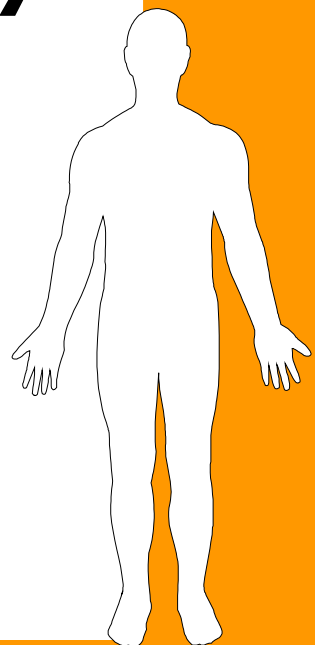




# **Cancer in West Virginia**

## **Incidence and Mortality**

### **1993 - 2001**





# Cancer in West Virginia

## Incidence and Mortality

### 1993 - 2001

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March 2004

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## Introduction

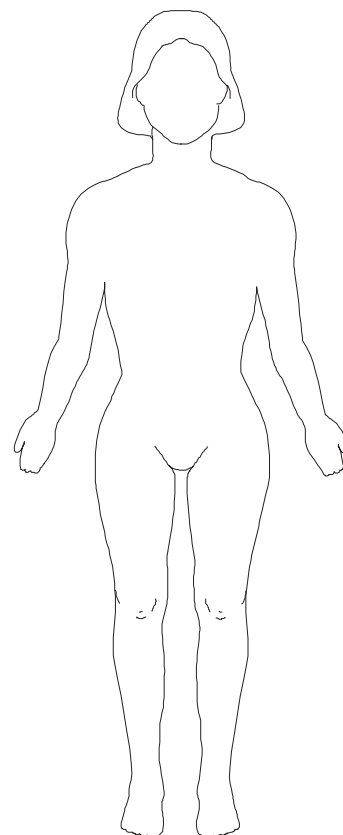
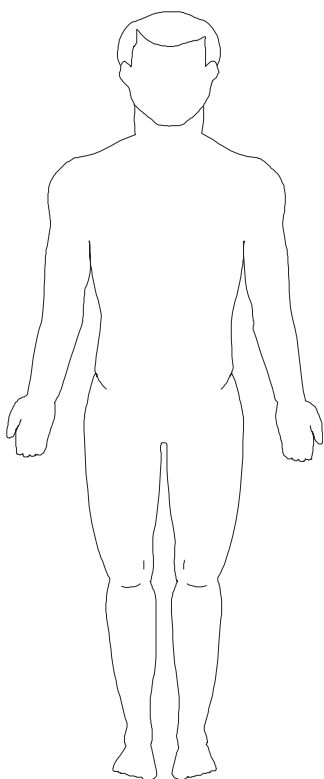
Cancer is a group of diseases characterized by uncontrolled growth and spread of abnormal cells (American Cancer Society, 2004). It can strike at any age and can spread to any part of the body. It is the second leading cause of death in the United States, accounting for one of four deaths (ACS, 2003a; ACS, 2004; U. S. Department of Health and Human Services, 2002). Among children between the ages of one and 19 years, cancer causes more deaths than any other disease (ACS, 2003a; Ries et al., 1999). Nationwide, it is expected that 563,700 persons will die of cancer in 2004 (ACS, 2004). In West Virginia, cancer is also the second leading cause of death (West Virginia Department of Health and Human Resources, 2002) and the greatest cause of years of potential life lost (i.e. premature deaths).

Research has demonstrated that many cancers can be prevented or, if detected and treated at early stages, cured (ACS, 2003a; National Cancer

Institute, 2002). All cancers caused by cigarette smoking and heavy use of alcohol could be prevented completely (ACS, 2003a). About one-third of cancer deaths are related to nutrition, physical inactivity, obesity, and other lifestyle factors (ACS, 2003a). Some cancers are related to infectious exposures such as the hepatitis B virus, human papillomavirus, human immunodeficiency virus, and *Helicobacter pylori* (ACS, 2003b, 2004). Behavioral changes, vaccines, and antibiotics may help prevent such cancers (ACS, 2003b, 2004). Many skin cancers could be prevented by protection from the sun's rays (ACS, 2003a, 2004; National Council on Skin Cancer Prevention, 2004).

Regular screening by health care professionals can detect cancers of the breast, colon, rectum, cervix, prostate, testis, mouth, tongue, and skin at earlier stages. Self-examinations for breast and skin cancer may also result in earlier detection. When cancer is detected at earlier stages, treatment is more likely to be successful. If all of these cancers were detected at earlier stages and properly treated, 95% of patients with these cancers would survive at least five years.

Information from the West Virginia Cancer Registry (WVCR) is used to examine the incidence and mortality rates of cancer in West Virginia. It helps identify high-risk populations who can then be targeted for prevention and early detection services. WVCR data are also being used in epidemiologic studies of oral/pharyngeal cancers, colon cancers, and lung cancers. These studies will, in turn, aid in prevention, detection, and treatment of cancer in West Virginia and the nation.



## West Virginia Cancer Registry

The West Virginia Department of Health and Human Resources, Bureau for Public Health, implemented a statewide, population-based Breast and Cervical Cancer Incidence Registry (BCCIR) in 1991 to monitor patterns of breast and cervical cancer among West Virginia women. In 1992 the Legislature amended the West Virginia Code to establish a statewide cancer registry. The BCCIR was expanded to include cancer diagnoses of all anatomical sites in 1993 and renamed the West Virginia Cancer Registry (WVCR).

### Methods of Data Collection

The WVCR collects data on all cancer cases, with the exception of basal cell and squamous cell carcinomas of the skin and carcinoma in situ of the cervix, diagnosed in West Virginia residents on or after January 1, 1993. Reporting sources include hospital-based cancer registries, hospitals without cancer registries, freestanding pathology laboratories, freestanding radiation treatment centers, clinics, nursing homes, physicians, and death certificates. Appendix A lists all participating hospitals, pathology laboratories, and freestanding cancer treatment centers as of January 2004.

To identify cases of cancer in residents who traveled outside West Virginia for diagnosis and/or treatment, the WVCR has established reciprocal agreements for data exchange with the central cancer registries in Alaska, Arkansas, the District of Columbia, Florida, Kentucky, Maryland, Mississippi, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Texas, Virginia, Washington, Wisconsin, and Wyoming.

To identify cases not found by routine casefinding activities, deaths among West Virginia residents with cancer listed as an underlying cause of death are matched against the WVCR data. Those cases which are verified to be reportable based on year of diagnosis are added to the WVCR database.

The Breast and Cervical Cancer Screening Program, Office of Maternal, Child, and Family Health, at least annually provides the WVCR a listing of cancer cases diagnosed as a result of that screening initiative. Those cases are matched with the WVCR database to insure that all reportable cases are included.

Finally, physicians and other medical providers are required to report all newly diagnosed cases of cancer not admitted to a hospital in West Virginia. This assists in identifying melanomas of the skin and other cancers diagnosed and treated on an outpatient basis or referred out-of-state (thus, not identifiable through routine casefinding activities).

The following data items have been collected on all residents diagnosed with cancer from January 1, 1993, forward:

- |  |   |
|--|---|
| * Name                                   | * Number of primary lesions if more than one                    |
| * Date of birth, sex, and race           | * Cancer site and type  |
| * Social Security Number                 | * Stage at diagnosis  |
| * Address at diagnosis, including county | * Reporting facility or physician                               |
| * Telephone number                       | * Physician(s) providing diagnosis, treatment, and/or follow-up |
| * Date of diagnosis                      |   |

Treatment information was added to the required data items in 1995, and occupation and industry information was added in 1996.

## **Cancer Reporting**

The WVCR reporting system is depicted in Figure I.1. Reports on individual cases of cancer are submitted electronically to the WVCR by hospital-based cancer registries and central registries in other states. Facilities without cancer registries provide access to medical records of cancer cases for the WVCR cancer data specialists to abstract their cases. The WVCR collects and analyzes the data and disseminates summaries of statistical findings.

## **Methodology**

### **Incidence Data**

In this report, all incidence rates for West Virginia are based on cancer data collected by the WVCR. Annual incidence rates are included for West Virginia from 1993 through 2001. United States incidence rates are included from 1993 through 2000. Due to a one-year lag in national cancer incidence data, 2001 national rates were not available for this publication.

Five years of combined data, 1997 - 2001, were used to present rates by age, stage at diagnosis, and county of residence. The incidence rates based on five years of data should be interpreted as the average annual rates that occurred from 1997 through 2001.

### **Mortality Data**

Mortality data were provided by the state's Health Statistics Center. Based on information recorded on death certificates, underlying causes of death were used to determine rates of cancer mortality in West Virginia. Deaths occurring from 1993 through 1998 due to primary sites of cancer were identified from appropriate rubrics in the International Classification of Diseases, Ninth Revision (ICD-9). These rubrics corresponded to the ICD-9 rubrics utilized by the National Cancer Institute in reporting cancer mortality data (Ries et al., 2003). West Virginia resident deaths occurring from 1999 through 2001 were identified from appropriate rubrics in the International Classification of Diseases, Tenth Revision (ICD-10).

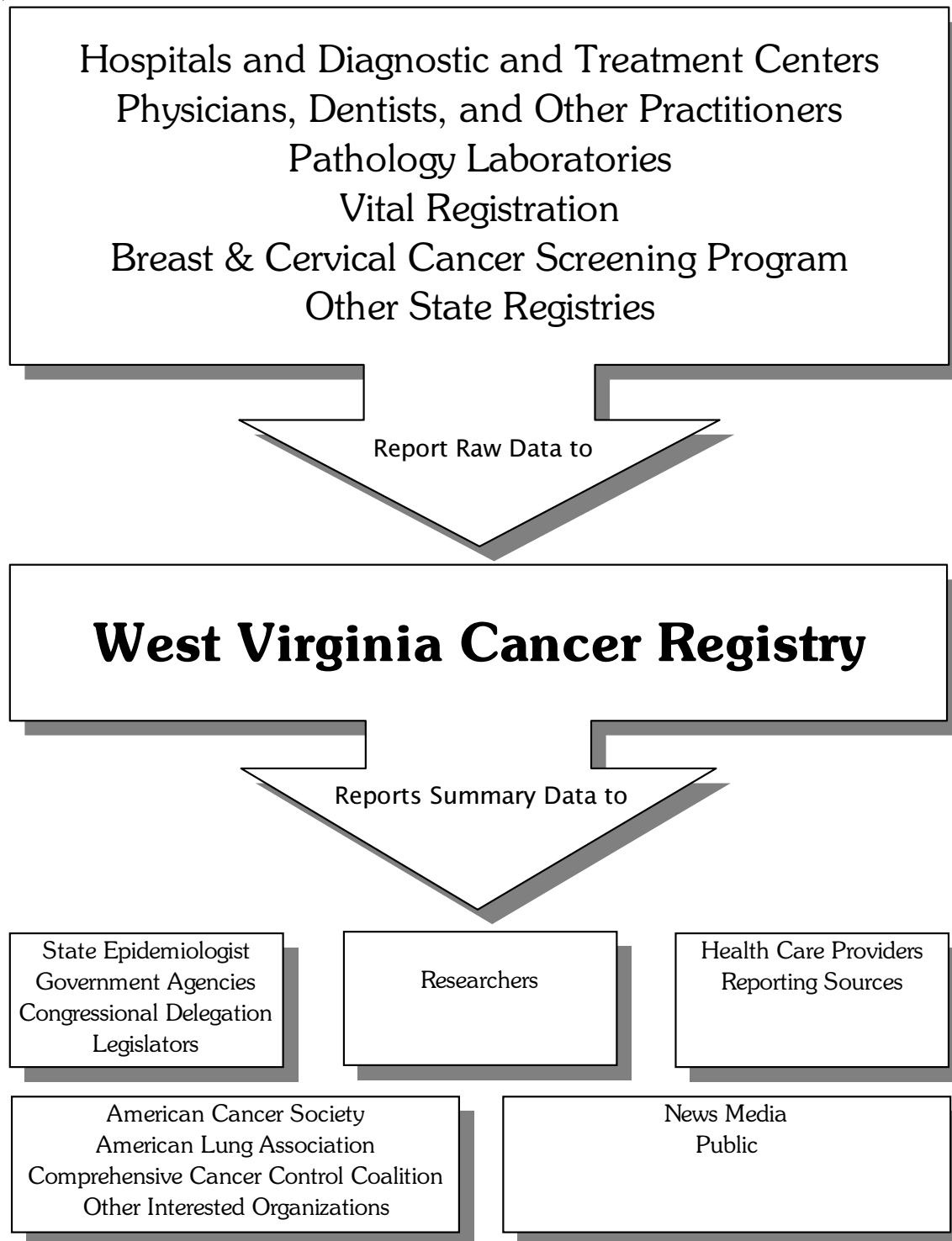
This report includes annual mortality rates for West Virginia from 1993 through 2001. United States mortality rates are included from 1993 through 2000. The national cancer mortality rates for 2001 were not available for this publication.

### **Age-Adjustment to the Year 2000 Standard Population**

Age-adjustment is the process used to compare incidence and mortality rates over time, or among geographic areas or other populations that have different age distributions. For example, without adjusting for age, it would be inaccurate and misleading to compare the cancer rates of West Virginia, which has a relatively large percentage of elderly residents, to those of Alaska, which has a younger population. This is especially important when examining cancer rates, since cancer is more frequently diagnosed in older people. Age-adjustment eliminates the confounding effect of age when comparing rates in different populations.



# Cancer Reporting in West Virginia



**Figure I.1**

Federal agencies adopted the year 2000 projected U.S. population distribution as the new standard for adjusting incidence and mortality from 1999 on. In previous years, at least three different population standards were used, resulting in difficulties comparing data prepared by national and federal agencies and causing confusion among data users and the general public. Use of the Year 2000 Standard was recommended to promote uniformity of data among agencies.

The Year 2000 Standard applies to data from calendar year 1999 and forward. Because this report includes incidence and mortality rates from 1999 forward, the WVCR has conformed to the recommendation of adjusting to the Year 2000 Population Standard. This change required recalculation of the age-adjusted rates for the years 1993 to 1998 to allow valid comparisons between current and past years.

## **Comparisons of Rates for West Virginia and the U.S.**

Comparisons of cancer incidence and mortality rates for West Virginia and the U.S. are complicated by a one-year lag in reporting national rates. For example, current national cancer data only cover up to 2000, while data for West Virginia cover 1993 through 2001.

## **Average Rates**

Age-specific incidence and mortality rates are calculated as average annual age-specific rates to provide more accurate estimates. When the total number of cancer cases for an anatomical site is broken down by age, very small numbers often result. Combining five years of data to calculate an average annual age-specific rate provides a more reliable estimate of this measure.

Similarly, average annual age-adjusted incidence and mortality rates are presented in this report. Since rates can fluctuate year to year due to small numbers, average rates calculated from five years of data can provide better estimates of these measures than individual year rates.

## **Population Denominators**

West Virginia population estimates by gender and age for 1993 through 2001 were obtained from the U.S. Bureau of the Census (Appendix D). These estimates were used as denominators in the calculation of 1993 - 2001 incidence and mortality rates for West Virginia. County population estimates (Appendix E) were obtained from the same source.

## **Confidentiality of Cancer Data**

Chapter 16-5A-2a of the West Virginia Code adopted by the West Virginia Legislature in 1992 specifically states:

All information reported pursuant to this section is confidential and shall be used for the purpose of determining the sources of malignant neoplasms and evaluating measures designed to eliminate, alleviate or ameliorate their effect. A report provided to the cancer registry disclosing the identity of an individual who was reported as having cancer 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.

Documents which identify individual cancer patients, individual hospitals, or individual physicians are regarded as confidential and are subject to specific regulations for maintenance of confidentiality. WVCR staff are fully aware of their responsibility to protect the confidentiality of patients' files and sign a confidentiality agreement upon employment with the registry.

Information which identifies a specific patient is only released to the reporting source, to a central cancer registry with whom a reciprocal agreement has been made, or to cancer researchers meeting all requirements established by the WVCR. Confidentiality guidelines are specifically addressed in any release of identifying cancer data.

Data about the cancer experience of an identified hospital or physician, regardless of whether the patient-identifying information is contained within, are available only with prior written permission from the hospital or physician involved.

Access to WVCR records is limited to WVCR personnel.

## Definitions of Terms

*Cancer* - a group of diseases characterized by uncontrolled growth and spread of abnormal cells. If the spread is not controlled, it can result in death.

*Cancer Clusters* - the occurrence of an unusually high number of cases and/or deaths from cancer of a specific body site among a defined population during a specific time. Possible "clusters" are usually reported when someone has a family member, friend, or neighbor diagnosed with cancer. This close contact with cancer often brings an awareness of others who have cancer and may lead to the perception that there is an unusually large number of cancer cases in a certain area. Determining that a true "cluster" exists requires multiple years of incidence and mortality data and statistical tests to establish if the number of cases is significantly higher than expected.

*Cancer Registry* - the office within the Bureau for Public Health where information is maintained on persons diagnosed with cancer. The WVCR maintains information on West Virginia residents diagnosed with cancer on or after January 1, 1993. The registry collects and stores information on cancer patients and prepares reports on the data collected.

*Case* - an incidence of a reportable primary site of cancer. (Note: A cancer patient may be diagnosed with more than one primary site of cancer. The number of cases in this report refers to the number of primary sites reported, not the number of cancer patients.)

*Confidence Interval* - an established range within which an estimated rate is expected to fall. The confidence interval specifies the probability that the estimated rate actually falls within that range. A 95% confidence interval means that one can be 95% certain that the true rate falls within the computed interval.

*Histology* - the study of the structure of tissues to determine the exact type of cancer, the behavior of the cancer, and the differentiation of tumor cells (grade).

*Microscopic Confirmation* - the microscopic examination of tissues or cells removed from the suspected cancer site for the purpose of verifying a malignancy.

*Primary Site* - the organ or tissue that has been determined to be the place of origin of the malignancy.

*Stage of Disease* - a classification system to describe the extent of the spread of disease from the site of origin at the time of diagnosis. The staging classification used for this report is the *Summary Staging Guide for Cancer: Surveillance Epidemiology and End Results Reporting*. The summary stages are defined as follows:

*In situ* - a tumor that fulfills all the microscopic criteria for malignancy except invasion

*Local* - a malignant tumor that appears to be confined entirely to the organ of origin with no evidence of metastasis elsewhere in the body

*Regional* - a malignant tumor that has extended beyond the limits of the organ of origin into adjacent organs or tissues by direct extension, regional lymph nodes by metastasis, or both and appears to have spread no farther

*Distant* - a malignant tumor that has spread by direct extension beyond adjacent organs or tissues or by metastasis to distant sites or distant lymph nodes

*Stage unknown* - insufficient information in patient's medical record to determine stage of disease

*Statistical Significance* - a measure of the strength of association between variables. Two measurements are considered significantly different when their confidence intervals do not overlap. In this document, measurements of statistical significance are calculated at the 95% confidence level.

## Definitions of Rates

*Rate* - the number of events occurring in a specific population during a given period of time. Rates in this report are expressed per 100,000 population.

*Crude Rate* - the total number of events per 100,000 total population.

*Age-Adjusted Rate* - the incidence and mortality per 100,000 population expected for West Virginia if the age distribution were the same as the standard population. For incidence and mortality in this report, the standard population used was the 2000 projected U.S. population. Age-adjusted rates allow meaningful comparisons of the incidence of events in different population groups by controlling the effects of age differences between populations.

*Average Annual Age-Specific Rate* - the average number of events in a specified age group population in a one-year time period. In this report, age-specific rates are based on five-year age groupings. Age groupings of less than 15 years, 15 through 24 years, 25 through 44 years, 45 through 64 years, and 65 years and older are also used. Average annual age-specific rates were calculated by combining the number of cases in a specified age group for multiple years and dividing by the combined age-specific populations for those years.

*Average Annual Age-Adjusted Rate* - the average yearly incidence and mortality per 100,000 population expected for West Virginia if the age distribution were the same as the standard population. Average

annual age-adjusted rates are determined by applying average annual age-specific rates calculated for five-year age intervals to the age distribution of the standard population using the direct method of adjustment. As noted above, the standard population used in this report is the 2000 projected U.S. population.

*Incidence Rate* - the number of new cancers of a specific site/type occurring in a specified population during a year, expressed as the number of cancers per 100,000 population. It should be noted that the numerator of the rate can include multiple primary cancers occurring in one individual and, with the exception of cancer of the urinary bladder, excludes carcinoma in situ. Except for age-specific rates, all incidence rates are age-adjusted to the 2000 U.S. standard population.

*Mortality Rate* - the number of deaths with cancer given as the underlying cause of death occurring in a specified population during a year, expressed as the number of deaths due to cancer per 100,000 population. Except for age-specific rates, all mortality rates are age-adjusted to the 2000 U.S. standard population.

## Reliability of Rates

Rates based on small numbers of events over a given time period or for sparsely populated geographic areas can vary widely year to year. This limits their usefulness in comparisons and estimation of further occurrences. Great caution should be used in assigning significance to rate changes from one year to the next for the majority of cancer sites in West Virginia and for geographic regions within the state. Multiple-year summary rates and trends over time provide better measurements and add credence to statements regarding rates.

Crude rates are not reliable for the purpose of comparing two different populations since they do not take into account demographic factors which influence the rate, such as age, sex, and race. Age-, sex-, and race-adjusted rates will provide a more reliable measurement to compare experiences over geographic areas or time periods.

Caution should always be used in attributing differences in rates to any particular factor or set of factors. Many variables may influence rates; valid interpretation of the reason for rate difference requires extensive research.

Although county rates of cancer incidence are based on population-based registries rather than estimates, caution should still be exercised in interpreting differences between jurisdictions. Given small numbers of cases and small populations, average annual age-adjusted rates for counties can vary widely year to year. In an effort to better assess the significant differences between county and state or U.S. rates, 95% confidence intervals were calculated for average annual age-adjusted county rates based on the following formula:

$$p \pm 1.96 \times \sqrt{\frac{p(1-p)}{n}}$$

In this formula,  $p$  represents the rate, and  $n$  represents the population. Differences in rates were interpreted to be statistically significant if the West Virginia rate or the U.S. rate fell outside the 95% confidence interval for the county rate.

Incidence and mortality rates for individual years from 1993 through 2000 found in this report are slightly higher than those found in last year's report, *Cancer in West Virginia, Incidence and Mortality, 1993 - 2000*. Following publication of annual reports, additional data for prior years are still received from various sources (central cancer registries in other states, previously unidentified cases from hospitals, etc.). These data are added to the WVCR database to increase its accuracy and completeness. As additional cases from a prior year are identified, these are included in calculations of incidence or mortality rates for that year of diagnosis, causing these rates to increase slightly over time.

Finally, cancer registries, like most projects, grow and develop over time. With increasing years of experience, improved data collection systems within West Virginia, and increasing data exchange with other state central cancer registries, it is likely that more complete, accurate, and geographically representational information will be obtained. This may be reflected in slight increases in rates due to improved case acquisition and registry development.

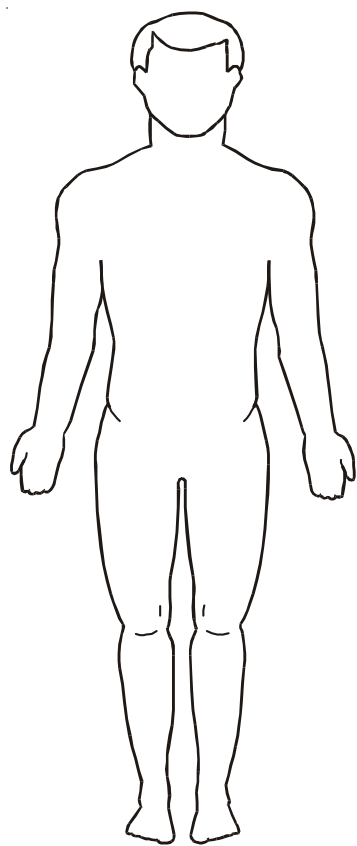
## **Limitations of 1993 Through 2001 Data Collection**

There are potential weaknesses in the 1993 - 2001 data collection. The first is the dependence on data exchange with central cancer registries in other states to identify West Virginia residents who were diagnosed and treated elsewhere. The WVCR currently has data exchange agreements with central registries in 17 states including the five bordering states. These central registries may experience delays in reporting in their states, which affect the timeliness of reporting to the WVCR.

Another potential weakness is the reporting of cases of cancer which were identified in out-of-state pathology laboratories and treated outside the hospital setting. The WVCR is dependent on physicians to report these cases that would not be identified by routine casefinding activities.

Each year the WVCR estimates the expected number of invasive cancer cases by computing SEER incidence to West Virginia mortality rate ratios that were standardized for age, sex, race, and primary tumor. At the time this report was prepared, the WVCR had accessioned 93% of the 1993 expected number of cases, 94% of the 1994 estimate, 98% of the 1995 estimate, 99% of the 1996 estimate, 103% of the 1997 estimate, 100% of the 1998 estimate, 101% of the 1999 estimate, 101% of the 2000 estimate, and 100% of the 2001 estimate. Delays in reporting by some sources impact the completeness of registry data.





# Chapter 1



**All Cancer Sites Combined**



## All Cancer Sites Combined

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	4,746	553.1	2,459	296.5	4,451	393.8	2,270	194.7	9,197	451.7	4,729	234.4
1994	4,774	550.0	2,512	300.1	4,555	401.9	2,204	186.2	9,329	455.7	4,716	230.3
1995	4,748	543.0	2,500	292.9	4,737	412.8	2,239	188.5	9,485	460.2	4,739	229.7
1996	4,869	552.4	2,398	281.5	4,802	421.8	2,284	191.0	9,671	469.0	4,682	225.9
1997	5,241	589.6	2,517	294.8	5,038	440.0	2,249	187.6	10,279	496.3	4,766	229.1
1998	5,290	590.5	2,480	285.3	5,002	432.7	2,252	187.4	10,292	492.9	4,732	225.9
1999	5,290	583.8	2,503	287.3	5,091	441.0	2,234	185.3	10,381	494.7	4,737	224.4
2000	5,328	582.6	2,433	278.4	5,009	431.2	2,307	188.6	10,337	489.3	4,740	223.3
2001	5,339	575.4	2,396	273.0	4,904	419.9	2,284	187.7	10,243	482.0	4,680	221.3

Number of new cases excludes in situ cases in all except urinary bladder.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 1.1**

### Overview

#### Incidence

- Each year 1993 through 2001, over 9,000 West Virginians were diagnosed with cancer (Table 1.1).
- For West Virginia males during 1997-2001, the most commonly diagnosed primary cancer was cancer of the prostate (average annual age-adjusted rate of 149.5 per 100,000 men). The second leading contributor to cancer incidence among men was cancer of the lung and bronchus (124.6 per 100,000 men). Cancer of the colon and rectum was the third leading primary cancer site (71.1 per 100,000 men) (Figure 1.3).
- For West Virginia women during 1997-2001, the most commonly diagnosed primary cancer was cancer of the breast (average annual age-adjusted rate of 119.2 per 100,000 women). As with men, cancer of the lung and bronchus was the second leading contributor to cancer incidence among women (68.9 per 100,000 women), and cancer of the colon and rectum was the third (52.8 per 100,000 women) (Figure 1.4).
- While some cancers occurred in childhood or early adulthood, the highest incidence occurred in individuals over the age of 45. The incidence of most types of cancer increased with increasing age.

#### Mortality

- Cancer is the second leading cause of death in West Virginia, second only to heart disease, and results in the greatest number of years of potential life lost.
- Among males in West Virginia during 1997-2001, the leading cause of cancer-related mortality was cancer of the lung and bronchus, causing well over three times more cancer deaths than any other site (average annual age-adjusted mortality rate of 103.5 per 100,000). Cancer of the prostate ranked a distant second in cancer-related mortality (29.1 per 100,000) and cancer of the colon and rectum third (26.9 per 100,000) (Figure 1.3).

- Similarly, among West Virginia women during 1997-2001, cancer of the lung was the leading cause of cancer-related mortality (average annual age-adjusted mortality rate of 52.8 per 100,000 women), almost twice that of any other site. The second leading cause for women was cancer of the breast (26.9 per 100,000 women). Cancer of the colon and rectum ranked third (19.9 per 100,000 women) (Figure 1.4).
- For all cancers, mortality was 12% higher in West Virginia men compared to U.S. men during 1996-2000. Among women, mortality from all cancers was 11% higher in West Virginia compared to the U.S. during 1996-2000 (Appendix B). Both of these differences were statistically significant ( $p \leq 0.0002$ ) (Appendix B).
- Excess deaths due to lung and bronchial cancer account for most of the discrepancy between West Virginia and U.S. all-site cancer mortality rates. The remaining elevation is attributable to higher-than-average mortality rates for cervical, colon and rectum, kidney, laryngeal, brain (in women), and urinary bladder cancers, as well as leukemias, multiple myeloma (in men), and melanomas (Appendix B).

## **Risk Factors**

- Tobacco use accounts for 87% of lung cancers (ACS, 2003a). Tobacco use is also associated with cancer of the larynx, oral cavity and pharynx, esophagus, bladder, kidney and renal pelvis, cervix, pancreas, and certain leukemias.
- Diets high in fat and low in fiber are associated with increased risk of cancer of the colon and rectum, uterus, prostate, and breast.
- Heavy alcohol use, especially when combined with use of tobacco products, is associated with increased risks of cancer of the oral cavity, throat, esophagus, and liver.
- Other risk factors include certain environmental or occupational exposures, as well as family and personal health histories.

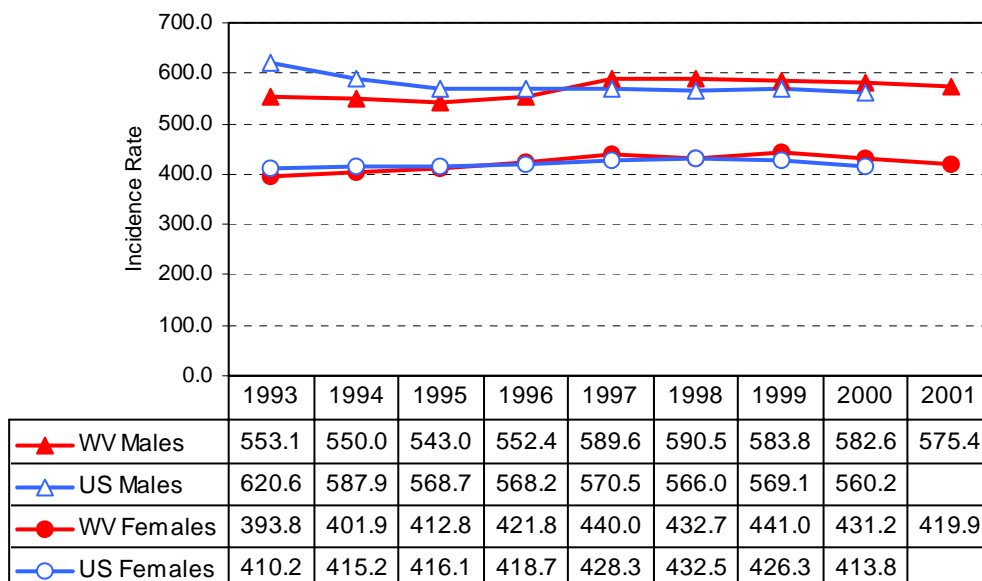
## **Prevention**

- Quitting smoking substantially decreases the risk of lung, laryngeal, esophageal, oral, pancreatic, bladder, and cervical cancers.
- Other lifestyle changes that are likely to significantly reduce cancer risk include:
  - a) eating five or more servings of vegetables and fruits each day;
  - b) choosing whole grains in preference to processed (refined) grains and sugar;
  - c) limiting consumption of red meats, especially high fat and processed meats;
  - d) choosing foods that help maintain a healthy weight;
  - e) adopting a physically active lifestyle; and
  - f) limiting intake of alcoholic beverages.
- Finally, regular physician visits are important to assure that appropriate cancer screenings (Pap smears, mammograms, etc.) are performed.

## All Cancer Sites Combined

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



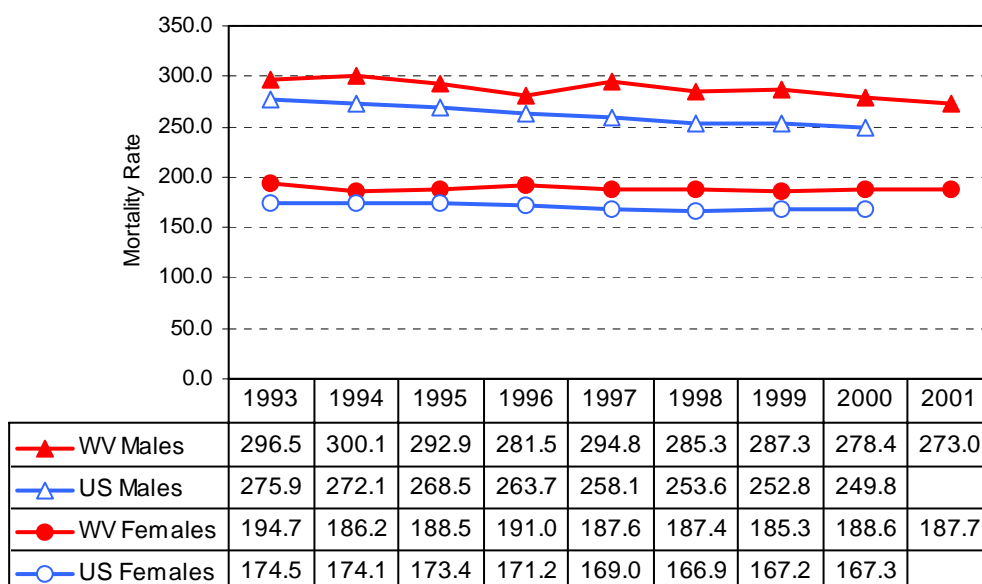
**Figure 1.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## All Cancer Sites Combined

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



**Figure 1.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Highest Cancer Incidence Rates\* for West Virginia by Gender and Age 1997 – 2001

Gender	Age in Years				
	Less than 15	15 to 24	25 to 44	45 to 64	65 and older
Male	Brain & ONS: 3.4 Leukemias: 3.4 Non-Hodgkin's Lymphoma: 1.2 Hodgkin's Disease: 0.8 Kidney & Renal Pelvis: 0.8	Hodgkin's Disease: 5.0 Testis: 5.0 Leukemias: 3.3 Brain & ONS: 2.5 Melanoma of the Skin: 2.3	Melanoma of the Skin: 11.8 Testis: 11.1 Lung & Bronchus: 11.0 Colorectal: 8.7 Non-Hodgkin's Lymphoma: 6.9	Prostate: 172.2 Lung & Bronchus: 165.4 Colorectal: 88.2 Urinary Bladder: 41.4 Oral Cavity & Pharynx: 34.1	Prostate: 878.1 Lung & Bronchus: 670.1 Colorectal: 375.5 Urinary Bladder: 233.9 Non-Hodgkin's Lymphoma: 96.7
Female	Leukemias: 4.0 Brain & ONS: 3.0 Non-Hodgkin's Lymphoma: 0.6	Thyroid: 5.2 Hodgkin's Disease: 4.4 Melanoma of the Skin: 3.4 Ovary: 1.9 Cervix Uteri: 1.8	Breast: 53.1 Cervix Uteri: 19.1 Thyroid: 14.4 Melanoma of the Skin: 14.3 Uterus: 9.4	Breast: 238.5 Lung & Bronchus: 104.8 Colorectal: 70.0 Uterus: 61.8 Ovary: 29.1	Breast: 404.1 Lung & Bronchus: 345.8 Colorectal: 282.7 Uterus: 90.8 Non-Hodgkin's Lymphoma: 74.7

\*Rates are five-year average annual age-specific incidence per 100,000 population. The five highest age-specific rates for 23 primary cancer sites are presented for each population subgroup; however, rates based on fewer than five cases are excluded.

**Table 1.2**

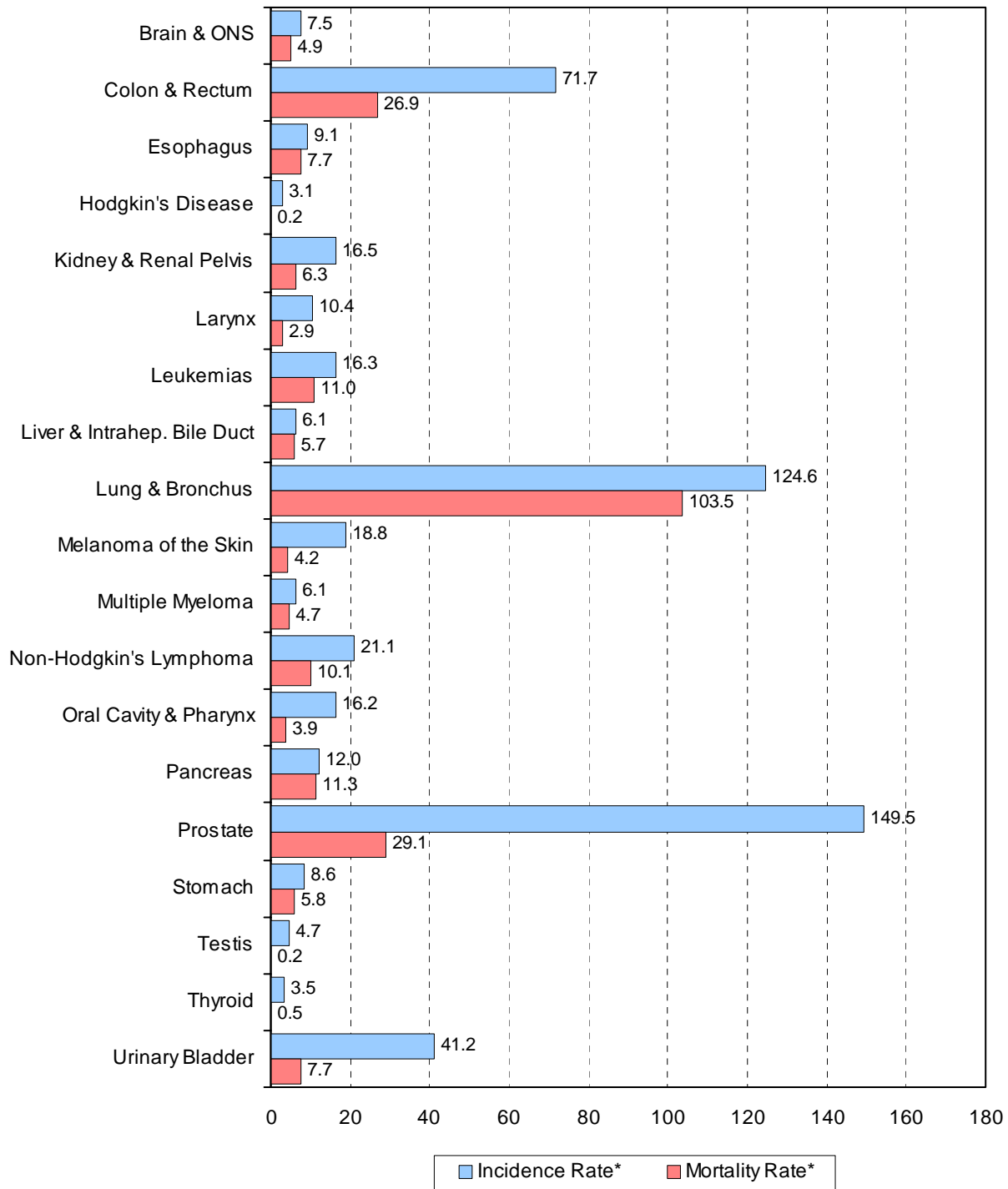
## Highest Cancer Mortality Rates\* for West Virginia by Gender and Age 1997 – 2001

Gender	Age in Years				
	Less than 15	15 to 24	25 to 44	45 to 64	65 and older
Male	Leukemias: 1.2 Brain & ONS: 0.7	Leukemias: 1.4 Brain & ONS: 0.8	Lung & Bronchus: 7.2 Colorectal: 3.1 Non-Hodgkin's Lymphoma: 2.4 Leukemias: 2.2 Melanoma of the Skin: 1.8	Lung & Bronchus: 117.9 Colorectal: 25.9 Pancreas: 14.1 Non-Hodgkin's Lymphoma: 11.3 Leukemias: 10.0	Lung & Bronchus: 583.1 Prostate: 186.6 Colorectal: 146.3 Pancreas: 58.2 Leukemias: 56.4
Female	Leukemias: 0.6	Leukemias: 1.3	Breast: 8.6 Lung & Bronchus: 5.2 Cervix Uteri: 3.6 Colorectal: 2.8 Brain & ONS: 1.9	Lung & Bronchus: 70.2 Breast: 44.8 Colorectal: 18.9 Ovary: 15.5 Pancreas: 9.0	Lung & Bronchus: 284.2 Colorectal: 120.3 Breast: 115.8 Ovary: 46.8 Non-Hodgkin's Lymphoma: 42.4 Pancreas: 42.4

\*Rates are five-year average annual age-specific mortality per 100,000 population. The five highest age-specific rates for 23 primary cancer sites are presented for each population subgroup; however, rates based on fewer than five deaths are excluded.

**Table 1.3**

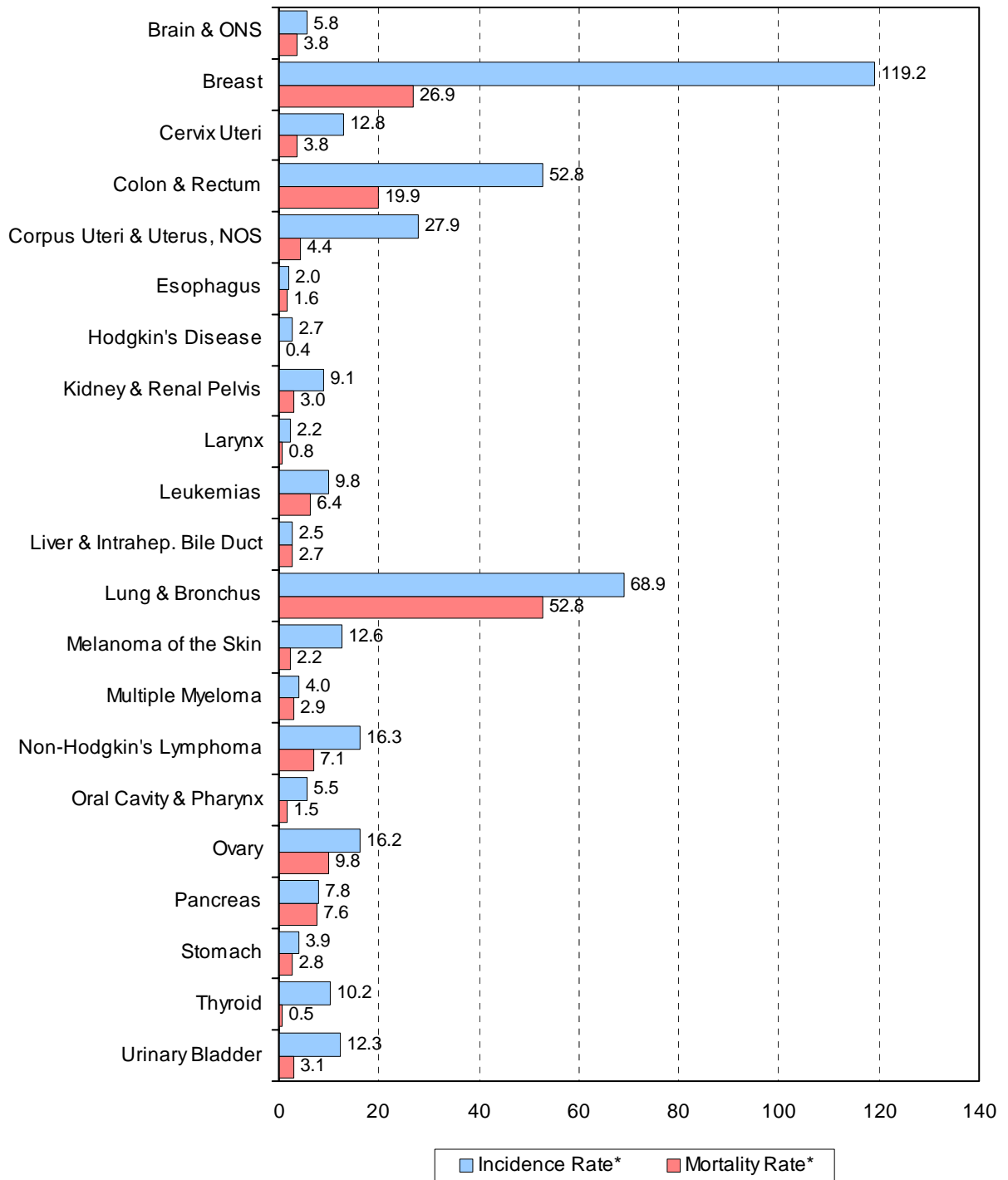
## Burden of Cancer Among West Virginia Males 1997 – 2001



\* Five-year average annual rate per 100,000 West Virginia males, age-adjusted to the 2000 U.S. population. Incidence rates exclude basal and squamous cell skin cancers and in situ carcinomas except bladder.

**Figure 1.3**

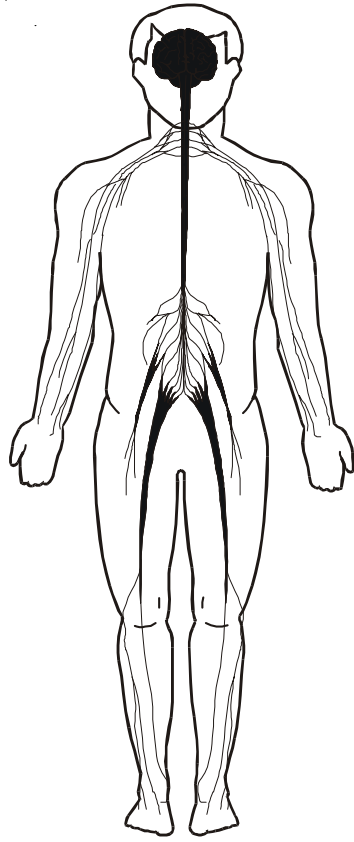
## Burden of Cancer Among West Virginia Females 1997 – 2001



\* Five-year average annual rate per 100,000 West Virginia females, age-adjusted to the 2000 U.S. population. Incidence rates exclude basal and squamous cell skin cancers and in situ carcinomas except bladder.

**Figure 1.4**





## Chapter 2

Cancer of the  
**Brain & Other Nervous System**





# Cancer of the Brain & Other Nervous System

## Incidence and Mortality by Sex and Year

West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	58	6.7	45	5.2	62	5.8	47	4.2	120	6.3	92	4.6
1994	82	9.3	62	7.2	60	5.5	47	4.1	142	7.2	109	5.5
1995	69	7.6	46	5.2	73	7.1	56	5.0	142	7.4	102	5.2
1996	62	6.9	52	5.7	71	6.5	57	5.1	133	6.7	109	5.5
1997	69	7.7	41	4.4	67	6.3	50	4.5	136	6.9	91	4.5
1998	62	7.0	40	4.7	59	5.5	48	4.2	121	6.2	88	4.4
1999	70	7.8	48	5.2	63	6.0	39	3.4	133	6.8	87	4.2
2000	67	7.2	38	4.2	60	5.6	40	3.5	127	6.4	78	3.8
2001	72	7.8	56	6.0	61	5.7	37	3.4	133	6.6	93	4.6

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 2.1**

### Overview

- Each year from 1993 through 2001, approximately 120-150 West Virginians were diagnosed with primary cancers of the brain and other nervous system (ONS). Eighty to 110 died each year from this disease (Table 2.1).
- Although brain and ONS cancers occurred at all ages and in both sexes, incidence generally increased with age (Figure 2.3) and was higher in males than in females (Figure 2.1).
- Because many other cancers are rare at young ages, cancer of the brain and ONS was the first and fourth largest contributor to cancer incidence among West Virginia males aged less than 15 years and 15-24 years, respectively, and the second largest contributor to cancer incidence among West Virginia females less than 15 years of age in 1997-2001 (Table 1.2).
- Although nearly two-thirds of the 1997-2001 cases were diagnosed with local disease (Figure 2.4), staging of brain cancers remains problematic and does not have the same prognostic significance as does staging for other sites.
- A recent National Cancer Institute study suggests that the reported rise in brain tumors among U.S. children over the past two decades is most likely due to better diagnosis and reporting rather than a true increase in cases (Rodrigues, 1998).

### Risk Factors

- Little is known about the etiology of most brain and other nervous system tumors.

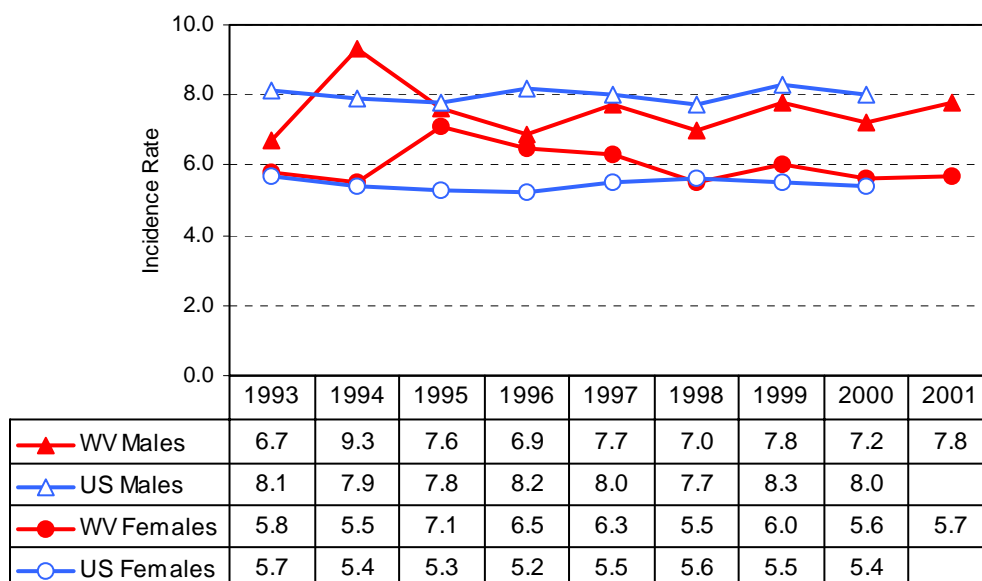
### Prevention

- No clearly effective methods of prevention or screening are currently available; however, many new technologies provide improved diagnostic and treatment options.

## Cancer of the Brain & Other Nervous System

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



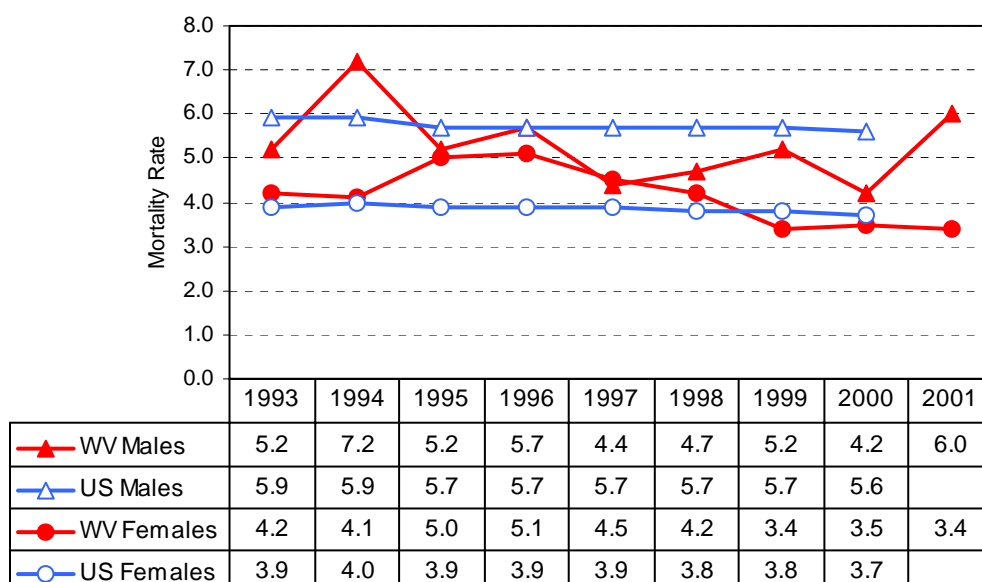
**Figure 2.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Brain & Other Nervous System

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

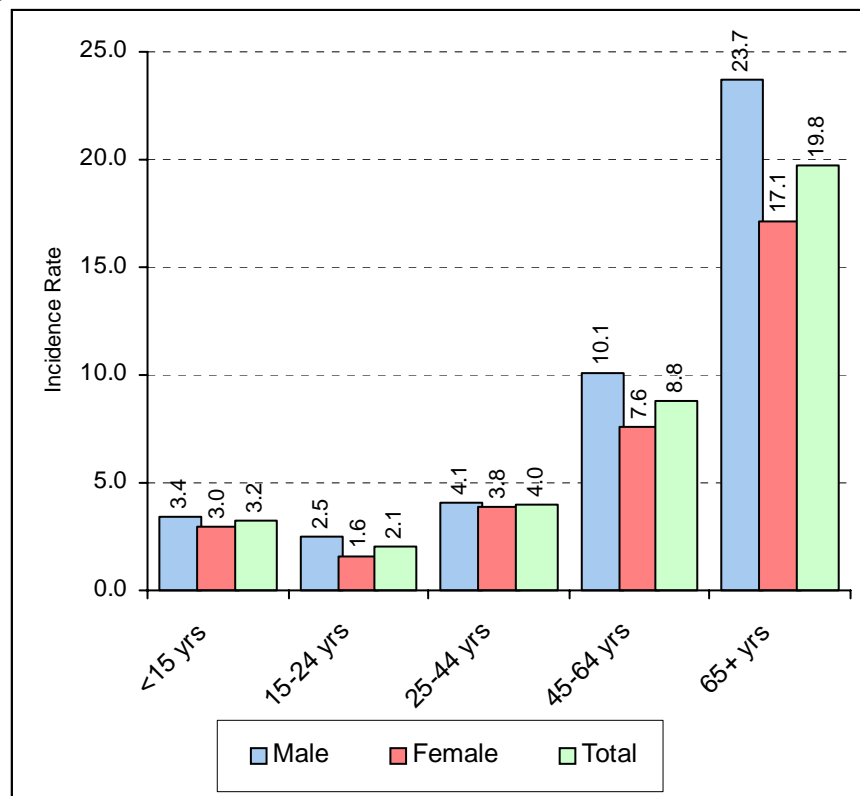


**Figure 2.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Brain & Other Nervous System

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 2.3**

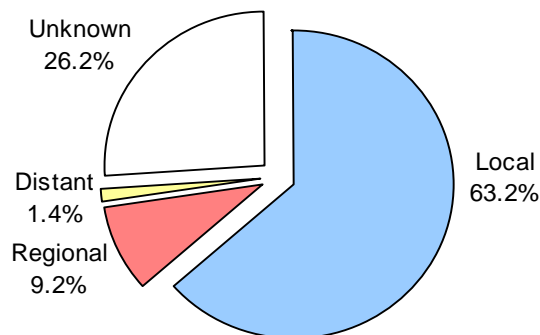
\*Five-year average annual rate per 100,000 West Virginia residents

Cancer of the Brain &  
Other Nervous System  
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
944	Glioblastoma	49.4
940	Astrocytoma	14.8
938	Glioma	7.1
945	Oligodendroglioma	6.9
942	Astrocytoma, Fibrillary or Pilocytic	6.3
800	Malignant Neoplasm	5.8
947	Medulloblastoma	3.5
939	Choroid Plexus Papilloma or Ependymoma	2.8
953	Meningioma	1.7

**Table 2.2**

Cancer of the Brain &  
Other Nervous System  
Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

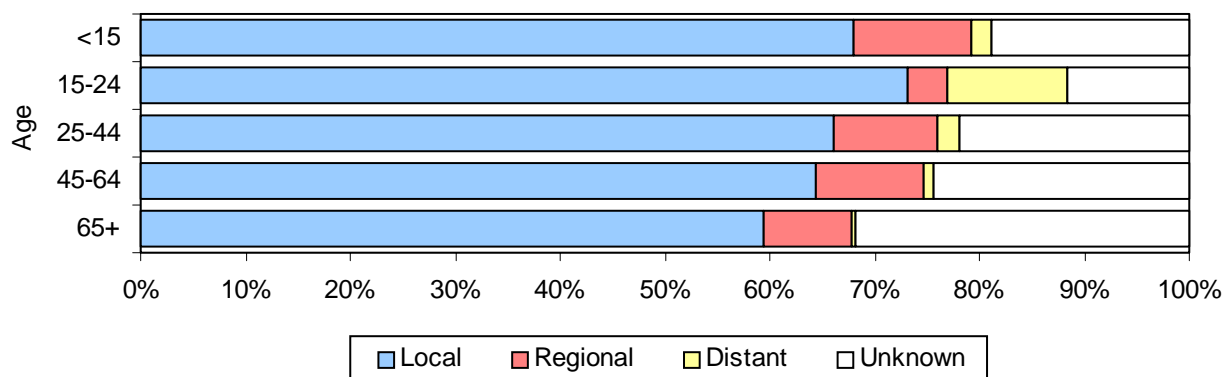


**Figure 2.4**

## Cancer of the Brain & Other Nervous System

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	N/A		36	67.9%	6	11.3%	~		~		53	100.0%
15-24	N/A		19	73.1%	~		~		~		26	100.0%
25-44	N/A		66	66.0%	~		~		22	22.0%	100	100.0%
45-64	N/A		127	64.5%	~		~		48	24.4%	197	100.0%
65+	N/A		163	59.5%	~		~		87	31.8%	274	100.0%
Total	N/A		411	63.2%	60	9.2%	9	1.4%	170	26.2%	650	100.0%

~ Suppressed due to small cell size

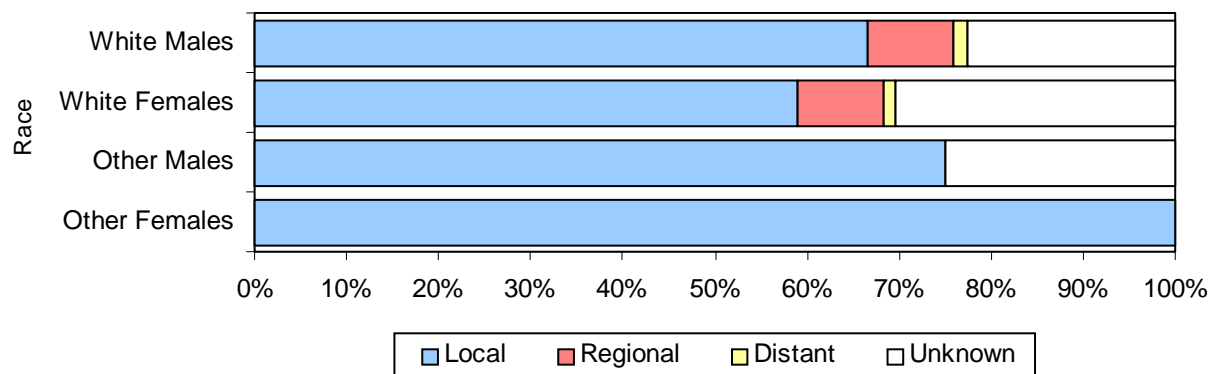
Total may not add to 100% due to rounding.

**Figure 2.5**

## Cancer of the Brain & Other Nervous System

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



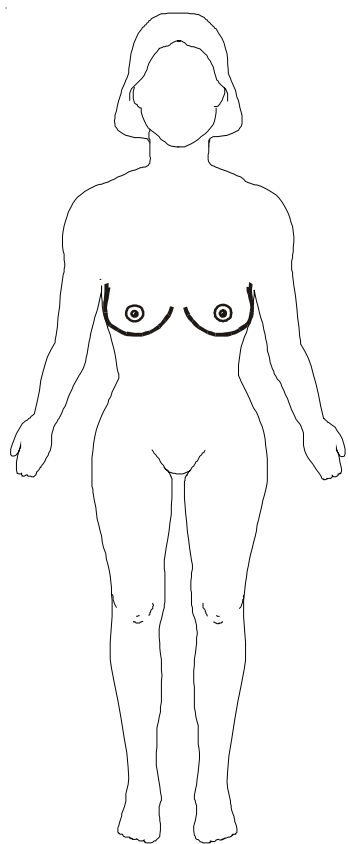
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	N/A		224	66.7%	31	9.2%	5	1.5%	76	22.6%	336	100.0%
White Females	N/A		181	59.0%	29	9.4%	4	1.3%	93	30.3%	307	100.0%
Other Males	N/A		~		0	0.0%	0	0.0%	~		~	100.0%
Other Females	N/A		~		0	0.0%	0	0.0%	~		~	100.0%
Total	N/A		411	63.2%	60	9.2%	9	1.4%	170	26.2%	650	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 2.6**





## **Chapter 3**

# **Cancer of the Female Breast**



## Cancer of the Female Breast

### Incidence and Mortality by Year

West Virginia Females 1993 – 2001

Year	Female			
	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	1,249	114.6	328	29.8
1994	1,220	110.7	326	28.8
1995	1,280	114.6	323	28.0
1996	1,319	119.4	327	28.7
1997	1,298	116.4	331	28.4
1998	1,380	122.6	346	29.6
1999	1,411	125.0	274	24.0
2000	1,322	117.2	317	27.0
2001	1,311	114.4	306	25.7

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia females and are age-adjusted to the 2000 U.S. standard population.

**Table 3.1**

### Overview

- Cancer of the breast was the most commonly diagnosed cancer among West Virginia women (almost twice as common during 1997-2001 as any other malignancy) (Figure 1.4). Each year from 1993 through 2001, approximately 1,300 West Virginia women were diagnosed with breast cancer (Table 3.1).
- The incidence of female breast cancer increased markedly with age. Compared to women aged 25-44, those 45-64 were over four times more likely to be diagnosed with breast cancer and those 65+ years of age over seven times more likely (Figure 3.3).
- Of the 1997-2001 West Virginia female breast cancer cases, two-thirds were diagnosed at an early stage (15% in situ and 53% local). Older women were diagnosed at an earlier stage of disease (68% of those aged 65+ and 68% of those aged 45-64) than were younger women (60% of those aged 25-44) (Figure 3.5).
- Twenty-seven percent (27%) of white women were diagnosed with regional or distant disease during 1997-2001, compared to 35% of non-white women (Figure 3.6).
- Approximately 320 West Virginia women died of breast cancer each year from 1993 through 2001 (Table 2.1). From 1997 to 2001, cancer of the breast was the leading cause of cancer-related deaths among West Virginia women aged 25 to 44 years. For West Virginia women aged 45 to 64 years, it was the second leading cause of cancer mortality (second only to lung cancer) (Table 1.3).
- State-specific age-adjusted data during 1996-2000 for female breast cancer ranked West Virginia 19th in breast cancer mortality (Appendix B).

## **Risk Factors**

- A personal history of breast cancer or certain family histories of breast cancer increase risk. A history of early menarche, late menopause, no pregnancies or a first pregnancy after the age of 30, consumption of two or more drinks of alcohol per day, and obesity are associated with increased risk. Use of tamoxifen by women at high risk of breast cancer appears to decrease their risk. This cancer is more common among those with higher education and socioeconomic status.
- Although a causal role for dietary factors has not been firmly established, international variability in breast cancer incidence rates suggests dietary factors may play a role in development of this disease. Other factors currently under study include pesticides and other chemical exposures, physical inactivity, alcohol intake, and weight gain.

## **Prevention**

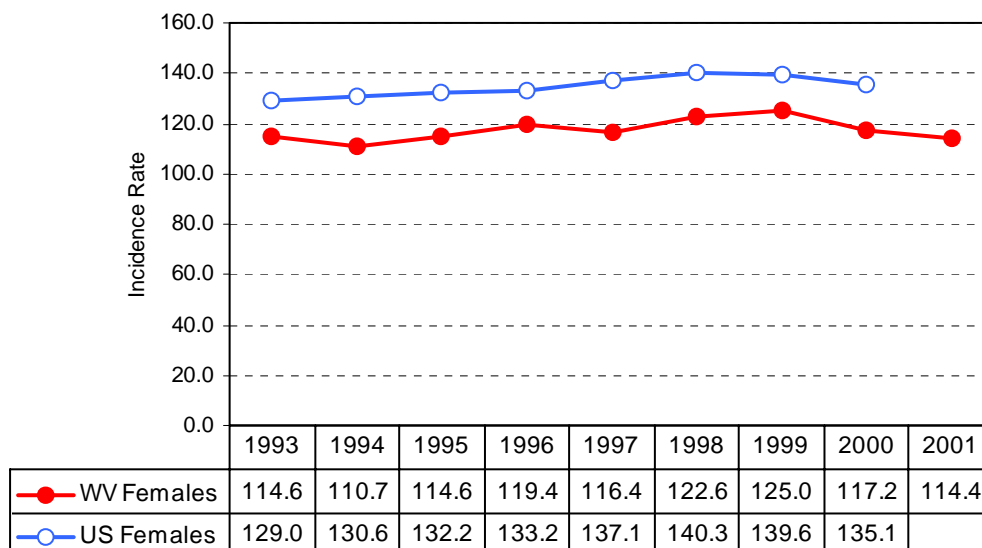
- Currently, the best method of reducing breast cancer mortality is through early detection of disease. While there is some debate about when screening should commence, the current American Cancer Society recommendation is to screen all women 40 years and older on an annual basis (ACS, 2003a).



## Cancer of the Female Breast

### Incidence Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000



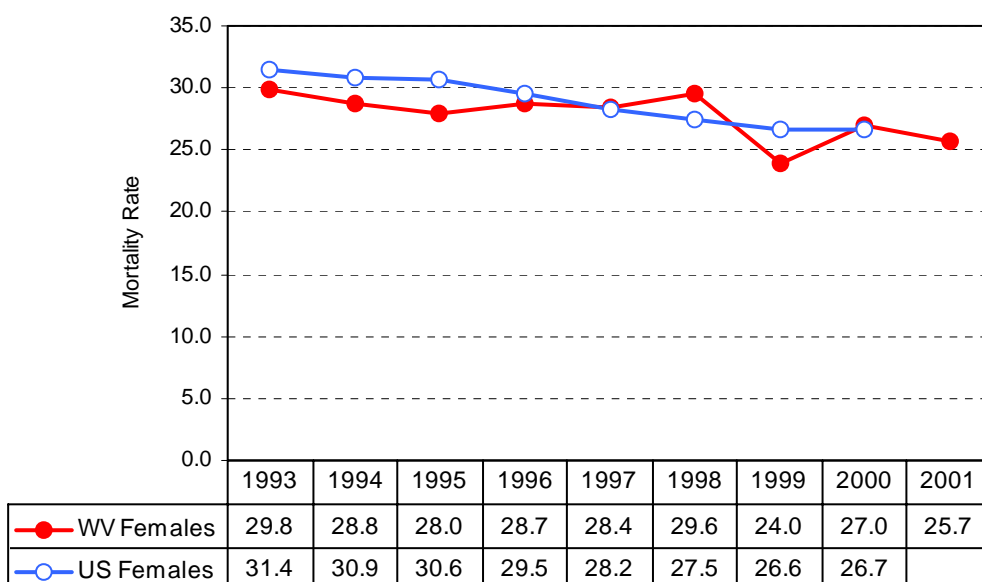
**Figure 3.1**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Female Breast

### Mortality Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000

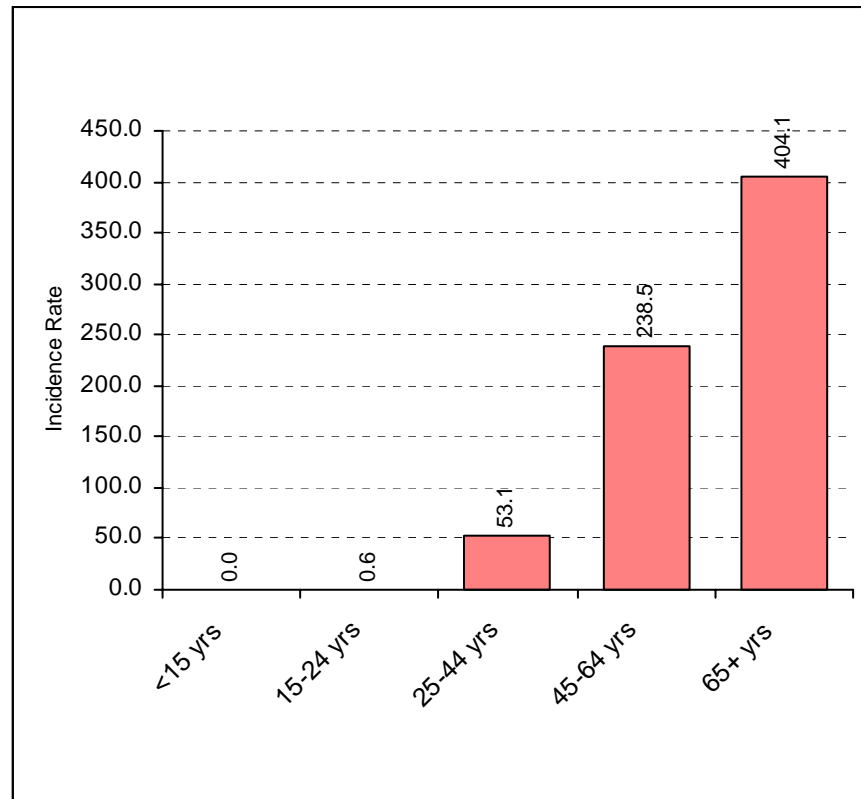


**Figure 3.2**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Female Breast

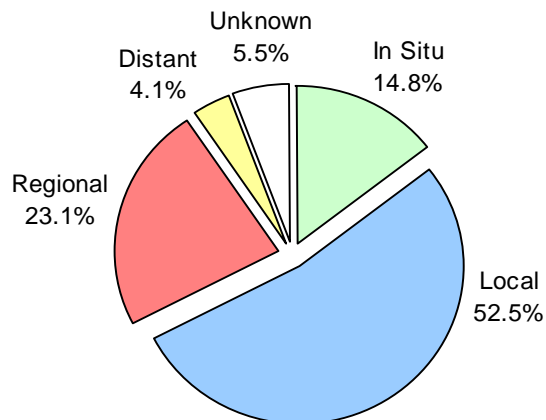
Incidence Rates\*, Age-Specific  
West Virginia Females 1997 – 2001



**Figure 3.3**

\*Five-year average annual rate per 100,000 West Virginia females

### Cancer of the Female Breast Stage of Disease at Diagnosis West Virginia Females 1997 – 2001



**Figure 3.4**

### Cancer of the Female Breast Most Frequent Histologies West Virginia Females 1997 – 2001

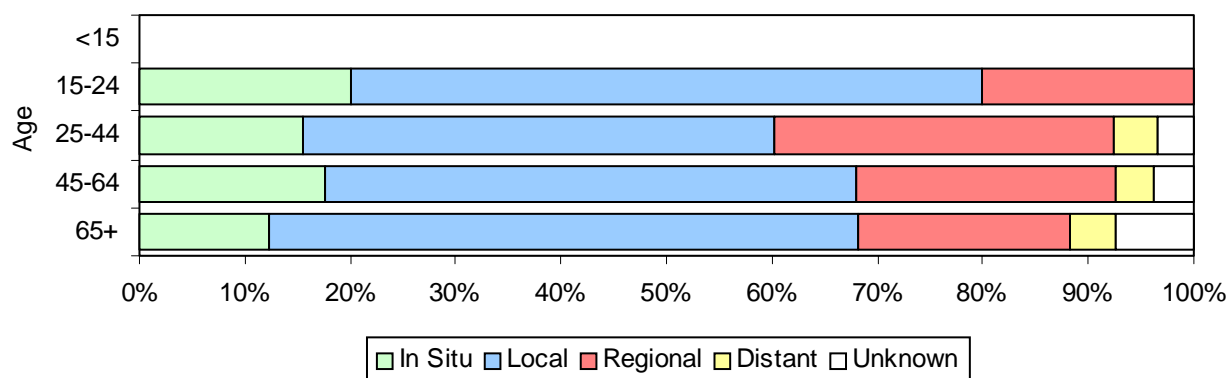
ICD-O Code	Histology	% of Invasive Cases
850	Duct Cell Carcinoma	69.1
852	Lobular Carcinoma	15.9
848	Mucinous Adenocarcinoma	3.0
801	Carcinoma	2.4
800	Malignant Neoplasm	1.8
851	Medullary Carcinoma	1.6
814	Adenocarcinoma	1.5
821	Tubular Adenocarcinoma	1.5

**Table 3.2**

## Cancer of the Female Breast

### Stage of Disease at Diagnosis by Age

West Virginia Females 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-24	~		~		~		0	0.0%	0	0.0%	5	100.0%
25-44	~		~		~		34	4.2%	27	3.4%	801	100.0%
45-64	580	17.6%	1,654	50.3%	809	24.6%	122	3.7%	123	3.7%	3,288	100.0%
65+	464	12.2%	2,129	56.1%	757	19.9%	166	4.4%	282	7.4%	3,798	100.0%
Total	1,169	14.8%	4,144	52.5%	1,825	23.1%	322	4.1%	432	5.5%	7,892	100.0%

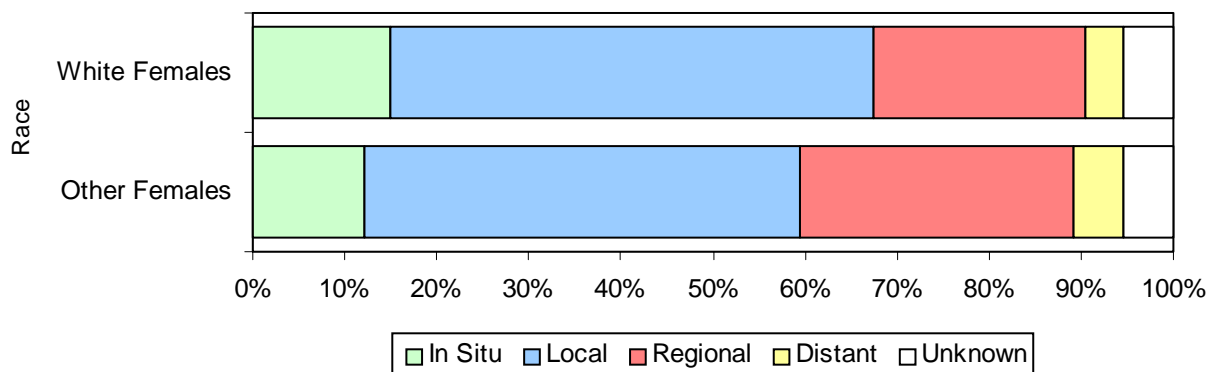
**Figure 3.5**

~ Suppressed due to small cell size  
Total may not add to 100% due to rounding.

## Cancer of the Female Breast

### Stage of Disease at Diagnosis by Race

West Virginia Females 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Females	1,140	14.9%	4,031	52.7%	1,754	22.9%	309	4.0%	419	5.5%	7,653	100.0%
Other Females	29	12.1%	113	47.3%	71	29.7%	13	5.4%	13	5.4%	239	100.0%
Total	1,169	14.8%	4,144	52.5%	1,825	23.1%	322	4.1%	432	5.5%	7,892	100.0%

**Figure 3.6**

Total may not add to 100% due to rounding.



## Taking a Closer Look

**Q**

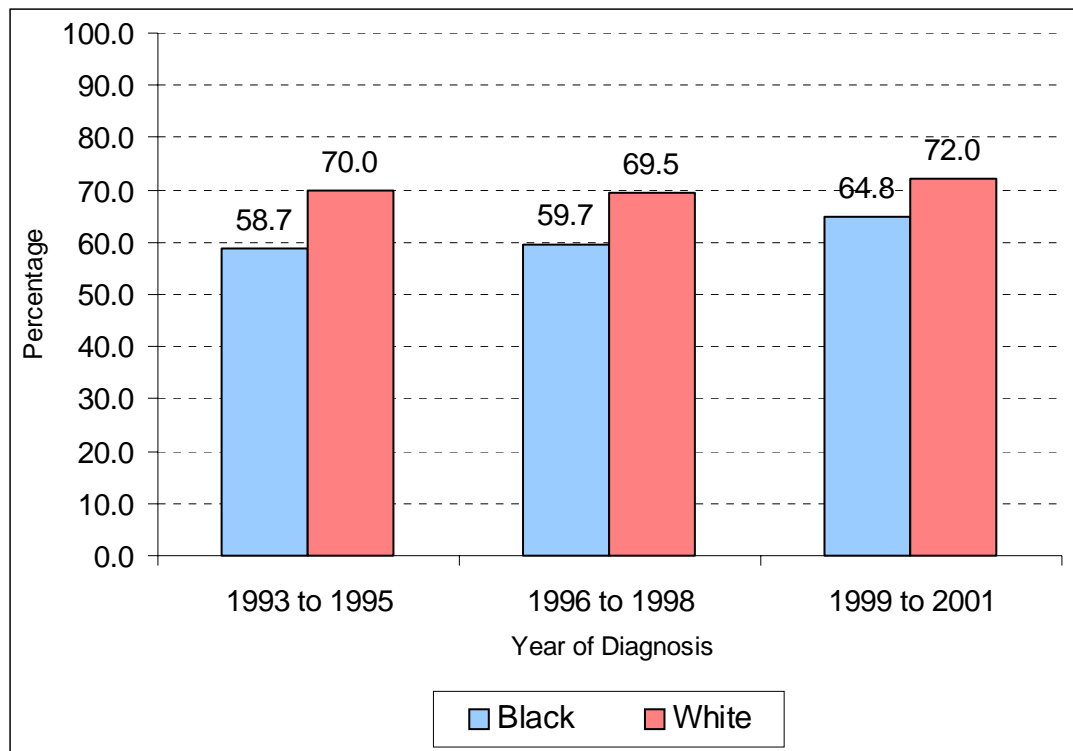
Has the relationship between **race** and **stage at diagnosis** changed over time in West Virginia?

**A**

Although race-based disparities in stage at diagnosis for female breast cancer still exist in West Virginia, they have lessened over time.

## Cancer of the Female Breast

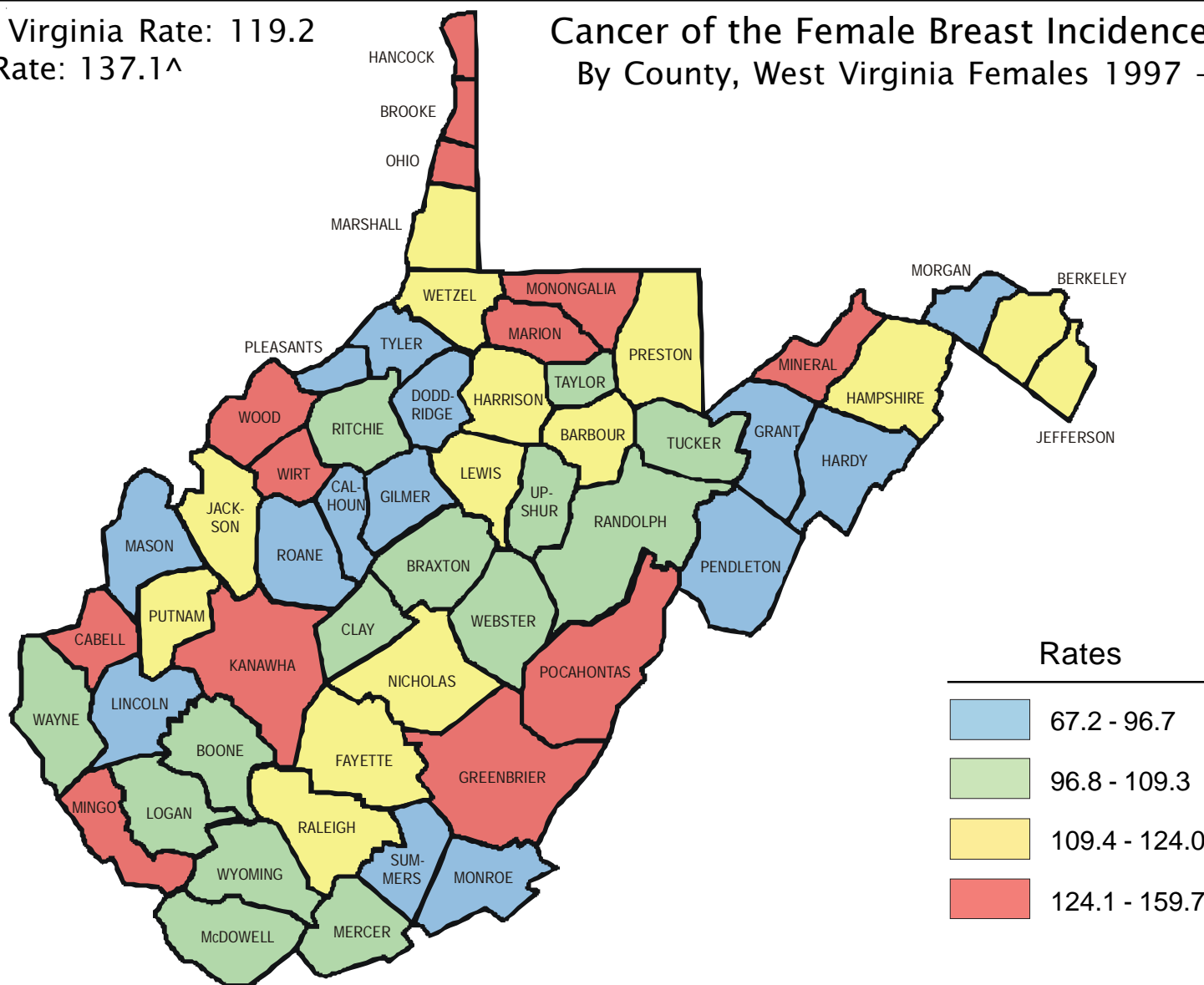
Average Percentage of Female Breast Cancers Diagnosed at In Situ or Local Stage, West Virginia Females, 1993 – 2001



**Figure 3.7**

West Virginia Rate: 119.2  
U.S. Rate: 137.1<sup>^</sup>

## Cancer of the Female Breast Incidence Rates\* By County, West Virginia Females 1997 – 2001



\* Five-year average annual rate per 100,000 West Virginia females, age-adjusted to the 2000 U.S. standard population.

<sup>^</sup> U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

Refer to Table 3.3 for individual county rates and measures of statistical significance.

**Figure 3.8**

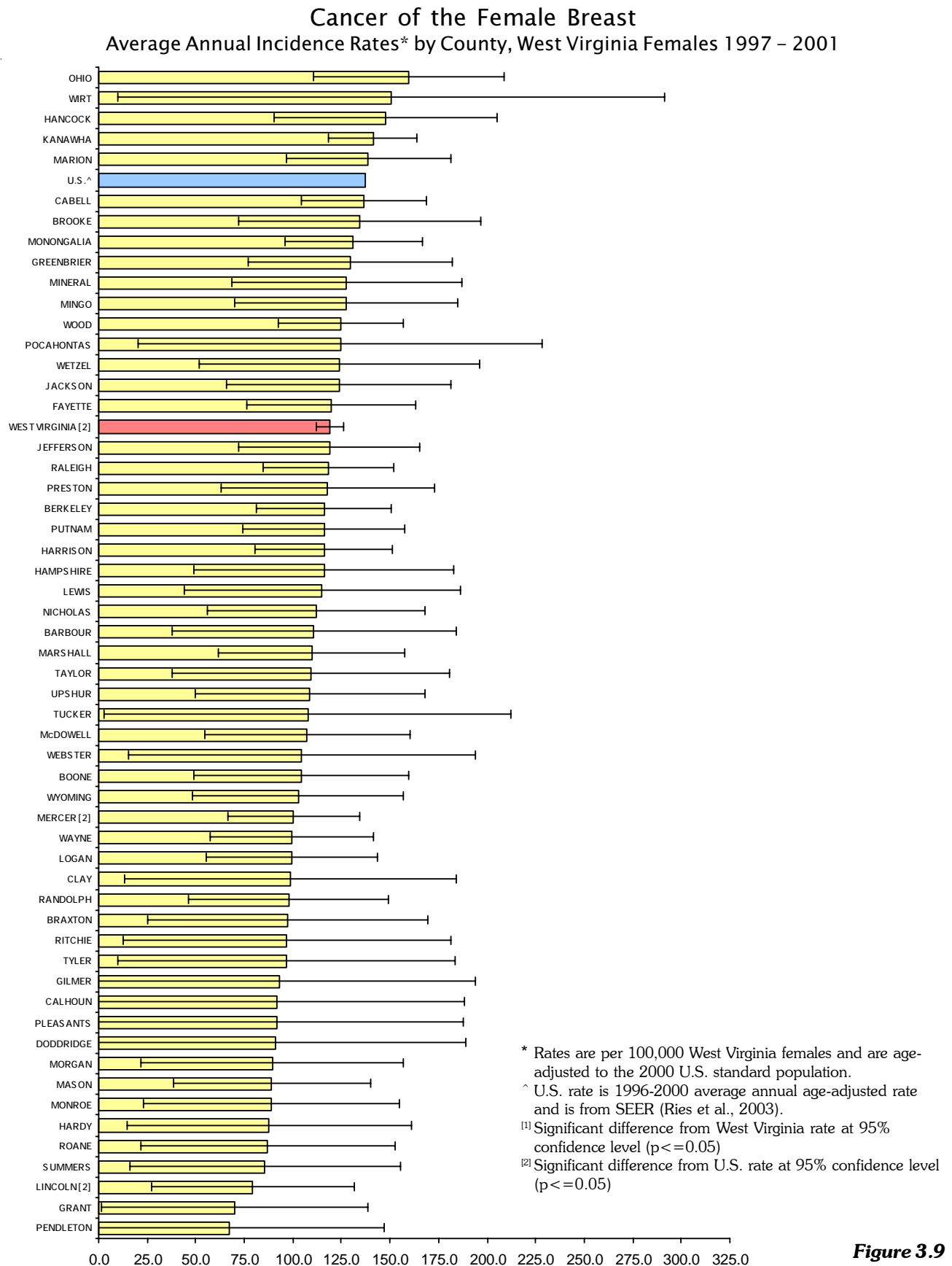


Figure 3.9

## Cancer of the Female Breast

### Average Annual Incidence Rates\* by County, West Virginia Females 1997 – 2001

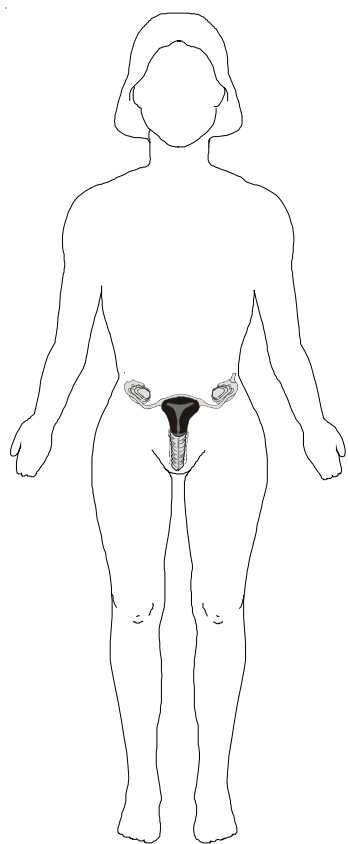
COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>		COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>	
			WV	U.S.				WV	U.S.
BARBOUR	51	110.8	No	No	MINGO	102	127.6	No	No
BERKELEY	219	116.1	No	No	MONONGALIA	249	131.3	No	No
BOONE	80	104.7	No	No	MONROE	42	88.9	No	No
BRAXTON	43	97.6	No	No	MORGAN	43	89.4	No	No
BROOKE	120	134.5	No	No	NICHOLAS	93	111.8	No	No
CABELL	409	136.7	No	No	OHIO	266	159.7	No	No
CALHOUN	23	92.1	No	No	PENDLETON	18	67.2	No	No
CLAY	28	98.8	No	No	PLEASANTS	22	91.7	No	No
DODDRIDGE	19	91.4	No	No	POCAHONTAS	37	124.5	No	No
FAYETTE	185	119.6	No	No	PRESTON	104	118.0	No	No
GILMER	20	93.5	No	No	PUTNAM	161	116.0	No	No
GRANT	25	69.9	No	No	RALEIGH	299	118.5	No	No
GREENBRIER	151	129.8	No	No	RANDOLPH	86	97.9	No	No
HAMPSHIRE	68	116.0	No	No	RITCHIE	32	96.9	No	No
HANCOCK	172	147.8	No	No	ROANE	42	87.0	No	No
HARDY	33	87.8	No	No	SUMMERS	44	85.7	No	No
HARRISON	261	116.0	No	No	TAYLOR	55	109.3	No	No
JACKSON	107	123.7	No	No	TUCKER	29	107.6	No	No
JEFFERSON	129	118.9	No	No	TYLER	29	96.7	No	No
KANAWHA	938	141.2	No	No	UPSHUR	73	108.9	No	No
LEWIS	64	115.1	No	No	WAYNE	128	99.5	No	No
LINCOLN	49	79.2	No	YES	WEBSTER	32	104.7	No	No
LOGAN	117	99.5	No	No	WETZEL	70	124.0	No	No
MARION	275	139.0	No	No	WIRT	24	150.6	No	No
MARSHALL	132	109.7	No	No	WOOD	350	124.6	No	No
MASON	71	89.1	No	No	WYOMING	79	102.7	No	No
MCDOWELL	97	107.4	No	No					
MERCER	218	100.4	No	YES	WEST VIRGINIA	6,722	119.2		YES
MINERAL	109	127.8	No	No	U.S.^		137.1		

\* Rates are per 100,000 West Virginia females and are age-adjusted to the 2000 U.S. standard population.

^ U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

+ Difference between county rate and West Virginia rate, and county rate and U.S. rate, is tested for statistical significance at the 95% confidence level ( $p \leq 0.05$ ).

**Table 3.3**



## Chapter 4

# Cancer of the Cervix Uteri





## Cancer of the Cervix Uteri

### Incidence and Mortality by Year

#### West Virginia Females 1993 – 2001

Year	Female			
	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	142	14.1	49	4.6
1994	142	14.6	41	3.8
1995	155	15.6	52	5.2
1996	125	12.6	49	4.5
1997	143	14.8	40	3.8
1998	119	11.7	46	4.4
1999	138	13.8	40	3.6
2000	112	11.1	38	3.5
2001	126	12.2	40	3.9

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia females and are age-adjusted to the 2000 U.S. standard population.

**Table 4.1**

### Overview

- During 1997-2001, invasive cancer of the cervix was the seventh leading cause of cancer incidence among West Virginia women (Figure 1.4). For women aged 25-44 years, it was the second most commonly diagnosed cancer (Table 1.2).
- For women older than age 24, there was little variation in incidence of cervical cancer with age (Figure 4.3).
- Invasive cervical cancer is defined as local, regional, or distant disease (excludes in situ cases). During 1997-2001, 37% of West Virginia cases were diagnosed with regional or distant spread. Stage at diagnosis was unknown for 10% of cases (Figure 4.4).
- Each year from 1993 through 2001, approximately 45 West Virginia women died of cancer of the cervix (Table 4.1). During 1997-2001, invasive cervical cancer was the third leading cause of cancer-related mortality among West Virginia women aged 25-44 years (Table 1.3).
- During 1996-2000, the average annual age-adjusted mortality rate for cervical cancer in West Virginia was statistically significantly higher than the U.S. average annual rate (Appendix B).

### Risk Factors

- Infection with certain types of human papillomavirus (HPV), a sexually transmitted disease, is associated with development of cancer of the cervix.
- Early age at first intercourse, multiple sexual partners, and cigarette smoking are all associated with an increased risk for cervical cancer.

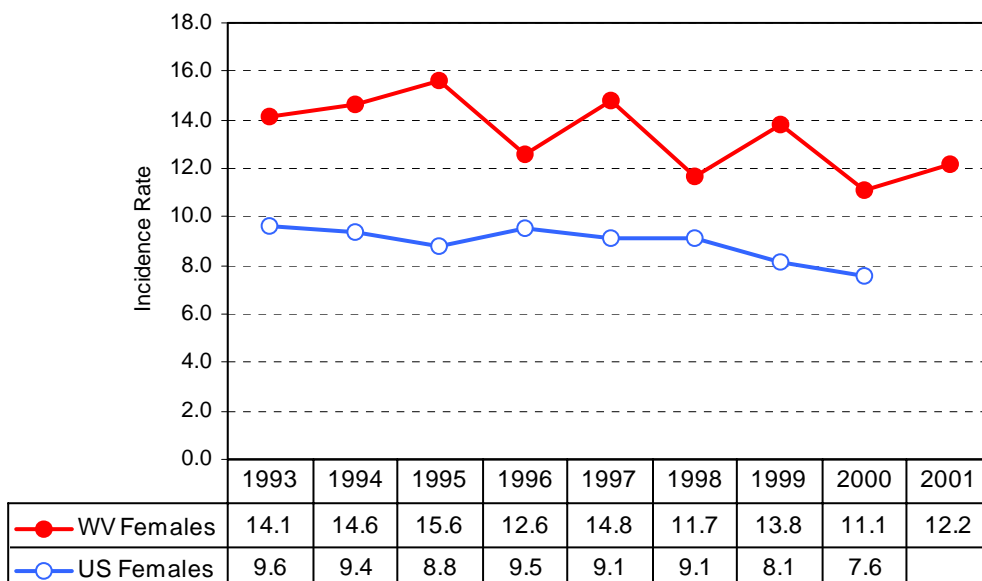
## **Prevention**

- Early detection through regular and widespread use of Pap smears, followed by proper treatment, lowers mortality from cervical cancer.
- All women who are sexually active or who have reached the age of 18 should have an annual Pap smear and pelvic exam. If three or more annual smears have been normal, further screening may be done at one- to three-year intervals at the discretion of the health care provider based on patient risk factors.

## Cancer of the Cervix Uteri

### Incidence Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000



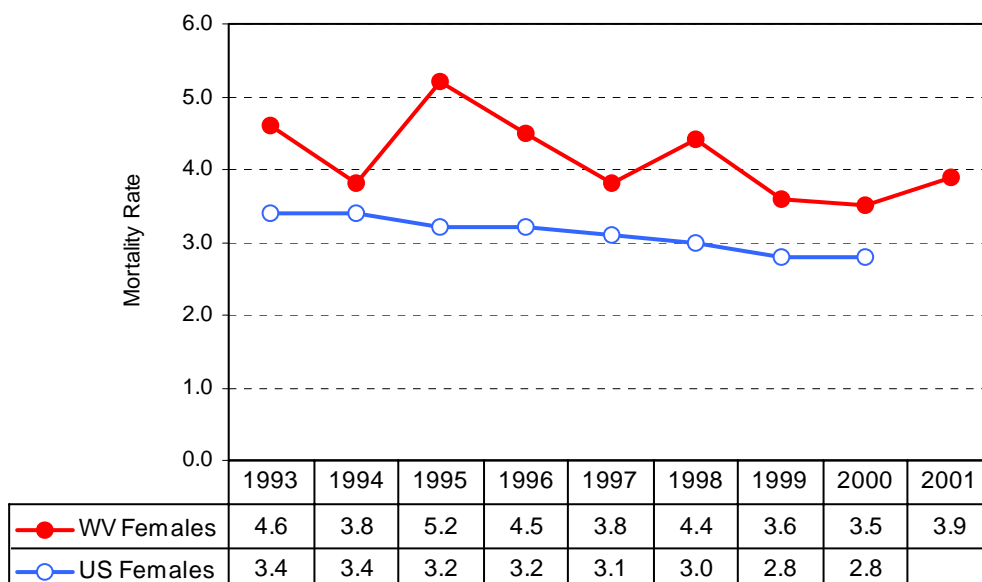
**Figure 4.1**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Cervix Uteri

### Mortality Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000

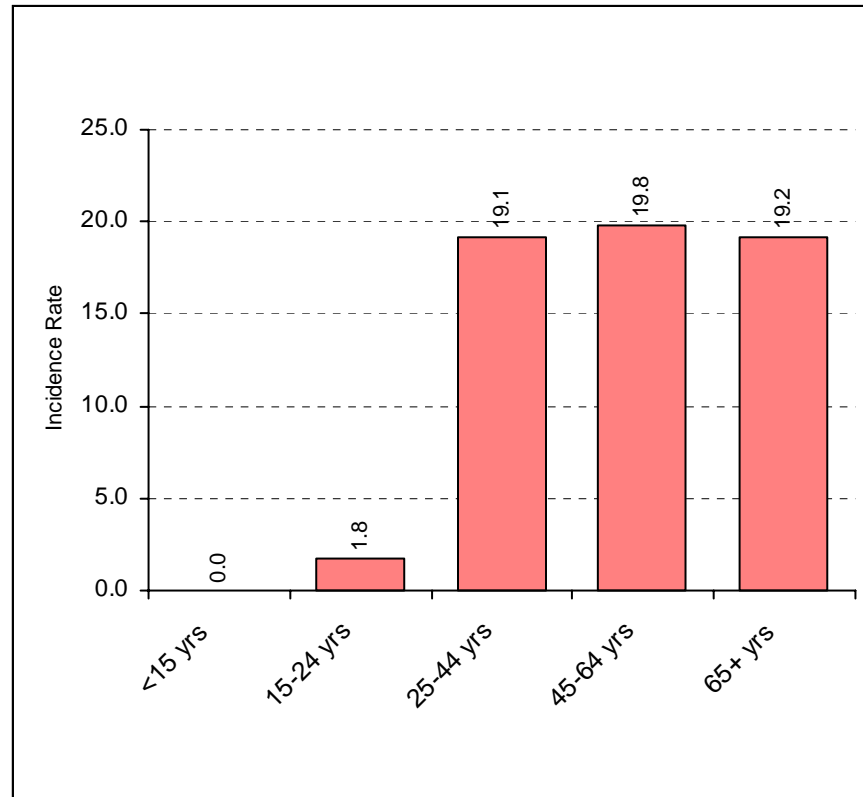


**Figure 4.2**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Cervix Uteri

Incidence Rates\*, Age-Specific  
West Virginia Females 1997 – 2001

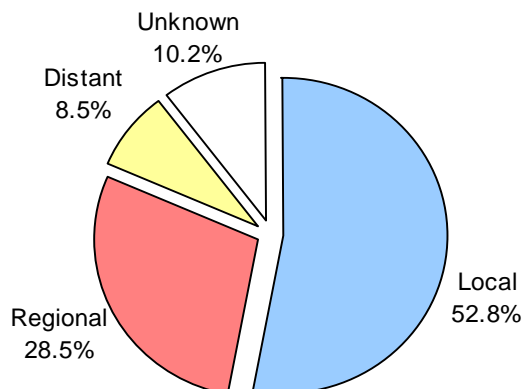


**Figure 4.3**

\*Five-year average annual rate per 100,000 West Virginia females

## Cancer of the Cervix Uteri

Stage of Disease at Diagnosis  
West Virginia Females 1997 – 2001



**Figure 4.4**

## Cancer of the Cervix Uteri

Most Frequent Histologies  
West Virginia Females 1997 – 2001

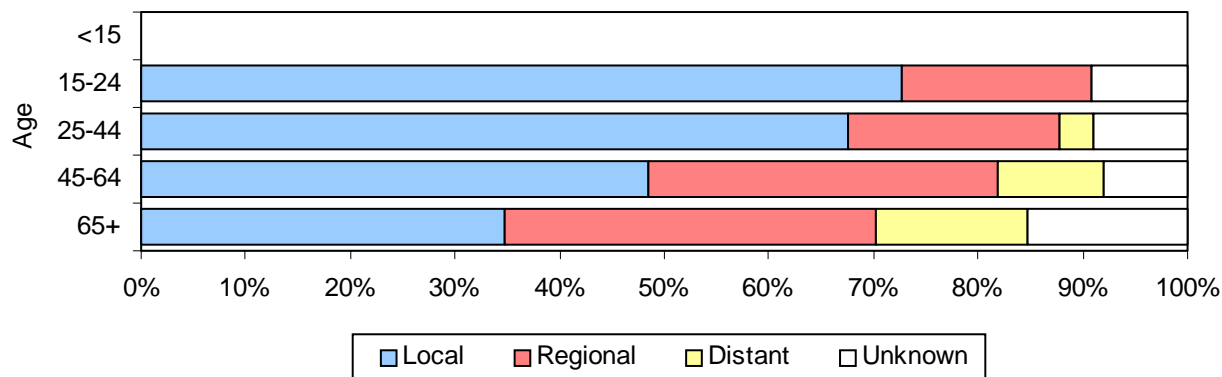
ICD-O Code	Histology	% of Invasive Cases
807	Squamous Cell Carcinoma	72.1
814	Adenocarcinoma	12.4
801	Carcinoma	6.0
856	Adenosquamous Carcinoma	3.0
800	Malignant Neoplasm	1.1
826	Adenocarcinoma (Papillary or in Villous Adenoma)	1.1
838	Endometrioid Carcinoma	1.1

**Table 4.2**

## Cancer of the Cervix Uteri

### Stage of Disease at Diagnosis by Age

West Virginia Females 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	N/A		0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-24	N/A		8	72.7%	~		0	0.0%	~		11	100.0%
25-44	N/A		165	67.6%	~		8	3.3%	~		244	100.0%
45-64	N/A		109	48.4%	75	33.3%	23	10.2%	18	8.0%	225	100.0%
65+	N/A		55	34.8%	56	35.4%	23	14.6%	24	15.2%	158	100.0%
Total	N/A		337	52.8%	182	28.5%	54	8.5%	65	10.2%	638	100.0%

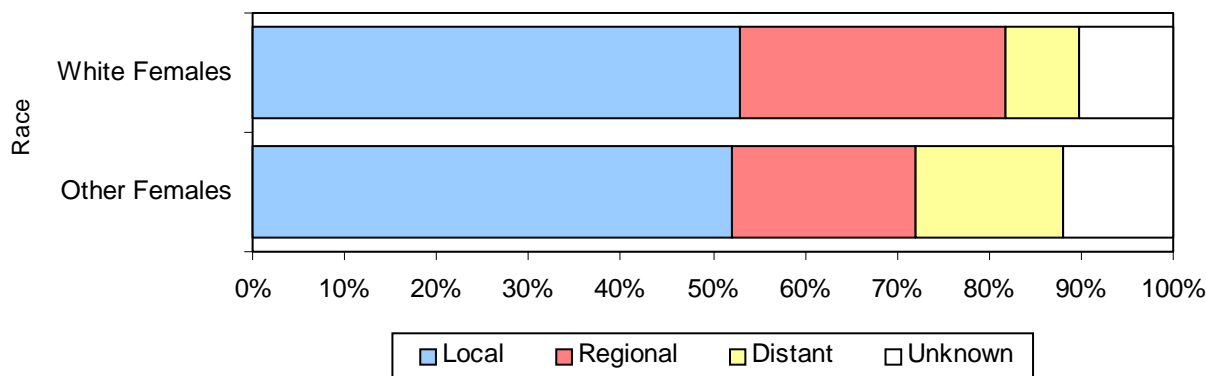
**Figure 4.5**

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Total may not add to 100% due to rounding.

## Cancer of the Cervix Uteri

### Stage of Disease at Diagnosis by Race

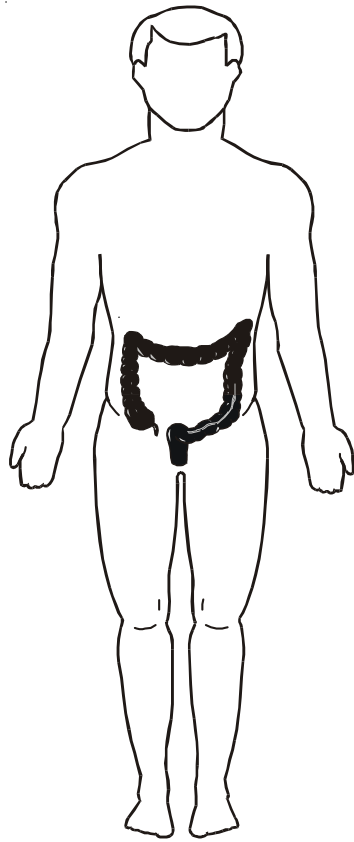
West Virginia Females 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Females	N/A		324	52.9%	177	28.9%	~		~		613	100.0%
Other Females	N/A		13	52.0%	5	20.0%	~		~		25	100.0%
Total	N/A		337	52.8%	182	28.5%	54	8.5%	65	10.2%	638	100.0%

**Figure 4.6**

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Total may not add to 100% due to rounding.



## **Chapter 5**

# **Cancer of the Colon & Rectum**



## Cancer of the Colon & Rectum

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	551	65.9	236	29.4	603	50.6	263	21.8	1,154	56.4	499	25.0
1994	550	63.9	242	29.6	604	50.1	249	20.3	1,154	55.8	491	24.1
1995	551	63.6	220	25.5	600	49.9	256	20.9	1,151	55.5	476	23.0
1996	561	65.2	250	29.5	616	51.0	261	21.2	1,177	56.6	511	24.7
1997	618	70.9	221	26.4	689	56.4	283	22.7	1,307	62.5	504	24.3
1998	655	74.4	223	25.7	604	49.0	239	19.5	1,259	59.6	462	22.2
1999	643	73.1	246	29.4	647	52.9	240	19.3	1,290	60.8	486	23.1
2000	651	72.1	211	24.7	643	52.3	243	19.3	1,294	60.6	454	21.4
2001	626	67.9	248	28.9	654	53.0	240	18.9	1,280	59.6	488	23.1

Number of new cases excludes in situ cases.

**Table 5.1**

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

### Overview

- During 1997-2001, cancer of the colon and rectum was the third most common primary cancer diagnosed in both West Virginia men and women (Figures 1.3 and 1.4).
- Incidence increased markedly with age. Colorectal cancer was over four times more common among those aged 65+ years compared to individuals aged 45-64 (Figure 5.3).
- Among colorectal cancer cases during 1997-2001, 40% were diagnosed at an in situ or local stage where five-year survival rates are excellent. Thirty-seven percent (37%) were found at a regional stage and 15% at a distant stage. Stage was not reported in 9% of cases (Figure 5.4).
- Cancer of the colon and rectum was the third leading cause of cancer-related mortality among both men and women in West Virginia during 1997-2001 (Figures 1.3 and 1.4). It accounted for about 10% of all cancer-related deaths.

### Risk Factors

- A personal or family history of colorectal cancer, certain types of polyps, or inflammatory bowel disease is associated with increased risk.
- A diet high in fat and/or low in fiber, as well as physical inactivity, may be associated with increased risk of this malignancy.
- Recent studies suggest that estrogen replacement therapy and non-steroidal anti-inflammatory drugs such as aspirin may reduce risk.

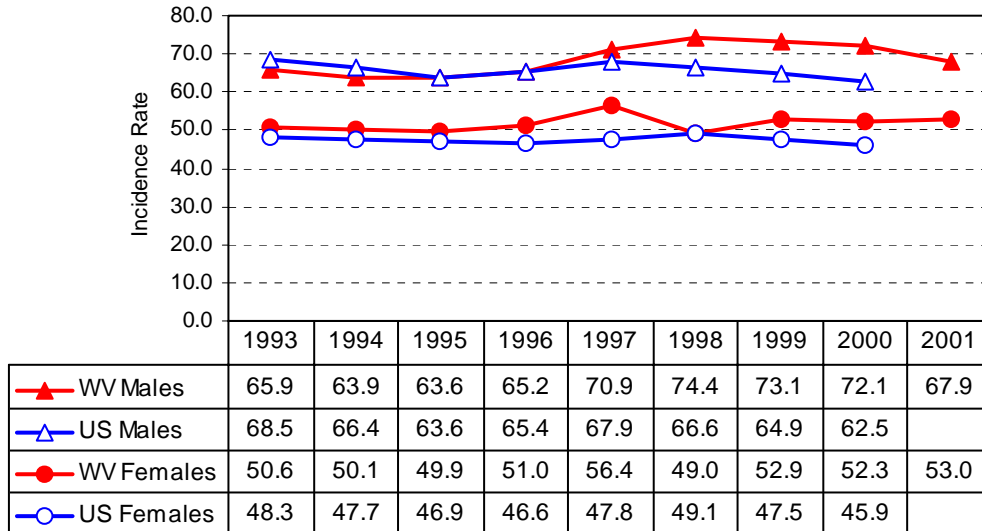
### Prevention

- Beginning at age 50, the American Cancer Society recommends an annual fecal occult blood test plus either flexible sigmoidoscopy or other studies on a periodic basis. Although screening for colon cancer is clearly beneficial, studies are still in progress to identify the most practical and effective approach to prevention of this disease.

## Cancer of the Colon & Rectum

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



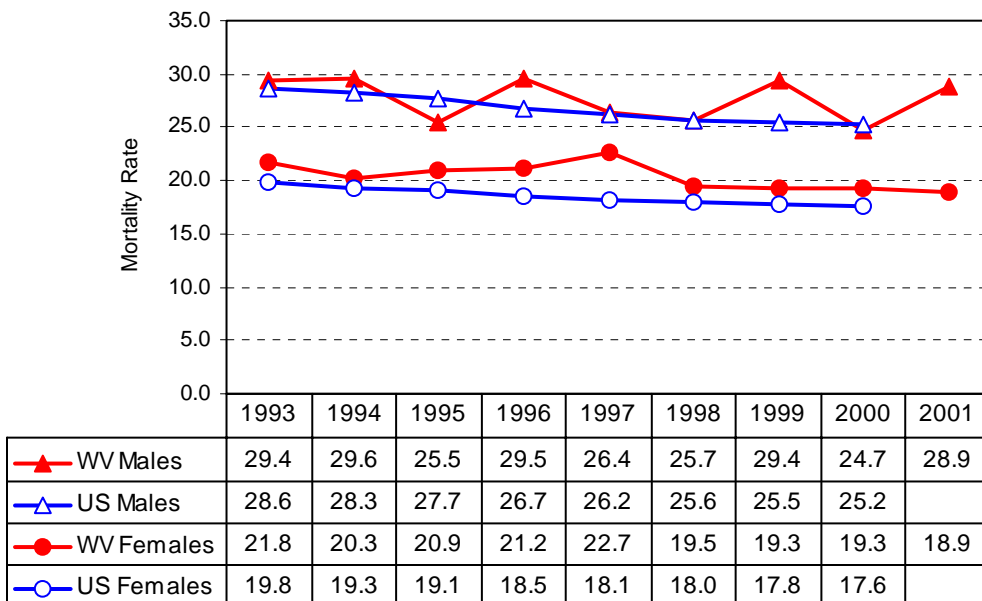
**Figure 5.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Colon & Rectum

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents, 1993 – 2000



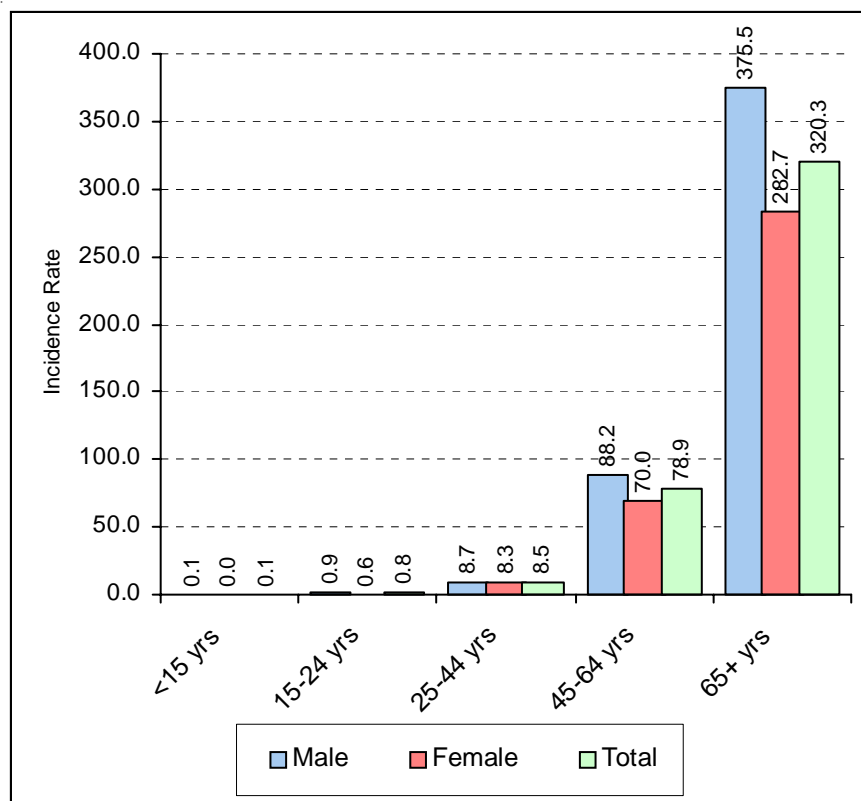
**Figure 5.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).



## Cancer of the Colon & Rectum

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 5.3**

\*Five-year average annual rate per 100,000 West Virginia residents

## Cancer of the Colon & Rectum

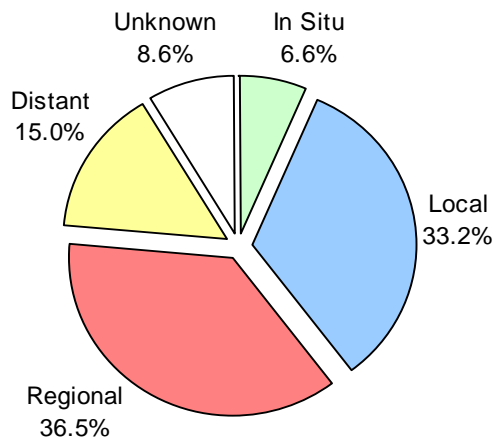
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
814	Adenocarcinoma	71.6
848	Mucinous Adenocarcinoma	11.1
826	Adenocarcinoma (Papillary or in Villous Adenoma)	7.2
821	Tubular Adenocarcinoma	2.8
801	Carcinoma	2.2
800	Malignant Neoplasm	2.0
824	Carcinoid Tumor	1.3

**Table 5.2**

## Cancer of the Colon & Rectum

Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

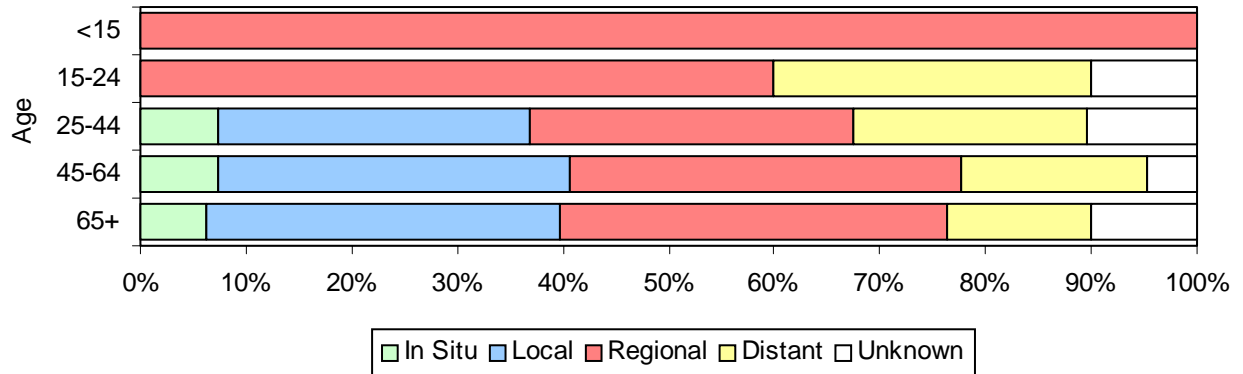


**Figure 5.4**

## Cancer of the Colon & Rectum

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	~		0	0.0%	0	0.0%	~	100.0%
15-24	0	0.0%	0	0.0%	~		~		~		~	100.0%
25-44	17	7.4%	68	29.4%	71	30.7%	~		~		231	100.0%
45-64	139	7.3%	634	33.3%	706	37.1%	335	17.6%	89	4.7%	1,903	100.0%
65+	299	6.3%	1,586	33.5%	1,732	36.5%	645	13.6%	479	10.1%	4,741	100.0%
Total	455	6.6%	2,288	33.2%	2,516	36.5%	1,034	15.0%	593	8.6%	6,886	100.0%

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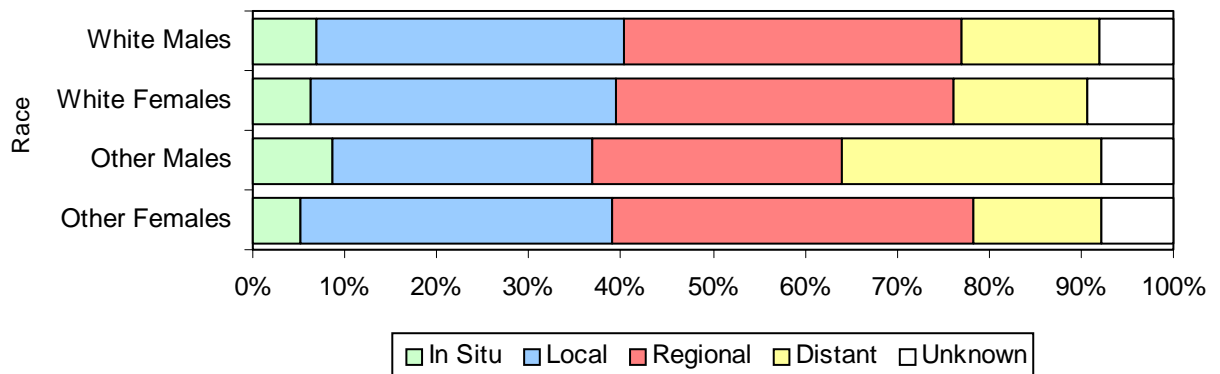
Total may not add to 100% due to rounding.

**Figure 5.5**

## Cancer of the Colon & Rectum

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	230	6.9%	1,115	33.5%	1,218	36.6%	503	15.1%	264	7.9%	3,330	100.0%
White Females	210	6.3%	1,105	33.1%	1,225	36.7%	486	14.6%	312	9.3%	3,338	100.0%
Other Males	9	8.7%	29	28.2%	28	27.2%	29	28.2%	8	7.8%	103	100.0%
Other Females	6	5.2%	39	33.9%	45	39.1%	16	13.9%	9	7.8%	115	100.0%
Total	455	6.6%	2,288	33.2%	2,516	36.5%	1,034	15.0%	593	8.6%	6,886	100.0%

Total may not add to 100% due to rounding.

**Figure 5.6**



## Taking a Closer Look

**Q** Has the relationship between **race** and **stage at diagnosis** changed over time in West Virginia?

**A** Although race-based disparities in stage at diagnosis for colorectal cancer still exist in West Virginia, they have decreased over time.

### Cancer of the Colon & Rectum

Average Percentage of Colorectal Cancers Diagnosed at In Situ or Local Stage, West Virginia Residents, 1993 – 2001

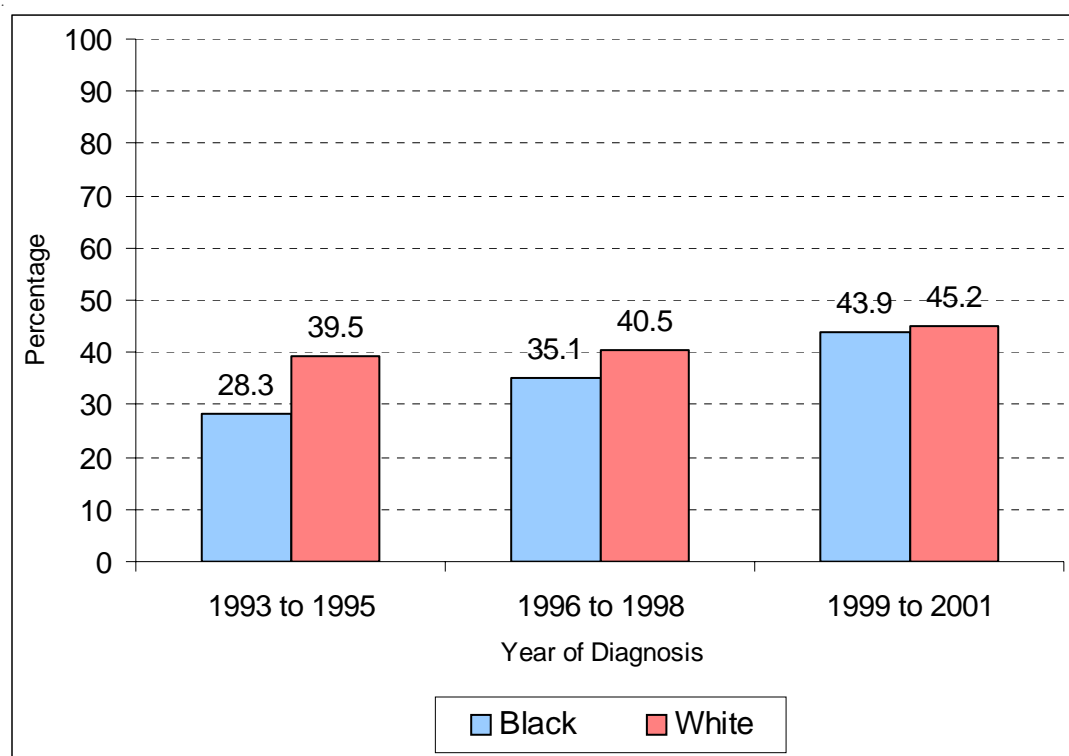
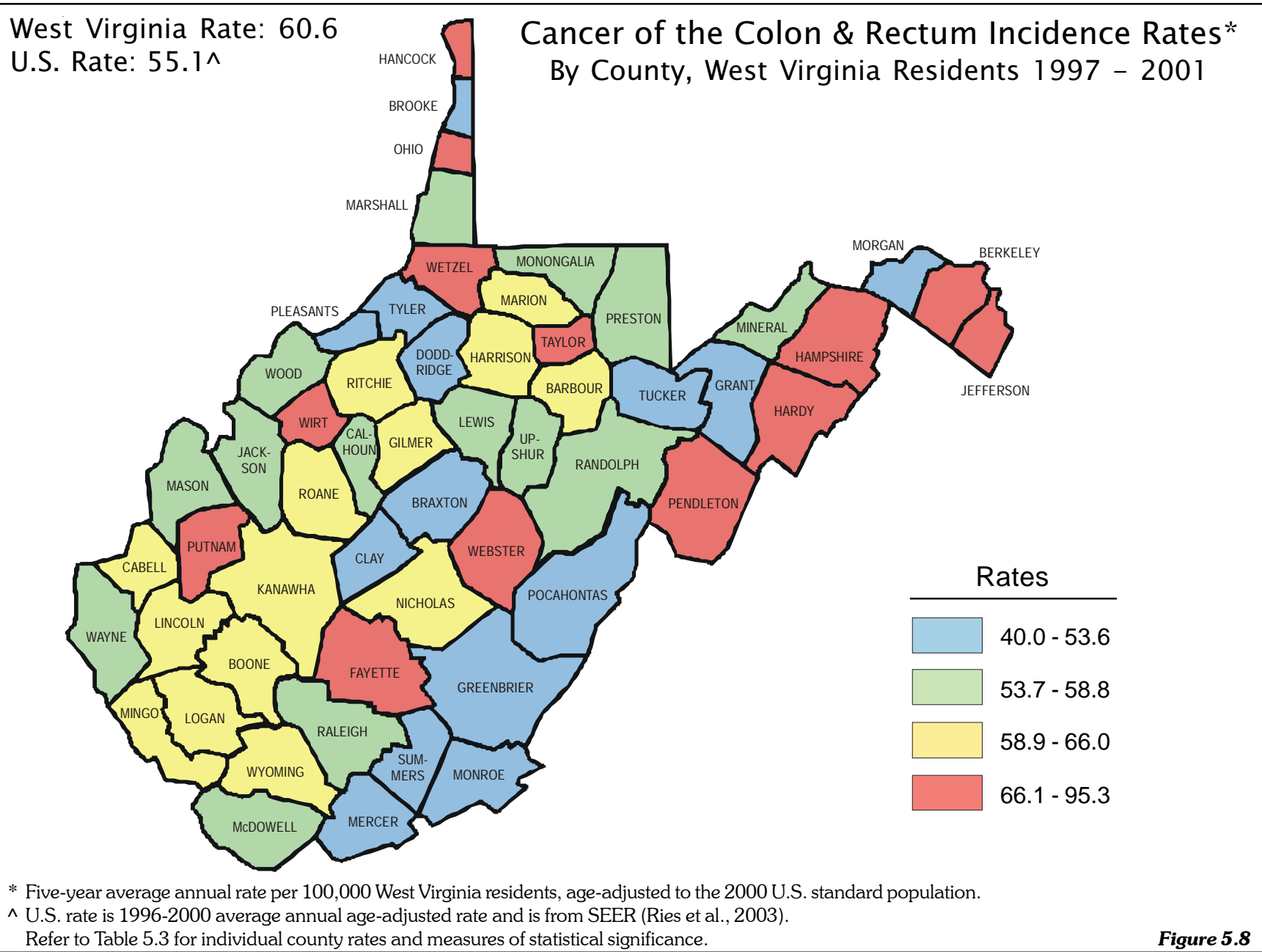


Figure 5.7



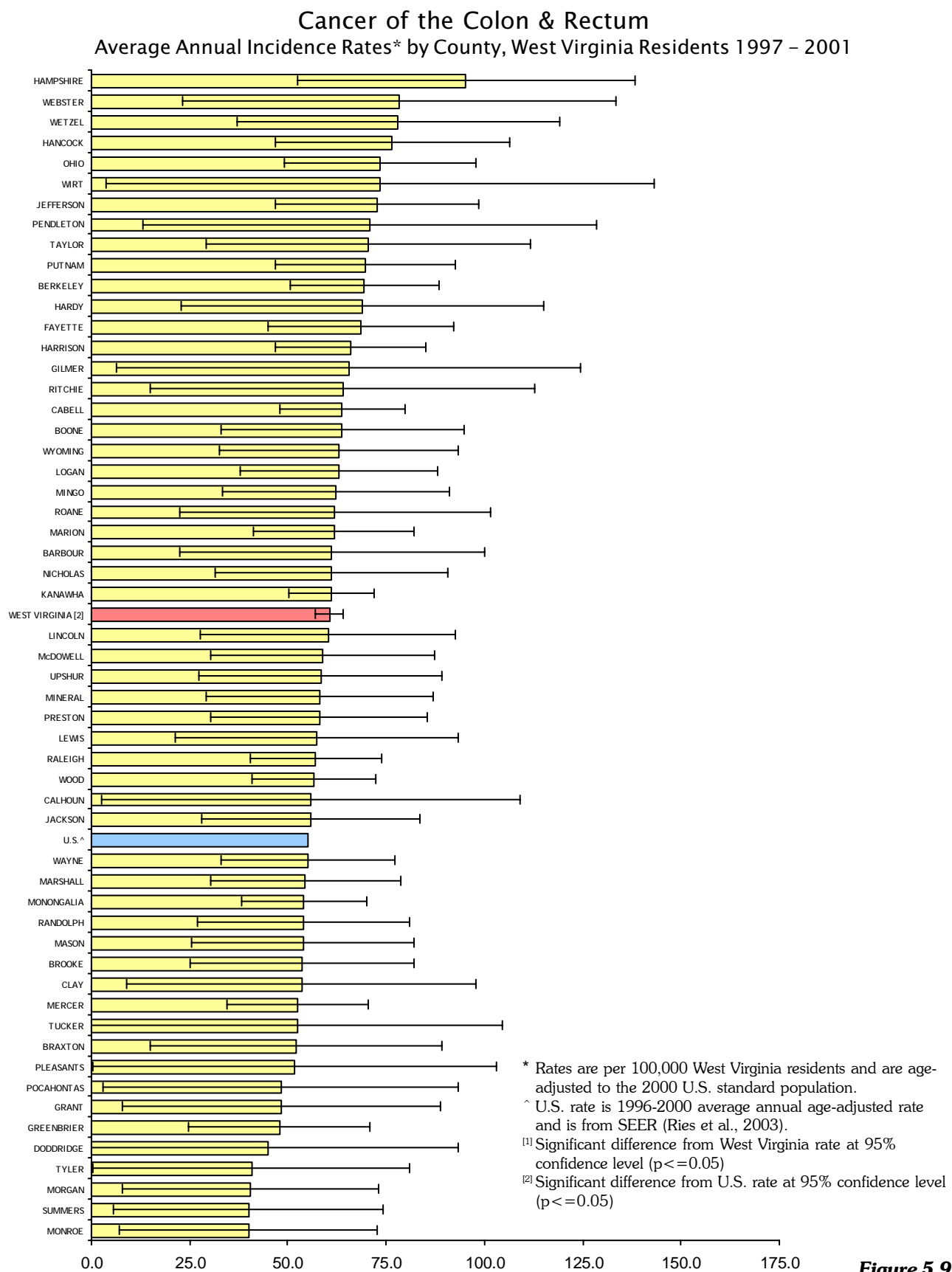


Figure 5.9

# Cancer of the Colon & Rectum

Average Annual Incidence Rates\* by County, West Virginia Residents 1997 – 2001

COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>		COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>	
			WV	U.S.				WV	U.S.
BARBOUR	58	61.2	No	No	MINGO	89	62.2	No	No
BERKELEY	235	69.5	No	No	MONONGALIA	189	54.1	No	No
BOONE	88	63.8	No	No	MONROE	34	40.0	No	No
BRAXTON	46	52.1	No	No	MORGAN	38	40.5	No	No
BROOKE	90	53.6	No	No	NICHOLAS	93	61.0	No	No
CABELL	371	63.8	No	No	OHIO	237	73.6	No	No
CALHOUN	28	55.9	No	No	PENDLETON	39	70.9	No	No
CLAY	29	53.4	No	No	PLEASANTS	22	51.7	No	No
DODDRIDGE	19	45.0	No	No	POCAHONTAS	29	48.2	No	No
FAYETTE	203	68.6	No	No	PRESTON	99	57.9	No	No
GILMER	28	65.4	No	No	PUTNAM	165	69.6	No	No
GRANT	33	48.2	No	No	RALEIGH	267	57.1	No	No
GREENBRIER	110	47.8	No	No	RANDOLPH	91	54.0	No	No
HAMPSHIRE	106	95.3	No	No	RITCHIE	39	63.9	No	No
HANCOCK	175	76.5	No	No	ROANE	55	62.0	No	No
HARDY	50	69.0	No	No	SUMMERS	37	40.0	No	No
HARRISON	284	66.0	No	No	TAYLOR	68	70.5	No	No
JACKSON	89	55.8	No	No	TUCKER	28	52.4	No	No
JEFFERSON	137	72.7	No	No	TYLER	24	40.7	No	No
KANAWHA	759	61.0	No	No	UPSHUR	78	58.3	No	No
LEWIS	60	57.2	No	No	WAYNE	132	55.1	No	No
LINCOLN	69	60.2	No	No	WEBSTER	46	78.3	No	No
LOGAN	133	62.9	No	No	WETZEL	86	78.1	No	No
MARION	231	61.8	No	No	WIRT	24	73.5	No	No
MARSHALL	120	54.4	No	No	WOOD	298	56.6	No	No
MASON	82	53.9	No	No	WYOMING	88	63.0	No	No
McDOWELL	100	58.8	No	No					
MERCER	210	52.5	No	No	WEST VIRGINIA	6,430	60.6		YES
MINERAL	92	58.1	No	No	U.S.^		55.1		

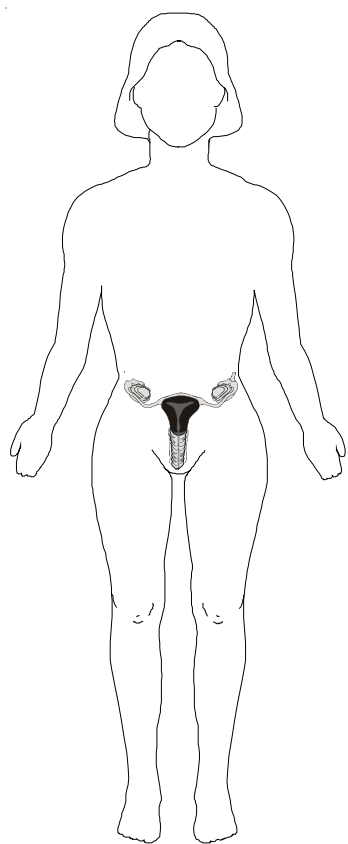
\* Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

^ U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

+ Difference between county rate and West Virginia rate, and county rate and U.S. rate, is tested for statistical significance at the 95% confidence level ( $p < 0.05$ ).

**Table 5.3**





## **Chapter 6**

# **Cancer of the Corpus Uteri & Uterus, NOS**





## Cancer of the Corpus Uteri & Uterus, NOS

### Incidence and Mortality by Year

West Virginia Females 1993 – 2001

Year	Female			
	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	259	23.2	35	3.0
1994	285	26.3	53	4.4
1995	283	24.7	45	3.7
1996	284	25.6	63	5.2
1997	343	30.9	52	4.4
1998	307	27.0	50	4.0
1999	301	26.6	57	4.6
2000	330	29.1	60	5.1
2001	292	25.9	48	4.0

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia females and are age-adjusted to the 2000 U.S. standard population.

**Table 6.1**

### Overview

- During 1997-2001, uterine cancer remained the fourth most common invasive cancer diagnosed in West Virginia women (Figure 1.4).
- Incidence increased markedly with age. Compared to women aged 25-44 years, those aged 45-64 years were over six times more likely to develop this disease. Those aged 65 and older were over nine times more likely to do so (Figure 6.3).
- The majority of uterine cancers were diagnosed at in situ or local stages (71%). Stage was not reported in 7% of cases (Figure 6.4).

### Risk Factors

- Early menarche, late menopause, obesity, a history of anovulation, tamoxifen, and unopposed estrogen therapy have all been associated with increased risk.

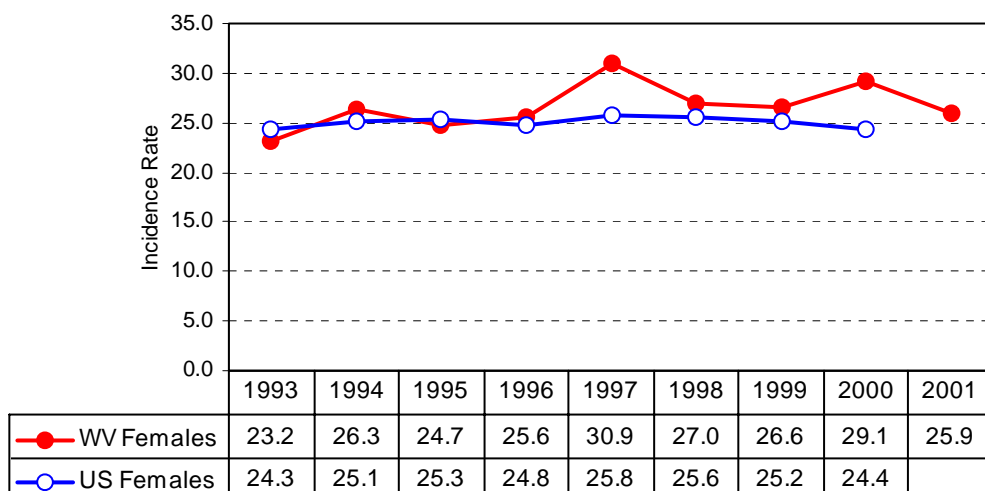
### Prevention

- Endometrial tissue sampling of high-risk menopausal and postmenopausal women is an effective method to screen for cancer of the uterus.
- Regular pelvic exams may also help detect this and other gynecologic problems.

## Cancer of the Corpus Uteri & Uterus, NOS

### Incidence Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000



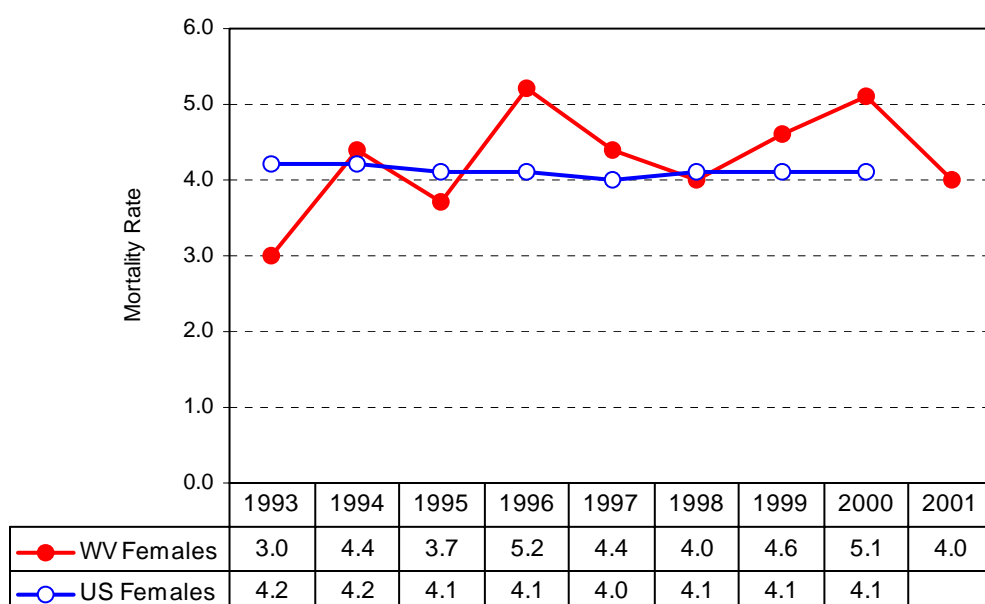
**Figure 6.1**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Corpus Uteri & Uterus, NOS

### Mortality Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000

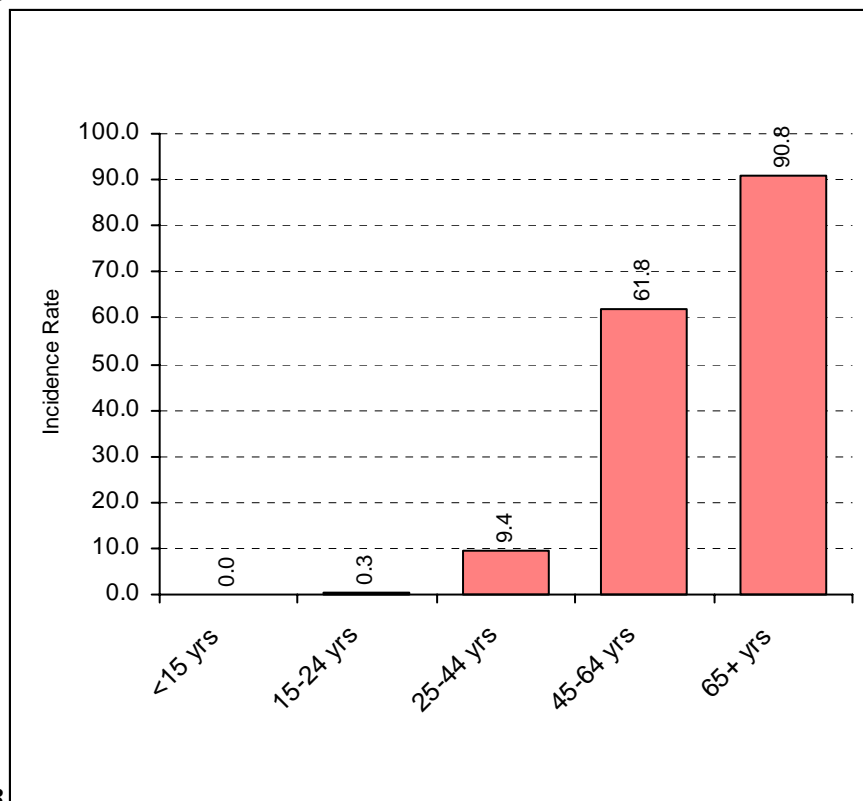


**Figure 6.2**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Corpus Uteri & Uterus, NOS

Incidence Rates\*, Age-Specific  
West Virginia Females 1997 – 2001



**Figure 6.3**

\*Five-year average annual rate per 100,000 West Virginia females

### Cancer of the Corpus Uteri & Uterus, NOS

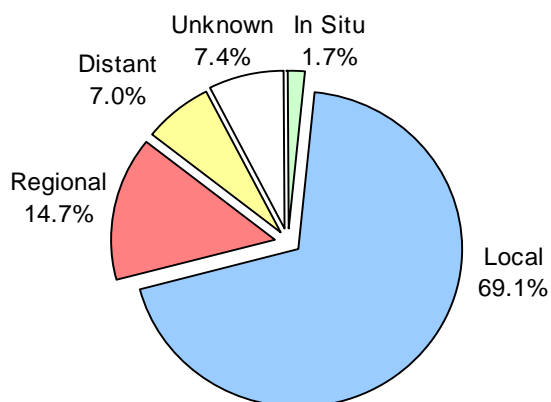
Most Frequent Histologies  
West Virginia Females 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
8380	Endometrioid Adenocarcinoma, NOS	42.7
8140	Adenocarcinoma	34.5
8560	Adenosquamous Carcinoma	2.0
8010	Carcinoma	1.9
8260	Papillary Adenocarcinoma	1.7
8570	Adenocarcinoma with Squamous Metaplasia	1.7
8460	Papillary Serous Cystadenocarcinoma	1.5
8890	Leiomyosarcoma	1.5
8980	Carcinosarcoma	1.4
8950	Mullerian Mixed Tumor	1.3

**Table 6.2**

### Cancer of the Corpus Uteri & Uterus, NOS

Stage of Disease at Diagnosis  
West Virginia Females 1997 – 2001

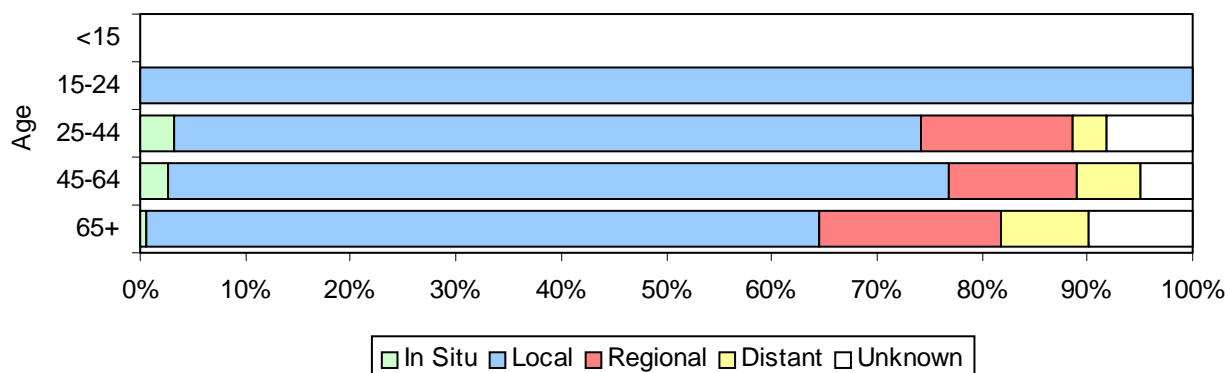


**Figure 6.4**

## Cancer of the Corpus Uteri & Uterus, NOS

### Stage of Disease at Diagnosis by Age

West Virginia Females 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-24	0	0.0%	~		0	0.0%	0	0.0%	0	0.0%	~	100.0%
25-44	4	3.2%	~		18	14.5%	4	3.2%	10	8.1%	~	100.0%
45-64	19	2.6%	535	74.2%	88	12.2%	44	6.1%	35	4.9%	721	100.0%
65+	5	0.7%	481	63.8%	130	17.2%	64	8.5%	74	9.8%	754	100.0%
Total	28	1.7%	1,106	69.1%	236	14.7%	112	7.0%	119	7.4%	1,601	100.0%

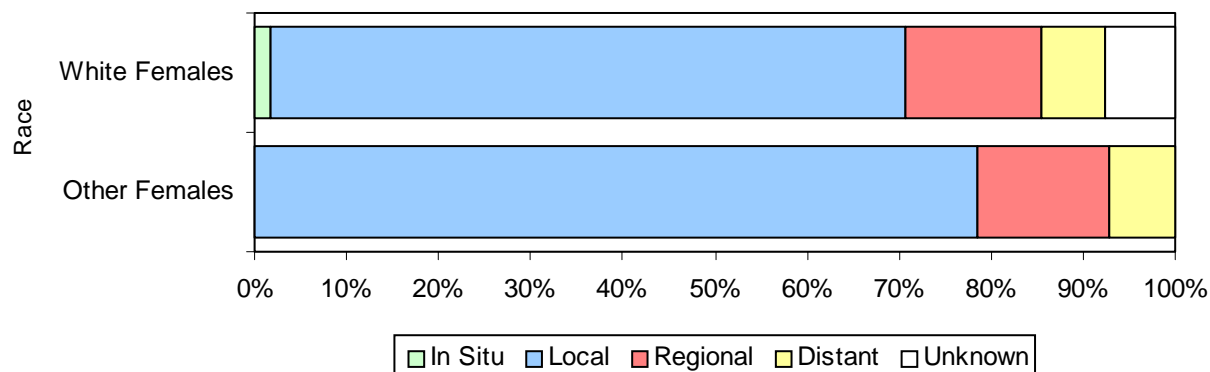
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Total may not add to 100% due to rounding.

**Figure 6.5**

## Cancer of the Corpus Uteri & Uterus, NOS

### Stage of Disease at Diagnosis by Race

West Virginia Females 1997 – 2001

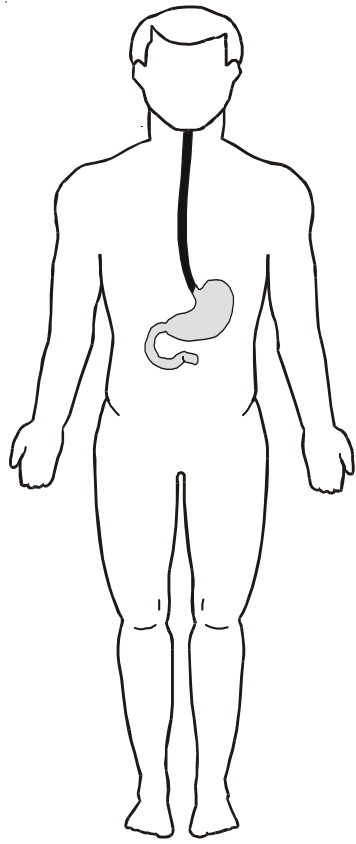


Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Females	28	1.8%	1,084	68.9%	232	14.7%	~		~		1,573	100.0%
Other Females	0	0.0%	22	78.6%	4	14.3%	~		~		28	100.0%
Total	28	1.7%	1,106	69.1%	236	14.7%	112	7.0%	119	7.4%	1,601	100.0%

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Total may not add to 100% due to rounding.

**Figure 6.6**





## **Chapter 7**

# **Cancer of the Esophagus**



## Cancer of the Esophagus

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	69	7.9	63	7.4	19	1.5	13	1.1	88	4.3	76	3.8
1994	73	8.0	69	7.6	23	1.8	26	2.1	96	4.6	95	4.5
1995	68	7.8	66	7.3	18	1.4	11	0.8	86	4.1	77	3.7
1996	60	6.8	52	5.8	26	2.1	20	1.6	86	4.2	72	3.5
1997	81	9.1	65	7.5	26	2.1	24	2.0	107	5.1	89	4.3
1998	86	9.5	71	8.0	23	1.9	12	0.9	109	5.2	83	4.0
1999	73	8.1	77	8.5	25	2.1	25	2.1	98	4.7	102	4.8
2000	93	10.0	65	7.0	16	1.2	16	1.3	109	5.1	81	3.8
2001	80	8.6	70	7.7	31	2.5	19	1.6	111	5.2	89	4.3

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 7.1**

### Overview

- Esophageal cancer most commonly occurs in men. For 1997-2001, this cancer was diagnosed over four times more often among men than among women (age-adjusted incidence rate of 9.1 per 100,000 West Virginia men and 2.0 per 100,000 West Virginia women) (Figures 1.3 and 1.4).
- For both men and women in West Virginia, invasive disease rarely occurred before age 45. Thereafter, incidence rates increased with increasing age (Figure 7.3).
- More than half (51%) of the cancers of the esophagus diagnosed between 1997 and 2001 had spread regionally or distantly at diagnosis (Figure 7.4). Although somewhat improved surgical approaches are available, prognosis at these stages remains relatively poor.
- For 1997-2001, cancer of the esophagus was the seventh leading cause of cancer-related mortality among West Virginia men (Figure 1.3).
- State-specific age-adjusted cancer mortality rates from 1996-2000 suggest that West Virginia mortality from esophageal cancer was slightly below national mortality for this disease (Appendix B).

### Risk Factors

- Alcohol and tobacco use have been implicated as risk factors for this disease.
- Although not fully elucidated, there is some suggestion that caustic or other injury to the esophageal mucosa (e.g. lye ingestion) may be associated with development of malignancy.

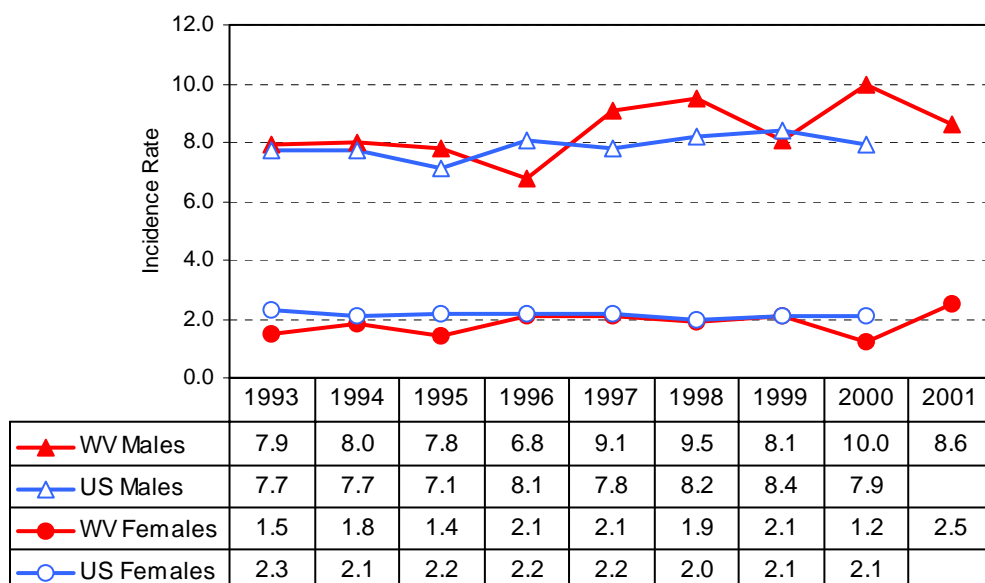
### Prevention

- Avoiding abuse of alcohol and tobacco is the best way to reduce the risk of esophageal cancer. The risk of esophageal cancer increases by 18 times in people who drink more than about 13 ounces of alcohol a day for years. If this same person smokes at least one to two packs of cigarettes a day, the risk of esophageal cancer increases 44 times (ACS, 2003a).

## Cancer of the Esophagus

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



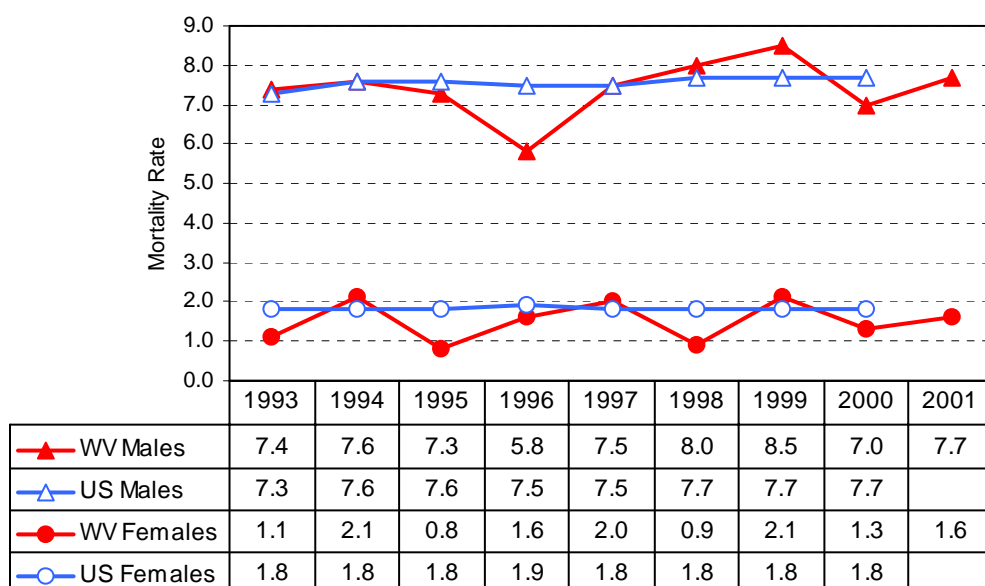
**Figure 7.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Esophagus

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



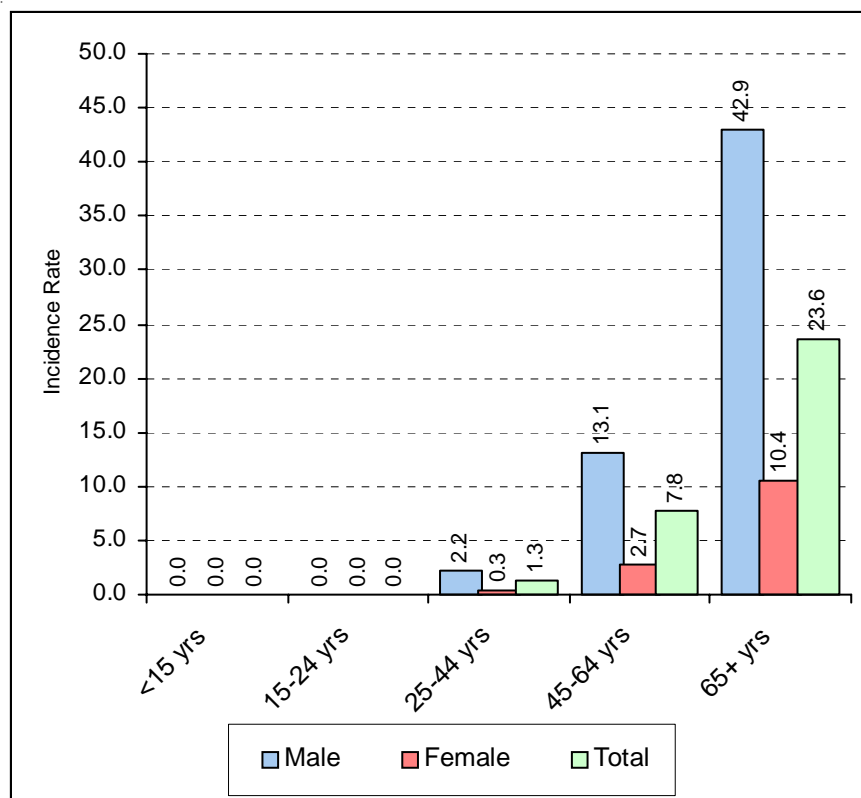
**Figure 7.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).



## Cancer of the Esophagus

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 7.3**

\*Five-year average annual rate per 100,000 West Virginia residents

## Cancer of the Esophagus

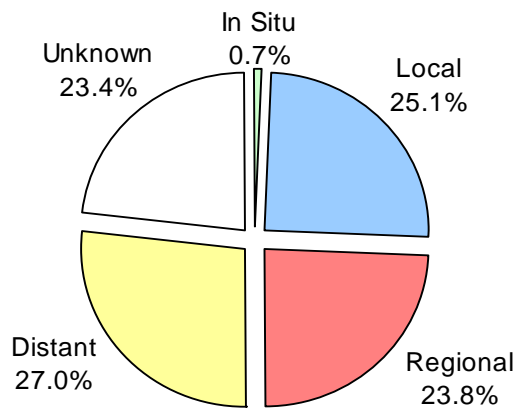
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
814	Adenocarcinoma	52.6
807	Squamous Cell Carcinoma	30.1
801	Carcinoma	5.8
800	Malignant Neoplasm	2.8
848	Mucinous Adenocarcinoma	2.8
849	Signet Ring Cell Carcinoma	2.2
856	Adenosquamous Carcinoma	1.5

**Table 7.2**

## Cancer of the Esophagus

Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

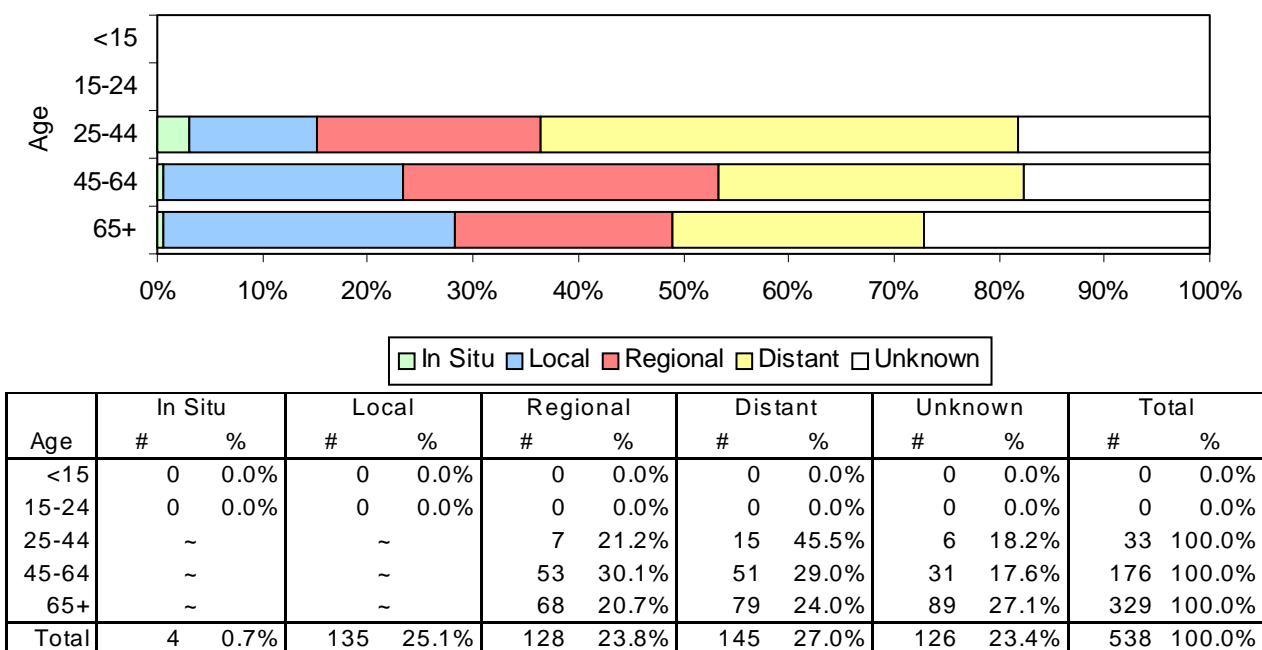


**Figure 7.4**

## Cancer of the Esophagus

### Stage of Disease at Diagnosis by Age

#### West Virginia Residents 1997 – 2001



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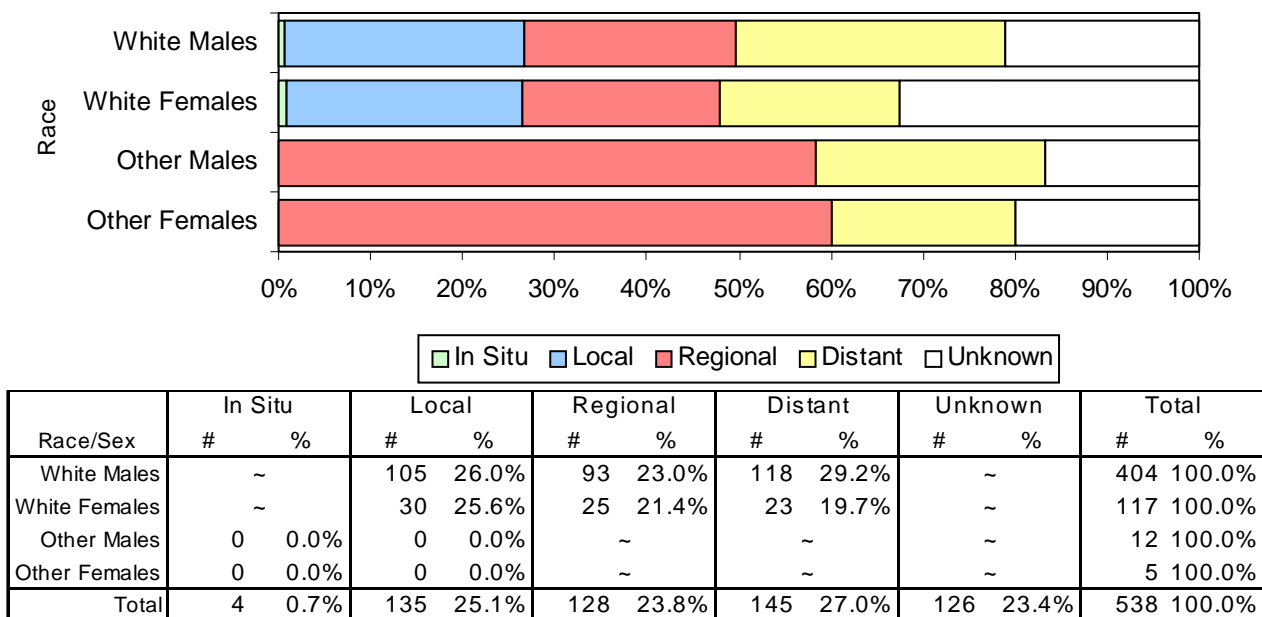
Total may not add to 100% due to rounding.

**Figure 7.5**

## Cancer of the Esophagus

### Stage of Disease at Diagnosis by Race and Sex

#### West Virginia Residents 1997 – 2001

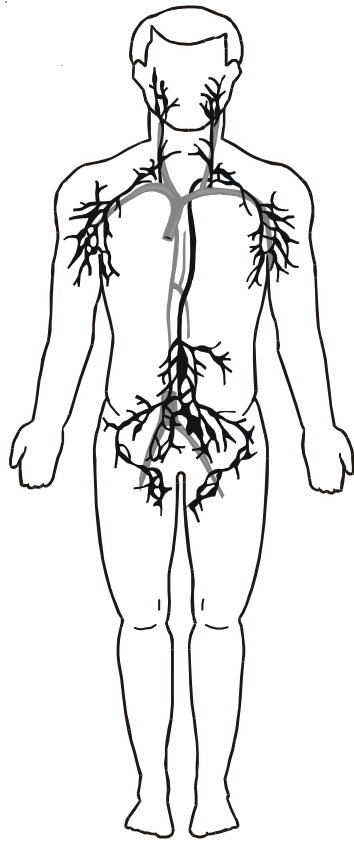


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Total may not add to 100% due to rounding.

**Figure 7.6**





## Chapter 8



## Hodgkin's Disease

## Hodgkin's Disease

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	42	4.5	7	0.8	23	2.2	8	0.7	65	3.4	15	0.7
1994	29	3.2	~	0.9	18	1.8	~	0.3	47	2.5	11	0.6
1995	20	2.2	8	0.9	24	2.4	4	0.4	44	2.3	12	0.6
1996	34	3.8	5	0.5	22	2.3	7	0.6	56	3.0	12	0.6
1997	32	3.5	4	0.4	33	3.2	6	0.5	65	3.4	10	0.5
1998	23	2.6	~	0.2	25	2.4	~	0.6	48	2.5	7	0.4
1999	31	3.4	~	0.1	30	3.1	~	0.3	61	3.3	4	0.2
2000	27	3.0	~	0.2	19	2.0	~	0.3	46	2.5	6	0.3
2001	28	3.1	~	0.2	26	2.6	~	0.2	54	2.9	5	0.2

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Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 8.1**

### Overview

- Although Hodgkin's disease occurs in all age groups, it tends to have two peaks of increased incidence. In the 1997-2001 West Virginia data, these were seen among the 15-24-year-old age group and again in the 65-and-older age group (Figure 8.3).
- While any cancer is a rare occurrence in teens and young adults, Hodgkin's disease was the most commonly diagnosed cancer among males 15-24 years of age and the second most commonly diagnosed cancer among females 15-24 years of age in West Virginia in 1997-2001 (Table 1.2).
- Mortality rates for Hodgkin's disease were much lower than incidence rates, reflecting the development of effective treatment regimens in the last several years (Figures 8.1 and 8.2).

### Risk Factors

- Risk factors for this disease are largely unknown.
- Some evidence suggests a possible genetic risk factor for this disease.

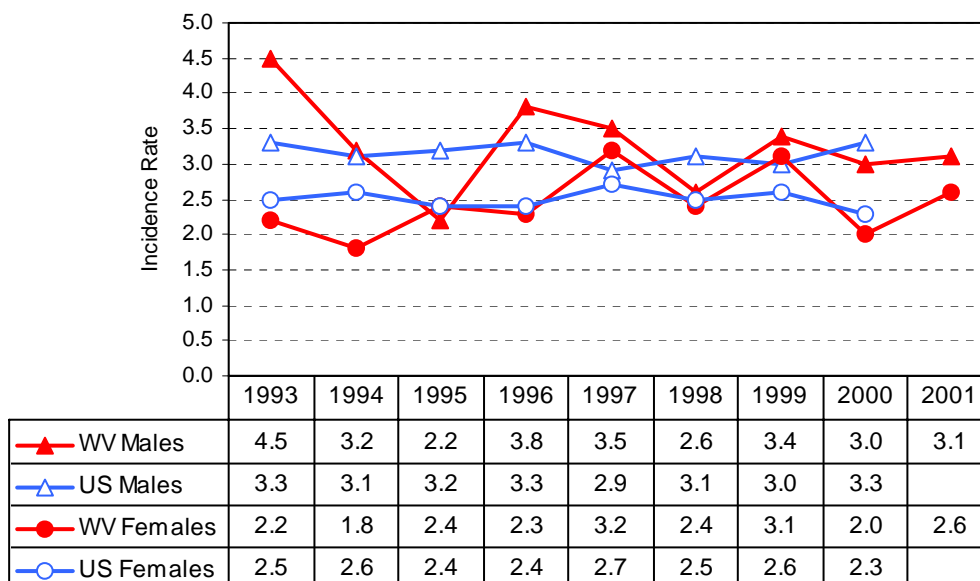
### Prevention

- No adequately effective methods of prevention or screening for Hodgkin's disease are currently available.

## Hodgkin's Disease

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



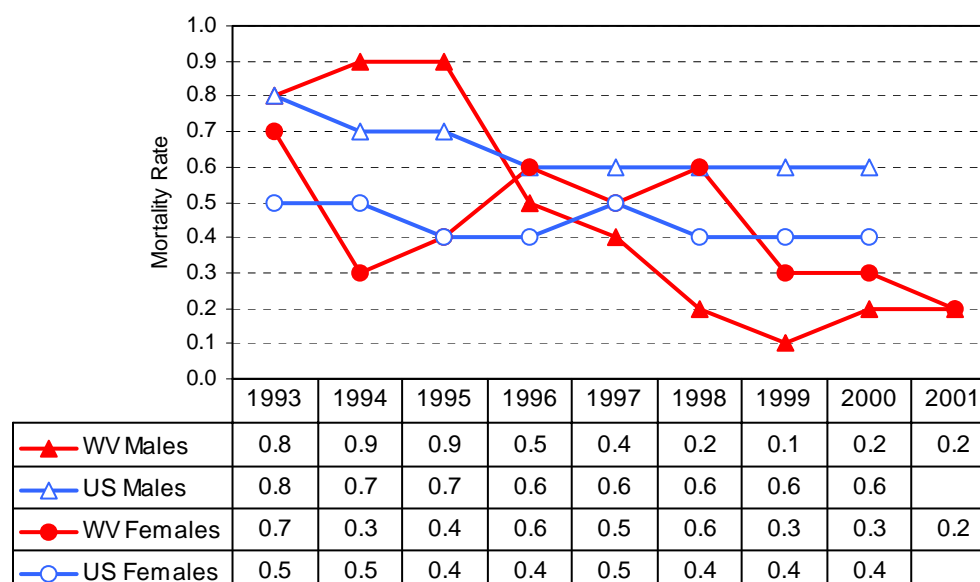
**Figure 8.1**

\* Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Hodgkin's Disease

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

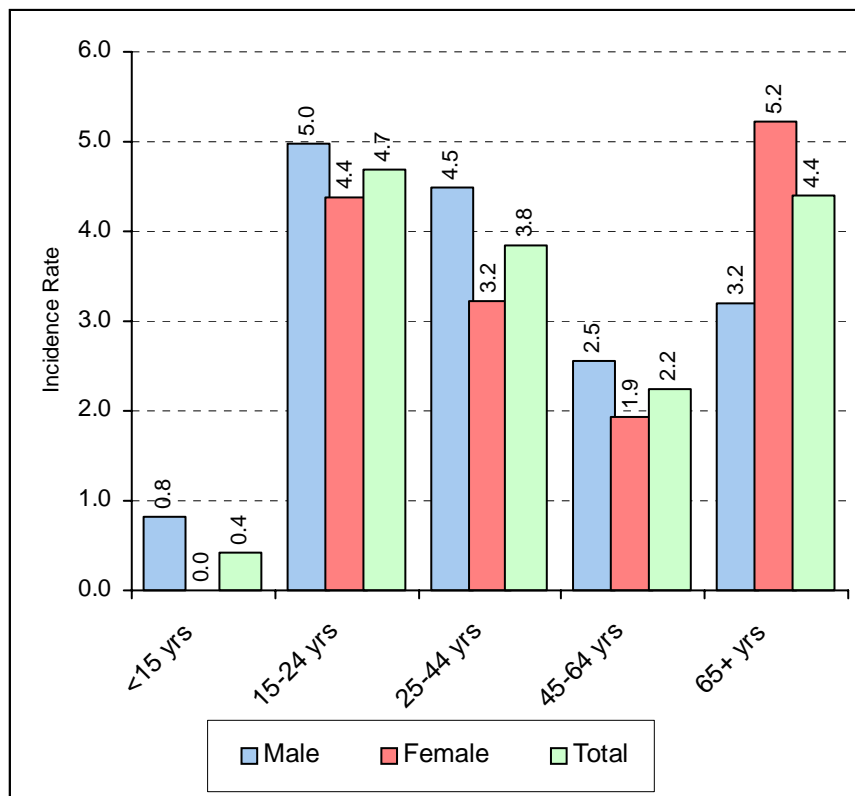


**Figure 8.2**

\* Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Hodgkin's Disease

### Incidence Rates\*, Age-Specific West Virginia Residents 1997 – 2001



**Figure 8.3**

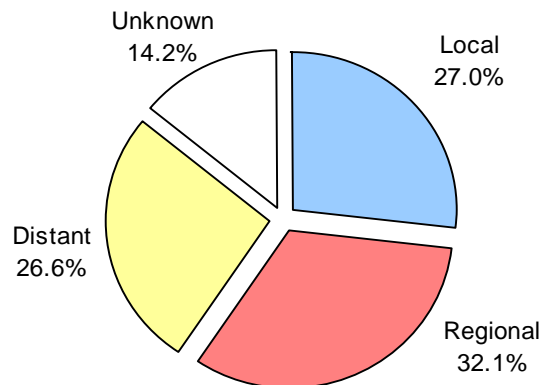
\*Five-year average annual rate per 100,000 West Virginia residents

### Hodgkin's Disease Most Frequent Histologies West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
9663	Nodular Sclerosis, NOS	44.2
9650	Hodgkin's Disease, NOS	19.3
9652	Mixed Cellularity, NOS	16.4
9651	Hodgkin's Disease, Lymphocyte-Rich	6.9
9665	Nodular Sclerosis, Grade 1	4.0

**Table 8.2**

### Hodgkin's Disease Stage of Disease at Diagnosis West Virginia Residents 1997 – 2001

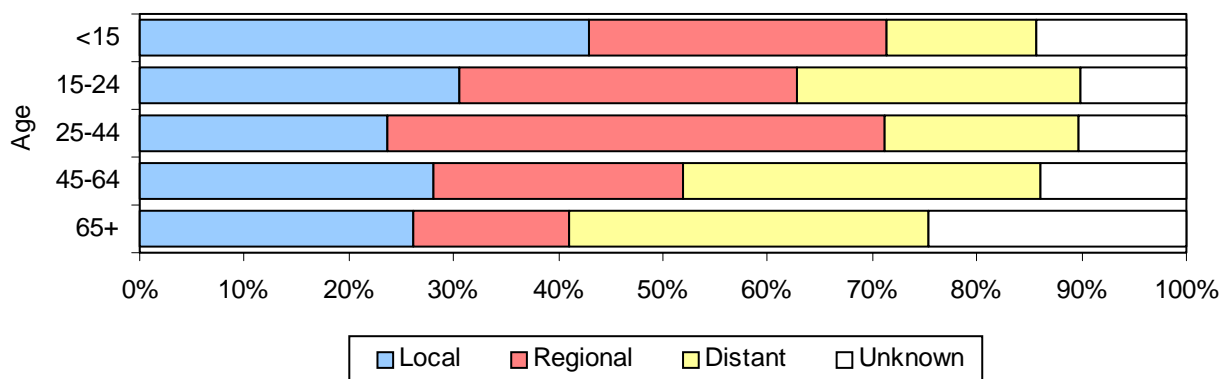


**Figure 8.4**

## Hodgkin's Disease

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	N/A		~		~		~		~		7	100.0%
15-24	N/A		~		~		~		~		59	100.0%
25-44	N/A		23	23.7%	46	47.4%	18	18.6%	10	10.3%	97	100.0%
45-64	N/A		14	28.0%	12	24.0%	17	34.0%	7	14.0%	50	100.0%
65+	N/A		16	26.2%	9	14.8%	21	34.4%	15	24.6%	61	100.0%
Total	N/A		74	27.0%	88	32.1%	73	26.6%	39	14.2%	274	100.0%

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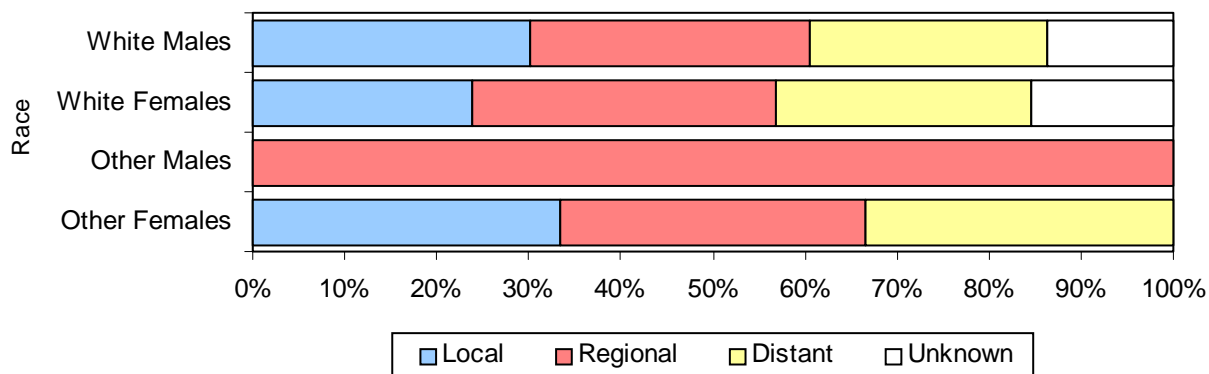
Total may not add to 100% due to rounding.

Figure 8.5

## Hodgkin's Disease

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	N/A		42	30.2%	42	30.2%	36	25.9%	19	13.7%	139	100.0%
White Females	N/A		31	23.8%	43	33.1%	36	27.7%	20	15.4%	130	100.0%
Other Males	N/A		~		~		~		0	0.0%	~	100.0%
Other Females	N/A		~		~		~		0	0.0%	~	100.0%
Total	N/A		74	27.0%	88	32.1%	73	26.6%	39	14.2%	274	100.0%

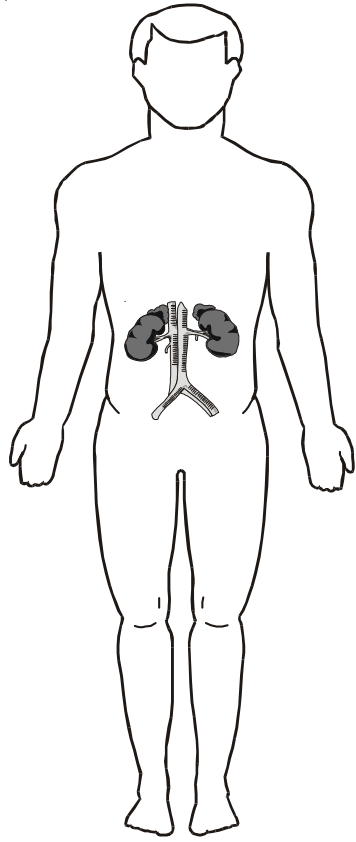
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Total may not add to 100% due to rounding.

Figure 8.6







## Chapter 9

# Cancer of the Kidney & Renal Pelvis



## Cancer of the Kidney & Renal Pelvis

### Incidence and Mortality by Sex and Year

West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	122	14.5	49	5.7	101	8.9	38	3.2	223	11.2	87	4.3
1994	118	13.7	54	6.5	90	7.9	46	3.9	208	10.2	100	4.9
1995	155	17.1	66	8.0	97	8.5	40	3.5	252	12.4	106	5.2
1996	144	16.3	58	6.5	105	9.2	47	3.8	249	12.2	105	5.1
1997	133	14.7	70	8.1	123	10.4	34	2.8	256	12.4	104	5.0
1998	158	16.9	53	5.7	80	6.6	39	3.2	238	11.4	92	4.4
1999	153	16.7	52	5.8	105	8.8	35	2.9	258	12.3	87	4.1
2000	154	16.5	50	5.7	114	9.6	40	3.1	268	12.7	90	4.2
2001	167	17.7	54	6.2	120	10.2	37	3.0	287	13.5	91	4.3

Number of new cases excludes in situ cases.

**Table 9.1**

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

### Overview

- After age 24, incidence for cancer of the kidney and renal pelvis increased with increasing age (Figure 9.3).
- The 1997-2001 average annual age-adjusted incidence rate for West Virginia men (16.5 per 100,000) was nearly twice that of West Virginia women (9.1 per 100,000) (Figures 1.3 and 1.4).
- During 1997-2001, 55% of newly diagnosed cases in West Virginia residents were identified with in situ or local disease. Stage was not reported in 10% of cases (Figure 9.5).
- Each year from 1993 through 2001, approximately 95 West Virginians died of cancer of the kidney and renal pelvis (Table 9.1).

### Risk Factors

- Cigarette smoking is causally linked to cancers of the kidney and renal pelvis.
- Abuse of phenacetin-containing pain relievers is also causally linked to these cancers. These medications have been available by prescription only since the late 1970s.
- Obesity is a risk factor.

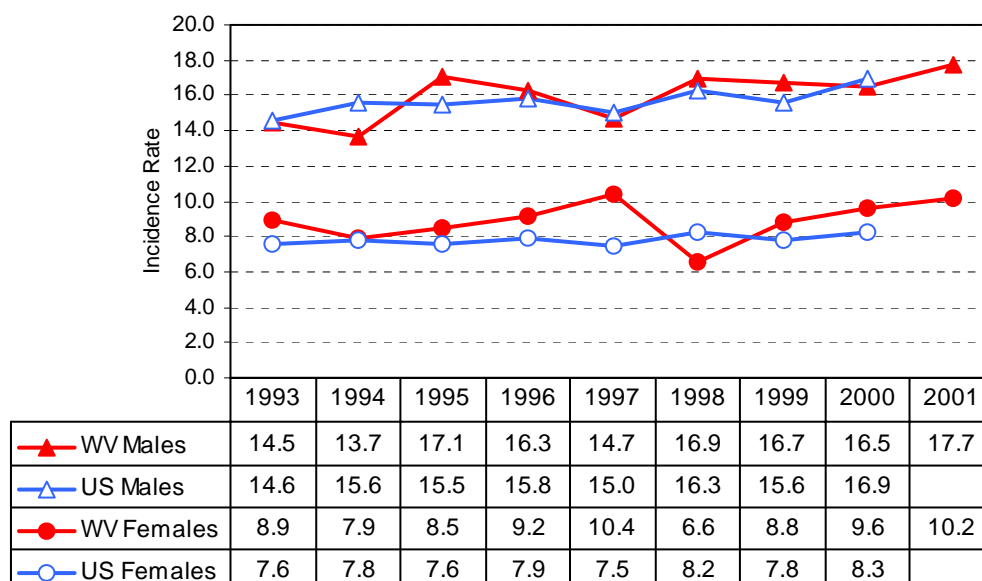
### Prevention

- Improved lifestyle behaviors, predominantly avoiding tobacco use, could potentially decrease the incidence of this malignancy.

## Cancer of the Kidney & Renal Pelvis

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



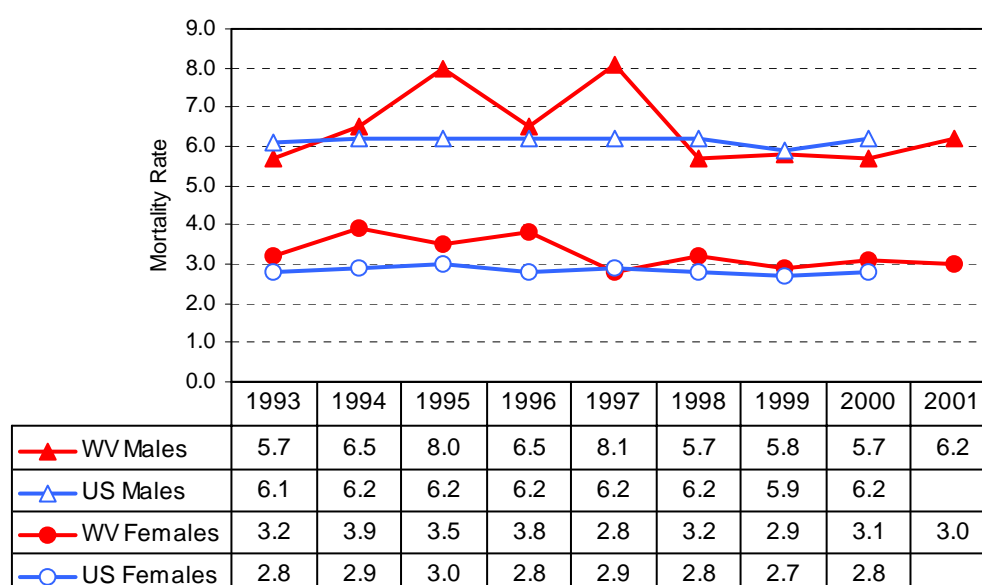
**Figure 9.1**

\* Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Kidney & Renal Pelvis

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

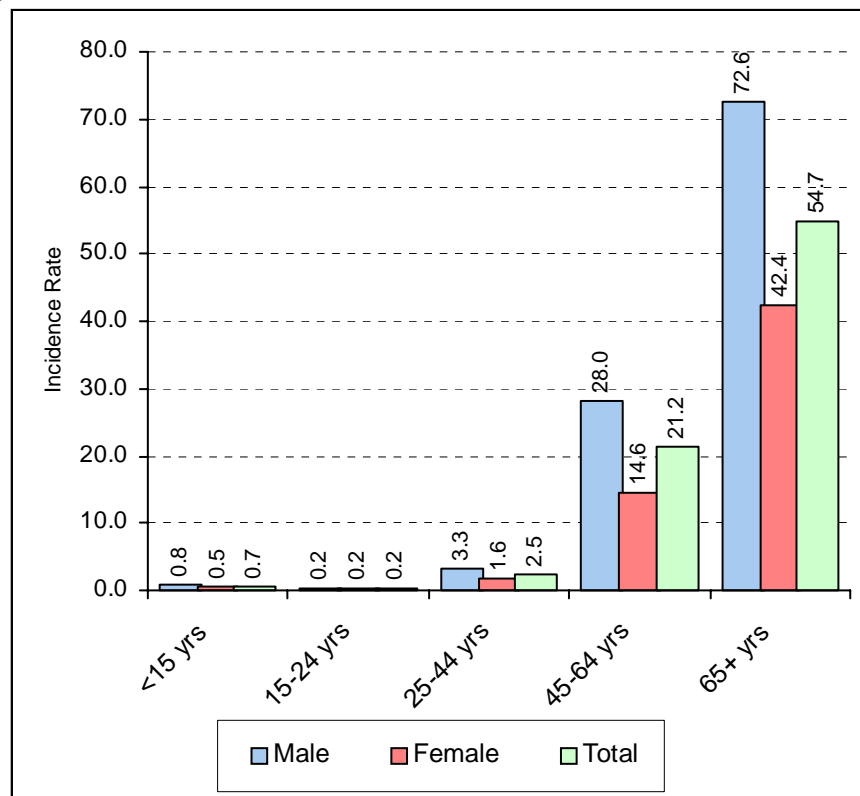


**Figure 9.2**

\* Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Kidney & Renal Pelvis

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 9.3**

\*Five-year average annual rate per 100,000 West Virginia residents

### Cancer of the Kidney & Renal Pelvis

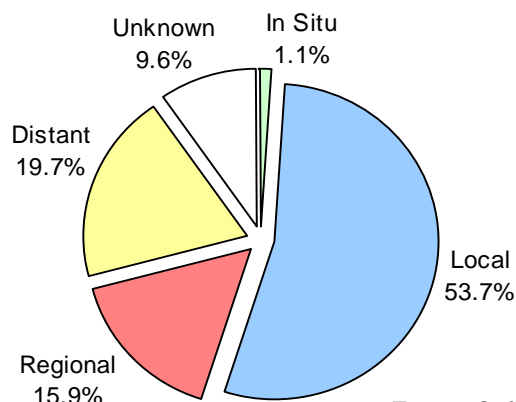
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
831	Renal Cell Carcinoma	79.0
813	Papillary Transitional Cell Carcinoma	6.0
812	Transitional Cell Carcinoma	4.1
800	Malignant Neoplasm	2.6
801	Carcinoma	2.4
814	Adenocarcinoma	1.9
826	Adenocarcinoma (Papillary or in Villous Adenoma)	1.3
896	Wilms' Tumor	1.0

**Table 9.2**

### Cancer of the Kidney & Renal Pelvis

Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

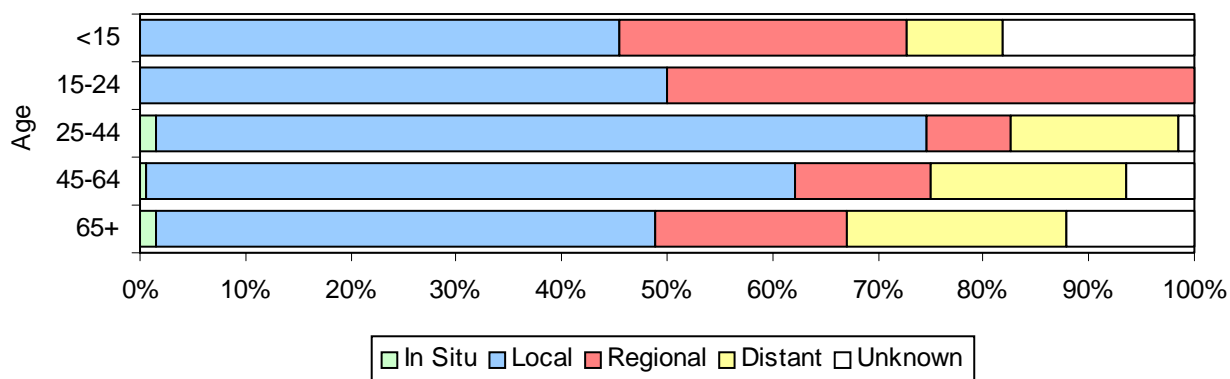


**Figure 9.4**

## Cancer of the Kidney & Renal Pelvis

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	~		~		~		~		~	100.0%
15-24	0	0.0%	~		~		0	0.0%	0	0.0%	~	100.0%
25-44	~		46	73.0%	5	7.9%	10	15.9%	~		63	100.0%
45-64	~		293	61.4%	62	13.0%	~		31	6.5%	477	100.0%
65+	11	1.4%	365	47.5%	139	18.1%	161	20.9%	93	12.1%	769	100.0%
Total	15	1.1%	710	53.7%	210	15.9%	260	19.7%	127	9.6%	1,322	100.0%

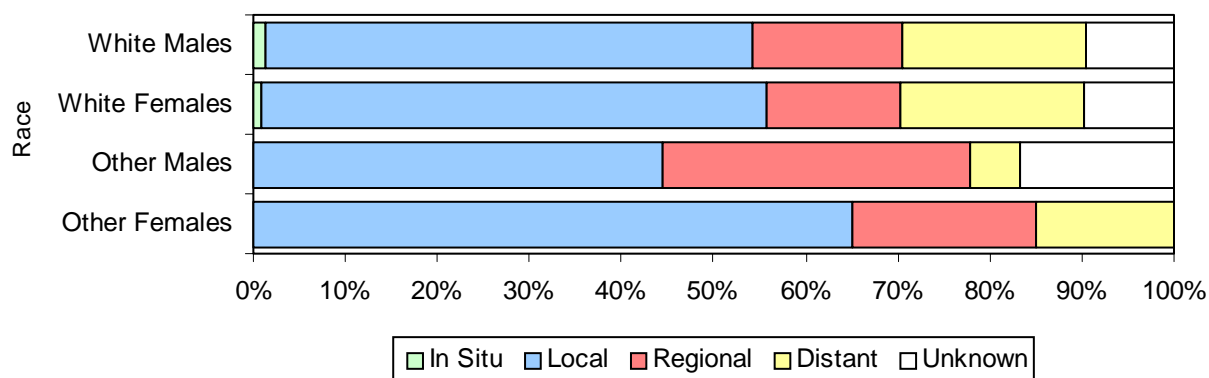
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Total may not add to 100% due to rounding.

**Figure 9.5**

## Cancer of the Kidney & Renal Pelvis

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001

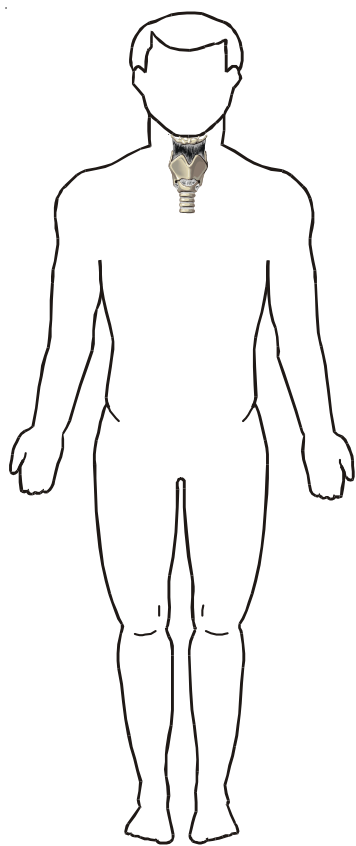


Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	10	1.3%	400	52.8%	124	16.4%	151	19.9%	72	9.5%	757	100.0%
White Females	5	0.9%	289	54.8%	76	14.4%	105	19.9%	52	9.9%	527	100.0%
Other Males	0	0.0%	8	44.4%	6	33.3%	~		~		18	100.0%
Other Females	0	0.0%	13	65.0%	4	20.0%	~		~		20	100.0%
Total	15	1.1%	710	53.7%	210	15.9%	260	19.7%	127	9.6%	1,322	100.0%

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Total may not add to 100% due to rounding.

**Figure 9.6**





## **Chapter 10**

# **Cancer of the Larynx**





## Cancer of the Larynx

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	88	9.9	32	3.6	18	1.6	12	1.0	106	5.2	44	2.1
1994	104	12.0	30	3.3	24	2.2	5	0.5	128	6.4	35	1.7
1995	82	9.2	32	3.6	37	3.2	13	1.2	119	5.7	45	2.2
1996	89	10.0	33	3.6	28	2.4	6	0.5	117	5.7	39	1.8
1997	99	10.8	26	2.9	22	1.9	11	0.9	121	5.9	37	1.7
1998	99	10.7	26	2.8	22	1.8	10	0.8	121	5.8	36	1.7
1999	101	10.5	28	3.0	27	2.4	9	0.7	128	6.0	37	1.7
2000	93	9.8	31	3.4	30	2.7	8	0.6	123	5.8	39	1.8
2001	96	10.1	24	2.5	22	1.9	9	0.8	118	5.6	33	1.6

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 10.1**

### Overview

- For 1997-2001, cancer of the larynx was rare among individuals under the age of 45. Incidence then increased with age (Figure 10.3).
- The 1997-2001 average annual age-adjusted incidence rate in West Virginia males (10.4 per 100,000) was over four times that of females (2.2 per 100,000) (Figures 1.3 and 1.4). This gender difference was most pronounced in older age groups (Figure 10.3). Nationally, gender differences and time trends of this disease have reflected changing patterns of tobacco use.
- In 1997-2001, more than half (57%) of all laryngeal cancers in West Virginia residents were diagnosed at an in situ or local stage (Figure 10.4). Five-year survival rates for some early stage laryngeal cancers are fairly good. Survival rates decline with more advanced disease.
- Like incidence rates, 1997-2001 average annual mortality rates for West Virginia men (2.9 per 100,000) were much higher than those for West Virginia women (0.8 per 100,000) (Figures 1.3 and 1.4).
- State-specific data (1996-2000) ranked West Virginia sixth for men and fourth for women in age-adjusted mortality rates for cancer of the larynx among the 50 states and the District of Columbia (Appendix B).

### Risk Factors

- Tobacco use increases the risk of cancer of the larynx nearly tenfold.
- Exposure to asbestos, nickel, or mustard gas has been suggested as risk factors.
- About one-fourth of people with laryngeal cancer are infected with human papillomavirus.

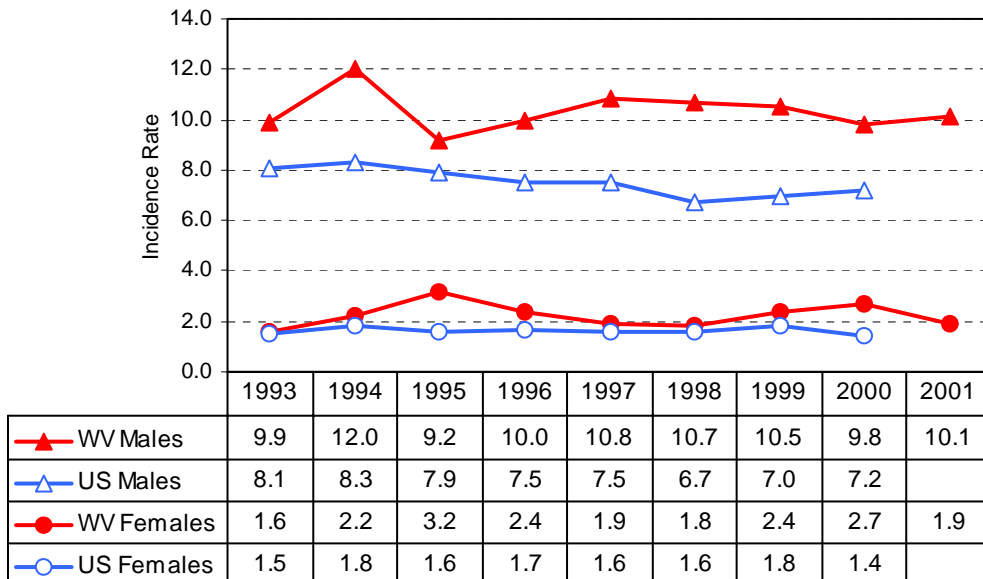
### Prevention

- Cessation of smoking and use of other tobacco products is the most important step in preventing this cancer.

## Cancer of the Larynx

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



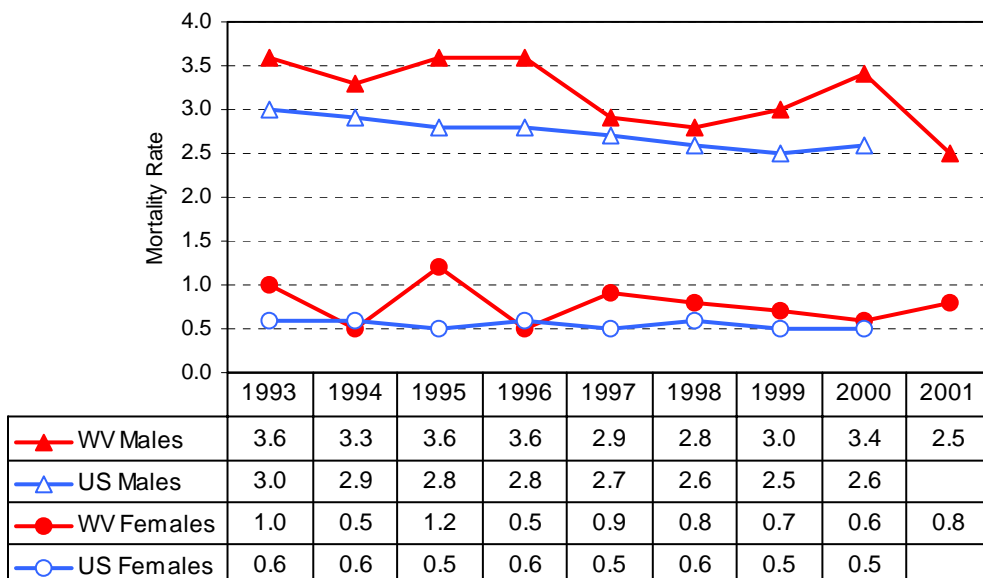
**Figure 10.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Larynx

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

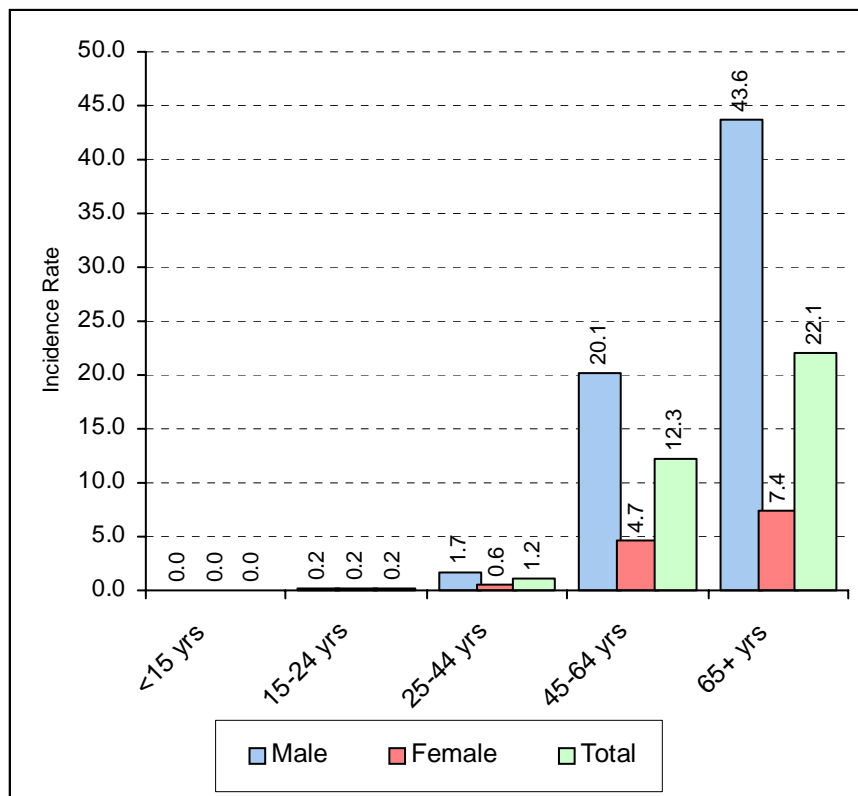


**Figure 10.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Larynx

### Incidence Rates\*, Age-Specific West Virginia Residents 1997 – 2001



**Figure 10.3**

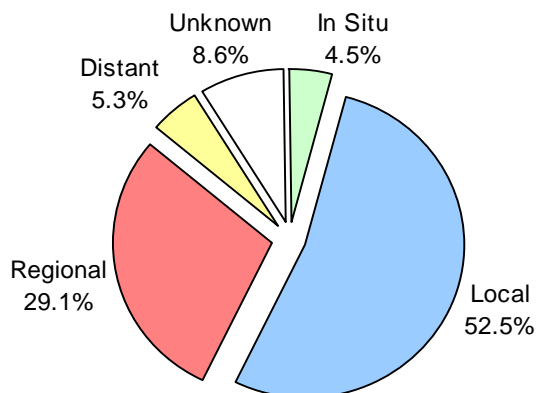
\*Five-year average annual rate per 100,000 West Virginia residents

### Cancer of the Larynx Most Frequent Histologies West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
8070	Squamous Cell Carcinoma, NOS	75.5
8071	Squamous Cell Carcinoma, Keratinizing	17.0
8000	Malignant Neoplasm	1.6
8072	Squamous Cell Carcinoma, Nonkeratinizing	1.3
8052	Papillary Squamous Cell Carcinoma	1.0

**Table 10.2**

### Cancer of the Larynx Stage of Disease at Diagnosis West Virginia Residents 1997 – 2001

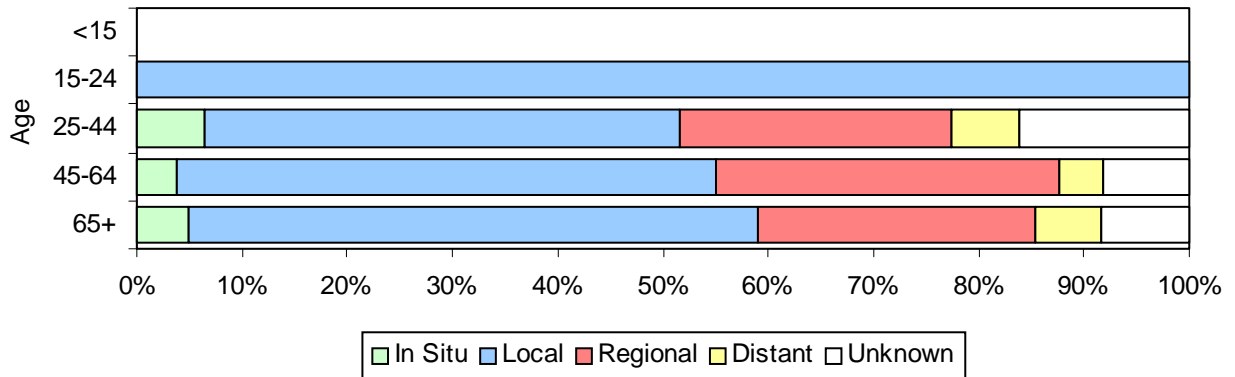


**Figure 10.4**

## Cancer of the Larynx

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-24	0	0.0%	~		0	0.0%	0	0.0%	0	0.0%	~	100.0%
25-44	~		~		8	25.8%	~		5	16.1%	~	100.0%
45-64	~		146	51.2%	93	32.6%	~		23	8.1%	285	100.0%
65+	16	5.0%	174	54.0%	85	26.4%	20	6.2%	27	8.4%	322	100.0%
Total	29	4.5%	336	52.5%	186	29.1%	34	5.3%	55	8.6%	640	100.0%

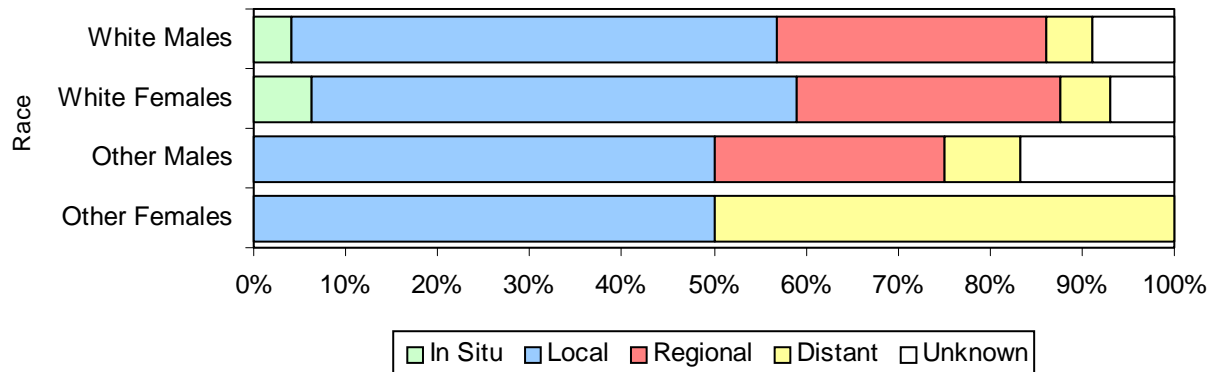
Figure 10.5

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Total may not add to 100% due to rounding.

## Cancer of the Larynx

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001

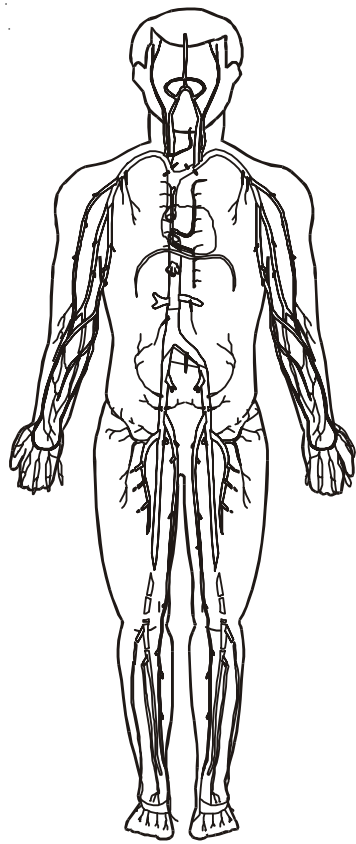


Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	21	4.2%	261	52.5%	146	29.4%	25	5.0%	44	8.9%	497	100.0%
White Females	8	6.2%	68	52.7%	37	28.7%	7	5.4%	9	7.0%	129	100.0%
Other Males	0	0.0%	~		~		~		~		~	100.0%
Other Females	0	0.0%	~		~		~		~		~	100.0%
Total	29	4.5%	336	52.5%	186	29.1%	34	5.3%	55	8.6%	640	100.0%

Figure 10.6

~ Suppressed due to small cell size  
Total may not add to 100% due to rounding.





## Chapter 11

**Leukemias**



# Leukemias

## Incidence and Mortality by Sex and Year

West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	129	14.9	89	10.8	91	7.9	68	6.0	220	11.1	157	8.0
1994	129	15.5	83	10.3	113	9.7	80	6.9	242	12.1	163	8.2
1995	130	15.6	104	12.7	116	9.8	88	7.2	246	12.2	192	9.5
1996	143	16.5	86	10.4	102	9.2	73	6.3	245	12.3	159	7.8
1997	153	17.9	101	11.8	96	8.4	73	6.1	249	12.3	174	8.5
1998	131	14.8	86	9.8	124	11.0	80	6.6	255	12.6	166	8.1
1999	150	17.4	96	11.1	125	10.7	78	6.4	275	13.5	174	8.4
2000	138	15.8	101	11.9	120	10.3	86	7.0	258	12.6	187	9.0
2001	139	15.6	90	10.4	101	8.7	75	6.1	240	11.6	165	7.9

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 11.1**

### Overview

- While leukemias occurred in all age groups in 1997-2001, incidence tended to increase with age. The highest average annual age-specific incidence (55.2 per 100,000) occurred among West Virginians 65 years of age and older (Figure 11.3).
- There are several types of leukemia. Different types predominate at different ages.
- Leukemia is one of the few cancers that occur in children. In 1997-2001, this disease was the most commonly diagnosed cancer in both males and females under age 15 (Table 1.2).
- State-specific data (1996-2000) rank West Virginia women highest in the nation and men fifth highest in age-adjusted mortality from leukemia (Appendix B). The reasons for this ranking are unclear.

### Risk Factors

- Causes of most cases are unknown.
- Persons with certain genetic abnormalities, such as Down's syndrome, are at increased risk of acute leukemias. Adults with a history of malignancies such as multiple myeloma, ovarian cancer, and Hodgkin's disease may be at increased risk for this disease as well.
- Cigarette smoking increases the risk for myeloid leukemia.
- Other risk factors include excessive exposure to ionizing radiation and certain chemicals such as benzene.
- Human T-cell leukemia/lymphoma virus I (HTLV-I) is associated with adult T-cell leukemia.

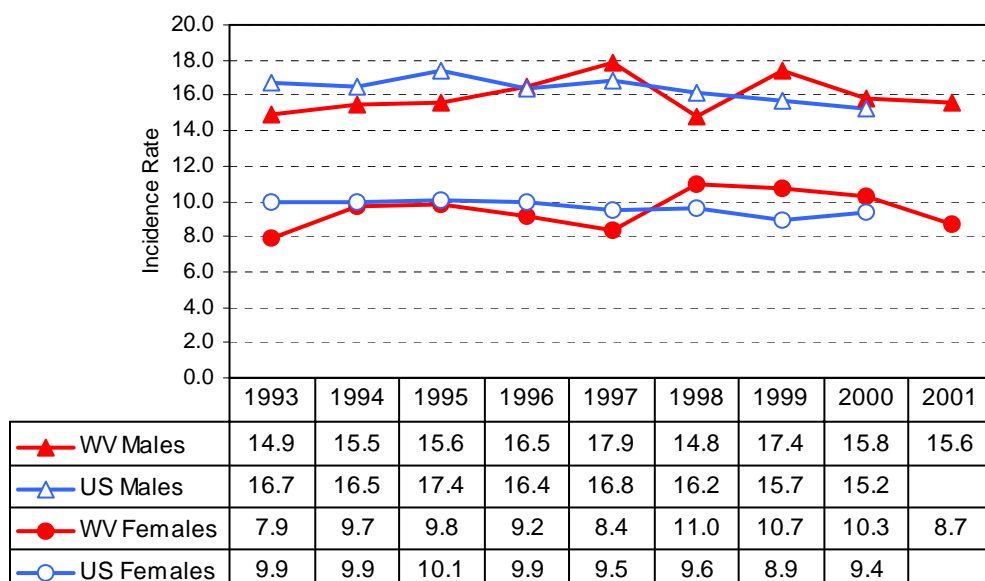
### Prevention

- Other than avoidance of the environmental and behavioral risks noted above, few effective methods of prevention or early detection are currently available.

## Leukemias

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



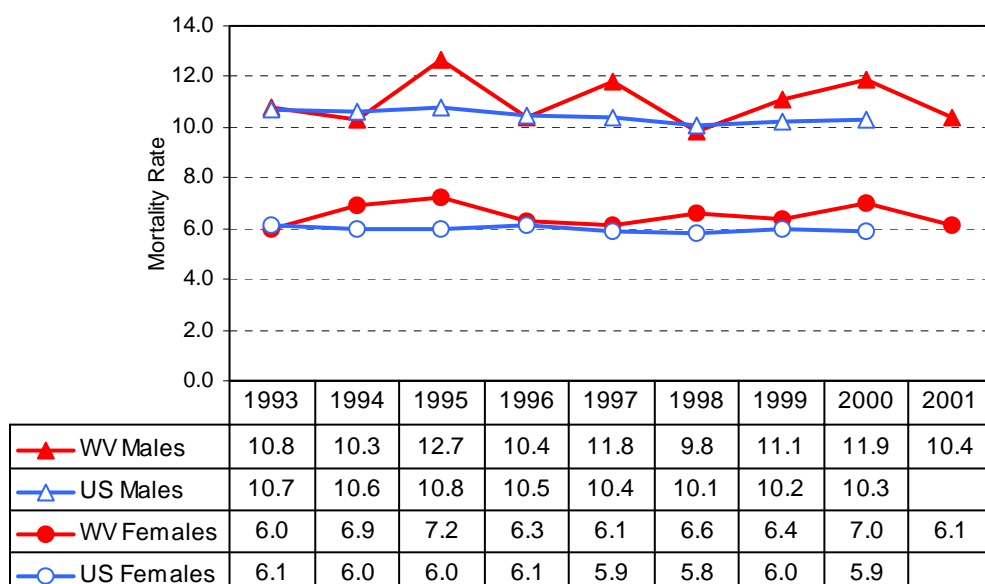
**Figure 11.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Leukemias

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



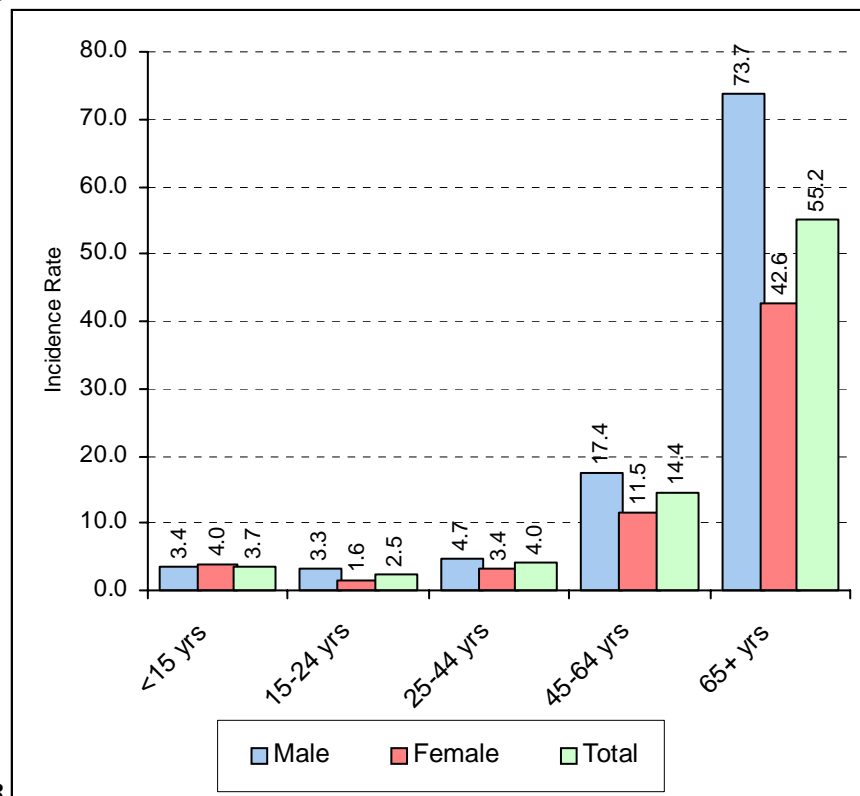
**Figure 11.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).



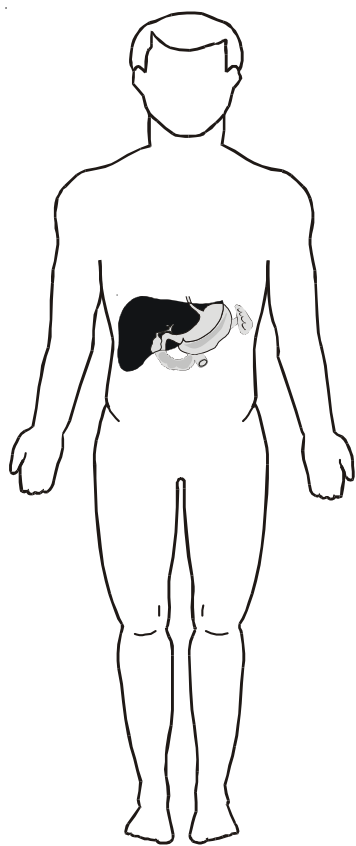
## Leukemias

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 11.3**

\*Five-year average annual rate per 100,000 West Virginia residents



## **Chapter 12**

**Cancer of the  
Liver & Intrahepatic Bile Duct**



# Cancer of the Liver & Intrahepatic Bile Duct

## Incidence and Mortality by Sex and Year

West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	26	3.1	35	4.3	26	2.2	41	3.3	52	2.6	76	3.7
1994	36	4.1	48	5.5	35	3.0	36	2.9	71	3.5	84	4.1
1995	42	4.5	44	4.8	33	2.7	36	2.9	75	3.6	80	3.8
1996	46	5.4	41	4.8	33	2.8	40	3.3	79	3.9	81	3.9
1997	63	7.3	57	6.7	32	2.6	29	2.4	95	4.6	86	4.2
1998	58	6.4	52	5.6	34	2.8	42	3.5	92	4.4	94	4.4
1999	48	5.5	45	4.9	32	2.5	29	2.3	80	3.8	74	3.5
2000	55	6.0	55	6.1	26	2.1	39	3.0	81	3.8	94	4.4
2001	50	5.4	49	5.4	28	2.3	30	2.4	78	3.6	79	3.7

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 12.1**

### Overview

- While cancer of the liver and intrahepatic bile duct occurred in all age groups in 1997-2001, incidence tended to increase with age. The highest average annual age-specific incidence (20.6 per 100,000) occurred among West Virginians 65 years of age and older (Figure 12.3).
- The average annual age-adjusted incidence rate in men (6.1 per 100,000) is more than twice that seen in women (2.5 per 100,000) (Figures 1.3 and 1.4).

### Risk Factors

- Chronic infection with certain types of viral hepatitis, including hepatitis B and C, is a very important risk factor for liver cancer. Cirrhosis, which can occur as a result of alcohol abuse or as a result of infection with hepatitis B and C, can also increase risk of liver cancer.
- Long-term exposure to aflatoxin, a fungus occurring in tropical and subtropical regions that can contaminate peanuts, wheat, soybeans, ground nuts, corn, and rice, increases risk of liver cancer.
- Exposure to vinyl chloride and thorium dioxide can increase risk of liver cancer. However, exposure of U.S. workers to vinyl chloride is now strictly regulated, and thorium dioxide is no longer used.
- Long-term use of anabolic steroids (male hormones used by some athletes to increase strength) can increase risk of liver cancer.

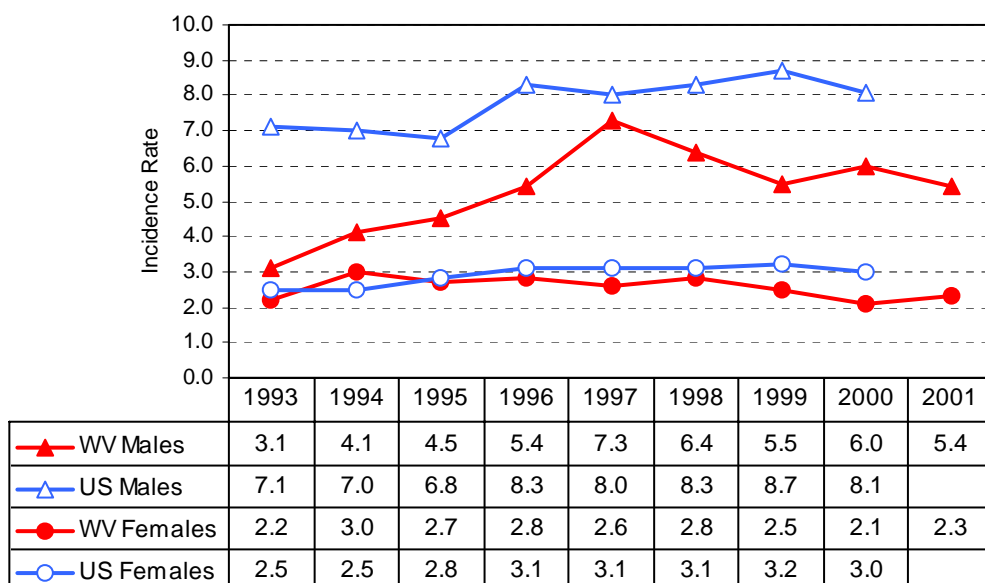
### Prevention

- Worldwide, infection with hepatitis B virus (HBV) and hepatitis C virus (HCV) is the most significant risk factor for liver cancer. Thus, public health measures aimed at reducing infection with HBV and HCV will help reduce liver cancer. Although there is a vaccine for HBV, there is not a vaccine at this time for HCV.
- Prevention of liver cancers associated with alcoholic cirrhosis remains challenging.

## Cancer of the Liver & Intrahepatic Bile Duct

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



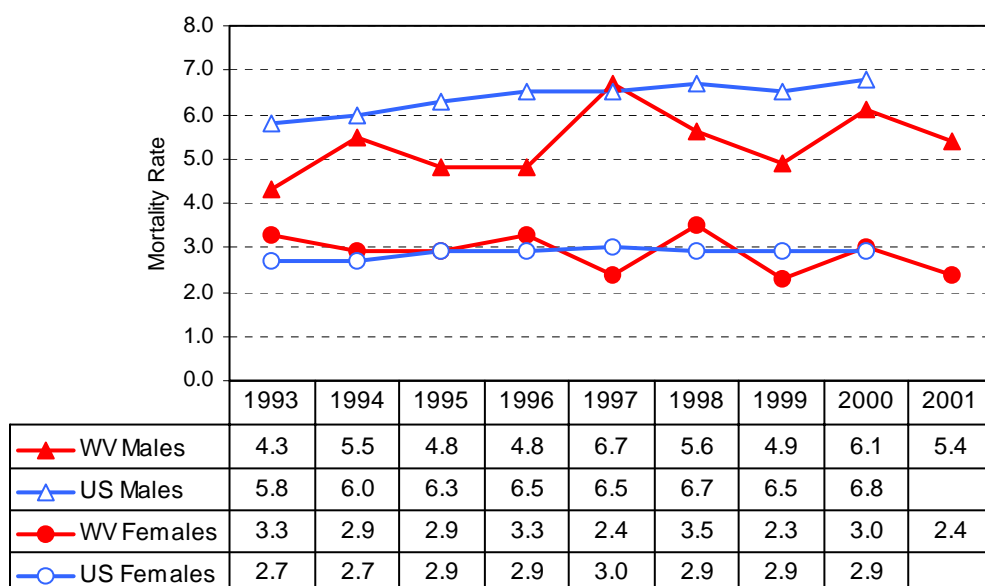
**Figure 12.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Liver & Intrahepatic Bile Duct

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

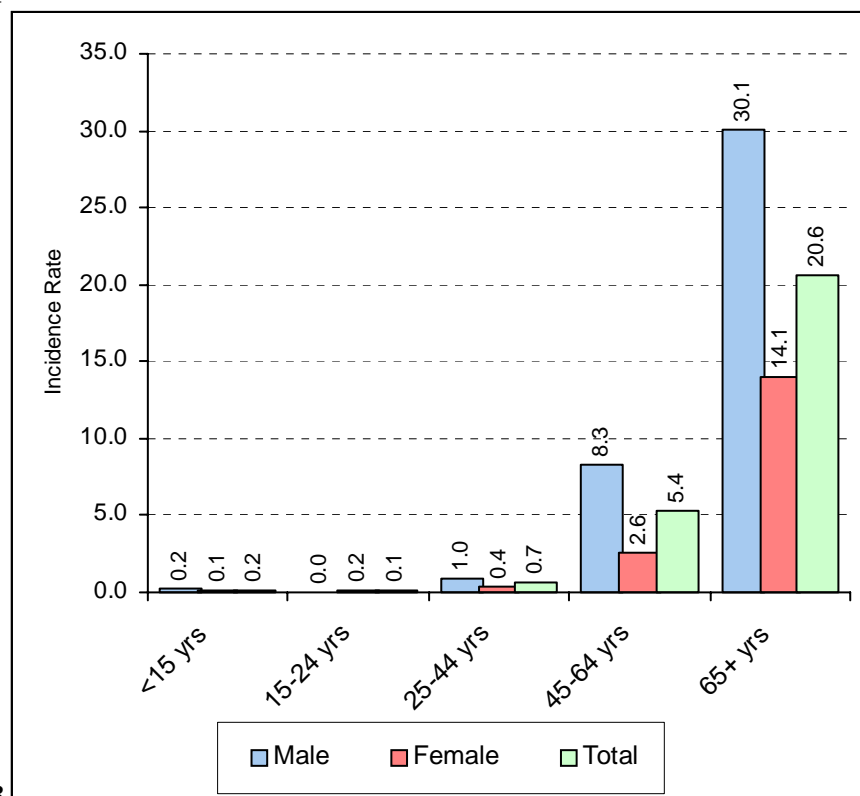


**Figure 12.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Liver & Intrahepatic Bile Duct

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 12.3**

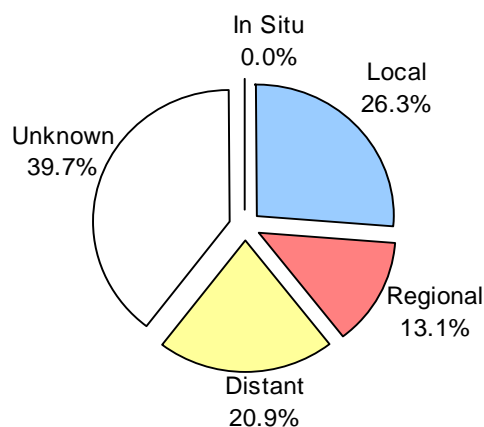
\*Five-year average annual rate per 100,000 West Virginia residents

Cancer of the Liver &  
Intrahepatic Bile Duct  
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
8170	Hepatocellular Carcinoma	52.3
8160	Cholangiocarcinoma	19.5
8000	Malignant Neoplasm	7.5
8140	Adenocarcinoma	6.1
8010	Carcinoma	5.6
8162	Klatskin's Tumor	2.1
8180	Combined Hepatocellular Carcinoma and Cholangiocarcinoma	1.4
8970	Hepatoblastoma	1.2

**Table 12.2**

Cancer of the Liver &  
Intrahepatic Bile Duct  
Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

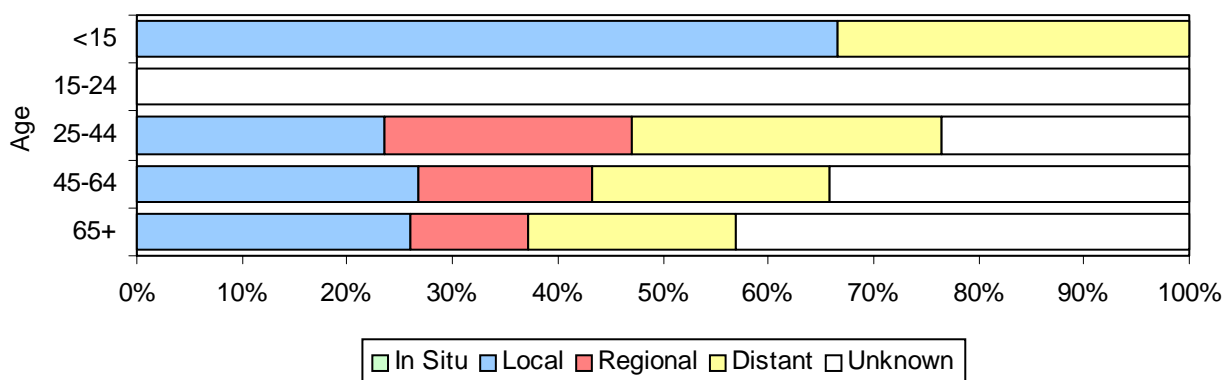


**Figure 12.4**

## Cancer of the Liver & Intrahepatic Bile Duct

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	~		0	0.0%	~		0	0.0%	~	100.0%
15-24	0	0.0%	0	0.0%	0	0.0%	0	0.0%	~		~	100.0%
25-44	0	0.0%	~		4	23.5%	~		~		17	100.0%
45-64	0	0.0%	32	26.7%	20	16.7%	27	22.5%	41	34.2%	120	100.0%
65+	0	0.0%	74	26.0%	32	11.2%	56	19.6%	123	43.2%	285	100.0%
Total	0	0.0%	112	26.3%	56	13.1%	89	20.9%	169	39.7%	426	100.0%

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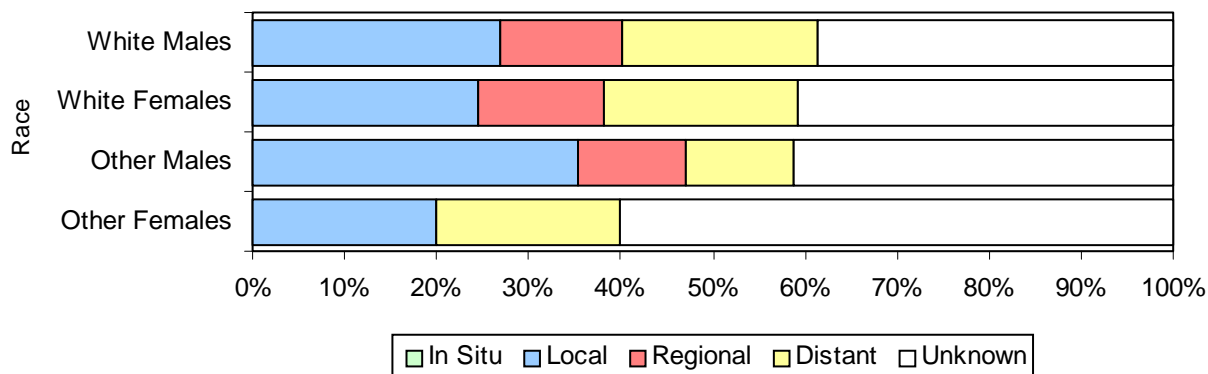
Total may not add to 100% due to rounding.

**Figure 12.5**

## Cancer of the Liver & Intrahepatic Bile Duct

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



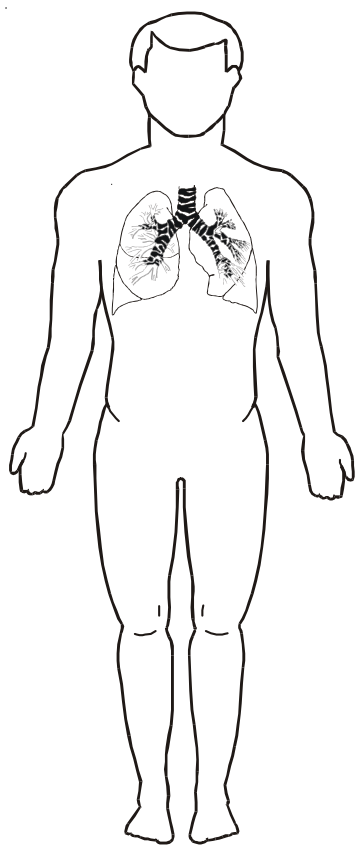
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	0	0.0%	69	26.8%	34	13.2%	55	21.4%	99	38.5%	257	100.0%
White Females	0	0.0%	36	24.5%	20	13.6%	31	21.1%	60	40.8%	147	100.0%
Other Males	0	0.0%	~		~		~		~		17	100.0%
Other Females	0	0.0%	~		~		~		~		5	100.0%
Total	0	0.0%	112	26.3%	56	13.1%	89	20.9%	169	39.7%	426	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 12.6**





## **Chapter 13**

# **Cancer of the Lung & Bronchus**





## Cancer of the Lung & Bronchus

### Incidence and Mortality by Sex and Year

West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	1,029	116.4	929	107.9	696	59.2	618	52.6	1,725	82.8	1,547	75.2
1994	1,088	122.3	958	109.5	717	60.5	585	49.2	1,805	85.8	1,543	74.1
1995	1,116	125.4	935	106.1	702	58.7	582	48.9	1,818	86.2	1,517	72.3
1996	1,101	122.5	904	102.6	794	66.6	591	48.9	1,895	89.5	1,495	70.6
1997	1,200	132.8	953	108.4	810	68.2	631	52.6	2,010	95.0	1,584	74.9
1998	1,156	127.6	978	109.0	836	69.6	615	50.8	1,992	93.3	1,593	74.9
1999	1,175	126.9	929	103.0	833	69.5	648	53.6	2,008	93.7	1,577	73.8
2000	1,121	121.7	937	103.5	813	67.1	633	51.6	1,934	89.7	1,570	73.2
2001	1,070	114.3	865	95.5	854	70.2	682	55.8	1,924	88.9	1,547	72.5

Number of new cases excludes in situ cases.

**Table 13.1**

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

### Overview

- Each year from 1993 through 2001, approximately 1,900 West Virginians were diagnosed with cancer of the lung and bronchus, making this the state's most commonly diagnosed cancer. This cancer accounted for almost one in every five invasive cancers diagnosed in West Virginia residents (Tables 1.1 and 13.1).
- During 1997-2001, cancer of the lung and bronchus occurred almost twice as often among West Virginia men as among West Virginia women (124.6 per 100,000 West Virginia men and 68.9 per 100,000 West Virginia women) (Figures 1.3 and 1.4).
- The highest incidence of lung cancer in West Virginia during 1997-2001 occurred in the southwestern region of the state (Figure 13.7). These same counties have some of the highest prevalences of current cigarette smoking reported in the West Virginia Behavioral Risk Factor Surveillance System survey (WVBRFSS, 2001).
- In 1997-2001, cancer of the lung and bronchus remained the leading cause of cancer-related death in West Virginia for both men and women. Cancer of the lung and bronchus accounted for approximately one of every three deaths due to cancer in West Virginia (Tables 1.1 and 13.1).
- State-specific data during 1996-2000 rank West Virginia fifth highest for men and third highest for women in age-adjusted mortality for cancer of the lung and bronchus among the 50 states and the District of Columbia. West Virginia mortality rates for both men and women were over 25% higher than national rates. Lung and bronchial cancers are the primary contributor to West Virginia's higher-than-U.S.-average all-site cancer mortality (Appendix B).

### Risk Factors

- Smoking is the most important risk factor for cancer of the lung and bronchus.
- Other risk factors include exposure to arsenic, certain organic chemicals, asbestos, radon, radiation, and environmental tobacco smoke.

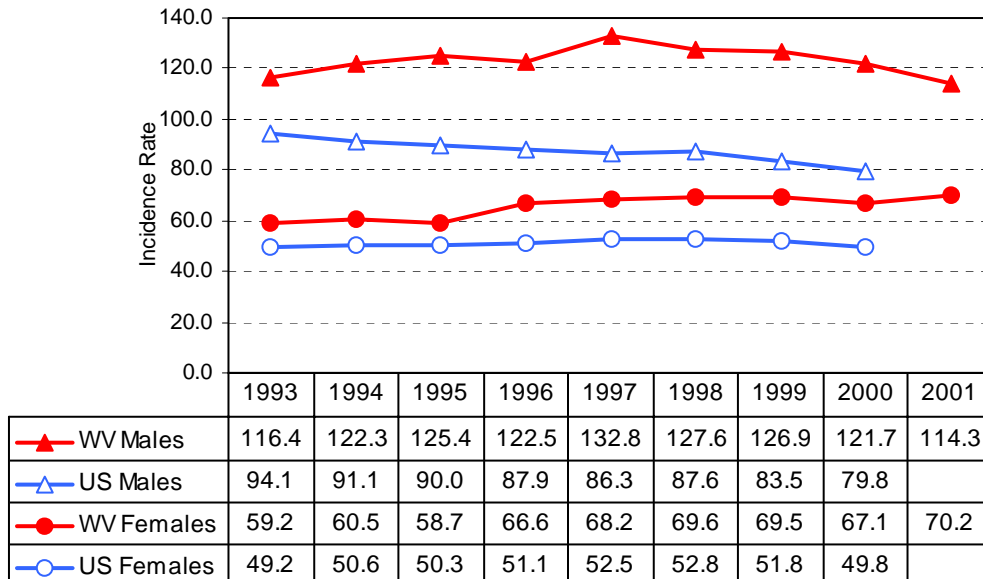
### Prevention

- Quitting smoking substantially reduces the risk of lung cancer.

## Cancer of the Lung & Bronchus

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



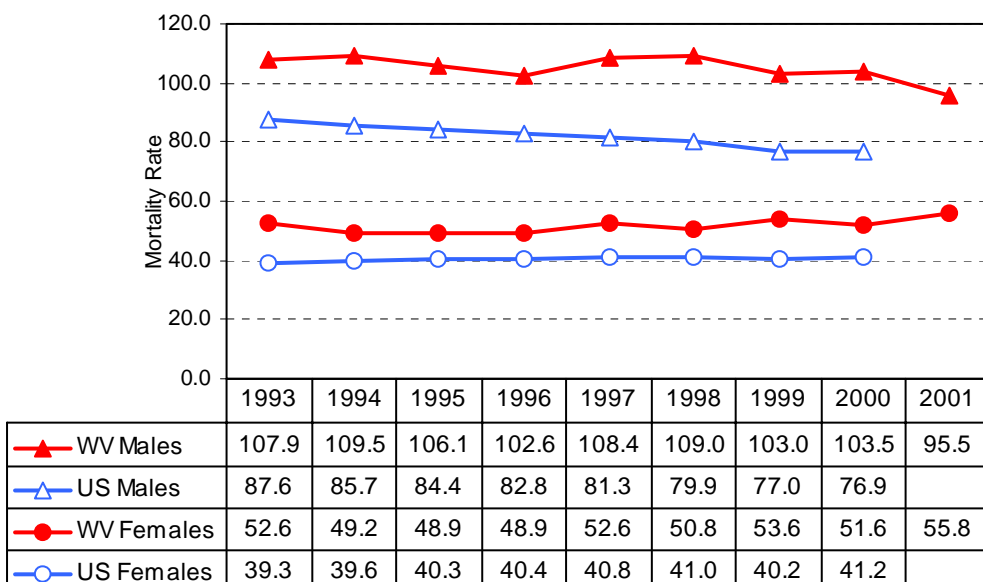
**Figure 13.1**

\* Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Lung & Bronchus

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

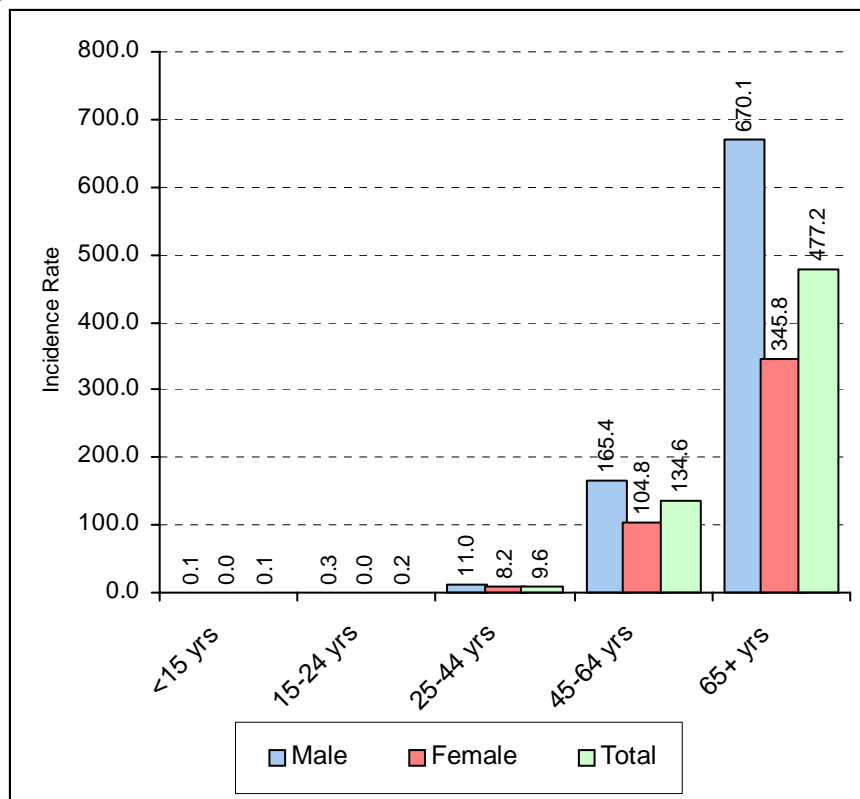


**Figure 13.2**

\* Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Lung & Bronchus

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 13.3**

\*Five-year average annual rate per 100,000 West Virginia residents

## Cancer of the Lung & Bronchus

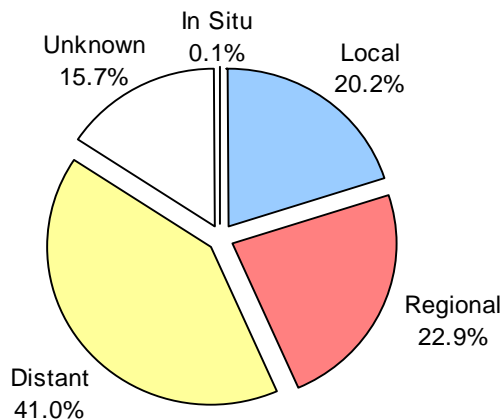
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
807	Squamous Cell Carcinoma	23.6
814	Adenocarcinoma	21.1
801	Carcinoma	19.8
804	Small Cell Carcinoma	18.5
800	Malignant Neoplasm	10.4
825	Alveolar Carcinoma	2.6
824	Carcinoid Tumor	1.2

**Table 13.2**

## Cancer of the Lung & Bronchus

Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

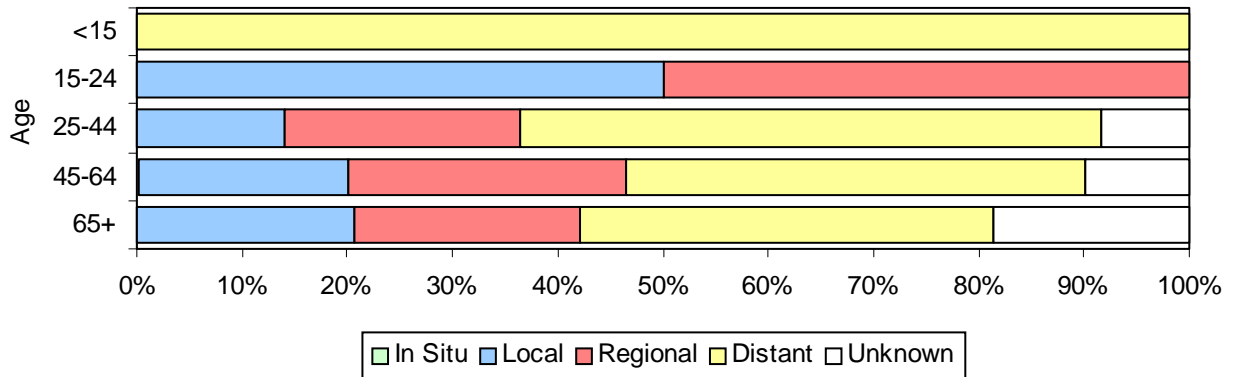


**Figure 13.4**

## Cancer of the Lung & Bronchus

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	0	0.0%	~		0	0.0%	~	100.0%
15-24	0	0.0%	~		~		0	0.0%	0	0.0%	~	100.0%
25-44	0	0.0%	~		~		~		20	8.3%	241	100.0%
45-64	6	0.2%	600	19.9%	793	26.3%	1,320	43.8%	295	9.8%	3,014	100.0%
65+	5	0.1%	1,362	20.6%	1,417	21.4%	2,601	39.3%	1,236	18.7%	6,621	100.0%
Total	11	0.1%	1,997	20.2%	2,265	22.9%	4,055	41.0%	1,551	15.7%	9,879	100.0%

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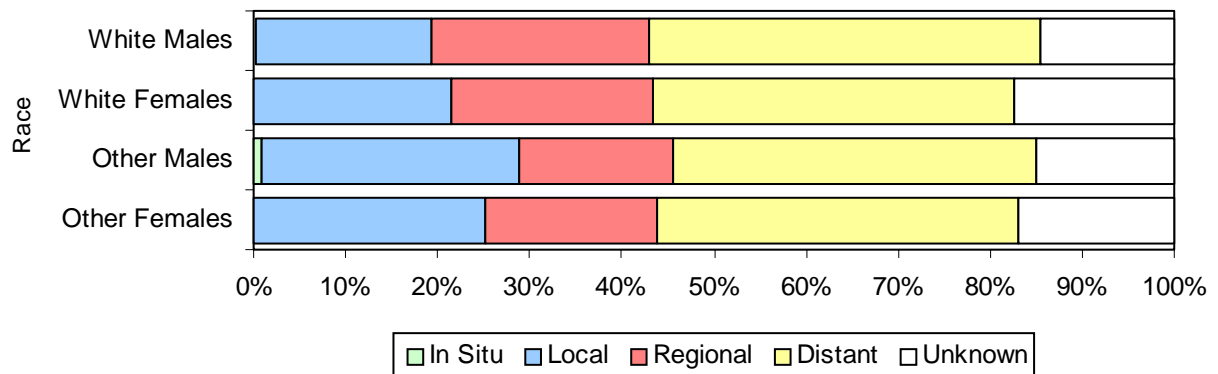
Total may not add to 100% due to rounding.

**Figure 13.5**

## Cancer of the Lung & Bronchus

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	8	0.1%	1,071	19.1%	1,336	23.8%	2,379	42.4%	816	14.5%	5,610	100.0%
White Females	~		865	21.4%	889	22.0%	1,586	39.2%	~		4,041	100.0%
Other Males	~		34	28.1%	20	16.5%	48	39.7%	~		121	100.0%
Other Females	0	0.0%	27	25.2%	20	18.7%	42	39.3%	18	16.8%	107	100.0%
Total	11	0.1%	1,997	20.2%	2,265	22.9%	4,055	41.0%	1,551	15.7%	9,879	100.0%

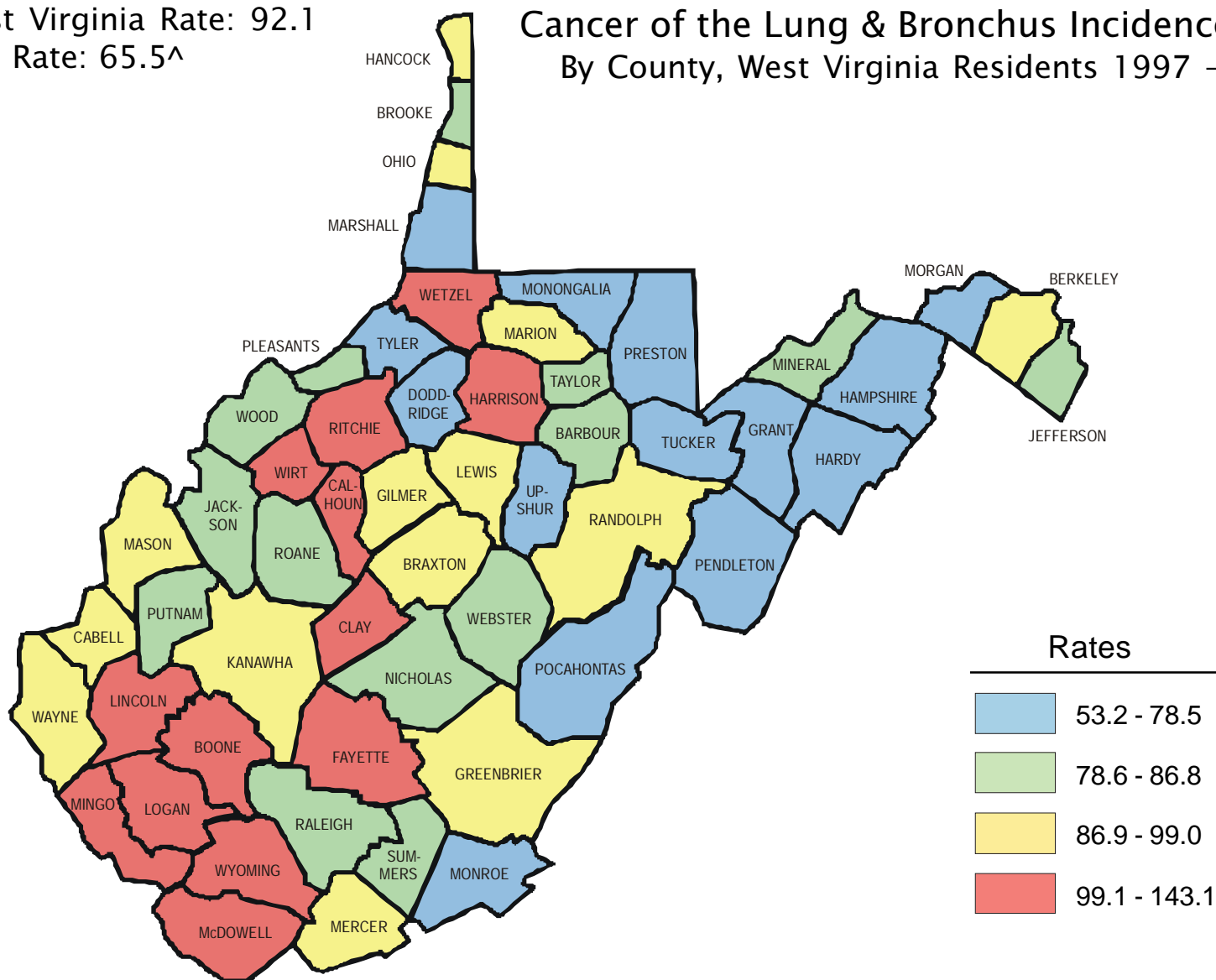
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Total may not add to 100% due to rounding.

**Figure 13.6**

West Virginia Rate: 92.1  
U.S. Rate: 65.5<sup>^</sup>

## Cancer of the Lung & Bronchus Incidence Rates\* By County, West Virginia Residents 1997 – 2001



\* Five-year average annual rate per 100,000 West Virginia residents, age-adjusted to the 2000 U.S. standard population.

<sup>^</sup> U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

Refer to Table 13.3 for individual county rates and measures of statistical significance.

**Figure 13.7**

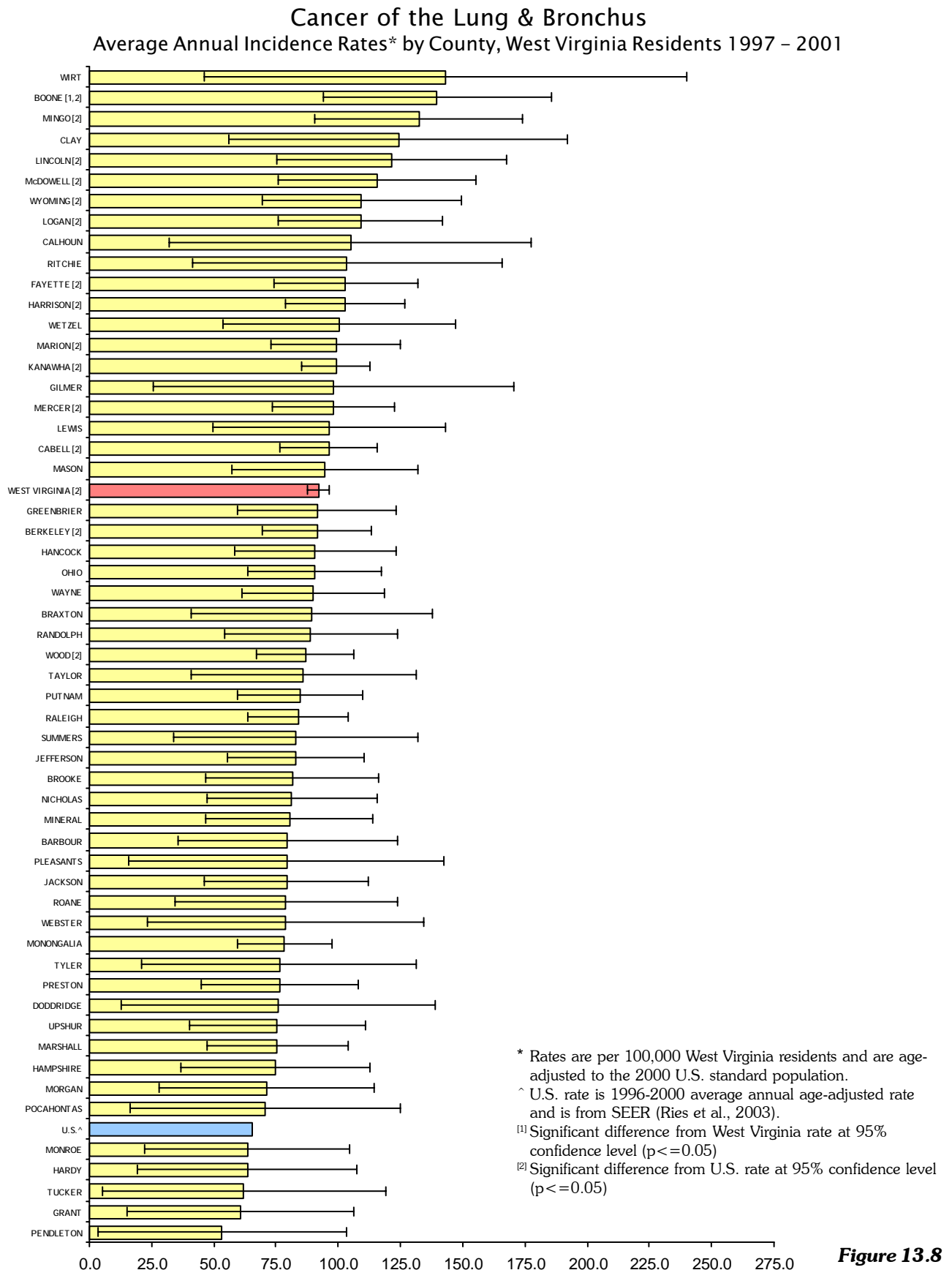


Figure 13.8

# Cancer of the Lung & Bronchus

## Average Annual Incidence Rates\* by County, West Virginia Residents 1997 – 2001

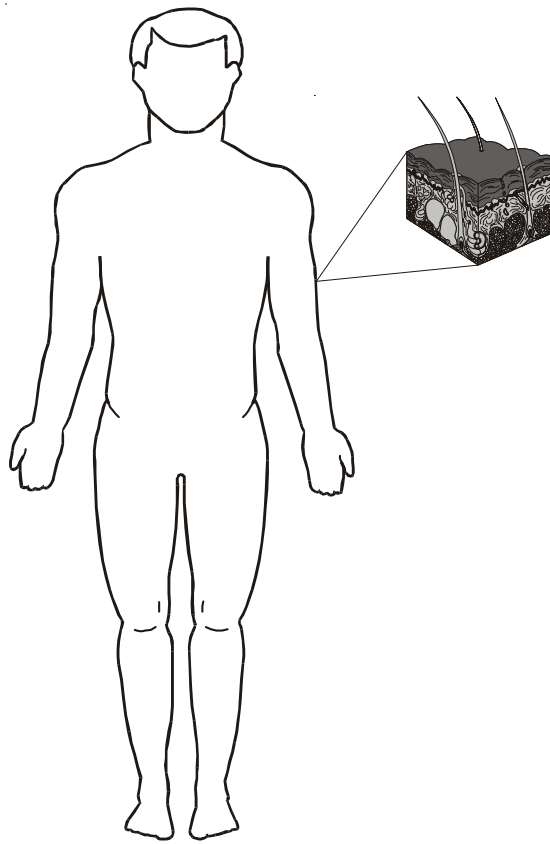
COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>		COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>	
			WV	U.S.				WV	U.S.
BARBOUR	75	79.6	No	No	MINGO	193	132.3	No	YES
BERKELEY	325	91.5	No	YES	MONONGALIA	274	78.5	No	No
BOONE	193	139.7	YES	YES	MONROE	56	63.4	No	No
BRAXTON	78	89.2	No	No	MORGAN	67	71.1	No	No
BROOKE	140	81.5	No	No	NICHOLAS	128	81.4	No	No
CABELL	559	96.1	No	YES	OHIO	295	90.5	No	No
CALHOUN	50	104.9	No	No	PENDLETON	29	53.2	No	No
CLAY	69	124.1	No	No	PLEASANTS	35	79.3	No	No
DODDRIDGE	33	76.0	No	No	POCAHONTAS	42	70.6	No	No
FAYETTE	303	103.0	No	YES	PRESTON	131	76.2	No	No
GILMER	41	98.1	No	No	PUTNAM	207	84.6	No	No
GRANT	41	60.6	No	No	RALEIGH	396	84.0	No	No
GREENBRIER	214	91.5	No	No	RANDOLPH	149	88.9	No	No
HAMPSHIRE	86	74.9	No	No	RITCHIE	65	103.4	No	No
HANCOCK	205	90.7	No	No	ROANE	71	79.1	No	No
HARDY	47	63.4	No	No	SUMMERS	79	82.9	No	No
HARRISON	445	102.8	No	YES	TAYLOR	84	86.1	No	No
JACKSON	131	79.3	No	No	TUCKER	31	62.1	No	No
JEFFERSON	165	82.8	No	No	TYLER	47	76.3	No	No
KANAWHA	1,241	99.0	No	YES	UPSHUR	100	75.6	No	No
LEWIS	101	96.2	No	No	WAYNE	222	89.9	No	No
LINCOLN	142	121.5	No	YES	WEBSTER	46	78.7	No	No
LOGAN	237	108.9	No	YES	WETZEL	113	100.4	No	No
MARION	373	99.0	No	YES	WIRT	44	143.1	No	No
MARSHALL	169	75.6	No	No	WOOD	463	86.8	No	YES
MASON	148	94.8	No	No	WYOMING	161	109.4	No	YES
MCDOWELL	196	115.6	No	YES					
MERCER	402	98.0	No	YES	WEST VIRGINIA	9,868	92.1		YES
MINERAL	131	80.3	No	No	U.S.^		65.5		

\* Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

^ U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

+ Difference between county rate and West Virginia rate, and county rate and U.S. rate, is tested for statistical significance at the 95% confidence level ( $p < 0.05$ ).

**Table 13.3**



## Chapter 14

# Melanoma of the Skin





## Melanoma of the Skin

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	106	12.5	33	3.7	97	9.1	31	2.9	203	10.4	64	3.3
1994	105	12.1	34	4.1	93	8.9	23	2.1	198	10.2	57	2.9
1995	109	12.2	30	3.5	94	9.1	25	2.2	203	10.3	55	2.8
1996	149	16.5	35	4.2	139	13.3	23	2.1	288	14.7	58	3.0
1997	160	18.5	44	4.9	128	12.2	28	2.6	288	14.6	72	3.6
1998	159	17.7	40	4.6	147	14.1	15	1.3	306	15.6	55	2.7
1999	176	19.3	32	3.5	119	11.4	37	3.3	295	14.7	69	3.4
2000	174	18.8	41	4.8	132	12.5	24	2.1	306	15.1	65	3.2
2001	180	19.5	33	3.5	134	12.9	17	1.5	314	15.7	50	2.5

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 14.1**

### Overview

- During 1997-2001, melanoma of the skin occurred in all age groups. Incidence increased with age, with the highest age-specific incidence rate (43.3 per 100,000) among individuals 65 years of age and older. Under age 65, gender differences in incidence were unremarkable. For the 65-and-older age group, incidence was two times higher in males than in females (Figure 14.3).
- Eighty-five percent (85%) of 1997-2001 West Virginia melanomas were diagnosed at an in situ or local stage. Stage was not reported for 7% of melanomas (Figure 14.4).
- Mortality rates from melanoma in West Virginia were not significantly different from the national average (Appendix B).

### Risk Factors

- Risk is increased by excessive exposure to ultraviolet radiation; fair complexion; occupational exposure to coal tar, pitch, creosote, arsenic compounds, or radium; family history; and multiple nevi or atypical nevi (ACS, 2003a).

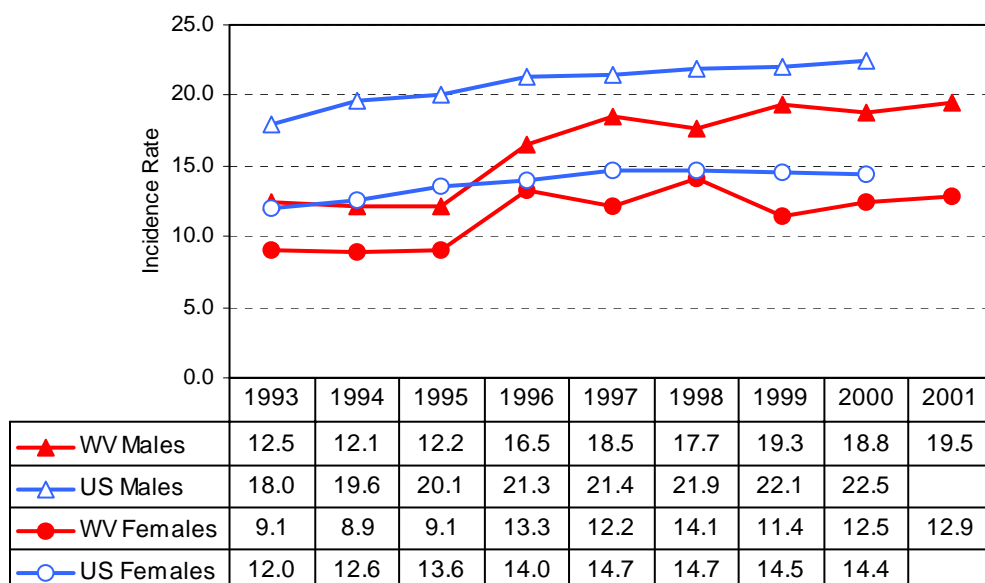
### Prevention

- Avoid direct sun exposure when ultraviolet rays are strongest (10 a.m. to 4 p.m.). Wear hats, protective clothing, and sunscreens (15 SPF or higher) when potentially exposed. This is especially important for children.
- Inspect skin regularly and have suspicious skin lesions evaluated by a medical provider.

## Melanoma of the Skin

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



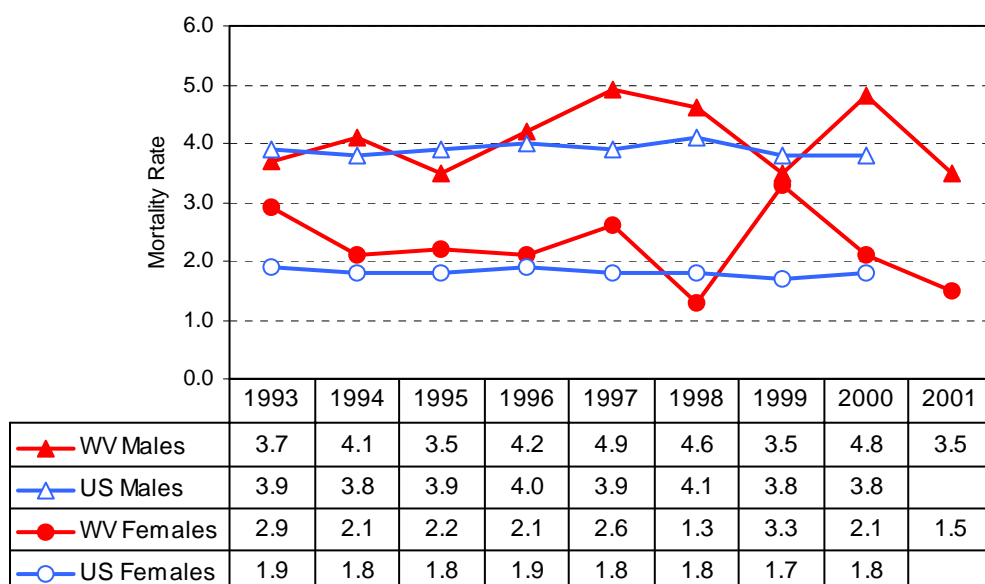
**Figure 14.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Melanoma of the Skin

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

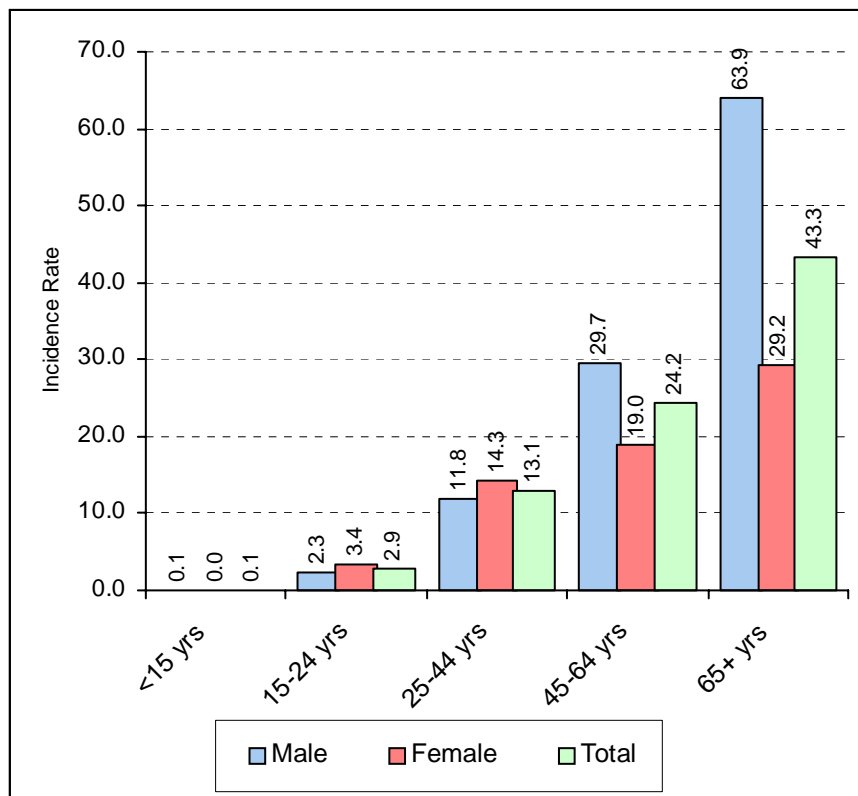


**Figure 14.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Melanoma of the Skin

### Incidence Rates\*, Age-Specific West Virginia Residents 1997 – 2001



**Figure 14.3**

\*Five-year average annual rate per 100,000 West Virginia residents

## Melanoma of the Skin

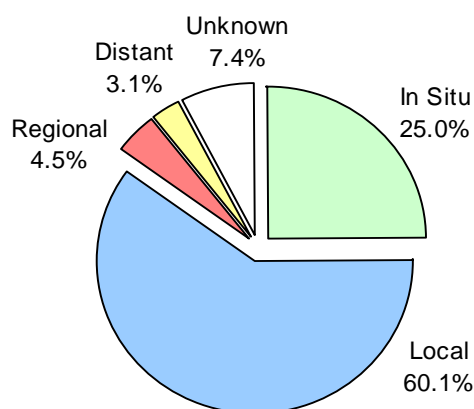
### Most Frequent Histologies West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
8720	Malignant Melanoma	49.8
8743	Superficial Spreading Melanoma	28.9
8721	Nodular Melanoma	8.4
8742	Melanoma in Hutchinson's Melanotic Freckle	7.9
8772	Spindle Cell Melanoma	1.3
8745	Desmoplastic Melanoma	1.0

**Table 14.2**

## Melanoma of the Skin

### Stage of Disease at Diagnosis West Virginia Residents 1997 – 2001

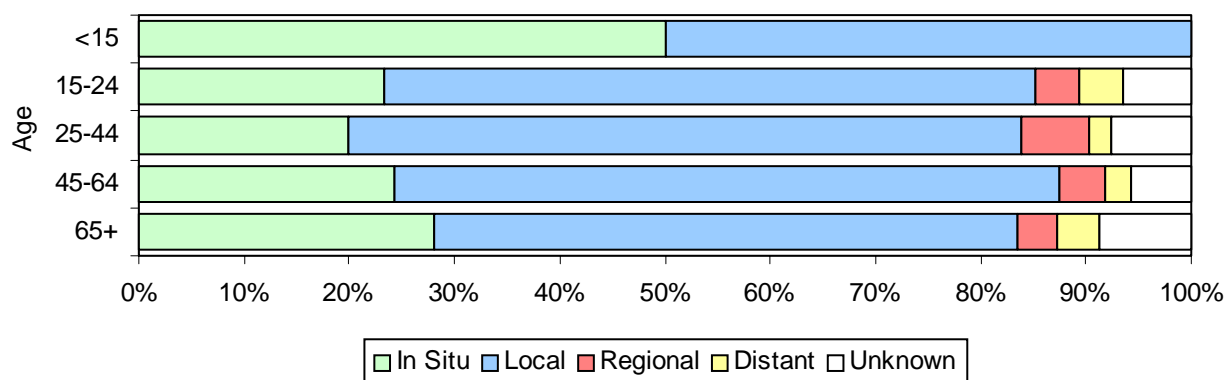


**Figure 14.4**

## Melanoma of the Skin

### Stage of Disease at Diagnosis by Age

#### West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	~		~		0	0.0%	0	0.0%	0	0.0%	~	100.0%
15-24	~		~		~		~		~		~	100.0%
25-44	82	20.0%	263	64.0%	~		~		~		411	100.0%
45-64	174	24.3%	453	63.3%	30	4.2%	18	2.5%	41	5.7%	716	100.0%
65+	234	28.1%	462	55.4%	32	3.8%	33	4.0%	73	8.8%	834	100.0%
Total	502	25.0%	1,208	60.1%	90	4.5%	62	3.1%	148	7.4%	2,010	100.0%

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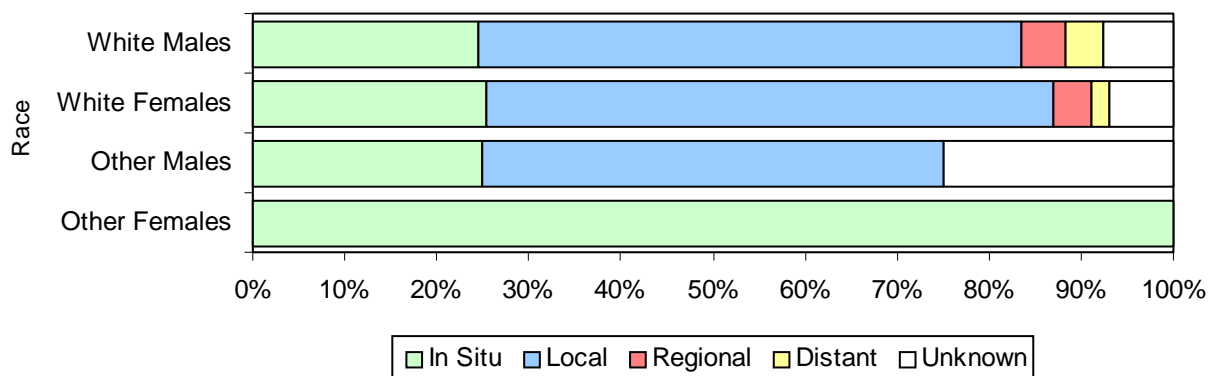
Total may not add to 100% due to rounding.

**Figure 14.5**

## Melanoma of the Skin

### Stage of Disease at Diagnosis by Race and Sex

#### West Virginia Residents 1997 – 2001



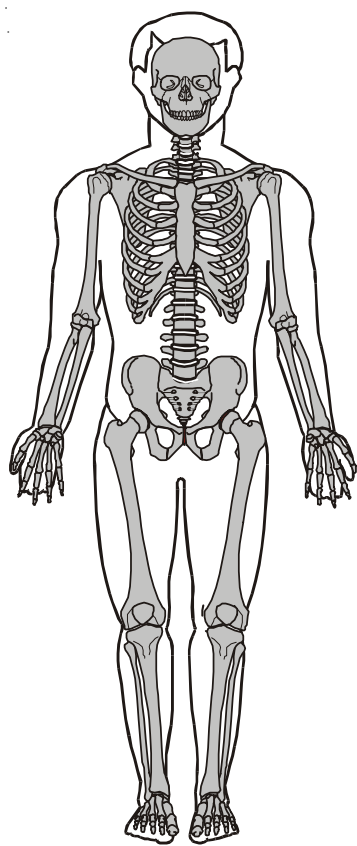
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	275	24.6%	661	59.0%	53	4.7%	46	4.1%	85	7.6%	1,120	100.0%
White Females	225	25.4%	545	61.6%	37	4.2%	16	1.8%	62	7.0%	885	100.0%
Other Males	~		~		0	0.0%	0	0.0%	~		~	100.0%
Other Females	~		~		0	0.0%	0	0.0%	~		~	100.0%
Total	502	25.0%	1,208	60.1%	90	4.5%	62	3.1%	148	7.4%	2,010	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 14.6**





## Chapter 15

## Multiple Myeloma



## Multiple Myeloma

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	58	7.0	42	5.0	50	4.2	35	2.9	108	5.3	77	3.8
1994	62	7.3	52	6.2	54	4.7	35	2.9	116	5.7	87	4.2
1995	72	8.5	48	5.9	56	4.5	38	3.1	128	6.1	86	4.2
1996	65	7.6	50	6.0	48	4.1	42	3.4	113	5.5	92	4.4
1997	57	6.5	42	4.9	47	3.9	36	2.9	104	4.9	78	3.8
1998	67	7.5	53	6.1	51	4.1	31	2.5	118	5.6	84	4.0
1999	47	5.3	40	4.7	47	3.8	50	4.0	94	4.4	90	4.2
2000	39	4.2	31	3.5	53	4.3	31	2.5	92	4.3	62	2.9
2001	63	6.9	39	4.5	50	4.1	29	2.4	113	5.2	68	3.2

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 15.1**

### Overview

- About 100 West Virginians were diagnosed with multiple myeloma each year from 1993 through 2001. Like many other cancers, more men were diagnosed with this disease than women (Table 15.1).
- In 1997-2001, almost all new cases occurred after the age of 40. Incidence increased sharply with age. The age-specific incidence for individuals aged 65 and older was nearly five times that of 45-64 year olds (Figure 15.3).
- About 80 West Virginians died of this disease each year from 1993 through 2001 (Table 15.1). As with incidence, mortality from multiple myeloma increased with increasing age and occurred more commonly in men than in women.

### Risk Factors

- Multiple myeloma is about twice as common in blacks as in whites. The reason for this is unknown.
- Little is known about the etiology of multiple myeloma.

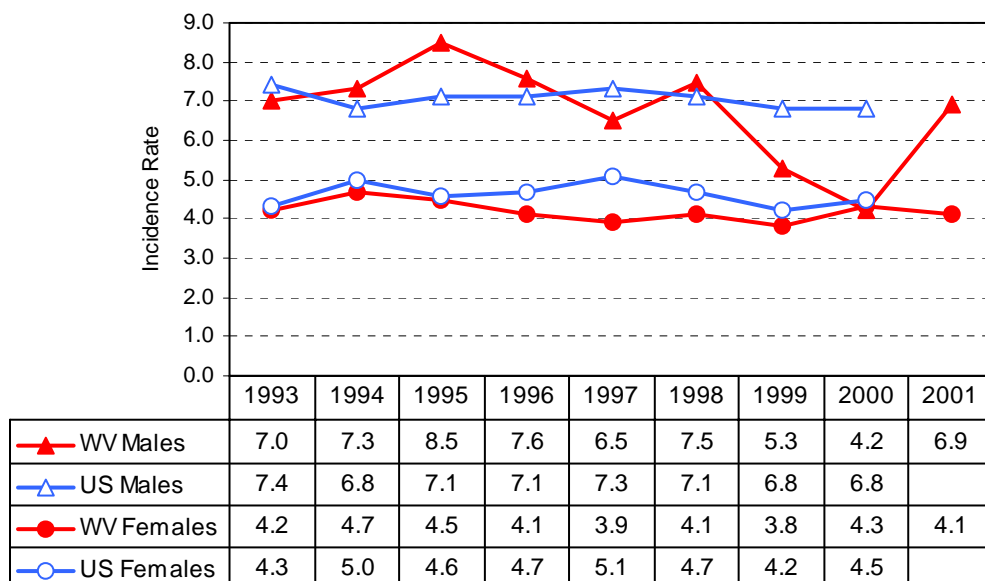
### Prevention

- No effective methods of early detection or prevention are currently available.

## Multiple Myeloma

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



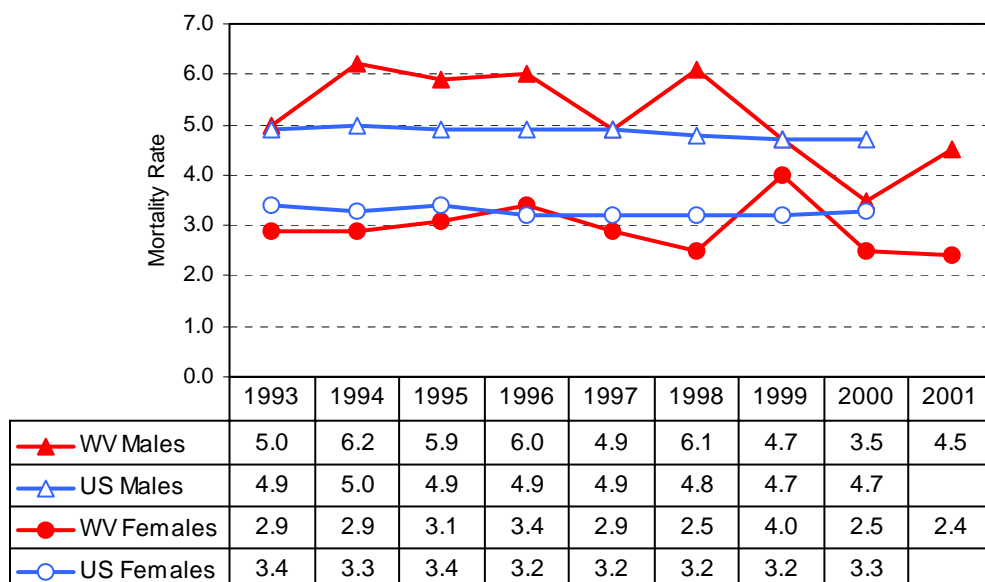
**Figure 15.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Multiple Myeloma

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



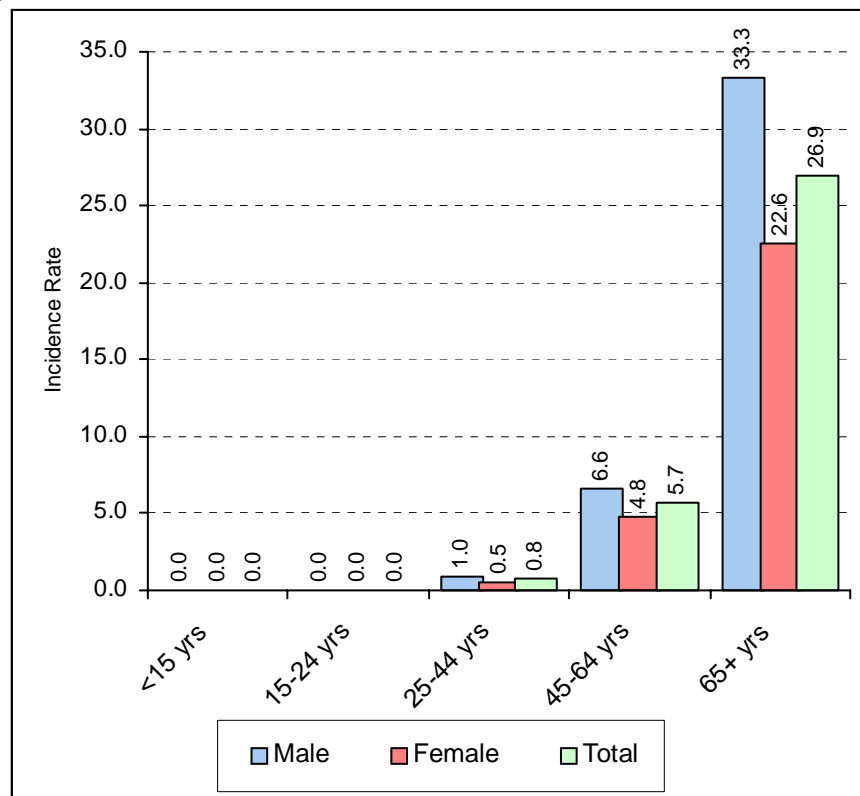
**Figure 15.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).



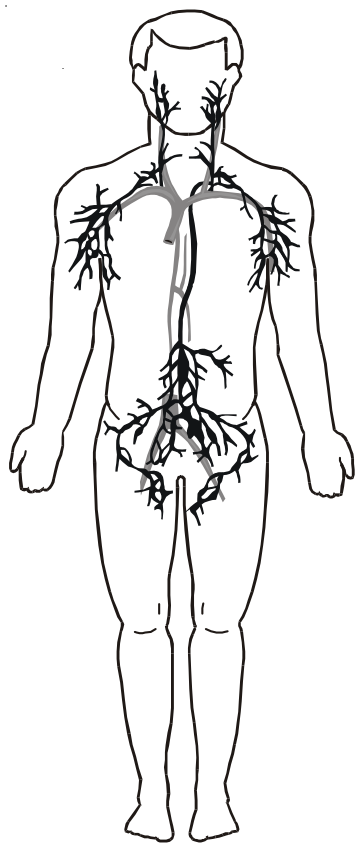
## Multiple Myeloma

### Incidence Rates\*, Age-Specific West Virginia Residents 1997 – 2001



**Figure 15.3**

\*Five-year average annual rate per 100,000 West Virginia residents



## Chapter 16

# Non-Hodgkin's Lymphoma



## Non-Hodgkin's Lymphoma

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	157	18.7	85	10.2	155	13.4	86	7.0	312	15.6	171	8.5
1994	155	17.9	87	10.3	162	13.8	78	6.5	317	15.7	165	8.1
1995	184	21.3	75	8.5	178	15.2	93	7.7	362	17.7	168	8.2
1996	182	20.7	92	10.7	191	16.2	86	7.0	373	18.1	178	8.5
1997	166	19.0	107	12.6	197	16.6	97	7.8	363	17.6	204	9.8
1998	206	23.0	102	11.6	201	17.3	87	7.1	407	19.7	189	9.1
1999	203	22.6	81	9.2	205	17.4	79	6.3	408	19.5	160	7.6
2000	169	19.0	69	7.8	187	15.8	92	7.5	356	17.0	161	7.7
2001	203	21.8	86	9.7	174	14.5	85	6.8	377	17.7	171	8.0

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 16.1**

### Overview

- Although non-Hodgkin's lymphoma occurred in all age groups, incidence increased with age. The highest age-specific incidence rate (83.6 per 100,000) occurred in the 65-and-older age group (Figure 16.3).
- Twenty-nine percent (29%) of all non-Hodgkin's lymphomas were diagnosed with local disease. Fourteen percent (14%) had regional and 41% distant disease. Stage was not reported in 16% of cases (Figure 16.4).
- Each year from 1993 through 2001, incidence in West Virginia males was higher than that in females (Figure 16.1).
- According to 1996-2000 SEER data, West Virginia mortality rates for non-Hodgkin's lymphoma were not significantly different from U.S. rates (Appendix B).

### Risk Factors

- Risk factors for non-Hodgkin's lymphomas are largely unknown.
- Individuals with reduced immune function such as organ transplant recipients, individuals with primary immunodeficiencies, or those with AIDS are at increased risk of disease.
- Exposure to human T-cell leukemia/lymphoma virus (HTLV-1) increases risk.
- Exposure to herbicides, industrial solvents, radiation, or vinyl chloride may possibly be a risk factor for this disease.
- Infection with *Helicobacter pylori* may also be a risk factor for non-Hodgkin's lymphoma of the stomach.

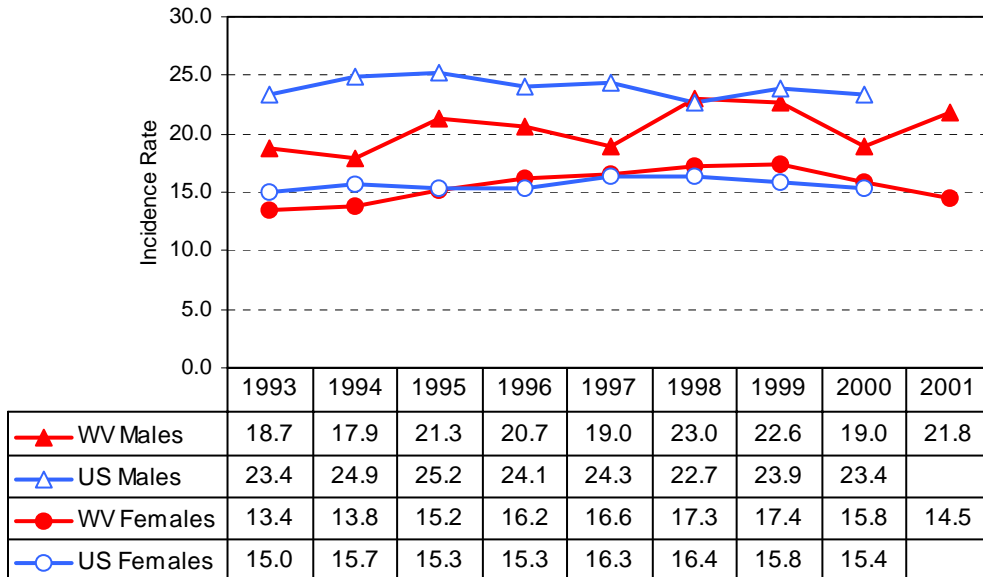
### Prevention

- Few effective prevention or early detection methods are currently available. The most preventable cause of non-Hodgkin's lymphoma is infection with HIV.

## Non-Hodgkin's Lymphoma

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



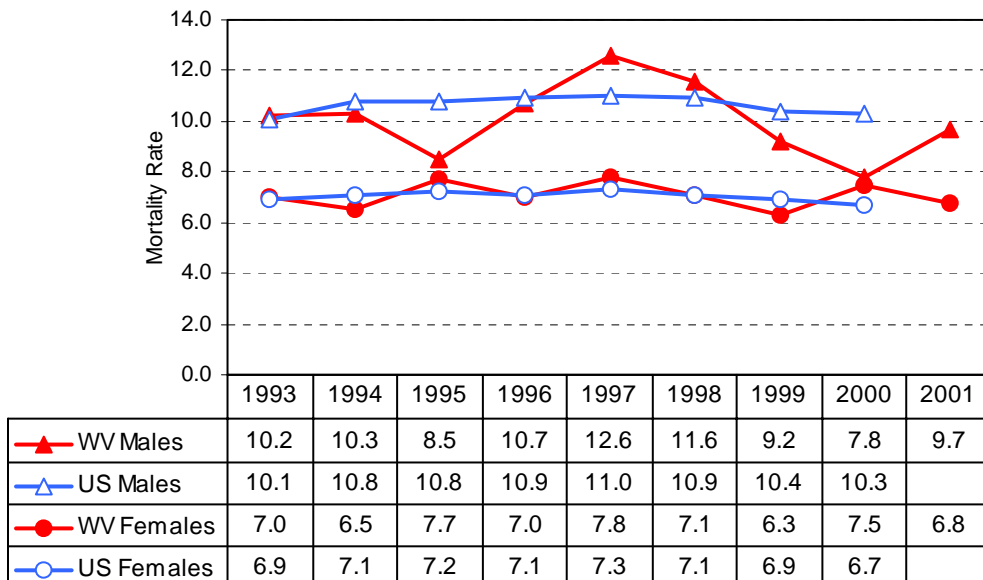
**Figure 16.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Non-Hodgkin's Lymphoma

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

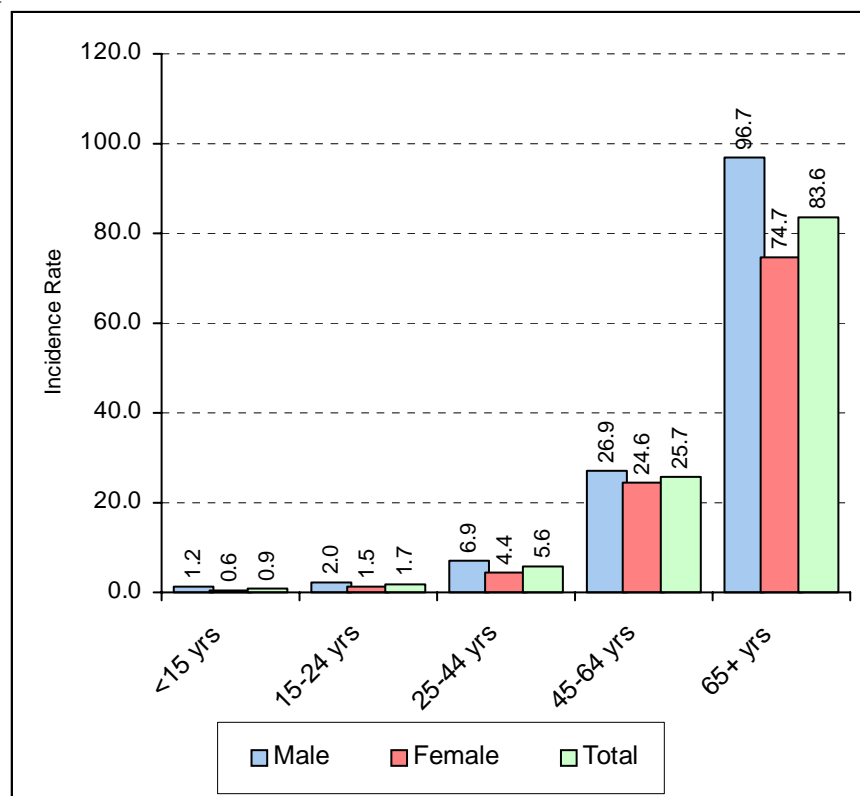


**Figure 16.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Non-Hodgkin's Lymphoma

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 16.3**

\*Five-year average annual rate per 100,000 West Virginia residents

## Non-Hodgkin's Lymphoma

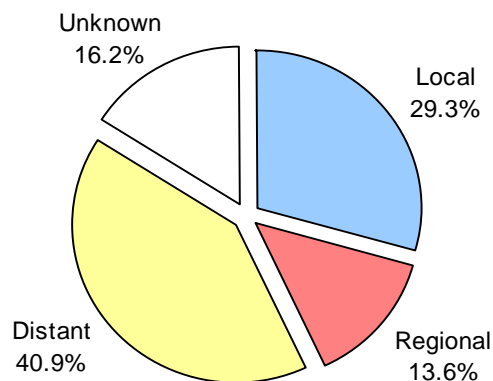
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
9680	Lymphoma, Large Cell Diffuse, NOS	31.4
9590	Lymphoma, NOS	13.3
9591	Lymphoma, Non-Hodgkin's, NOS	11.4
9670	Lymphoma, Small Lymphocytic	9.2
9695	Lymphoma, Small Cleaved Cell, Follicular	6.2
9691	Lymphoma, Mixed Small Cleaved and Large Cell, Follicular	5.9
9690	Lymphoma, Follicular, NOS	4.2
9699	Marginal Zone B-cell Lymphoma, NOS	3.0

**Table 16.2**

## Non-Hodgkin's Lymphoma

Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

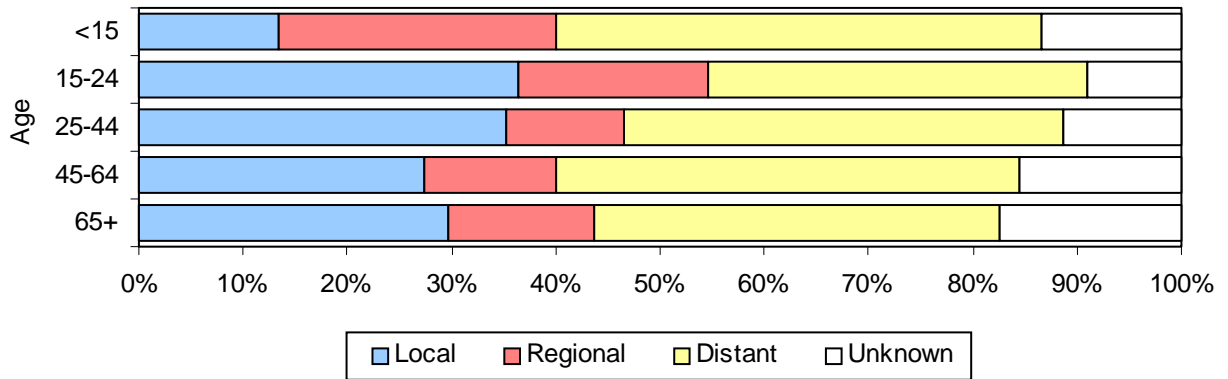


**Figure 16.4**

## Non-Hodgkin's Lymphoma

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	N/A		~		4	26.7%	7	46.7%	~		15	100.0%
15-24	N/A		~		4	18.2%	8	36.4%	~		22	100.0%
25-44	N/A		50	35.2%	16	11.3%	60	42.3%	16	11.3%	142	100.0%
45-64	N/A		157	27.3%	73	12.7%	256	44.5%	89	15.5%	575	100.0%
65+	N/A		344	29.7%	163	14.1%	451	38.9%	201	17.3%	1,159	100.0%
Total	N/A		561	29.3%	260	13.6%	782	40.9%	310	16.2%	1,913	100.0%

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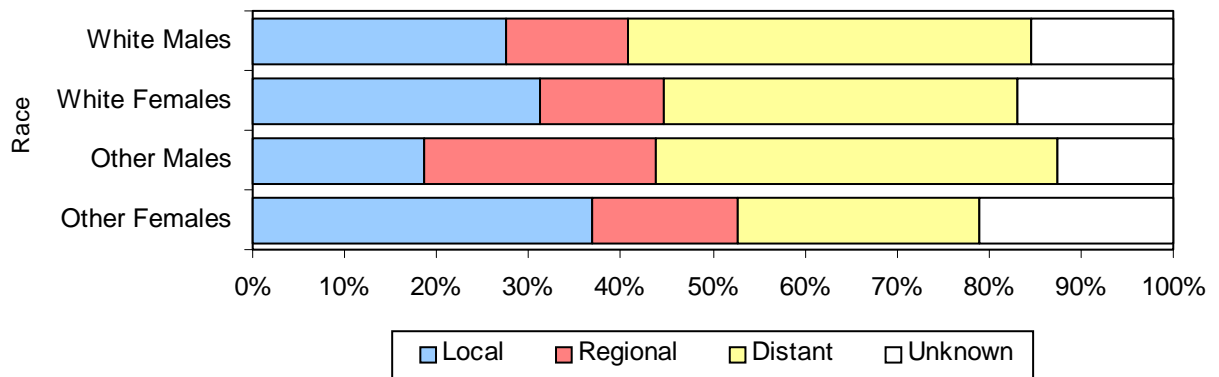
Total may not add to 100% due to rounding.

Figure 16.5

## Non-Hodgkin's Lymphoma

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



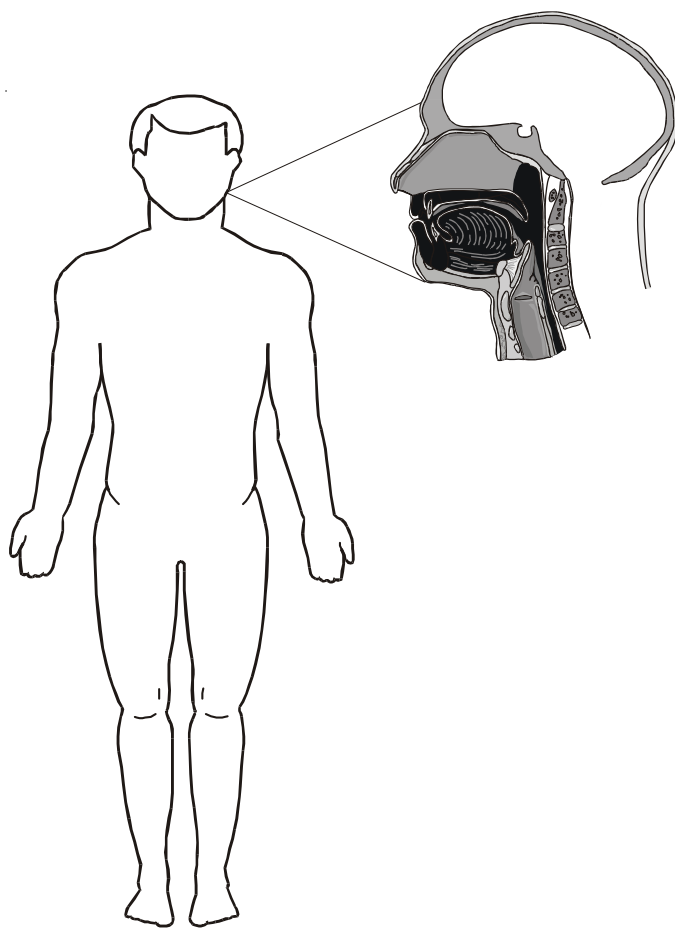
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	N/A		256	27.5%	125	13.4%	408	43.8%	143	15.3%	932	100.0%
White Females	N/A		295	31.2%	128	13.5%	362	38.3%	161	17.0%	946	100.0%
Other Males	N/A		~		~		7	43.8%	~		16	100.0%
Other Females	N/A		~		~		5	26.3%	~		19	100.0%
Total	N/A		561	29.3%	260	13.6%	782	40.9%	310	16.2%	1,913	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

Figure 16.6





## Chapter 17

# Cancer of the Oral Cavity & Pharynx





## Cancer of the Oral Cavity & Pharynx

### Incidence and Mortality by Sex and Year

West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	152	17.8	47	5.5	65	5.7	30	2.5	217	11.0	77	3.9
1994	132	14.9	47	5.5	78	7.2	11	1.0	210	10.6	58	2.9
1995	157	17.5	45	5.2	69	5.9	16	1.3	226	11.3	61	3.0
1996	143	15.6	33	3.8	66	5.7	13	1.1	209	10.3	46	2.3
1997	150	16.2	35	3.7	48	4.1	23	1.9	198	9.7	58	2.8
1998	144	16.0	39	4.4	75	6.6	23	1.9	219	10.7	62	3.0
1999	152	15.9	39	4.3	70	5.8	12	1.0	222	10.5	51	2.4
2000	146	15.7	26	2.8	79	7.0	13	1.1	225	10.9	39	1.9
2001	158	16.9	42	4.3	44	3.7	21	1.7	202	9.6	63	3.0

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 17.1**

### Overview

- The 1997-2001 average annual age-adjusted incidence of cancer of the oral cavity and pharynx in West Virginia men (16.2 per 100,000) was nearly three times the incidence in women (5.5 per 100,000) (Figures 1.3 and 1.4), which is consistent with national trends.
- Cancer of the oral cavity and pharynx occurred in all age groups; however, incidence increased with age (Figure 17.3). Over 90% of all cases were diagnosed in individuals aged 45 and older (Figure 17.5).
- Fifty-three percent (53%) of all cases were diagnosed at the regional or distant stage. Stage at diagnosis was not reported in 12% of cases (Figure 17.4).
- State-specific mortality data during 1996-2000 suggest that West Virginia mortality rates from cancer of the oral cavity and pharynx were not significantly different from the national average (Appendix B).

### Risk Factors

- Risk factors include cigarette, cigar, or pipe smoking; use of smokeless tobacco; and excessive consumption of alcohol (ACS, 2003a).
- Infection with human papillomavirus (HPV) may also contribute to the development of cancer of the oral cavity and oropharyngeal cavity (ACS, 2003a).

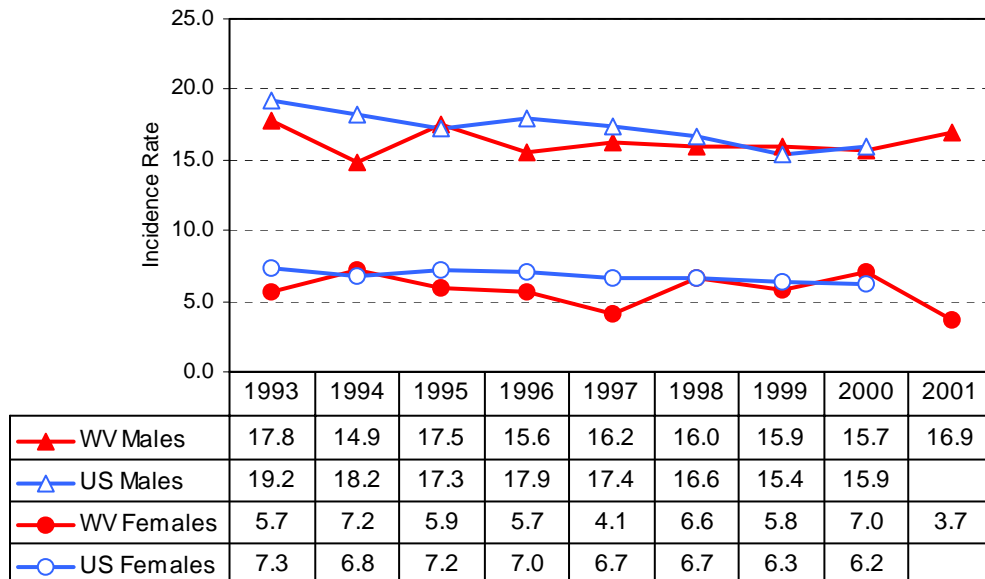
### Prevention

- Quitting smoking substantially decreases the risk of oral cancer.
- Alcohol abuse should be avoided.
- Regular oral examinations are important for this disease and other health reasons. Dentists and primary care physicians can do oral examinations (ACS, 2003a).

## Cancer of the Oral Cavity & Pharynx

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



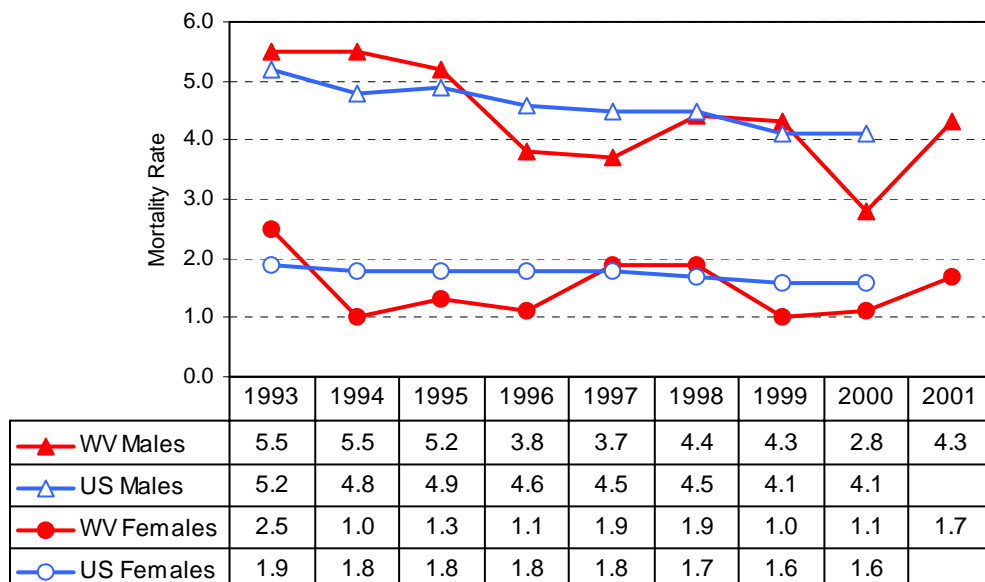
**Figure 17.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Oral Cavity & Pharynx

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

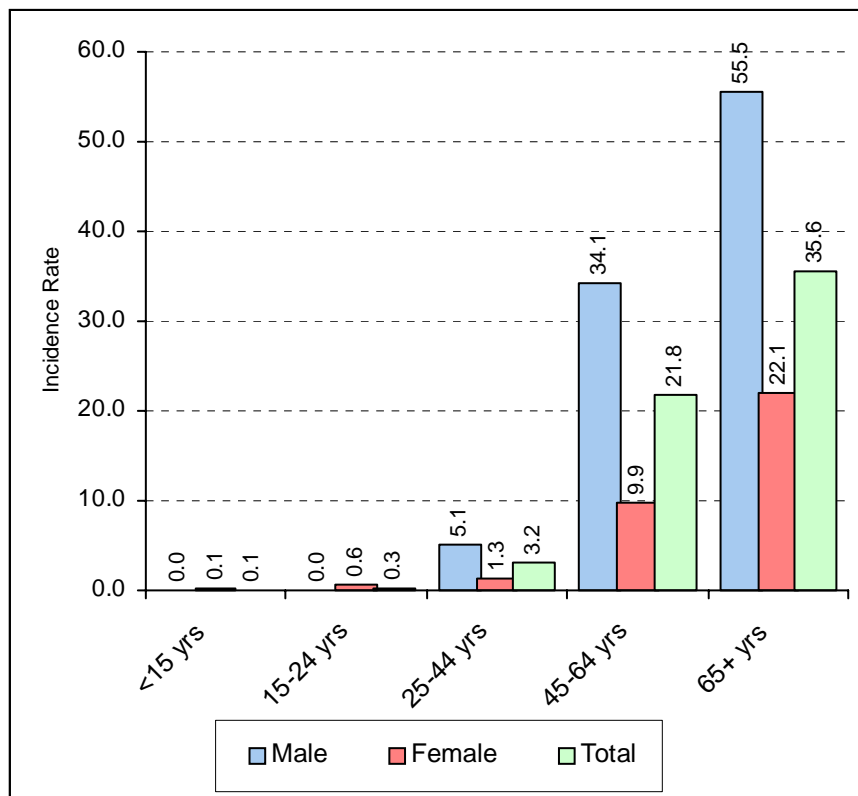


**Figure 17.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Oral Cavity & Pharynx

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 17.3**

\*Five-year average annual rate per 100,000 West Virginia residents

### Cancer of the Oral Cavity & Pharynx

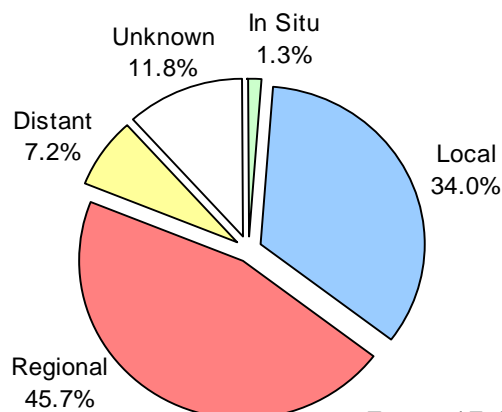
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
807	Squamous Cell Carcinoma	81.8
801	Carcinoma	3.5
843	Mucoepidermoid Carcinoma	2.6
814	Adenocarcinoma	2.5
805	Papillary Carcinoma	2.0
820	Adenoid Cystic Carcinoma	1.8
800	Malignant Neoplasm	1.4

**Table 17.2**

### Cancer of the Oral Cavity & Pharynx

Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

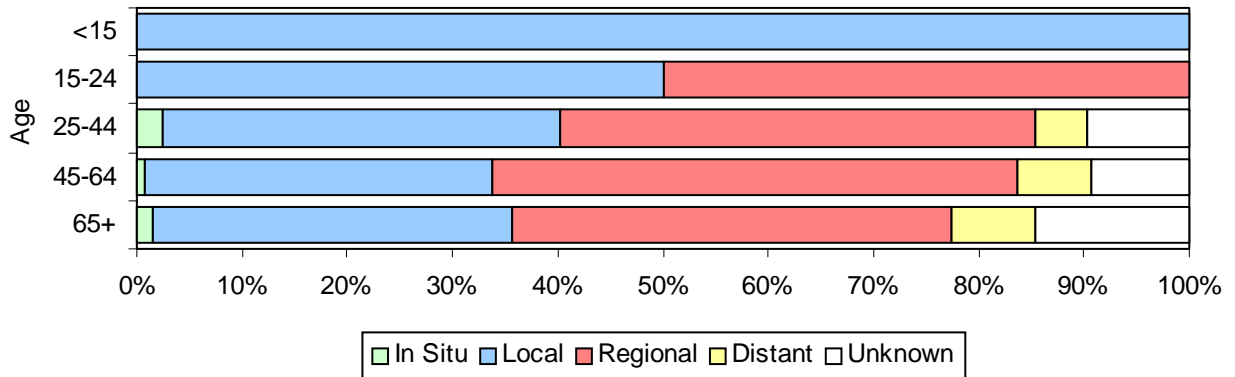


**Figure 17.4**

## Cancer of the Oral Cavity & Pharynx

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	~		0	0.0%	0	0.0%	0	0.0%	~	100.0%
15-24	0	0.0%	~		~		0	0.0%	0	0.0%	~	100.0%
25-44	~		31	37.8%	~		4	4.9%	8	9.8%	82	100.0%
45-64	~		162	33.0%	~		34	6.9%	46	9.4%	491	100.0%
65+	8	1.6%	171	34.1%	210	41.8%	40	8.0%	73	14.5%	502	100.0%
Total	14	1.3%	367	34.0%	494	45.7%	78	7.2%	127	11.8%	1,080	100.0%

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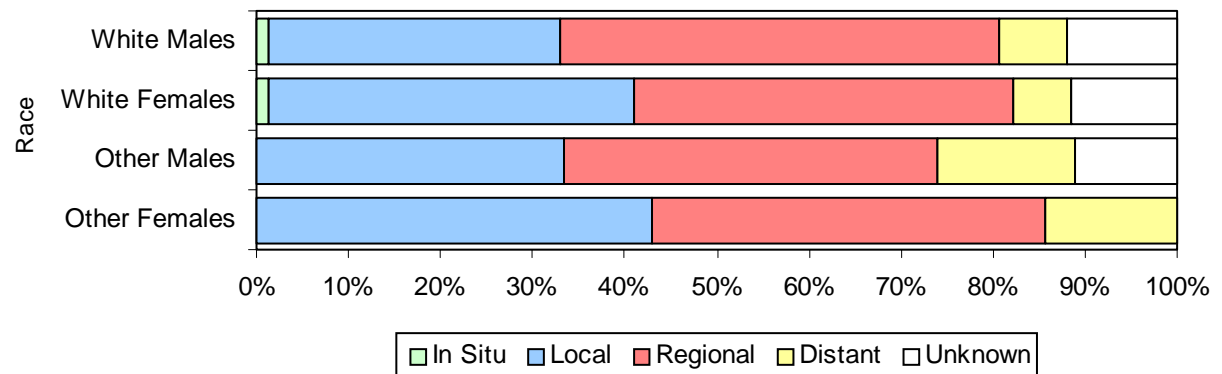
Total may not add to 100% due to rounding.

**Figure 17.5**

## Cancer of the Oral Cavity & Pharynx

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



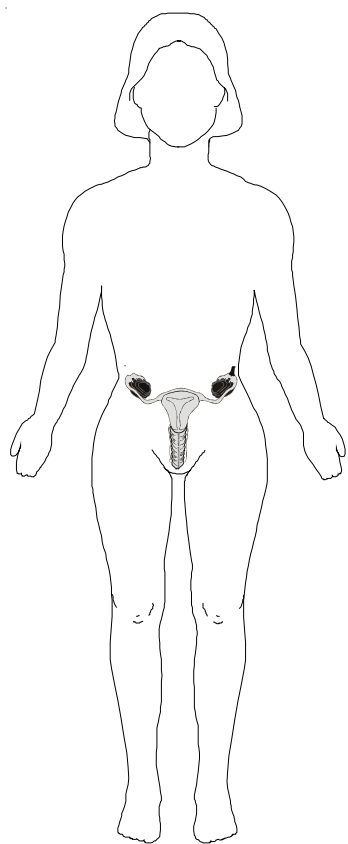
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	10	1.4%	231	31.5%	351	47.9%	53	7.2%	88	12.0%	733	100.0%
White Females	4	1.3%	124	39.6%	129	41.2%	20	6.4%	36	11.5%	313	100.0%
Other Males	0	0.0%	~		~		~		~		27	100.0%
Other Females	0	0.0%	~		~		~		~		7	100.0%
Total	14	1.3%	367	34.0%	494	45.7%	78	7.2%	127	11.8%	1,080	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 17.6**





## **Chapter 18**

# **Cancer of the Ovary**



## Cancer of the Ovary

### Incidence and Mortality by Year

#### West Virginia Females 1993 – 2001

Year	Female			
	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	137	13.1	97	8.6
1994	176	16.4	94	7.9
1995	215	19.4	115	9.9
1996	164	15.3	106	8.7
1997	190	17.4	105	9.0
1998	192	17.3	129	10.8
1999	167	14.9	102	8.5
2000	193	16.8	127	10.4
2001	170	14.4	122	10.3

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia females and are age-adjusted to the 2000 U.S. standard population.

**Table 18.1**

### Overview

- Although cancer of the ovary was identified in all age groups during 1997-2001, incidence increased with age (Figure 18.3).
- Cancer of the ovary was diagnosed at a regional or distant stage in 65% of cases during 1997-2001. Stage at diagnosis was not reported for 12% of cases. Older women were more likely to be diagnosed at a later stage (Figure 18.5).
- During 1997-2001, cancer of the ovary was the sixth leading cause of cancer incidence and the fourth leading cause of cancer-related mortality for women in West Virginia (Figure 1.4).
- West Virginia ovarian cancer mortality rates were not significantly different from the U.S. during 1996-2000 (Appendix B).

### Risk Factors

- Risk increases with age.
- Pregnancy and the use of oral contraceptives reduce the risk of ovarian cancer.
- A family history of breast or ovarian cancer is associated with increased risk (ACS, 2003a).

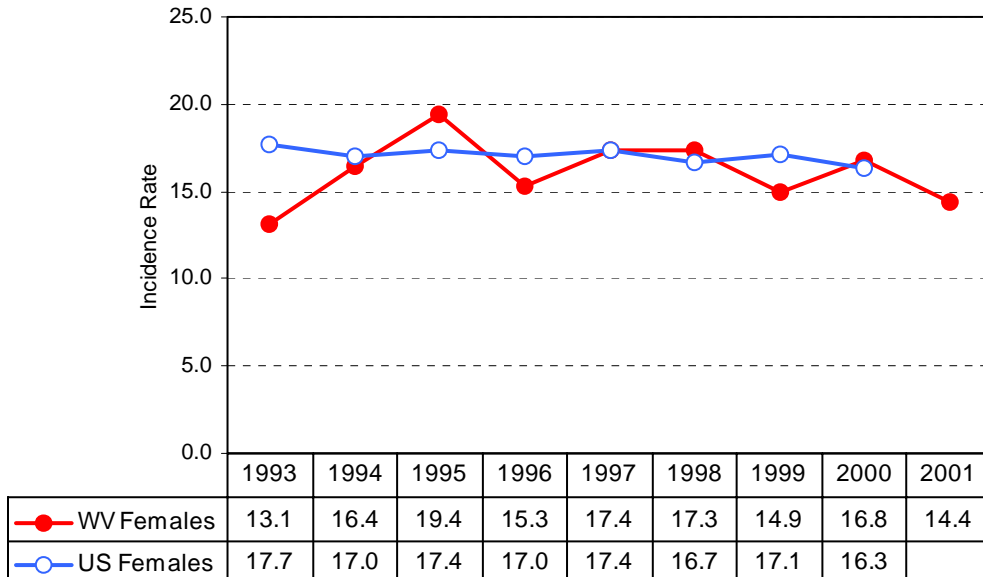
### Prevention

- Periodic thorough pelvic examinations are important for identifying this disease and for other health reasons (ACS, 2003a).

## Cancer of the Ovary

### Incidence Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000



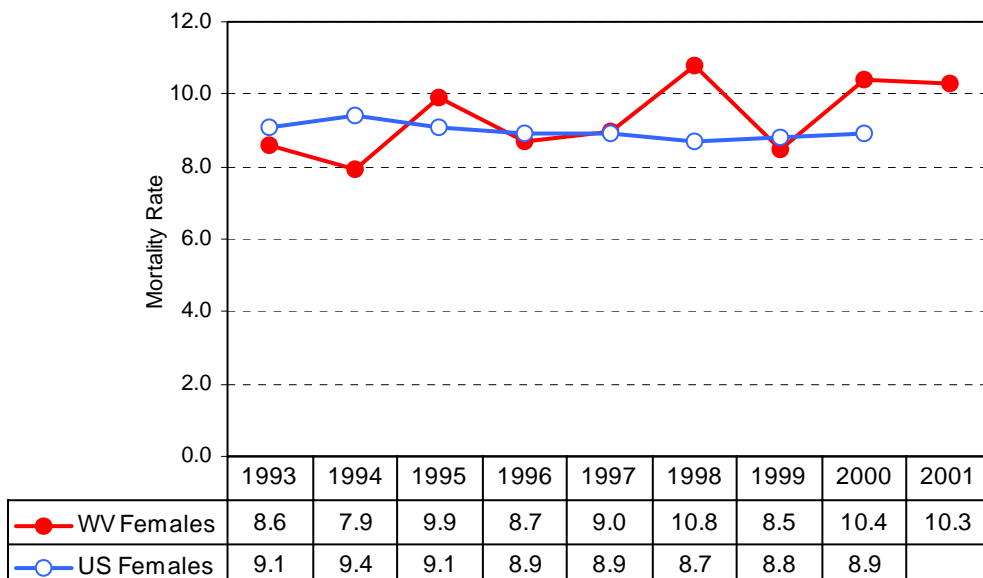
**Figure 18.1**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Ovary

### Mortality Rates\*, Age-Adjusted

West Virginia Females 1993 – 2001, U.S. Females 1993 – 2000



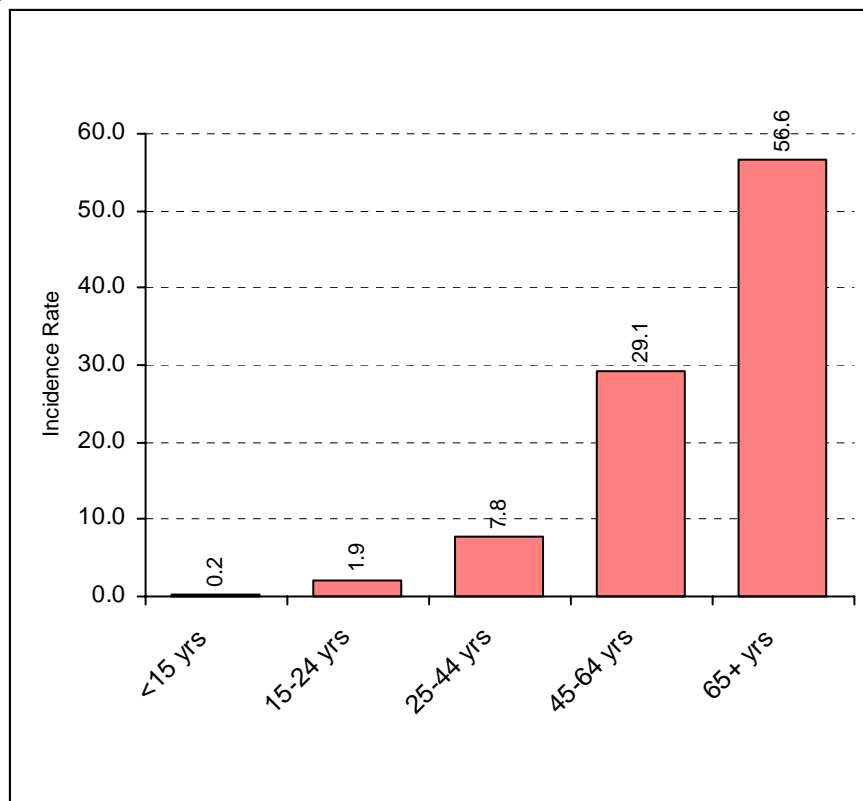
**Figure 18.2**

\*Rates are per 100,000 females and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).



## Cancer of the Ovary

Incidence Rates\*, Age-Specific  
West Virginia Females 1997 – 2001



**Figure 18.3**

\*Five-year average annual rate per 100,000 West Virginia females

## Cancer of the Ovary

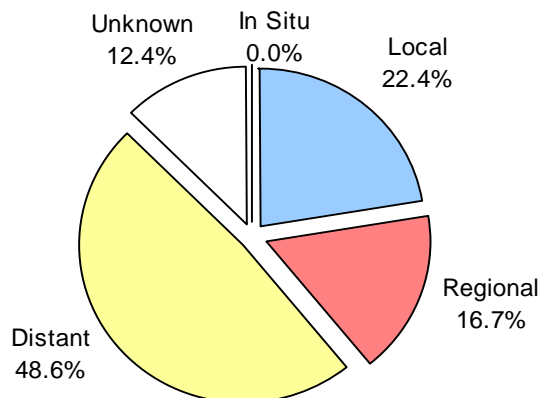
Most Frequent Histologies  
West Virginia Females 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
846	Papillary Serous Cystadenocarcinoma	29.3
814	Adenocarcinoma	12.8
838	Endometrioid Carcinoma	10.5
801	Carcinoma	7.8
844	Cystadenocarcinoma	7.2
800	Malignant Neoplasm	6.9
847	Papillary Mucinous Carcinoma	6.4
826	Papillary Adenocarcinoma	4.3
848	Mucinous Adenocarcinoma	3.4
831	Clear Cell Carcinoma	2.3

**Table 18.2**

## Cancer of the Ovary

Stage of Disease at Diagnosis  
West Virginia Females 1997 – 2001

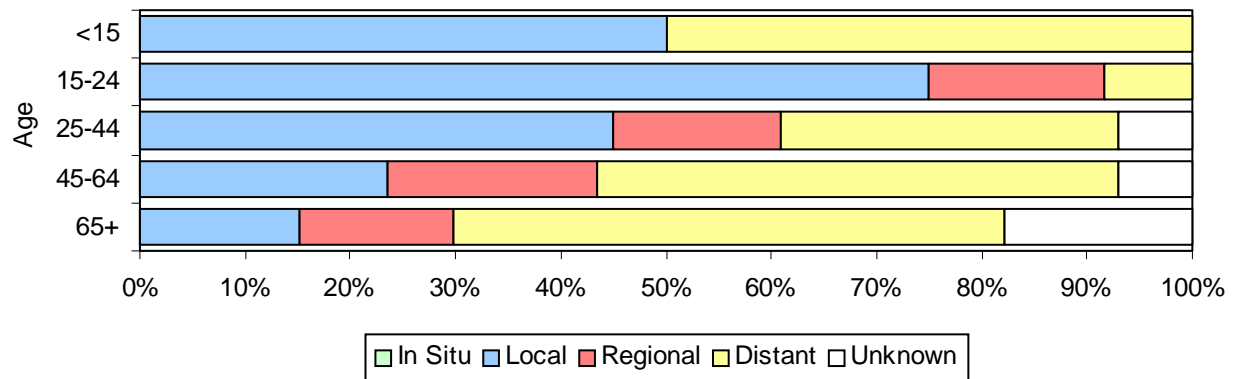


**Figure 18.4**

## Cancer of the Ovary

### Stage of Disease at Diagnosis by Age

#### West Virginia Females 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	~		0	0.0%	~		0	0.0%	~	100.0%
15-24	0	0.0%	9	75.0%	~		~		0	0.0%	~	100.0%
25-44	0	0.0%	~		~		32	32.0%	7	7.0%	100	100.0%
45-64	0	0.0%	78	23.6%	66	19.9%	164	49.5%	23	6.9%	331	100.0%
65+	0	0.0%	71	15.2%	68	14.6%	245	52.5%	83	17.8%	467	100.0%
Total	0	0.0%	204	22.4%	152	16.7%	443	48.6%	113	12.4%	912	100.0%

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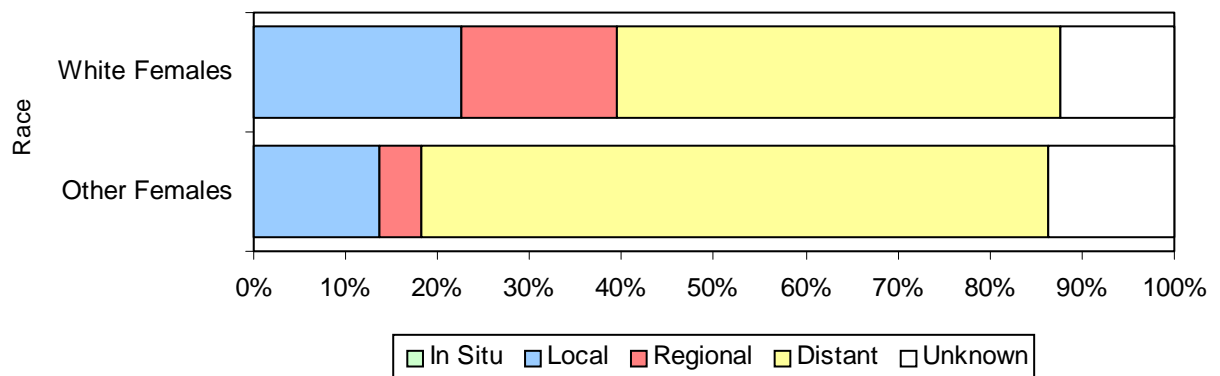
Total may not add to 100% due to rounding.

**Figure 18.5**

## Cancer of the Ovary

### Stage of Disease at Diagnosis by Race

#### West Virginia Females 1997 – 2001



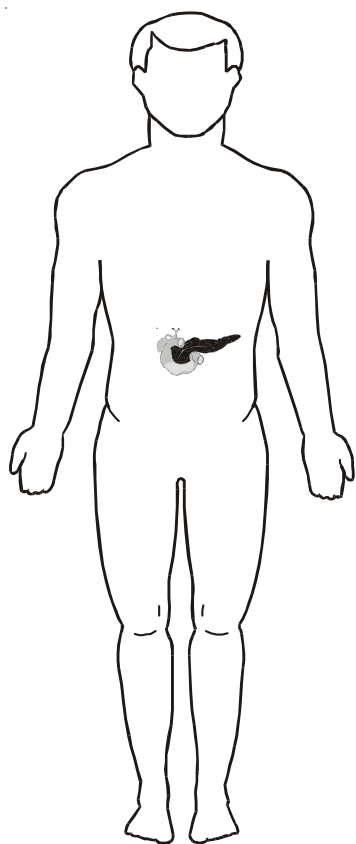
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Females	0	0.0%	~		~		428	48.1%	~		890	100.0%
Other Females	0	0.0%	~		~		15	68.2%	~		22	100.0%
Total	0	0.0%	204	22.4%	152	16.7%	443	48.6%	113	12.4%	912	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 18.6**





## **Chapter 19**

# **Cancer of the Pancreas**



## Cancer of the Pancreas

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	78	8.9	90	10.8	98	8.3	111	9.3	176	8.5	201	10.0
1994	90	10.6	96	11.3	109	8.8	129	10.4	199	9.5	225	10.8
1995	97	11.2	87	10.2	115	9.3	92	7.4	212	10.2	179	8.6
1996	93	11.0	109	13.1	85	6.8	110	8.8	178	8.5	219	10.5
1997	115	13.4	97	11.2	113	9.4	90	7.3	228	11.0	187	9.0
1998	107	12.5	105	12.5	90	7.3	98	8.1	197	9.3	203	9.8
1999	96	10.6	91	10.5	83	6.8	82	6.7	179	8.4	173	8.2
2000	104	11.6	99	11.1	101	7.9	116	9.3	205	9.5	215	10.1
2001	112	12.0	101	11.2	97	7.8	80	6.6	209	9.7	181	8.5

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 19.1**

### Overview

- In 1997-2001, cancer of the pancreas rarely occurred in individuals less than 45 years of age. Incidence increased markedly with age (Figure 19.3).
- Unfortunately, most cancers of the pancreas (64%) were diagnosed when disease was regional or distant. A high proportion of pancreatic cancers were reported as stage unknown at time of diagnosis (Figure 19.4).
- In 1997-2001, cancer of the pancreas was the fourth leading cause of cancer-related mortality for men and fifth for women in West Virginia (Figures 1.3 and 1.4).
- Data from 1996 through 2000 for age-adjusted mortality from pancreatic cancer ranked West Virginia lower than the national average for this disease (Appendix B).

### Risk Factors

- Risk factors for this disease are not yet fully understood.
- Incidence of cancer of the pancreas among individuals who smoke is more than twice that of non-smokers. Incidence is also higher in countries with high dietary fat intake.
- Diabetes and chronic pancreatitis are risk factors for pancreatic cancer.

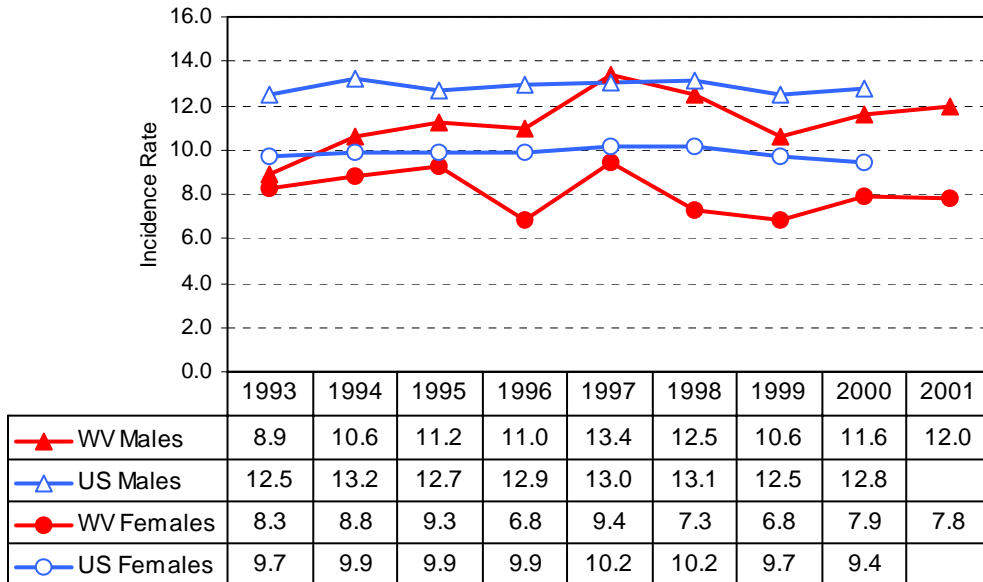
### Prevention

- Little is known about the prevention of pancreatic cancer. Although the causal relationship between smoking and pancreatic cancer is not fully clear, individuals should be encouraged to discontinue or not initiate tobacco use for this and other health reasons.

## Cancer of the Pancreas

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



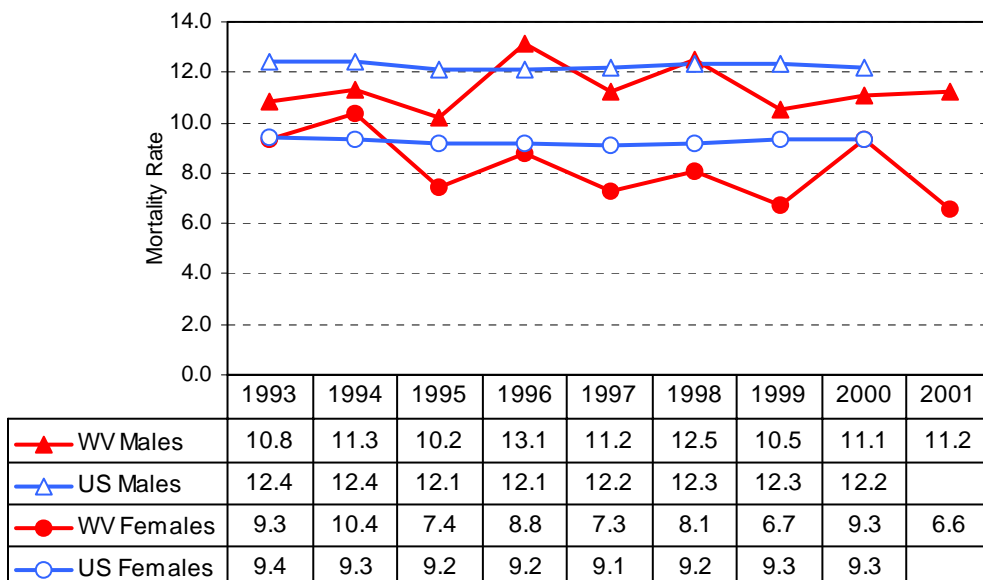
**Figure 19.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Pancreas

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

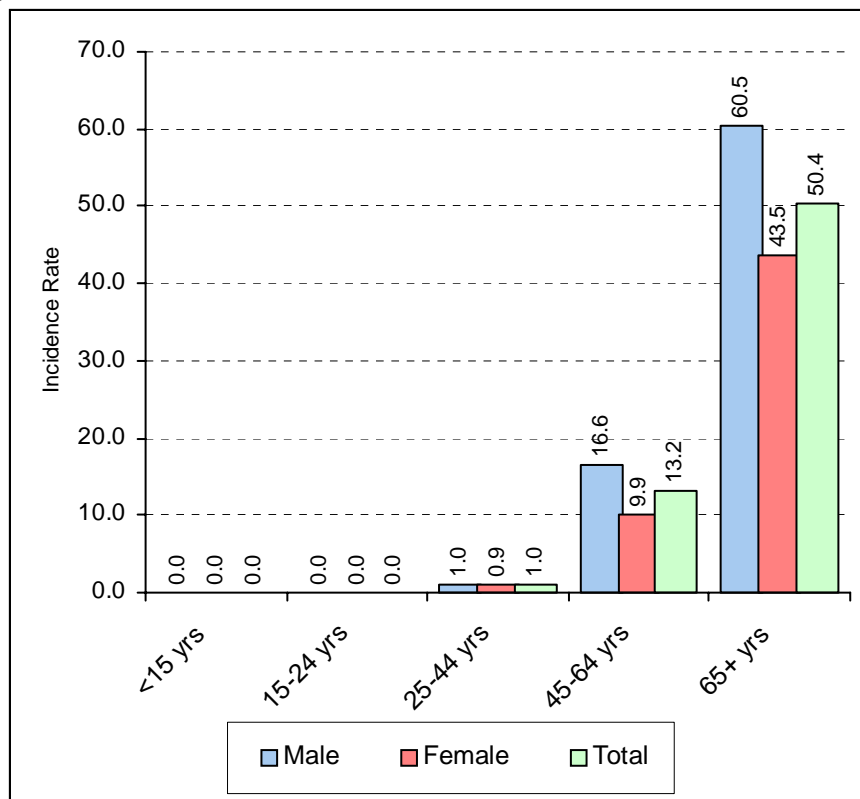


**Figure 19.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Pancreas

### Incidence Rates\*, Age-Specific West Virginia Residents 1997 – 2001



**Figure 19.3**

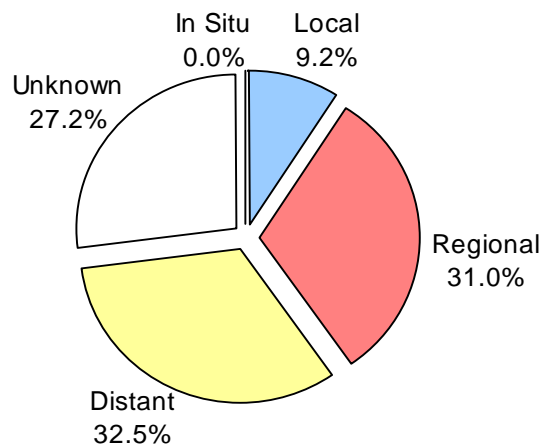
\*Five-year average annual rate per 100,000 West Virginia residents

### Cancer of the Pancreas Most Frequent Histologies West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
8140	Adenocarcinoma	48.9
8010	Carcinoma	18.5
8000	Malignant Neoplasm	18.0
8500	Infiltrating Duct Carcinoma	4.7
8246	Neuroendocrine Carcinoma	1.6
8481	Mucin-producing Adenocarcinoma	1.5
8480	Mucinous Adenocarcinoma	1.3

**Table 19.2**

### Cancer of the Pancreas Stage of Disease at Diagnosis West Virginia Residents 1997 – 2001



**Figure 19.4**

## Cancer of the Pancreas

### Stage of Disease at Diagnosis by Age

#### West Virginia Residents 1997 – 2001

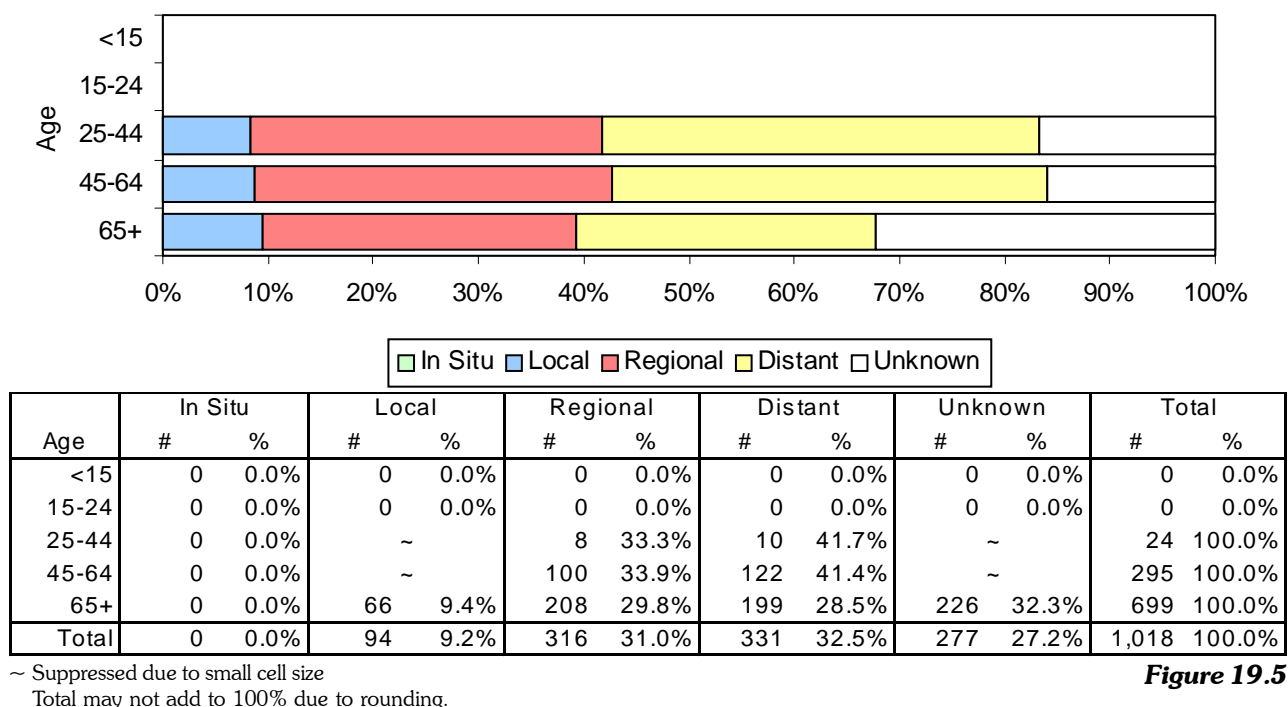


Figure 19.5

## Cancer of the Pancreas

### Stage of Disease at Diagnosis by Race and Sex

#### West Virginia Residents 1997 – 2001

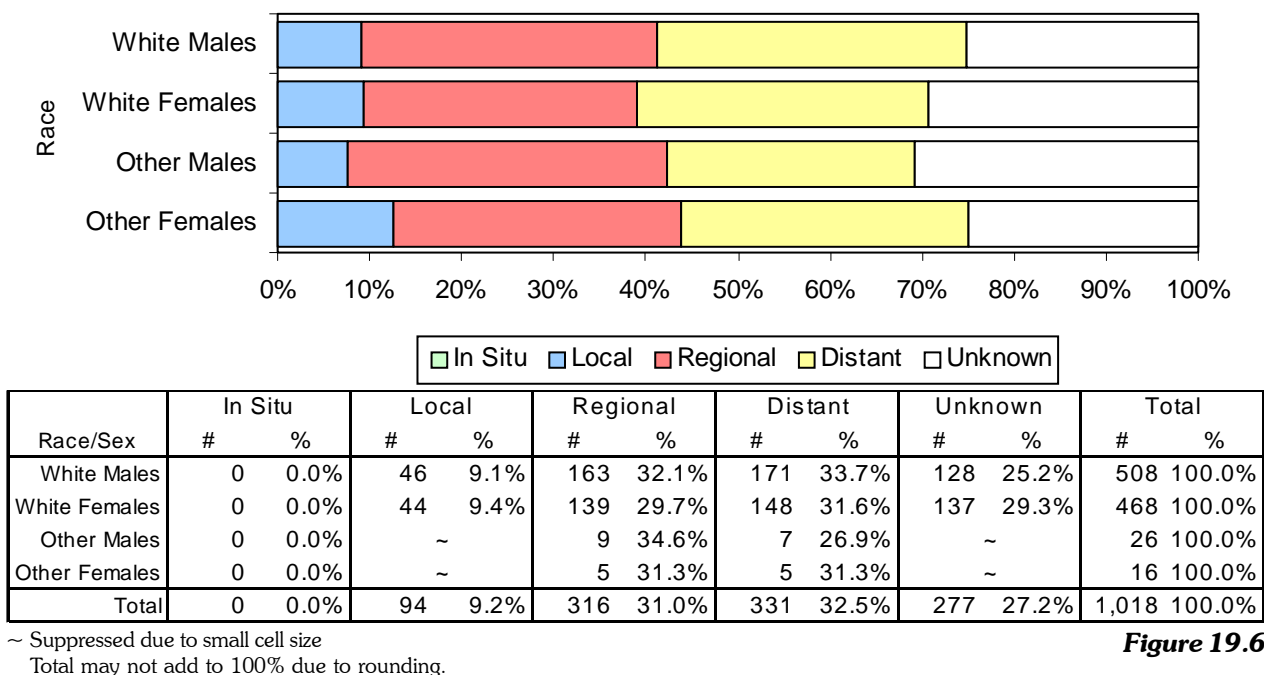
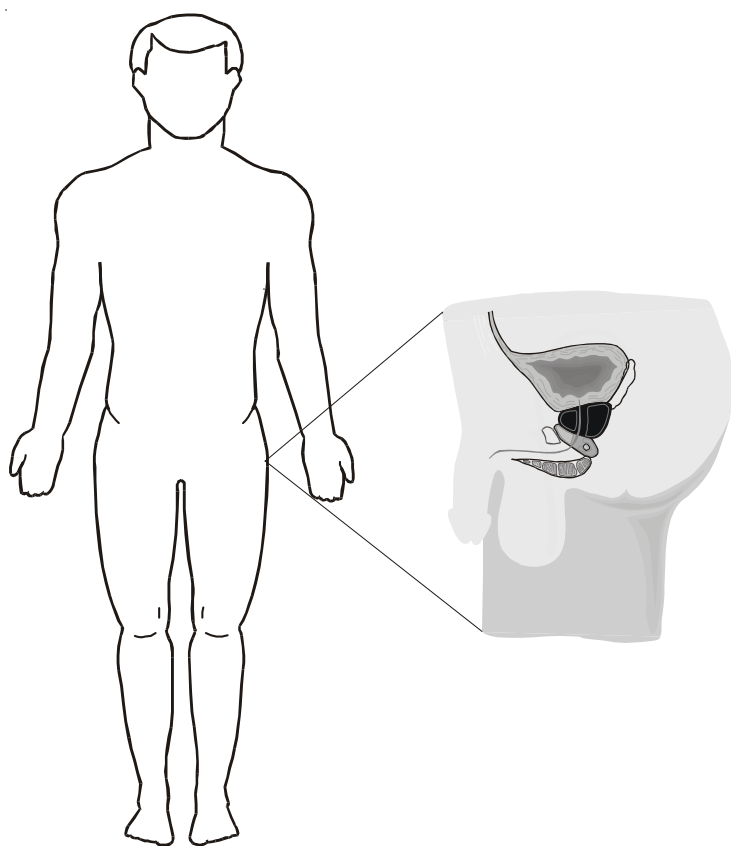


Figure 19.6







## Chapter 20

# Cancer of the Prostate



## Cancer of the Prostate

### Incidence and Mortality by Year

#### West Virginia Males 1993 – 2001

Year	Male			
	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	1,297	152.4	281	38.3
1994	1,265	146.5	288	38.4
1995	1,129	129.4	288	37.5
1996	1,194	134.2	244	31.6
1997	1,241	138.0	231	30.1
1998	1,329	147.0	235	30.3
1999	1,341	146.3	217	27.9
2000	1,485	160.3	244	31.0
2001	1,448	154.5	206	26.7

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia males and are age-adjusted to the 2000 U.S. standard population.

**Table 20.1**

### Overview

- Cancer of the prostate was the most commonly diagnosed cancer in West Virginia men during 1997-2001 (Figure 1.3).
- Cancer of the prostate very rarely occurred before the age of 45 and the incidence dramatically increased with age. Nearly three-quarters of prostate cancer was diagnosed in men age 65 and older (Figure 20.5).
- During 1997-2001 in West Virginia, 73% of men with prostate cancer were diagnosed with early (in situ or local) disease. Stage at diagnosis was not reported in 15% of cases (Figure 20.4).
- Cancer of the prostate in West Virginia was the second leading cause of cancer-related mortality in men during 1997-2001 (Figure 1.3). It accounted for approximately one in ten male cancer deaths (Tables 1.1 and 20.1).

### Risk Factors

- Age is the most significant risk factor.
- Race is also prominent as a risk factor. Black Americans have the highest prostate cancer incidence in the world. The disease is rare in Asia, Africa, Central America, and South America (ACS, 2003a).
- Having a father or brother with prostate cancer doubles a man's risk for this disease.
- Dietary fat may also be a risk factor (ACS, 2003a).

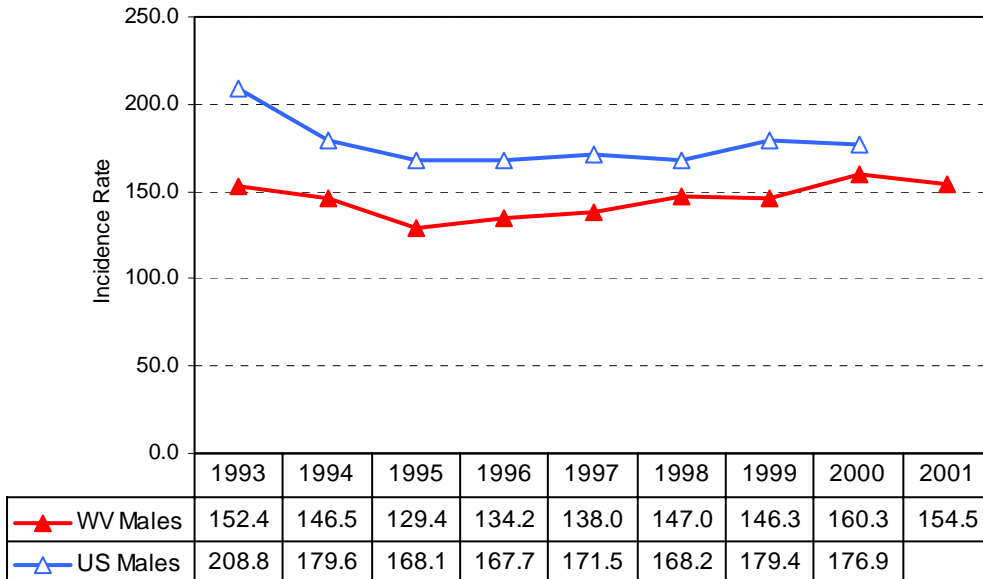
### Prevention

- While opinions vary regarding routine screening for prostate cancer, the American Cancer Society suggests that men over the age of 50 discuss an annual digital examination and Prostate Specific Antigen test with a health care professional. African American men and men with a family history of prostate cancer should begin screening at age 45.

## Cancer of the Prostate

### Incidence Rates\*, Age-Adjusted

West Virginia Males 1993 – 2001, U.S. Males 1993 – 2000

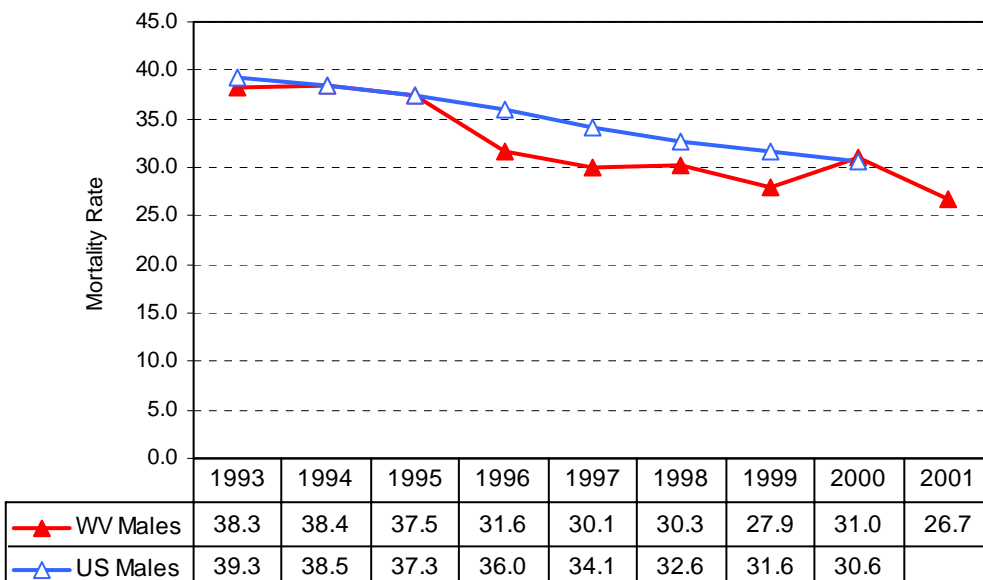
**Figure 20.1**

\* Rates are per 100,000 males and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Prostate

### Mortality Rates\*, Age-Adjusted

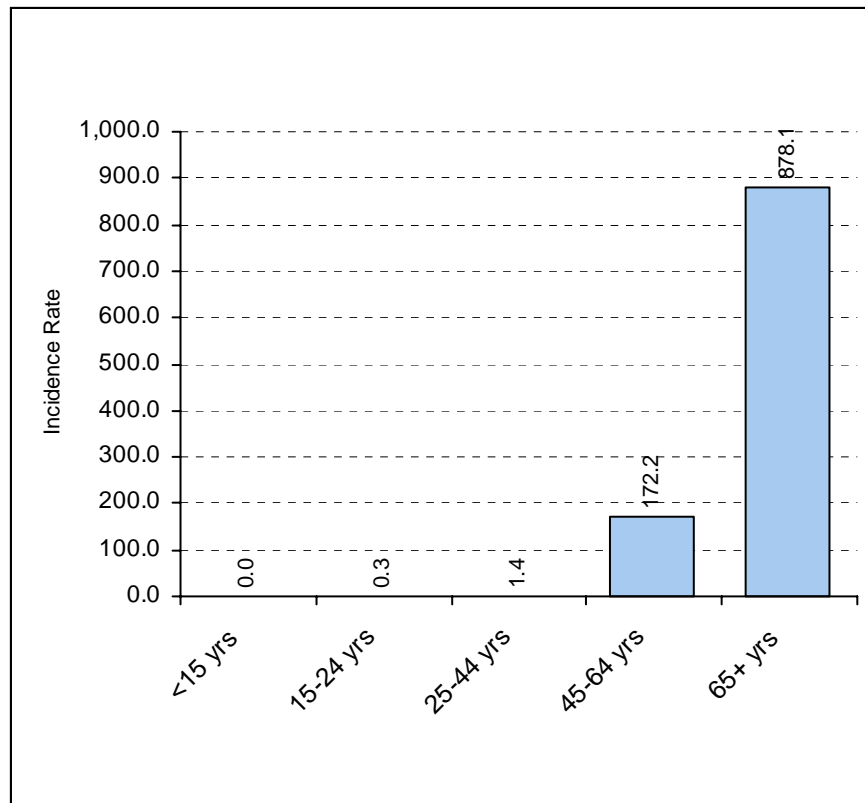
West Virginia Males 1993 – 2001, U.S. Males 1993 – 2000

**Figure 20.2**

\* Rates are per 100,000 males and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Prostate

### Incidence Rates\*, Age-Specific West Virginia Males 1997 – 2001



**Figure 20.3**

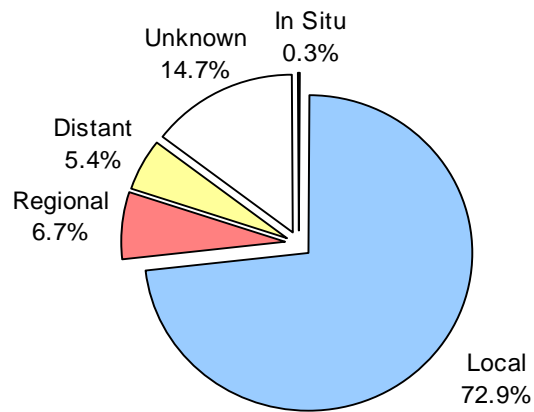
\*Five-year average annual rate per 100,000 West Virginia males

### Cancer of the Prostate Most Frequent Histologies West Virginia Males 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
814	Adenocarcinoma	95.1
801	Carcinoma	2.5
800	Malignant Neoplasm	2.0

**Table 20.2**

### Cancer of the Prostate Stage of Disease at Diagnosis West Virginia Males 1997 – 2001

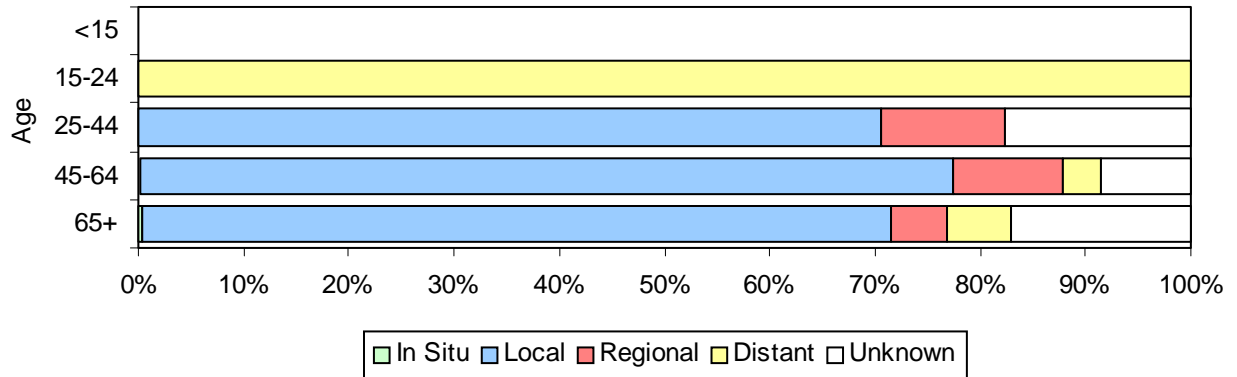


**Figure 20.4**

## Cancer of the Prostate

### Stage of Disease at Diagnosis by Age

#### West Virginia Males 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-24	0	0.0%	0	0.0%	0	0.0%	~	0.0%	0	0.0%	~	100.0%
25-44	0	0.0%	12	70.6%	~	~	0	0.0%	~	~	~	100.0%
45-64	~	~	1,464	77.2%	~	~	~	~	161	8.5%	1,896	100.0%
65+	~	~	3,527	71.3%	259	5.2%	298	6.0%	~	~	4,948	100.0%
Total	19	0.3%	5,003	72.9%	461	6.7%	368	5.4%	1,012	14.7%	6,863	100.0%

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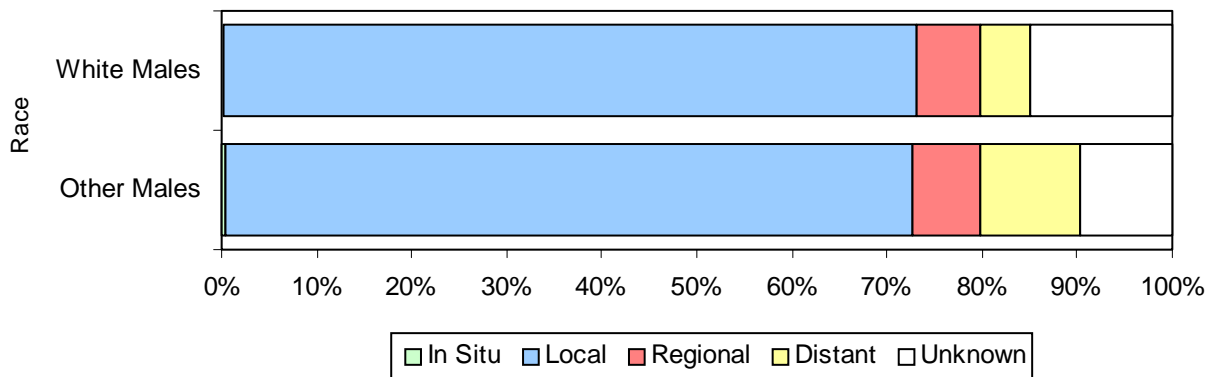
Total may not add to 100% due to rounding.

**Figure 20.5**

## Cancer of the Prostate

### Stage of Disease at Diagnosis by Race

#### West Virginia Males 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	~	~	4,816	72.9%	~	~	341	5.2%	987	14.9%	6,604	100.0%
Other Males	~	~	187	72.2%	~	~	27	10.4%	25	9.7%	259	100.0%
Total	19	0.3%	5,003	72.9%	461	6.7%	368	5.4%	1,012	14.7%	6,863	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 20.6**



## Taking a Closer Look

**Q** Has the relationship between **race** and **stage at diagnosis** changed over time in West Virginia?

**A** Although race-based disparities in stage at diagnosis of prostate cancer still exist in West Virginia, they have decreased over time.

### Cancer of the Prostate

Average Percentage of Prostate Cancers Diagnosed at Local Stage,  
West Virginia Males, 1993 – 2001

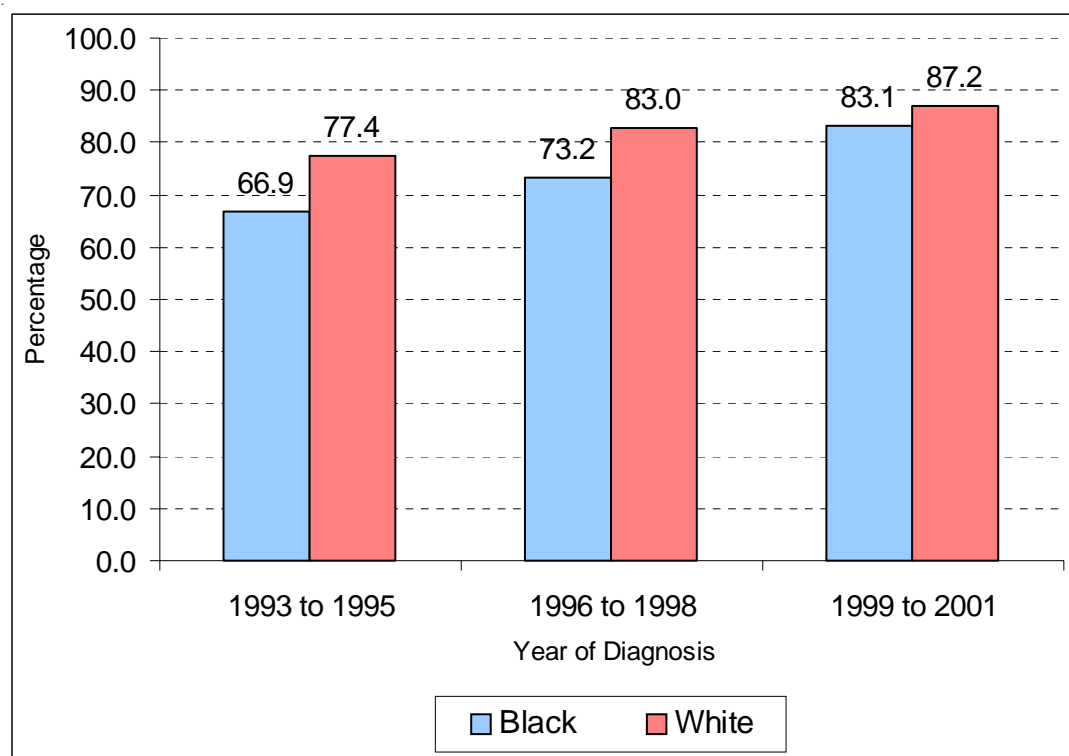
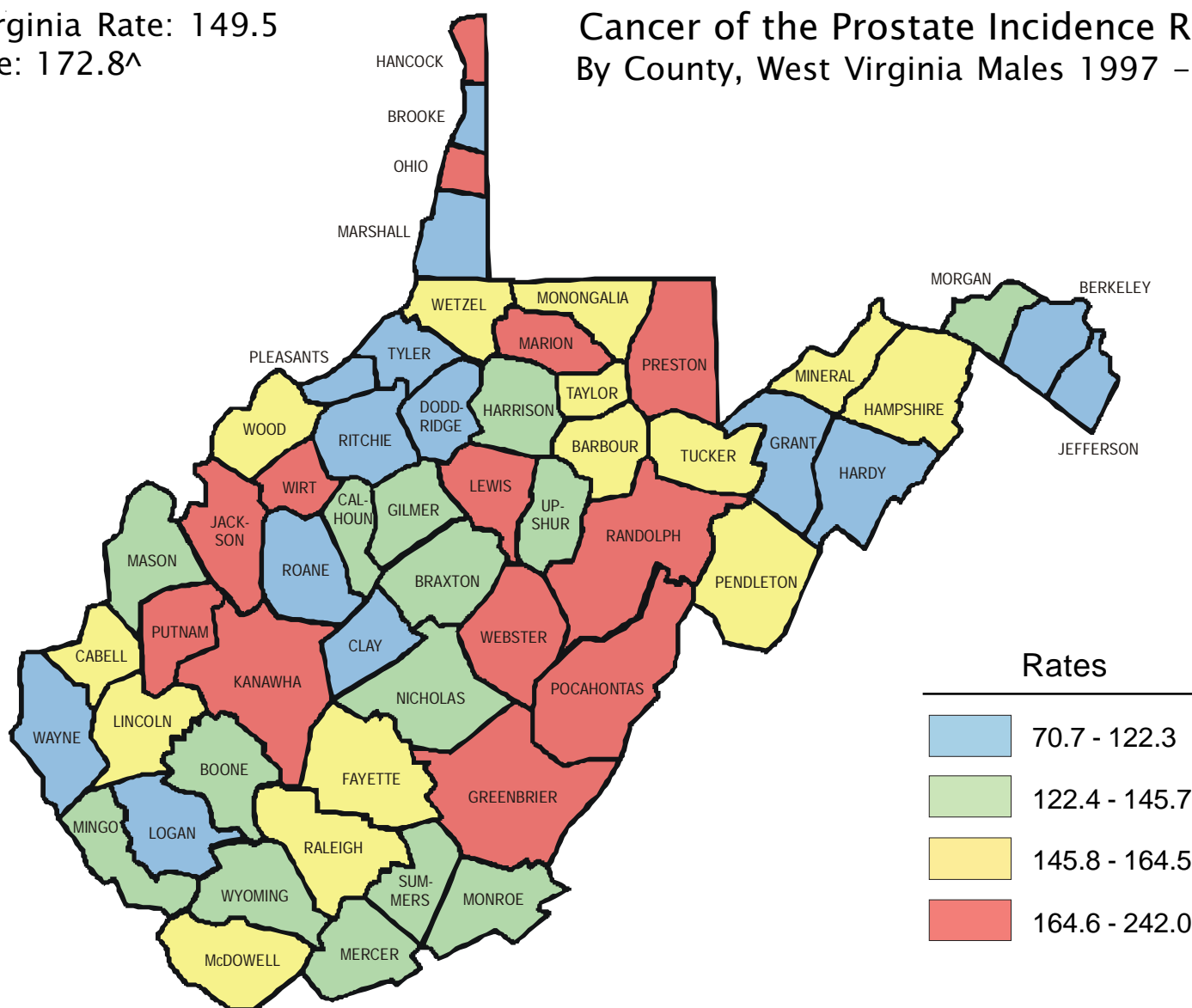


Figure 20.7

West Virginia Rate: 149.5  
U.S. Rate: 172.8<sup>^</sup>

## Cancer of the Prostate Incidence Rates\* By County, West Virginia Males 1997 – 2001



### Rates

	70.7 - 122.3
	122.4 - 145.7
	145.8 - 164.5
	164.6 - 242.0

\* Five-year average annual rate per 100,000 West Virginia males, age-adjusted to the 2000 U.S. standard population.

<sup>^</sup> U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

Refer to Table 20.3 for individual county rates and measures of statistical significance.

**Figure 20.8**



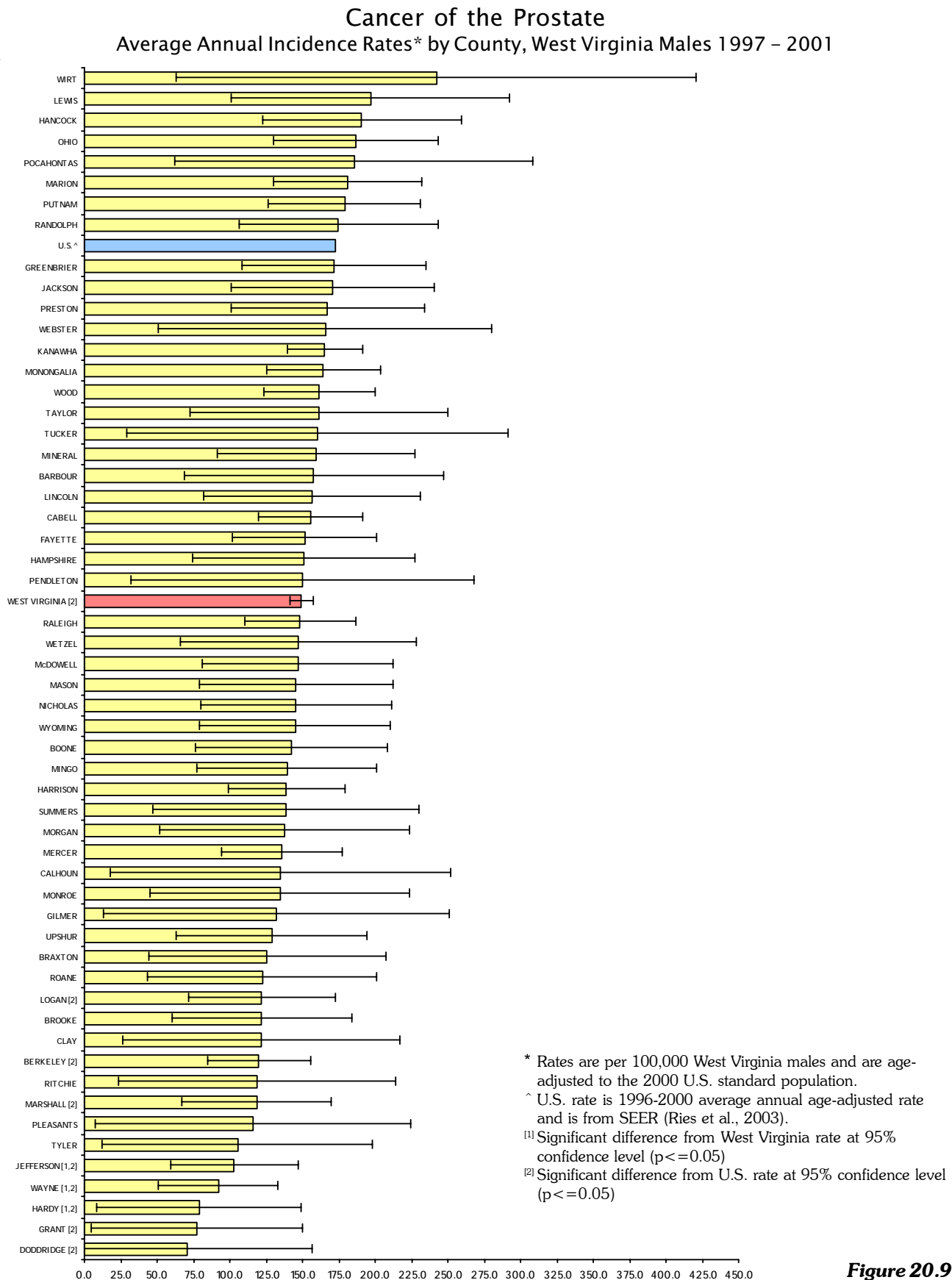


Figure 20.9

# Cancer of the Prostate

Average Annual Incidence Rates\* by County, West Virginia Males 1997 – 2001

COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>		COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>	
			WV	U.S.				WV	U.S.
BARBOUR	66	157.8	No	No	MINGO	82	139.3	No	No
BERKELEY	191	120.1	No	YES	MONONGALIA	250	164.5	No	No
BOONE	83	142.3	No	No	MONROE	52	134.7	No	No
BRAXTON	49	125.9	No	No	MORGAN	53	138.0	No	No
BROOKE	88	122.1	No	No	NICHOLAS	99	145.5	No	No
CABELL	380	155.3	No	No	OHIO	247	186.8	No	No
CALHOUN	29	134.8	No	No	PENDLETON	39	149.6	No	No
CLAY	31	121.7	No	No	PLEASANTS	22	115.7	No	No
DODDRIDGE	14	70.7	No	YES	POCAHONTAS	51	185.6	No	No
FAYETTE	187	151.5	No	No	PRESTON	131	167.2	No	No
GILMER	25	132.3	No	No	PUTNAM	203	179.1	No	No
GRANT	25	77.1	No	YES	RALEIGH	284	148.2	No	No
GREENBRIER	169	171.5	No	No	RANDOLPH	128	174.9	No	No
HAMPSHIRE	80	151.3	No	No	RITCHIE	32	119.2	No	No
HANCOCK	190	191.0	No	No	ROANE	48	122.3	No	No
HARDY	26	78.8	YES	YES	SUMMERS	59	138.9	No	No
HARRISON	250	139.1	No	No	TAYLOR	66	161.2	No	No
JACKSON	124	171.0	No	No	TUCKER	35	160.4	No	No
JEFFERSON	91	103.1	YES	YES	TYLER	30	105.2	No	No
KANAWHA	857	165.5	No	No	UPSHUR	77	128.8	No	No
LEWIS	89	196.9	No	No	WAYNE	102	92.1	YES	YES
LINCOLN	80	156.5	No	No	WEBSTER	40	165.9	No	No
LOGAN	107	122.1	No	YES	WETZEL	75	147.5	No	No
MARION	281	181.1	No	No	WIRT	33	242.0	No	No
MARSHALL	112	118.6	No	YES	WOOD	362	161.5	No	No
MASON	100	145.7	No	No	WYOMING	85	144.9	No	No
McDOWELL	96	146.8	No	No					
MERCER	228	135.6	No	No	WEST VIRGINIA	6,844	149.5		YES
MINERAL	111	159.8	No	No	U.S.^		172.8		

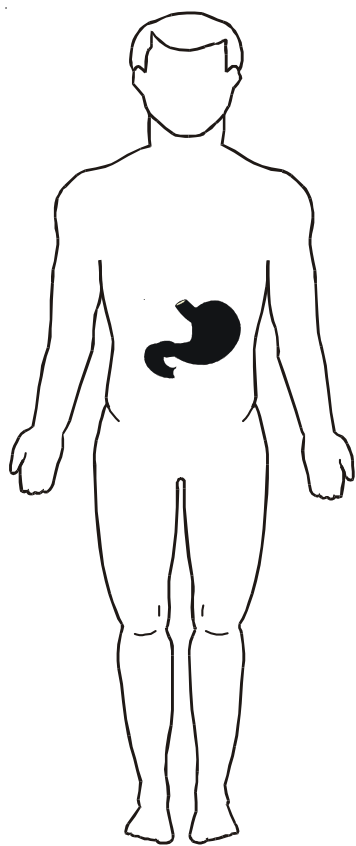
\* Rates are per 100,000 West Virginia males and are age-adjusted to the 2000 U.S. standard population.

^ U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

+ Difference between county rate and West Virginia rate, and county rate and U.S. rate, is tested for statistical significance at the 95% confidence level ( $p < 0.05$ ).

**Table 20.3**





## **Chapter 21**

# **Cancer of the Stomach**



## Cancer of the Stomach

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	86	10.6	63	7.7	47	3.7	36	3.0	133	6.5	99	4.9
1994	84	10.2	56	7.1	43	3.5	24	2.0	127	6.1	80	3.9
1995	93	11.3	59	7.5	60	5.0	35	2.8	153	7.4	94	4.5
1996	95	11.1	57	6.7	60	5.0	39	3.2	155	7.5	96	4.7
1997	81	9.6	60	7.5	60	4.9	39	3.1	141	6.7	99	4.8
1998	74	8.5	46	5.4	45	3.6	43	3.5	119	5.6	89	4.3
1999	66	7.8	49	5.7	43	3.5	30	2.4	109	5.1	79	3.7
2000	79	8.5	50	5.6	40	3.1	32	2.5	119	5.6	82	3.9
2001	78	8.7	42	5.0	52	4.3	28	2.3	130	6.2	70	3.3

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 21.1**

### Overview

- In 1997-2001 in West Virginia, incidence of cancer of the stomach increased markedly with age (Figure 21.3). Ninety-six percent (96%) of newly diagnosed cases occurred in individuals over the age of 45 and 70% in those over the age of 65 (Figure 21.5).
- Average annual age-adjusted incidence (1997-2001) among West Virginia men (8.6 per 100,000) was over twice the incidence among West Virginia women (3.9 per 100,000) (Figures 1.3 and 1.4).
- In 1997-2001, about one in five stomach cancers were identified as in situ or local disease; almost two-thirds were identified as regional or distant (Figure 21.5).
- As with incidence for this disease, mortality rates were higher among men. The 1997-2001 West Virginia average annual age-adjusted mortality rates for cancer of the stomach were 5.8 per 100,000 men and 2.8 per 100,000 women (Figures 1.3 and 1.4).
- Combined 1996-2000 mortality data suggest that West Virginia mortality rates for cancer of the stomach are somewhat lower than the national average (Appendix B).

### Risk Factors

- Diets with large amounts of smoked foods, salted fish and meat, and pickled vegetables appear to increase risk of stomach cancer. On the other hand, eating whole grain products and fresh fruits and vegetables that contain vitamins A and C appears to lower the risk of stomach cancer.
- Smoking increases the risk of stomach cancer, especially cancers of the upper part of the stomach nearest to the esophagus.
- *Helicobacter pylori* infection is associated with increased risk of lymphoma of the stomach (see chapter on non-Hodgkin's lymphoma). Persons with adenocarcinoma of the stomach have a higher rate of *H. pylori* infection than do persons without cancer of the stomach.

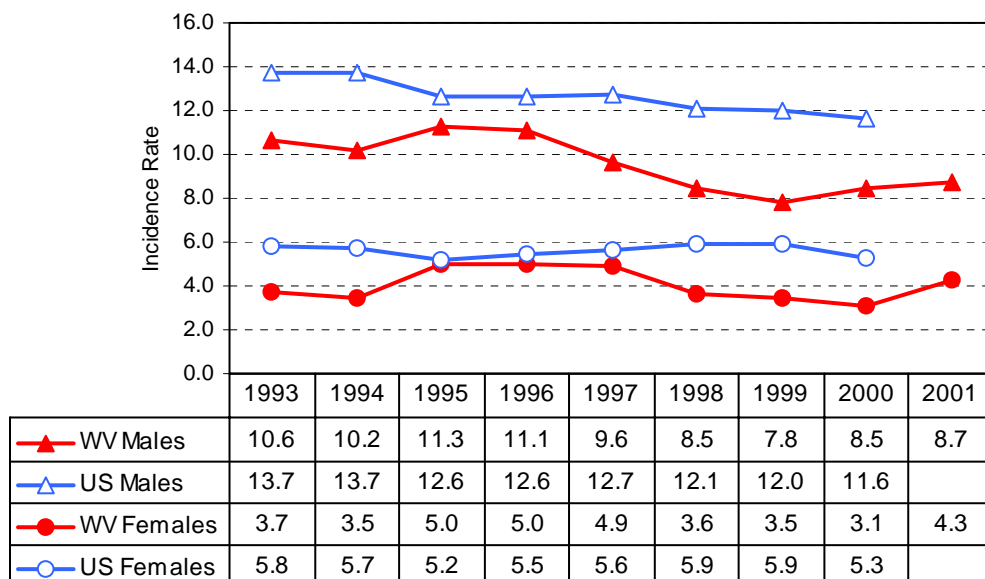
### Prevention

- A diet high in fresh fruits and vegetables can lower stomach cancer risk.
- It is not yet known if people without symptoms whose stomach linings are chronically infected with the bacteria *H. pylori* should be treated.

## Cancer of the Stomach

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



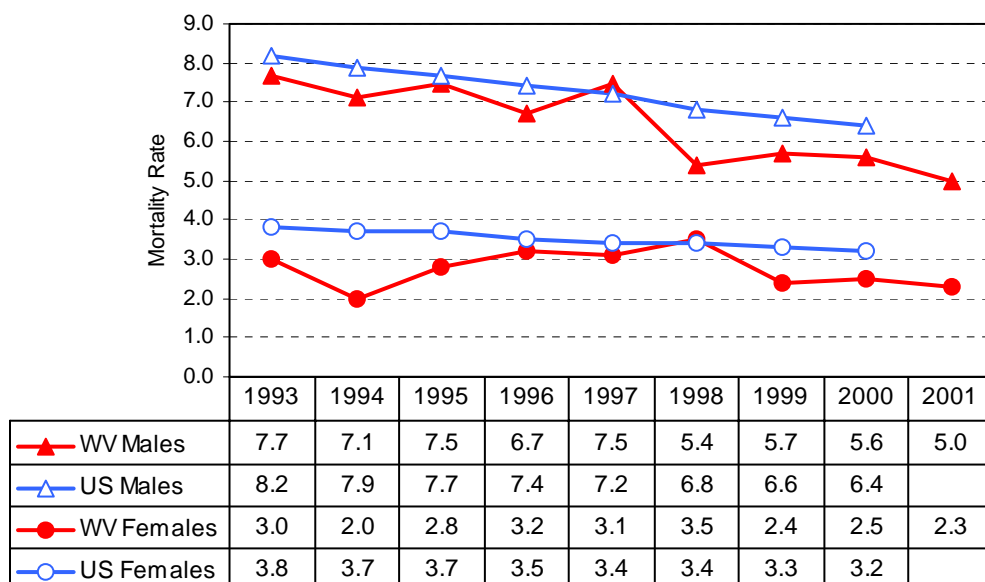
**Figure 21.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Stomach

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

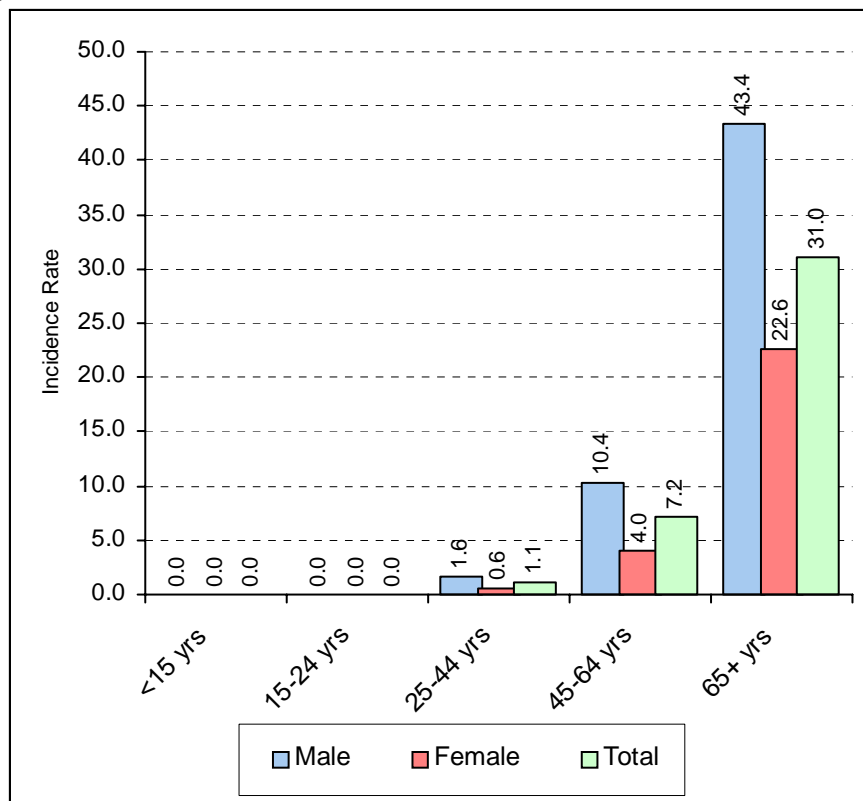


**Figure 21.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Stomach

### Incidence Rates\*, Age-Specific West Virginia Residents 1997 – 2001



**Figure 21.3**

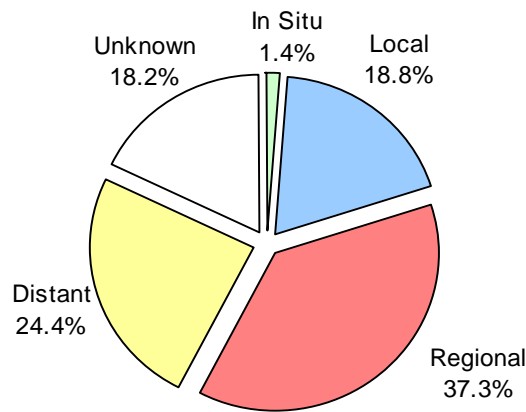
\*Five-year average annual rate per 100,000 West Virginia residents

### Cancer of the Stomach Most Frequent Histologies West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
8140	Adenocarcinoma	61.3
8490	Signet Ring Cell Carcinoma	13.1
8010	Carcinoma	4.4
8000	Malignant Neoplasm	3.9
8480	Mucinous Adenocarcinoma	2.9
8144	Adenocarcinoma, Intestinal Type	2.4
8240	Carcinoid Tumor	2.3
8481	Mucin-producing Adenocarcinoma	1.3
8936	Gastrointestinal Stromal Sarcoma	1.1
8070	Squamous Cell Carcinoma, NOS	1.0

**Table 21.2**

### Cancer of the Stomach Stage of Disease at Diagnosis West Virginia Residents 1997 – 2001

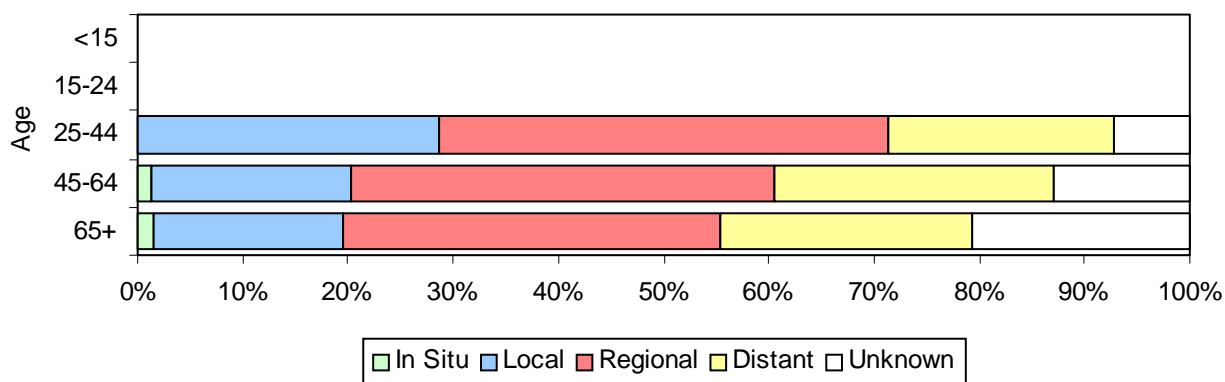


**Figure 21.4**

## Cancer of the Stomach

### Stage of Disease at Diagnosis by Age

#### West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-24	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
25-44	0	0.0%	8	28.6%	12	42.9%	~	~	~	~	28	100.0%
45-64	~	~	31	19.1%	65	40.1%	~	~	21	13.0%	162	100.0%
65+	~	~	79	18.0%	157	35.8%	104	23.7%	~	~	438	100.0%
Total	9	1.4%	118	18.8%	234	37.3%	153	24.4%	114	18.2%	628	100.0%

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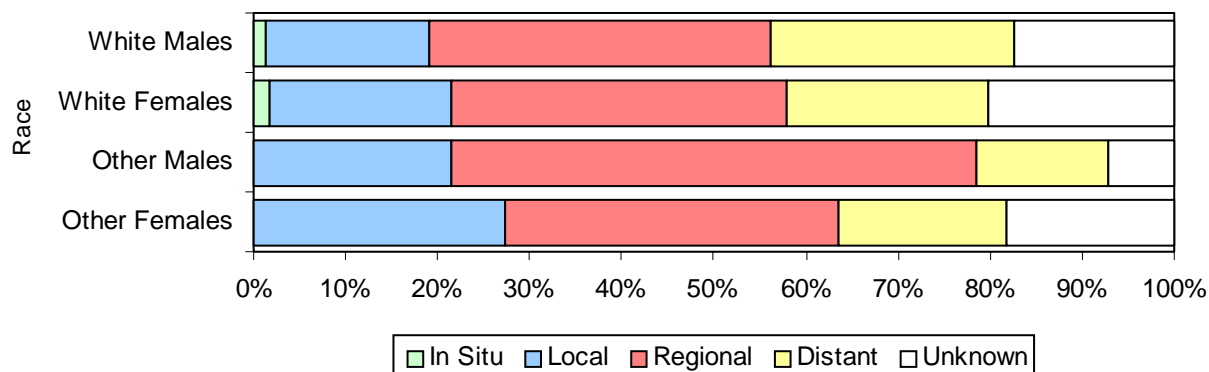
Total may not add to 100% due to rounding.

**Figure 21.5**

## Cancer of the Stomach

### Stage of Disease at Diagnosis by Race and Sex

#### West Virginia Residents 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	5	1.4%	66	17.8%	137	37.0%	98	26.5%	64	17.3%	370	100.0%
White Females	4	1.7%	46	19.7%	85	36.5%	51	21.9%	47	20.2%	233	100.0%
Other Males	0	0.0%	~	~	8	57.1%	~	~	~	~	14	100.0%
Other Females	0	0.0%	~	~	4	36.4%	~	~	~	~	11	100.0%
Total	9	1.4%	118	18.8%	234	37.3%	153	24.4%	114	18.2%	628	100.0%

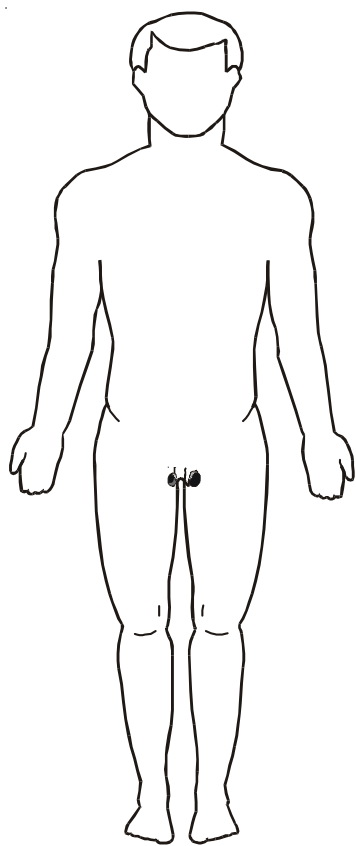
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Total may not add to 100% due to rounding.

**Figure 21.6**







## **Chapter 22**

# **Cancer of the Testis**



## Cancer of the Testis

### Incidence and Mortality by Year

#### West Virginia Males 1993 – 2001

Year	Male			
	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	44	4.9	~	0.3
1994	50	5.7	~	0.2
1995	43	4.9	~	0.1
1996	53	6.0	~	0.2
1997	41	4.6	4	0.5
1998	38	4.3	~	0.1
1999	44	5.0	4	0.5
2000	49	5.7	0	0.0
2001	34	4.0	~	0.1

~ Three or fewer deaths

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia males and are age-adjusted to the 2000 U.S. standard population.

**Table 22.1**

### Overview

- Cancer of the testis is a disease of young men. Eighty-three percent (83%) of testicular cancer in West Virginia occurred in men under the age of 45 (Figure 22.5). Testicular cancer and Hodgkin's disease tied as the leading cause of cancer incidence for West Virginia males age 15-44 (Table 1.2).
- During 1997-2001, 65% of males with testicular cancer in West Virginia were diagnosed at a local stage of disease (Figure 22.4).
- Mortality from cancer of the testis is very rare. In fact, mortality rates for this site were the lowest for any cancer site in 1997-2001 in West Virginia (Figure 1.3).

### Risk Factors

- A history of cryptorchidism, orchiopexy, or testicular atrophy are risk factors for testicular cancer.

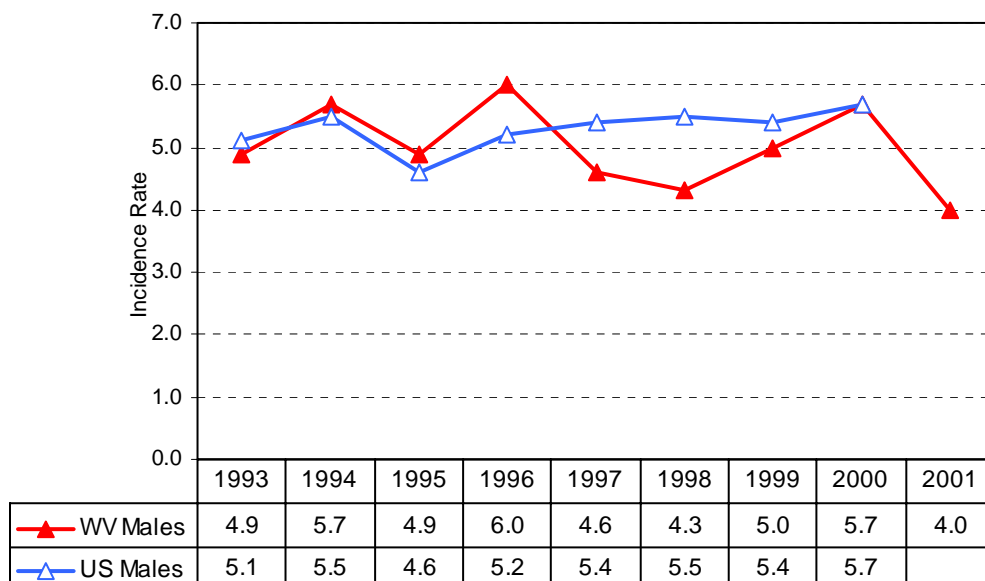
### Prevention

- Periodic screening by testicular examination for individuals with the above risk factors is indicated. Some recommend periodic screening of all males as well as self testicular exams. While these may be helpful for detecting other abnormalities, conclusive evidence of their benefit in early detection of testicular cancer has not been shown.

## Cancer of the Testis

### Incidence Rates\*, Age-Adjusted

West Virginia Males 1993 – 2001, U.S. Males 1993 – 2000



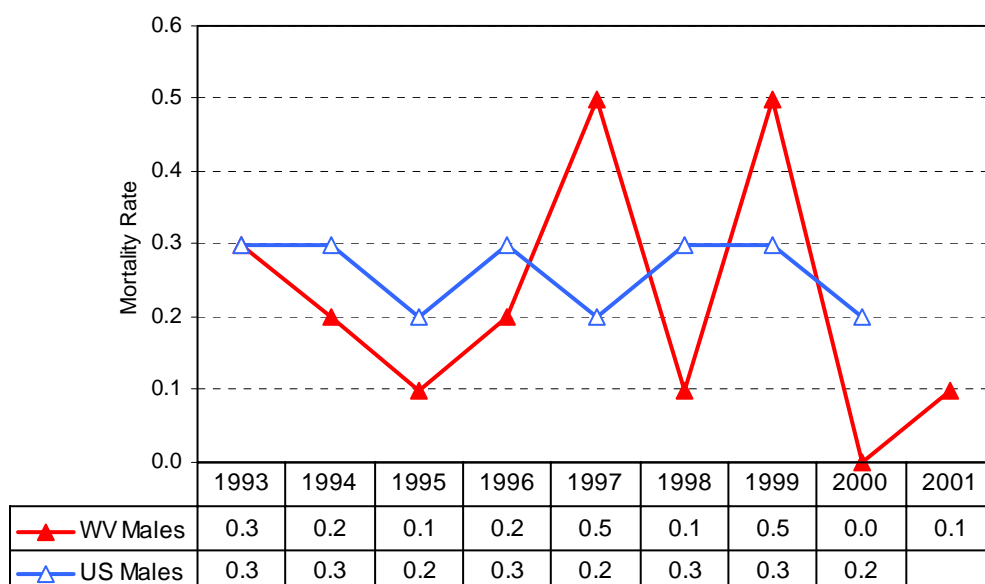
**Figure 22.1**

\* Rates are per 100,000 males and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Testis

### Mortality Rates\*, Age-Adjusted

West Virginia Males 1993 – 2001, U.S. Males 1993 – 2000

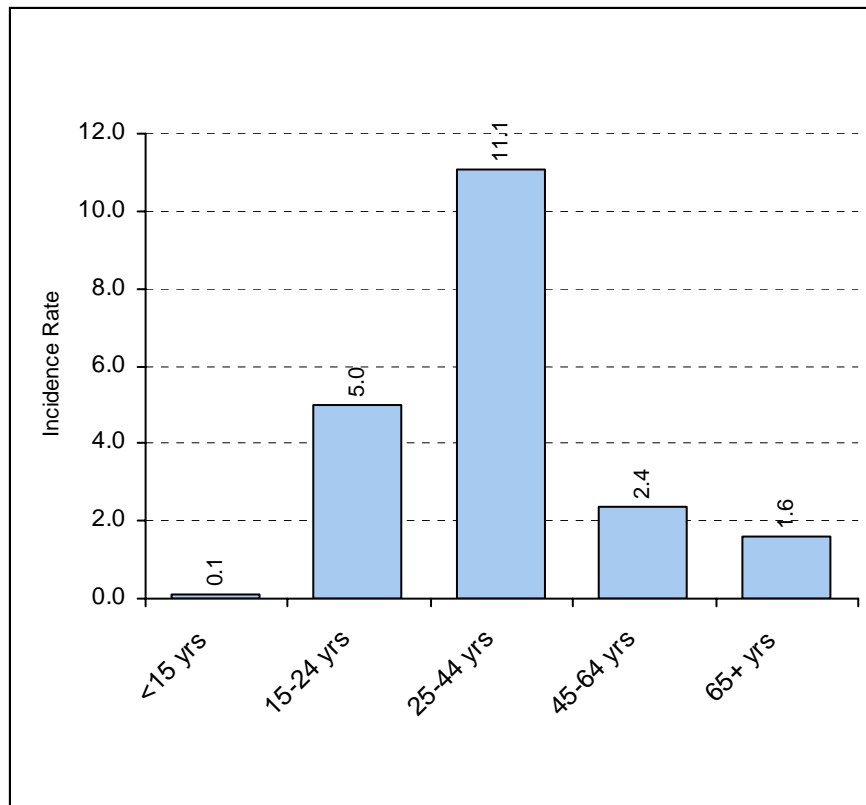


**Figure 22.2**

\* Rates are per 100,000 males and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Testis

Incidence Rates\*, Age-Specific  
West Virginia Males 1997 – 2001



**Figure 22.3**

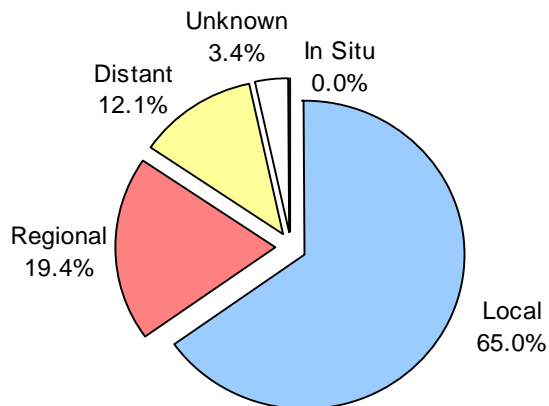
\*Five-year average annual rate per 100,000 West Virginia males

Cancer of the Testis  
Most Frequent Histologies  
West Virginia Males 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
9061	Seminoma	55.8
9085	Mixed Germ Cell Tumor	14.6
9070	Embryonal Carcinoma	10.7
9081	Teratocarcinoma	6.3
9064	Germinoma	3.4
9063	Spermatocytic Seminoma	1.5
9101	Choriocarcinoma Combined with Other Germ Cell Elements	1.5

**Table 22.2**

Cancer of the Testis  
Stage of Disease at Diagnosis  
West Virginia Males 1997 – 2001

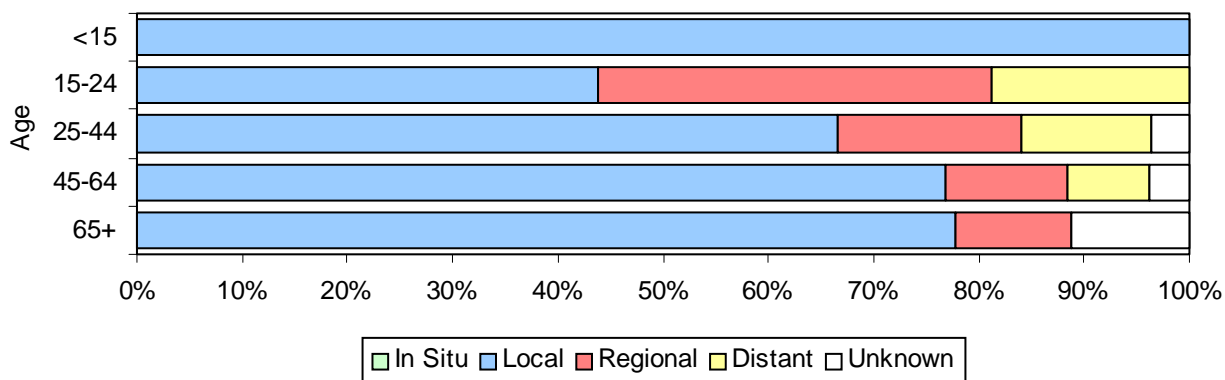


**Figure 22.4**

## Cancer of the Testis

### Stage of Disease at Diagnosis by Age

#### West Virginia Males 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	~		0	0.0%	0	0.0%	0	0.0%	~	100.0%
15-24	0	0.0%	~		12	37.5%	~		0	0.0%	32	100.0%
25-44	0	0.0%	92	66.7%	24	17.4%	17	12.3%	5	3.6%	138	100.0%
45-64	0	0.0%	20	76.9%	~		~		~		26	100.0%
65+	0	0.0%	7	77.8%	~		0	0.0%	~		~	100.0%
Total	0	0.0%	134	65.0%	40	19.4%	25	12.1%	7	3.4%	206	100.0%

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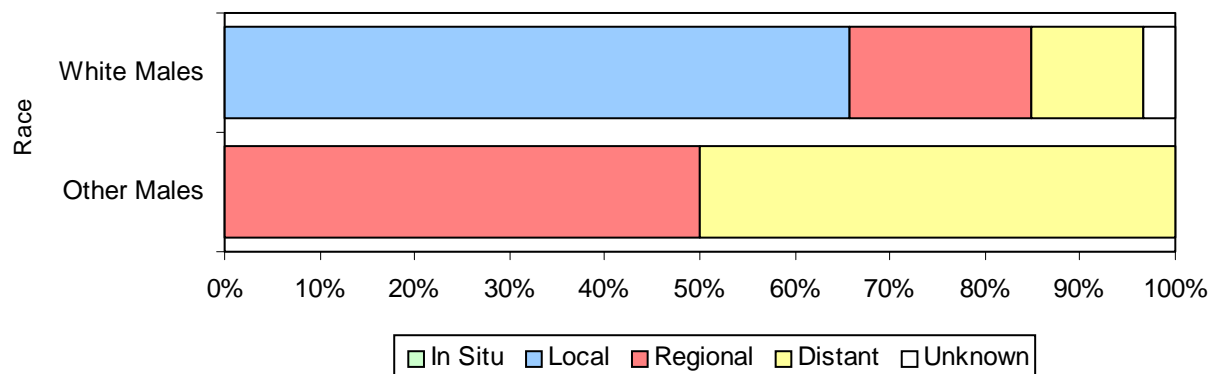
Total may not add to 100% due to rounding.

**Figure 22.5**

## Cancer of the Testis

### Stage of Disease at Diagnosis by Race

#### West Virginia Males 1997 – 2001



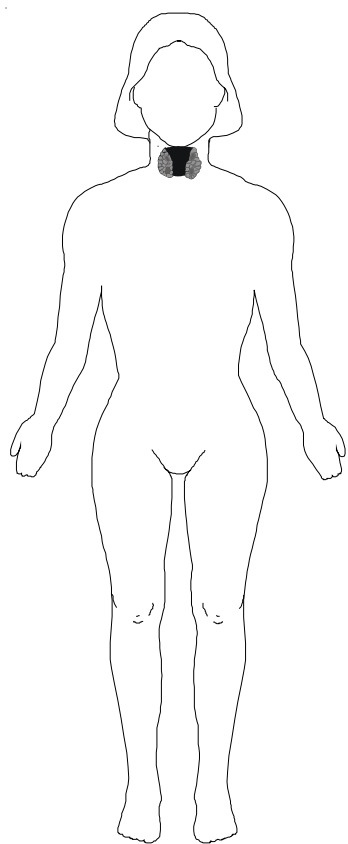
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	0	0.0%	134	65.7%	~		~		7	3.4%	~	100.0%
Other Males	0	0.0%	0	0.0%	~		~		0	0.0%	~	100.0%
Total	0	0.0%	134	65.0%	40	19.4%	25	12.1%	7	3.4%	206	100.0%

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Total may not add to 100% due to rounding.

**Figure 22.6**





## **Chapter 23**

# **Cancer of the Thyroid**





## Cancer of the Thyroid

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	20	2.2	~	0.5	33	3.2	~	0.6	53	2.7	10	0.5
1994	17	1.9	~	0.1	50	5.1	~	0.4	67	3.6	6	0.3
1995	21	2.3	9	1.0	66	6.6	6	0.5	87	4.5	15	0.7
1996	17	2.1	~	0.3	56	5.5	~	0.2	73	3.8	6	0.3
1997	22	2.4	~	0.3	96	9.8	~	0.3	118	6.3	7	0.3
1998	36	3.8	6	0.7	83	8.3	8	0.6	119	6.2	14	0.7
1999	31	3.4	5	0.6	109	11.2	8	0.6	140	7.4	13	0.6
2000	31	3.5	~	0.3	105	10.6	~	0.1	136	7.1	4	0.2
2001	40	4.2	6	0.7	109	10.9	8	0.7	149	7.7	14	0.7

~ Suppressed due to small cell size

Number of new cases excludes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 23.1**

### Overview

- Although cancer of the thyroid was a relatively rare disease in West Virginia in 1997-2001, it occurred more commonly among females (average annual incidence rate of 10.2 per 100,000 females versus 3.5 per 100,000 males). This was consistent with national data and suggests possible hormonal factors in development of this disease (Figures 1.3 and 1.4).
- Cancer of the thyroid occurred in all age groups in West Virginia in 1997-2001, and incidence generally increased with age up to age 65 (Figure 23.3).
- Three-quarters (75%) of all West Virginia cases diagnosed in 1997-2001 were identified as local disease (Figure 23.5).
- Deaths due to thyroid cancer were rare in West Virginia in 1997-2001 (Table 23.1). Average annual age-adjusted mortality rates for both men and women were 0.5 per 100,000. Only testicular cancer and Hodgkin's disease had lower mortality rates (Figures 1.3 and 1.4).

### Risk Factors

- Radiation exposure when young (most commonly for therapeutic purposes) is one identified risk factor for this disease.

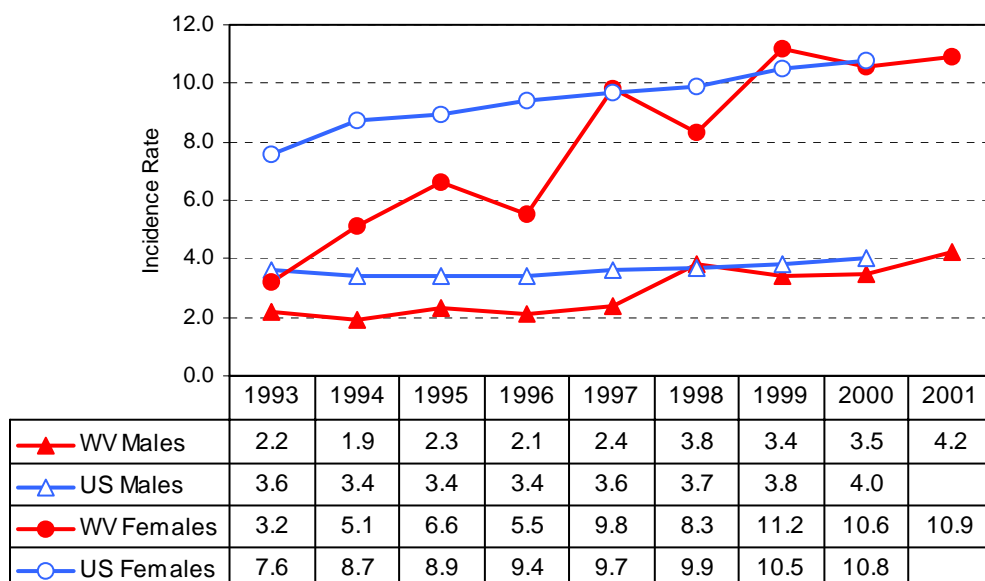
### Prevention

- Screening is most commonly directed at those with a history of radiation during childhood. The effectiveness of this practice is not known.

## Cancer of the Thyroid

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



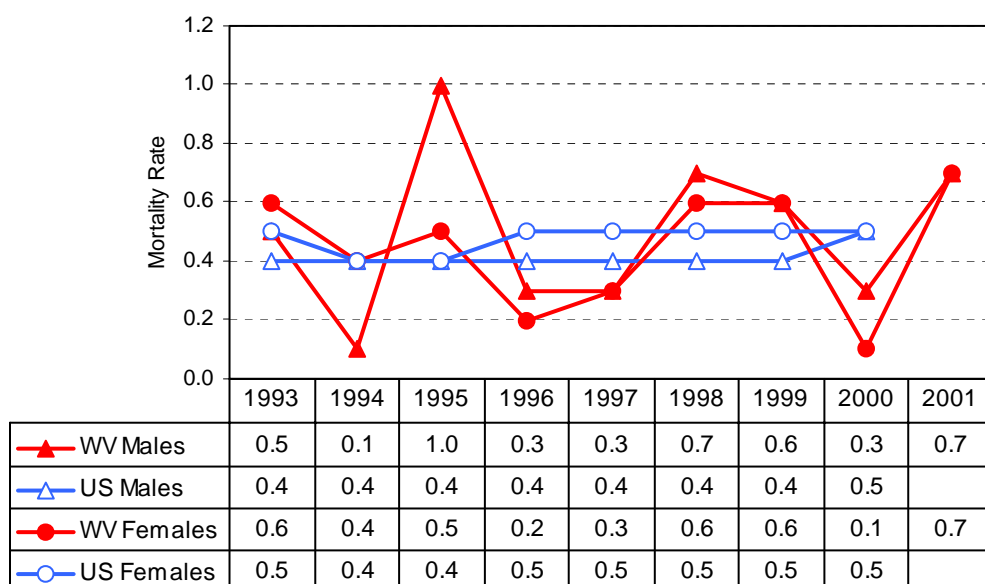
**Figure 23.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Thyroid

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000

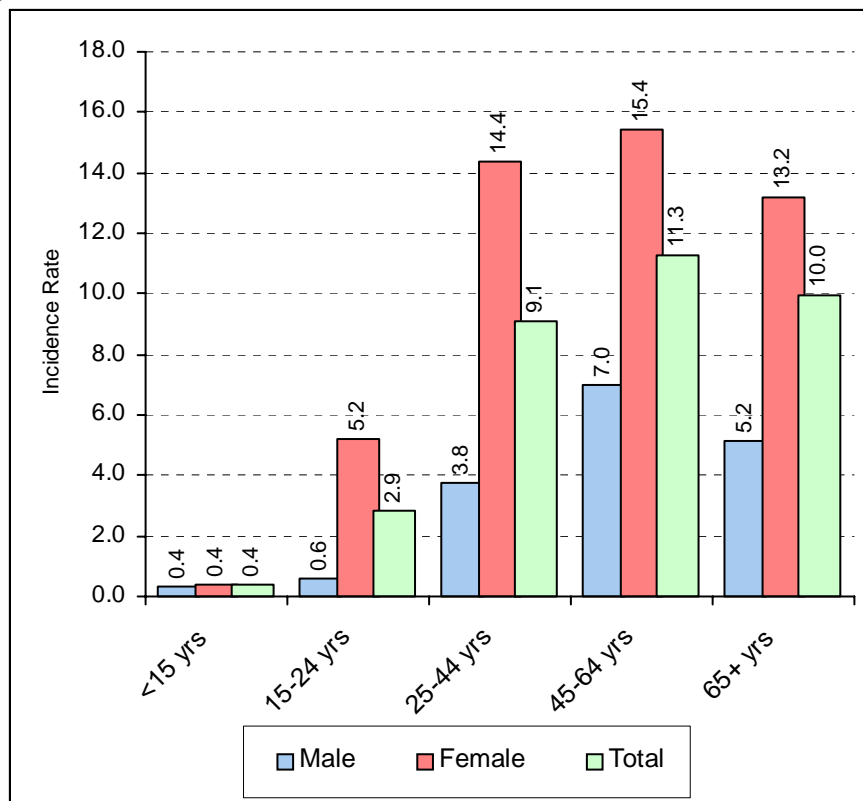


**Figure 23.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Thyroid

### Incidence Rates\*, Age-Specific West Virginia Residents 1997 – 2001



**Figure 23.3**

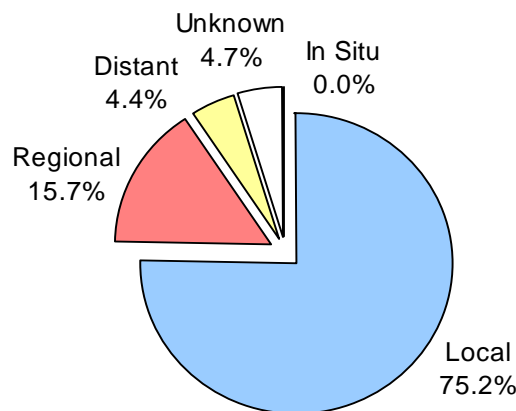
\*Five-year average annual rate per 100,000 West Virginia residents

### Cancer of the Thyroid Most Frequent Histologies West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
805	Papillary Carcinoma	44.1
834	Papillary Carcinoma, Follicular Variant	31.1
833	Follicular Adenocarcinoma	9.7
826	Adenocarcinoma (Papillary or in Villous Adenoma)	5.7
829	Oxyphilic Adenocarcinoma	3.9
800	Malignant Neoplasm	1.2
801	Carcinoma	1.2
802	Carcinoma, Undifferentiated	1.2

**Table 23.2**

### Cancer of the Thyroid Stage of Disease at Diagnosis West Virginia Residents 1997 – 2001

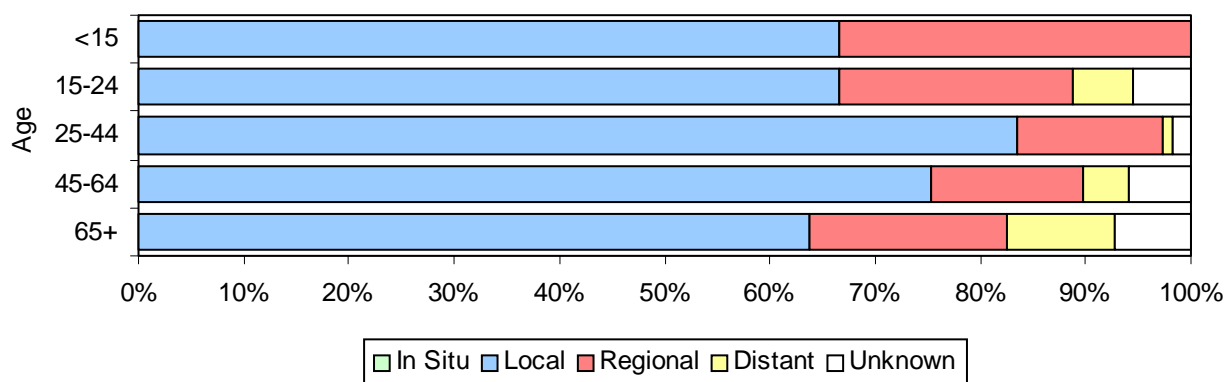


**Figure 23.4**

## Cancer of the Thyroid

### Stage of Disease at Diagnosis by Age

#### West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	4	66.7%	~	~	0	0.0%	0	0.0%	~	100.0%
15-24	0	0.0%	24	66.7%	8	22.2%	~	~	~	~	~	100.0%
25-44	0	0.0%	192	83.5%	~	~	~	~	~	~	230	100.0%
45-64	0	0.0%	190	75.4%	36	14.3%	11	4.4%	15	6.0%	252	100.0%
65+	0	0.0%	88	63.8%	26	18.8%	14	10.1%	10	7.2%	138	100.0%
Total	0	0.0%	498	75.2%	104	15.7%	29	4.4%	31	4.7%	662	100.0%

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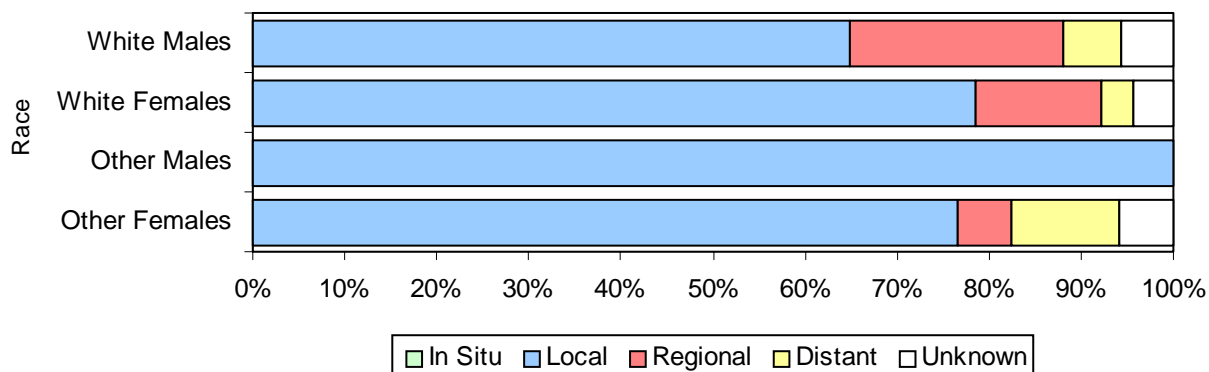
Total may not add to 100% due to rounding.

**Figure 23.5**

## Cancer of the Thyroid

### Stage of Disease at Diagnosis by Race and Sex

#### West Virginia Residents 1997 – 2001



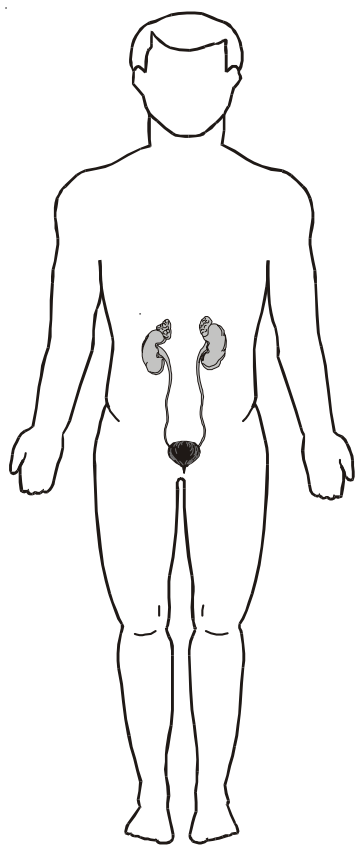
Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	0	0.0%	103	64.8%	37	23.3%	10	6.3%	9	5.7%	159	100.0%
White Females	0	0.0%	381	78.6%	66	13.6%	17	3.5%	21	4.3%	485	100.0%
Other Males	0	0.0%	~	~	~	~	~	~	~	~	~	100.0%
Other Females	0	0.0%	~	~	~	~	~	~	~	~	~	100.0%
Total	0	0.0%	498	75.2%	104	15.7%	29	4.4%	31	4.7%	662	100.0%

~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 23.6**





## Chapter 24

# Cancer of the Urinary Bladder



## Cancer of the Urinary Bladder

### Incidence and Mortality by Sex and Year

#### West Virginia Residents 1993 – 2001

Year	Male				Female				Total			
	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate	New Cases	Incid. Rate	Deaths	Mort. Rate
1993	329	38.3	69	8.6	130	10.7	25	2.0	459	22.0	94	4.6
1994	310	36.7	52	6.4	131	10.9	44	3.6	441	21.5	96	4.7
1995	306	36.3	66	8.0	121	10.2	29	2.3	427	20.7	95	4.6
1996	333	38.7	53	7.3	117	9.7	35	2.8	450	21.5	88	4.3
1997	376	43.0	60	7.5	144	11.7	23	1.8	520	24.6	83	4.0
1998	386	44.5	76	9.7	160	13.2	52	4.2	546	25.7	128	6.1
1999	356	39.9	54	6.6	169	13.9	37	2.9	525	24.6	91	4.3
2000	336	38.2	61	7.9	146	12.0	39	3.0	482	22.5	100	4.7
2001	367	40.1	56	6.8	133	10.9	47	3.7	500	23.1	103	4.8

Number of new cases includes in situ cases.

Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

**Table 24.1**

### Overview

- Cancer of the urinary bladder was the fourth most common site of primary cancer diagnosed among West Virginia men during 1997-2001 (Figure 1.3). For both men and women, incidence markedly increased with increasing age (Figure 24.3).
- During 1997-2001, the average annual age-adjusted incidence rate for West Virginia men (41.2 per 100,000) was over three times higher than that for women (12.3 per 100,000) (Figures 1.3 and 1.4).
- The majority (82%) of 1997-2001 bladder cancer cases were diagnosed as in situ or local disease (Figure 24.4).
- As with incidence, 1997-2001 average annual age-adjusted mortality rates among West Virginia men (7.7 per 100,000) were higher than those for West Virginia women (3.1 per 100,000) (Figures 1.3 and 1.4).

### Risk Factors

- Smoking is the greatest risk factor for bladder cancer. It is estimated that smoking accounts for nearly half of all deaths from bladder cancer among men and over one-third of all deaths among women (ACS, 2003a).
- In addition, workers in certain dye, rubber, leather, textile, and paint industries are at higher risk.

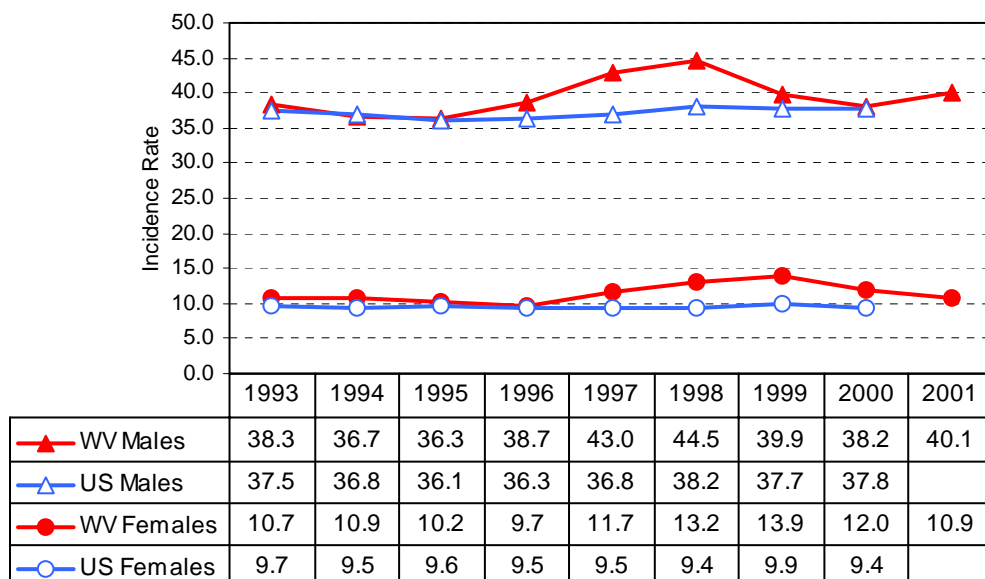
### Prevention

- Quitting smoking substantially decreases the risk of bladder cancer.

## Cancer of the Urinary Bladder

### Incidence Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



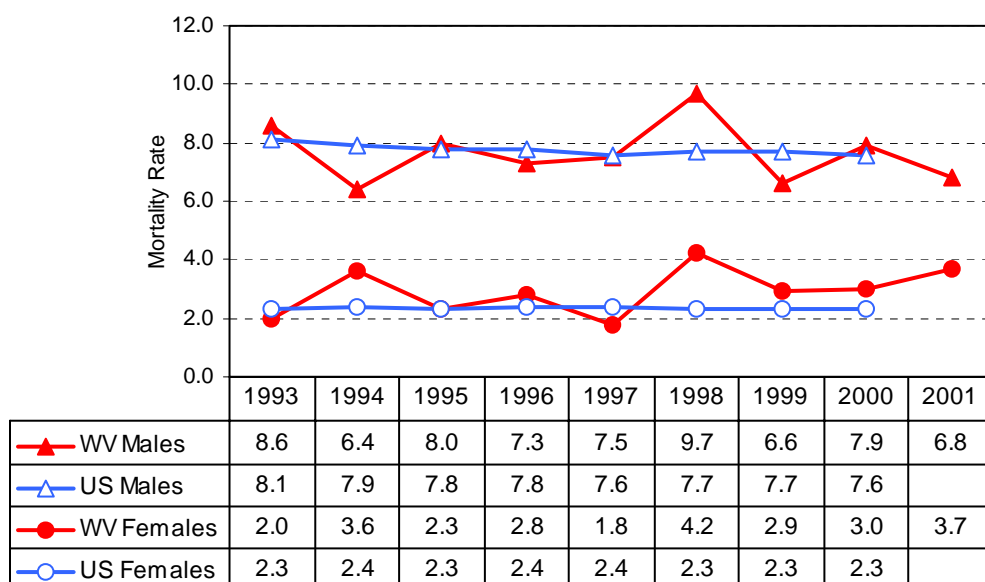
**Figure 24.1**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).

## Cancer of the Urinary Bladder

### Mortality Rates\*, Age-Adjusted

West Virginia Residents 1993 – 2001, U.S. Residents 1993 – 2000



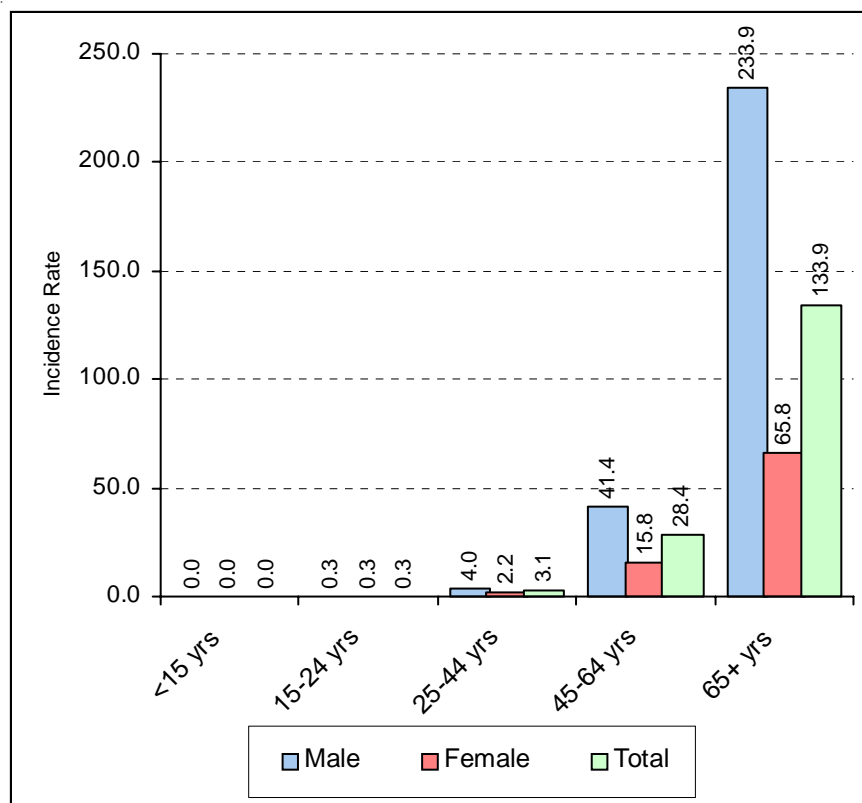
**Figure 24.2**

\*Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.  
U.S. rates are from SEER (Ries et al., 2003).



## Cancer of the Urinary Bladder

Incidence Rates\*, Age-Specific  
West Virginia Residents 1997 – 2001



**Figure 24.3**

\*Five-year average annual rate per 100,000 West Virginia residents

## Cancer of the Urinary Bladder

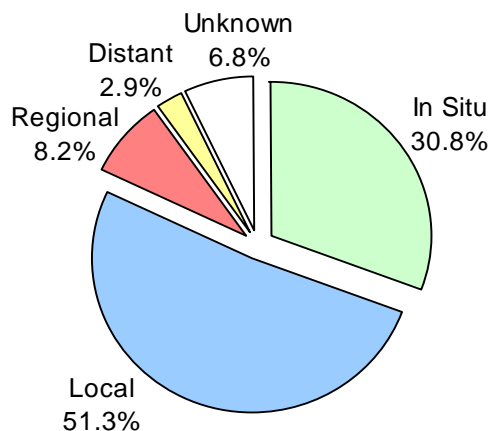
Most Frequent Histologies  
West Virginia Residents 1997 – 2001

ICD-O Code	Histology	% of Invasive Cases
813	Papillary Transitional Cell Carcinoma	62.5
812	Transitional Cell Carcinoma	30.5
805	Papillary Carcinoma	1.6
801	Carcinoma	1.5
807	Squamous Cell Carcinoma	1.4
800	Malignant Neoplasm	1.3

**Table 24.2**

## Cancer of the Urinary Bladder

Stage of Disease at Diagnosis  
West Virginia Residents 1997 – 2001

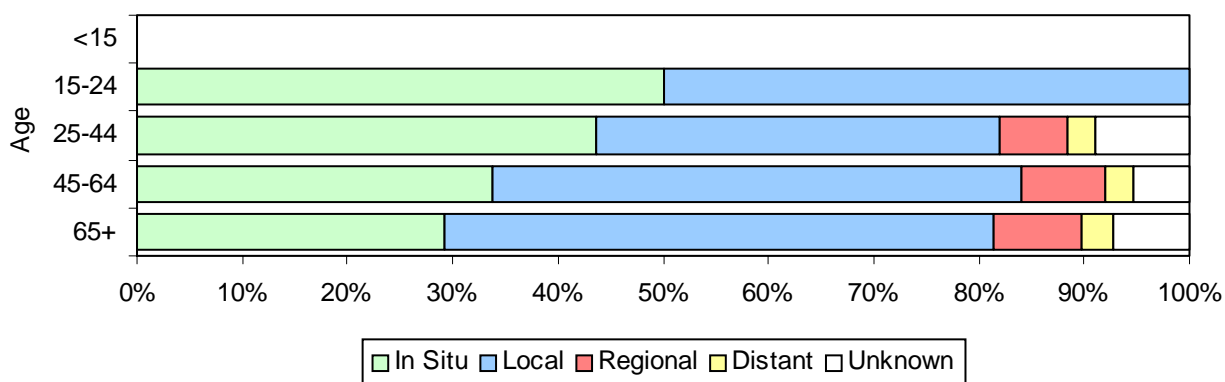


**Figure 24.4**

## Cancer of the Urinary Bladder

### Stage of Disease at Diagnosis by Age

West Virginia Residents 1997 – 2001



Age	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
<15	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
15-24	~		~		0	0.0%	0	0.0%	0	0.0%	4	100.0%
25-44	34	43.6%	~		5	6.4%	~		7	9.0%	78	100.0%
45-64	~		319	50.3%	50	7.9%	~		34	5.4%	634	100.0%
65+	542	29.2%	969	52.2%	156	8.4%	55	3.0%	135	7.3%	1,857	100.0%
Total	792	30.8%	1,320	51.3%	211	8.2%	74	2.9%	176	6.8%	2,573	100.0%

~ Suppressed due to small cell size

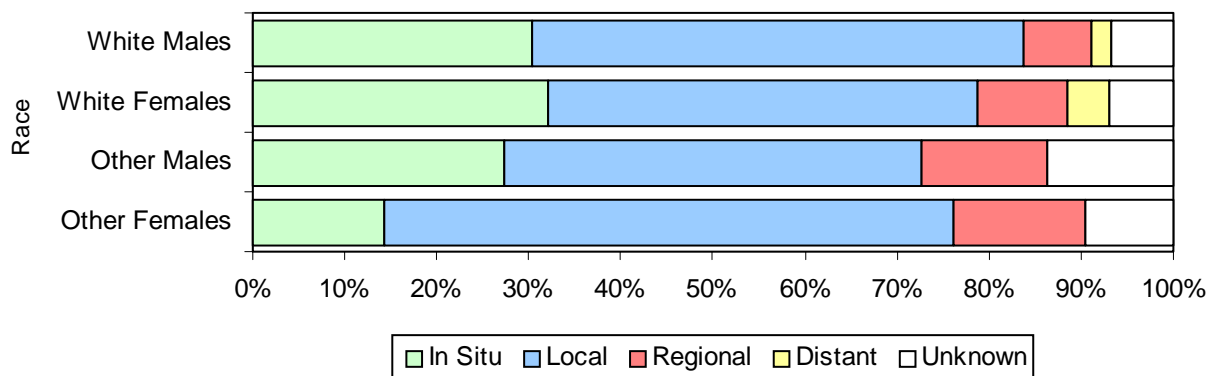
Total may not add to 100% due to rounding.

**Figure 24.5**

## Cancer of the Urinary Bladder

### Stage of Disease at Diagnosis by Race and Sex

West Virginia Residents 1997 – 2001



Race/Sex	In Situ		Local		Regional		Distant		Unknown		Total	
	#	%	#	%	#	%	#	%	#	%	#	%
White Males	548	30.5%	957	53.2%	133	7.4%	41	2.3%	120	6.7%	1,799	100.0%
White Females	235	32.1%	340	46.5%	72	9.8%	33	4.5%	51	7.0%	731	100.0%
Other Males	~		10	45.5%	~		0	0.0%	~		22	100.0%
Other Females	~		13	61.9%	~		0	0.0%	~		21	100.0%
Total	792	30.8%	1,320	51.3%	211	8.2%	74	2.9%	176	6.8%	2,573	100.0%

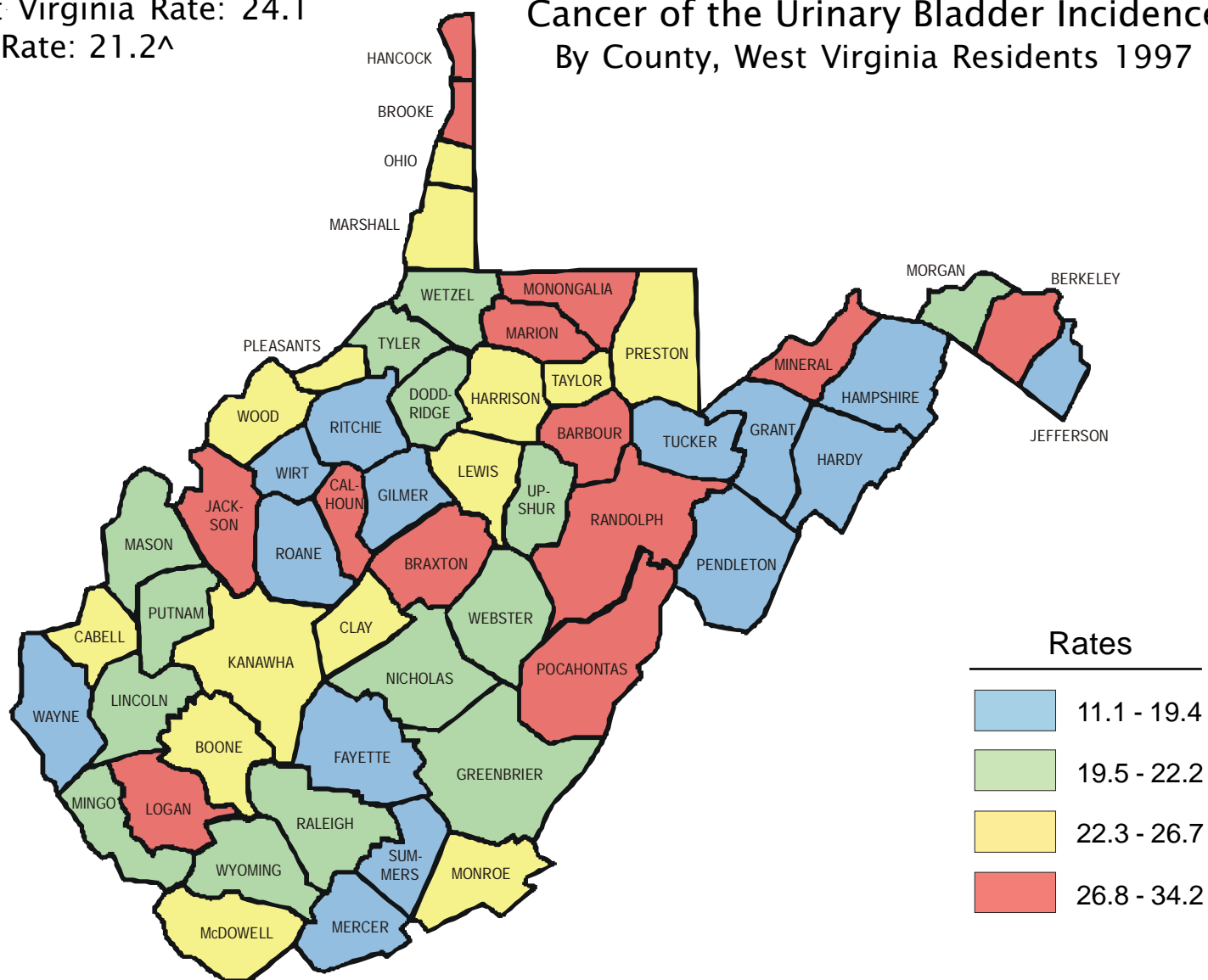
~ Suppressed due to small cell size

Total may not add to 100% due to rounding.

**Figure 24.6**

West Virginia Rate: 24.1  
U.S. Rate: 21.2<sup>^</sup>

## Cancer of the Urinary Bladder Incidence Rates\* By County, West Virginia Residents 1997 – 2001



\* Five-year average annual rate per 100,000 West Virginia residents, age-adjusted to the 2000 U.S. standard population.

<sup>^</sup> U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

Refer to Table 24.3 for individual county rates and measures of statistical significance.

**Figure 24.7**

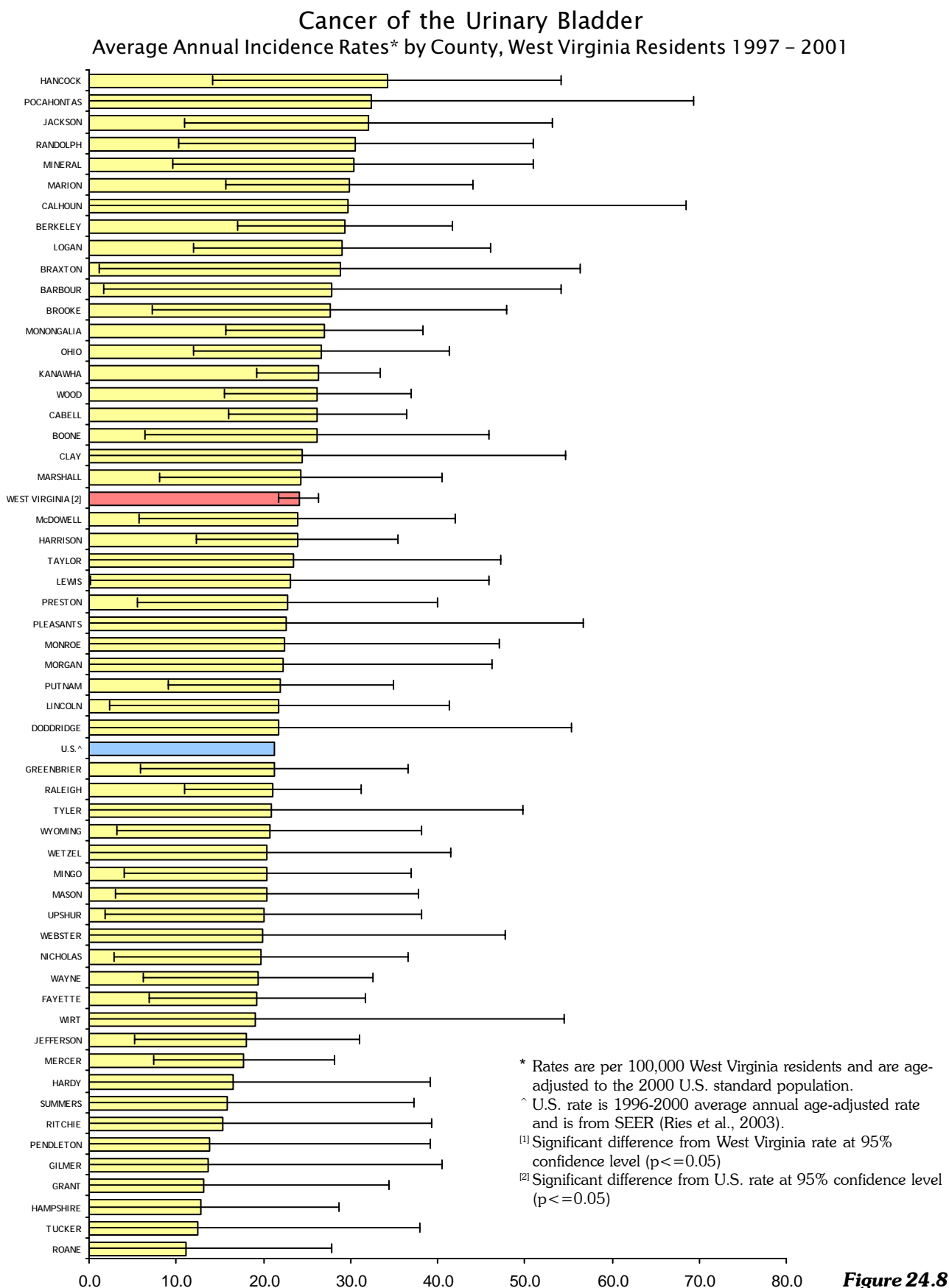


Figure 24.8

# Cancer of the Urinary Bladder

Average Annual Incidence Rates\* by County, West Virginia Residents 1997 – 2001

COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>		COUNTY	1997-2001 TOTAL CASES	5-YR AVG. ANN. RATE	Significant Difference <sup>+</sup>	
			WV	U.S.				WV	U.S.
BARBOUR	26	27.9	No	No	MINGO	29	20.5	No	No
BERKELEY	104	29.4	No	No	MONONGALIA	94	27.0	No	No
BOONE	36	26.1	No	No	MONROE	20	22.5	No	No
BRAXTON	25	28.8	No	No	MORGAN	21	22.2	No	No
BROOKE	47	27.6	No	No	NICHOLAS	30	19.7	No	No
CABELL	153	26.2	No	No	OHIO	90	26.7	No	No
CALHOUN	14	29.7	No	No	PENDLETON	7	13.8	No	No
CLAY	14	24.5	No	No	PLEASANTS	10	22.7	No	No
DODDRIDGE	9	21.7	No	No	POCAHONTAS	20	32.4	No	No
FAYETTE	58	19.3	No	No	PRESTON	39	22.8	No	No
GILMER	6	13.6	No	No	PUTNAM	56	22.0	No	No
GRANT	9	13.2	No	No	RALEIGH	99	21.1	No	No
GREENBRIER	49	21.2	No	No	RANDOLPH	52	30.6	No	No
HAMPSHIRE	15	12.9	No	No	RITCHIE	10	15.4	No	No
HANCOCK	77	34.2	No	No	ROANE	10	11.1	No	No
HARDY	12	16.6	No	No	SUMMERS	16	15.8	No	No
HARRISON	103	23.9	No	No	TAYLOR	23	23.5	No	No
JACKSON	51	32.1	No	No	TUCKER	6	12.5	No	No
JEFFERSON	36	18.1	No	No	TYLER	13	20.9	No	No
KANAWHA	330	26.4	No	No	UPSHUR	27	20.0	No	No
LEWIS	25	23.1	No	No	WAYNE	48	19.4	No	No
LINCOLN	24	21.8	No	No	WEBSTER	11	19.9	No	No
LOGAN	63	29.1	No	No	WETZEL	23	20.5	No	No
MARION	111	29.9	No	No	WIRT	6	19.1	No	No
MARSHALL	54	24.3	No	No	WOOD	140	26.2	No	No
MASON	31	20.4	No	No	WYOMING	29	20.7	No	No
MCDOWELL	40	23.9	No	No					
MERCER	73	17.8	No	No	WEST VIRGINIA	2,573	24.1		YES
MINERAL	49	30.3	No	No	U.S.^		21.2		

\* Rates are per 100,000 West Virginia residents and are age-adjusted to the 2000 U.S. standard population.

^ U.S. rate is 1996-2000 average annual age-adjusted rate and is from SEER (Ries et al., 2003).

+ Difference between county rate and West Virginia rate, and county rate and U.S. rate, is tested for statistical significance at the 95% confidence level ( $p \leq 0.05$ ).

**Table 24.3**



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# Appendices

## Participating Health Care Facilities

**Hospital**

Beckley Appalachian Regional Hospital\*  
Bluefield Regional Medical Center\*  
Boone Memorial Hospital  
Braxton County Memorial Hospital  
Broaddus Hospital Association, Inc.  
Cabell-Huntington Hospital, Inc.\*  
Camden-Clark Memorial Hospital\*  
Charleston Area Medical Center\*  
City Hospital, Inc.\*  
Columbia Raleigh General Hospital  
Columbia St. Francis Hospital\*  
Davis Memorial Hospital\*  
Eye & Ear Clinic of Charleston, Inc.  
Fairmont General Hospital, Inc.\*  
Grafton City Hospital, Inc.  
Grant Memorial Hospital  
Greenbrier Valley Medical Center\*  
Guyan Valley Hospital  
Hampshire Memorial Hospital, Inc.\*  
Jackson General Hospital  
Jefferson Memorial Hospital\*  
Logan Regional Medical Center\*  
Minnie Hamilton Health Care Center, Inc.  
Monongalia General Hospital\*  
Montgomery General Hospital, Inc.  
Morgan County War Memorial Hospital  
Ohio Valley Medical Center\*  
Plateau Medical Center  
Pleasant Valley Hospital, Inc.\*  
Pocahontas Memorial Hospital  
Potomac Valley Hospital of West Virginia, Inc.\*  
Preston Memorial Hospital  
Princeton Community Hospital\*  
Putnam General Hospital\*  
Reynolds Memorial Hospital, Inc.\*  
Richwood Area Community Hospital  
Roane General Hospital  
St. Joseph's Hospital  
St. Joseph's Hospital of Buckhannon, Inc.  
St. Luke's Hospital  
St. Mary's Hospital of Huntington, Inc.\*

**Location**

Beckley  
Bluefield  
Madison  
Gassaway  
Philippi  
Huntington  
Parkersburg  
Charleston  
Martinsburg  
Beckley  
Charleston  
Elkins  
Charleston  
Fairmont  
Grafton  
Petersburg  
Ronceverte  
Logan  
Romney  
Ripley  
Ranson  
Logan  
Grantsville  
Morgantown  
Montgomery  
Berkeley Springs  
Wheeling  
Oak Hill  
Point Pleasant  
Marlinton  
Keyser  
Kingwood  
Princeton  
Hurricane  
Glen Dale  
Richwood  
Spencer  
Parkersburg  
Buckhannon  
Bluefield  
Huntington

**Hospital (continued)****Location**

Sistersville General Hospital	Sistersville
Stonewall Jackson Memorial Hospital*	Weston
Summers County Appalachian Regional Hospital	Hinton
Summersville Memorial Hospital	Summersville
Thomas Memorial Hospital*	South Charleston
United Hospital Center*	Clarksburg
Veterans Administration Medical Center*	Beckley
Veterans Administration Medical Center*	Clarksburg
Veterans Administration Medical Center*	Huntington
Veterans Administration Medical Center*	Martinsburg
Webster County Memorial Hospital	Webster Springs
Weirton Medical Center, Inc.	Weirton
Welch Community Hospital	Welch
West Virginia University Hospitals*	Morgantown
Wetzel County Hospital Association	New Martinsville
Wheeling Hospital, Inc.*	Wheeling
Williamson Memorial Hospital*	Williamson

*\*Hospitals with computerized cancer registries*

**Pathology Laboratory****Location**

Beckley Appalachian Regional Hospital Pathology Laboratory	Beckley
Bluefield Regional Medical Center Pathology Laboratory	Bluefield
Cabell-Huntington Hospital Pathology Laboratory	Huntington
Camden-Clark Memorial Hospital Pathology Laboratory	Parkersburg
Charleston Area Medical Center Pathology Laboratory	Charleston
City Hospital Pathology Laboratory	Martinsburg
Columbia Raleigh General Hospital Pathology Laboratory	Beckley
Columbia St. Francis Hospital Pathology Laboratory	Charleston
Davis Memorial Hospital Pathology Laboratory	Elkins
Dianon Systems, Inc. Pathology Laboratory	Stratford, CT
Fairmont General Hospital Pathology Laboratory	Fairmont
General Consultants Medical Laboratory	Parkersburg
Greenbrier Valley Medical Center Pathology Laboratory	Ronceverte
Head and Neck Diagnostics of America	Morgantown
Jefferson Memorial Hospital Pathology Laboratory	Ranson
Lab Corp. of America Pathology Laboratory	Fairmont
Lab Corp. of America Pathology Laboratory	Research Triangle Park, NC
Logan Regional Medical Center Pathology Laboratory	Logan
Monongalia General Hospital Pathology Laboratory	Morgantown

**Pathology Laboratory (continued)**

Montgomery General Hospital Pathology Laboratory  
 Myers Clinic Laboratory  
 Ohio Valley Medical Center Pathology Laboratory  
 Pleasant Valley Hospital Pathology Laboratory  
 Princeton Community Hospital Pathology Laboratory  
 Putnam General Hospital Pathology Laboratory  
 Quest Diagnostics (formerly American Laboratories)  
 Reynolds Memorial Hospital Pathology Laboratory  
 St. Joseph's Hospital Pathology Laboratory  
 St. Luke's Hospital Pathology Laboratory  
 St. Mary's Hospital Pathology Laboratory  
 SVI Laboratory Services  
 Thomas Memorial Hospital Pathology Laboratory  
 United Hospital Center Pathology Laboratory  
 University Pathology Services Pathology Laboratory  
 VAMC Pathology Laboratory  
 VAMC Pathology Laboratory  
 VAMC Pathology Laboratory  
 VAMC Pathology Laboratory  
 Weirton Medical Center Pathology Laboratory  
 Welch Emergency Hospital Pathology Laboratory  
 West Virginia University Hospitals Pathology Laboratory  
 Wetzel County Hospital Pathology Laboratory  
 Wheeling Hospital Pathology Laboratory  
 Williamson Memorial Hospital Pathology Laboratory

**Location**

Montgomery  
 Philippi  
 Wheeling  
 Point Pleasant  
 Princeton  
 Hurricane  
 Chantilly, VA  
 Glen Dale  
 Parkersburg  
 Bluefield  
 Huntington  
 Charleston  
 South Charleston  
 Clarksburg  
 Huntington  
 Beckley  
 Clarksburg  
 Huntington  
 Martinsburg  
 Weirton  
 Welch  
 Morgantown  
 New Martinsville  
 Wheeling  
 Williamson

**Cancer Treatment Center**

Fairmont Regional Cancer Center  
 Greenbrier Valley Cancer Care Center  
 Princeton Radiation and Oncology  
 Raleigh Regional Cancer Center

**Location**

Fairmont  
 Lewisburg  
 Princeton  
 Beckley

## Comparison of Average Annual Age-Adjusted Cancer Death Rates\* For the U.S. and West Virginia, SEER Program, 1996 – 2000

Site of Invasive Cancer	All Races, Males				All Races, Females			
	Total U.S.	West Virginia	Rank of State Rate	Percent Difference	Total U.S.	West Virginia	Rank of State Rate	Percent Difference
All Sites	255.5	286.3 <sup>^</sup>	7	12.1	168.3	186.9 <sup>^</sup>	3	11.1
Brain and ONS	5.7	4.8	47	-15.8	3.8	4.1	23	7.9
Breast	--	--	--	--	27.7	27.8	19	0.4
Cervix Uteri	--	--	--	--	3.0	4.0 <sup>^</sup>	3	33.3
Colon and Rectum	25.8	28.3	12	9.7	18.0	20.6 <sup>^</sup>	3	14.4
Corpus Uteri	--	--	--	--	4.1	4.5	9	9.8
Esophagus	7.6	7.3	33	-3.9	1.8	1.5	37	-16.7
Hodgkin's Disease	0.6	0.4	48	-33.3	0.4	0.5	4	25.0
Kidney and Renal Pelvis	6.1	6.4	18	4.9	2.8	3.2	13	14.3
Larynx	2.6	3.3	6	26.9	0.5	0.8	4	60.0
Leukemias (All)	10.3	11.4	5	10.7	5.9	6.8	1	15.3
Liver and Intrahepatic Bile Duct	6.6	5.8	35	-12.1	2.9	2.8	24	-3.4
Lung and Bronchus	79.5	104.3 <sup>^</sup>	5	31.2	40.7	51.0 <sup>^</sup>	3	25.3
Melanomas of the Skin	3.9	4.4	11	12.8	1.8	2.2	6	22.2
Multiple Myeloma	4.8	5.1	20	6.3	3.2	3.1	32	-3.1
Non-Hodgkin's Lymphomas	10.7	10.6	27	-0.9	7.0	7.4	12	5.7
Oral Cavity and Pharynx	4.4	3.9	33	-11.4	1.7	1.4	46	-17.6
Ovary	--	--	--	--	8.8	9.4	10	6.8
Pancreas	12.2	11.8	36	-3.3	9.2	7.9	49	-14.1
Prostate	32.9	31.2	37	-5.2	--	--	--	--
Stomach	6.9	6.2	30	-10.1	3.4	2.9	33	-14.7
Testis	0.3	0.3	10	0.0	--	--	--	--
Thyroid	0.4	0.5	13	25.0	0.5	0.4	44	-20.0
Urinary Bladder	7.7	8.1	16	5.2	2.3	2.9	8	26.1

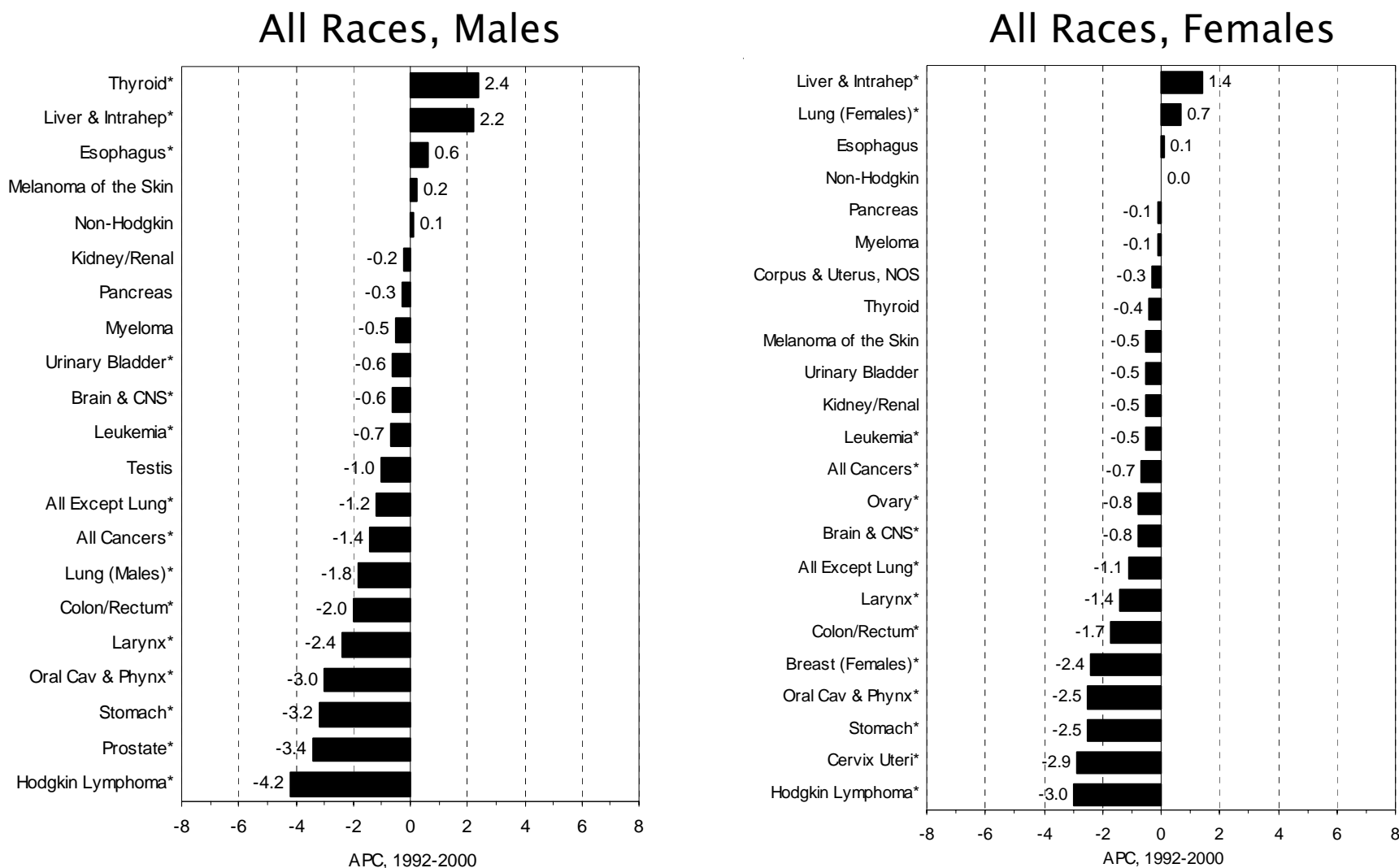
\* Rates are per 100,000 and are age-adjusted to the 2000 U.S. standard population.

**Table A.1**

<sup>^</sup> Difference between West Virginia rate and total U.S. rate is statistically significant ( $p < 0.0002$ ).

All rates are from SEER (Ries et al., 2003).

# Trends in U.S. Death Rates by Primary Cancer Site 1992 – 2000



The APC is the Annual Percent Change over the time interval.

NCHS public use data file. Rates are per 100,000 and are age-adjusted to the 2000 U.S. Standard Population by 5-year age groups.

\*The APC is significantly different from zero ( $p < .05$ ).

Source: SEER Cancer Statistics Review, 1975 - 2000, National Cancer Institute.

**Figure A.1**

West Virginia Population Estimates, 1993 – 2001									
Age	M A L E								
	1993	1994	1995	1996	1997	1998	1999	2000	2001
<5	55,534	55,539	55,699	54,730	53,806	53,092	52,250	51,512	50,234
5-9	56,933	56,477	56,979	57,014	57,493	57,824	57,677	56,571	55,501
10-14	67,241	65,564	64,470	63,038	61,797	60,884	60,304	59,501	59,423
15-19	71,144	71,670	72,029	71,748	70,471	68,878	66,483	63,951	62,245
20-24	67,029	66,918	65,969	64,001	62,743	62,046	61,462	61,390	63,325
25-29	54,176	53,943	54,678	56,850	58,055	58,277	57,723	56,469	54,833
30-34	63,435	61,934	60,196	58,580	57,105	56,327	56,534	57,663	57,516
35-39	71,826	71,699	70,899	69,872	67,901	65,960	64,505	63,030	61,517
40-44	70,259	70,912	71,168	71,479	71,493	71,325	70,771	69,936	68,470
45-49	58,558	62,007	65,196	68,823	68,615	69,079	69,687	70,272	70,097
50-54	47,938	49,089	50,168	51,008	55,638	58,385	61,921	65,588	67,580
55-59	41,665	42,853	43,133	43,905	44,911	46,571	47,599	48,929	50,623
60-64	40,366	39,451	39,161	39,046	39,271	40,107	41,036	41,325	41,885
65-69	39,146	38,650	38,198	37,427	36,474	35,297	34,677	34,508	34,359
70-74	30,699	31,175	31,898	31,876	31,948	32,006	31,893	31,733	31,252
75-79	21,074	21,166	21,184	21,707	22,422	22,794	23,467	24,058	24,276
80-84	12,452	12,607	12,994	13,200	13,161	13,271	13,314	13,381	13,649
85+	7,634	7,723	7,921	8,087	8,282	8,462	8,687	8,995	9,331
Total	877,109	879,377	881,940	882,391	881,586	880,585	879,990	878,812	876,116
Age	F E M A L E								
	1993	1994	1995	1996	1997	1998	1999	2000	2001
<5	52,878	52,946	53,185	52,312	51,528	50,933	50,262	49,599	48,573
5-9	53,638	53,188	53,672	53,717	54,190	54,512	54,349	53,359	52,337
10-14	63,292	61,703	60,665	59,294	58,146	57,247	56,695	55,967	56,240
15-19	67,278	67,673	67,949	67,666	66,497	64,999	62,818	60,473	58,847
20-24	67,273	67,006	65,745	63,414	61,911	61,024	60,233	60,020	61,356
25-29	56,919	56,181	56,419	58,224	59,065	58,889	57,835	56,088	54,355
30-34	66,095	64,176	62,064	60,104	58,396	57,379	57,277	58,091	57,764
35-39	74,215	74,191	73,416	72,448	70,554	68,713	67,386	65,946	63,692
40-44	71,539	72,399	72,820	73,345	73,510	73,467	72,995	72,269	71,163
45-49	59,444	63,031	66,283	69,986	69,790	70,224	70,775	71,270	71,703
50-54	49,944	50,868	51,728	52,376	56,576	58,927	62,101	65,601	67,783
55-59	46,085	46,939	46,779	47,131	47,719	48,898	49,544	50,552	52,204
60-64	45,724	44,356	43,831	43,424	43,371	44,021	44,779	44,953	45,193
65-69	47,285	46,694	46,149	45,453	44,311	42,762	41,682	41,136	40,597
70-74	41,801	42,067	42,374	42,120	41,620	41,759	41,621	40,642	40,067
75-79	33,222	33,138	33,197	33,445	33,856	34,311	34,632	34,890	34,645
80-84	23,815	24,115	24,508	24,434	24,593	24,444	24,479	24,576	24,954
85+	19,983	20,373	20,976	21,524	21,894	22,515	22,748	23,082	23,386
Total	940,430	941,044	941,760	940,417	937,527	935,024	931,809	928,514	924,859
Age	T O T A L								
	1993	1994	1995	1996	1997	1998	1999	2000	2001
<5	108,412	108,485	108,884	107,042	105,334	104,025	102,512	101,111	98,807
5-9	110,571	109,665	110,651	110,731	111,683	112,336	112,026	109,930	107,838
10-14	130,533	127,267	125,135	122,332	119,943	118,131	116,999	115,468	115,663
15-19	138,422	139,343	139,978	139,414	136,968	133,877	129,301	124,424	121,092
20-24	134,302	133,924	131,714	127,415	124,654	123,070	121,695	121,410	124,681
25-29	111,095	110,124	111,097	115,074	117,120	117,166	115,558	112,557	109,188
30-34	129,530	126,110	122,260	118,684	115,501	113,706	113,811	115,754	115,280
35-39	146,041	145,890	144,315	142,320	138,455	134,673	131,891	128,976	125,209
40-44	141,798	143,311	143,988	144,824	145,003	144,792	143,766	142,205	139,633
45-49	118,002	125,038	131,479	138,809	138,405	139,303	140,462	141,542	141,800
50-54	97,882	99,957	101,896	103,384	112,214	117,312	124,022	131,189	135,363
55-59	87,750	89,792	89,912	91,036	92,630	95,469	97,143	99,481	102,827
60-64	86,090	83,807	82,992	82,470	82,642	84,128	85,815	86,278	87,078
65-69	86,431	85,344	84,347	82,880	80,785	78,059	76,359	75,644	74,956
70-74	72,500	73,242	74,272	73,996	73,568	73,765	73,112	72,375	71,319
75-79	54,296	54,304	54,381	55,152	56,278	57,105	58,099	58,948	58,921
80-84	36,267	36,722	37,502	37,634	37,754	37,715	37,793	37,957	38,603
85+	27,617	28,096	28,897	29,611	30,176	30,977	31,435	32,077	32,717
Total	1,817,539	1,820,421	1,823,700	1,822,808	1,819,113	1,815,609	1,811,799	1,807,326	1,800,975

1993-1999 Data Source: Population Estimates Branch, U.S. Bureau of the Census. 1990-1999 Intercensal State and County Characteristics Population Estimates Files for Internet Display. Internet release date: June 23, 2003.  
 2000-2001 Data Source: Population Estimates Branch, U.S. Bureau of the Census. 7/1/2002 County Characteristics Estimates File for Internet Display. Internet release date: September 18, 2003 (last revised November 14, 2003).

Table A.2



West Virginia County Population Estimates, 1997 – 2001															
County	1997			1998			1999			2000			2001		
	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both	Male	Female	Both
Barbour	7,666	8,032	15,698	7,712	8,023	15,735	7,664	7,952	15,616	7,640	7,905	15,545	7,579	7,849	15,428
Berkeley	34,813	35,248	70,061	35,902	36,383	72,285	36,972	37,394	74,366	38,072	38,357	76,429	39,186	39,504	78,690
Boone	12,666	13,310	25,976	12,514	13,128	25,642	12,517	13,123	25,640	12,461	13,050	25,511	12,451	13,015	25,466
Braxton	7,083	7,072	14,155	7,186	7,113	14,299	7,332	7,189	14,521	7,442	7,272	14,714	7,458	7,317	14,775
Brooke	12,488	13,573	26,061	12,400	13,492	25,892	12,343	13,433	25,776	12,144	13,227	25,371	12,114	13,087	25,201
Cabell	46,551	51,467	98,018	46,244	50,952	97,196	46,241	50,746	96,987	46,172	50,498	96,670	45,761	50,011	95,772
Calhoun	3,805	3,863	7,668	3,805	3,844	7,649	3,809	3,839	7,648	3,789	3,792	7,581	3,697	3,734	7,431
Clay	5,117	5,233	10,350	5,107	5,220	10,327	5,129	5,234	10,363	5,115	5,224	10,339	5,090	5,192	10,282
Doddridge	3,660	3,634	7,294	3,699	3,669	7,368	3,690	3,644	7,334	3,741	3,674	7,415	3,754	3,697	7,451
Fayette	23,824	24,724	48,548	23,583	24,377	47,960	23,640	24,177	47,817	23,545	23,976	47,521	23,439	23,799	47,238
Gilmer	3,576	3,570	7,146	3,662	3,625	7,287	3,595	3,557	7,152	3,604	3,558	7,162	3,584	3,530	7,114
Grant	5,553	5,663	11,216	5,558	5,688	11,246	5,595	5,719	11,314	5,576	5,709	11,285	5,607	5,747	11,354
Greenbrier	16,703	18,138	34,841	16,594	18,023	34,617	16,622	17,966	34,588	16,534	17,889	34,423	16,561	17,849	34,410
Hampshire	9,615	9,695	19,310	9,779	9,810	19,589	9,929	9,967	19,896	10,142	10,175	20,317	10,302	10,360	20,662
Hancock	16,216	17,607	33,823	16,025	17,388	33,413	15,814	17,140	32,954	15,668	16,953	32,621	15,487	16,808	32,295
Hardy	5,966	6,146	12,112	6,069	6,245	12,314	6,179	6,362	12,541	6,266	6,424	12,690	6,313	6,465	12,778
Harrison	33,550	36,624	70,174	33,283	36,364	69,647	33,023	36,033	69,056	32,839	35,740	68,579	32,591	35,384	67,975
Jackson	13,335	14,038	27,373	13,453	14,210	27,663	13,579	14,333	27,912	13,647	14,406	28,053	13,620	14,386	28,006
Jefferson	19,852	20,330	40,182	20,148	20,621	40,769	20,559	20,994	41,553	21,005	21,442	42,447	21,511	21,904	43,415
Kanawha	97,185	107,548	204,733	96,521	106,739	203,260	95,711	105,598	201,309	95,038	104,633	199,671	94,095	103,545	197,640
Lewis	8,297	8,789	17,086	8,331	8,818	17,149	8,244	8,736	16,980	8,180	8,696	16,876	8,168	8,650	16,818
Lincoln	10,751	11,083	21,834	10,743	11,058	21,801	10,850	11,152	22,002	10,911	11,218	22,129	10,921	11,267	22,188
Logan	19,310	20,579	39,889	19,097	20,324	39,421	18,565	19,741	38,306	18,228	19,355	37,583	17,846	19,028	36,874
Marion	27,254	30,328	57,582	27,111	30,110	57,221	26,961	29,859	56,820	26,863	29,652	56,515	26,827	29,559	56,386
Marshall	17,576	18,690	36,266	17,479	18,587	36,066	17,449	18,451	35,900	17,231	18,167	35,398	17,181	18,032	35,213
Mason	12,685	13,252	25,937	12,683	13,225	25,908	12,690	13,233	25,923	12,722	13,242	25,964	12,740	13,327	26,067
McDowell	13,878	15,392	29,270	13,546	15,014	28,560	13,219	14,629	27,848	12,901	14,268	27,169	12,657	13,941	26,598
Mercer	30,320	33,513	63,833	30,155	33,271	63,426	30,080	33,101	63,181	30,006	32,938	62,944	29,576	32,519	62,095
Mineral	13,263	13,884	27,147	13,280	13,891	27,171	13,279	13,891	27,170	13,237	13,802	27,039	13,224	13,792	27,016
Mingo	14,791	15,725	30,516	14,368	15,320	29,688	14,077	15,021	29,098	13,554	14,476	28,030	13,289	14,217	27,506
Monongalia	40,818	40,401	81,219	40,951	40,419	81,370	41,054	40,381	81,435	41,329	40,593	81,922	41,721	40,906	82,627
Monroe	6,465	7,465	13,930	6,464	7,646	14,110	6,485	7,881	14,366	6,476	8,131	14,607	6,477	8,130	14,607
Morgan	6,941	7,239	14,180	7,075	7,332	14,407	7,203	7,453	14,656	7,372	7,641	15,013	7,447	7,735	15,182
Nicholas	13,177	13,771	26,948	13,121	13,724	26,845	13,048	13,659	26,707	12,982	13,571	26,553	12,842	13,501	26,343
Ohio	22,604	25,891	48,495	22,439	25,694	48,133	22,300	25,443	47,743	22,137	25,197	47,334	21,827	24,791	46,618
Pendleton	4,129	4,076	8,205	4,165	4,113	8,278	4,151	4,091	8,242	4,115	4,053	8,168	4,060	4,007	8,067
Pleasants	3,747	3,818	7,565	3,773	3,811	7,584	3,777	3,801	7,578	3,752	3,753	7,505	3,807	3,771	7,578
Pocahontas	4,695	4,467	9,162	4,741	4,470	9,211	4,724	4,452	9,176	4,695	4,412	9,107	4,615	4,329	8,944
Preston	14,628	14,934	29,562	14,625	14,923	29,548	14,596	14,857	29,453	14,519	14,785	29,304	14,475	14,791	29,266
Putnam	24,525	25,375	49,900	24,898	25,772	50,670	25,176	26,069	51,245	25,441	26,304	51,745	25,442	26,255	51,697
Raleigh	38,673	41,054	79,727	38,930	41,002	79,932	38,994	40,620	79,614	38,908	40,166	79,074	38,579	39,853	78,432
Randolph	14,230	14,209	28,439	14,250	14,170	28,420	14,267	14,122	28,389	14,190	14,022	28,212	14,233	13,991	28,224
Ritchie	4,940	5,196	10,136	5,016	5,254	10,270	5,056	5,295	10,351	5,068	5,266	10,334	5,083	5,229	10,312
Roane	7,532	7,705	15,237	7,541	7,700	15,241	7,588	7,748	15,336	7,654	7,815	15,469	7,641	7,790	15,431
Summers	6,390	6,909	13,299	6,439	6,912	13,351	6,406	6,792	13,198	6,326	6,608	12,934	6,294	6,502	12,796
Taylor	7,707	8,091	15,798	7,753	8,142	15,895	7,816	8,180	15,996	7,875	8,227	16,102	7,912	8,206	16,118
Tucker	3,698	3,883	7,581	3,631	3,819	7,450	3,596	3,769	7,365	3,559	3,738	7,297	3,496	3,686	7,182
Tyler	4,834	5,063	9,897	4,727	4,967	9,694	4,695	4,926	9,621	4,690	4,900	9,590	4,640	4,868	9,508
Upshur	11,477	12,103	23,580	11,368	12,012	23,380	11,365	12,022	23,387	11,357	12,051	23,408	11,332	12,022	23,354
Wayne	20,892	21,956	42,848	20,906	21,927	42,833	20,920	21,892	42,812	21,002	21,907	42,909	20,894	21,795	42,689
Webster	4,957	5,152	10,109	4,919	5,097	10,016	4,814	4,968	9,782	4,767	4,931	9,698	4,763	4,901	9,664
Wetzel	8,764	9,335	18,099	8,675	9,234	17,909	8,617	9,159	17,776	8,575	9,101	17,676	8,429	8,971	17,400
Wirt	2,834	2,855	5,689	2,877	2,890	5,767	2,920	2,929	5,849	2,941	2,939	5,880	2,976	2,969	5,945
Wood	42,401	46,139	88,540	42,285	45,983	88,268	42,265	45,844	88,109	42,213	45,680	87,893	42,110	45,517	87,627
Wyoming	13,179	13,690	26,869	12,979	13,479	26,458	12,800	13,242	26,042	12,596	13,005	25,601	12,392	12,828	25,220
Total	881,586	937,527	1,819,113	880,585	935,024	1,815,609	879,990	931,809	1,811,799	878,812	928,514	1,807,326	876,116	924,859	1,800,975

1993-1999 Data Source: Population Estimates Branch, U.S. Bureau of the Census. 1990-1999 Intercensal State and County Characteristics Population Estimates Files for Internet Display. Internet release date: June 23, 2003.

2000-2001 Data Source: Population Estimates Branch, U.S. Bureau of the Census. 7/1/2002 County Characteristics Estimates File for Internet Display. Internet release date: September 18, 2003 (last revised November 14, 2003).

Table A.3



West Virginia  
**Cancer Registry**

350 Capitol Street, Room 125  
Charleston, West Virginia 25301-3715  
(304) 558-6421 (800) 423-1271  
[www.wvdhhr.org/bph/oehp/sdc/cancerrep.htm](http://www.wvdhhr.org/bph/oehp/sdc/cancerrep.htm)

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