1.2	10.3	19.3	NO
Pocahontas	4	0.1	6.1	12.1	NO
Preston	7	1.0	3.8	6.6	NO
Putnam	11	1.4	3.4	5.5	NO
Raleigh	26	3.1	5.1	7.1	NO
Randolph	7	1.0	4.0	6.9	NO
Ritchie	4	0.1	5.9	11.7	NO
Roane	4	0.1	3.5	7.0	NO
Summers	~				
Taylor	4	0.1	3.8	7.6	NO
Tucker	~				
Tyler	~				
Upshur	5	0.4	3.6	6.9	NO
Wayne	14	2.6	5.5	8.5	NO
Webster	~				
Wetzel	7	1.6	6.2	10.8	NO
Wirt	4	0.0	12.2	24.5	NO
Wood	21	2.2	3.9	5.5	NO
Wyoming	10	2.4	6.9	11.4	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). More than half of laryngeal cancer in West Virginia is diagnosed at the in situ or local stage.

Table 11-5. Stage at Diagnosis, Laryngeal Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	3.3
Local	53.9
Regional	19.6
Distant	17.2
Unknown	6.0

Table 11-6. Early Diagnosis of Laryngeal Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	45.8
≥ 50	58.7
RACE	
White	57.3
African American	46.7
SEX	
Male	58.5
Female	52.6

Table 11-7. Early Diagnosis of Laryngeal Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	58.3
1999-2003	55.4
2004-2008	57.2

Chapter

12

Lung and Bronchus

Risk Factors

Tobacco smoking, personal or family history of lung cancer, high levels of arsenic in drinking water, exposure to radon, exposure to asbestos, occupational exposure to radioactive ores such as uranium, certain inhaled chemicals or minerals, fuels such as gasoline and diesel exhaust, and radiation therapy to the lungs increase risk of lung cancer (American Cancer Society, 2011).

Screening

Efforts are underway to test screening methods for lung cancer among current and former smokers. The United States Preventive Services Taskforce (USPSTF) currently neither recommends for nor against use of chest X-rays, CT scans or sputum cytologies to screen for persons who have no symptoms suggesting the presence of lung cancer (American Cancer Society, 2011).

Rates

Age-adjusted West Virginia lung cancer rates for men and women are statistically significantly greater than the corresponding US rates (see Table 12-1). Males have higher rates than females (Table 12-1). Rates for small cell and non-small cell lung cancer (defined per the World Health Organization classification schema) are provided in Table 12-2. Invasive lung and bronchus cancer incidence rates increase with age through the 70s and then they decrease (Table 12-3 and Table 12-4). In West Virginia, lung cancer rates are statistically significantly lower in African American women than white women; however, no statistically significant difference exists in rates between African American men and white men (Table 12-5).

Table 12-1. Age-Adjusted (2000 Standard) Invasive Lung Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	117.1 (109.8-124.5)	59.1 (54.6-63.6)	NA	NA
1994	122.7 (115.3-130.2)	60.8 (56.3-65.3)	NA	NA
1995	125.3 (117.8-132.8)	59.3 (54.8-63.7)	NA	NA
1996	122.9 (115.5-130.3)	66.9 (62.2-71.6)	NA	NA
1997	133.4 (125.7-141.0)	68.5 (63.8-73.3)	NA	NA
1998	128.7 (121.2-136.2)	69.9 (65.1-74.6)	NA	NA
1999	128.0 (120.6-135.4)	70.8 (66.0-75.6)	93.5 (92.9-94.0)	54.3 (54.0-54.7)
2000	124.9 (117.6-132.3)	69.6 (64.8-74.3)	91.5 (90.9-92.1)	54.5 (54.1-54.9)
2001	122.1 (114.9-129.2)	73.1 (68.2-77.9)	91.0 (90.5-91.6)	55.2 (54.8-55.6)
2002	119.5 (112.5-126.6)	70.3 (65.5-75.0)	89.7 (89.2-90.3)	55.6 (55.2-56.0)
2003	113.3 (106.5-120.1)	66.7 (62.1-71.3)	89.3 (88.7-89.8)	55.9 (55.5-56.3)
2004	120.9 (113.8-127.9)	67.5 (62.8-72.1)	87.8 (87.3-88.3)	55.8 (55.4-56.1)
2005	119.7 (112.8-126.7)	77.8 (72.8-82.8)	86.6 (86.1-87.1)	56.7 (56.3-57.0)
2006	120.1 (113.1-127.0)	72.6 (67.8-77.3)	84.2 (83.7-84.7)	56.1 (55.7-56.5)
2007	109.1 (102.6-115.7)	74.1 (69.2-79.0)	80.5 (80.1-81.0)	54.5 (54.1-54.8)
2008	106.9 (100.5-113.4)	75.5 (70.6-80.3)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 12-2. Age-Adjusted (2000 Standard) Invasive Lung Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis, Small Cell and Non-small Cell, West Virginia

YEAR	SMALL CELL		NON-SMALL CELL	
	Men	Women	Men	Women
1993	17.3 (14.6-20.1)	12.2 (10.1-14.3)	99.8 (93.0-106.6)	46.9 (42.9-50.8)
1994	16.8 (14.1-19.5)	12.3 (10.3-14.4)	105.9 (98.9-112.8)	48.5 (44.4-52.5)
1995	17.8 (15.0-20.7)	11.5 (9.6-13.5)	107.5 (100.5-114.2)	47.7 (43.8-51.7)
1996	18.2 (15.4-21.0)	12.5 (10.5-14.6)	104.7 (97.9-111.5)	54.4 (50.1-58.6)
1997	17.1 (14.4-19.8)	13.6 (11.4-15.8)	116.3 (109.1-123.5)	54.9 (50.7-59.2)
1998	18.7 (15.9-21.6)	12.0 (10.0-14.1)	110.0 (103.0-117.0)	57.8 (53.5-62.1)
1999	14.9 (12.4-17.4)	14.3 (12.1-16.6)	113.1 (106.2-120.1)	56.4 (52.2-60.7)
2000	17.2 (14.6-19.9)	14.6 (12.4-16.8)	107.7 (100.9-114.5)	55.0 (50.8-59.2)
2001	20.3 (17.4-23.1)	14.7 (12.2-16.9)	101.8 (95.2-108.4)	58.3 (54.0-62.7)
2002	18.7 (16.0-21.5)	14.4 (12.2-16.6)	100.8 (94.3-107.3)	55.9 (51.7-60.1)
2003	15.5 (13.1-18.0)	13.2 (11.1-15.2)	97.7 (91.4-104.1)	53.6 (49.4-57.7)
2004	15.0 (12.6-17.4)	12.3 (10.3-14.3)	105.9 (99.2-112.5)	55.1 (50.9-59.3)
2005	16.8 (14.2-19.3)	14.3 (12.1-16.4)	103.0 (96.5-109.4)	63.5 (59.0-68.0)
2006	14.8 (12.4-17.2)	13.0 (11.0-15.0)	105.2 (98.8-111.7)	59.6 (55.2-63.9)
2007	13.7 (11.5-16.0)	13.2 (11.2-15.3)	95.4 (89.3-101.5)	60.9 (56.5-65.3)
2008	14.1 (11.8-16.5)	14.5 (12.3-16.7)	92.8 (86.8-98.8)	61.0 (56.6-65.3)

Table 12-3. Age-Specific Average Annual (2004 to 2008) Invasive Lung and Bronchus Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0.7
25 to 29	~
30 to 34	2.9
35 to 39	7.0
40 to 44	20.5
45 to 49	51.5
50 to 54	87.0
55 to 59	147.5
60 to 64	276.6
65 to 69	424.2
70 to 74	543.0
75 to 79	574.7
80 to 84	527.1
85 and older	340.2

~ Fewer than 4 cases reported during the entire period.

Table 12-4. Age-Specific Average Annual (2004 to 2008) Invasive Lung and Bronchus Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	SMALL CELL RATE	NON-SMALL CELL RATE
Birth to 4	0	0
5 to 9	0	0
10 to 14	0	0
15 to 19	0	0
20 to 24	0	0.7
25 to 29	0	~
30 to 34	0.7	2.2
35 to 39	1.0	6.0
40 to 44	2.9	17.6
45 to 49	12.5	39.0
50 to 54	15.1	71.9
55 to 59	29.5	118.0
60 to 64	48.7	227.9
65 to 69	72.6	351.6
70 to 74	79.8	463.2
75 to 79	76.7	498.0
80 to 84	55.2	471.9
85 and older	26.0	314.2

~ Fewer than 4 cases reported during the entire period.

Table 12-5. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Lung and Bronchus Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	129.0 (107.9-150.1)	116.4 (113.3-119.5)
Women	55.9 (44.0-67.7)	74.9 (72.7-77.1)

County Rates

The table (Table 12-6) on the following pages summarizes county-level information on invasive lung and bronchus cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive lung and bronchus cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

In West Virginia, rates of invasive lung and bronchus cancer are significantly higher in Boone, Cabell, Fayette, Lincoln, Logan and Mingo counties and significantly lower in Brooke, Grant, Hardy, Jefferson, Marshall, Monongalia, Pendleton, Preston, Raleigh, Randolph, and Tucker counties in comparison to West Virginia as a whole (Table 12-6).

Table 12-6. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Lung and Bronchus Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	10232	89.8	91.5	93.3	
Barbour	72	57.2	74.6	91.9	NO
Berkeley	428	84.8	93.8	102.8	NO
Boone	192	113.8	132.8	151.9	HIGHER
Braxton	72	58.2	75.9	93.6	NO
Brooke	129	60.8	73.7	86.5	LOWER
Cabell	618	96.7	105.0	113.4	HIGHER
Calhoun	43	61.4	87.8	114.3	NO
Clay	71	90.4	118.0	145.7	NO
Doddridge	31	47.5	74.5	101.4	NO
Fayette	334	102.4	114.8	127.2	HIGHER
Gilmer	42	67.9	97.6	127.4	NO
Grant	51	43.7	60.4	77.0	LOWER
Greenbrier	230	83.0	95.5	107.9	NO
Hampshire	147	92.6	110.6	128.6	NO
Hancock	226	88.8	102.4	115.9	NO
Hardy	37	29.3	43.4	57.5	LOWER
Harrison	409	85.7	95.0	104.2	NO
Jackson	181	84.1	98.5	113.0	NO
Jefferson	164	58.1	69.0	79.8	LOWER
Kanawha	1199	89.8	95.3	100.7	NO
Lewis	104	74.2	92.0	109.8	NO
Lincoln	179	115.3	135.3	155.3	HIGHER
Logan	271	111.5	126.7	142.0	HIGHER
McDowell	164	88.9	105.2	121.4	NO
Marion	326	79.3	89.2	99.0	NO
Marshall	171	66.0	77.7	89.5	LOWER
Mason	150	76.8	91.6	106.4	NO
Mercer	381	82.6	91.9	101.2	NO
Mineral	160	85.6	101.6	117.5	NO
Mingo	195	112.2	130.8	149.5	HIGHER
Monongalia	236	55.7	63.9	72.2	LOWER
Monroe	74	62.7	81.6	100.6	NO
Morgan	94	71.2	89.4	107.6	NO
Nicholas	150	74.7	89.0	103.4	NO
Ohio	287	81.4	92.3	103.1	NO

~ Fewer than 4 cases reported during the entire period.

Table 12-6. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Lung and Bronchus Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	10232	89.8	91.5	93.3	
Pendleton	38	44.9	66.2	87.5	LOWER
Pleasants	31	47.1	73.1	99.2	NO
Pocahontas	53	64.7	88.8	112.9	NO
Preston	128	58.1	70.4	82.7	LOWER
Putnam	240	70.7	81.1	91.5	NO
Raleigh	390	69.8	77.5	85.3	LOWER
Randolph	126	59.3	71.9	84.6	LOWER
Ritchie	53	57.4	78.7	100.1	NO
Roane	85	67.1	85.4	103.8	NO
Summers	71	57.7	75.2	92.8	NO
Taylor	87	68.2	86.5	104.9	NO
Tucker	32	38.3	58.8	79.3	LOWER
Tyler	47	51.7	72.6	93.5	NO
Upshur	126	70.9	86.1	101.2	NO
Wayne	234	81.0	93.1	105.1	NO
Webster	67	82.9	109.5	136.1	NO
Wetzel	103	72.2	89.8	107.3	NO
Wirt	39	72.6	106.4	140.3	NO
Wood	504	84.1	92.2	100.4	NO
Wyoming	160	91.2	108.3	125.3	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better. In West Virginia, approximately one-fifth of lung cancers are diagnosed at an early stage (i.e. in situ or local), and close to half of lung cancers are diagnosed at a distant stage (Table 12-7).

Table 12-7 Stage at Diagnosis, Lung and Bronchus Cancer
by Type of Lung Cancer, West Virginia, 2004 to 2008

STAGE	ALL	% SMALL CELL	% NON-SMALL CELL
In situ or local	18.8	7.3	20.8
Regional	22.8	22.5	22.9
Distant	47.4	65.2	44.1
Unknown	11.0	5.0	12.1

Table 12-8. Early Diagnosis of Lung and Bronchus Cancer
by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	14.1
≥ 50	19.0
RACE	
White	18.8
African American	18.6
SEX	
Male	16.6
Female	21.5

Table 12-9. Early Diagnosis of Lung Cancer
by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	20.5
1999-2003	19.6
2004-2008	18.8

Chapter

13

Bone

Risk Factors

A very small number of bone cancers appear to be hereditary. Exposure to therapeutic radiation to treat cancer, especially if the radiation was at a high level (over 60 Gy) or administered at a young age can increase the risk of subsequent bone cancer (American Cancer Society, 2011).

Screening

According to the American Cancer Society, there are no routine screening tests for bone cancer that are recommended for the general population (American Cancer Society, 2011).

Please note: It is not uncommon for some types of cancer that spread to the distant stage, notably breast, prostate, kidney, thyroid and lung, to metastasize or spread to the bones. As used in this report, bone cancer refers only to **primary** bone cancers, that is, those cancers that actually arise in the bones.

Rates

The age-adjusted incidence rate of bone cancer for West Virginia is not statistically different than the rate of the US as a whole (Table 13-1). The rate of developing bone cancer is about the same for both men and women (Table 13-1).

Table 13-1. Age-Adjusted (2000 Standard) Invasive Bone Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	1.1 (0.4-1.8)	0.6 (0.1-1.1)	NA	NA
1994	2.0 (1.1-2.9)	0.4 (0.0-0.8)	NA	NA
1995	0.8 (0.2-1.4)	1.3 (0.5-2.0)	NA	NA
1996	1.3 (0.6-2.1)	0.9 (0.3-1.5)	NA	NA
1997	1.7 (0.8-2.5)	0.6 (0.1-1.1)	NA	NA
1998	1.1 (0.4-1.8)	0.7 (0.1-1.2)	NA	NA
1999	1.1 (0.4-1.8)	0.4 (0.0-0.9)	1.1 (1.0-1.2)	0.8 (0.8-0.9)
2000	1.2 (0.5-2.0)	0.7 (0.1-1.3)	1.1 (1.0-1.1)	0.8 (0.8-0.9)
2001	0.8 (0.2-1.4)	1.6 (0.8-2.4)	1.1 (1.0-1.2)	0.9 (0.8-0.9)
2002	0.7 (0.1-1.2)	1.0 (0.4-1.6)	1.1 (1.1-1.2)	0.8 (0.8-0.9)
2003	1.6 (0.8-2.4)	0.8 (0.2-1.4)	1.1 (1.0-1.1)	0.8 (0.8-0.9)
2004	1.1 (0.4-1.7)	1.0 (0.4-1.6)	1.1 (1.0-1.1)	0.9 (0.8-0.9)
2005	0.9 (0.2-1.5)	1.1 (0.5-1.8)	1.1 (1.1-1.2)	0.8 (0.8-0.9)
2006	1.0 (0.3-1.6)	0.7 (0.2-1.2)	1.1 (1.0-1.2)	0.8 (0.8-0.9)
2007	1.3 (0.6-2.0)	0.7 (0.1-1.2)	1.1 (1.0-1.1)	0.8 (0.8-0.8)
2008	1.1 (0.4-1.7)	0.9 (0.2-1.5)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 13-2. Age-Specific Average Annual (2004 to 2008)
Invasive Bone Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	~
5 to 9	~
10 to 14	~
15 to 19	1.2
20 to 24	~
25 to 29	1.2
30 to 34	~
35 to 39	1.0
40 to 44	1.1
45 to 49	~
50 to 54	0.9
55 to 59	1.2
60 to 64	1.0
65 to 69	2.3
70 to 74	2.8
75 to 79	2.5
80 to 84	~
85 and older	3.3

~ Fewer than 4 cases reported during the entire period.

Table 13-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Bone Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	0	1.1 (0.8-1.4)
Women	~	0.9 (0.6-1.1)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 13-4) on the following pages summarizes county-level information on invasive bone cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive bone cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of bone cancer were observed for any of the counties in comparison with the state as a whole (Table 13-4).

Table 13-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Bone Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	92	0.8	1.0	1.2	
Barbour	0				
Berkeley	4	0.0	0.9	1.7	NO
Boone	0				
Braxton	0				
Brooke	~				
Cabell	6	0.2	1.4	2.5	NO
Calhoun	~				
Clay	0				
Doddridge	0				
Fayette	~				
Gilmer	~				
Grant	~				
Greenbrier	4	0.0	2.3	4.6	NO
Hampshire	~				
Hancock	~				
Hardy	~				
Harrison	~				
Jackson	0				
Jefferson	~				
Kanawha	12	0.4	1.1	1.7	NO
Lewis	0				
Lincoln	~				
Logan	~				
McDowell	0				
Marion	~				
Marshall	0				
Mason	~				
Mercer	~				
Mineral	~				
Mingo	5	0.4	3.7	7.0	NO
Monongalia	5	0.1	1.2	2.4	NO
Monroe	0				
Morgan	0				
Nicholas	~				
Ohio	~				

~Fewer than 4 cases reported during the entire period.

Table 13-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Bone Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	92	0.8	1.0	1.2	
Pendleton	~				
Pleasants	0				
Pocahontas	~				
Preston	0				
Putnam	~				
Raleigh	6	0.3	1.5	2.7	NO
Randolph	~				
Ritchie	0				
Roane	0				
Summers	0				
Taylor	0				
Tucker	~				
Tyler	0				
Upshur	0				
Wayne	0				
Webster	~				
Wetzel	~				
Wirt	0				
Wood	~				
Wyoming	~				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately 40% of bone cancers are diagnosed at the local stage before the disease has spread.

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Table 13-5. Stage at Diagnosis, Bone Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
Local	41.3
Regional	26.1
Distant	16.3
Unknown	16.3

Table 13-6. Early Diagnosis of Bone Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	46.3
≥ 50	37.3
RACE	
White	40.0
African American	~
SEX	
Male	36.7
Female	46.5

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 13-7. Early Diagnosis of Bone Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	51.5
1999-2003	41.1
2004-2008	41.3

Chapter

14

Soft Tissue

Risk Factors

Risk factors for soft tissue cancers include exposure to ionizing radiation, typically when the radiation has been given to treat other cancer, and family history of diseases such as neurofibromatosis, Gardner syndrome and Li Fraumeni syndrome (American Cancer Society, 2011).

Screening

People with a family history of soft tissue cancers may wish to discuss the risks and benefits of genetic testing with their health care provider and should seek prompt attention for any growths or lumps. There are currently no screening tests that are recommended for persons with no known risk factors for soft tissue cancers (American Cancer Society, 2011).

Rates

The age-adjusted incidence rate of soft tissue cancer for West Virginia is not statistically different than the rate of the US as a whole (Table 14-1). The majority of soft tissue cancer develops in people over the age of 50 (Table 14-2). There is no racial predominance of invasive soft tissue cancer in West Virginia (Table 14-3).

Table 14-1. Age-Adjusted (2000 Standard) Invasive Soft Tissue Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	2.4 (1.4-3.5)	2.4 (1.5-3.3)	NA	NA
1994	2.0 (1.0-3.0)	3.0 (1.9-4.1)	NA	NA
1995	1.9 (1.0-2.8)	1.9 (1.1-2.8)	NA	NA
1996	2.3 (1.3-3.3)	2.0 (1.1-2.8)	NA	NA
1997	3.0 (1.9-4.1)	1.8 (1.0-2.6)	NA	NA
1998	3.5 (2.2-4.7)	1.9 (1.0-2.7)	NA	NA
1999	4.0 (2.7-5.4)	2.1 (1.2-3.1)	3.4 (3.3-3.5)	2.5 (2.4-2.6)
2000	3.4 (2.2-4.6)	2.2 (1.3-3.0)	3.4 (3.3-3.6)	2.6 (2.5-2.7)
2001	3.4 (2.2-4.6)	3.4 (2.3-4.5)	3.5 (3.4-3.6)	2.5 (2.4-2.6)
2002	3.8 (2.5-5.1)	2.0 (1.1-2.8)	3.6 (3.5-3.7)	2.5 (2.5-2.6)
2003	3.4 (2.2-4.6)	3.2 (2.1-4.3)	3.6 (3.5-3.7)	2.7 (2.6-2.7)
2004	3.8 (2.5-5.1)	2.6 (1.6-3.7)	3.7 (3.6-3.8)	2.7 (2.7-2.8)
2005	3.6 (2.4-4.8)	2.6 (1.6-3.6)	3.8 (3.7-3.9)	2.8 (2.7-2.9)
2006	2.8 (1.8-3.9)	3.3 (2.1-4.4)	3.6 (3.5-3.7)	2.7 (2.6-2.8)
2007	3.4 (2.2-4.6)	3.6 (2.4-4.8)	3.8 (3.7-3.9)	2.6 (2.6-2.7)
2008	4.7 (3.3-6.1)	2.3 (1.4-3.2)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 14-2. Age-Specific Average Annual (2004 to 2008)
Invasive Soft Tissue Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	1.5
5 to 9	~
10 to 14	~
15 to 19	2.2
20 to 24	2.3
25 to 29	1.2
30 to 34	1.3
35 to 39	2.2
40 to 44	2.1
45 to 49	2.7
50 to 54	4.2
55 to 59	4.5
60 to 64	4.6
65 to 69	9.2
70 to 74	11.1
75 to 79	10.2
80 to 84	12.9
85 and older	12.7

~ Fewer than 4 cases reported during the entire period.

Table 14-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Soft Tissue Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	3.9 (1.0-6.8)	3.7 (3.1-4.3)
Women	4.2 (0.8-7.6)	2.9 (2.4-3.4)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 14-4) on the following pages summarizes county-level information on invasive soft tissue cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive soft tissue cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of soft tissue cancer were observed for any of the counties in comparison with the state as a whole (Table 14-4).

Table 14-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Soft Tissue Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	330	2.9	3.2	3.6	
Barbour	4	0.1	6.0	11.9	NO
Berkeley	15	1.6	3.3	5.0	NO
Boone	7	1.2	5.2	9.2	NO
Braxton	~				
Brooke	~				
Cabell	15	1.4	2.9	4.4	NO
Calhoun	~				
Clay	~				
Doddridge	~				
Fayette	8	0.9	3.0	5.2	NO
Gilmer	~				
Grant	~				
Greenbrier	5	0.2	2.3	4.5	NO
Hampshire	~				
Hancock	4	0.0	1.7	3.4	NO
Hardy	~				
Harrison	12	1.3	3.2	5.0	NO
Jackson	9	1.9	5.5	9.1	NO
Jefferson	7	0.7	2.7	4.7	NO
Kanawha	42	2.6	3.8	5.0	NO
Lewis	~				
Lincoln	~				
Logan	~				
McDowell	4	0.0	3.2	6.5	NO
Marion	9	0.9	2.6	4.3	NO
Marshall	5	0.2	2.4	4.5	NO
Mason	~				
Mercer	11	1.3	3.3	5.2	NO
Mineral	8	1.6	5.2	8.9	NO
Mingo	4	0.0	2.7	5.3	NO
Monongalia	22	3.3	5.8	8.3	NO
Monroe	4	0.1	4.4	8.7	NO
Morgan	6	1.1	6.2	11.3	NO
Nicholas	~				
Ohio	12	1.8	4.4	7.0	NO

~ Fewer than 4 cases reported during the entire period.

Table 14-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Soft Tissue Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	330	2.9	3.2	3.6	
Pendleton	~				
Pleasants	~				
Pocahontas	~				
Preston	7	1.1	4.5	7.9	NO
Putnam	7	0.6	2.4	4.3	NO
Raleigh	21	2.8	4.9	7.1	NO
Randolph	4	0.0	2.1	4.2	NO
Ritchie	~				
Roane	~				
Summers	~				
Taylor	~				
Tucker	4	0.0	8.0	16.0	NO
Tyler	~				
Upshur	~				
Wayne	7	0.7	2.8	4.9	NO
Webster	0				
Wetzel	6	1.0	5.6	10.2	NO
Wirt	~				
Wood	13	1.3	2.9	4.5	NO
Wyoming	~				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately 50% of soft tissue cancers are diagnosed at the local stage before the disease has spread.

Table 14-5. Stage at Diagnosis, Soft Tissue Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
Local	51.2
Regional	23.9
Distant	14.2
Unknown	10.6

Table 14-6. Early Diagnosis of Soft Tissue Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	52.0
≥ 50	50.9
RACE	
White	50.6
African American	69.2
SEX	
Male	52.3
Female	50.0

Table 14-7. Early Diagnosis of Soft Tissue Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	54.3
1999-2003	50.7
2004-2008	51.2

Chapter

15

Skin Melanoma

Risk Factors

Risk factors for melanoma skin cancer include ultraviolet (UV) light exposure, atypical moles, having fair skin, freckling and light hair, family history of skin melanoma, having suppressed immunity, xeroderma pigmentosum or a past history of melanoma and being older or male (American Cancer Society, 2011).

Screening

The American Cancer Society recommends that persons check their own skin once a month using the ABCD rule:

Asymmetry: One half of the mole does not match the other half.

Border irregularity: The edges of the mole are irregular, ragged, blurred, or notched.

Color: The color over the mole is not the same. There may be differing shades of tan, brown, or black, and sometimes patches of red, blue, or white.

Diameter: The mole is larger than six millimeters (about ¼ inch), although in recent years doctors are finding more melanomas between three and six millimeters.

Skin examination should also be a part of routine cancer-related examinations by health care professionals qualified to diagnose skin cancer (American Cancer Society, 2011).

Rates

Melanoma skin cancer risk is greater for men than women (Table 15-1), and increases with age (Table 15-3). Melanoma rates for West Virginia and the US as a whole are similar (Table 15-1).

Table 15-1. Age-Adjusted (2000 Standard) Invasive Melanoma Skin Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	12.6 (10.2-15.0)	9.2 (7.4-11.1)	NA	NA
1994	12.2 (9.9-14.6)	8.9 (7.1-10.8)	NA	NA
1995	12.5 (10.1-14.8)	9.1 (7.2-10.9)	NA	NA
1996	16.8 (14.1-19.5)	13.9 (11.6-16.2)	NA	NA
1997	18.6 (15.7-21.6)	12.1 (9.9-14.2)	NA	NA
1998	17.9 (15.1-20.7)	14.6 (12.2-16.9)	NA	NA
1999	19.5 (16.6-22.4)	11.6 (9.5-13.7)	19.4 (19.1-19.6)	12.1 (11.9-12.2)
2000	19.2 (16.3-22.1)	12.8 (10.6-15.0)	20.5 (20.2-20.8)	12.9 (12.7-13.1)
2001	21.5 (18.5-24.5)	13.7 (11.4-16.0)	21.4 (21.1-21.6)	13.9 (13.7-14.1)
2002	20.1 (17.2-23.0)	14.7 (12.3-17.1)	21.9 (21.6-22.2)	14.1 (13.9-14.3)
2003	19.6 (16.8-22.5)	12.6 (10.4-14.8)	21.7 (21.4-21.9)	13.8 (13.6-14.0)
2004	24.5 (21.3-27.7)	16.3 (13.8-18.7)	22.6 (22.4-22.9)	14.6 (14.4-14.8)
2005	22.4 (19.4-25.5)	15.1 (12.7-17.5)	23.9 (23.7-24.2)	15.5 (15.4-15.7)
2006	22.4 (19.4-25.4)	14.5 (12.1-16.9)	23.5 (23.2-23.8)	15.3 (15.1-15.5)
2007	21.4 (18.5-24.4)	17.4 (14.8-20.0)	23.5 (23.3-23.8)	15.4 (15.2-15.6)
2008	24.0 (20.9-27.1)	16.1 (13.5-18.6)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 15-2. Age-Specific Average Annual (2004 to 2008)
Invasive Melanoma Skin Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	~
5 to 9	~
10 to 14	1.3
15 to 19	2.2
20 to 24	4.8
25 to 29	7.4
30 to 34	12.2
35 to 39	17.3
40 to 44	16.0
45 to 49	23.5
50 to 54	28.3
55 to 59	33.5
60 to 64	42.6
65 to 69	54.2
70 to 74	57.0
75 to 79	58.4
80 to 84	64.3
85 and older	62.1

~ Fewer than 4 cases reported during the entire period.

Table 15-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Melanoma Skin Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	0	23.8 (22.4-25.2)
Women	~	16.4 (15.3-17.6)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 15-4) on the following pages summarizes county-level information on invasive melanoma skin cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive melanoma skin cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Cabell, Kanawha, Pocahontas, Putnam, and Wood counties have statistically significantly higher rates of invasive melanoma skin cancer in comparison to the rate for West Virginia as a whole (Table 15-4). Melanoma skin cancer rates are significantly lower in Boone, Brooke, Lewis, McDowell, Marshall, Mineral, and Wayne counties in comparison to West Virginia as a whole (Table 15-4).

Table 15-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Melanoma Skin Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1960	17.9	18.8	19.6	
Barbour	15	7.9	16.3	24.6	NO
Berkeley	91	14.9	18.8	22.7	NO
Boone	14	4.4	9.6	14.8	LOWER
Braxton	17	10.5	20.5	30.4	NO
Brooke	12	3.3	8.1	12.8	LOWER
Cabell	132	20.2	24.5	28.8	HIGHER
Calhoun	5	1.3	11.3	21.3	NO
Clay	8	4.7	15.9	27.2	NO
Doddridge	~				
Fayette	46	11.8	16.8	21.7	NO
Gilmer	7	4.0	18.4	32.8	NO
Grant	11	6.4	16.5	26.6	NO
Greenbrier	46	14.7	20.9	27.1	NO
Hampshire	27	14.0	22.6	31.2	NO
Hancock	26	8.0	13.5	19.0	NO
Hardy	10	4.9	13.4	21.9	NO
Harrison	69	13.4	17.7	21.9	NO
Jackson	26	9.1	14.9	20.7	NO
Jefferson	42	10.9	15.8	20.7	NO
Kanawha	259	19.7	22.5	25.2	HIGHER
Lewis	12	4.4	10.4	16.3	LOWER
Lincoln	20	9.2	16.5	23.9	NO
Logan	41	13.9	20.3	26.7	NO
McDowell	14	4.8	10.6	16.4	LOWER
Marion	64	14.7	19.6	24.6	NO
Marshall	24	6.5	11.0	15.5	LOWER
Mason	33	13.8	21.3	28.7	NO
Mercer	85	18.6	23.8	29.1	NO
Mineral	14	4.5	9.7	14.9	LOWER
Mingo	26	10.6	17.3	24.1	NO
Monongalia	64	12.1	16.1	20.2	NO
Monroe	13	6.8	15.6	24.3	NO
Morgan	14	6.7	14.2	21.6	NO
Nicholas	43	19.0	27.5	35.9	NO
Ohio	57	15.3	21.0	26.7	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Table 15-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Melanoma Skin Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1960	17.9	18.8	19.6	
Pendleton	~				
Pleasants	9	6.7	20.2	33.7	NO
Pocahontas	20	19.7	35.8	51.9	HIGHER
Preston	27	9.7	15.9	22.0	NO
Putnam	82	22.1	28.3	34.6	HIGHER
Raleigh	76	12.3	16.0	19.6	NO
Randolph	39	15.3	22.5	29.7	NO
Ritchie	11	6.8	17.0	27.3	NO
Roane	15	7.6	15.6	23.7	NO
Summers	21	12.4	22.1	31.7	NO
Taylor	12	5.2	12.1	19.0	NO
Tucker	6	2.2	11.3	20.3	NO
Tyler	11	7.8	19.6	31.4	NO
Upshur	25	12.1	20.2	28.3	NO
Wayne	28	7.1	11.4	15.7	LOWER
Webster	7	2.8	12.6	22.4	NO
Wetzel	16	8.0	16.4	24.7	NO
Wirt	7	5.0	20.9	36.8	NO
Wood	134	21.7	26.3	30.9	HIGHER
Wyoming	21	7.6	13.5	19.5	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately 80% of melanoma skin cancer diagnoses are made at an early stage (i.e. in situ and local) (Table 15-5).

Table 15-5 Stage at Diagnosis, Melanoma Skin Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	31.3
Local	52.9
Regional	6.8
Distant	3.2
Unknown	5.7

Table 15-6. Early Diagnosis of Melanoma Skin Cancers by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	85.3
≥ 50	83.9
RACE	
White	84.3
African American	~
SEX	
Male	83.4
Female	85.3

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 15-7. Early Diagnosis of Melanoma Skin Cancers by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	84.4
1999-2003	83.6
2004-2008	84.2

Chapter

16

Female Breast

Risk Factors

Risk factors for breast cancer include being female, increasing age, having certain gene mutations associated with breast cancer (this accounts for 5% to 10% of female breast cancers), family history of breast cancer, having a personal history of breast cancer, being white, having a history of therapeutic chest radiation (e.g., for treatment of Hodgkin's or non-Hodgkin's lymphoma), starting menstruation early (before age 12) or going through menopause late (after age 55), not having had children, using postmenopausal hormone replacement therapy, having dense breasts, use of alcohol, and being obese (American Cancer Society, 2011).

Screening

The American Cancer Society recommends these screening guidelines for most adults (American Cancer Society, 2011):

- Yearly mammograms are recommended starting at age 40 and continuing for as long as a woman is in good health.
- Clinical breast exam (CBE) is recommended about every three years for women in their 20s and 30s and every year for women 40 and over.
- Women should know how their breasts normally look and feel and report any breast change promptly to their health care provider. Breast self-exam (BSE) is an option for women starting in their 20s.
- Some women (because of their family history, a genetic tendency, or certain other factors) should be screened with magnetic resonance imaging (MRI) in addition to mammograms. Women should talk with their doctor about their history and whether they should have additional tests at an earlier age.

Rates

West Virginia invasive female breast cancer rates are lower than US rates (Table 16-1). The rate of breast cancer increases with age until the late 70s (Table 16-2).

Table 16-1. Age-Adjusted (2000 Standard) Invasive Female Breast Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	116.2 (109.6-122.7)	NA
1994	111.8 (105.5-118.2)	NA
1995	115.5 (109.0-121.9)	NA
1996	120.4 (113.9-127.0)	NA
1997	117.6 (111.1-124.0)	NA
1998	124.3 (117.7-130.9)	NA
1999	127.0 (120.3-133.6)	134.4 (133.8-135.0)
2000	120.3 (113.9-126.8)	131.9 (131.3-132.5)
2001	121.2 (114.8-127.7)	131.3 (130.7-131.9)
2002	112.5 (106.3-118.8)	128.3 (127.7-128.9)
2003	116.8 (110.4-123.2)	121.7 (121.2-122.3)
2004	117.5 (111.2-123.9)	120.1 (119.6-120.6)
2005	116.3 (110.0-122.6)	119.6 (119.0-120.1)
2006	113.3 (107.0-119.5)	120.3 (119.8-120.8)
2007	114.1 (107.9-120.4)	120.4 (119.8-120.9)
2008	103.4 (97.5-109.3)	NA

Note: USCS data are available only for 1999 through 2007.

Table 16-2. Age-Specific Average Annual (2004 to 2008)
Invasive Female Breast Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	~
20 to 24	1.5
25 to 29	6.0
30 to 34	24.2
35 to 39	56.4
40 to 44	120.4
45 to 49	156.2
50 to 54	191.9
55 to 59	254.4
60 to 64	346.4
65 to 69	368.3
70 to 74	377.4
75 to 79	424.7
80 to 84	380.1
85 and older	295.9

~ Fewer than 4 cases reported during the entire period.

Table 16-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Female Breast Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	101.9 (85.6-118.3)
White	114.1 (111.2-117.0)

County Rates

The table (Table 16-4) on the following pages summarizes county-level information on invasive female breast cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive female breast cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Cabell and Ohio counties have statistically significantly higher rates of invasive breast cancer in comparison to the rate for West Virginia as a whole (Table 16-4). Invasive breast cancer rates are significantly lower in Barbour, Braxton, Brooke, Doddridge, Grant, Pendleton, Raleigh, and Wayne counties in comparison to West Virginia as a whole (Table 16-4).

Table 16-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Female Breast Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	6567	110.4	113.1	115.9	
Barbour	42	57.6	83.6	109.6	LOWER
Berkeley	292	107.0	121.0	135.0	NO
Boone	72	71.1	93.0	114.9	NO
Braxton	36	51.2	76.5	101.8	LOWER
Brooke	77	68.2	88.9	109.6	LOWER
Cabell	433	130.2	144.2	158.2	HIGHER
Calhoun	25	63.8	106.8	149.8	NO
Clay	41	99.9	145.2	190.5	NO
Doddridge	14	29.5	62.2	94.9	LOWER
Fayette	179	100.1	117.9	135.7	NO
Gilmer	14	34.2	74.0	113.7	NO
Grant	28	41.6	67.2	92.8	LOWER
Greenbrier	157	111.9	133.5	155.2	NO
Hampshire	89	107.0	135.6	164.1	NO
Hancock	157	114.4	136.5	158.6	NO
Hardy	43	68.3	97.7	127.2	NO
Harrison	273	106.5	121.3	136.1	NO
Jackson	106	92.5	114.6	136.8	NO
Jefferson	174	111.7	131.7	151.6	NO
Kanawha	808	114.5	123.3	132.0	NO
Lewis	82	109.4	140.6	171.7	NO
Lincoln	65	71.8	95.2	118.6	NO
Logan	120	86.8	106.3	125.9	NO
McDowell	86	80.2	102.2	124.3	NO
Marion	193	89.7	105.2	120.7	NO
Marshall	126	85.3	103.8	122.4	NO
Mason	79	70.2	90.6	110.9	NO
Mercer	230	94.9	109.6	124.3	NO
Mineral	103	94.1	117.1	140.1	NO
Mingo	79	74.2	95.5	116.8	NO
Monongalia	250	108.4	120.4	139.6	NO
Monroe	52	82.1	113.8	145.5	NO
Morgan	49	67.9	95.1	122.4	NO
Nicholas	90	81.2	102.9	124.6	NO
Ohio	221	118.6	137.7	156.8	HIGHER

~ Fewer than 4 cases reported during the entire period.

Table 16-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Female Breast Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	6567	110.4	113.1	115.9	
Pendleton	20	38.8	70.3	101.9	LOWER
Pleasants	23	55.5	95.0	134.5	NO
Pocahontas	31	66.4	104.1	141.8	NO
Preston	107	90.5	112.1	133.7	NO
Putnam	170	88.0	103.7	119.5	NO
Raleigh	242	82.4	94.7	107.0	LOWER
Randolph	99	87.5	109.7	131.8	NO
Ritchie	30	55.1	87.0	118.9	NO
Roane	54	78.8	108.1	137.4	NO
Summers	41	58.5	84.7	110.9	NO
Taylor	49	67.6	94.5	121.5	NO
Tucker	35	83.7	128.7	173.7	NO
Tyler	30	56.4	88.1	119.7	NO
Upshur	90	97.5	123.7	149.9	NO
Wayne	106	64.2	79.6	95.0	LOWER
Webster	33	69.6	106.7	143.7	NO
Wetzel	57	71.8	98.1	124.5	NO
Wirt	19	58.7	108.0	157.2	NO
Wood	367	113.0	126.2	139.5	NO
Wyoming	79	80.5	104.0	127.5	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, close to 70% of female breast cancers are diagnosed at the in situ and local stages before the disease has spread.

Table 16-5. Stage at Diagnosis, Female Breast Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	17.1
Local	50.7
Regional	24.7
Distant	4.6
Unknown	2.9

Table 16-6. Early Diagnosis of Female Breast Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	62.1
≥ 50	69.2
RACE	
White	68.1
African American	59.3

Table 16-7. Early Diagnosis of Female Breast Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	65.5
1999-2003	67.3
2004-2008	67.9

Chapter

17

Uterine Cervix

Risk Factors

Infection with certain types of human papillomavirus (HPV) is the most important risk factor for cervical cancer. High risk types of HPV include HPV 16, HPV 18, HPV 31, HPV 33 and HPV 45, but about two-thirds of cervical cancers are caused by HPV 16 and 18. Certain types of sexual behavior increase a woman's risk of HPV, including having sex at an early age, having multiple sex partners, and having a partner who has had many sexual partners. Two other important risk factors include cigarette smoking and infection with the human immunodeficiency virus (HIV) which makes women more susceptible to HPV infection. Other risk factors include diet low in fruits and vegetables, obesity, long-term oral contraceptive use, multiple pregnancies, low socioeconomic status, use of diethylstibesterol (DES) and family history of cervical cancer (American Cancer Society, 2011).

Screening

The American Cancer Society makes the following recommendations for cervical cancer screening (American Cancer Society, 2011):

- All women should begin cervical cancer testing (screening) three years after they start having sex (vaginal intercourse). A woman who waits until she is over 18 to have sex should start screening no later than age 21. A conventional (regular Pap) test should be done every year. If a liquid-based Pap test is used instead, testing should be done every two years.
- Beginning at age 30, many women who have had three normal Pap test results in a row may be tested less often, every two to three years. Either the conventional (regular) Pap test or the liquid-based Pap test can be used. Some women should continue getting tested yearly such as women exposed to DES before birth, those with a history of treatment for a pre-cancer, and those with a weakened immune system (such as from HIV infection, organ transplant, chemotherapy, or chronic steroid use).

- Another reasonable option for women over 30 (who have normal immune systems and no abnormal Pap results) is to get tested only every three years with a Pap test plus the HPV DNA test. The Pap test used can be either the regular or the liquid-based Pap test.
- Women 70 years of age or older who have had three or more normal Pap tests in a row and no abnormal Pap test results in the last 10 years may choose to stop having cervical cancer testing. Women with a history of cervical cancer, DES exposure before birth, HIV infection, or a weakened immune system should continue to have testing as long as they are in good health.
- Women who have had a total hysterectomy (removal of the uterus and cervix) may also choose to stop having cervical cancer testing, unless the hysterectomy was done as a treatment for cervical cancer or pre-cancer. Women who have had a hysterectomy without removal of the cervix (called a supra-cervical hysterectomy) need to continue cervical cancer screening according to the guidelines above.

Rates

With the exception of years 1999 and 2001, invasive cervical cancer incidence rates for West Virginia were not significantly different from US rates as a whole (Table 17-1). In West Virginia, the incidence rate for cervical cancer is highest for those aged 40 to 44 reaching around 22 per 100,000 women (Table 17-2). There is no racial predominance of cervical cancer in West Virginia (Table 17-3).

Table 17-1. Age-Adjusted (2000 Standard) Invasive Cervical Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	14.1 (11.8-16.5)	NA
1994	14.7 (12.3-17.2)	NA
1995	15.6 (13.1-18.1)	NA
1996	12.6 (10.4-14.8)	NA
1997	15.0 (12.5-17.4)	NA
1998	11.7 (9.6-13.9)	NA
1999	13.8 (11.5-16.2)	9.7 (9.5-9.9)
2000	11.0 (8.9-13.1)	9.6 (9.4-9.7)
2001	12.3 (10.2-14.5)	9.1 (8.9-9.2)
2002	9.3 (7.4-11.2)	8.7 (8.5-8.8)
2003	9.5 (7.5-11.5)	8.4 (8.2-8.5)
2004	9.6 (7.7-11.6)	8.1 (8.0-8.3)
2005	10.5 (8.4-12.6)	8.2 (8.1-8.4)
2006	8.7 (6.8-10.6)	8.1 (7.9-8.2)
2007	9.4 (7.5-11.3)	7.9 (7.7-8.0)
2008	10.0 (7.9-12.0)	NA

Note: USCS data are available only for 1999 through 2007.

Table 17-2. Age-Specific Average Annual (2004 to 2008) Invasive Cervical Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	1.5
25 to 29	6.6
30 to 34	13.0
35 to 39	17.7
40 to 44	22.3
45 to 49	19.1
50 to 54	14.6
55 to 59	11.7
60 to 64	16.3
65 to 69	15.0
70 to 74	8.9
75 to 79	14.0
80 to 84	10.0
85 and older	6.4

Table 17-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Cervical Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	10.5 (5.3-15.8)
White	9.4 (8.5-10.3)

County Rates

The table (Table 17-4) on the following pages summarizes county-level information on invasive cervical cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive cervical cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

The age-adjusted invasive cervical cancer rate for Putnam County is significantly lower than the age-adjusted cervical cancer rate for West Virginia as a whole (Table 17-4).

Table 17-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Cervical Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	472	8.8	9.6	10.5	
Barbour	~				
Berkeley	18	3.8	7.1	10.4	NO
Boone	5	0.7	6.0	11.3	NO
Braxton	~				
Brooke	4	0.0	6.1	12.3	NO
Cabell	21	5.3	9.5	13.7	NO
Calhoun	~				
Clay	~				
Doddridge	4	0.3	18.0	35.6	NO
Fayette	18	7.1	13.8	20.4	NO
Gilmer	~				
Grant	~				
Greenbrier	12	5.3	12.8	20.3	NO
Hampshire	9	5.7	16.8	28.0	NO
Hancock	8	3.1	10.6	18.0	NO
Hardy	~				
Harrison	27	8.5	14.0	19.4	NO
Jackson	~				
Jefferson	12	4.2	9.9	15.6	NO
Kanawha	62	8.6	11.6	14.6	NO
Lewis	11	8.1	21.1	34.0	NO
Lincoln	6	1.8	9.3	16.9	NO
Logan	8	2.4	8.6	14.7	NO
McDowell	13	8.3	19.1	29.8	NO
Marion	14	4.6	9.9	15.2	NO
Marshall	7	2.0	8.1	14.2	NO
Mason	8	2.8	9.6	16.5	NO
Mercer	19	6.2	11.7	17.2	NO
Mineral	4	0.0	5.1	10.2	NO
Mingo	8	3.4	11.4	19.4	NO
Monongalia	17	4.7	9.0	13.4	NO
Monroe	4	0.0	10.6	21.7	NO
Morgan	4	0.0	9.1	18.2	NO
Nicholas	9	4.4	13.3	22.2	NO
Ohio	13	4.1	9.5	14.8	NO

~ Fewer than 4 cases reported during the entire period.

Table 17-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Cervical Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	472	8.8	9.6	10.5	
Pendleton	~				
Pleasants	~				
Pocahontas	~				
Preston	6	1.3	7.1	12.9	NO
Putnam	7	1.3	5.0	8.7	LOWER
Raleigh	16	3.5	7.0	10.6	NO
Randolph	5	0.6	5.9	11.3	NO
Ritchie	~				
Roane	7	3.8	16.5	29.1	NO
Summers	5	1.3	11.4	21.4	NO
Taylor	~				
Tucker	~				
Tyler	~				
Upshur	8	3.3	12.0	20.6	NO
Wayne	9	2.8	8.2	13.7	NO
Webster	5	1.8	19.2	36.6	NO
Wetzel	~	0.0	7.5	16.5	NO
Wirt	~				
Wood	23	5.8	9.9	14.1	NO
Wyoming	5	0.7	7.2	13.6	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, between 2004 and 2008, 44% of cervical cancers were diagnosed at the local stage (Table 17-5).

Table 17-5. Stage at Diagnosis, Invasive Cervical Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
Local	44.3
Regional	35.4
Distant	13.3
Unknown	7.0

In situ cancer of the cervix is not reportable in West Virginia.

Table 17-6. Early Diagnosis of Invasive Cervical Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	51.4
≥ 50	36.2
RACE	
White	44.4
African American	50.0

In situ cancer of the cervix is not reportable in West Virginia.

Table 17-7. Early Diagnosis of Invasive Cervical Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT LOCAL STAGE
1994-1998	54.4
1999-2003	50.5
2004-2008	44.3

In situ cancer of the cervix is not reportable in West Virginia.

Chapter

18

Corpus and Uterus

Risk Factors

Uterine cancer includes endometrial cancer, uterine sarcomas, and placental cancer. Risk factors for uterine cancer include starting menstruation before age 12 and/or going through menopause later in life, obesity, diet high in fat, personal history of diabetes or ovarian diseases such as polycystic ovarian disease, family history of uterine cancer, personal or family history of hereditary non-polyposis colon cancer (HNPCC), personal history of breast or ovarian cancer and prior pelvic irradiation (American Cancer Society, 2011). Use of tamoxifen may increase risk of uterine cancer, but this risk should be weighed against the value of tamoxifen in treating breast cancer (American Cancer Society, 2011).

Screening

According to the American Cancer Society (American Cancer Society, 2011), there are currently no early detection tests specifically for uterine cancer for women at average risk of developing uterine cancer. Such women should discuss regular pelvic exams and Pap tests with their health care providers. Women at increased risk should be informed of their risk and advised to see their health care provider if they experience abnormal vaginal bleeding. Women at risk of hereditary nonpolyposis colorectal cancer (HNPCC) should be offered yearly endometrial biopsies starting at age 35.

Rates

West Virginia rates of uterine cancer tend to be higher than those for the US as a whole, with statistically significant differences for multiple years (Table 18-1). Rates increase with age (Table 18-2). In West Virginia, invasive uterine cancer rates are higher for white women than for African American women (Table 18-3).

Table 18-1. Age-Adjusted (2000 Standard) Invasive Uterine Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	23.3 (20.4-26.2)	NA
1994	26.4 (23.2-29.5)	NA
1995	24.7 (21.8-27.7)	NA
1996	25.8 (22.7-28.8)	NA
1997	31.0 (27.7-34.3)	NA
1998	27.2 (24.1-30.2)	NA
1999	27.1 (24.0-30.2)	24.1 (23.9-24.4)
2000	29.6 (26.4-32.8)	23.9 (23.6-24.2)
2001	26.8 (23.8-29.9)	24.2 (24.0-24.5)
2002	28.3 (25.1-31.4)	24.0 (23.7-24.2)
2003	27.6 (24.6-30.7)	23.1 (22.9-23.4)
2004	28.9 (25.7-32.1)	23.5 (23.3-23.7)
2005	32.3 (28.9-35.6)	23.7 (23.5-24.0)
2006	28.4 (25.2-31.5)	23.9 (23.7-24.2)
2007	28.4 (25.3-31.5)	24.1 (23.8-24.3)
2008	27.0 (24.0-30.0)	NA

Note: USCS data are available only for 1999 through 2007.

Table 18-2. Age-Specific Average Annual (2004 to 2008)
Invasive Uterine Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	~
25 to 29	4.6
30 to 34	10.8
35 to 39	16.3
40 to 44	24.8
45 to 49	35.2
50 to 54	62.1
55 to 59	89.6
60 to 64	95.1
65 to 69	88.6
70 to 74	86.8
75 to 79	77.8
80 to 84	83.9
85 and older	49.3

~ Fewer than 4 cases reported during the entire period.

Table 18-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Uterine Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	18.3 (11.5-25.1)
White	29.0 (27.6-30.5)

County Rates

The table (Table 18-4) on the following pages summarizes county-level information on invasive uterine cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive uterine cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

The age-adjusted invasive uterine cancer rates for Grant, Marshall, and Monroe counties are significantly lower than the age-adjusted uterine cancer rate for West Virginia as a whole (Table 18-4). The uterine cancer rate for Harrison County is significantly higher than the state as a whole (Table 18-4).

Table 18-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Uterine Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1684	27.6	29.1	30.5	
Barbour	19	22.6	41.8	61.0	NO
Berkeley	78	24.5	31.6	38.6	NO
Boone	23	17.0	29.3	41.6	NO
Braxton	~				
Brooke	23	15.7	27.1	38.5	NO
Cabell	103	27.8	34.7	41.6	NO
Calhoun	7	7.3	29.5	51.7	NO
Clay	11	14.3	35.4	56.6	NO
Doddridge	7	6.7	25.9	45.2	NO
Fayette	58	28.8	39.3	49.7	NO
Gilmer	~				
Grant	6	2.7	14.2	25.6	LOWER
Greenbrier	33	17.2	26.4	35.6	NO
Hampshire	23	18.9	32.2	45.5	NO
Hancock	34	21.3	32.9	44.4	NO
Hardy	14	16.1	34.1	52.2	NO
Harrison	90	31.7	40.3	48.9	HIGHER
Jackson	22	14.3	24.9	35.6	NO
Jefferson	40	19.7	28.7	37.7	NO
Kanawha	178	23.2	27.3	31.5	NO
Lewis	15	12.8	26.7	40.6	NO
Lincoln	22	20.0	34.8	49.6	NO
Logan	43	25.5	36.6	47.7	NO
McDowell	22	15.3	26.6	38.0	NO
Marion	51	18.9	26.3	33.6	NO
Marshall	18	8.4	16.1	23.8	LOWER
Mason	25	17.8	30.1	42.4	NO
Mercer	50	18.0	25.2	32.4	NO
Mineral	31	22.8	35.4	48.1	NO
Mingo	24	15.9	26.7	37.4	NO
Monongalia	61	22.8	30.5	38.3	NO
Monroe	6	2.2	11.5	20.7	LOWER
Morgan	23	23.6	40.1	56.6	NO
Nicholas	15	8.7	18.1	27.6	NO
Ohio	57	25.0	34.3	43.5	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Table 18-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Uterine Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1684	27.6	29.1	30.5	
Pendleton	7	5.8	23.3	40.7	NO
Pleasants	12	22.2	52.4	82.6	NO
Pocahontas	~				
Preston	28	18.2	29.1	40.0	NO
Putnam	41	16.9	24.5	32.1	NO
Raleigh	87	26.0	33.2	40.4	NO
Randolph	32	24.5	38.0	51.5	NO
Ritchie	12	15.5	37.1	58.7	NO
Roane	9	5.9	17.3	28.8	NO
Summers	11	8.3	20.6	33.0	NO
Taylor	9	5.7	17.2	28.7	NO
Tucker	9	11.3	34.7	58.1	NO
Tyler	10	12.1	34.3	56.5	NO
Upshur	19	12.9	23.7	34.4	NO
Wayne	31	14.9	23.2	31.4	NO
Webster	6	3.3	19.8	36.3	NO
Wetzel	15	12.6	26.0	39.4	NO
Wirt	5	3.9	34.3	64.8	NO
Wood	78	21.1	27.3	33.5	NO
Wyoming	20	13.5	24.8	36.0	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). Two-thirds of uterine cancers diagnosed in West Virginia are diagnosed at the in situ or local stage (Table 18-5).

Table 18-5. Stage at Diagnosis, Uterine Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	0.9
Local	67.6
Regional	19.4
Distant	5.3
Unknown	6.9

Table 18-6. Early Diagnosis of Uterine Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	75.4
≥ 50	69.4
RACE	
White	68.7
African American	60.7

Table 18-7. Early Diagnosis of Uterine Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	72.7
1999-2003	71.3
2004-2008	68.5

Chapter

19

Ovary

Risk Factors

Several factors may increase a woman's risk of developing ovarian cancer and include increasing age, obesity, use of estrogen therapy for menopause, having never given birth, having endometriosis, family history of ovarian, breast or colorectal cancer, personal history of breast cancer, and having a BRCA1 or BRCA2 mutation (American Cancer Society, 2011). Breast feeding, having a tubal ligation, and personal use of oral contraceptives may lower the risk of ovarian cancer (American Cancer Society, 2011).

Screening

Ovarian cancer symptoms are often vague and easily confused with symptoms for other non-cancerous disorders. Women experiencing the following symptoms daily or almost daily for more than a few weeks are urged to see their health care providers:

- Bloating
- Pelvic or abdominal pain
- Trouble eating or feeling full quickly
- Urinary symptoms such as urgent or frequent feelings of needing to go

Women with elevated risk of epithelial ovarian cancer may be regularly screened with transvaginal ultrasound. Use of CA-125 may be useful in women at high risk, but CA-125 can be elevated in other, non-cancerous diseases of the ovaries, and some ovarian tumors do not produce high levels of CA-125.

Rates

With the exception of in 2000, West Virginia rates of ovarian cancer are not statistically different from ovarian cancer rates for the US as a whole (Table 19-1). Rates of ovarian cancer increase with age (Table 19-2), and are higher among white women than African American women (Table 19-3).

Table 19-1. Age-Adjusted (2000 Standard) Invasive Ovarian Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	13.1 (10.8-15.3)	NA
1994	16.7 (14.2-19.2)	NA
1995	19.6 (17.0-22.3)	NA
1996	15.4 (13.0-17.8)	NA
1997	17.4 (14.9-19.9)	NA
1998	17.6 (15.1-20.1)	NA
1999	15.6 (13.2-17.9)	14.2 (14.0-14.4)
2000	17.6 (15.1-20.0)	14.3 (14.1-14.5)
2001	15.4 (13.2-17.7)	14.1 (13.9-14.3)
2002	15.9 (13.6-18.2)	13.7 (13.5-13.8)
2003	15.8 (13.5-18.2)	13.4 (13.3-13.6)
2004	13.1 (11.0-15.2)	12.9 (12.8-13.1)
2005	13.4 (11.2-15.5)	12.8 (12.6-13.0)
2006	13.7 (11.5-15.9)	12.6 (12.4-12.8)
2007	12.1 (10.1-14.1)	12.2 (12.0-12.4)
2008	13.2 (11.1-15.3)	NA

Note: USCS data are available only for 1999 through 2007.

Table 19-2. Age-Specific Average Annual (2004 to 2008)
Invasive Ovarian Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	~
20 to 24	1.5
25 to 29	2.7
30 to 34	4.7
35 to 39	6.1
40 to 44	10.1
45 to 49	14.9
50 to 54	26.3
55 to 59	30.3
60 to 64	31.0
65 to 69	44.0
70 to 74	41.7
75 to 79	48.6
80 to 84	50.0
85 and older	44.6

~ Fewer than 4 cases reported during the entire period.

Table 19-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Ovarian Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	6.8 (2.6-11.1)
White	13.4 (12.4-14.3)

County Rates

The table (Table 19-4) on the following pages summarizes county-level information on invasive ovarian cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive ovarian cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of ovarian cancer were observed for any of the counties in comparison with West Virginia as a whole (Table 19-4).

Table 19-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Ovarian Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	766	12.1	13.1	14.0	
Barbour	6	2.2	11.8	21.4	NO
Berkeley	37	10.5	15.5	20.5	NO
Boone	8	2.8	9.2	15.7	NO
Braxton	9	5.6	16.4	27.1	NO
Brooke	8	2.7	10.0	17.3	NO
Cabell	47	11.7	16.6	21.5	NO
Calhoun	4	0.0	21.3	43.3	NO
Clay	7	5.8	23.6	41.3	NO
Doddridge	~				
Fayette	29	11.4	18.1	24.8	NO
Gilmer	~				
Grant	~				
Greenbrier	19	8.3	15.5	22.8	NO
Hampshire	15	12.4	25.6	38.8	NO
Hancock	15	5.7	11.8	17.9	NO
Hardy	6	2.8	14.0	25.3	NO
Harrison	26	6.9	11.4	15.8	NO
Jackson	10	4.5	12.5	20.5	NO
Jefferson	22	9.4	16.4	23.4	NO
Kanawha	84	9.6	12.3	15.0	NO
Lewis	9	5.9	17.9	29.8	NO
Lincoln	12	7.5	17.3	27.1	NO
Logan	12	4.2	9.7	15.2	NO
McDowell	8	2.6	8.8	14.9	NO
Marion	25	8.0	13.5	18.9	NO
Marshall	12	4.0	9.5	14.9	NO
Mason	9	3.5	10.1	16.8	NO
Mercer	26	7.2	12.1	17.0	NO
Mineral	6	1.3	6.8	12.3	NO
Mingo	10	4.5	12.0	19.5	NO
Monongalia	22	6.4	11.1	15.8	NO
Monroe	6	2.3	12.2	22.1	NO
Morgan	6	2.1	10.7	19.4	NO
Nicholas	11	5.1	12.5	19.9	NO
Ohio	15	4.3	8.9	13.6	NO

~ Fewer than 4 cases reported during the entire period.

Table 19-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Ovarian Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	766	12.1	13.1	14.0	
Pendleton	5	1.5	18.7	36.0	NO
Pleasants	~				
Pocahontas	5	1.8	15.2	28.6	NO
Preston	13	5.8	12.8	19.8	NO
Putnam	25	9.5	15.7	21.9	NO
Raleigh	33	8.0	12.2	16.5	NO
Randolph	9	3.2	10.0	16.8	NO
Ritchie	7	5.2	21.0	36.7	NO
Roane	8	5.1	16.9	28.6	NO
Summers	5	1.0	9.6	18.1	NO
Taylor	6	1.7	11.0	20.4	NO
Tucker	~				
Tyler	4	0.0	14.4	29.2	NO
Upshur	17	12.0	23.4	34.9	NO
Wayne	12	3.9	9.1	14.4	NO
Webster	5	1.8	15.1	28.4	NO
Wetzel	7	2.6	12.1	21.6	NO
Wirt	4	0.1	23.5	46.9	NO
Wood	40	9.5	13.9	18.3	NO
Wyoming	9	3.6	10.7	17.8	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, only about 12% of ovarian cancers are diagnosed at the earliest stages (i.e. in situ and local stages combined) (Table 19-5). More than half of ovarian cancers are diagnosed at the distant stage (Table 19-5).

Table 19-5. Stage at Diagnosis, Ovarian Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ and Local	12.0
Regional	17.8
Distant	57.3
Unknown	12.9

Table 19-6. Early Diagnosis of Ovarian Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	24.2
≥ 50	9.4
RACE	
White	12.1
African American	~

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 19-7. Early Diagnosis of Ovarian Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	25.6
1999-2003	18.9
2004-2008	12.0

Chapter

20

Vagina

Risk Factors

Risk factors for vaginal cancer include age older than 70 years, maternal use of Diethylstilbestrol (DES), vaginal adenosis (the presence of glandular cells in the vagina), infection with human papillomavirus, personal history of cervical cancer, smoking and infection with HIV (human immunodeficiency virus) (American Cancer Society, 2011).

Screening

Many early vaginal cancers can be detected through Pap testing.

Rates

The age-adjusted incidence rate of vaginal cancer for West Virginia is not statistically different than the rate of the US as a whole (Table 20-1). Most cases of invasive vaginal cancer occur in women 70 years and older (Table 20-2).

Table 20-1. Age-Adjusted (2000 Standard) Invasive Vaginal Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	1.0 (0.5-1.6)	NA
1994	1.1 (0.4-1.7)	NA
1995	1.1 (0.5-1.7)	NA
1996	0.8 (0.3-1.4)	NA
1997	1.1 (0.5-1.8)	NA
1998	1.2 (0.5-1.8)	NA
1999	0.7 (0.2-1.2)	0.7 (0.7-0.8)
2000	0.9 (0.4-1.5)	0.8 (0.7-0.8)
2001	1.1 (0.5-1.7)	0.7 (0.7-0.8)
2002	0.6 (0.2-1.1)	0.7 (0.7-0.8)
2003	0.7 (0.2-1.2)	0.7 (0.7-0.7)
2004	0.7 (0.2-1.2)	0.7 (0.7-0.8)
2005	1.0 (0.5-1.6)	0.6 (0.6-0.7)
2006	0.6 (0.1-1.0)	0.7 (0.6-0.7)
2007	0.8 (0.3-1.2)	0.7 (0.6-0.7)
2008	0.8 (0.3-1.3)	NA

Note: USCS data are available only for 1999 through 2007.

Table 20-2. Age-Specific Average Annual (2004 to 2008)
Invasive Vaginal Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	~
30 to 34	0
35 to 39	~
40 to 44	~
45 to 49	~
50 to 54	~
55 to 59	2.7
60 to 64	1.6
65 to 69	~
70 to 74	3.9
75 to 79	3.6
80 to 84	4.6
85 and older	5.6

~ Fewer than 4 cases reported during the entire period.

Table 20-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Vaginal Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	~
White	0.7 (0.5-1.0)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 20-4) on the following pages summarizes county-level information on invasive vaginal cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive vaginal cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of vaginal cancer were observed for any of the counties in comparison with West Virginia as a whole (Table 20-4).

Table 20-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Vaginal Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	48	0.5	0.8	1.0	
Barbour	0				
Berkeley	~				
Boone	~				
Braxton	0				
Brooke	0				
Cabell	~				
Calhoun	0				
Clay	~				
Doddridge	0				
Fayette	~				
Gilmer	0				
Grant	~				
Greenbrier	~				
Hampshire	~				
Hancock	0				
Hardy	0				
Harrison	0				
Jackson	~				
Jefferson	~				
Kanawha	6	0.2	0.8	1.5	NO
Lewis	~				
Lincoln	0				
Logan	~				
McDowell	~				
Marion	~				
Marshall	~				
Mason	0				
Mercer	~				
Mineral	0				
Mingo	~				
Monongalia	~				
Monroe	0				
Morgan	~				
Nicholas	0				
Ohio	~				

~ Fewer than 4 cases reported during the entire period.

Table 20-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Vaginal Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	48	0.5	0.8	1.0	
Pendleton	0				
Pleasants	0				
Pocahontas	0				
Preston	0				
Putnam	0				
Raleigh	4	0.0	1.3	2.6	NO
Randolph	~				
Ritchie	~				
Roane	0				
Summers	0				
Taylor	0				
Tucker	0				
Tyler	~				
Upshur	~				
Wayne	0				
Webster	0				
Wetzel	0				
Wirt	0				
Wood	0				
Wyoming	~				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, just over half of all vaginal cancers are diagnosed at the earliest stages (i.e. in situ and local stages combined) (Table 20-5).

Table 20-5. Stage at Diagnosis, Vaginal Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	20.0
Local	36.7
Regional	11.7
Distant	15.0
Unknown	16.7

Table 20-6. Early Diagnosis of Vaginal Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	87.5
≥ 50	51.9
RACE	
White	54.4
African American	~

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 20-7. Early Diagnosis of Vaginal Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	57.1
1999-2003	62.2
2004-2008	56.7

Chapter 21

Vulva

Risk Factors

Risk factors for vulvar cancer include increasing age (less than 20% of cases are in women younger than 50 years of age), infection with human papillomavirus (HPV), infection with HIV (human immunodeficiency virus), personal history of *lichen sclerosus et atrophicus*, personal history of other genital cancers or melanoma/dysplastic nevi, and smoking (American Cancer Society, 2011).

Screening

There is no standard screening for vulvar cancer other than routine physical examinations. Regular pelvic exams increase the likelihood that vulvar cancer will be detected early (American Cancer Society, 2011).

Rates

The age-adjusted incidence rate of vulvar cancer for West Virginia is not statistically different than the rate of the US as a whole (Table 20-1). The risk of vulvar cancer increases with age (Table 20-2).

Table 21-1. Age-Adjusted (2000 Standard) Invasive Vulvar Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	2.9 (1.8-3.9)	NA
1994	3.5 (2.4-4.6)	NA
1995	2.7 (1.7-3.6)	NA
1996	3.2 (2.1-4.2)	NA
1997	3.2 (2.1-4.2)	NA
1998	2.3 (1.4-3.1)	NA
1999	3.1 (2.1-4.1)	2.4 (2.3-2.4)
2000	2.2 (1.4-3.1)	2.3 (2.2-2.4)
2001	2.6 (1.7-3.5)	2.4 (2.3-2.4)
2002	3.2 (2.2-4.2)	2.3 (2.3-2.4)
2003	2.0 (1.2-2.8)	2.3 (2.2-2.4)
2004	3.7 (2.6-4.8)	2.3 (2.3-2.4)
2005	2.8 (1.8-3.8)	2.3 (2.3-2.4)
2006	3.1 (2.0-4.1)	2.3 (2.3-2.4)
2007	2.7 (1.8-3.7)	2.4 (2.3-2.5)
2008	3.3 (2.3-4.4)	NA

Note: USCS data are available only for 1999 through 2007.

Table 21-2. Age-Specific Average Annual (2004 to 2008)
Invasive Vulvar Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	0
30 to 34	~
35 to 39	2.7
40 to 44	3.5
45 to 49	2.5
50 to 54	3.7
55 to 59	5.1
60 to 64	5.7
65 to 69	8.7
70 to 74	13.9
75 to 79	12.2
80 to 84	17.7
85 and older	18.3

~ Fewer than 4 cases reported during the entire period.

Table 21-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Vulvar Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	~
White	3.2 (2.7-3.7)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 21-4) on the following pages summarizes county-level information on invasive vulvar cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive vulvar cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of vulvar cancer were observed for any of the counties in comparison with West Virginia as a whole (Table 21-4).

Table 21-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Vulvar Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	184	2.7	3.1	3.6	
Barbour	~				
Berkeley	~				
Boone	~				
Braxton	~				
Brooke	7	1.7	6.8	12.0	NO
Cabell	9	1.0	3.1	5.2	NO
Calhoun	~				
Clay	~				
Doddridge	~				
Fayette	~				
Gilmer	~				
Grant	~				
Greenbrier	4	0.0	3.2	6.4	NO
Hampshire	~				
Hancock	~				
Hardy	~				
Harrison	9	1.3	4.1	6.8	NO
Jackson	~				
Jefferson	~				
Kanawha	25	2.2	3.7	5.2	NO
Lewis	~				
Lincoln	0				
Logan	~				
McDowell	0				
Marion	5	0.2	2.3	4.4	NO
Marshall	4	0.0	3.1	6.3	NO
Mason	~				
Mercer	~				
Mineral	~				
Mingo	~				
Monongalia	10	2.0	5.3	8.6	NO
Monroe	~				
Morgan	0				
Nicholas	~				
Ohio	7	0.5	3.6	6.8	NO

~ Fewer than 4 cases reported during the entire period.

Table 21-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Vulvar Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	184	2.7	3.1	3.6	
Pendleton	~				
Pleasants	~				
Pocahontas	~				
Preston	~				
Putnam	5	0.4	3.4	6.4	NO
Raleigh	5	0.2	1.6	3.1	NO
Randolph	4	0.0	5.4	10.8	NO
Ritchie	~				
Roane	~				
Summers	4	0.1	7.4	14.7	NO
Taylor	~				
Tucker	0				
Tyler	~				
Upshur	~				
Wayne	4	0.0	3.2	6.3	NO
Webster	~				
Wetzel	4	0.1	6.7	13.3	NO
Wirt	~				
Wood	8	0.9	3.2	5.5	NO
Wyoming	5	0.7	7.7	14.7	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). Over 75% of vulvar cancers are diagnosed at the in situ or local stage (Table 21-5).

Table 21.5. Stage at Diagnosis, Vulvar Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	44.6
Local	32.5
Regional	15.4
Distant	1.8
Unknown	5.7

Table 21-6. Early Diagnosis of Vulvar Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	93.3
≥ 50	69.6
RACE	
White	77.1
African American	~

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 21-7. Early Diagnosis of Vulvar Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	81.0
1999-2003	79.0
2004-2008	77.1

Chapter

22

Penis

Risk Factors

Risk factors for penile cancer include smoking, increasing age, infection with human papillomavirus (HPV), use of ultraviolet light in conjunction with the drug psoralen to treat psoriasis and infection with HIV (American Cancer Society, 2011). Circumcision is protective against invasive penile cancer when done shortly after birth, but not when done later in life (American Cancer Society, 2011).

Screening

There are no widely recommended screening tests for penile cancer, but many cases can be found early. A man should see a doctor if he finds any new growths or other penile abnormality, even if it is not painful (American Cancer Society, 2011).

Rates

The age-adjusted incidence rate of penile cancer for West Virginia is not statistically different than the rate of the US as a whole (Table 22-1). Penile cancer increases with age (Table 22-2).

Table 22-1. Age-Adjusted (2000 Standard) Invasive Penile Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	0.6 (0.1-1.1)	NA
1994	1.6 (0.7-2.4)	NA
1995	0.4 (0.0-0.8)	NA
1996	1.4 (0.6-2.2)	NA
1997	1.3 (0.6-2.0)	NA
1998	1.0 (0.3-1.6)	NA
1999	1.7 (0.9-2.5)	0.9 (0.8-1.0)
2000	0.8 (0.2-1.3)	0.9 (0.8-1.0)
2001	1.6 (0.8-2.4)	0.9 (0.8-0.9)
2002	1.1 (0.5-1.8)	0.9 (0.8-0.9)
2003	0.9 (0.3-1.5)	0.9 (0.8-0.9)
2004	1.5 (0.7-2.3)	0.8 (0.8-0.9)
2005	0.9 (0.3-1.6)	0.8 (0.8-0.9)
2006	1.4 (0.7-2.2)	0.8 (0.7-0.8)
2007	0.6 (0.1-1.1)	0.8 (0.8-0.9)
2008	0.7 (0.2-1.3)	NA

Note: USCS data are available only for 1999 through 2007.

Table 22-2. Age-Specific Average Annual (2004 to 2008)
Invasive Penile Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	0
30 to 34	0
35 to 39	0
40 to 44	~
45 to 49	1.2
50 to 54	1.5
55 to 59	3.4
60 to 64	2.6
65 to 69	2.7
70 to 74	4.8
75 to 79	~
80 to 84	5.0
85 and older	9.1

~ Fewer than 4 cases reported during the entire period.

Table 22-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Penile Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	0
White	1.1 (0.8-1.4)

County Rates

The table (Table 22-4) on the following pages summarizes county-level information on invasive penile cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive penile cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of penile cancer were observed for any of the counties in comparison with West Virginia as a whole (Table 22-4).

Table 22-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Penile Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	52	0.7	1.0	1.3	
Barbour	~				
Berkeley	~				
Boone	~				
Braxton	~				
Brooke	0				
Cabell	7	0.8	3.0	5.3	NO
Calhoun	~				
Clay	0				
Doddridge	0				
Fayette	~				
Gilmer	0				
Grant	0				
Greenbrier	0				
Hampshire	~				
Hancock	0				
Hardy	0				
Harrison	~				
Jackson	0				
Jefferson	0				
Kanawha	5	0.1	1.0	1.8	NO
Lewis	~				
Lincoln	~				
Logan	~				
McDowell	0				
Marion	~				
Marshall	~				
Mason	0				
Mercer	0				
Mineral	0				
Mingo	~				
Monongalia	~				
Monroe	~				
Morgan	~				
Nicholas	~				
Ohio	0				

~ Fewer than 4 cases reported during the entire period.

Table 22-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Penile Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	52	0.7	1.0	1.3	
Pendleton	0				
Pleasants	~				
Pocahontas	0				
Preston	~				
Putnam	~				
Raleigh	~				
Randolph	0				
Ritchie	~				
Roane	0				
Summers	0				
Taylor	0				
Tucker	~				
Tyler	0				
Upshur	0				
Wayne	~				
Webster	0				
Wetzel	~				
Wirt	0				
Wood	~				
Wyoming	0				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, between 2004 and 2008, over 60% of penile cancers were diagnosed at the earliest stages (i.e. in situ and local) (Table 22-5).

Table 22-5. Stage at Diagnosis, Penile Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	29.7
Local	32.4
Regional	28.4
Distant	4.1
Unknown	5.4

Table 22-6. Early Diagnosis of Penile Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	~
≥ 50	65.7
RACE	
White	61.1
African American	~

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 22-7. Early Diagnosis of Penile Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	74.6
1999-2003	74.3
2004-2008	62.1

Chapter

23

Prostate

Risk Factors

Prostate cancer risk factors include increasing age (rates increase rapidly after age 50), race (rates are higher among African American men), and family history of prostate cancer (American Cancer Society, 2011).

Screening

According to the American Cancer Society (American Cancer Society, 2011):

- Men who are 50 and who have a life expectancy of at least 10 years should be offered a yearly prostate specific antigen test and digital rectal exam.
- Men at high risk, such as African Americans and men who have a close relative (father, brother, son) diagnosed with prostate cancer should be offered screening at age 45.
- Men at very high risk (those with several first degree relatives diagnosed with prostate cancer at a young age) should be offered screening at age 40.

Health care professionals should inform men of the benefits, side-effects and scientific questions about early detection and treatment of prostate cancer so that men can make informed decisions. The American Cancer Society does not support routine testing for prostate cancer at this time.

Rates

West Virginia rates of prostate cancer are lower than those for US men, with statistically significant differences for multiple years (Table 23-1). Rates of prostate cancer increase sharply around age 50 (Table 23-1) and are statistically significantly higher in African American men than in white men (Table 23-3).

Table 23-1. Age-Adjusted (2000 Standard) Invasive Prostate Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	153.4 (144.8-162.0)	NA
1994	147.7 (139.4-156.1)	NA
1995	131.0 (123.2-138.8)	NA
1996	136.0 (128.2-143.9)	NA
1997	139.4 (131.5-147.2)	NA
1998	148.6 (140.5-156.7)	NA
1999	148.1 (140.1-156.1)	168.5 (167.7-169.3)
2000	163.6 (155.2-172.0)	170.2 (169.4-171.0)
2001	162.3 (154.0-170.5)	172.2 (171.4-172.9)
2002	152.4 (144.4-160.3)	170.3 (169.6-171.1)
2003	130.0 (122.7-137.3)	155.8 (155.1-156.5)
2004	127.1 (120.0-134.3)	150.8 (150.1-151.4)
2005	135.2 (127.9-142.6)	147.0 (146.4-147.7)
2006	151.1 (143.4-158.7)	155.9 (155.3-156.6)
2007	157.7 (149.9-165.4)	156.9 (156.3-157.6)
2008	131.4 (124.4-138.5)	NA

Note: USCS data are available only for 1999 through 2007.

Table 23-2. Age-Specific Average Annual (2004 to 2008)
Invasive Prostate Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	~
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	0
30 to 34	0
35 to 39	~
40 to 44	6.4
45 to 49	35.7
50 to 54	122.5
55 to 59	268.6
60 to 64	490.4
65 to 69	742.0
70 to 74	869.3
75 to 79	836.1
80 to 84	715.8
85 and older	640.7

~ Fewer than 4 cases reported during the entire period.

Table 23-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Prostate Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	220.5 (192.6-248.5)
White	140.1 (136.7-143.4)

County Rates

The table (Table 23-4) on the following pages summarizes county-level information on invasive prostate cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive prostate cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Cabell, Hancock, Monongalia, Ohio, and Wetzel counties have statistically significantly higher rates of invasive prostate cancer in comparison to the rate for West Virginia as a whole (Table 23-4). Invasive prostate cancer rates are significantly lower in Boone, Fayette, Jefferson, Morgan, Pendleton, Raleigh, and Wayne counties in comparison to West Virginia as a whole (Table 23-4).

Table 23-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Prostate Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	7148	137.9	141.2	144.5	
Barbour	67	114.9	152.2	189.4	NO
Berkeley	318	128.9	145.4	162.0	NO
Boone	66	75.3	100.3	125.2	LOWER
Braxton	57	92.5	125.3	158.2	NO
Brooke	112	117.5	144.6	171.6	NO
Cabell	414	145.4	160.9	176.5	HIGHER
Calhoun	30	79.9	125.4	170.8	NO
Clay	39	85.6	125.7	165.9	NO
Doddridge	23	63.0	110.4	157.9	NO
Fayette	147	95.8	114.5	133.2	LOWER
Gilmer	28	84.6	135.1	185.6	NO
Grant	47	80.4	113.2	146.0	NO
Greenbrier	141	108.8	130.7	152.5	NO
Hampshire	89	105.3	133.5	161.6	NO
Hancock	194	171.5	199.9	228.3	HIGHER
Hardy	47	82.2	118.7	155.3	NO
Harrison	256	120.4	137.5	154.5	NO
Jackson	129	126.0	152.7	179.4	NO
Jefferson	124	89.0	109.3	129.5	LOWER
Kanawha	836	144.4	155.0	165.6	NO
Lewis	80	123.5	158.8	194.1	NO
Lincoln	80	100.0	128.9	157.7	NO
Logan	121	104.9	129.1	153.2	NO
McDowell	84	101.6	130.3	159.0	NO
Marion	239	130.4	149.5	168.7	NO
Marshall	147	122.8	147.0	171.1	NO
Mason	102	106.4	132.4	158.5	NO
Mercer	268	133.0	151.3	169.5	NO
Mineral	109	116.9	145.2	173.5	NO
Mingo	89	105.2	134.4	163.5	NO
Monongalia	288	147.6	167.4	187.2	HIGHER
Monroe	66	119.6	158.4	197.2	NO
Morgan	53	76.5	105.9	135.3	LOWER
Nicholas	97	97.5	122.1	146.7	NO
Ohio	261	171.4	195.3	219.3	HIGHER

Table 23-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Prostate Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	7148	137.9	141.2	144.5	
Pendleton	29	62.5	99.0	135.2	LOWER
Pleasants	35	108.8	164.2	219.6	NO
Pocahontas	35	74.0	111.5	149.0	NO
Preston	135	129.3	155.9	182.6	NO
Putnam	212	126.9	147.3	167.7	NO
Raleigh	258	102.9	117.5	132.1	LOWER
Randolph	123	123.2	150.3	177.3	NO
Ritchie	46	101.6	144.1	186.5	NO
Roane	57	89.9	122.3	154.7	NO
Summers	52	85.4	117.4	149.4	NO
Taylor	57	92.5	125.6	158.6	NO
Tucker	31	78.4	121.4	164.5	NO
Tyler	39	82.5	120.9	159.3	NO
Upshur	85	97.5	124.2	150.9	NO
Wayne	108	73.0	90.5	107.9	LOWER
Webster	37	86.0	128.5	171.0	NO
Wetzel	104	153.7	191.1	228.5	HIGHER
Wirt	22	76.3	136.3	196.3	NO
Wood	348	124.9	139.8	154.8	NO
Wyoming	87	97.1	124.7	152.4	NO

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, between 2004 and 2008, over 84% of prostate cancers were diagnosed at the earlier stages (in situ or local) (Table 23-5).

Table 23-5. Stage at Diagnosis, Prostate Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ and Local	84.8
Regional	6.1
Distant	3.7
Unknown	5.4

Table 23-6. Early Diagnosis of Prostate Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	83.4
≥ 50	84.8
RACE	
White	85.0
African American	78.0

Table 23-7. Early Diagnosis of Prostate Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	66.5
1999-2003	73.8
2004-2008	84.8

Chapter

24

Testis

Risk Factors

Risk factors for testicular cancer include having cryptorchidism (undescended testicle(s)), family history of testicular cancer, personal history of testicular cancer, age (90% of testicular cancers occur in men between 20 and 54 years of age) and race (highest in whites) (American Cancer Society, 2011).

Screening

The American Cancer Society recommends that men have a testicular exam as a part of a regular cancer-related checkup (American Cancer Society, 2011). Men with risk factors for testicular cancer should discuss testicular self-exams with their health care provider.

Rates

The age-adjusted incidence rate of testicular cancer for West Virginia is not statistically different than the rate of the US as a whole (Table 24-1). In West Virginia, the highest rates of testicular cancer were found among men between the ages of 20 and 40 (Table 24-2).

Table 24-1. Age-Adjusted (2000 Standard) Invasive Testicular Cancer Incidence Rates per 100,000 by Year of Diagnosis

YEAR	WEST VIRGINIA	USCS
1993	4.9 (3.5-6.4)	NA
1994	5.8 (4.2-7.4)	NA
1995	4.9 (3.4-6.4)	NA
1996	6.0 (4.4-7.6)	NA
1997	4.6 (3.2-6.1)	NA
1998	4.4 (3.0-5.8)	NA
1999	5.1 (3.6-6.7)	5.3 (5.2-5.5)
2000	5.6 (4.0-7.2)	5.3 (5.2-5.5)
2001	4.1 (2.7-5.4)	5.4 (5.3-5.5)
2002	4.5 (3.1-5.9)	5.2 (5.1-5.4)
2003	5.6 (4.0-7.2)	5.4 (5.2-5.5)
2004	4.9 (3.4-6.5)	5.4 (5.3-5.5)
2005	5.8 (4.2-7.4)	5.5 (5.4-5.6)
2006	5.0 (3.5-6.5)	5.3 (5.2-5.4)
2007	5.9 (4.2-7.5)	5.3 (5.1-5.4)
2008	5.1 (3.5-6.6)	NA

Note: USCS data are available only for 1999 through 2007.

Table 24-2. Age-Specific Average Annual (2004 to 2008)
Invasive Testicular Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	~
5 to 9	0
10 to 14	~
15 to 19	1.7
20 to 24	10.4
25 to 29	18.3
30 to 34	14.0
35 to 39	9.5
40 to 44	7.4
45 to 49	5.9
50 to 54	3.8
55 to 59	2.1
60 to 64	~
65 to 69	~
70 to 74	~
75 to 79	~
80 to 84	0
85 and older	0

~ Fewer than 4 cases reported during the entire period.

Table 24-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Testicular Cancer Incidence Rates per 100,000 by Race

RACE	RATE
African American	0
White	5.6 (4.9-6.3)

County Rates

The table (Table 24-4) on the following pages summarizes county-level information on invasive testicular cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive testicular cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of testicular cancer were observed for any of the counties in comparison with West Virginia as a whole (Table 24-4).

Table 24-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Testicular Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	230	4.6	5.3	6.0	
Barbour	~				
Berkeley	13	2.4	5.2	8.1	NO
Boone	4	0.0	6.4	12.8	NO
Braxton	~				
Brooke	~				
Cabell	11	2.0	4.9	7.9	NO
Calhoun	0				
Clay	0				
Doddridge	0				
Fayette	8	2.2	7.3	12.3	NO
Gilmer	0				
Grant	0				
Greenbrier	9	4.0	12.0	20.0	NO
Hampshire	4	0.1	7.5	14.9	NO
Hancock	~				
Hardy	~				
Harrison	7	1.2	4.5	7.9	NO
Jackson	8	3.8	12.6	21.5	NO
Jefferson	11	3.8	9.6	15.3	NO
Kanawha	27	3.8	6.2	8.6	NO
Lewis	5	1.6	13.4	25.2	NO
Lincoln	~				
Logan	7	2.1	8.4	14.7	NO
McDowell	~				
Marion	~				
Marshall	~				
Mason	~				
Mercer	5	0.4	3.4	6.4	NO
Mineral	5	1.0	8.3	15.7	NO
Mingo	~				
Monongalia	11	1.8	4.9	8.0	NO
Monroe	~				
Morgan	~				
Nicholas	~				
Ohio	10	3.3	9.2	15.1	NO

~ Fewer than 4 cases reported during the entire period.

Table 24-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Testicular Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	230	4.6	5.3	6.0	
Pendleton	0				
Pleasants	~				
Pocahontas	0				
Preston	~				
Putnam	5	0.4	3.8	7.2	NO
Raleigh	9	1.7	5.1	8.4	NO
Randolph	~				
Ritchie	~				
Roane	~				
Summers	~				
Taylor	~				
Tucker	~				
Tyler	~				
Upshur	5	1.1	9.5	18.0	NO
Wayne	6	1.2	6.0	10.8	NO
Webster	~				
Wetzel	~				
Wirt	0				
Wood	13	2.9	6.4	10.0	NO
Wyoming	5	1.0	9.1	17.1	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, more than two-thirds of testicular cancers are diagnosed at the in situ or local stage, before the disease has spread (Table 24-5).

Table 24.5. Stage at Diagnosis, Testicular Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ and Local	69.3
Regional	16.9
Distant	12.1
Unknown	1.7

Table 24-6. Early Diagnosis of Testicular Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	68.8
≥ 50	73.1
RACE	
White	70.0
African American	~

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 24-7. Early Diagnosis of Testicular Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	64.8
1999-2003	64.8
2004-2008	69.3

Chapter

25

Urinary Bladder

Risk Factors

Risk factors for bladder cancer include smoking, occupational exposures to industrial chemicals such as aromatic amines used in the dye industry and organic chemicals used in the manufacture of rubber, leather, textiles and paint products, race (whites have higher risk), increasing age, sex (men have higher risk), personal history of bladder cancer, certain bladder birth defects such as exstrophy, family history of bladder cancer, cancer chemotherapy agents such as cyclophosphamide (Cytoxan) and ifosamide (Ifex), pelvic irradiation, and consumption of drinking water with arsenic in it (American Cancer Society, 2011).

Screening

Screening for bladder cancer is not recommended for the general public. Some doctors recommend screening for persons at very high risk for bladder cancer. Risk factors that would justify screening include a previous diagnosis of bladder cancer or certain birth defects of the bladder. People with a lot of work-related exposure to certain chemicals might also be screened (American Cancer Society, 2011).

Rates

West Virginia female bladder cancer incidence rates were statistically significantly higher than US female bladder cancer rates for multiple years (Table 25-1). Men have higher rates of bladder cancer than women (Table 25-2). Bladder cancer rates increase with age (Table 25-2) and are higher among whites than African Americans (Table 25-3).

Table 25-1. Age-Adjusted (2000 Standard) Bladder Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

(Note that bladder cancer rates include BOTH in situ and invasive cancers.)

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	38.8 (34.5-43.1)	10.9 (9.0-12.7)	NA	NA
1994	37.2 (33.0-41.4)	11.1 (9.2-13.0)	NA	NA
1995	36.4 (32.3-40.6)	10.2 (8.3-12.0)	NA	NA
1996	38.9 (34.7-43.2)	9.6 (7.8-11.4)	NA	NA
1997	42.9 (38.4-47.3)	12.0 (10.1-14.0)	NA	NA
1998	44.7 (40.1-49.3)	13.2 (11.1-15.3)	NA	NA
1999	40.9 (36.6-45.1)	13.6 (11.5-15.7)	39.1 (38.7-39.5)	9.9 (9.8-10.1)
2000	39.6 (35.4-43.9)	12.3 (10.3-14.3)	39.1 (38.7-39.4)	10.0 (9.8-10.2)
2001	42.9 (38.6-47.2)	11.0 (9.1-12.9)	38.6 (38.2-38.9)	9.7 (9.6-9.9)
2002	40.7 (36.5-44.9)	13.1 (11.1-15.1)	38.6 (38.2-39.0)	9.7 (9.5-9.8)
2003	40.1 (36.0-44.2)	10.3 (8.5-12.1)	38.2 (37.8-38.5)	9.8 (9.6-9.9)
2004	39.0 (35.0-43.0)	10.0 (8.3-11.8)	38.3 (38.0-38.7)	9.8 (9.6-9.9)
2005	40.1 (36.0-44.1)	13.0 (10.9-15.0)	37.9 (37.6-38.3)	9.7 (9.5-9.8)
2006	40.2 (36.1-44.2)	10.9 (9.1-12.8)	36.7 (36.4-37.1)	9.2 (9.0-9.3)
2007	40.4 (36.4-44.5)	10.7 (8.9-12.5)	36.0 (35.7-36.3)	9.1 (8.9-9.2)
2008	39.8 (35.9-43.8)	10.9 (9.1-12.8)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 25-2. Age-Specific Average Annual (2004 to 2008)
Bladder Cancer Incidence Rates per 100,000

(Note that bladder cancer rates include BOTH in situ and invasive cancers.)

AGE AT DIAGNOSIS	RATE
Birth to 4	~
5 to 9	0
10 to 14	0
15 to 19	~
20 to 24	~
25 to 29	1.0
30 to 34	1.4
35 to 39	2.0
40 to 44	5.4
45 to 49	9.8
50 to 54	20.0
55 to 59	33.3
60 to 64	62.1
65 to 69	88.1
70 to 74	131.6
75 to 79	155.8
80 to 84	167.6
85 and older	154.0

~ Fewer than 4 cases reported during the entire period.

Table 25-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Bladder Cancer Incidence Rates per 100,000 by Race and Sex

(Note that bladder cancer rates include BOTH in situ and invasive cancers.)

GENDER	AFRICAN AMERICAN	WHITE
Men	17.8 (9.8-25.9)	41.0 (39.1-42.9)
Women	6.0 (2.4-9.6)	11.4 (10.5-12.3)

County Rates

The table (Table 25-4) on the following pages summarizes county-level information on bladder cancer incidence. Included are:

- The total number of newly-diagnosed cases of in situ and invasive bladder cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Doddridge, Summers, Taylor, and Wayne counties have statistically significantly lower rates of bladder cancer in comparison to the rate for West Virginia as a whole (Table 25-4).

Table 25-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Bladder Cancer Incidence Rates per 100,000

(Note that bladder cancer rates include BOTH in situ and invasive cancers.)

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	2633	22.7	23.6	24.5	
Barbour	23	14.4	24.4	34.5	NO
Berkeley	103	18.7	23.2	27.8	NO
Boone	26	11.2	18.3	25.5	NO
Braxton	20	12.1	21.8	31.4	NO
Brooke	35	13.8	20.8	27.8	NO
Cabell	141	20.0	23.9	27.9	NO
Calhoun	14	14.0	29.7	45.3	NO
Clay	13	9.8	21.5	33.2	NO
Doddridge	5	1.2	11.2	21.1	LOWER
Fayette	70	18.2	23.8	29.4	NO
Gilmer	9	6.7	19.5	32.2	NO
Grant	13	7.2	16.2	25.2	NO
Greenbrier	74	23.4	30.4	37.4	NO
Hampshire	39	20.0	29.2	38.4	NO
Hancock	60	19.6	26.3	32.9	NO
Hardy	18	12.2	22.8	33.4	NO
Harrison	101	19.0	23.7	28.3	NO
Jackson	51	20.3	28.0	35.8	NO
Jefferson	60	19.4	26.2	33.0	NO
Kanawha	296	20.7	23.4	26.0	NO
Lewis	27	14.9	23.9	33.0	NO
Lincoln	25	11.8	19.5	27.3	NO
Logan	51	17.9	24.8	31.8	NO
McDowell	38	16.9	25.0	33.1	NO
Marion	98	20.8	26.0	31.3	NO
Marshall	51	16.2	22.4	28.6	NO
Mason	34	14.1	21.5	28.8	NO
Mercer	112	21.4	26.3	31.3	NO
Mineral	30	12.2	19.1	26.1	NO
Mingo	38	18.3	27.0	35.7	NO
Monongalia	92	19.6	24.7	29.8	NO
Monroe	22	13.4	23.2	32.9	NO
Morgan	20	11.2	20.1	29.0	NO
Nicholas	38	15.5	22.8	30.1	NO
Ohio	87	20.0	25.4	30.9	NO

~ Fewer than 4 cases reported during the entire period.

Table 25-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Bladder Cancer Incidence Rates per 100,000, Continued
(Note that bladder cancer rates include BOTH in situ and invasive cancers.)

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	2633	22.7	23.6	24.5	
Pendleton	11	7.3	17.9	28.6	NO
Pleasants	9	7.1	21.0	34.9	NO
Pocahontas	14	10.3	21.8	33.3	NO
Preston	40	14.7	21.3	28.0	NO
Putnam	80	21.6	27.7	33.9	NO
Raleigh	106	17.0	21.1	25.1	NO
Randolph	55	23.2	31.6	40.0	NO
Ritchie	13	9.0	19.9	30.7	NO
Roane	25	15.7	26.0	36.4	NO
Summers	10	3.9	10.4	16.9	LOWER
Taylor	13	5.9	13.0	20.1	LOWER
Tucker	13	11.1	24.5	37.8	NO
Tyler	14	11.0	23.2	35.5	NO
Upshur	29	12.7	20.1	27.5	NO
Wayne	35	9.3	14.1	18.8	LOWER
Webster	12	8.3	19.3	30.3	NO
Wetzel	30	16.2	25.3	34.5	NO
Wirt	13	17.2	38.4	59.7	NO
Wood	138	20.8	25.0	29.2	NO
Wyoming	39	18.8	27.6	36.3	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, most bladder cancers are diagnosed at the in situ and local stages, before the disease has spread (Table 25-5).

Table 25-5 Stage at Diagnosis, Bladder Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	44.5
Local	40.1
Regional	6.7
Distant	4.0
Unknown	4.7

Table 25-6. Early Diagnosis of Bladder Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	81.8
≥ 50	84.8
RACE	
White	84.8
African American	67.7
SEX	
Male	85.2
Female	82.9

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 25-7. Early Diagnosis of Bladder Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	79.9
1999-2003	83.4
2004-2008	84.6

Chapter

26

Kidney and Renal Pelvis

Risk Factors

Risk factors for kidney and renal pelvis cancer include smoking, obesity, occupational exposures to substances such as asbestos, cadmium, benzene, organic solvents and some herbicides, hereditary factors such as having von Hippel-Lindau disease, hereditary papillary renal cell carcinoma, Birt-Hogg-Dube syndrome, hereditary leiomyomastosis renal cell carcinoma syndrome, and hereditary renal oncocytoma. Other risk factors include family history of kidney cancer, personal history of high blood pressure, personal history of advanced renal disease, sex (males have higher risk) and race (African Americans have higher risk) (American Cancer Society, 2011).

Screening

There are no simple tests for early detection of kidney and renal pelvis cancer (American Cancer Society, 2011).

Rates

The age-adjusted incidence rates (male and female) of kidney and renal pelvis cancer for West Virginia are not statistically different than rates (male and female) of the US as a whole (Table 26-1). Males have higher rates of invasive kidney and renal pelvis cancer than females (Table 26-1). Kidney and renal pelvis cancer rates increase with age (Table 26-2). In West Virginia, there is no difference in kidney and renal pelvis cancer incidence rates between whites and African Americans (Table 26-3).

Table 26-1. Age-Adjusted (2000 Standard) Invasive Kidney and Renal Pelvis Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	15.1 (12.4-17.8)	8.7 (6.9-10.4)	NA	NA
1994	13.9 (11.4-16.5)	8.0 (6.3-9.7)	NA	NA
1995	17.2 (14.5-20.0)	8.6 (6.9-10.3)	NA	NA
1996	16.4 (13.7-19.1)	9.2 (7.4-11.0)	NA	NA
1997	14.8 (12.2-17.3)	10.5 (8.6-12.3)	NA	NA
1998	16.9 (14.2-19.6)	6.7 (5.2-8.2)	NA	NA
1999	16.9 (14.2-19.6)	9.0 (7.3-10.7)	16.8 (16.5-17.0)	8.6 (8.4-8.8)
2000	17.3 (14.6-20.0)	9.8 (8.0-11.6)	17.3 (17.1-17.6)	8.9 (8.8-9.1)
2001	19.2 (16.4-22.0)	10.5 (8.6-12.4)	18.1 (17.9-18.4)	9.3 (9.1-9.4)
2002	20.0 (17.1-22.9)	10.1 (8.3-12.0)	18.7 (18.5-19.0)	9.5 (9.4-9.7)
2003	17.7 (15.1-20.4)	8.8 (7.1-10.5)	19.2 (19.0-19.5)	10.0 (9.8-10.1)
2004	20.4 (17.6-23.3)	11.1 (9.1-13.0)	19.7 (19.5-19.9)	10.3 (10.1-10.4)
2005	22.3 (19.3-25.3)	13.7 (11.5-15.9)	20.2 (20.0-20.4)	10.6 (10.4-10.8)
2006	22.9 (19.9-26.0)	11.8 (9.8-13.8)	20.7 (20.5-21.0)	11.0 (10.8-11.2)
2007	22.0 (19.0-25.0)	12.6 (10.6-14.7)	20.8 (20.5-21.0)	10.9 (10.7-11.0)
2008	21.5 (18.6-24.4)	12.7 (10.6-14.7)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 26-2. Age-Specific Average Annual (2004 to 2008)
Invasive Kidney and Renal Pelvis Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	2.1
5 to 9	~
10 to 14	0
15 to 19	~
20 to 24	~
25 to 29	1.6
30 to 34	2.7
35 to 39	7.1
40 to 44	13.0
45 to 49	16.9
50 to 54	24.2
55 to 59	32.0
60 to 64	47.2
65 to 69	64.4
70 to 74	69.3
75 to 79	77.4
80 to 84	67.1
85 and older	45.4

~ Fewer than 4 cases reported during the entire period.

Table 26-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Kidney and Renal Pelvis Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	24.6 (16.0-33.2)	22.0 (20.7-23.4)
Women	10.9 (5.5-16.4)	12.5 (11.6-13.5)

County Rates

The table (Table 26-4) on the following pages summarizes county-level information on invasive kidney and renal pelvis cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive kidney and renal pelvis cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Fayette, Marshall, and Summers counties have statistically significantly lower rates of kidney and renal pelvis cancer in comparison to the rate for West Virginia as a whole (Table 26-4). Hampshire County has a significantly higher rate of kidney and renal pelvis cancer than West Virginia (Table 26-4).

Table 26-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Kidney and Renal Pelvis Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1809	15.9	16.7	17.5	
Barbour	20	11.8	21.2	30.6	NO
Berkeley	90	15.3	19.3	23.4	NO
Boone	23	9.8	16.7	23.7	NO
Braxton	12	5.6	13.3	20.9	NO
Brooke	20	6.3	11.5	16.6	NO
Cabell	109	15.6	19.3	23.0	NO
Calhoun	6	2.4	11.9	21.4	NO
Clay	10	6.7	17.9	29.1	NO
Doddridge	~				
Fayette	33	7.4	11.4	15.3	LOWER
Gilmer	12	12.6	30.0	47.5	NO
Grant	11	5.3	13.8	22.3	NO
Greenbrier	35	10.0	15.2	20.4	NO
Hampshire	35	17.6	26.5	35.4	HIGHER
Hancock	36	11.2	16.7	22.2	NO
Hardy	16	9.3	18.4	27.5	NO
Harrison	70	12.8	16.8	20.8	NO
Jackson	38	14.4	21.2	28.0	NO
Jefferson	34	8.3	12.7	17.2	NO
Kanawha	221	15.7	18.1	20.5	NO
Lewis	22	12.5	21.8	31.1	NO
Lincoln	19	8.3	15.1	22.0	NO
Logan	37	11.6	17.3	22.9	NO
McDowell	29	12.8	20.4	28.0	NO
Marion	56	12.1	16.6	21.0	NO
Marshall	22	5.6	9.8	13.9	LOWER
Mason	23	8.2	14.0	19.7	NO
Mercer	58	10.9	14.8	18.7	NO
Mineral	31	12.9	20.0	27.1	NO
Mingo	24	9.0	15.2	21.3	NO
Monongalia	56	10.9	14.9	18.8	NO
Monroe	14	7.7	16.6	25.4	NO
Morgan	17	9.0	17.5	26.0	NO
Nicholas	24	8.7	14.8	20.9	NO
Ohio	65	17.1	22.7	28.4	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Table 26-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Kidney and Renal Pelvis Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1809	15.9	16.7	17.5	
Pendleton	6	2.0	11.7	21.4	NO
Pleasants	~				
Pocahontas	12	8.3	19.6	30.8	NO
Preston	34	12.8	19.4	26.0	NO
Putnam	49	11.9	16.6	21.4	NO
Raleigh	82	13.0	16.7	20.3	NO
Randolph	27	9.5	15.4	21.2	NO
Ritchie	9	4.5	13.2	22.0	NO
Roane	14	7.1	15.0	22.9	NO
Summers	6	1.3	6.7	12.1	LOWER
Taylor	14	7.1	15.2	23.3	NO
Tucker	6	2.2	11.4	20.6	NO
Tyler	12	9.6	22.8	35.9	NO
Upshur	18	6.4	11.9	17.4	NO
Wayne	29	7.5	11.8	16.2	NO
Webster	8	3.9	13.8	23.7	NO
Wetzel	20	9.8	17.7	25.6	NO
Wirt	10	11.2	29.9	48.6	NO
Wood	92	13.9	17.6	21.2	NO
Wyoming	25	10.2	17.1	24.1	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, nearly two-thirds of kidney and renal pelvis cancers are diagnosed at the in situ or local stage, before the disease has spread (Table 26-5).

Table 26-5. Stage at Diagnosis, Kidney and Renal Pelvis Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	1.4
Local	61.4
Regional	15.2
Distant	15.3
Unknown	6.6

Table 26-6. Early Diagnosis of Kidney and Renal Pelvis Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	70.7
≥ 50	61.4
RACE	
White	62.8
African American	62.0
SEX	
Male	60.6
Female	66.2

Table 26-7. Early Diagnosis of Kidney and Renal Pelvis Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	53.7
1999-2003	58.6
2004-2008	62.8

Chapter 27

Eye

Risk Factors

Different types of eye cancer have different risk factors. Risk factors for melanoma of the eye include light skin and/or eye color, and personal history of dysplastic nevus syndrome (American Cancer Society, 2011). Risk factors for retinoblastoma include age (most cases are younger than three years of age) and heredity (American Cancer Society, 2011).

Screening

Persons at increased risk for eye cancers should be regularly monitored by an ophthalmologist (American Cancer Society, 2011). Regular eye examinations are useful in the detection of other eye cancers, such as non-hereditary retinoblastomas (American Cancer Society, 2011).

Rates

The age-adjusted incidence rate of eye cancer for West Virginia is not statistically different than rates of the US as a whole (Table 27-1). In West Virginia, the rate of invasive eye cancer does not differ significantly by gender (Table 27-1) or race (Table 27-3).

Table 27-1. Age-Adjusted (2000 Standard) Invasive Eye Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	1.2 (0.5-2.0)	1.3 (0.6-1.9)	NA	NA
1994	1.1 (0.4-1.8)	0.8 (0.2-1.3)	NA	NA
1995	0.4 (0.0-0.8)	0.6 (0.2-1.1)	NA	NA
1996	1.0 (0.3-1.7)	0.7 (0.2-1.2)	NA	NA
1997	1.6 (0.8-2.4)	1.3 (0.6-2.0)	NA	NA
1998	1.2 (0.4-1.9)	0.8 (0.3-1.3)	NA	NA
1999	0.8 (0.2-1.4)	0.7 (0.2-1.3)	1.0 (0.9-1.0)	0.7 (0.7-0.8)
2000	1.8 (0.9-2.7)	1.1 (0.4-1.7)	1.1 (1.0-1.1)	0.7 (0.6-0.7)
2001	1.0 (0.3-1.7)	0.9 (0.3-1.5)	1.0 (1.0-1.1)	0.7 (0.7-0.8)
2002	1.3 (0.6-2.0)	0.7 (0.2-1.2)	1.0 (1.0-1.1)	0.7 (0.6-0.7)
2003	1.4 (0.6-2.2)	1.1 (0.4-1.7)	1.1 (1.0-1.1)	0.7 (0.7-0.8)
2004	1.1 (0.4-1.8)	0.9 (0.4-1.4)	1.0 (1.0-1.1)	0.7 (0.7-0.8)
2005	1.6 (0.8-2.4)	0.6 (0.1-1.0)	1.0 (0.9-1.0)	0.7 (0.7-0.8)
2006	1.1 (0.4-1.7)	0.8 (0.3-1.3)	1.0 (0.9-1.0)	0.7 (0.7-0.8)
2007	1.4 (0.7-2.2)	1.5 (0.7-2.3)	0.9 (0.9-1.0)	0.7 (0.7-0.8)
2008	1.1 (0.4-1.7)	0.6 (0.1-1.0)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 27-2. Age-Specific Average Annual (2004 to 2008)
Invasive Eye Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	1.1
5 to 9	0
10 to 14	0
15 to 19	~
20 to 24	0
25 to 29	0
30 to 34	~
35 to 39	~
40 to 44	0.6
45 to 49	0.9
50 to 54	0.9
55 to 59	2.4
60 to 64	4.0
65 to 69	3.3
70 to 74	3.7
75 to 79	3.2
80 to 84	6.2
85 and older	~

~ Fewer than 4 cases reported during the entire period.

Table 27-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Eye Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	~	1.2 (0.9-1.6)
Women	0	0.9 (0.6-1.2)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 27-4) on the following pages summarizes county-level information on invasive eye cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive eye cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of eye cancer were observed for any of the counties in comparison with West Virginia as a whole (Table 27-4).

Table 27-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Eye Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	112	0.8	1.0	1.2	
Barbour	~				
Berkeley	7	0.4	1.5	2.6	NO
Boone	~				
Braxton	~				
Brooke	~				
Cabell	4	0.0	0.7	1.3	NO
Calhoun	~				
Clay	~				
Doddridge	0				
Fayette	4	0.0	1.5	2.9	NO
Gilmer	0				
Grant	~				
Greenbrier	~				
Hampshire	~				
Hancock	~				
Hardy	~				
Harrison	~				
Jackson	~				
Jefferson	~				
Kanawha	19	0.9	1.7	2.5	NO
Lewis	~				
Lincoln	0				
Logan	~				
McDowell	~				
Marion	~				
Marshall	~				
Mason	0				
Mercer	6	0.3	1.5	2.7	NO
Mineral	~				
Mingo	~				
Monongalia	5	0.1	1.2	2.2	NO
Monroe	0				
Morgan	0				
Nicholas	~				
Ohio	~				

~ Fewer than 4 cases reported during the entire period.

Table 27-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Eye Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	112	0.8	1.0	1.2	
Pendleton	0				
Pleasants	~				
Pocahontas	~				
Preston	0				
Putnam	5	0.1	1.5	2.9	NO
Raleigh	4	0.0	0.9	1.8	NO
Randolph	~				
Ritchie	0				
Roane	~				
Summers	~				
Taylor	~				
Tucker	0				
Tyler	~				
Upshur	0				
Wayne	~				
Webster	~				
Wetzel	0				
Wirt	~				
Wood	6	0.2	1.0	1.8	NO
Wyoming	~				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately three-fourths of eye cancers are diagnosed at the in situ or local stage, before the disease has spread (Table 27-5).

Table 27-5. Stage at Diagnosis, Eye Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ	6.7
Local	70.8
Regional	9.2
Distant	2.5
Unknown	10.8

Table 27-6. Early Diagnosis of Eye Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	66.7
≥ 50	79.8
RACE	
White	77.1
African American	~
SEX	
Male	75.0
Female	80.8

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 27-7. Early Diagnosis of Eye Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	74.0
1999-2003	79.3
2004-2008	77.5

Chapter

28

Brain and Other Nervous System

Risk Factors

Radiation to the head, most often for treatment of other cancers such as leukemia, increases risk of brain tumors 10 to 15 years after the radiation. Certain rare conditions increase risk of brain tumors, including neurofibromatosis type 2, tuberous sclerosis and von Hippel-Lindau disease although malignant brain tumors are rare in these conditions (American Cancer Society, 2011).

Screening

No blood or other screening exam currently exists for brain and other nervous system cancer (American Cancer Society, 2011).

Rates

With the exception of 2007 (females), brain and other nervous system cancer incidence rates for West Virginia were not statistically significantly different from US rates (Table 28-1). Brain and other nervous system cancers occur throughout the lifespan, with a peak in early childhood followed by a decrease in the 20s and then increase again in the 40s (Table 28-2). No significant differences in brain and other nervous system cancer incidence rates were observed by race (Table 28-3).

Table 28-1. Age-Adjusted (2000 Standard) Invasive Brain and Other Nervous System Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	6.7 (4.9-8.4)	5.8 (4.4-7.3)	NA	NA
1994	9.2 (7.1-11.2)	5.8 (4.4-7.3)	NA	NA
1995	7.6 (5.8-9.5)	7.2 (5.5-8.9)	NA	NA
1996	6.9 (5.1-8.6)	6.6 (5.0-8.1)	NA	NA
1997	7.8 (6.0-9.7)	6.2 (4.6-7.7)	NA	NA
1998	7.0 (5.3-8.8)	5.5 (4.1-7.0)	NA	NA
1999	8.1 (6.2-10.0)	6.0 (4.5-7.5)	8.0 (7.8-8.2)	5.9 (5.7-6.0)
2000	7.5 (5.8-9.3)	6.0 (4.5-7.5)	8.1 (7.9-8.2)	5.8 (5.7-5.9)
2001	8.3 (6.4-10.2)	6.6 (5.0-8.2)	8.0 (7.8-8.1)	5.6 (5.5-5.8)
2002	9.0 (7.0-10.9)	5.5 (4.0-6.9)	8.1 (8.0-8.3)	5.7 (5.6-5.8)
2003	9.3 (7.4-11.3)	6.7 (5.1-8.2)	7.9 (7.8-8.1)	5.8 (5.6-5.9)
2004	8.9 (7.0-10.9)	7.3 (5.6-8.9)	8.0 (7.9-8.2)	5.8 (5.7-6.0)
2005	7.9 (6.1-9.7)	5.9 (4.4-7.4)	7.9 (7.8-8.1)	5.8 (5.7-5.9)
2006	9.8 (7.8-11.8)	5.8 (4.4-7.3)	7.8 (7.7-8.0)	5.7 (5.6-5.8)
2007	8.5 (6.6-10.3)	8.3 (6.5-10.1)	7.7 (7.5-7.8)	5.6 (5.5-5.8)
2008	7.8 (6.1-9.6)	6.4 (4.9-8.0)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 28-2. Age-Specific Average Annual (2004 to 2008) Invasive Brain and Other Nervous System Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	5.5
5 to 9	3.3
10 to 14	3.1
15 to 19	1.7
20 to 24	2.5
25 to 29	3.9
30 to 34	4.1
35 to 39	4.3
40 to 44	5.7
45 to 49	7.2
50 to 54	8.0
55 to 59	12.7
60 to 64	20.5
65 to 69	17.6
70 to 74	21.0
75 to 79	26.0
80 to 84	22.9
85 and older	19.9

Table 28-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Brain and Other Nervous System Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	4.6 (0.8-8.3)	8.8 (8.0-9.7)
Women	3.2 (0.4-6.0)	7.0 (6.2-7.7)

County Rates

The table (Table 28-4) on the following pages summarizes county-level information on invasive brain and other nervous cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive brain and other nervous system cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Mercer County has a statistically significantly higher rate of invasive brain and other nervous system cancer in comparison to the rate for West Virginia as a whole (Table 28-4).

Table 28-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Brain and Other Nervous System Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	777	6.7	7.0	7.4	
Barbour	6	1.3	7.3	13.3	NO
Berkeley	36	5.1	7.5	10.0	NO
Boone	13	4.2	9.4	14.6	NO
Braxton	5	0.7	6.6	12.5	NO
Brooke	4	0.0	3.4	6.9	NO
Cabell	45	5.8	8.3	10.8	NO
Calhoun	~				
Clay	4	0.0	7.6	15.2	NO
Doddridge	~				
Fayette	22	4.5	7.9	11.3	NO
Gilmer	~				
Grant	4	0.0	6.4	12.9	NO
Greenbrier	20	5.5	10.2	14.8	NO
Hampshire	10	3.0	8.0	13.1	NO
Hancock	9	1.4	4.4	7.3	NO
Hardy	9	4.1	12.4	20.7	NO
Harrison	31	5.1	8.0	10.8	NO
Jackson	15	4.5	9.4	14.3	NO
Jefferson	17	3.4	6.6	9.9	NO
Kanawha	91	6.4	8.1	9.8	NO
Lewis	9	2.8	8.5	14.1	NO
Lincoln	~				
Logan	20	5.7	10.5	15.2	NO
McDowell	9	2.2	7.0	11.7	NO
Marion	23	4.3	7.3	10.4	NO
Marshall	13	2.9	6.6	10.4	NO
Mason	9	1.9	5.9	9.9	NO
Mercer	40	7.8	11.4	15.1	HIGHER
Mineral	9	1.8	5.4	9.1	NO
Mingo	11	2.8	7.1	11.4	NO
Monongalia	21	3.0	5.3	7.6	NO
Monroe	5	0.6	5.9	11.1	NO
Morgan	9	3.3	9.9	16.4	NO
Nicholas	16	5.2	10.4	15.6	NO
Ohio	29	6.7	10.8	14.9	NO

~ Fewer than 4 cases reported during the entire period.

Table 28-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Brain and Other Nervous System Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	777	6.7	7.0	7.4	
Pendleton	~				
Pleasants	5	1.1	9.9	18.7	NO
Pocahontas	5	0.9	9.8	18.7	NO
Preston	15	4.1	8.4	12.7	NO
Putnam	16	2.7	5.3	7.9	NO
Raleigh	32	4.6	7.1	9.6	NO
Randolph	12	3.2	7.6	12.1	NO
Ritchie	7	2.8	11.9	21.0	NO
Roane	6	1.2	6.9	12.6	NO
Summers	7	1.8	9.3	16.8	NO
Taylor	8	2.7	9.0	15.3	NO
Tucker	4	0.0	9.2	18.7	NO
Tyler	~				
Upshur	10	3.0	8.2	13.4	NO
Wayne	8	1.0	3.4	5.8	NO
Webster	~				
Wetzel	10	3.9	10.8	17.7	NO
Wirt	~				
Wood	40	5.3	7.7	10.2	NO
Wyoming	10	2.5	6.8	11.1	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, stage at diagnosis does not have the same prognostic significance for brain and other nervous system cancers as it does for other cancers and there is disagreement among the staging systems as to how to stage these cancers. As a result, staging data are not presented here.

Chapter

29

Thyroid Cancer

Risk Factors

Risk factors for thyroid cancer include diets low in iodine, being female, history of head or neck radiation in childhood, exposure to radioactive fallout in childhood (such as occurred at Chernobyl), family history of medullary thyroid cancer, and a personal history of Gardner syndrome, familial polyposis or Cowden's disease (American Cancer Society, 2011).

Screening

Many cases of thyroid cancer are found early when persons ask their health care providers about lumps they have noticed or when health care providers find lumps during regular examinations. Some doctors recommend that people examine their own necks twice a year to look for any growths or lumps. Persons with a family history of medullary thyroid cancer may be at very high risk for developing thyroid cancer and should discuss their genetic screening and preventive options with their health care providers (American Cancer Society, 2011).

Rates

In West Virginia, as in the US as a whole, rates of invasive thyroid cancer have been increasing (Table 29-1). Rates are higher among women than men (Tables 29-1). No difference in thyroid cancer risk was observed between whites and African Americans (Table 29-3).

Table 29-1. Age-Adjusted (2000 Standard) Invasive Thyroid Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	2.2 (1.2-3.1)	3.2 (2.1-4.3)	NA	NA
1994	1.9 (1.0-2.9)	5.1 (3.7-6.5)	NA	NA
1995	2.3 (1.3-3.3)	6.6 (5.0-8.2)	NA	NA
1996	2.1 (1.1-3.1)	5.5 (4.1-7.0)	NA	NA
1997	2.4 (1.4-3.4)	9.9 (7.9-11.9)	NA	NA
1998	3.8 (2.6-5.1)	8.4 (6.6-10.2)	NA	NA
1999	3.5 (2.3-4.8)	11.3 (9.2-13.5)	3.7 (3.6-3.8)	9.9 (9.7-10.1)
2000	3.8 (2.5-5.1)	10.9 (8.8-13.0)	3.9 (3.8-4.0)	11.0 (10.8-11.2)
2001	4.5 (3.1-5.9)	11.8 (9.6-14.0)	4.0 (3.9-4.1)	11.6 (11.4-11.7)
2002	3.9 (2.6-5.2)	13.0 (10.7-15.3)	4.4 (4.3-4.5)	12.4 (12.2-12.5)
2003	2.9 (1.8-4.0)	10.2 (8.2-12.2)	4.4 (4.3-4.6)	13.0 (12.8-13.2)
2004	4.3 (2.9-5.6)	12.2 (10.0-14.4)	4.7 (4.6-4.9)	14.1 (13.9-14.3)
2005	6.5 (4.9-8.1)	14.2 (11.8-16.6)	5.2 (5.1-5.4)	15.1 (14.9-15.3)
2006	6.1 (4.5-7.6)	16.2 (13.6-18.8)	5.4 (5.3-5.5)	16.1 (15.9-16.3)
2007	5.8 (4.2-7.3)	16.9 (14.3-19.4)	5.8 (5.6-5.9)	17.2 (17.0-17.4)
2008	5.6 (4.0-7.1)	19.5 (16.7-22.3)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 29-2. Age-Specific Average Annual (2004 to 2008)
Invasive Thyroid Cancer Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	~
5 to 9	0
10 to 14	~
15 to 19	2.4
20 to 24	5.0
25 to 29	6.9
30 to 34	11.3
35 to 39	15.0
40 to 44	17.0
45 to 49	17.4
50 to 54	21.0
55 to 59	16.8
60 to 64	22.6
65 to 69	21.6
70 to 74	18.5
75 to 79	18.6
80 to 84	11.9
85 and older	9.4

~ Fewer than 4 cases reported during the entire period.

Table 29-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Invasive Thyroid Cancer Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	~	5.7 (5.0-6.4)
Women	12.2 (6.6-17.8)	16.0 (14.8-17.1)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 29-4) on the following pages summarizes county-level information on thyroid cancer incidence. Included are:

- The total number of newly-diagnosed cases of invasive thyroid cancer for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Rates of invasive thyroid cancer are statistically significantly higher in Cabell and Ohio counties, and lower in Roane County in comparison to West Virginia as a whole (Table 29-4).

Table 29-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Thyroid Cancer Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1069	10.2	10.8	11.5	
Barbour	6	1.2	6.0	10.9	NO
Berkeley	42	5.9	8.5	11.1	NO
Boone	14	4.5	9.7	14.9	NO
Braxton	6	1.8	9.2	16.6	NO
Brooke	25	10.8	18.4	26.0	NO
Cabell	79	12.6	16.3	20.0	HIGHER
Calhoun	~				
Clay	7	2.9	11.6	20.2	NO
Doddridge	~				
Fayette	23	5.2	9.0	12.7	NO
Gilmer	~				
Grant	~				
Greenbrier	16	3.7	7.5	11.3	NO
Hampshire	11	3.8	9.4	15.0	NO
Hancock	28	9.2	15.0	20.8	NO
Hardy	9	4.6	13.8	23.1	NO
Harrison	47	9.1	12.8	16.6	NO
Jackson	18	6.2	11.7	17.3	NO
Jefferson	21	4.3	7.6	10.9	NO
Kanawha	141	10.7	12.9	15.1	NO
Lewis	7	1.5	6.0	10.5	NO
Lincoln	11	3.1	7.7	12.4	NO
Logan	28	8.4	13.5	18.6	NO
McDowell	13	3.9	8.7	13.6	NO
Marion	24	4.5	7.6	10.7	NO
Marshall	19	4.8	9.1	13.3	NO
Mason	14	4.5	9.9	15.2	NO
Mercer	30	5.7	9.0	12.3	NO
Mineral	13	4.5	10.0	15.5	NO
Mingo	11	3.1	7.7	12.3	NO
Monongalia	44	7.6	10.9	14.2	NO
Monroe	6	1.1	5.7	10.2	NO
Morgan	5	0.6	5.9	11.2	NO
Nicholas	17	6.2	12.3	18.3	NO
Ohio	49	15.6	22.1	28.6	HIGHER

~ Fewer than 4 cases reported during the entire period.

Table 29-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Invasive Thyroid Cancer Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1069	10.2	10.8	11.5	
Pendleton	4	0.0	9.1	18.6	NO
Pleasants	5	1.7	14.6	27.5	NO
Pocahontas	~				
Preston	19	6.4	11.8	17.2	NO
Putnam	34	7.1	10.8	14.5	NO
Raleigh	43	7.3	10.6	13.8	NO
Randolph	14	4.3	9.1	13.9	NO
Ritchie	7	3.4	13.6	23.7	NO
Roane	4	0.0	4.0	7.9	LOWER
Summers	9	3.6	10.7	17.7	NO
Taylor	8	2.6	9.1	15.6	NO
Tucker	6	2.2	15.2	28.2	NO
Tyler	~				
Upshur	21	9.9	17.5	25.1	NO
Wayne	26	7.4	12.2	16.9	NO
Webster	7	2.8	11.7	20.7	NO
Wetzel	9	3.0	9.5	16.0	NO
Wirt	4	0.2	12.6	25.0	NO
Wood	43	6.1	8.8	11.5	NO
Wyoming	11	3.6	9.1	14.6	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, between 2004 and 2008, over three-fourths of thyroid cancers were diagnosed at the in situ or local stage (Table 29-5).

Table 29-5. Stage at Diagnosis, Thyroid Cancer, West Virginia, 2004 to 2008

STAGE	PERCENT
In situ or local	76.0
Regional	16.7
Distant	4.0
Unknown	3.3

Table 29-6. Early Diagnosis of Thyroid Cancer by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	76.2
≥ 50	75.8
RACE	
White	76.1
African American	81.8
SEX	
Male	68.6
Female	78.5

Table 29-7. Early Diagnosis of Thyroid Cancer by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	69.7
1999-2003	75.0
2004-2008	76.0

Chapter

30

Hodgkin's Disease

Risk Factors

Risk factors for Hodgkin's disease include personal history of infection with the Epstein-Barr virus (infectious mononucleosis), family history of Hodgkin's disease, higher socioeconomic status, and human immunodeficiency virus infection (American Cancer Society, 2011). Hodgkin's disease is most common in early adulthood (ages 15 to 40, especially in a person's 20s) and in late adulthood (after age 55) and is slightly more common in males (American Cancer Society, 2011).

Screening

There are no specific screening tests that are recommended for the early detection of Hodgkin's disease (American Cancer Society, 2011).

Rates

With the exception of in 2004 (males only), the age-adjusted incidence rates of Hodgkin's disease for West Virginia are not statistically different than rates of the US as a whole (Table 30-1). Between 2004 and 2008 Hodgkin's disease occurred most commonly in people between the ages of 15 and 30 and in individuals over the age of 70 (Table 30-2). There is no racial predominance of Hodgkin's disease in West Virginia (Table 30-3).

Table 30-1. Age-Adjusted (2000 Standard) Hodgkin's Disease Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	4.6 (3.2-6.0)	2.2 (1.3-3.1)	NA	NA
1994	3.2 (2.0-4.4)	1.8 (1.0-2.7)	NA	NA
1995	2.2 (1.2-3.1)	2.5 (1.5-3.5)	NA	NA
1996	3.8 (2.5-5.1)	2.6 (1.6-3.6)	NA	NA
1997	3.5 (2.3-4.8)	3.2 (2.1-4.3)	NA	NA
1998	2.8 (1.7-3.9)	2.4 (1.4-3.3)	NA	NA
1999	3.4 (2.2-4.7)	3.2 (2.0-4.3)	3.2 (3.1-3.3)	2.5 (2.4-2.5)
2000	3.0 (1.9-4.2)	2.1 (1.1-3.0)	3.3 (3.2-3.4)	2.4 (2.3-2.5)
2001	3.1 (2.0-4.3)	2.7 (1.6-3.7)	3.1 (3.0-3.2)	2.5 (2.4-2.5)
2002	3.5 (2.3-4.8)	1.8 (0.9-2.6)	3.2 (3.1-3.3)	2.5 (2.4-2.6)
2003	2.6 (1.5-3.6)	2.0 (1.1-2.9)	3.2 (3.1-3.3)	2.5 (2.4-2.6)
2004	1.7 (0.8-2.5)	2.5 (1.5-3.5)	3.1 (3.0-3.2)	2.6 (2.5-2.6)
2005	3.1 (1.9-4.2)	3.3 (2.1-4.5)	3.2 (3.1-3.3)	2.6 (2.5-2.7)
2006	3.3 (2.1-4.6)	2.3 (1.3-3.3)	3.1 (3.0-3.2)	2.5 (2.4-2.6)
2007	3.2 (2.0-4.4)	1.6 (0.8-2.4)	3.1 (3.0-3.2)	2.4 (2.3-2.5)
2008	3.6 (2.3-4.8)	4.1 (2.8-5.4)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 30-2. Age-Specific Average Annual (2004 to 2008)
Hodgkin's Disease Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0.9
15 to 19	4.6
20 to 24	5.5
25 to 29	4.1
30 to 34	3.2
35 to 39	2.7
40 to 44	3.8
45 to 49	2.6
50 to 54	2.2
55 to 59	2.9
60 to 64	2.9
65 to 69	3.3
70 to 74	4.0
75 to 79	4.2
80 to 84	4.3
85 and older	3.9

~ Fewer than 4 cases reported during the entire period.

Table 30-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Hodgkin's Disease Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	~	3.1 (2.5-3.6)
Women	3.3 (0.4-6.2)	2.8 (2.3-3.3)

~ Fewer than 4 cases reported during the entire period.

County Rates

The table (Table 30-4) on the following pages summarizes county-level information on Hodgkin's disease incidence. Included are:

- The total number of newly-diagnosed cases of Hodgkin's disease for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

No differences in rates of Hodgkin's disease were observed for any of the counties in comparison with West Virginia as a whole (Table 30-4).

Table 30-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Hodgkin's Disease Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	266	2.5	2.9	3.2	
Barbour	~				
Berkeley	11	0.9	2.2	3.5	NO
Boone	~				
Braxton	~				
Brooke	5	0.4	4.2	8.0	NO
Cabell	21	2.4	4.3	6.3	NO
Calhoun	~				
Clay	~				
Doddridge	0				
Fayette	6	0.4	2.3	4.2	NO
Gilmer	0				
Grant	4	0.1	8.7	17.2	NO
Greenbrier	6	0.6	3.5	6.4	NO
Hampshire	6	1.2	6.4	11.5	NO
Hancock	9	2.0	6.0	9.9	NO
Hardy	~				
Harrison	13	1.7	3.9	6.0	NO
Jackson	~				
Jefferson	5	0.2	2.1	4.0	NO
Kanawha	34	2.4	3.7	4.9	NO
Lewis	~				
Lincoln	~				
Logan	~				
McDowell	4	0.0	3.1	6.3	NO
Marion	7	0.6	2.5	4.4	NO
Marshall	7	1.0	4.2	7.4	NO
Mason	4	0.0	2.5	5.0	NO
Mercer	5	0.2	1.9	3.5	NO
Mineral	~				
Mingo	5	0.5	3.9	7.3	NO
Monongalia	13	1.0	2.4	3.8	NO
Monroe	0				
Morgan	~				
Nicholas	5	0.4	3.7	7.0	NO
Ohio	7	0.8	3.4	6.0	NO

~ Fewer than 4 cases reported during the entire period.

Table 30-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Hodgkin's Disease Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	266	2.5	2.9	3.2	
Pendleton	0				
Pleasants	~				
Pocahontas	4	0.0	8.0	16.4	NO
Preston	~				
Putnam	5	0.2	1.6	3.1	NO
Raleigh	15	1.8	3.6	5.5	NO
Randolph	~				
Ritchie	0				
Roane	5	0.6	5.9	11.1	NO
Summers	~				
Taylor	~				
Tucker	0				
Tyler	0				
Upshur	~				
Wayne	~				
Webster	4	0.0	7.6	15.2	NO
Wetzel	~				
Wirt	0				
Wood	17	2.2	4.2	6.3	NO
Wyoming	~				

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, less than a quarter of all Hodgkin's disease is diagnosed at an early stage (i.e. local stage) (Table 30-5).

Table 30-5. Stage at Diagnosis, Hodgkin's Disease, West Virginia, 2004 to 2008

STAGE	PERCENT
Local	23.3
Regional	39.5
Distant	32.7
Unknown	4.5

Table 30-6. Early Diagnosis of Hodgkin's Disease by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT LOCAL STAGE
AGE	
< 50	18.9
≥ 50	30.4
RACE	
White	23.3
African American	~
SEX	
Male	24.1
Female	22.6

~ Fewer than 4 cases diagnosed at the early stage reported.

Table 30-7. Early Diagnosis of Hodgkin's Disease by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	24.4
1999-2003	25.3
2004-2008	23.3

Chapter

31

Non-Hodgkin's Lymphoma

Risk Factors

Risk factors for non-Hodgkin's lymphoma include increasing age, immune deficiencies from human immunodeficiency virus (HIV) infection, taking immunosuppressive drugs to prevent rejection of transplanted organs or having congenital immunodeficiency syndromes, being exposed to radiation from an atomic bomb or a nuclear reactor accident, and personal history of an autoimmune disease such as lupus erythematosis or infection with the human T-cell leukemia/lymphoma virus (American Cancer Society, 2011).

Screening

Currently, there are no widely recommended screening tests for early detection of non-Hodgkin's lymphoma (American Cancer Society, 2011).

Rates

With the exception of in 2007 (females), the age-adjusted incidence rates of non-Hodkin's lymphoma for West Virginia are not statistically different than rates of the US as a whole (Table 31-1). Rates of non-Hodgkin's lymphoma increase with age (Table 31-2), are higher among men than women (Table 31-1) and are higher among whites than African Americans (Table 31-3).

Table 31-1. Age-Adjusted (2000 Standard) non-Hodgkin's Lymphoma Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	18.8 (15.8-21.8)	13.7 (11.5-15.9)	NA	NA
1994	17.9 (15.0-20.8)	14.1 (11.9-16.3)	NA	NA
1995	21.3 (18.2-24.5)	15.4 (13.2-17.7)	NA	NA
1996	21.0 (17.9-24.1)	16.8 (14.4-19.2)	NA	NA
1997	19.0 (16.1-22.0)	17.2 (14.8-19.5)	NA	NA
1998	23.6 (20.4-26.9)	17.6 (15.1-20.0)	NA	NA
1999	23.1 (19.9-26.3)	17.7 (15.3-20.1)	23.0 (22.7-23.3)	16.3 (16.1-16.5)
2000	19.9 (16.9-22.9)	16.1 (13.8-18.4)	22.8 (22.5-23.1)	16.2 (16.0-16.4)
2001	23.0 (19.9-26.1)	15.3 (13.1-17.6)	22.9 (22.6-23.1)	16.2 (16.0-16.4)
2002	20.2 (17.3-23.1)	17.8 (15.3-20.2)	23.1 (22.9-23.4)	16.3 (16.1-16.5)
2003	23.7 (20.5-26.9)	16.9 (14.5-19.3)	23.1 (22.8-23.4)	16.4 (16.2-16.6)
2004	23.9 (20.8-27.0)	17.3 (14.9-19.7)	23.4 (23.1-23.7)	16.7 (16.5-16.9)
2005	23.0 (20.0-26.0)	14.8 (12.6-17.0)	23.5 (23.2-23.8)	16.3 (16.1-16.5)
2006	24.1 (21.0-27.3)	18.7 (16.2-21.2)	22.9 (22.7-23.2)	16.1 (15.9-16.3)
2007	25.7 (22.5-28.9)	19.4 (16.9-22.0)	22.6 (22.3-22.8)	15.7 (15.6-15.9)
2008	23.2 (20.1-26.2)	16.4 (14.1-18.6)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 31-2. Age-Specific Average Annual (2004 to 2008) non-Hodgkin's Lymphoma Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0.8
5 to 9	~
10 to 14	~
15 to 19	1.2
20 to 24	1.6
25 to 29	3.0
30 to 34	3.8
35 to 39	6.3
40 to 44	11.4
45 to 49	15.8
50 to 54	24.4
55 to 59	33.2
60 to 64	56.4
65 to 69	78.7
70 to 74	84.8
75 to 79	104.1
80 to 84	109.5
85 and older	97.0

~ Fewer than 4 cases reported during the entire period.

Table 31-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) non-Hodgkin's Lymphoma Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	13.0 (6.6-19.3)	24.5 (23.1-26.0)
Women	13.5 (7.7-19.3)	17.6 (16.5-18.7)

County Rates

The table (Table 31-4) on the following pages summarizes county-level information on non-Hodgkin's lymphoma incidence. Included are:

- The total number of newly-diagnosed cases of invasive non-Hodgkin's lymphoma for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

The rate of non-Hodgkin's lymphoma is statistically significantly higher in Mineral County, and rates are lower in Ritchie, Tyler, and Wayne counties in comparison to West Virginia as a whole (Table 31-4).

Table 31-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Non-Hodgkin's Lymphoma Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	2226	19.5	20.3	21.2	
Barbour	17	9.0	17.1	25.3	NO
Berkeley	83	14.1	18.1	22.0	NO
Boone	25	9.7	16.1	22.6	NO
Braxton	14	6.6	14.0	21.4	NO
Brooke	30	11.2	17.8	24.4	NO
Cabell	127	18.4	22.3	26.3	NO
Calhoun	9	6.7	20.9	35.2	NO
Clay	11	7.7	18.8	30.0	NO
Doddridge	~				
Fayette	59	15.3	20.6	26.0	NO
Gilmer	~				
Grant	21	15.1	26.9	38.8	NO
Greenbrier	47	14.8	20.9	27.1	NO
Hampshire	31	15.1	23.4	31.8	NO
Hancock	58	19.8	26.9	33.9	NO
Hardy	17	10.4	20.0	29.6	NO
Harrison	100	18.9	23.6	28.2	NO
Jackson	45	17.4	24.7	32.0	NO
Jefferson	43	12.2	17.6	22.9	NO
Kanawha	256	18.6	21.2	23.8	NO
Lewis	21	11.3	19.9	28.6	NO
Lincoln	29	14.2	22.5	30.8	NO
Logan	36	11.4	17.1	22.8	NO
McDowell	29	12.0	19.1	26.2	NO
Marion	94	21.1	26.6	32.1	NO
Marshall	48	16.0	22.4	28.8	NO
Mason	28	10.6	17.0	23.3	NO
Mercer	68	12.8	16.9	21.0	NO
Mineral	47	21.9	30.9	39.8	HIGHER
Mingo	34	14.5	22.0	29.6	NO
Monongalia	90	18.8	23.8	28.8	NO
Monroe	14	6.6	14.3	21.9	NO
Morgan	14	6.4	13.7	20.9	NO
Nicholas	34	14.0	21.3	28.6	NO
Ohio	71	17.8	23.4	29.0	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Table 31-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Non-Hodgkin's Lymphoma Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	2226	19.5	20.3	21.2	
Pendleton	13	11.3	26.6	41.9	NO
Pleasants	9	7.2	21.0	34.8	NO
Pocahontas	7	2.8	13.8	24.8	NO
Preston	34	12.4	18.8	25.3	NO
Putnam	64	16.6	22.1	27.5	NO
Raleigh	90	14.4	18.2	22.0	NO
Randolph	38	15.1	22.2	29.4	NO
Ritchie	6	1.7	8.7	15.7	LOWER
Roane	17	10.0	19.3	28.7	NO
Summers	18	9.7	18.3	26.9	NO
Taylor	19	10.5	19.3	28.0	NO
Tucker	10	7.7	20.7	33.8	NO
Tyler	6	1.9	9.9	17.8	LOWER
Upshur	29	12.8	20.3	27.9	NO
Wayne	31	8.0	12.5	17.0	LOWER
Webster	9	5.3	15.8	26.2	NO
Wetzel	23	11.5	19.6	27.8	NO
Wirt	6	3.2	17.6	31.9	NO
Wood	110	16.8	20.7	24.7	NO
Wyoming	28	12.2	19.7	27.1	NO

~ Fewer than 4 cases reported during the entire period or to avoid inadvertent back disclosure.

Stage at Diagnosis

In general, when cancer is diagnosed at an early stage, before it has spread to distant parts of the body, it is easier to treat and survival rates are better (see Appendix C for definitions of cancer stages). In West Virginia, approximately one-quarter of all non-Hodgkin's lymphoma is diagnosed at an early stage (i.e. local stage) and nearly half are diagnosed at the distant stage (Table 31-5).

Table 31-5. Stage at Diagnosis, non-Hodgkin's Lymphoma, West Virginia, 2004 to 2008

STAGE	PERCENT
Local	27.8
Regional	16.7
Distant	47.5
Unknown	8.1

Table 31-6. Early Diagnosis of non-Hodgkin's Lymphoma by Select Characteristics, West Virginia, 2004 to 2008

CHARACTERISTIC	% DIAGNOSED AT IN SITU OR LOCAL STAGE
AGE	
< 50	25.7
≥ 50	28.1
RACE	
White	28.0
African American	17.9
SEX	
Male	27.1
Female	28.5

Table 31-7. Early Diagnosis of non-Hodgkin's Lymphoma by Year of Diagnosis, West Virginia, 1994 to 2008

YEAR DIAGNOSED	% DIAGNOSED AT IN SITU OR LOCAL
1994-1998	28.6
1999-2003	25.9
2004-2008	27.8

Chapter

32

Multiple Myeloma

Risk Factors

Risk factors for multiple myeloma include increasing age, sex (risk is higher for men), race (risk is higher for African Americans), family history, obesity and personal history of other plasma cell diseases (American Cancer Society, 2011).

Screening

No screening tests are available for the early detection of multiple myeloma. It is difficult to detect multiple myeloma early because in many patients it does not cause symptoms until it is advanced (American Cancer Society, 2011).

Rates

With the exception of in 2000 (males), the age-adjusted incidence rates of multiple myeloma for West Virginia were not statistically different from US rates (Table 32-1). In the US, multiple myeloma rates are statistically significantly higher among men than among women (Table 32-1). The rate of multiple myeloma is also higher among West Virginia men in comparison to West Virginia women; however, this difference is not statistically significant (Table 32-1). Multiple myeloma risk increases with age (Table 32-2) and is higher among African Americans than whites (Table 32-3).

Table 32-1. Age-Adjusted (2000 Standard) Multiple Myeloma Cancer Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	6.8 (5.0-8.7)	4.3 (3.1-5.5)	NA	NA
1994	7.5 (5.6-9.4)	4.6 (3.3-5.9)	NA	NA
1995	8.5 (6.5-10.5)	4.6 (3.4-5.9)	NA	NA
1996	7.6 (5.7-9.5)	4.2 (3.0-5.4)	NA	NA
1997	6.6 (4.9-8.3)	3.9 (2.8-5.0)	NA	NA
1998	7.6 (5.7-9.4)	4.2 (3.1-5.4)	NA	NA
1999	5.4 (3.8-6.9)	3.8 (2.7-4.9)	6.7 (6.6-6.9)	4.7 (4.5-4.8)
2000	4.8 (3.4-6.2)	4.6 (3.4-5.8)	6.9 (6.8-7.1)	4.7 (4.6-4.8)
2001	7.5 (5.7-9.3)	4.5 (3.3-5.7)	7.1 (7.0-7.3)	4.7 (4.6-4.8)
2002	6.8 (5.1-8.5)	4.9 (3.7-6.2)	7.1 (7.0-7.3)	4.7 (4.6-4.8)
2003	6.6 (4.9-8.2)	5.5 (4.2-6.7)	7.0 (6.9-7.2)	4.7 (4.6-4.8)
2004	7.3 (5.5-9.1)	4.0 (2.9-5.1)	7.3 (7.2-7.5)	4.7 (4.6-4.8)
2005	6.4 (4.8-8.1)	5.0 (3.7-6.2)	7.1 (6.9-7.2)	4.6 (4.5-4.7)
2006	6.0 (4.5-7.6)	5.9 (4.6-7.2)	6.9 (6.8-7.1)	4.6 (4.5-4.7)
2007	6.9 (5.3-8.5)	4.2 (3.1-5.4)	6.7 (6.6-6.9)	4.3 (4.2-4.4)
2008	7.4 (5.7-9.1)	3.2 (2.2-4.3)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 32-2. Age-Specific Average Annual (2004 to 2008)
Multiple Myeloma Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	0
5 to 9	0
10 to 14	0
15 to 19	0
20 to 24	0
25 to 29	0
30 to 34	~
35 to 39	~
40 to 44	1.7
45 to 49	3.6
50 to 54	6.2
55 to 59	9.5
60 to 64	14.4
65 to 69	20.6
70 to 74	26.8
75 to 79	40.1
80 to 84	30.0
85 and older	28.8

~ Fewer than 4 cases reported during the entire period.

Table 32-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008)
Multiple Myeloma Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	13.7 (6.6-20.8)	6.7 (6.0-7.5)
Women	12.0 (6.5-17.4)	4.3 (3.8-4.8)

County Rates

The table (Table 32-4) on the following pages summarizes county-level information on multiple myeloma incidence. Included are:

- The total number of newly-diagnosed cases of multiple myeloma for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Rates of multiple myeloma are higher in Mercer County and lower in Hancock County in comparison to West Virginia as a whole (Table 32-4).

Table 32-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Multiple Myeloma Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	610	5.0	5.5	5.9	
Barbour	11	4.5	11.2	17.8	NO
Berkeley	29	4.0	6.3	8.6	NO
Boone	4	0.0	2.6	5.2	NO
Braxton	5	0.6	4.9	9.3	NO
Brooke	5	0.3	3.3	6.4	NO
Cabell	36	4.2	6.3	8.3	NO
Calhoun	~				
Clay	~				
Doddridge	~				
Fayette	10	1.3	3.3	5.4	NO
Gilmer	0				
Grant	4	0.1	4.6	9.0	NO
Greenbrier	13	2.5	5.5	8.6	NO
Hampshire	7	1.4	5.6	9.8	NO
Hancock	4	0.0	1.7	3.4	LOWER
Hardy	6	1.4	7.1	12.7	NO
Harrison	26	3.7	6.0	8.3	NO
Jackson	10	2.1	5.5	8.9	NO
Jefferson	16	3.1	6.3	9.4	NO
Kanawha	73	4.5	5.8	7.2	NO
Lewis	~				
Lincoln	5	0.5	4.1	7.7	NO
Logan	8	1.1	3.6	6.1	NO
McDowell	10	2.5	6.6	10.7	NO
Marion	31	5.4	8.5	11.5	NO
Marshall	10	1.6	4.3	7.0	NO
Mason	5	0.4	2.9	5.5	NO
Mercer	42	7.1	10.3	13.5	HIGHER
Mineral	12	3.4	7.9	12.5	NO
Mingo	7	1.1	4.5	8.0	NO
Monongalia	27	4.3	6.9	9.5	NO
Monroe	4	0.1	4.4	8.7	NO
Morgan	7	1.7	6.9	12.0	NO
Nicholas	9	1.8	5.4	8.9	NO
Ohio	12	1.5	3.6	5.7	NO

~ Fewer than 4 cases reported during the entire period.

Table 32-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Multiple Myeloma Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	610	5.0	5.5	5.9	
Pendleton	~				
Pleasants	~				
Pocahontas	~				
Preston	12	2.8	6.4	10.1	NO
Putnam	14	2.1	4.6	7.0	NO
Raleigh	19	2.1	3.8	5.6	NO
Randolph	8	1.4	4.7	8.0	NO
Ritchie	4	0.1	6.3	12.5	NO
Roane	6	1.2	6.2	11.3	NO
Summers	6	1.3	6.5	11.8	NO
Taylor	~				
Tucker	~				
Tyler	4	0.1	6.5	13.0	NO
Upshur	9	2.1	6.1	10.1	NO
Wayne	9	1.2	3.6	6.0	NO
Webster	4	0.1	6.9	13.6	NO
Wetzel	~				
Wirt	~				
Wood	33	3.9	5.9	7.9	NO
Wyoming	7	1.1	4.4	7.7	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

Multiple myeloma is automatically considered “distant” at diagnosis.

Chapter

33

Leukemia

Risk Factors

Risk factors for leukemia vary somewhat by type of leukemia (American Cancer Society, 2011), but include:

- High dose exposure to radiation (acute lymphocytic; acute myeloid; chronic myeloid)
- Infection with human T-cell lymphoma/leukemia virus (acute lymphocytic)
- Race (more common in whites: acute lymphocytic)
- Gender (more common in males: acute lymphocytic; chronic lymphocytic, acute myeloid; chronic myeloid, chronic myelomoncytic)
- Having a close relative with the disease (chronic lymphocytic)
- Exposure to certain herbicides such as Agent Orange (chronic lymphocytic)
- Smoking (acute myeloid)
- Occupational exposure to benzene (acute myeloid)
- Prior treatment with chemotherapy (chronic myelomonocytic)
- Personal health history of having a myeloproliferative disorder or myelodysplastic syndrome (acute myeloid)
- Increasing age (chronic myeloid, chronic myelomonocytic)

Screening

No screening tests are available for the early detection of leukemia (American Cancer Society, 2011).

Rates

For most years, the West Virginia rate of leukemia does not differ from the rate of leukemia for the US as a whole (Table 33-1). Males have statistically higher rates of leukemia than females (Table 33-1), and rates increase with age (Table 33-2).

Table 33-1. Age-Adjusted (2000 Standard) Leukemia Incidence Rates per 100,000 by Sex and Year of Diagnosis

YEAR	WEST VIRGINIA		USCS	
	Men	Women	Men	Women
1993	15.3 (12.6-17.9)	7.9 (6.3-9.6)	NA	NA
1994	15.8 (13.0-18.6)	9.9 (8.1-11.8)	NA	NA
1995	15.7 (13.0-18.5)	10.0 (8.2-11.9)	NA	NA
1996	17.0 (14.2-19.8)	9.3 (7.5-11.2)	NA	NA
1997	18.6 (15.6-21.5)	8.6 (6.9-10.3)	NA	NA
1998	15.1 (12.5-17.7)	11.5 (9.5-13.6)	NA	NA
1999	18.7 (15.8-21.7)	12.0 (10.0-14.1)	16.5 (16.3-16.8)	9.8 (9.7-10.0)
2000	17.0 (14.3-19.8)	11.2 (9.2-13.1)	17.0 (16.8-17.3)	10.1 (9.9-10.3)
2001	18.0 (15.2-20.9)	9.7 (7.8-11.5)	17.0 (16.8-17.3)	10.2 (10.0-10.3)
2002	14.9 (12.4-17.4)	8.5 (6.8-10.2)	16.5 (16.2-16.7)	9.7 (9.6-9.9)
2003	17.9 (15.2-20.7)	9.1 (7.3-10.9)	16.4 (16.2-16.7)	9.9 (9.8-10.1)
2004	19.5 (16.7-22.4)	8.9 (7.2-10.6)	16.4 (16.2-16.6)	9.7 (9.6-9.9)
2005	16.7 (14.0-19.4)	12.3 (10.2-14.3)	15.8 (15.6-16.0)	9.6 (9.4-9.7)
2006	17.3 (14.6-20.0)	10.9 (8.9-12.8)	15.7 (15.4-15.9)	9.6 (9.4-9.7
2007	18.6 (15.8-21.4)	11.3 (9.3-13.3)	15.0 (14.8-15.2)	9.2 (9.1-9.4)
2008	17.2 (14.6-19.9)	9.5 (7.7-11.3)	NA	NA

Note: USCS data are available only for 1999 through 2007.

Table 33-2. Age-Specific Average Annual (2004 to 2008) Leukemia Incidence Rates per 100,000

AGE AT DIAGNOSIS	RATE
Birth to 4	7.6
5 to 9	4.3
10 to 14	2.4
15 to 19	2.1
20 to 24	2.8
25 to 29	3.3
30 to 34	3.6
35 to 39	3.9
40 to 44	6.5
45 to 49	7.9
50 to 54	12.5
55 to 59	22.1
60 to 64	27.4
65 to 69	38.7
70 to 74	57.0
75 to 79	65.4
80 to 84	75.7
85 and older	92.0

Table 33-3. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Leukemia Incidence Rates per 100,000 by Race and Sex

GENDER	AFRICAN AMERICAN	WHITE
Men	19.6 (11.6-27.7)	18.1 (16.8-19.3)
Women	7.4 (3.2-11.7)	10.8 (9.9-11.7)

County Rates

The table (Table 33-4) on the following pages summarizes county-level information on leukemia incidence. Included are:

- The total number of newly-diagnosed cases of leukemia for the period 2004 through 2008.
- The average annual (2004 through 2008) age-adjusted (2000 standard) incidence rate per 100,000.
- The lower and upper bounds of the 95% confidence interval.
- An indication of whether the county rate differs in a statistically significant manner from the rate for the entire state of West Virginia.

Rates of leukemia are lower in Hardy, Jefferson, and Wayne counties in comparison to West Virginia as a whole (Table 33-4).

Table 33-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Leukemia Incidence Rates per 100,000

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1473	13.1	13.8	14.5	
Barbour	13	6.3	14.1	21.9	NO
Berkeley	52	8.5	11.8	15.0	NO
Boone	19	7.0	12.8	18.7	NO
Braxton	10	4.0	11.2	18.4	NO
Brooke	24	8.6	14.7	20.7	NO
Cabell	100	13.6	17.0	20.4	NO
Calhoun	7	3.6	14.2	24.8	NO
Clay	11	8.4	21.0	33.6	NO
Doddridge	6	3.0	16.3	29.6	NO
Fayette	44	11.5	16.4	21.4	NO
Gilmer	5	1.3	14.7	28.2	NO
Grant	10	5.2	14.5	23.8	NO
Greenbrier	33	9.5	14.7	19.9	NO
Hampshire	16	7.1	14.1	21.2	NO
Hancock	23	6.5	11.4	16.3	NO
Hardy	4	0.1	5.6	11.2	LOWER
Harrison	60	10.4	14.0	17.6	NO
Jackson	28	10.5	16.8	23.2	NO
Jefferson	16	3.5	7.0	10.5	LOWER
Kanawha	183	12.9	15.2	17.4	NO
Lewis	11	4.4	11.2	17.9	NO
Lincoln	23	11.4	19.5	27.6	NO
Logan	30	9.8	15.4	21.0	NO
McDowell	13	4.0	9.1	14.2	NO
Marion	43	8.5	12.3	16.0	NO
Marshall	31	8.9	14.0	19.0	NO
Mason	25	9.8	16.3	22.8	NO
Mercer	67	13.2	17.5	21.8	NO
Mineral	20	7.3	13.0	18.8	NO
Mingo	30	13.2	20.9	28.6	NO
Monongalia	45	8.5	12.0	15.6	NO
Monroe	10	4.6	12.8	20.9	NO
Morgan	9	3.1	9.1	15.1	NO
Nicholas	25	9.2	15.4	21.5	NO
Ohio	34	6.5	9.8	13.2	NO

~ Fewer than 4 cases reported during the entire period.

Table 33-4. Age-Adjusted (2000 Standard) Average Annual (2004 to 2008) Leukemia Incidence Rates per 100,000, Continued

COUNTY	# CASES	LOWER BOUND	RATE	UPPER BOUND	DIFFERENT FROM WV?
WV	1473	13.1	13.8	14.5	
Pendleton	6	2.0	10.2	18.3	NO
Pleasants	6	2.7	14.5	26.3	NO
Pocahontas	10	5.9	15.8	25.7	NO
Preston	27	9.8	15.9	22.1	NO
Putnam	34	7.9	11.9	16.0	NO
Raleigh	62	9.8	13.2	16.6	NO
Randolph	22	7.8	13.5	19.2	NO
Ritchie	5	0.9	8.6	16.3	NO
Roane	13	7.4	16.8	26.1	NO
Summers	14	7.5	15.9	24.4	NO
Taylor	9	3.2	9.4	15.6	NO
Tucker	5	1.0	9.0	17.0	NO
Tyler	7	3.0	11.5	20.0	NO
Upshur	26	12.1	19.9	27.8	NO
Wayne	15	3.2	6.7	10.1	LOWER
Webster	11	7.6	19.0	30.4	NO
Wetzel	11	4.1	10.3	16.5	NO
Wirt	4	0.2	11.1	22.0	NO
Wood	79	11.6	14.9	18.3	NO
Wyoming	27	11.4	18.8	26.1	NO

~ Fewer than 4 cases reported during the entire period.

Stage at Diagnosis

Leukemia is automatically considered “distant” at diagnosis.

Chapter

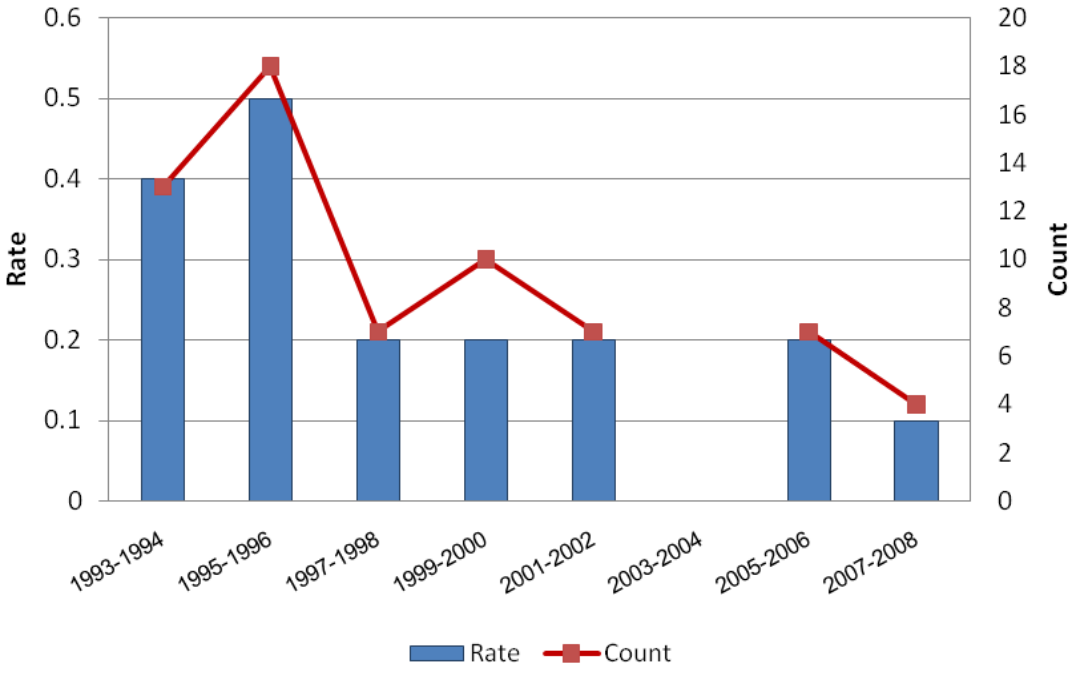
34

Special Topics

Kaposi Sarcoma

Classic Kaposi sarcoma (KS) is an extremely rare cancer occurring primarily in elderly men of Mediterranean heritage (American Cancer Society, 2011). Most KS, however, is associated with HIV infection and is called AIDS-related KS. As HIV treatment has improved, AIDS-related KS rates have decreased. West Virginia rates of KS and the number of cases are shown in Figure 34-1. West Virginia rates are significantly lower than US rates (US Cancer Statistics Working Group, 2010).

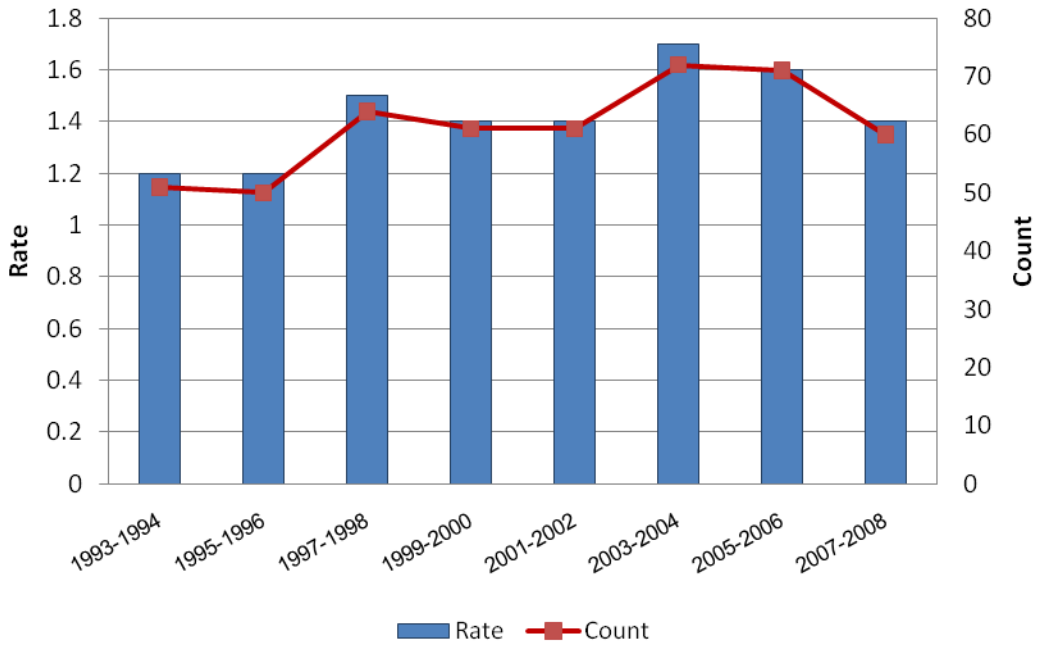
Figure 34-1. Age-Adjusted (2000 Standard) Average Annual Rates and Case Counts of Kaposi Sarcoma



Mesothelioma

Malignant mesothelioma is a rare cancer of mesothelial cells, which line the chest, pericardial and abdominal cavities. The major risk factor for mesothelioma is exposure to asbestos. West Virginia rates of mesothelioma and the number of cases are shown in Figure 34-2. West Virginia rates are statistically significantly greater than US rates (US Cancer Statistics Working Group, 2010).

Figure 34-2. Age-Adjusted (2000 Standard) Average Annual Rates and Case Counts of Malignant Mesothelioma



Chapter

35

Provisional 2009 Counts

Background

National Program of Cancer Registries Program Standards require that, when data are estimated to be 90% complete, provisional case counts or case distributions be provided. It is critical to bear in mind that these data are PROVISIONAL. It is expected that they will change. Moreover, it is likely that the amount of change will vary by primary site, sex, and county of residence. These factors all predict the likelihood of being seen at a non-West Virginia facility (i.e., persons with certain types of cancer and persons who live in border counties are all more likely to be diagnosed and particularly treated out-of-state) and data provided by other states under data exchange agreements typically are not provided to WVCR until at least 18 months after diagnosis. Thus, while these data provide guidance as to what to expect once 2009 data are complete, they are NOT to be used as final verified case counts. WVCR estimates that, as of this writing, the data are 91% to 96% complete.

Table 35-1. PROVISIONAL 2009 Cancer Case Counts by Primary Site

TYPE OF CANCER	MEN	WOMEN
All types of cancer	5088	4765
Lung and bronchus	1011	742
Prostate	1183	NA
Breast	18	1266
Colon and rectum	553	484
Urinary bladder	335	140
Non-Hodgkin's lymphoma	217	173
Melanoma (skin)	244	188
Uterus	NA	386
Kidney and renal pelvis	203	135
Leukemia (all)	128	120
Head and neck	141	66
Thyroid	55	166
Pancreas	99	100
Brain and other nervous system	82	49
Ovary	NA	118
Esophagus	100	22
Larynx	93	27
Stomach	83	44
Liver and bile duct	59	28
Multiple myeloma	54	48
Cervix	NA	95
Soft tissues	45	29
Testis	42	NA
Hodgkin's disease	20	16
Small intestine	26	19
Gallbladder	8	13
Eye	4	~
Bones and joints	10	4

Note. Invasive cancers only, except for bladder, which includes both in situ and invasive.
~ Fewer than 4 cases reported during the entire period.

Table 35-2. PROVISIONAL 2009 Cancer Case Counts by County

COUNTY	MEN	WOMEN	COUNTY	MEN	WOMEN
Barbour	41	52	Mineral	33	22
Berkeley	224	206	Mingo	85	63
Boone	96	74	Monongalia	161	155
Braxton	39	31	Monroe	37	34
Brooke	55	41	Morgan	25	46
Cabell	308	303	Nicholas	70	67
Calhoun	14	18	Ohio	142	146
Clay	34	39	Pendleton	15	15
Doddridge	13	9	Pleasants	11	15
Fayette	143	115	Pocahontas	19	31
Gilmer	18	16	Preston	78	87
Grant	18	17	Putnam	149	137
Greenbrier	123	113	Raleigh	208	212
Hampshire	58	77	Randolph	93	83
Hancock	82	44	Ritchie	28	28
Hardy	26	19	Roane	40	50
Harrison	208	206	Summers	29	35
Jackson	89	93	Taylor	38	36
Jefferson	86	88	Tucker	23	18
Kanawha	689	581	Tyler	27	29
Lewis	58	66	Upshur	59	65
Lincoln	66	60	Wayne	76	70
Logan	121	109	Webster	25	26
McDowell	57	49	Wetzel	53	51
Marion	180	185	Wirt	14	14
Marshall	78	82	Wood	257	230
Mason	80	57	Wyoming	53	72
Mercer	236	178	**WV**	**5088**	**4765**

Note. Invasive cancers only, except for bladder, which includes both in situ and invasive.

APPENDIX A:

References

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U.S. Cancer Statistics Working Group. *United States Cancer Statistics: 1999-2007 Incidence and Mortality Web–based Report.* Atlanta: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, and National Cancer Institute; 2010. Available at www.cdc.gov/uscs.

APPENDIX B:

Chapter 16-5A-2a of the West Virginia Code and Title 64, West Virginia Administrative Rules, Division of Health, Cancer Registry, Series 68

§16-5A-2a. Cancer and tumor registry.

(a) To the extent funds are available, the director of the division of health shall establish a cancer and tumor registry for the purpose of collecting information concerning the incidence of cancer and nonmalignant intracranial and central nervous system tumors. The information collected by the registry shall be analyzed to prepare reports and perform studies as necessary when such data identifies hazards to public health. Pending appropriate funding, a statewide system shall be phased in and be fully operational by the first day of July, two thousand two, pursuant to the enactment of this section in two thousand one.

(b) All reporting sources, including hospitals, physicians, laboratories, clinics or other similar units diagnosing or providing treatment for cancer and nonmalignant intracranial and central nervous system tumors, shall provide a report of each cancer or tumor case to the cancer and tumor registry in a format specified by the director. The reporting sources shall grant the director or an authorized representative of the registry access to all records which would identify cases of cancer or nonmalignant intracranial and central nervous system tumors or would establish characteristics of cancer or nonmalignant intracranial or central nervous system tumors.

(c) All information reported pursuant to this section is confidential and shall be used for the purpose of determining the sources of malignant neoplasms and nonmalignant intracranial and central nervous system tumors and evaluating measures designed to eliminate, alleviate or ameliorate their effect. A report provided to the cancer and tumor registry disclosing the identity of an individual who was reported as having cancer or tumors shall only be released to reporting sources and persons demonstrating a need which is essential to health related research, except that the release shall be conditioned upon the reporting source and personal identities remaining confidential. No liability of any kind or character for damages or other relief shall arise or be enforced against any reporting source by reason of having provided the information or material to the cancer and tumor registry.

(d) The director of the division of health shall appoint an advisory committee on cancer and tumors with membership consisting of representatives of appropriate agencies, including the West Virginia hospital association; the American cancer society, West Virginia division; the American lung association of West Virginia; the West Virginia medical association; the association of osteopathic medicine; the West Virginia nurses association; the Mary Babb Randolph cancer center; and, at the discretion of the director, any other individuals directly involved. The advisory committee shall provide technical guidance regarding the operation of the cancer registry and shall provide such advice and assistance as needed to carry out effective cancer prevention and control activities. The members of the advisory committee shall serve four-year terms. Vacancies shall be filled in a like manner for the unexpired term.

(e) The director shall promulgate rules related to: (1) The content and design of all forms and reports required by this section; (2) the procedures for disclosure of information gathered by the cancer and tumor registry by monitoring and evaluating health data and from completed risk assessments; and (3) any other matter necessary to the administration of this section.

TITLE 64
LEGISLATIVE RULE
BUREAU FOR PUBLIC HEALTH
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

SERIES 68
CANCER REGISTRY

§64-68-1. General.

1.1. Scope. -- This legislative rule establishes standards and procedures for reporting cancer cases to the West Virginia Cancer Registry, maintaining the confidentiality of information in its cancer registry and disclosing information from the cancer registry.

1.2. Authority. -- W. Va. Code §§16-1-4, 16-1-11(a) and 16-5A-2a(e).

1.3. Filing Date. -- May 8, 2006.

1.4. Effective Date. -- May 8, 2006.

§64-68-2. Application and Enforcement.

2.1. Application -- This rule applies to health care providers, health care facilities and persons with access to or in charge of medical records or other sources of cancer-related information.

2.2. Enforcement -- This rule is enforced by the commissioner of the bureau for public health.

§64-68-3. Definitions.

3.1. Abstract - A summary of information relating to the diagnosis and course of disease of an individual case of cancer.

3.2. Cancer - A cellular tumor, the natural course of which is fatal and usually associated with the formation of secondary tumors.

3.3. Cancer Registry - A registry maintained for the collection of information concerning newly diagnosed cancer cases.

3.4. Commissioner - The commissioner of the bureau for public health in the department of health and human resources or his or her designee.

3.5. Confidential Information - Information which identifies individual cancer patients, health care facilities, or health care providers.

3.6. Diagnosis - The determination of the nature of a case of disease.

3.7. Health Care Facility - Any hospital, nursing home, clinic, cancer treatment center, laboratory, or any other facility or institution which provides health care or diagnostic services to individuals.

3.8. Health Care Provider - Any physician, dentist, nurse, or other individual who provides to individuals medical, dental, nursing, or other health care services of any kind.

3.9. Hospital - An entity subject to licensure as a hospital under W. Va. Code §16-5B-1.

3.10. Person - An individual, partnership, corporation or other legal entity.

3.11. Reportable Cancer Case - Any case of cancer diagnosed after December 31, 1992, where the primary tumor is determined to be malignant or carcinoma in situ, with the exception of basal cell or squamous cell carcinomas of the skin and carcinoma in situ of the cervix.

3.12. Reporting Source - A health care facility or provider which diagnoses or provides treatment for cancer.

3.13. West Virginia Cancer Registry - The office within the bureau for public health which collects and maintains information on cancer cases.

§64-68-4. Reporting.

4.1. All reporting sources shall provide the West Virginia Cancer Registry with the following patient-related information on all reportable cancer cases to the extent that the information would be routinely available at a particular type of reporting source:

4.1.a. The last name, first name, and middle initial;

4.1.b. Social security number;

4.1.c. Sex;

4.1.d. Birth date;

4.1.e. Maiden name;

4.1.f. Race/ethnicity;

4.1.g. Address at the time of diagnosis, including street, city, county and zip code;

4.1.h. Date of diagnosis;

4.1.i. A description of the cancer, including site, type, and any other information needed to describe the case clearly;

4.1.j. Stage of disease at diagnosis using:

4.1.j.1. Surveillance, Epidemiology, and End Results (SEER) system; and

4.1.j.2. American Joint Commission on Cancer (AJCC) system if maintained by the reporting source.

4.1.k. The treatment of the cancer and the patient's medical status;

4.1.l. Date of death, if the patient has died;

4.1.m. Cause of death;

4.1.n. Usual occupation;

4.1.o. Usual industry of employment; and

4.1.p. Other information relevant for the identification of hazards to the public, i.e., the presence of factors placing the patient at risk for development of cancer. Risk factor information includes, but is not limited to: tobacco use, familial history of cancer and alcohol use.

4.2. Each cancer case report shall also include:

4.2.a. The name of the reporting source;

4.2.b. The name of the diagnosing physician; and

4.2.c. Sufficient narrative to determine the accuracy of coding and information.

4.3. Features of Health care facility reporting.

4.3.a. Any health care facility diagnosing or treating cancer patients within the state of West Virginia shall submit the required information on all reportable cases of cancer served by that facility to the West Virginia Cancer Registry within six months of diagnosis.

4.3.b. Reports shall be submitted monthly via electronic information transfer or paper copy of case abstracts, in a manner or on forms acceptable to the West Virginia Cancer Registry.

4.3.c. If the health care facility fails to report in a format prescribed by the commissioner, authorized West Virginia Cancer Registry personnel may enter the health care facility, access the information and report it in the appropriate format. In these cases, if a health care facility is licensed for fifty beds or more, the bureau for public health shall assess the health care facility a service fee for accessing and reporting the information. In accordance with W.Va. Code §16-1-11(a) and this rule, the fee collected shall be deposited into the health services fund. The fee shall be based upon the fair market value of the services. The health care facility shall pay the bureau for public health within sixty days of assessment of the fee.

4.4. Health care facilities shall provide authorized West Virginia Cancer Registry personnel access to all medical records which would identify cases of cancer or establish characteristics of

cancer to collect the required information on reportable cases of cancer for the purposes of assuring the accuracy and completeness of reported data. Registry staff shall schedule access at reasonable times convenient to the health care facility and registry staff. The West Virginia Cancer Registry staff shall notify the health care facility a minimum of thirty days in advance of its need to access medical records to allow for the health care facility to prepare records for review.

4.5. The West Virginia Cancer Registry shall collect standardized data usable for research purposes.

§64-68-5. Confidentiality; Disclosure.

5.1. No person who obtains information protected by the provisions of W. Va. Code §16-5A-2a and this rule may disclose confidential information to any other person except in strict compliance with W. Va. Code §16-5A-2a and this rule.

5.2. Any person who obtains information protected by the provisions of W. Va. Code §16-5A-2a and this rule shall sign a statement that he or she fully understands and will maintain the confidentiality of the information.

5.3. The West Virginia Cancer Registry may release information which identifies a specific patient to the reporting source which originally reported the cancer case.

5.4. The West Virginia Cancer Registry may release information which identifies a specific patient whose address at the time of diagnosis was outside West Virginia to the central cancer registry in the state where the patient resides. The West Virginia Cancer Registry shall release the information only to central cancer registries in states which have confidentiality standards equivalent to those of West Virginia and which establish reciprocal reporting with West Virginia. The West Virginia Cancer Registry shall have a written agreement with other state cancer registries to which it releases information which specifically addresses provisions for maintaining confidentiality.

5.5. The West Virginia Cancer Registry may release case data to cancer researchers for the purposes of cancer prevention, control and research.

§64-68-6. Violations and Sanctions.

Failure to comply with this rule as required subjects a person to the criminal penalties prescribed in W. Va. Code §16-1-18.

§64-68-7. Administrative Due Process.

Those persons adversely affected by the enforcement of this rule desiring a contested case hearing to determine any rights, duties, interests or privileges shall do so in a manner prescribed in the bureau for public health Rules of Procedure for Contested Case Hearings and Declaratory Rulings, 64 CSR 1.

APPENDIX C:

United States Department of Health and Human Services Findings on the Permissibility of Reporting to Public Health Authorities under HIPAA

and

North American Association of Central Cancer Registries Legal Opinion of Permissibility of Reporting to Central Cancer Registries

United States Department of Health and Human Services Findings on the Permissibility of Reporting to Public Health Authorities under HIPAA

DISCLOSURES FOR PUBLIC HEALTH ACTIVITIES

[*45 CFR 164.512(b)*]

Background

The HIPAA Privacy Rule recognizes the legitimate need for public health authorities and others responsible for ensuring public health and safety to have access to protected health information to carry out their public health mission. The Rule also recognizes that public health reports made by covered entities are an important means of identifying threats to the health and safety of the public at large, as well as individuals. Accordingly, the Rule permits covered entities to disclose protected health information without authorization for specified public health purposes.

How the Rule Works

General Public Health Activities. The Privacy Rule permits covered entities to disclose protected health information, without authorization, to public health authorities who are legally authorized to receive such reports for the purpose of preventing or controlling disease, injury, or disability. This would include, for example, the reporting of a disease or injury; reporting vital events, such as births or deaths; and conducting public health surveillance, investigations, or interventions. See 45 CFR 164.512(b)(1)(i). Also, covered entities may, at the direction of a public health authority, disclose protected health information to a foreign government agency that is acting in collaboration with a public health authority. See 45 CFR 164.512(b)(1)(i). Covered entities who are also a public health authority may use, as well as disclose, protected health information for these public health purposes. See 45 CFR 164.512(b)(2).

A "public health authority" is an agency or authority of the United States government, a State, a territory, a political subdivision of a State or territory, or Indian tribe that is responsible for public health matters as part of its official mandate, as well as a person or entity acting under a grant of authority from, or under a contract with, a public health agency. See 45 CFR 164.501. Examples of a public health authority include State and local health departments, the Food and Drug Administration (FDA), the Centers for Disease Control and Prevention, and the Occupational Safety and Health Administration (OSHA).

Generally, covered entities are required reasonably to limit the protected health information disclosed for public health purposes to the minimum amount necessary to accomplish the public health purpose. However, covered entities are not required to make a minimum necessary determination for public health disclosures that are made pursuant to an individual's authorization, or for disclosures that are required by other law. See 45 CFR 164.502(b). For disclosures to a public health authority, covered entities may reasonably rely on a minimum necessary determination made by the public health authority in requesting the protected health information. See 45 CFR 164.514(d)(3)(iii)(A). For routine and recurring public health disclosures, covered entities may develop standard protocols, as part of their minimum necessary policies and procedures that address the types and amount of protected health information that may be disclosed for such purposes. See 45 CFR 164.514(d)(3)(i).

Other Public Health Activities. The Privacy Rule recognizes the important role that persons or entities other than public health authorities play in certain essential public health activities. Accordingly, the Rule permits covered entities to disclose protected health information, without authorization, to such persons or entities for the public health activities discussed below.

- Child abuse or neglect. Covered entities may disclose protected health information to report known or suspected child abuse or neglect, if the report is made to a public health authority or other appropriate government authority that is authorized by law to receive such reports. For instance, the social services department of a local government might have legal authority to receive reports of child abuse or neglect, in which case, the Privacy Rule would permit a covered entity to report such cases to that authority without obtaining individual authorization. Likewise, a covered entity could report such cases to the police department when the police department is authorized by law to receive such reports. See 45 CFR 164.512(b)(1)(ii). See also 45 CFR 512(c) for information regarding disclosures about adult victims of abuse, neglect, or domestic violence.

- Quality, safety or effectiveness of a product or activity regulated by the FDA. Covered entities may disclose protected health information to a person subject to FDA jurisdiction, for public health purposes related to the quality, safety or effectiveness of an FDA-regulated product or activity for which that person has responsibility. Examples of purposes or activities for which such disclosures may be made include, but are not limited to:

  < Collecting or reporting adverse events (including similar reports regarding food and dietary supplements), product defects or problems (including problems regarding use or labeling), or biological product deviations;
  < Tracking FDA-regulated products;
  < Enabling product recalls, repairs, replacement or lookback (which includes locating and notifying individuals who received recalled or withdrawn products or products that are the subject of lookback); and
  < Conducting post-marketing surveillance.

  See 45 CFR 164.512(b)(1)(iii). The "person" subject to the jurisdiction of the FDA does not have to be a specific individual. Rather, it can be an individual or an entity, such as a partnership, corporation, or association. Covered entities may identify the party or parties responsible for an FDA-regulated product from the product label, from written material that accompanies the product (know as labeling), or from sources of labeling, such as the Physician's Desk Reference.

- Persons at risk of contracting or spreading a disease. A covered entity may disclose protected health information to a person who is at risk of contracting or spreading a disease or condition if other law authorizes the covered entity to notify such individuals as necessary to carry out public health interventions or investigations. For example, a covered health care provider may disclose protected

health information as needed to notify a person that (s)he has been exposed to a communicable disease if the covered entity is legally authorized to do so to prevent or control the spread of the disease. See 45 CFR 164.512(b)(1)(iv).

- Workplace medical surveillance. A covered health care provider who provides a health care service to an individual at the request of the individual's employer, or provides the service in the capacity of a member of the employer's workforce, may disclose the individual's protected health information to the employer for the purposes of workplace medical surveillance or the evaluation of work-related illness and injuries to the extent the employer needs that information to comply with OSHA, the Mine Safety and Health Administration (MSHA), or the requirements of State laws having a similar purpose. The information disclosed must be limited to the provider's findings regarding such medical surveillance or work-related illness or injury. The covered health care provider must provide the individual with written notice that the information will be disclosed to his or her employer (or the notice may be posted at the worksite if that is where the service is provided). See 45 CFR 164.512(b)(1)(v).

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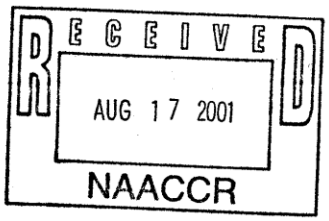
August 15, 2001



Holly L. Howe, PhD.
Executive Director
North American Association
of Central Cancer Registries
2121 W. White Oaks Dr., Suite C
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Re: ***The Federal Privacy Rule's Application to Central Cancer Registries***

Dear Dr. Howe:

At your request, we have reviewed the letter dated July 13, 2001, which you received from Professor James Hodge of the Georgetown University Law Center. As discussed by Professor Hodge, federal regulations, entitled *Standards for Privacy of Individually Identifiable Health Information* (the "Privacy Rule"), restrict the use and disclosure of health information by health care providers, health plans, and health care clearinghouses.[1] After reviewing the relevant regulations, Professor Hodge concluded that the Privacy Rule does not restrict the disclosure of patient information by a health care provider to a central cancer registry so long as the central cancer registry is a "public health authority." We agree with that conclusion.

On July 6, 2001, the U.S. Department of Health and Human Services ("DHHS") issued its Guidance on the Privacy Rule and on the issue addressed by Professor Hodge.[2] DHHS concluded that disclosures to public health authorities are permitted under the Privacy Rule, and among various Questions and Answers, stated:

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[1] 45 C.F.R. § 164.500 *et. seq.*

[2] *Guidance on Standards for Privacy of Individually Identifiable Health Information*, issued by the U.S. Department of Health and Human Services, at pg. 54 (July 6, 2001).

Q: Must a health care provider or other covered entity obtain permission from a patient prior to notifying public health authorities of the occurrence of a reportable disease?

A: No. All states have laws that require providers to report cases of specific diseases to public health officials. The Privacy Rule allows disclosures that are required by law. Furthermore, disclosures to public health authorities that are authorized by law to collect or receive information for public health purposes are also permissible under the Privacy Rule. In order to do their job of protecting the health of the public, it is frequently necessary for public health officials to obtain information about the persons affected by a disease. In some cases they may need to contact those affected in order to determine the cause of the disease to allow for actions to prevent further illness.

> The Privacy Rule continues to allow for the existing practice of sharing [protected health information] with public health authorities that are authorized by law to collect or receive such information to aid them in their mission of protecting the health of the public. Examples of such activities include those directed at the reporting of disease or injury, reporting deaths and births, investigating the occurrence and cause of injury and disease, and monitoring adverse outcomes related to food, drugs, biological products and dietary supplements. (emphasis added).

As explained by DHHS in its Guidance, the Privacy Rule allows disclosure of information to public health authorities. With respect to the disclosure of information to central cancer registries, and as noted by Professor Hodge, whether the Privacy Rule restricts the disclosure of information depends on whether each central cancer registry falls within the definition of a "public health authority." A public health authority is defined as:

> an agency or authority of the United States, a State or territory, a political subdivision of a State or territory, or an Indian tribe, or a person or entity acting under a grant of authority from or contract with such public agency...that is responsible for public health matters as part of the official mandate.[3] (emphasis added).

[3] 45 C.F.R. §164.501

Since state cancer registries come within this definition, the Privacy Rule does not restrict disclosure of patient information to them. For the exemption to apply to a non-governmental registry, however, the registry must operate pursuant to a contract with a public agency or under a grant of authority from a public agency.

Should you have any further questions regarding this issue, please advise.

Very truly yours,

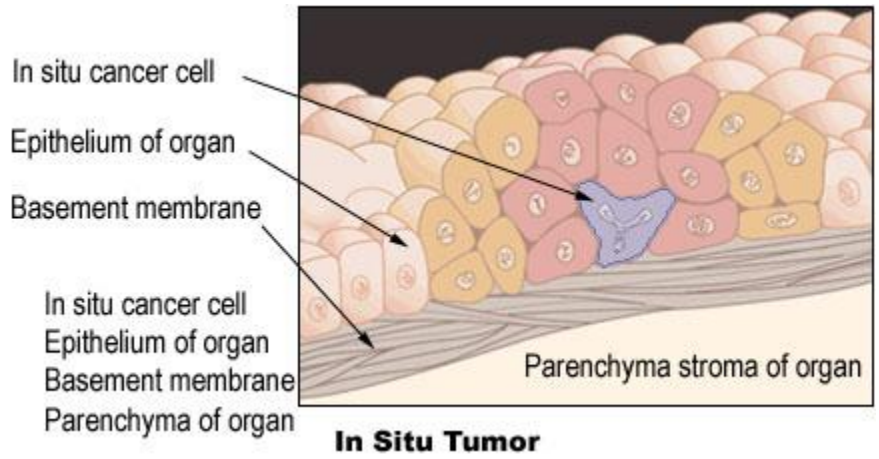
Jeffery M. Wilday

JMW:ddh

APPENDIX D:

Cancer Staging
from the SEER Summary Staging 2000 Manual

In situ



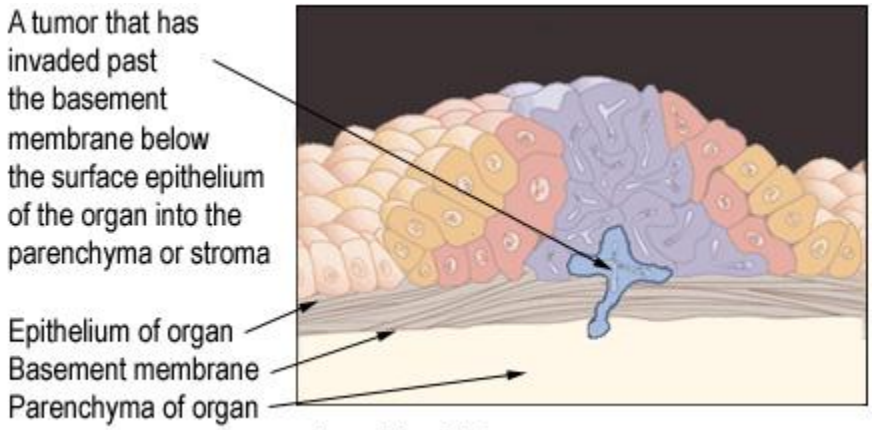
In Situ Tumor

Source: Adapted from an illustration by Brian Shellito of *Scientific American*, as printed in *Cancer in Michigan, The Detroit News,* Nov. 1-2, 1998.

In situ means “in place.” The technical definition of in situ is the presence of malignant cells within the cell group from which they arose. There is no penetration of the basement membrane of the tissue and no stromal invasion. Generally, a cancer begins in the rapidly dividing cells of the epithelium or lining of an organ and grows from the inside to the outside of the organ. An in situ cancer fulfills all pathologic criteria for malignancy except that it has not invaded the supporting structure of organ on which it arose.

An in situ diagnosis can only be made microscopically, because a pathologist must identify the basement membrane and determine that it has not been penetrated. If the basement membrane has been disrupted (in other words, the pathologist describes the tumor as microinvasive), the case is no longer in situ and is at least localized. Pathologists have many ways of describing in situ cancer, such as non-invasive, pre-invasive, non-infiltrating, intra-epithelial, Stage 0, intraductal, intracystic, no stromal invasion, and no penetration below the basement membrane. Organs and tissues that have no epithelial layer cannot be staged as in situ, since they do not have a basement membrane. Therefore, there cannot be a diagnosis of “sarcoma in situ.”

Localized



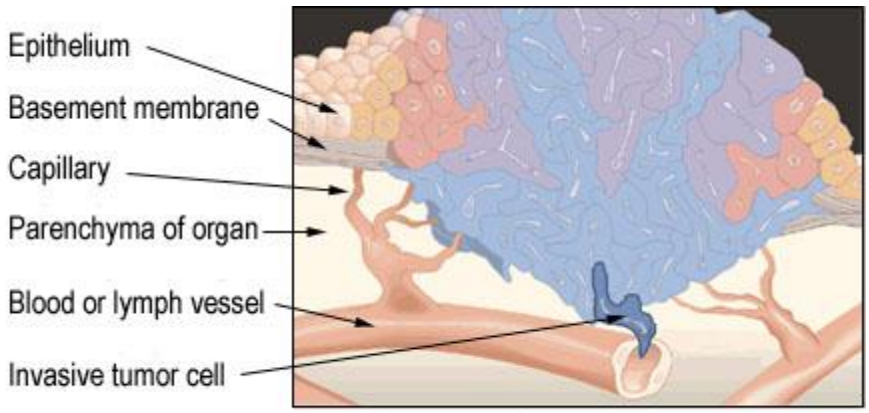
Localized Tumor

Source: Adapted from an illustration by Brian Shellito of *Scientific American*, as printed in *Cancer in Michigan, The Detroit News,* Nov. 1-2, 1998.

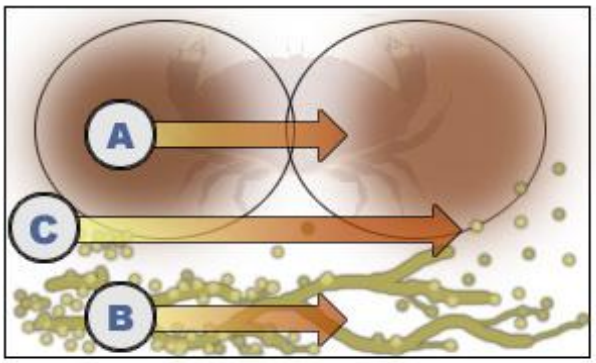
A localized cancer is a malignancy limited to the organ of origin; it has spread no farther than the organ in which it started. There is infiltration past the basement membrane of the epithelium into the functional part of the organ, but there is no spread beyond the boundaries of the organ. A tumor can be widely invasive or even show metastases within the organ itself and still be considered “confined to organ of origin” or localized in summary stage.

For organs that have definite boundaries (such as prostate, testis, or stomach) or sites where there is a clear line between the organ of origin and the surrounding region (such as breast or bladder), it is usually straightforward to determine whether the cancer is localized. An exception is skin, because it is sometimes difficult to determine where the dermis ends and subcutaneous tissue begins. For most internal organs, it is not possible to determine whether tumor is localized without exploratory surgery. However, the increasing sophistication of many imaging techniques is predicted to eventually make exploratory surgery obsolete.

Regional



Invasive (Regional) Tumor



A. Direct extention
B. To regional lymph nodes
C. Combination of A and B

Regional Stages

Source: Adapted from an illustration by Brian Shellito of *Scientific American*, as printed in *Cancer in Michigan, The Detroit News,* Nov. 1-2, 1998.

Regional stage is perhaps the broadest category as well as the most difficult to properly identify. The brief definition of regional stage is tumor extension beyond the limits of the organ of origin. Although the boundary between localized and regional tumor extension is usually well-identified, the boundary between regional and distant spread is not always clear and can be defined differently by physicians in various specialties.

Cancer becomes regional when there is the potential for spread by more than one lymphatic or vascular supply route. For example, the tumor in the hepatic flexure of the colon with extension along the lumen to the ascending colon is staged as localized because both areas drain to same lymph nodes. On the other hand, a sigmoid tumor

extending into the rectum is staged as regional because the tumor now has potential for the tumor cell drainage to both iliac and mesenteric nodes.

The formal (scientific) definition used by surgeons is that area extending from the periphery of an involved organ that lends itself to removal en bloc with a portion of— or an entire— organ with outer limits to include at least the first level nodal basin. However, en bloc resection (removal of multiple organs or tissues in one piece at the same time) is not always feasible or may have been shown not to be necessary. For example, a number of clinical trials have shown that lumpectomy or modified radical mastectomy has equivalent survival to the very disfiguring radical mastectomy for treatment of breast cancer. In contrast, radiation oncologists define the term regional as including any organs or tissues encompassed in the radiation field used to treat the primary site and regional lymph nodes.

Regional stage has several subcategories, each of which is described in detail below.

Regional by direct extension only

Regional lymph nodes involved only

Regional by BOTH direct extension AND lymph node involvement

These subcategories describe different methods of regional spread of tumor:

A. Invasion through entire wall of organ into surrounding organs and/or adjacent tissues (code 2, regional by direct extension or contiguous spread)

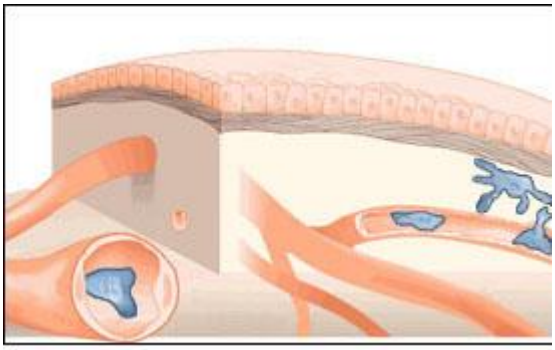
B. Tumor invasion of walls of lymphatics where cells can travel through lymphatic vessels to nearby lymph nodes where they are “filtered” out and begin to grow in the nodes (code 3, regional to lymph nodes)

C. A combination of direct extension and lymph node involvement (code 4, regional by direct extension and to regional nodes)

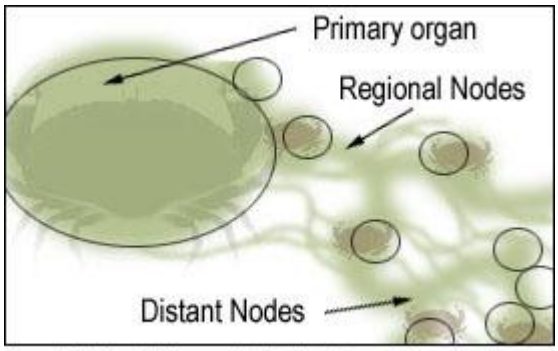
Distant

Distant metastases are tumor cells that have broken away from the primary tumor, have travelled to other parts of the body, and have begun to grow at the new location. Distant stage is also called remote, diffuse, disseminated, metastatic, or secondary disease. The point is that in most cases there is no continuous trail of tumor cells between the primary site and the distant site. Cancer cells can travel from the primary site in any of four ways:

1. Extension from primary organ into next beyond adjacent tissue the lung organ; for example, from bone or through the pleura into nerve.



Source: Adapted from an illustration by Brian Shellito of *Scientific American*, as printed in *Cancer in Michigan, The Detroit News,* Nov. 1-2, 1998.

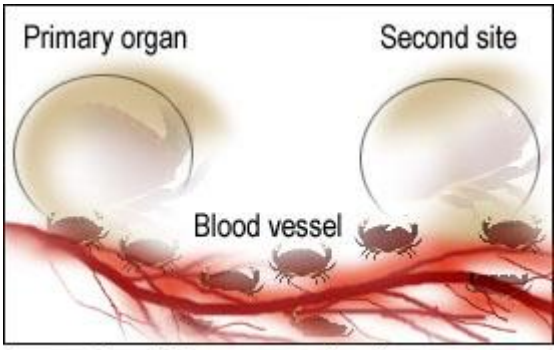


Distant Lymph Node Involvement

Source: Adapted from an illustration by Brian Shellito of *Scientific American*, as printed in *Cancer in Michigan, The Detroit News,* Nov. 1-2, 1998.

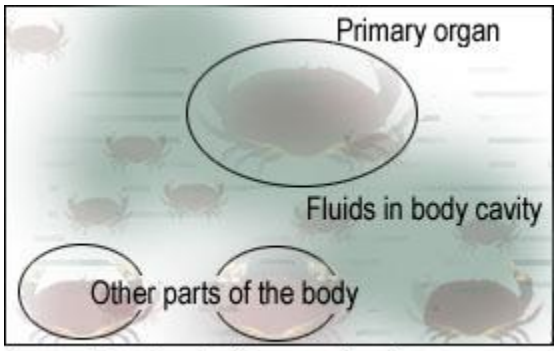
2. Travel in lymph channels beyond the first (regional) drainage area. Tumor cells can be filtered, trapped and begin to grow in any lymph nodes in the body.

3. Hematogenous or blood-borne metastases. Invasion of blood vessels within the primary tumor (veins are more susceptible to invasion than thicker-walled arteries) allows escape of tumor cells or tumor emboli which are transported through the blood stream to another part of the body where it lodges in a capillary or arteriole. At that point the tumor penetrates the vessel wall and grows back into the surrounding tissue.



Blood-borne metastases

Source: Adapted from an illustration by Brian Shellito of *Scientific American*, as printed in *Cancer in Michigan, The Detroit News,* Nov. 1-2, 1998.



Implantation metastases

Source: Adapted from an illustration by Brian Shellito of *Scientific American*, as printed in *Cancer in Michigan, The Detroit News,* Nov. 1-2, 1998.

4. Spread through fluids in a body cavity. Example: malignant cells rupture the surface of the primary tumor and are released into the thoracic or peritoneal cavity. They float in the fluid and can land on and begin to grow on any tissue reached by the fluid. This type of spread is also called implantation or seeding metastases. Some tumors form large quantities of fluid called ascites that can be removed, but the fluid rapidly re-accumulates. However, the presence of fluid or ascites does not automatically indicate dissemination. There must be cytologic evidence of malignant cells.

Common sites of distant spread are liver, lung, brain, and bones, but they are not listed specifically for each scheme. These organs receive blood flow from all parts of body and thus are a target for distant metastases.

APPENDIX E:

Cancer Mortality

NOTES ON MORTALITY RATES

In keeping with the National Program of Cancer Registries Program Standards, the West Virginia Cancer Registry is providing mortality data comparisons using United States Cancer Statistics (USCS) age-adjusted (2000 Standard) average annual (2003-2007) rates per 100,000 (U.S. Cancer Statistics Working Group, 2010).

Rates are suppressed when there are fewer than 16 cases, in accordance with USCS practices.

The “South” region is comprised of Delaware, District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia, West Virginia, Alabama, Kentucky, Mississippi, Tennessee, Arkansas, Louisiana, Oklahoma, and Texas.

The “South Atlantic” region is comprised of Delaware, the District of Columbia, Florida, Georgia, Maryland, North Carolina, South Carolina, Virginia and West Virginia.

Table Appendix E-1. Age-Adjusted Average Annual (2003 to 2007) Cancer Death Rates and 95% Confidence Intervals by US Census Region and Division, State and Race

CANCER SITE	ALL RACES	WHITE	BLACK
ALL SITE			
United States	183.8 (183.6-184.0)	182.4 (182.2-182.6)	224.2 (223.4-225.0)
South	189.0 (188.6-189.3)	184.3 (183.9-184.7)	228.4 (227.3-229.5)
South Atlantic	184.3 (183.8-184.8)	179.8 (179.3-180.3)	218.2 (216.8-219.6)
West Virginia	209.8 (207.1-212.6)	210.6 (207.8-213.4)	223.8 (206.7-241.8)
HEAD & NECK			
United States	2.5 (2.5-2.6)	2.4 (2.4-2.5)	3.6 (3.5-3.7)
South	2.8 (2.7-2.8)	2.6 (2.6-2.7)	3.8 (3.7-3.9)
South Atlantic	2.7 (2.7-2.8)	2.6 (2.5-2.6)	3.6 (3.4-3.8)
West Virginia	2.7 (2.4-3.0)	2.7 (2.4-3.0)	~
ESOPHAGUS			
United States	4.4 (4.3-4.4)	4.4 (4.4-4.4)	5.1 (5.0-5.2)
South	4.2 (4.1-4.2)	4.0 (3.9-4.1)	5.4 (5.2-5.5)
South Atlantic	4.3 (4.2-4.4)	4.1 (4.0-4.2)	5.4 (5.2-5.6)
West Virginia	4.7 (4.3-5.1)	4.7 (4.3-5.1)	5.4 (3.1-8.8)
STOMACH			
United States	3.8 (3.8-3.9)	3.3 (3.3-3.4)	7.3 (7.1-7.4)
South	3.7 (3.7-3.8)	3.2 (3.1-3.2)	7.2 (7.0-7.4)
South Atlantic	3.6 (3.6-3.7)	3.0 (2.9-3.0)	7.1 (6.8-7.3)
West Virginia	3.3 (2.9-3.6)	3.2 (2.9-3.6)	~

Table Appendix E-1. Age-Adjusted Average Annual (2003 to 2007) Cancer Death Rates and 95% Confidence Intervals by US Census Region and Division, State and Race, Continued

CANCER SITE	ALL RACES	WHITE	BLACK
COLON & RECTUM			
United States	17.6 (17.5-17.7)	17.1 (17.0-17.2)	24.7 (24.5-25.0)
South	17.7 (17.6-17.9)	16.7 (16.6-16.8)	25.4 (25.0-25.8)
South Atlantic	17.1 (17.0-17.3)	16.1 (15.9-16.2)	24.0 (23.5-24.4)
West Virginia	21.0 (20.2-21.9)	20.9 (20.0-21.8)	30.2 (24.1-37.2)
LIVER & INTRAHEPATIC BILE DUCT			
United States	5.2 (5.2-5.2)	4.8 (4.7-4.8)	7.0 (6.8-7.1)
South	5.3 (5.3-5.4)	5.0 (4.9-5.1)	6.5 (6.3-6.7)
South Atlantic	4.8 (4.7-4.9)	4.5 (4.4-4.5)	5.8 (5.6-6.0)
West Virginia	4.4 (4.0-4.8)	4.3 (3.9-4.7)	8.5 (5.5-12.5)
PANCREAS			
United States	10.7 (10.7-10.8)	10.5 (10.5-10.6)	13.8 (13.6-14.0)
South	10.5 (10.4-10.6)	10.1 (10.0-10.2)	13.9 (13.6-14.2)
South Atlantic	10.5 (10.4-10.6)	10.1 (9.9-10.2)	13.7 (13.3-14.0)
West Virginia	9.2 (8.7-9.8)	9.3 (8.7-9.9)	10.2 (6.8-14.6)
LARYNX			
United States	1.2 (1.2-1.2)	1.1 (1.1-1.2)	2.3 (2.2-2.3)
South	1.4 (1.4-1.4)	1.3 (1.2-1.3)	2.3 (2.2-2.4)
South Atlantic	1.4 (1.3-1.4)	1.3 (1.2-1.3)	2.2 (2.1-2.4)
West Virginia	1.8 (1.6-2.1)	1.8 (1.6-2.1)	~

Table Appendix E-1. Age-Adjusted Average Annual (2003 to 2007) Cancer Death Rates and 95% Confidence Intervals by US Census Region and Division, State and Race, Continued

CANCER SITE	ALL RACES	WHITE	BLACK
LUNG & BRONCHUS			
United States	52.5 (52.4-52.6)	52.9 (52.8-53.1)	58.6 (58.2-59.0)
South	57.6 (57.4-57.8)	57.9 (57.7-58.1)	59.2 (58.6-59.7)
South Atlantic	55.3 (55.1-55.6)	56.1 (55.8-56.4)	54.3 (53.6-55.0)
West Virginia	67.6 (66.0-69.1)	68.2 (66.7-69.8)	55.2 (46.8-64.5)
SKIN MELANOMA			
United States	2.7 (2.7-2.7)	3.1 (3.0-3.1)	0.4 (0.4-0.5)
South	2.8 (2.7-2.8)	3.2 (3.2-3.3)	0.5 (0.4-0.5)
South Atlantic	2.8 (2.7-2.9)	3.3 (3.3-3.4)	0.5 (0.4-0.5)
West Virginia	3.2 (2.9-3.6)	3.3 (3.0-3.7)	~
FEMALE BREAST			
United States	24.0 (23.9-24.1)	23.4 (23.2-23.5)	32.4 (32.0-32.8)
South	24.1 (23.9-24.3)	22.6 (22.4-22.8)	33.0 (32.5-33.5)
South Atlantic	23.9 (23.6-24.1)	22.3 (22.1-22.6)	31.6 (31.0-32.3)
West Virginia	24.3 (23.0-25.5)	24.1 (22.9-25.4)	33.9 (25.4-44.3)
UTERINE CERVIX			
United States	2.4 (2.4-2.5)	2.2 (2.2-2.2)	4.4 (4.3-4.6)
South	2.8 (2.7-2.8)	2.4 (2.4-2.5)	4.7 (4.5-4.9)
South Atlantic	2.5 (2.4-2.6)	2.2 (2.1-2.3)	4.2 (4.0-4.4)
West Virginia	3.2 (2.7-3.7)	3.2 (2.7-3.8)	~

Table Appendix E-1. Age-Adjusted Average Annual (2003 to 2007) Cancer Death Rates and 95% Confidence Intervals by US Census Region and Division, State and Race, Continued

CANCER SITE	ALL RACES	WHITE	BLACK
CORPUS & UTERUS			
United States	4.1 (4.1-4.2)	3.9 (3.8-3.9)	7.2 (7.0-7.4)
South	3.8 (3.7-3.8)	3.3 (3.2-3.3)	7.0 (6.7-7.2)
South Atlantic	3.9 (3.8-4.0)	3.3 (3.2-3.4)	7.2 (6.9-7.6)
West Virginia	4.4 (3.9-4.9)	4.4 (3.9-5.0)	~
OVARY			
United States	8.6 (8.5-8.7)	8.9 (8.9-9.0)	7.2 (7.0-7.3)
South	8.3 (8.2-8.4)	8.5 (8.4-8.6)	7.3 (7.1-7.6)
South Atlantic	8.3 (8.1-8.4)	8.6 (8.4-8.7)	7.0 (6.7-7.3)
West Virginia	9.1 (8.3-9.9)	9.2 (8.5-10.0)	~
NON-HODGKIN'S LYMPHOMA			
United States	6.9 (6.8-6.9)	7.2 (7.1-7.2)	4.8 (4.7-4.9)
South	6.7 (6.6-6.8)	7.0 (6.9-7.1)	4.9 (4.7-5.0)
South Atlantic	6.5 (6.4-6.6)	6.8 (6.7-6.9)	4.8 (4.6-5.0)
West Virginia	8.0 (7.5-8.5)	8.1 (7.6-8.7)	5.4 (3.1-8.8)
PROSTATE			
United States	24.7 (24.6-24.9)	22.8 (22.6-22.9)	54.2 (53.5-54.9)
South	25.1 (24.8-25.3)	21.2 (21.0-21.4)	57.7 (56.7-58.7)
South Atlantic	24.4 (24.1-24.7)	20.3 (20.1-20.6)	57.1 (55.8-58.4)
West Virginia	22.3 (20.9-23.8)	21.6 (20.2-23.1)	55.3 (41.7-71.5)

Table Appendix E-1. Age-Adjusted Average Annual (2003 to 2007) Cancer Death Rates and 95% Confidence Intervals by US Census Region and Division, State and Race, Continued

CANCER SITE	ALL RACES	WHITE	BLACK
TESTIS			
United States	0.2 (0.2-0.3)	0.3 (0.3-0.3)	0.2 (0.1-0.2)
South	0.2 (0.2-0.3)	0.3 (0.2-0.3)	0.2 (0.1-0.2)
South Atlantic	0.2 (0.2-0.2)	0.2 (0.2-0.3)	0.1 (0.1-0.2)
West Virginia	~	~	~
URINARY BLADDER			
United States	4.3 (4.3-4.4)	4.5 (4.5-4.5)	3.7 (3.6-3.8)
South	4.1 (4.0-4.2)	4.2 (4.2-4.3)	3.7 (3.5-3.8)
South Atlantic	4.2 (4.2-4.3)	4.4 (4.3-4.5)	3.7 (3.5-3.9)
West Virginia	4.7 (4.3-5.1)	4.7 (4.3-5.1)	~
KIDNEY & RENAL PELVIS			
United States	4.1 (4.0-4.1)	4.2 (4.1-4.2)	4.0 (3.9-4.1)
South	4.2 (4.1-4.2)	4.2 (4.2-4.3)	4.1 (4.0-4.3)
South Atlantic	3.8 (3.8-3.9)	3.9 (3.8-4.0)	3.8 (3.6-4.0)
West Virginia	4.5 (4.1-4.9)	4.5 (4.1-4.9)	5.2 (2.9-8.4)
BRAIN & OTHER NERVOUS SYSTEM			
United States	4.3 (4.3-4.3)	4.6 (4.6-4.7)	2.5 (2.4-2.6)
South	4.3 (4.2-4.3)	4.6 (4.5-4.7)	2.6 (2.5-2.8)
South Atlantic	4.0 (3.9-4.1)	4.4 (4.3-4.5)	2.4 (2.3-2.5)
West Virginia	4.6 (4.2-5.0)	4.7 (4.3-5.2)	~

Table Appendix E-1. Age-Adjusted Average Annual (2003 to 2007) Cancer Death Rates and 95% Confidence Intervals by US Census Region and Division, State and Race, Continued

CANCER SITE	ALL RACES	WHITE	BLACK
THYROID			
United States	0.5 (0.5-0.5)	0.5 (0.5-0.5)	0.5 (0.4-0.5)
South	0.4 (0.4-0.5)	0.4 (0.4-0.5)	0.4 (0.4-0.5)
South Atlantic	0.4 (0.4-0.4)	0.4 (0.4-0.4)	0.4 (0.3-0.5)
West Virginia	0.4 (0.3-0.5)	0.4 (0.3-0.5)	~
HODGKIN'S DISEASE			
United States	0.4 (0.4-0.4)	0.4 (0.4-0.5)	0.4 (0.4-0.4)
South	0.4 (0.4-0.4)	0.4 (0.4-0.5)	0.4 (0.4-0.4)
South Atlantic	0.4 (0.4-0.4)	0.4 (0.4-0.4)	0.4 (0.3-0.4)
West Virginia	0.5 (0.4-0.6)	0.5 (0.4-0.6)	~
MULTIPLE MYELOMA			
United States	3.6 (3.5-3.6)	3.3 (3.3-3.3)	6.7 (6.6-6.8)
South	3.7 (3.6-3.7)	3.2 (3.2-3.3)	6.8 (6.6-7.0)
South Atlantic	3.6 (3.6-3.7)	3.1 (3.1-3.2)	6.7 (6.4-6.9)
West Virginia	3.7 (3.3-4.0)	3.6 (3.2-3.9)	8.3 (5.3-12.4)
LEUKEMIA			
United States	7.2 (7.2-7.2)	7.4 (7.4-7.5)	6.3 (6.2-6.5)
South	7.1 (7.0-7.2)	7.3 (7.2-7.3)	6.5 (6.3-6.7)
South Atlantic	6.9 (6.8-7.0)	7.1 (7.0-7.2)	6.3 (6.0-6.5)
West Virginia	7.6 (7.1-8.2)	7.7 (7.2-8.3)	5.9 (3.5-9.3)

Table Appendix E-1. Age-Adjusted Average Annual (2003 to 2007) Cancer Death Rates and 95% Confidence Intervals by US Census Region and Division, State and Race, Continued

CANCER SITE	ALL RACES	WHITE	BLACK
MESOTHELIOMA			
United States	0.8 (0.8-0.8)	0.9 (0.9-0.9)	0.4 (0.3-0.4)
South	0.7 (0.7-0.7)	0.8 (0.7-0.8)	0.3 (0.3-0.4)
South Atlantic	0.7 (0.7-0.8)	0.8 (0.8-0.8)	0.3 (0.3-0.4)
West Virginia	1.2 (1.0-1.5)	1.3 (1.1-1.5)	~