

Cancer Incidence in North Carolina 2007

State Center for Health Statistics

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Introduction

Background

The North Carolina Central Cancer Registry (CCR), located within the State Center for Health Statistics, was established in 1986. The CCR operates under the authority granted in North Carolina General Statute 130A-208.

Legislation declaring cancer reporting to be mandatory in North Carolina became effective in 1947. Authorized funding for establishing a registry, however, was not appropriated until 1986. Between 1986 and 1989, only 50-60 percent of the cases were reported each year. Calendar year 1990 is the first year for which relatively complete statewide reporting was achieved. In 1999, new legislation was passed that requires every healthcare provider that detects, diagnoses, or treats cancer cases to report all cases to the CCR.

The CCR collects, analyzes, and disseminates information on newly diagnosed cancer patients in North Carolina with respect to demographics and medical characteristics. There are 143 hospitals in North Carolina which routinely diagnose and treat cancer patients; and 82 of these hospitals have their own tumor registries where the data is abstracted and submitted to the CCR. The 2007 incidence data was reported to the CCR by 185 facilities via a secure internet-based database. In addition to hospitals, 63 physician office practices are reporting to the CCR.

Purpose

Cancer Incidence in North Carolina 2007 is the thirteenth annual report of the CCR. The contents of this report represent a summary of the information collected on cancer diagnosed among North Carolina residents in 2007. Previous volumes are located on the State Center for Health Statistics web site located at <http://www.schs.state.nc.us/SCHS/data/cancer.cfm>, under the title “Cancer Incidence in North Carolina, County-Specific Numbers.”

Confidentiality

The CCR is committed to preserving the confidentiality of information obtained for medical, educational, research, and statistical purposes. Thus the CCR demands strict confidentiality and the protection of the identity of both cancer patients and reporting sources in registry data. The CCR does not release any identifying information regarding patients, hospitals, or physicians except under the authority of the General Statute guidelines.

Technical Notes

Overview and Definitions

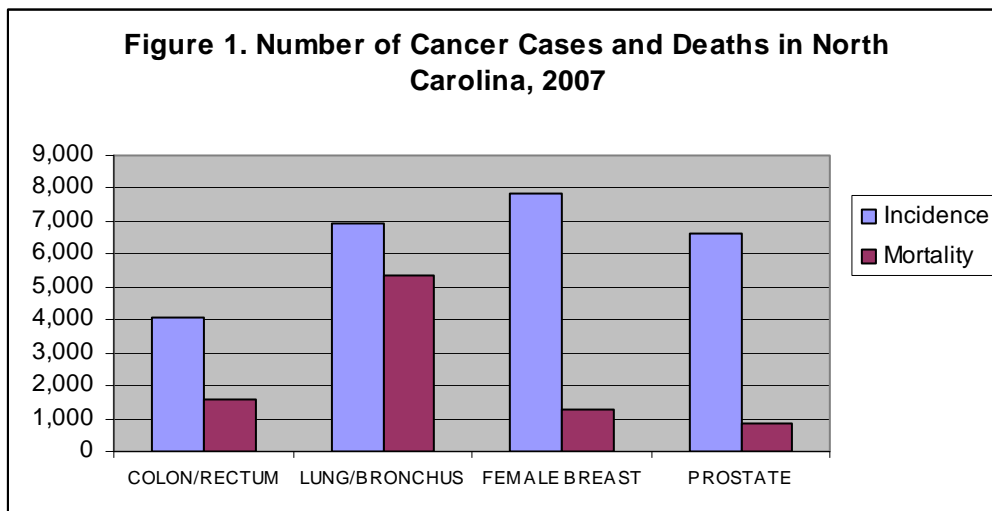
This report presents frequency counts, age-specific rates, and age-adjusted rates to describe newly diagnosed cases of cancer and mortality due to cancer.

Cancer Incidence and Mortality

Cancer incidence is the number of newly diagnosed cancer cases whereas cancer mortality is the number of deaths due to cancer. Cancer incidence and mortality in 2007 for the top four cancers, colon/rectum, lung/bronchus, female breast, and prostate cancers are presented in Figure 1.

We assume that death certificates provide complete and accurate data on all causes of death. However, the accuracy of recording the cause of death varies for many cancers. For example, at the time of death, the history of cancer may not be known by the physician, or is considered not to have contributed to the death. Nonetheless, mortality data have been historically used widely to analyze cancer risk in populations.

Instances of under-reporting of cancer incidence have occurred. For some cancers (e.g., Multiple Myeloma), under-reporting may lead to more cancer deaths being shown than incidence cases for some age groups. Also, survival following a cancer diagnosis varies by cancer site. In populations with low use of health care services (e.g., rural and minority populations), more cancers are diagnosed at advanced stages when therapies are less successful; or the cases may not be diagnosed until death.



Differences in Reporting Cancer Incidence and Mortality Data

Many people living near the Virginia border go outside North Carolina for health care. It is known that Norfolk and Danville, Virginia attract patients for secondary and tertiary care. The State of North Carolina has an exchange agreement with all 50 states for exchanging death certificates, but only has an exchange agreement for cancer incidence data with 26 states, including our border states of Virginia, Tennessee and South Carolina.

Because death certificate data are available more quickly than incidence data, the 2007 mortality data include deaths of North Carolina residents who died in other states, but the incidence data may not include all cases diagnosed out-of-state. However, even with an exchange agreement in place, the interchange of Vital Records among states is voluntary and varies. Each year, it is known that some states have not properly exchanged resident mortality records with other states. Therefore, annual North Carolina resident cancer mortality statistics may miss some resident deaths occurring in other states and U.S. territories.

Some counties have been found to under-report their cancer incidence due to poor case-finding procedures. These counties, especially rural counties where small hospitals do not have the services of trained tumor registrars, may have inadequate case finding. This results in incomplete reporting of new cancer cases. Death data are considered to be complete. This also contributes to what appears to be an excess of deaths compared to the number of cases for some cancer sites in some of the rural counties.

In the last few years, more cases are being diagnosed and treated outside of a hospital, in physician offices. This is particularly true for cancers of the skin and prostate, as well as some lymphoma and leukemia cases. Although physicians are required to report all cases to the CCR, many of them do not have the staff to do so. Physicians associated with a hospital will often report cases via a hospital registrar, but those not affiliated with a hospital may not report cases to the CCR. As a result, reporting for some cancers is known to be incomplete. Due to recent efforts by the CCR to improve the completeness of reporting by physician offices and pathology laboratories, the incidence of melanoma and prostate cancers has increased.

Incidence Rates

Two types of rates are presented in this report: age-adjusted and age-specific, each of which has a specific purpose. Both rates are expressed in this report as annual or five-year rates per 100,000 population.

Age-Adjusted Rates

An age-adjusted rate accurately describes the cancer experience that the population would have had if it had exactly the same age distribution as the comparison or standard population. Age-adjusted rates provide a single, summary rate for each area. The direct method for 18 year age groups was used to calculate all age-adjusted rates in this report by multiplying each age-specific

rate by the number of people within that age group in the standard population and then summing these products, and dividing by the total population in the standard population. The age groups used in the report Age-adjusted rates should not be compared with any other type of rate or be used as absolute measurements of vital events; their sole purpose is to provide summary rates that can be compared between populations that have different age structures. The standard population used in the calculation was the 2000 United States Census population. Incidence and mortality rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics, available online at http://www.cdc.gov/nchs/nvss/bridged_race.htm. Incidence reports published prior to 2005 were calculated using the State Demographer's population estimates. Hence, rates from previous diagnosis years are not comparable.

Age-Specific Rates

The age-specific cancer incidence is the number of cancer cases that occur in the age groups from 0-4 to 85+. Age-specific rates are used to compare rates between different population groups of the same age and to examine age patterns for particular cancers. As expected, age-specific rates have a general tendency to increase with age. More than half of cancer cases occur among persons age 65 and older (Figure 2). North Carolina has attracted a large number of retirement-age people over the last decade. Understanding migration patterns is important for interpreting the data and is one reason for showing the data by age group. The largest concentrations of older-age residents are in the mountain counties, along the coast, and in the sandhills (along the mid-southern border).

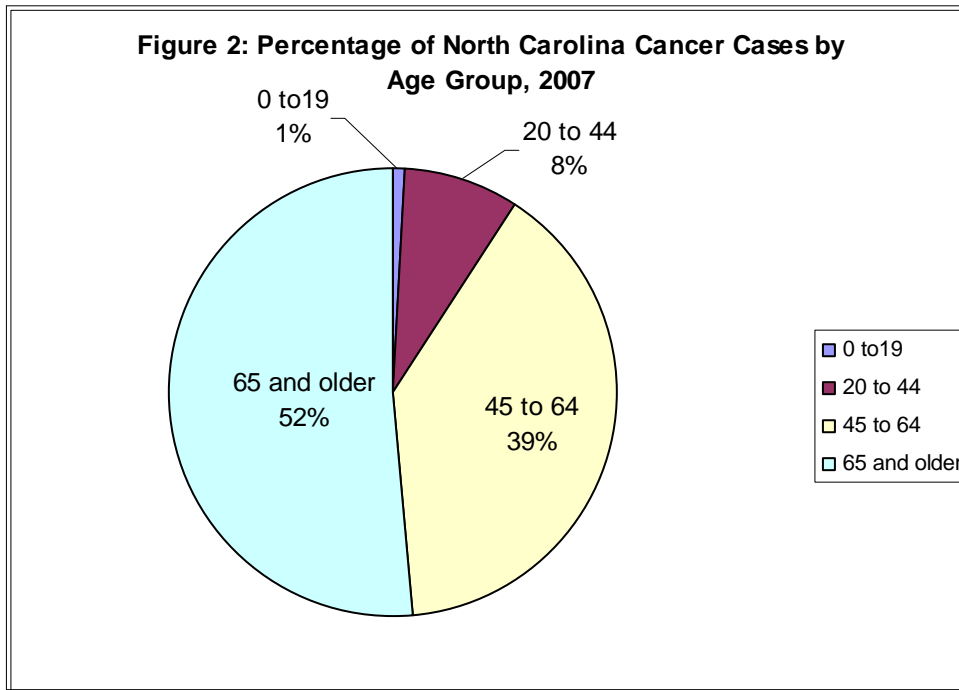
Cancer patterns vary by age group. Children have a very different pattern of cancer than do adults. Leukemia, brain cancer, endocrine, and lymphomas are the main cancer in people under age 20. In general, North Carolina's pediatric cancer patterns are quite consistent with national patterns.

Young adults (20-44) have a different pattern of cancer than do children. In this age group, lymphomas are even more common, as are some digestive and reproductive tissue cancers. All of these cancers are quite rare and cancer rates in these ages are generally lower than for other age groups.

In the middle ages (45-64), cancer rates begin to rise, and the common cancers (lung, breast, and colon) emerge. The incursion of these cancers into younger age groups is the subject of considerable research at this time. All cancer rates are at a maximum in the 70+ age categories. Prostate cancer is almost exclusively a disease of older men.

These age-specific patterns offer significant direction for screening priorities. For most cancers, the prospect for a normal life expectancy is good when the diagnosis is made early in the disease process. North Carolina legislation and federal programs are focused on increasing the access to screening services in this state. Older and underprivileged people are priority groups for these programs.

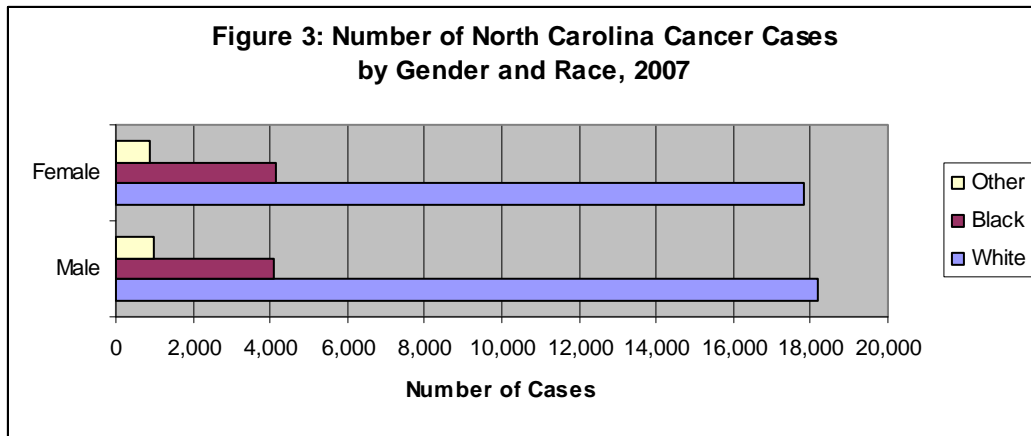
Age-specific cancer incidence and rates are presented in Table 10. The age-specific incidence rates demonstrate how cancer is a disease primarily of the older population.



Race/Gender Specific Cases and Rates

The race/gender-specific cancer incidence is the number of cancer cases that occurred in each race/gender group. See Figure 3.

These data are provided because race is an important factor in interpreting cancer patterns in North Carolina. Cancer rates vary by race, race distributions vary across the state, and health care use has been found to vary by race. Because cancer risk is strongly associated with lifestyle and behavior, differences among ethnic and cultural groups can provide clues to factors involved in the development of cancer such as dietary patterns, alcohol use, and sexual and reproductive behaviors involved in the development of cancer. Cancer cases by gender and race are presented in Tables 2-4.



Reliability of Rates

Precautions should always be taken when comparing rates. Both the size of the numbers and the characteristics of the population are important indicators of a rate's real value. Rates based on small numbers of events over a given period of time or for sparsely populated geographic areas should be viewed with caution. These rates show considerable variation from year to year, thus limiting their usefulness in comparisons and estimation of rare occurrences. See the section titled "Small Numbers" on page 8.

Age-adjusted rates offer a standard method to compare cancer risk across geographic areas or time periods. However, there are limitations to their use and one should be familiar with these types of rates before using them. As already mentioned, age-adjusted rates are to be used only for comparison purposes and only if the same standard population was used in the calculation. This publication uses the 2000 U.S. Census as the standard population.

For assistance in interpreting these data, please contact the CCR statistical staff at (919) 715-4574.

Morphology (Cell Type) and Behavior

The specific morphology codes for these primary site categories have been provided in the Appendix in the table "Primary Site Definitions" to clarify counting of these cases. The lymphoma category includes all lymphoma cases with the morphology codes shown regardless of body site. Data on basal and squamous cell skin cancers are not collected by the CCR unless they have spread to tissue beyond the original site. Malignant melanoma may occur at many different body sites; however, this report focuses on melanoma of the skin. Please note that lymphomas are not grouped consistently by all researchers.

In these data, only malignant tumors are included with one exception. Data on benign central nervous system and brain and unspecified types are also reported to the CCR and are included in

this report. Only invasive cervical cancer cases are included. Also, in situ cancers except those of the urinary bladder and female breast are excluded in the report.

Stage at Diagnosis

The stage at diagnosis indicates how far the cancer has spread and is important in treatment and prognosis. The codes for the listed stages have been provided in Appendix E to clarify counting of these cases. All cancers that were staged regional direct extension only, regional lymph nodes only, regional direct extension and regional lymph nodes, and regional NOS have been grouped together in one group called 'Regional'.

To find more information on the staging definitions and methodology please refer the SEER Summary Staging Manual available at <http://seer.cancer.gov/tools/ssm/intro.pdf>.

Limitations of Data

The user should be cautious when making county-to-county comparisons of the data in this report. Under-reporting in areas close to neighboring states and under-reporting for cancers that may not be diagnosed in hospitals must be considered when interpreting cancer incidence data. In addition, comparison of rates (computed with the number of cases and population data) can be easily misinterpreted. The age distributions and racial percentages in counties vary considerably.

Consider a comparison of Transylvania and Onslow counties. In 2007 over 24% percent of the Transylvania County population was at least 65 years old, while less than 7% percent of the Onslow County population was 65 and over. A larger proportion of the Transylvania County population can be expected to have cancer than the Onslow County population just because of the difference in the age pattern for these two counties. The use of age-adjusted rates will facilitate comparisons of risk.

On the other hand, almost 64% percent of Hertford County's population was comprised of minorities while over 98% percent of Ashe County's population is white. This difference in the racial composition of the populations of the two counties can also have a marked influence on the patterns of cancer incidence and mortality. Age-adjusted rates control for differences in the age structures of populations, but they do not control for differences in racial composition.

Interpretations of melanoma and prostate cancer data should be treated with caution since the thoroughness of case-finding is suspect due to the likelihood that cases may be treated outside of hospitals and not reported to the CCR. Reporting has increased from physician offices across the state, but is not complete.

Small Numbers

Small numbers of cases are a problem for statistical reports of health data. Even for the most common cancers, some counties can expect to have only one or two cases in a year. For example, Hyde County, which has a very small population, can expect to have only two cases of female lung cancer each year (based on state lung cancer rates). Between 2003 and 2007, there were 12 cases of female lung cancer in Tyrrell County reported to the CCR. The majority of the cases were reported in 2007. It would appear that the county had an excessive amount of lung cancer in females in 2007. However, over the five-year period, the county averages to what was expected.

All statistics are subject to chance variation. Rates based on a very small number of events over a specified period of time or for a sparsely populated geographic area should be of particular concern and caution. When the number of events is small, multiple-year summary rates will provide a much better measurement of risk. Expanding the period of time studied enlarges the absolute numbers and adds more credence to a statement regarding a rate.

Interpretation

This descriptive report is intended to serve as a baseline report for future reference. Because of the limitations described above, this publication should not be regarded as a definitive description of the cancer incidence in North Carolina. With additional training of hospital staff, collaboration from neighboring states, and increased physician and pathology laboratories reporting, the problems of under-reporting have declined. Although there are important limitations in the use of these data, the observed number of cases within a gender group in a specific county can be used for:

- ◆ Planning and evaluating health services at the county level;
- ◆ Identifying high cancer incidence within a county;
- ◆ Educating the public;
- ◆ Motivating facilities such as hospitals and physicians to report incidence data accurately and in a timely manner; and
- ◆ Encouraging more hospitals to organize tumor registries to provide better service to their cancer patients.

Comparison to National Data

This report was prepared to provide data for evaluation of cancer incidence and mortality patterns in North Carolina. The Annual Report to the Nation on the Status of Cancer, 1975-2006, produced by the North American Association of Cancer Registries (NAACCR), the National Cancer Institute (NCI) and the National Program of Cancer Registries (NPCR) at www.cdc.gov/cancer/npcr is available for comparison with North Carolina's observed incidence cases for 2006 and previous years.

Available Cancer Information

Cancer is the second leading cause of death (first being heart disease) in the United States. This increase is largely the result of the aging of the population and the decline in mortality from other causes of death (e.g., heart disease and stroke). In 2007, cancer was the second leading cause of death in North Carolina. It is estimated that by the year 2015, cancer will be the leading cause of death in the United States.

Cancer is expected to strike one in three people sometime during their lifetime. For more information about cancer, contact a local office of the American Cancer Society or call 1-800-ACS-2345. Many communities also have hospital-based cancer programs through which local data and/or cancer-related services may be obtained. In many counties, local health departments have active cancer control programs. Another source of information on cancer is the Cancer Information Service, 1-800-4CANCER (1-800-422-6237) which is a national program funded by the National Cancer Institute that provides cancer information.

The CCR produces other reports on cancer in North Carolina, many of which are available on the web site at www.schs.state.nc.us/SCHS/CCR. A notable one is the American Cancer Society's *South Atlantic Division Cancer Facts and Figures* available on the web site at http://health.state.ga.us/pdfs/chronic/cancer/ACSSAD_CF&F08.pdf. Also, other units with the State Center for Health Statistics (SCHS) publish many reports on other diseases and on health care measures. For more information about other reports from the CCR please call (919) 715-4574. For information from other programs of the SCHS, please call (919) 733-4728, or write:

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Support for Cancer Research and Control

The CCR is actively involved with cancer research programs at universities in North Carolina, as well as with federal agencies and research institutes located within the state. One feature of this participation is the rapid identification of cancer patients for projects that are designed to collect information before the patient's first course of treatment is completed (e.g., genetic studies). Several organizations in North Carolina work to prevent cancer or to provide for early detection. Others work to promote a higher quality of life for cancer patients undergoing treatment and for cancer survivors. Still others are working to understand and reduce the racial/ethnic gaps in cancer diagnosis and mortality.

The state Comprehensive Cancer Control Program and the Breast and Cervical Cancer Control Program are located in the Chronic Disease and Injury Section of the North Carolina Division of Public Health and are state agencies committed to reducing the cancer burden among North Carolinians. The CCR provides statistical and data analysis support for these programs. Also, the CCR is associated with organizations such as the American Cancer Society and the state's Advisory Committee for Cancer Coordination and Control.

Table 1: 2007 Incidence Rates By Sex

Site	Males		Females	
	Cases	Rate ¹	Cases	Rate ¹
All Sites	23,275	561.4	22,900	444.3
Oral Cavity and Pharynx	776	17.5	300	5.8
Lip	33	0.8	10	0.2
Tongue	199	4.4	77	1.5
Salivary Glands	70	1.8	42	0.8
Floor of Mouth	55	1.3	19	0.4
Nasopharynx	34	0.7	18	0.4
Oropharynx	34	0.8	15	0.3
Hypopharynx	68	1.5	16	0.3
Other Mouth and Pharynx	283	6.2	103	2.0
Digestive System	4,006	97.8	3,432	65.3
Esophagus	358	8.4	86	1.6
Stomach	334	8.4	226	4.4
Small Intestine	125	3.0	100	1.9
Colon and Rectum	2,098	51.3	2,002	38.0
Anus and Anal Canal	56	1.3	115	2.2
Liver and Intrahepatic Bile Duct	406	9.2	150	2.9
Gallbladder	34	0.9	55	1.0
Pancreas	503	12.7	559	10.6
Other Digestive Organs	92	2.4	139	2.7
Respiratory System	4,262	105.3	3,185	60.9
Larynx	339	7.8	72	1.4
Lung and Bronchus	3,875	96.3	3,072	58.7
Other Respiratory Organs	48	1.2	41	0.8
Bones and Joints	43	1.0	37	0.8
Soft Tissues	175	4.2	143	2.9
Melanoma of the Skin	1034	25.3	802	16.2
Breast	90	2.1	7,866	152.7
Invasive Breast	79	1.9	6,362	123.4
In Situ Breast	11	0.2	1,504	29.4
Female Genital System	0	0.0	2,283	44.5
Cervix Uteri	0	0.0	347	7.2
Uterus (Corpus, NOS)	0	0.0	1,141	21.8
Ovary	0	0.0	612	12.0
Other Female Genital Organs	0	0.0	183	3.6
Male Genital System	6,888	160.1	0	0.0
Prostate	6,631	154.2	0	0.0
Testis	214	4.9	0	0.0
Penis	36	0.9	0	0.0
Other Male Genital Organs	7	0.2	0	0.0
Urinary System	2,418	60.3	1,051	20.1
Bladder (incl. in situ)	1,383	36.0	474	9.0
Kidney and Renal Pelvis	995	23.2	546	10.5
Ureter	33	0.9	20	0.4
Other Urinary System	7	0.2	11	0.2
Eye and Orbit	39	1.0	36	0.7
Brain and CNS (excludes benign brain/CNS)	328	7.6	257	5.2
Endocrine System	419	9.5	1012	21.0
Thyroid	253	5.7	822	17.0
Other Endocrine and Thymus	166	3.8	190	4.0
Lymphomas	1051	25.3	934	18.3
Hodgkin Disease	132	3.1	118	2.6
Non-Hodgkin Lymphoma	919	22.2	816	15.7
Multiple Myeloma	276	7.0	273	5.1
Leukemia	571	14.4	464	9.2
Acute Lymphocytic Leukemia	65	1.5	52	1.2
Chronic Lymphocytic Leukemia	192	4.9	142	2.7
Acute Myeloid Leukemia	169	4.2	159	3.2
Chronic Myeloid Leukemia	77	2.0	51	1.0
Other Leukemia	68	1.7	60	1.1
All Other Cancers-Uncategorized	899	23.1	825	15.6

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

* Cases less than 5 are suppressed.

In situ cancers except those of the urinary bladder and female breast are excluded.

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

Table 2: 2003 - 2007 Ten Most Frequently Diagnosed Cancers by Sex

Cancer	Males			
	Incidence		Mortality	
	Cases	Rate¹	Deaths	Rate¹
Prostate	30,578	153.8	4,313	27.6
Lung/Bronchus	19,219	101.1	15,302	82.3
Colon/Rectum	10,751	56.0	3,844	21.2
Bladder	6,456	35.7	1,163	7.1
Melanoma (Skin)	4,629	23.6	785	4.2
Kidney	4,538	22.7	1,194	6.4
Non-Hodgkin Lymphoma	4,238	21.9	1,490	8.3
Oral Cavity	3,567	17.2	802	4.0
Leukemia	2,783	14.8	1,725	9.8
Pancreas	2,470	13.1	2,369	12.8

Cancer	Females			
	Incidence		Mortality	
	Cases	Rate¹	Deaths	Rate¹
Female Breast	36,562	149.6	6,181	24.8
Lung/Bronchus	14,340	57.6	10,498	41.9
Colon/Rectum	10,249	40.9	3,704	14.5
Corpus Uteri	5,210	20.9	1,045	4.1
Endocrine	3,889	16.9	153	0.6
Non-Hodgkin Lymphoma	3,801	15.4	1,382	5.4
Melanoma (Skin)	3,617	15.3	502	2.0
Ovary	2,998	12.2	2,076	8.3
Kidney	2,658	10.8	680	2.7
Pancreas	2,600	10.3	2,429	9.6

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census. In situ cancers except those of the urinary bladder and female breast are excluded. Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at: www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

Table 3: 2007 Incidence Rates By Race

Site	Whites		Minorities	
	Cases	Rate ¹	Cases	Rate ¹
All Sites	36,013	478.9	8,987	472.5
Oral Cavity and Pharynx	842	11.0	216	10.5
Lip	40	0.5	*	*
Tongue	216	2.8	58	2.7
Salivary Glands	96	1.3	13	0.6
Floor of Mouth	57	0.8	16	0.8
Nasopharynx	38	0.5	13	0.6
Oropharynx	35	0.5	12	0.6
Hypopharynx	51	0.6	32	1.6
Other Mouth and Pharynx	309	4.0	69	3.4
Digestive System	5,495	73.0	1,711	92.8
Esophagus	335	4.4	97	5.0
Stomach	362	4.9	187	10.6
Small Intestine	159	2.1	64	3.4
Colon and Rectum	3,128	41.5	889	47.8
Anus and Anal Canal	133	1.7	37	1.9
Liver and Intrahepatic Bile Duct	379	5.0	130	6.2
Gallbladder	63	0.9	25	1.5
Pancreas	758	10.2	234	13.8
Other Digestive Organs	178	2.4	48	2.8
Respiratory System	5,816	77.0	1,332	72.3
Larynx	300	3.9	106	5.5
Lung and Bronchus	5,445	72.2	1,208	65.8
Other Respiratory Organs	71	1.0	18	1.0
Bones and Joints	63	0.9	15	0.7
Soft Tissues	253	3.5	58	2.8
Melanoma of the Skin	1,790	24.5	24	1.3
Breast	6,146	152.6	1,648	146.3
Invasive Breast	4,965	122.9	1,330	118.2
In Situ Breast	30	1181.0	28.1	318.0
Female Genital System	1,795	45.0	446	40.8
Cervix Uteri	244	6.9	98	8.6
Uterus (Corpus, NOS)	897	21.9	232	21.7
Ovary	496	12.4	91	8.2
Other Female Genital Organs	158	3.9	25	2.2
Male Genital System	5,130	145.4	1,625	207.0
Prostate	4,911	138.8	1,591	203.4
Testis	186	5.6	24	2.3
Penis	26	0.8	10	1.4
Other Male Genital Organs	7	0.2	0	0.0
Urinary System	2,895	38.5	521	28.6
Bladder (incl. in situ)	1,641	21.9	191	11.4
Kidney and Renal Pelvis	1,190	15.7	326	17.0
Ureter	50	0.7	*	*
Other Urinary System	14	0.2	*	*
Eye and Orbit	64	0.9	9	0.4
Brain and CNS (excludes benign brain/CNS)	482	6.8	85	4.1
Endocrine System	1,110	15.6	306	14.5
Thyroid	881	12.3	184	8.6
Other Endocrine and Thymus	229	3.2	122	5.9
Lymphomas	1,627	22.0	322	15.8
Hodgkin Disease	174	2.6	75	3.3
Non-Hodgkin Lymphoma	1,453	19.4	247	12.5
Multiple Myeloma	358	4.8	157	8.6
Leukemia	804	11.0	165	8.6
Acute Lymphocytic Leukemia	93	1.4	21	0.9
Chronic Lymphocytic Leukemia	267	3.5	43	2.5
Acute Myeloid Leukemia	268	3.7	46	2.3
Chronic Myeloid Leukemia	96	1.3	26	1.3
Other Leukemia	80	1.1	29	1.6
All Other Cancers-Uncategorized	1,273	17.1	327	17.6

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

* Cases less than 5 are suppressed.

In situ cancers except those of the urinary bladder and female breast are excluded.

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at: www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

**Table 4: 2003-2007 Ten Most Frequently Diagnosed Cancers
By Race**

Cancer	Cases	Whites		Deaths	Rate¹
		Incidence	Rate¹		
Female Breast	28,863	150.4		4,527	22.7
Lung/Bronchus	27,463	76.5		21,194	59.3
Prostate	22,345	136.5		2,856	22.1
Colon/Rectum	16,274	45.5		5,731	16.1
Melanoma (Skin)	8,047	23.0		1,238	3.5
Bladder	7,781	21.8		1,474	4.2
Non-Hodgkin Lymphoma	6,750	19.0		2,476	7.0
Kidney	5,630	15.7		1,518	4.2
Endocrine	4,297	12.6		220	0.6
Corpus Uteri	4,126	21.1		700	3.4

Cancer	Cases	Minorities		Deaths	Rate¹
		Incidence	Rate¹		
Prostate	7,965	226.8		1,457	57.4
Female Breast	7,556	142.6		1,654	31.8
Lung/Bronchus	5,761	67.5		4,606	55.1
Colon/Rectum	4,607	53.5		1,817	22.2
Kidney	1,535	16.9		355	4.2
Non-Hodgkin Lymphoma	1,233	13.4		396	4.7
Pancreas	1,207	14.7		1,158	14.3
Endocrine	1,104	11.0		71	0.8
Oral Cavity	1,098	11.4		328	3.6
Corpus Uteri	1,065	21.0		345	7.2

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

In situ cancers except those of the urinary bladder and female breast are excluded.

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at: www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

Table 5: 2007 Total Cancer Incidence and Mortality Rates By County

<i>County</i>	<i>Cases</i>	<i>Rate</i> ¹	<i>Deaths</i>	<i>Rate</i> ¹
NORTH CAROLINA	46,175	490.7	17,425	188.7
<i>Alamance</i>	871	543.6	314	192.3
<i>Alexander</i>	204	508.5	78	206.4
<i>Alleghany</i>	77	478.3	24	144.1
<i>Anson</i>	123	421.3	70	234.2
<i>Ashe</i>	168	473.0	53	140.5
<i>Avery</i>	93	417.0	36	149.9
<i>Beaufort</i>	299	491.5	111	183.1
<i>Bertie</i>	125	523.6	53	219.2
<i>Bladen</i>	161	434.0	83	216.8
<i>Brunswick</i>	594	456.3	237	176.2
<i>Buncombe</i>	1,375	497.9	491	172.9
<i>Burke</i>	528	496.0	194	181.5
<i>Cabarrus</i>	873	561.0	295	202.6
<i>Caldwell</i>	416	438.7	182	192.7
<i>Camden</i>	51	543.5	21	243.3
<i>Carteret</i>	486	562.8	169	194.6
<i>Caswell</i>	135	464.9	48	166.0
<i>Catawba</i>	812	483.3	335	200.7
<i>Chatham</i>	325	473.3	114	158.6
<i>Cherokee</i>	183	468.1	71	174.9
<i>Chowan</i>	88	446.5	46	228.3
<i>Clay</i>	72	435.8	29	178.1
<i>Cleveland</i>	553	481.4	233	199.0
<i>Columbus</i>	305	474.4	129	204.1
<i>Craven</i>	621	553.7	220	194.6
<i>Cumberland</i>	1,184	448.8	470	194.8
<i>Currituck</i>	92	400.9	43	196.9
<i>Dare</i>	178	454.2	80	216.0
<i>Davidson</i>	794	449.8	340	197.0
<i>Davie</i>	240	504.3	101	212.0
<i>Duplin</i>	250	453.2	103	189.1
<i>Durham</i>	1,050	473.6	408	194.8
<i>Edgecombe</i>	275	493.7	122	226.3
<i>Forsyth</i>	1,945	546.6	675	192.0
<i>Franklin</i>	281	507.8	120	225.6
<i>Gaston</i>	1,110	499.0	426	194.5
<i>Gates</i>	39	311.4	31	251.1
<i>Graham</i>	49	474.5	22	199.8
<i>Granville</i>	340	607.5	157	292.8
<i>Greene</i>	106	514.5	40	203.6
<i>Guilford</i>	2,281	479.5	814	173.5
<i>Halifax</i>	344	520.0	159	236.2
<i>Harnett</i>	421	438.2	170	190.0
<i>Haywood</i>	389	485.5	151	178.2
<i>Henderson</i>	789	541.3	282	173.8
<i>Hertford</i>	119	422.3	80	285.7
<i>Hoke</i>	150	468.6	80	299.0
<i>Hyde</i>	40	585.9	24	351.8
<i>Iredell</i>	830	524.6	267	171.6
<i>Jackson</i>	177	428.5	74	178.4

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

In situ cancers except those of the urinary bladder and female breast are excluded.

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

Table 5 (continued) : 2007 Total Cancer Incidence and Mortality Rates By County

<i>County</i>	<i>Cases</i>	<i>Rate</i> ¹	<i>Deaths</i>	<i>Rate</i> ¹
NORTH CAROLINA	46,175	490.7	17,425	188.7
<i>Johnston</i>	625	455.5	253	196.3
<i>Jones</i>	68	514.5	18	135.1
<i>Lee</i>	324	500.1	98	146.8
<i>Lenoir</i>	436	607.7	153	211.8
<i>Lincoln</i>	376	486.2	131	173.5
<i>McDowell</i>	306	593.7	112	210.9
<i>Macon</i>	273	547.0	103	188.7
<i>Madison</i>	151	590.2	62	230.9
<i>Martin</i>	131	429.4	65	212.5
<i>Mecklenburg</i>	3,540	487.8	1,173	179.3
<i>Mitchell</i>	88	390.8	44	187.9
<i>Montgomery</i>	138	436.1	43	140.8
<i>Moore</i>	622	518.1	256	195.6
<i>Nash</i>	474	448.9	214	203.9
<i>New Hanover</i>	973	470.4	384	186.9
<i>Northampton</i>	133	455.9	62	205.1
<i>Onslow</i>	534	469.5	181	176.5
<i>Orange</i>	573	501.4	164	149.0
<i>Pamlico</i>	78	414.9	44	228.6
<i>Pasquotank</i>	186	433.8	85	200.5
<i>Pender</i>	268	445.9	101	166.3
<i>Perquimans</i>	82	440.2	42	233.5
<i>Person</i>	204	466.4	113	266.5
<i>Pitt</i>	625	466.8	233	180.1
<i>Polk</i>	129	409.0	59	173.6
<i>Randolph</i>	738	478.8	279	183.1
<i>Richmond</i>	262	507.0	126	248.8
<i>Robeson</i>	600	496.6	261	218.0
<i>Rockingham</i>	581	510.0	238	206.4
<i>Rowan</i>	771	498.0	288	180.6
<i>Rutherford</i>	443	554.7	207	253.0
<i>Sampson</i>	258	380.2	151	223.3
<i>Scotland</i>	230	586.6	90	237.3
<i>Stanly</i>	380	548.7	121	171.5
<i>Stokes</i>	234	417.4	103	188.6
<i>Surry</i>	471	527.4	184	198.1
<i>Swain</i>	91	519.3	34	189.6
<i>Transylvania</i>	244	517.6	84	162.0
<i>Tyrrell</i>	21	438.3	7	140.2
<i>Union</i>	708	466.6	207	150.5
<i>Vance</i>	244	528.7	100	219.8
<i>Wake</i>	3,282	490.0	992	169.7
<i>Warren</i>	145	554.1	63	234.3
<i>Washington</i>	80	477.3	34	190.6
<i>Watauga</i>	236	532.9	66	152.8
<i>Wayne</i>	580	482.3	247	209.7
<i>Wilkes</i>	392	472.4	154	184.8
<i>Wilson</i>	462	543.4	179	209.7
<i>Yadkin</i>	216	481.2	90	200.5
<i>Yancey</i>	135	529.8	52	189.6

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

In situ cancers except those of the urinary bladder and female breast are excluded.

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

Table 6: 2003-2007 Incidence Rates By Area Health Education Centers Region by Race

Colon/Rectum					Prostate				
Region	Whites		Minorities		Region	Whites		Minorities	
	Cases	Rate ¹	Cases	Rate ¹		Cases	Rate ¹	Cases	Rate ¹
Mountain AHEC	2,091	45.9	127	58.0	Mountain AHEC	2,934	141.3	178	186.3
North West AHEC	3,270	44.8	409	49.7	North West AHEC	4,345	130.7	695	201.8
Charlotte AHEC	2,642	46.3	731	55.0	Charlotte AHEC	3,733	143.3	1,134	206.6
Greensboro AHEC	2,008	45.2	563	54.1	Greensboro AHEC	2,896	146.3	1,025	244.1
Southern Regional AHEC	1,213	46.1	683	52.7	Southern Regional AHEC	1,509	124.6	1,213	225.5
Wake AHEC	1,905	43.2	797	52.6	Wake AHEC	3,029	148.9	1,471	238.6
South East AHEC	795	39.6	192	44.6	South East AHEC	981	100.7	345	189.7
Area L AHEC	553	54.1	383	59.0	Area L AHEC	622	135.4	567	216.0
Eastern AHEC	1,764	48.7	709	54.3	Eastern AHEC	2,222	130.5	1,306	255.2

Lung/Bronchus					All Cancers				
Region	Whites		Minorities		Region	Whites		Minorities	
	Cases	Rate ¹	Cases	Rate ¹		Cases	Rate ¹	Cases	Rate ¹
Mountain AHEC	3,339	72.5	151	69.1	Mountain AHEC	21,403	485.5	1,058	474.9
North West AHEC	5,747	78.0	602	72.9	North West AHEC	34,354	473.1	4,075	480.4
Charlotte AHEC	4,219	75.1	857	66.0	Charlotte AHEC	27,875	482.1	6,599	469.3
Greensboro AHEC	3,374	76.3	695	67.4	Greensboro AHEC	21,701	493.5	5,418	509.3
Southern Regional AHEC	2,333	87.5	924	70.7	Southern Regional AHEC	12,662	478.8	6,263	468.5
Wake AHEC	3,061	71.0	949	64.2	Wake AHEC	21,722	476.8	7,661	490.0
South East AHEC	1,627	79.6	269	62.6	South East AHEC	9,099	458.3	2,024	468.5
Area L AHEC	772	74.4	428	65.5	Area L AHEC	4,996	496.8	3,315	503.4
Eastern AHEC	2,925	79.4	870	67.3	Eastern AHEC	17,784	491.3	6,589	502.6

Female Breast				
Region	Whites		Minorities	
	Cases	Rate ¹	Cases	Rate ¹
Mountain AHEC	3,549	153.2	146	113.5
North West AHEC	5,506	142.3	678	136.6
Charlotte AHEC	4,855	152.6	1,196	136.0
Greensboro AHEC	3,501	147.6	875	138.4
Southern Regional AHEC	2,034	142.8	1,087	135.3
Wake AHEC	3,958	155.3	1,447	152.2
South East AHEC	1,556	150.6	349	139.9
Area L AHEC	895	167.9	591	151.7
Eastern AHEC	2,955	154.1	1,167	151.3

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census. In situ cancers except those of the bladder and female breast are excluded. Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at: www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008

Table 7: Five Most Frequently Diagnosed Cancers By Age Group, Sex, and Race, 2003-2007

The cancers listed are the five most frequently diagnosed cancers for each age group. Different age groups are at higher risks for different types of cancer. As age increases, the risk of cancer increases.

WHITE MALES			MINORITY MALES		
Ages 0-19			Ages 0-19		
Type	Cases	Rate ¹	Type	Cases	Rate ¹
Leukemia	190	4.5	Leukemia	68	3.8
Brain/Other CNS	160	3.8	Brain/Other CNS	44	2.5
Non-Hodgkin Lymphoma	59	1.4	Non-Hodgkin Lymphoma	29	1.6
Testes	51	1.2	Kidney	19	1.1
Endocrine	50	1.2	Soft Tissue	18	1.0
Ages 20-44			Ages 20-44		
Type	Cases	Rate ¹	Type	Cases	Rate ¹
Testes	704	12.0	Colon/Rectum	165	8.4
Melanoma (Skin)	658	11.2	Non-Hodgkin Lymphoma	157	8.0
Colon/Rectum	418	7.1	Prostate	105	5.4
Non-Hodgkin Lymphoma	334	5.7	Lung/Bronchus	104	5.3
Endocrine	313	5.3	Testes	98	5.0
Ages 45-64			Ages 45-64		
Type	Cases	Rate ¹	Type	Cases	Rate ¹
Prostate	8,946	217.1	Prostate	3,850	350.3
Lung/Bronchus	4,952	120.2	Lung/Bronchus	1,667	151.7
Colon/Rectum	3,217	78.1	Colon/Rectum	1,007	91.6
Melanoma (Skin)	1,744	42.3	Oral Cavity	540	49.1
Bladder	1,586	38.5	Kidney	510	46.4
Ages 65 and older			Ages 65 and older		
Type	Cases	Rate ¹	Type	Cases	Rate ¹
Prostate	13,278	729.2	Prostate	4,009	1,165.3
Lung/Bronchus	10,202	560.3	Lung/Bronchus	1,802	523.8
Colon/Rectum	4,880	268.0	Colon/Rectum	1,002	291.2
Bladder	4,126	226.6	Bladder	368	107.0
Melanoma (Skin)	2,107	115.7	Kidney	304	88.4

¹Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

In situ cancers except those of the bladder and female breast are excluded.

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

Table 7 (continued) : Five Most Frequently Diagnosed Cancers By Age Group, Sex, and Race, 2003-2007

<u>WHITE FEMALES</u>			<u>MINORITY FEMALES</u>		
Ages 0-19			Ages 0-19		
Type	Cases	Rate¹	Type	Cases	Rate¹
Leukemia	165	4.1	Leukemia	42	2.4
Brain/Other CNS	137	3.4	Brain/Other CNS	35	2.0
Endocrine	103	2.6	Endocrine	26	1.5
Melanoma (Skin)	47	1.2	Bone	18	1.0
Hodgkin Disease	47	1.2	Kidney	18	1.0
Ages 20-44			Ages 20-44		
Type	Cases	Rate¹	Type	Cases	Rate¹
Female Breast	3,263	58.5	Female Breast	1,269	58.6
Endocrine	1,195	21.4	Endocrine	347	16.0
Melanoma (Skin)	1,035	18.6	Colon/Rectum	190	8.8
Cervix Uteri	545	9.8	Cervix Uteri	188	8.7
Colon/Rectum	410	7.4	Non-Hodgkins Lymphoma	131	6.1
Ages 45-64			Ages 45-64		
Type	Cases	Rate¹	Type	Cases	Rate¹
Female Breast	13,397	311.6	Female Breast	3,809	290.6
Lung/Bronchus	3,832	89.1	Colon/Rectum	960	73.2
Colon/Rectum	2,298	53.4	Lung/Bronchus	907	69.2
Corpus Uteri	2,057	47.8	Corpus Uteri	454	34.6
Melanoma (Skin)	1,277	29.7	Endocrine	335	25.6
Ages 65 and older			Ages 65 and older		
Type	Cases	Rate¹	Type	Cases	Rate¹
Female Breast	12,202	479.8	Female Breast	2,476	432.1
Lung/Bronchus	7,905	310.8	Colon/Rectum	1,281	223.6
Colon/Rectum	5,046	198.4	Lung/Bronchus	1,176	205.2
Non-Hodgkin Lymphoma	1,943	76.4	Corpus Uteri	523	91.3
Corpus Uteri	1,745	68.6	Pancreas	440	76.8

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

In situ cancers except those of the bladder and female breast are excluded.

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at: www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

Table 8: 2003-2007 Cancer Incidence Rates by Race and Ethnicity

Site	White Non Hispanics		African American, Non Hispanics		American Indians, Non Hispanics		Hispanics		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
ALL CANCERS	169,419	486.3	39,457	503.6	1,403	329.2	3,107	311.5	216,944	487.0
Oral Cavity	3,911	11.1	1,004	11.9	28	5.9	65	6.2	5,094	11.2
Esophagus	1,631	4.6	473	6.0	11	2.5	13	2.0	2,152	4.8
Stomach	1,688	4.8	802	10.9	19	5.3	73	8.7	2,648	6.0
Colon/Rectum	16,089	45.9	4,289	55.9	117	27.4	227	28.3	21,000	47.4
Liver	1,622	4.6	456	5.4	23	5.6	58	7.5	2,288	5.1
Gallbladder	290	0.8	111	1.5	*	*	9	1.5	421	1.0
Pancreas	3,728	10.6	1,150	15.6	22	5.8	66	8.5	5,070	11.6
Larynx	1,510	4.2	520	6.5	11	2.7	18	2.0	2,075	4.6
Lung/Bronchus	27,284	77.3	5,338	70.1	244	58.1	207	30.3	33,559	75.8
Bone	291	0.9	64	0.7	*	*	22	0.7	389	0.9
Soft Tissue	1,007	3.1	282	3.3	9	2.0	49	2.5	1,371	3.1
Melanoma (Skin)	8,004	23.8	67	0.9	12	2.8	45	4.1	8,246	18.6
Female Breast	28,406	151.5	6,873	146.7	221	88.9	553	111.9	36,562	149.6
Cervix Uteri	1,189	7.1	457	9.7	14	5.6	120	17.1	1,835	7.9
Corpus Uteri	4,051	21.1	952	21.1	37	16.2	85	16.8	5,210	20.9
Ovary	2,449	12.9	423	9.2	11	4.5	51	9.9	2,998	12.2
Prostate	22,124	137.7	7,420	238.6	294	156.1	275	85.8	30,578	153.8
Testes	867	6.0	88	2.1	7	2.8	89	3.9	1,063	4.9
Bladder	7,725	22.1	810	11.2	27	8.3	59	10.5	8,715	20.0
Kidney	5,514	15.8	1,411	17.6	59	14.3	135	14.2	7,197	16.1
Endocrine	4,115	12.7	949	10.9	24	5.1	209	10.8	5,434	12.2
Multiple Myeloma	1,770	5.1	813	10.8	15	3.8	35	4.6	2,690	6.1
Leukemia	3,943	11.7	691	8.7	29	6.6	172	8.6	4,979	11.4
Brain/Other CNS (excludes benign brain/CNS)	2,442	7.5	367	4.3	22	4.7	73	3.8	2,964	6.7
Hodgkin Disease	839	2.8	224	2.4	11	2.1	35	1.2	1,128	2.6
Non-Hodgkin lymphoma	6,622	19.2	1,093	13.5	39	8.4	146	14.2	8,039	18.2
Other Cancers	10,306	29.8	2,330	30.3	93	23.4	218	24.3	13,237	30.2

¹ Rates are per 100,000 population and are age-adjusted to the 2000 U.S. Census.

* Cases less than 5 are suppressed.

In situ cancers except those of the bladder and female breast are excluded.

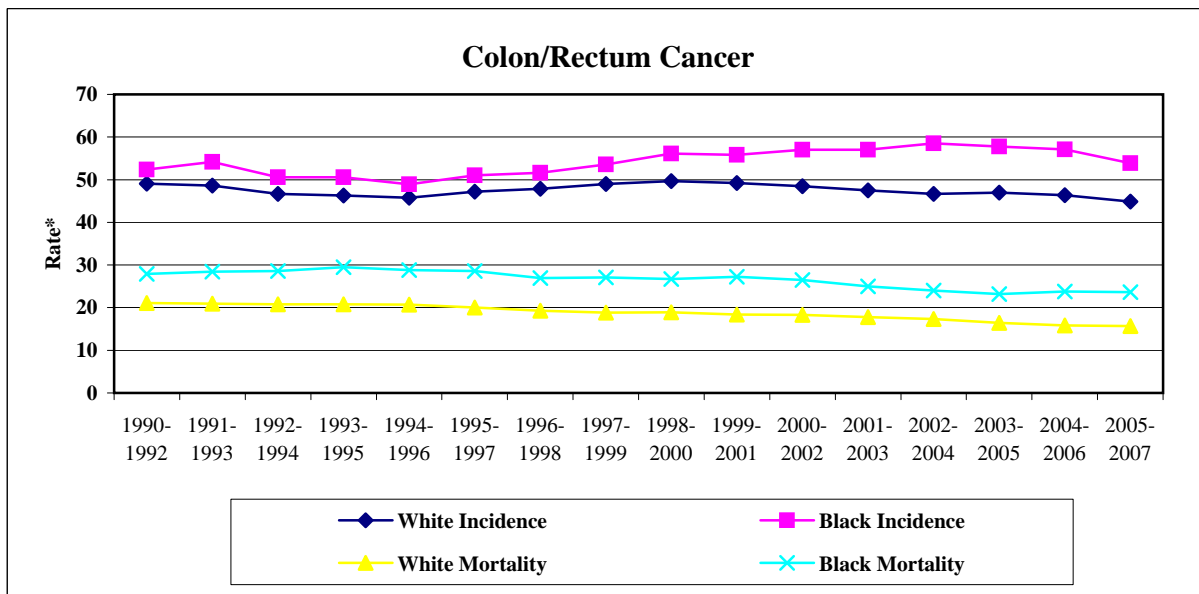
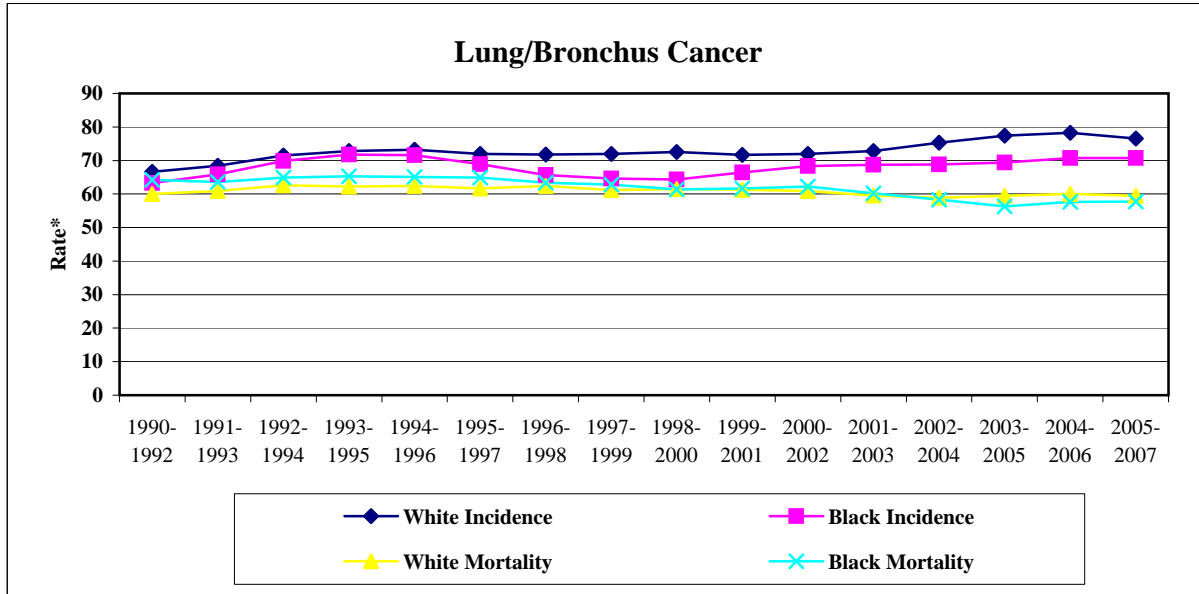
Hispanic ethnicity is independent of race, so the counts will not sum to the total.

Hispanic ethnicity is determined by self-report and the National Hispanic Identification Algorithm available online at www.naacr.org.

American Indian race is known to be underreported. Previous analyses by the North Carolina Central Cancer Registry indicates approximately 17% of patients of American Indian race are reported as a different race. Incidence is assumed to be under-estimated as a result of misclassification.

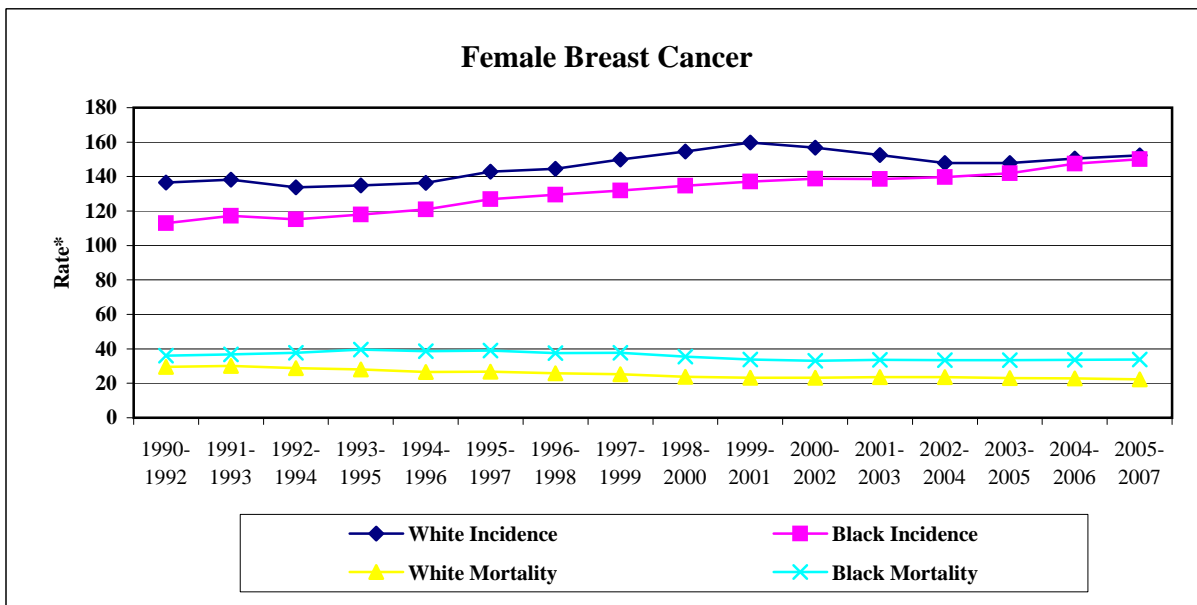
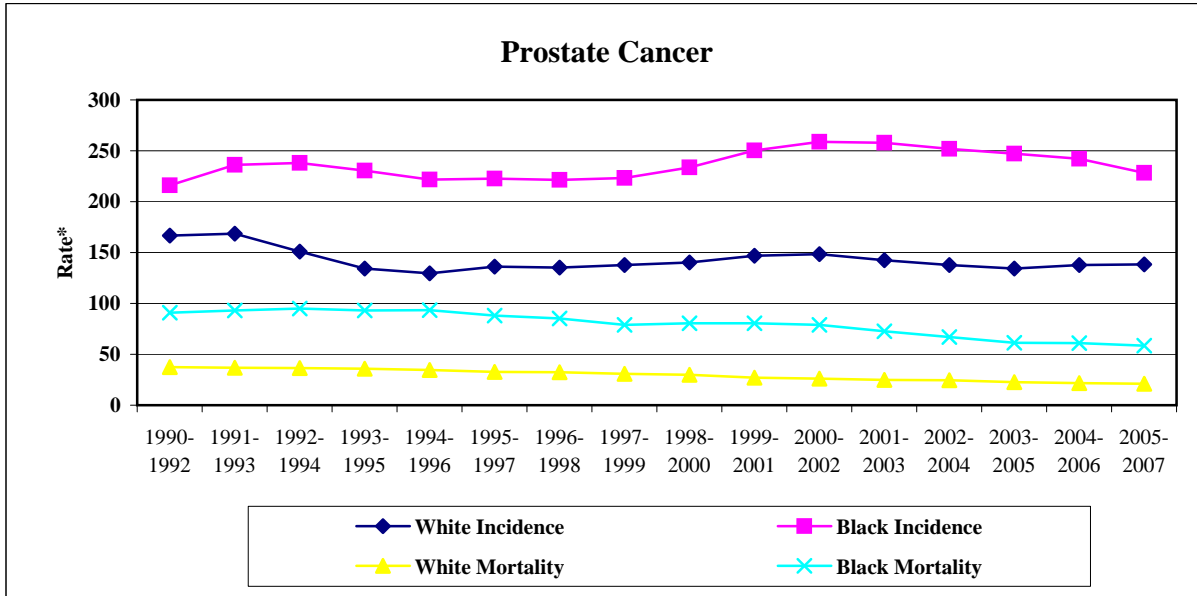
Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics available online at: www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008.

**Chart 1: Incidence Trends by Race for Selected Cancers
1990-2007**



* Rates per 100,000 Population
Age-Adjusted to the 2000 U.S. Census

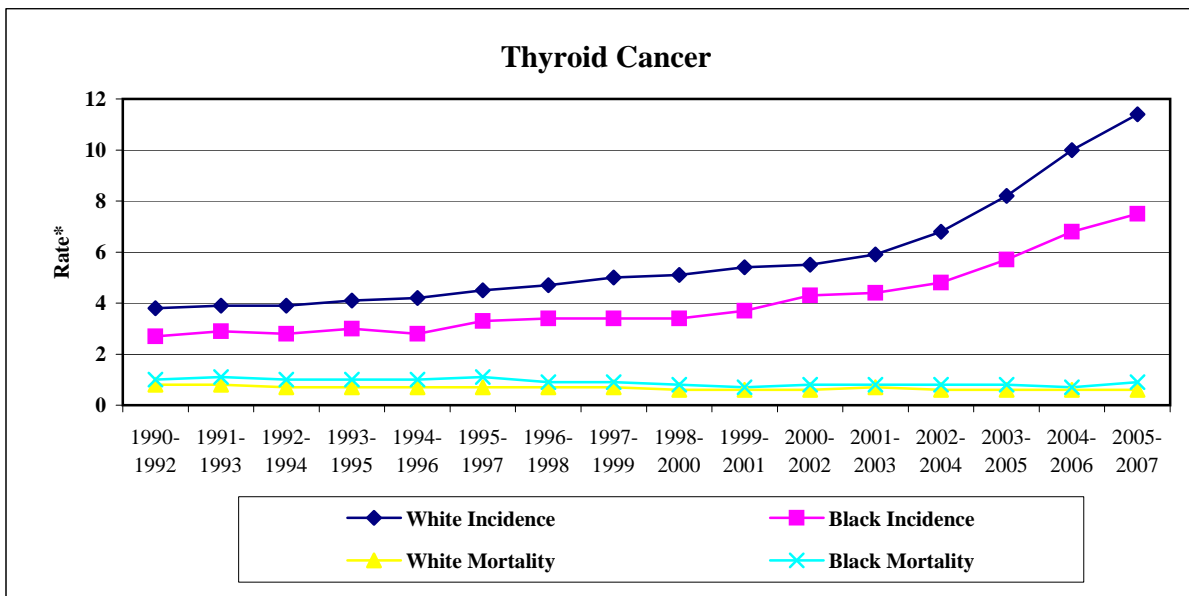
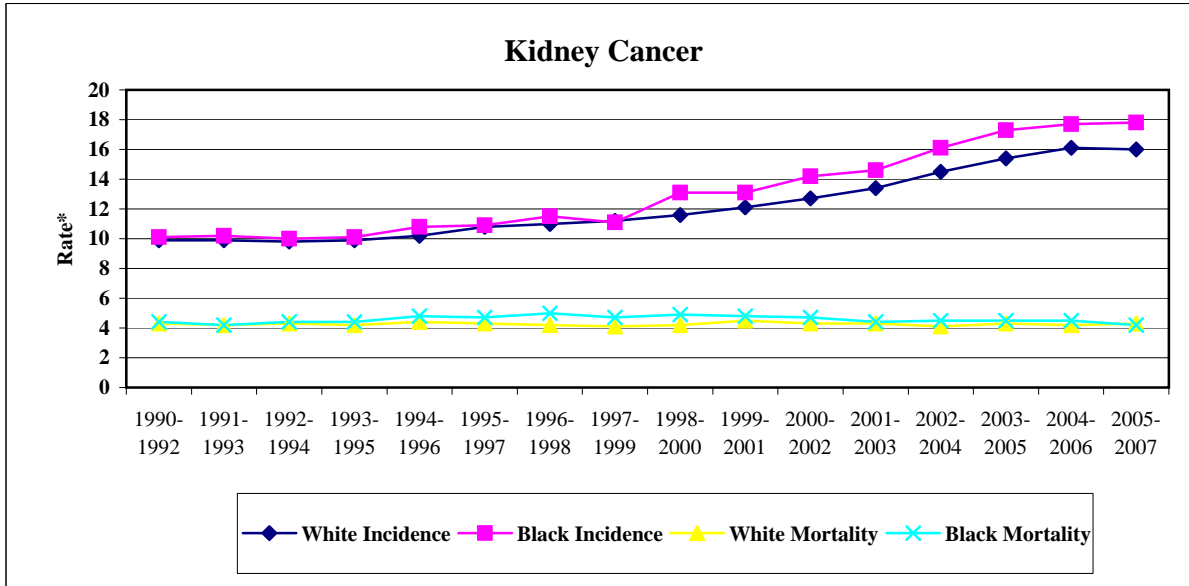
**Chart 1: Incidence Trends by Race for Selected Cancers
1990-2007 (continued)**



Includes in situ breast cancers.

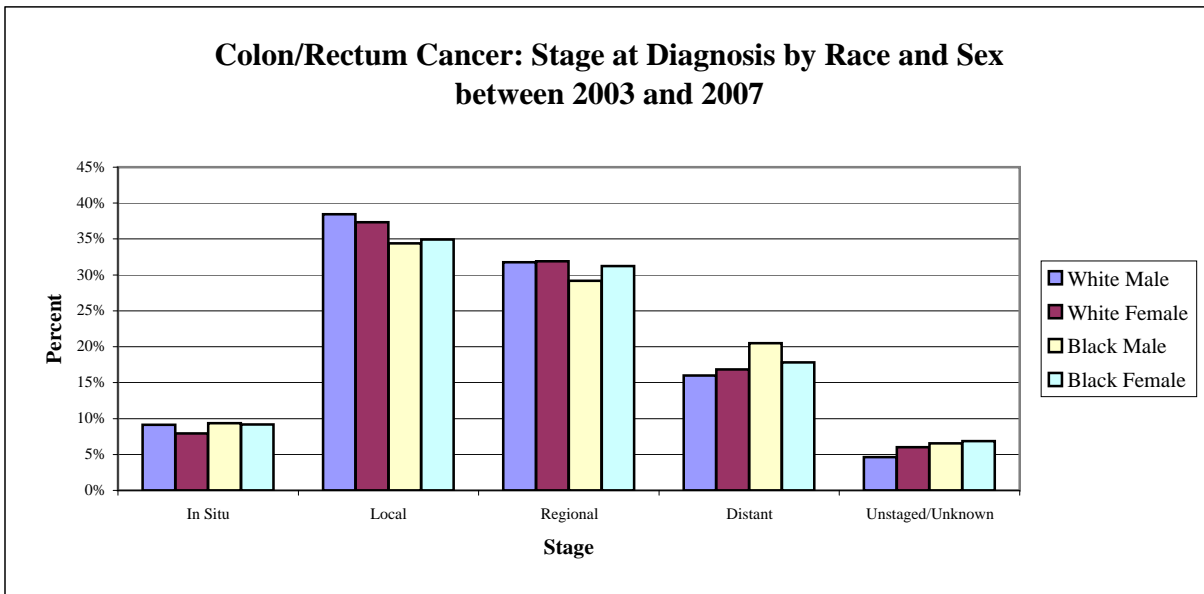
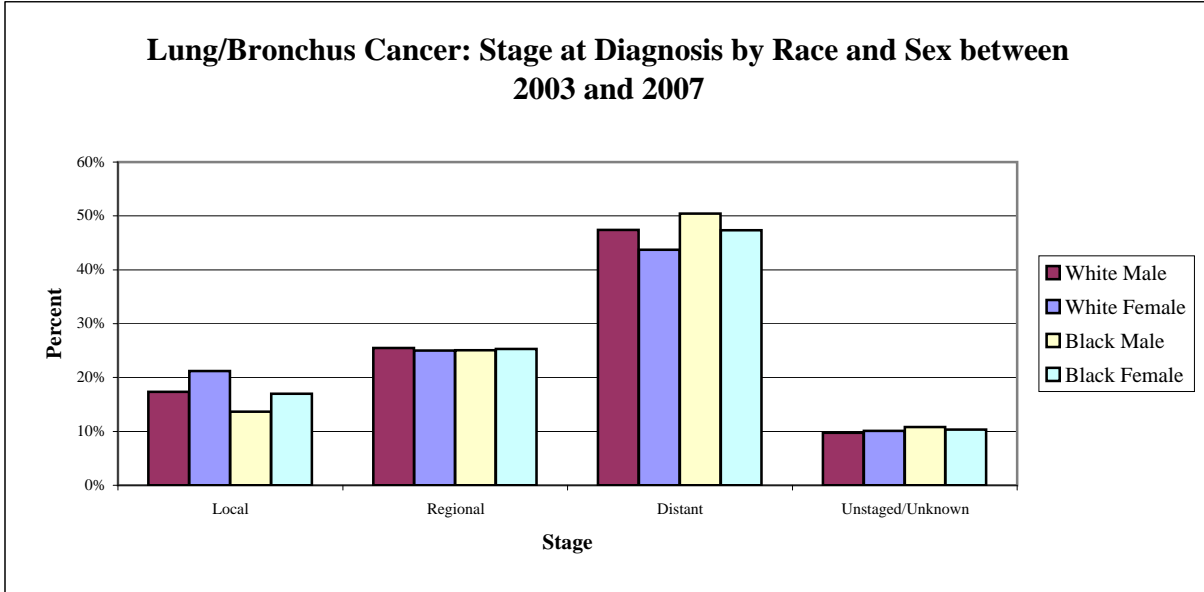
* Rates per 100,000 Population
Age-Adjusted to the 2000 U.S. Census

**Chart 1: Incidence Trends by Race for Selected Cancers
1990-2007 (continued)**

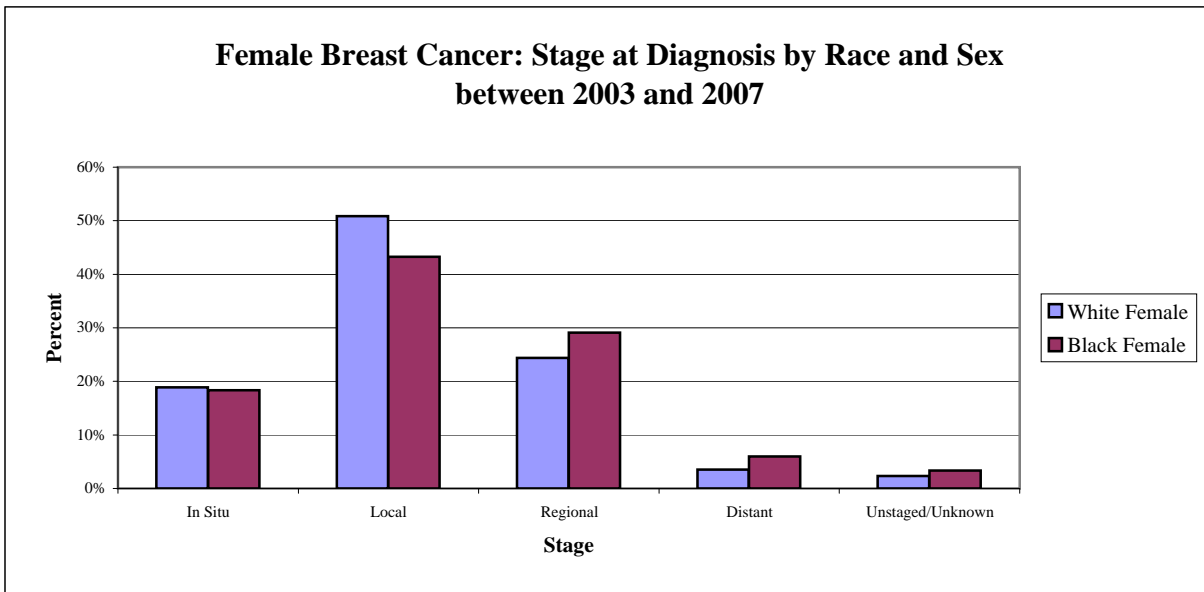
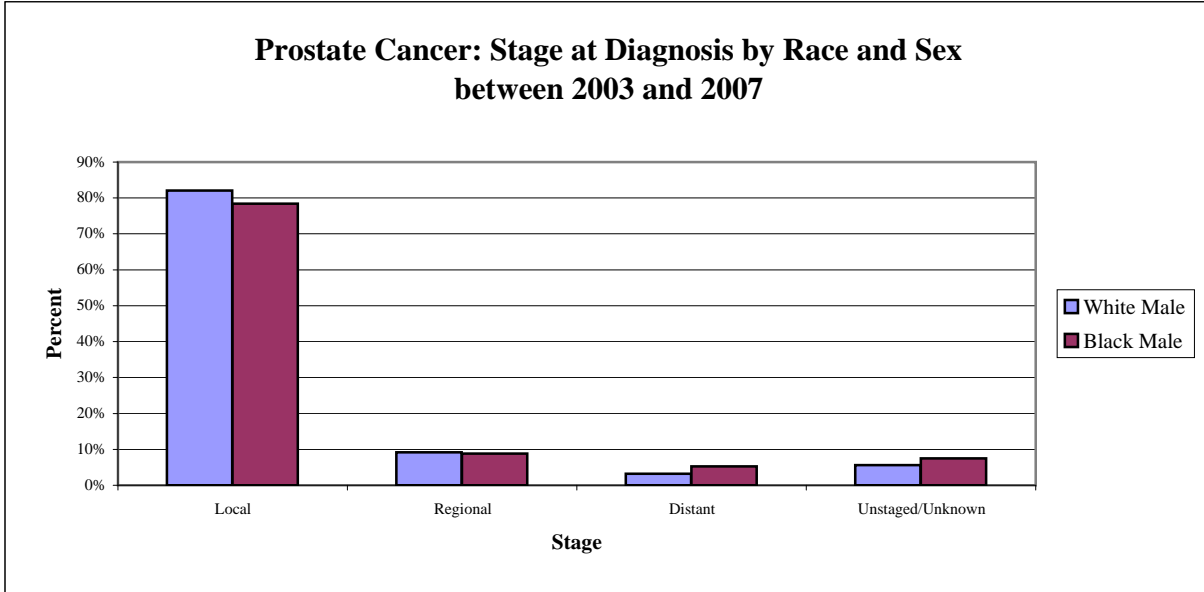


* Rates per 100,000 Population
Age-Adjusted to the 2000 U.S. Census

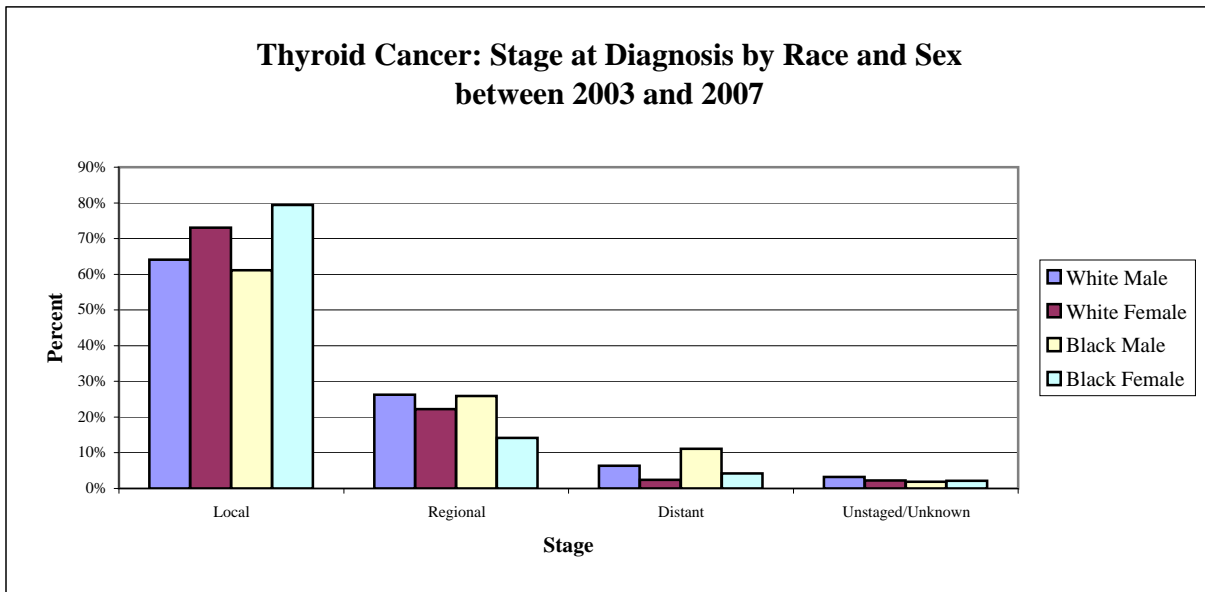
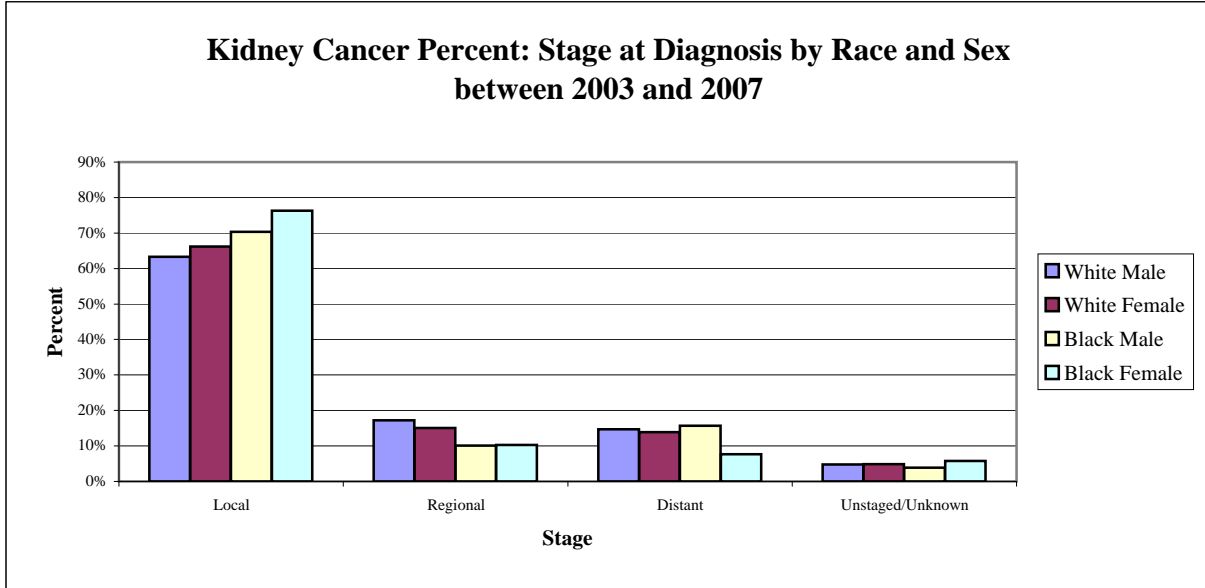
**Chart 2: Stage at Diagnosis by Race and Sex
2003-2007 for Selected Sites**



**Chart 2: Stage at Diagnosis by Race and Sex
2003-2007 for Selected Sites (continued)**



**Chart 2: Stage at Diagnosis by Race and Sex
2003-2007 for Selected Sites (continued)**



Appendix A

Primary Site Definitions

International Classification of Disease for Oncology (ICD-O-3) Codes for Newly Diagnosed Neoplasms¹

Primary Site	ICD-O-3
All Sites	C000-C809
Oral Cavity and Pharynx:	C000-C148
❖ Lips	C000-C009
❖ Tongue	C019-C029
❖ Salivary Glands	C079-C089
❖ Floor of Mouth	C040-C049
❖ Nasopharynx	C110-C119
❖ Oropharynx	C100-C109
❖ Hypopharynx	C129-C139
❖ Other Mouth and Pharynx	C030-C039, C050-C069, C090-C099, C140, C142-C148
Digestive System:	C150-C269, C480-C488
❖ Esophagus	C150-C159
❖ Stomach	C160-C169
❖ Small Intestine	C170-C179
❖ Colon and Rectum	C180-C209, C260
❖ Anus, Anal Cavity and Anorectum	C210-C212, C218
❖ Liver and Intrahepatic Bile Duct	C220-C221
❖ Gallbladder	C239
❖ Pancreas	C250-C259
❖ Other Digestive Organs	C240-C249, C268-C269, C480-C488
Respiratory System:	C300-C399
❖ Larynx	C320-C329
❖ Lung and Bronchus	C340-C349
❖ Other Respiratory Organs	C300-C319, C339, C381-C399
Bones and Joints	C400-C419
Soft Tissues	C380, C470-C479, C490-C499
Skin	C440-C449
❖ Melanoma of Skin	C440-C449 (M8720-M8790)
❖ Other Skin	C440-C449 (Other histology)
Breast	C500-C509
❖ Invasive	C500-C509 (Behavior=3)
❖ In Situ	C500-C509 (Behavior=2)
Female Genital Organs:	C510-C589
❖ Cervix Uteri	C530-C539
❖ Uterus (Corpus, NOS)	C540-C559
❖ Ovary	C569
❖ Other Female Genital Organs	C510-C529, C570-C589

Appendix A (Continued)

Primary Site Definitions

International Classification of Disease for Oncology (ICD-O-3) Codes for Newly Diagnosed Neoplasms¹

Male Genital Organs:	C600-C639
❖ Prostate	C619
❖ Testis	C620-C629
❖ Penis	C600-C609
❖ Other Male Genital Organs	C630-C639
Urinary System:	C649-C689
❖ Bladder	C670-C679
❖ Kidney and Renal Pelvis	C649, C659
❖ Ureter	C669
❖ Other Urinary System	C680-C689
Eye & Orbit:	C690-C699
Brain & Central Nervous System (CNS):	C700-C729
Endocrine System:	C379, C739-C759
❖ Thyroid	C739
❖ Other Endocrine and Thymus	C379, C740-C759
Lymphomas:	M9590-M9729,M9823,M9827
❖ Hodgkin's Disease	M9650-M9667
❖ Non-Hodgkin's	M9590-M9596, M9670-M9671, M9673,M9675,M9678- M9680,M9684,M9687,M9689- M9691,M9695,M9698-M9702,M9705,M9708- M9709,M9714-M9719,M9727- M9729,M9823,M9827
Multiple Myeloma:	M9731-M9732,M9734
Leukemia:	M9800-M9948
❖ Acute Lymphocytic	M9826, M9835-M9837
❖ Chronic Lymphocytic	M9823
❖ Acute Myeloid	M9840, M9861, M9866, M9867, M9871-M9874, M9895-M9897,M9910,M9920
❖ Chronic Myeloid	M9863,M9875,M9876, M9945,M9946
❖ Other Leukemia	M9733, M9742,M9800-M9801,M9805, M9827,M9831, M9870, M9931, M9948, M9963-M9964
Ill-Defined & Unspecified Hematopoietic Neoplasms	M9740-M9741,M9750-M9758,M9760- M9769,M9950-M9960 M9962,M9970,M9975,M9980,M9982- M9978,M9989

¹ Based on the SEER Incidence Site ICD-O-3 Recode, 1/27/2003
<http://seer.cancer.gov/siterecode/>

Appendix B

Formulae

Mathematical definitions:

Age Group (i):

0-4	45-49
5-9	50-54
10-14	55-59
15-19	60-64
20-24	65-69
25-29	70-74
30-34	74-79
35-39	80-84
40-44	85+

Age-specific rate:

$$r_i = (c_i/r_i)*100,000$$

where r_i is the age-specific rate for age group (i), c_i is the count of cases for that age group (i) and r_i is the count of persons at risk (i.e., the population) for that age group (i); rates in all tables are presented per 100,000 population.

Observed:

- ◆ Male Observed = Number of new cases of cancer among males
- ◆ Female Observed = Number of new cases of cancer among females

Age-adjusted rate:

$$A.A.R. = \sum_{i=0-4}^{85+} (w_i r_i)$$

where w_i is the proportion of the age group in the 2000 U.S. Standard and r_i is the age-specific rate for age group.

**Appendix C: Population by County and Race/Sex
North Carolina, 2007**

County	White Males	White Females	Minority Males	Minority Females
NORTH CAROLINA	3,338,449	3,411,804	1,081,803	1,209,538
<i>Alamance</i>	55,724	58,792	14,010	16,264
<i>Alexander</i>	16,864	16,707	1,574	1,153
<i>Alleghany</i>	5,280	5,363	141	90
<i>Anson</i>	6,391	6,238	6,494	6,095
<i>Ashe</i>	12,343	12,736	214	192
<i>Avery</i>	8,662	8,125	944	111
<i>Beaufort</i>	15,816	16,910	5,818	7,092
<i>Bertie</i>	3,579	3,899	5,417	6,555
<i>Bladen</i>	9,691	10,037	5,756	6,726
<i>Brunswick</i>	41,890	43,506	6,410	7,160
<i>Buncombe</i>	98,749	107,018	9,811	10,822
<i>Burke</i>	38,935	39,997	5,485	4,370
<i>Cabarrus</i>	66,821	68,362	13,119	14,496
<i>Caldwell</i>	36,461	37,883	2,456	2,561
<i>Camden</i>	3,850	3,978	765	868
<i>Carteret</i>	28,060	29,519	2,725	2,850
<i>Caswell</i>	7,628	7,525	4,129	4,021
<i>Catawba</i>	67,392	68,858	9,119	9,754
<i>Chatham</i>	25,310	25,704	4,676	5,339
<i>Cherokee</i>	12,207	13,178	519	532
<i>Chowan</i>	4,466	4,795	2,408	2,966
<i>Clay</i>	4,846	5,184	82	98
<i>Cleveland</i>	36,976	39,654	10,013	11,636
<i>Columbus</i>	17,123	18,209	8,624	10,010
<i>Craven</i>	34,834	35,920	12,024	13,524
<i>Cumberland</i>	88,455	88,751	61,274	70,467
<i>Currituck</i>	10,742	11,034	982	1,101
<i>Dare</i>	16,105	16,108	739	741
<i>Davidson</i>	68,212	70,397	8,151	9,314
<i>Davie</i>	18,296	18,861	1,553	1,654
<i>Duplin</i>	19,557	18,586	6,639	7,830
<i>Durham</i>	73,426	72,130	50,970	58,834
<i>Edgecombe</i>	10,860	11,336	13,637	16,795
<i>Forsyth</i>	117,785	123,608	44,283	51,963
<i>Franklin</i>	20,423	20,440	7,656	8,533
<i>Gaston</i>	81,990	86,460	15,681	18,035
<i>Gates</i>	3,712	3,752	1,993	2,246
<i>Graham</i>	3,466	3,676	342	349
<i>Granville</i>	18,817	17,368	10,837	9,033
<i>Greene</i>	6,361	5,683	4,774	3,882
<i>Guilford</i>	145,095	152,594	77,679	88,666
<i>Halifax</i>	10,948	11,999	15,197	16,828
<i>Harnett</i>	40,173	41,239	12,921	14,209
<i>Haywood</i>	26,386	28,614	670	735
<i>Henderson</i>	46,256	49,498	2,237	2,454
<i>Hertford</i>	4,112	4,387	7,089	7,654
<i>Hoke</i>	11,211	11,311	9,400	10,213
<i>Hyde</i>	1,721	1,599	1,099	797
<i>Iredell</i>	63,665	65,249	10,354	11,738
<i>Jackson</i>	15,095	16,002	2,602	2,573
<i>Johnston</i>	65,144	64,673	12,957	14,106
<i>Jones</i>	3,255	3,359	1,596	1,878

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008).

**Appendix C (continued) : Population by County and Race/Sex
North Carolina, 2007**

County	White Males	White Females	Minority Males	Minority Females
NORTH CAROLINA	3,338,449	3,411,804	1,081,803	1,209,538
<i>Lee</i>	22,635	22,633	5,830	6,717
<i>Lenoir</i>	16,018	16,948	10,758	12,961
<i>Lincoln</i>	33,445	33,885	2,610	2,828
<i>McDowell</i>	20,221	20,835	1,385	1,075
<i>Macon</i>	15,011	16,689	500	395
<i>Madison</i>	9,753	10,138	227	160
<i>Martin</i>	6,076	6,721	4,759	5,971
<i>Mecklenburg</i>	283,504	280,650	140,275	159,372
<i>Mitchell</i>	7,615	7,929	115	111
<i>Montgomery</i>	10,642	10,550	3,104	3,027
<i>Moore</i>	33,961	36,406	6,351	7,491
<i>Nash</i>	27,496	29,281	16,801	19,127
<i>New Hanover</i>	76,349	79,910	15,531	18,314
<i>Northampton</i>	4,141	4,330	5,708	6,577
<i>Onslow</i>	70,554	57,077	18,347	17,358
<i>Orange</i>	47,548	51,638	11,559	13,563
<i>Pamlico</i>	4,670	4,800	1,592	1,441
<i>Pasquotank</i>	11,836	12,312	7,893	8,639
<i>Pender</i>	19,631	19,692	5,066	5,321
<i>Perquimans</i>	4,475	4,808	1,456	1,753
<i>Person</i>	12,969	13,487	5,034	5,816
<i>Pitt</i>	47,875	50,161	24,612	29,490
<i>Polk</i>	8,401	9,376	556	618
<i>Randolph</i>	63,724	65,343	5,013	5,432
<i>Richmond</i>	14,975	15,234	7,650	8,064
<i>Robeson</i>	23,461	22,852	39,030	42,723
<i>Rockingham</i>	35,704	37,767	8,721	10,000
<i>Rowan</i>	55,914	57,495	11,498	12,131
<i>Rutherford</i>	26,557	28,863	3,604	3,904
<i>Sampson</i>	21,705	21,616	9,626	10,408
<i>Scotland</i>	8,891	9,562	8,621	9,267
<i>Stanly</i>	25,100	25,806	4,145	4,102
<i>Stokes</i>	21,122	22,287	1,202	1,326
<i>Surry</i>	33,400	35,121	1,788	1,863
<i>Swain</i>	4,553	4,899	1,953	2,011
<i>Transylvania</i>	13,528	14,639	859	927
<i>Tyrrell</i>	1,229	1,114	1,099	705
<i>Union</i>	78,689	78,861	12,713	13,621
<i>Vance</i>	10,197	10,867	10,006	11,822
<i>Wake</i>	308,222	303,901	103,406	114,500
<i>Warren</i>	3,868	3,926	5,690	5,936
<i>Washington</i>	3,069	3,243	3,008	3,546
<i>Watauga</i>	21,373	21,607	750	743
<i>Wayne</i>	36,862	37,322	18,354	20,858
<i>Wilkes</i>	31,264	31,897	1,757	1,777
<i>Wilson</i>	22,376	22,981	14,283	16,892
<i>Yadkin</i>	17,727	18,405	751	792
<i>Yancey</i>	8,947	9,129	162	150

Incidence rates for 2007 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/nvss/bridged_race/data_documentation.htm#vintage2008).

Appendix D: U.S. Standard Million Population 2000

Ages 0-4	69135
Ages 5-9	72532
Ages 10-14	73032
Ages 15-19	72168
Ages 20-24	66478
Ages 25-29	64530
Ages 30-34	71044
Ages 35-39	80762
Ages 40-44	81851
Ages 45-49	72118
Ages 50-54	62716
Ages 55-59	48454
Ages 60-64	38793
Ages 65-69	34264
Ages 70-74	31773
Ages 75-79	27000
Ages 80-84	17842
Ages 85+	15508

Source: U.S. Bureau of the Census, Census of Population: 2000.

Appendix E: Stage at Diagnosis

SEER Summary Stage 2000

- 0 In situ
- 1 Localized
- 2 Regional, direct extension
- 3 Regional, regional lymph nodes only
- 4 Regional, direct extension and regional lymph nodes
- 5 Regional, NOS
- 7 Distant
- 8 Not applicable
- 9 Unstaged

Source: Standards for Cancer Registries, Volume II: Data Standards and Data Dictionary, Fourteenth Edition. See www.naaccr.org.