

Cancer Incidence in North Carolina 2006

State Center for Health Statistics

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Table of Contents

Introduction

▪ Background	1
▪ Purpose	1
▪ Confidentiality.....	1

Technical Notes

▪ Overview and Definitions.....	2
Cancer Incidence and Mortality	2
Differences in Reporting Cancer	3
Incidence Rates.....	3
Race/Gender Specific Cases and Rates	5
Reliability of Rates.....	6
Morphology (Cell Type) and Behavior	6
▪ Limitations of Data	7
Small Numbers.....	7
Interpretation	8
▪ Comparison to National Data.....	8
▪ Available Cancer Information.....	8
▪ Support for Cancer Research and Control.....	9

Tables/Charts

▪ Table 1: Incidence Rates by Sex	10
▪ Table 2: Ten Most Frequently Diagnosed Cancers by Sex	11
▪ Table 3: Incidence Rates by Race	12
▪ Table 4: Ten Most Frequently Diagnosed Cancers by Race	13
▪ Table 5: Cancer Incidence and Mortality Rates by County	14
▪ Table 6: Incidence Rates by AHEC Regions	16
▪ Table 7: Incidence Rates by Age Group and Race.....	17
▪ Table 8: Incidence Rates by Race and Ethnicity	19
▪ Chart 1: Trends for the Four Major Cancers	20
▪ Chart 2: Stage at Diagnosis by Race and Sex.....	23

Appendices

▪ Appendix A: Primary Site Definitions	26
▪ Appendix B: Mathematical Formulae.....	28
▪ Appendix C: 2006 Population by County and Race.....	29
▪ Appendix D: 2000 U.S. Standard Million Population.....	31

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 75 of these hospitals have their own tumor registries where the data is abstracted and submitted to the CCR. The 2006 incidence data was reported to the CCR by 185 facilities via a secure internet-based database.

Purpose

Cancer Incidence in North Carolina 2006 is the twelfth 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 2006. 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

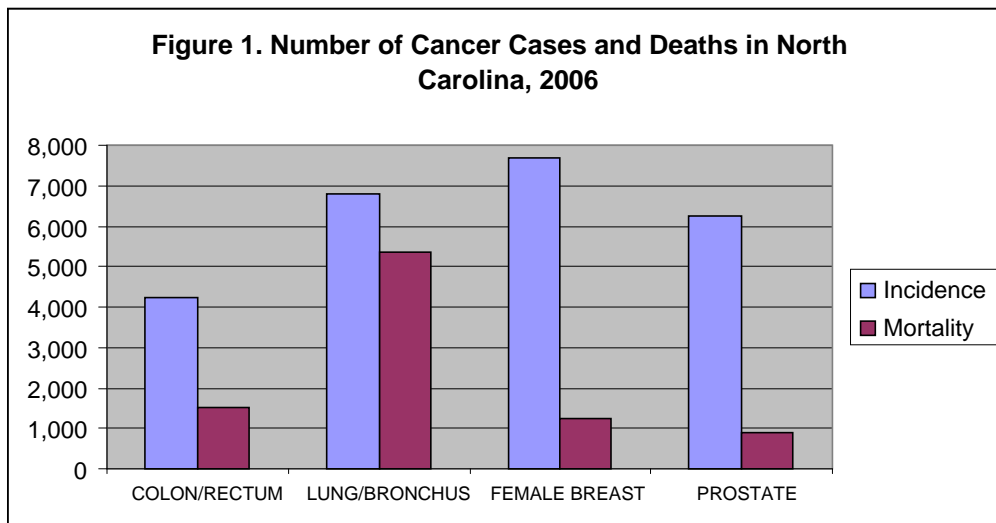
This report presents frequency counts, age-specific rates, and age-adjusted rates to describe newly diagnosed cases of cancer and mortality due to cancer.

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. See 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., melanomas), under-reporting may lead to more cancer deaths being shown than incidence cases. 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.



Cancer incidence and mortality cases by site for colon/rectum, lung/bronchus, female breast, and prostate cancers are presented in Figure 1.

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 24 states, including our border states of Virginia, Tennessee and South Carolina.

Because death certificate data are available more quickly than incidence data, the 2006 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics, available online at <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.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.

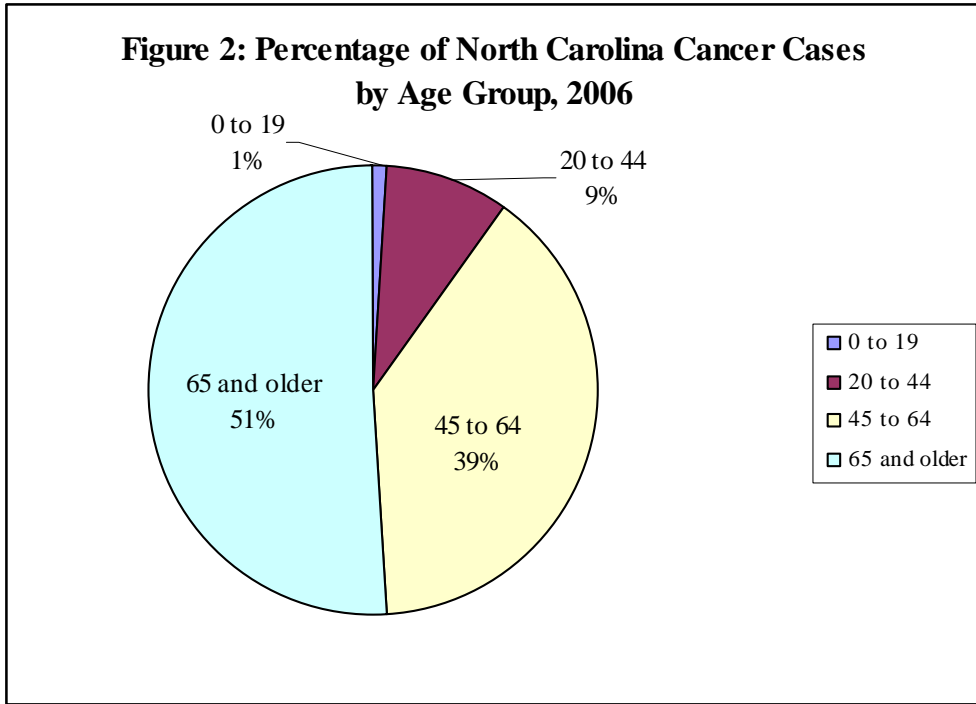
Young adults (20-44) have a different pattern of cancer than do children. In this age group, lymphomas are even more common, as are some digestive and reproductive tissue cancers. All of these cancers are quite rare and cancer rates in these ages are generally lower than for other age groups.

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.

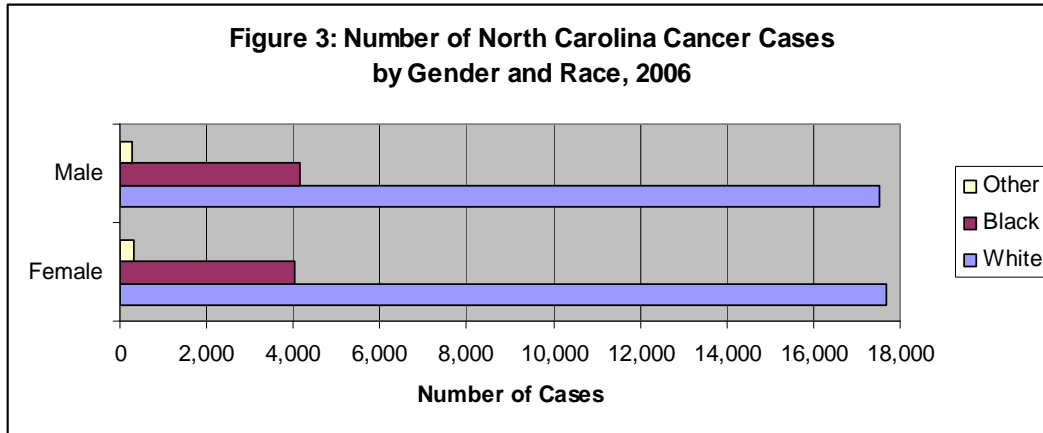


Race/Gender Specific Cases and Rates

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 and age-adjusted rates for North Carolina are presented by gender in Table 1 and by race in Table 3.



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 7.

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 see the web site for the North American Association of Central Cancer Registries (www.naaccr.org).

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 2006 over 22% 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 65% percent of Hertford County's population was comprised of minorities while over 97% 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, Tyrrell County, which has the smallest population of any county in the state, can expect to have only one case of female lung cancer each year (based on state lung cancer rates). Between 2001 and 2005, there were 6 cases of female breast cancer in Tyrrell County reported to the CCR. The majority of the cases were reported in 2001. It would appear that the county had an excessive

amount of breast cancer in females in 2001. 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, 1975-2005, 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 2005 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 2006, cancer was the 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). The Cancer Information Service, located at Duke University, 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 www.health.state.ga.us/pdfs/chronic/cancer/ACSSAD07.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: 2006 Incidence Rates By Sex

Site	Males		Females	
	Cases	Rate ¹	Cases	Rate ¹
All Sites	22,141	554.0	22,177	441.9
Oral Cavity and Pharynx	672	15.8	298	5.9
Lip	28	0.7	9	0.2
Tongue	179	4.2	65	1.3
Salivary Glands	57	1.5	50	1.0
Floor of Mouth	52	1.2	24	0.5
Nasopharynx	24	0.6	9	0.2
Oropharynx	47	1.1	13	0.3
Hypopharynx	54	1.2	15	0.3
Other Mouth and Pharynx	231	5.4	113	2.2
Digestive System	3,914	98.5	3,444	67.1
Esophagus	327	8.0	94	1.8
Stomach	292	7.6	222	4.4
Small Intestine	85	2.1	98	1.9
Colon and Rectum	2,189	55.4	2,039	39.8
Anus and Anal Canal	53	1.3	102	2.0
Liver and Intrahepatic Bile Duct	324	7.8	126	2.5
Gallbladder	37	1.0	59	1.1
Pancreas	512	12.9	558	10.8
Other Digestive Organs	95	2.4	145	2.8
Respiratory System	4,293	109.8	3,038	59.8
Larynx	309	7.5	98	1.9
Lung and Bronchus	3,899	100.2	2,901	57.1
Other Respiratory Organs	85	2.1	39	0.8
Bones and Joints	38	0.9	26	0.6
Soft Tissues	149	3.8	116	2.4
Melanoma of the Skin	903	22.4	779	16.2
Breast	106	2.5	7,679	153.3
Invasive Breast	87	2.1	6,212	124.0
In Situ Breast	19	0.4	1,467	29.3
Female Genital System	.	.	2,312	46.0
Cervix Uteri	.	.	383	8.0
Uterus (Corpus, NOS)	.	.	1,114	21.7
Ovary	.	.	630	12.5
Other Female Genital Organs	.	.	185	3.8
Male Genital System	6,519	158.2	.	.
Prostate	6,263	152.3	.	.
Testis	228	5.2	.	.
Penis	24	0.6	.	.
Other Male Genital Organs	*	*	.	.
Urinary System	2,241	58.3	1,047	20.7
Bladder (incl. in situ)	1,278	34.9	442	8.6
Kidney and Renal Pelvis	927	22.5	574	11.5
Ureter	28	0.7	22	0.4
Other Urinary System	8	0.2	9	0.2
Eye and Orbit	38	0.9	34	0.7
Brain and CNS (excludes benign brain/CNS)	329	7.9	314	6.5
Endocrine System	369	8.7	915	19.4
Thyroid	232	5.4	752	16.0
Other Endocrine and Thymus	137	3.3	163	3.5
Lymphomas	952	23.8	804	16.1
Hodgkins Disease	103	2.4	97	2.1
Non-Hodgkin Lymphoma	849	21.4	707	14.0
Multiple Myeloma	274	7.0	231	4.5
Leukemia	559	14.4	418	8.4
Acute Lymphocytic Leukemia	66	1.5	40	0.9
Chronic Lymphocytic Leukemia	184	4.8	126	2.4
Acute Myeloid Leukemia	161	4.2	154	3.1
Chronic Myeloid Leukemia	76	1.9	47	1.0
Other Leukemia	72	1.9	51	1.0
Ill-Defined and Unspecified	702	18.7	667	12.9
All Other Cancers-Uncategorized	83	2.2	55	1.1

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 2: 2002 - 2006 Ten Most Frequently Diagnosed Cancers by Sex

Cancer	Males			
	Incidence		Mortality	
	Cases	Rate¹	Deaths	Rate¹
Prostate	29,403	153.2	4,330	28.8
Lung/Bronchus	18,755	101.3	15,140	83.5
Colon/Rectum	10,645	57.2	3,786	21.5
Bladder	6,131	34.9	1,124	7.0
Melanoma (skin)	4,295	22.4	774	4.2
Kidney	4,186	21.5	1,162	6.5
Non-Hodgkin Lymphoma	3,994	21.2	1,504	8.6
Oral Cavity	3,382	16.8	797	4.1
Leukemia	2,625	14.2	1,666	9.7
Pancreas	2,384	12.9	2,329	12.9

Cancer	Females			
	Incidence		Mortality	
	Cases	Rate¹	Deaths	Rate¹
Female Breast	35,163	147.2	6,110	25.0
Lung/Bronchus	13,621	56.0	10,176	41.7
Colon/Rectum	10,198	41.6	3,731	14.9
Corpus Uteri	5,018	20.7	990	4.0
Non-Hodgkin Lymphoma	3,647	15.1	1,415	5.7
Melanoma (Skin)	3,388	14.6	478	2.0
Endocrine	3,146	13.9	138	0.6
Ovary	2,970	12.3	2,116	8.6
Kidney	2,523	10.5	638	2.6
Pancreas	2,426	9.8	2,309	9.3

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 3: 2006 Incidence Rates By Race

Site	Whites		Minorities	
	Cases	Rate ¹	Cases	Rate ¹
All Sites	35,221	482.3	8,908	485.6
Oral Cavity and Pharynx	779	10.5	185	9.3
Lip	37	0.5	.	.
Tongue	210	2.8	34	1.7
Salivary Glands	79	1.1	26	1.3
Floor of Mouth	62	0.8	14	0.7
Nasopharynx	22	0.3	10	0.5
Oropharynx	45	0.6	14	0.7
Hypopharynx	50	0.6	19	0.9
Other Mouth and Pharynx	274	3.7	68	3.4
Digestive System	5,587	76.1	1,754	98.5
Esophagus	307	4.1	112	6.1
Stomach	341	4.7	171	10.2
Small Intestine	143	1.9	40	2.2
Colon and Rectum	3,285	44.8	932	51.8
Anus and Anal Canal	121	1.7	33	1.8
Liver and Intrahepatic Bile Duct	344	4.7	107	5.7
Gallbladder	65	0.9	31	1.8
Pancreas	789	10.7	280	16.2
Other Digestive Organs	192	2.6	48	2.7
Respiratory System	5,982	81.7	1,337	75.3
Larynx	295	3.9	112	6.0
Lung and Bronchus	5,590	76.5	1,198	67.8
Other Respiratory Organs	97	1.3	27	1.5
Bones and Joints	50	0.8	13	0.5
Soft Tissues	202	2.9	63	3.2
Melanoma of the Skin	1,647	23.1	23	1.2
Breast	6,042	153.7	1,617	148.1
Invasive Breast	4,882	124.1	1,313	120.3
In Situ Breast	1,160	29.6	304	27.7
Female Genital System	1,822	46.4	483	44.8
Cervix Uteri	275	7.6	107	9.7
Uterus (Corpus, NOS)	882	21.9	228	21.2
Ovary	520	13.1	109	10.3
Other Female Genital Organs	145	3.8	39	3.6
Male Genital System	4,831	143.4	1,632	219.8
Prostate	4,606	136.7	1,602	216.8
Testis	201	6.0	26	2.4
Penis	21	0.6	*	*
Other Male Genital Organs	*	*	*	*
Urinary System	2,780	38.3	494	27.2
Bladder (incl. in situ)	1,549	21.4	162	9.8
Kidney and Renal Pelvis	1,173	16.1	323	16.8
Ureter	45	0.6	5	0.3
Other Urinary System	13	0.2	*	*
Eye and Orbit	65	0.9	5	0.2
Brain and CNS (excludes benign brain/CNS)	552	7.9	88	4.3
Endocrine System	1035	14.8	243	11.7
Thyroid	822	11.7	159	7.5
Other Endocrine and Thymus	213	3.1	84	4.1
Lymphomas	1,419	19.7	329	16.9
Hodgkins Disease	158	2.3	42	1.8
Non-Hodgkin Lymphoma	1,261	17.4	287	15.1
Multiple Myeloma	346	4.7	158	9.2
Leukemia	806	11.4	160	8.4
Acute Lymphocytic Leukemia	84	1.3	22	0.9
Chronic Lymphocytic Leukemia	255	3.5	45	2.7
Acute Myeloid Leukemia	268	3.8	47	2.3
Chronic Myeloid Leukemia	103	1.5	20	1.0
Other Leukemia	96	1.3	26	1.5
Ill-Defined and Unspecified	1,077	14.9	281	16.7
All Other Cancers-Uncategorized	119	1.7	18	0.9

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

**Table 4: 2002-2006 Ten Most Frequently Diagnosed Cancers
By Race**

Cancer	Cases	Whites		Deaths	Rate¹
		Incidence	Rate¹		
Female Breast (includes in situ)	27,926	148.5	4,514	23.1	
Lung/Bronchus	26,749	76.2	20,797	59.5	
Prostate	21,488	135.8	2,859	22.9	
Colon/Rectum	16,231	46.5	5,714	16.5	
Melanoma (skin)	7,517	21.9	1,208	3.5	
Bladder	7,438	21.4	1,439	4.2	
Non-Hodgkin Lymphoma	6,431	18.6	2,522	7.3	
Kidney	5,267	15.0	1,452	4.2	
Corpus Uteri	3,988	20.8	672	3.3	
Leukemia	3,887	11.5	2,480	7.3	

Cancer	Minorities		Deaths	Rate¹
	Incidence	Rate¹		
Prostate	7,743	231.3	1,471	60.3
Female Breast (includes in situ)	7,162	139.1	1,596	31.6
Lung/Bronchus	5,582	67.5	4,519	55.8
Colon/Rectum	4,571	55.1	1,803	22.7
Kidney	1,435	16.3	348	4.3
Non-Hodgkin Lymphoma	1,188	13.3	397	4.9
Pancreas	1,160	14.5	1,092	13.9
Oral Cavity	1,068	11.5	318	3.6
Corpus Uteri	1,022	20.8	318	6.8
Endocrine	855	8.7	63	0.8

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 5: 2006 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	44,319	485.5	17,267	192.7
<i>Alamance</i>	865	554.6	313	196.1
<i>Alexander</i>	172	435.8	92	237.5
<i>Alleghany</i>	61	404.9	25	147.4
<i>Anson</i>	110	391.1	55	191.1
<i>Ashe</i>	150	414.9	72	196.4
<i>Avery</i>	119	512.8	44	192.0
<i>Beaufort</i>	325	544.5	127	207.6
<i>Bertie</i>	106	453.5	70	295.9
<i>Bladen</i>	143	388.7	59	162.6
<i>Brunswick</i>	519	413.9	228	185.1
<i>Buncombe</i>	1,302	485.5	532	191.3
<i>Burke</i>	358	345.9	181	174.6
<i>Cabarrus</i>	876	596.1	277	195.2
<i>Caldwell</i>	412	434.6	205	223.7
<i>Camden</i>	41	441.2	17	178.1
<i>Carteret</i>	418	494.2	187	211.6
<i>Caswell</i>	80	288.3	58	204.5
<i>Catawba</i>	820	493.8	324	199.7
<i>Chatham</i>	253	377.2	123	178.3
<i>Cherokee</i>	148	396.2	70	175.8
<i>Chowan</i>	86	440.7	36	176.3
<i>Clay</i>	70	472.2	28	154.6
<i>Cleveland</i>	656	583.0	225	201.5
<i>Columbus</i>	293	476.7	138	224.8
<i>Craven</i>	603	554.5	212	192.3
<i>Cumberland</i>	1,182	458.3	475	199.1
<i>Currituck</i>	116	489.4	48	206.7
<i>Dare</i>	154	385.2	56	148.6
<i>Davidson</i>	789	463.9	368	216.6
<i>Davie</i>	214	467.7	89	197.6
<i>Duplin</i>	228	421.0	107	199.3
<i>Durham</i>	1,031	472.6	389	190.3
<i>Edgecombe</i>	293	521.4	131	236.6
<i>Forsyth</i>	1,778	512.4	673	197.1
<i>Franklin</i>	215	396.0	101	193.3
<i>Gaston</i>	1,096	515.2	444	211.5
<i>Gates</i>	42	331.9	29	237.2
<i>Graham</i>	38	364.4	19	171.1
<i>Granville</i>	296	546.3	154	296.8
<i>Greene</i>	85	416.4	38	195.9
<i>Guilford</i>	2,549	548.7	770	168.3
<i>Halifax</i>	336	510.3	160	238.6
<i>Harnett</i>	337	364.0	194	222.8
<i>Haywood</i>	393	489.4	161	192.5
<i>Henderson</i>	741	511.9	276	172.3
<i>Hertford</i>	135	493.3	63	225.5
<i>Hoke</i>	119	396.0	44	163.7
<i>Hyde</i>	27	388.0	12	167.4
<i>Iredell</i>	607	396.4	278	187.6
<i>Jackson</i>	184	465.7	79	199.7

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 5 (continued) : 2006 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	44,319	485.5	17,267	192.7
<i>Johnston</i>	576	433.5	246	194.9
<i>Jones</i>	55	422.4	21	151.5
<i>Lee</i>	283	447.8	106	164.9
<i>Lenoir</i>	421	610.4	164	227.9
<i>Lincoln</i>	360	477.2	138	195.3
<i>McDowell</i>	282	549.3	118	223.7
<i>Macon</i>	198	395.8	86	162.0
<i>Madison</i>	191	758.6	49	188.4
<i>Martin</i>	96	323.7	66	214.6
<i>Mecklenburg</i>	3,251	466.7	1,108	179.1
<i>Mitchell</i>	93	422.7	50	210.5
<i>Montgomery</i>	142	453.2	56	183.6
<i>Moore</i>	652	562.4	229	181.6
<i>Nash</i>	540	526.5	198	194.7
<i>New Hanover</i>	910	453.7	383	191.9
<i>Northampton</i>	124	439.2	51	168.5
<i>Onslow</i>	579	523.6	202	204.6
<i>Orange</i>	586	540.5	168	164.6
<i>Pamlico</i>	73	388.8	36	183.0
<i>Pasquotank</i>	170	412.4	91	215.2
<i>Pender</i>	250	440.7	119	209.8
<i>Perquimans</i>	58	310.3	33	184.5
<i>Person</i>	194	469.1	89	211.2
<i>Pitt</i>	642	500.5	231	188.5
<i>Polk</i>	122	401.1	51	157.5
<i>Randolph</i>	679	451.2	283	188.3
<i>Richmond</i>	242	482.1	119	230.2
<i>Robeson</i>	624	523.5	215	191.4
<i>Rockingham</i>	587	528.6	253	223.8
<i>Rowan</i>	675	445.3	287	185.7
<i>Rutherford</i>	419	533.2	173	215.2
<i>Sampson</i>	282	424.3	146	220.4
<i>Scotland</i>	234	622.8	106	285.8
<i>Stanly</i>	375	551.0	158	225.9
<i>Stokes</i>	205	385.0	101	191.3
<i>Surry</i>	413	469.5	195	209.5
<i>Swain</i>	62	374.7	36	217.8
<i>Transylvania</i>	202	438.9	61	125.6
<i>Tyrrell</i>	23	478.6	6	118.5
<i>Union</i>	603	423.9	266	208.2
<i>Vance</i>	234	511.5	93	205.1
<i>Wake</i>	3,134	493.4	954	169.3
<i>Warren</i>	116	444.4	40	149.6
<i>Washington</i>	88	527.5	32	187.3
<i>Watauga</i>	213	499.0	92	214.8
<i>Wayne</i>	594	514.4	253	226.5
<i>Wilkes</i>	388	485.8	136	170.9
<i>Wilson</i>	436	524.4	181	220.0
<i>Yadkin</i>	270	608.2	86	191.6
<i>Yancey</i>	145	575.4	50	189.3

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 6: 2002-2006 Incidence Rates By Area Health Education Centers Region by Race

Colon/Rectum					Prostate				
Region	Whites		Minorities		Region	Whites		Minorities	
	Cases	Rate¹	Cases	Rate¹		Cases	Rate¹	Cases	Rate¹
Eastern AHEC	1,770	50.0	739	57.8	Eastern AHEC	2,216	133.7	1,309	272.9
Coastal AHEC	795	41.2	183	43.3	Coastal AHEC	937	100.2	311	187.2
Southern Regional	1,239	47.9	692	54.9	Southern Regional	1,527	129.3	1,220	300.8
Wake AHEC	1,885	44.7	780	54.6	Wake AHEC	2,779	145.1	1,373	263.5
Area L AHEC	556	55.0	370	58.5	Area L AHEC	628	141.1	569	233.3
Mountain AHEC	2,078	46.3	142	65.9	Mountain AHEC	2,762	135.8	187	280.4
Northwest AHEC	3,169	44.3	402	50.2	Northwest AHEC	4,107	126.9	672	221.9
Charlotte AHEC	2,694	48.7	686	54.7	Charlotte AHEC	3,536	142.8	1,054	235.3
Greensboro	1,969	45.1	557	55.8	Greensboro	2,859	148.7	1,000	271.9

Lung/Bronchus					All Cancers				
Region	Whites		Minorities		Region	Whites		Minorities	
	Cases	Rate¹	Cases	Rate¹		Cases	Rate¹	Cases	Rate¹
Eastern AHEC	2,895	80.3	838	66.2	Eastern AHEC	17,304	487.0	6,414	499.2
Coastal AHEC	1,542	78.0	269	64.0	Coastal AHEC	8,607	448.3	1,925	455.2
Southern Regional	2,256	85.9	880	69.0	Southern Regional	12,264	471.1	6,080	466.3
Wake AHEC	2,978	71.8	899	63.4	Wake AHEC	20,687	472.2	7,265	487.6
Area L AHEC	765	74.3	429	66.9	Area L AHEC	4,897	490.7	3,214	497.4
Mountain AHEC	3,299	72.8	160	74.4	Mountain AHEC	20,508	471.8	1,083	493.9
Northwest AHEC	5,414	74.9	583	72.9	Northwest AHEC	32,338	453.8	3,812	462.7
Charlotte AHEC	4,170	76.3	804	64.9	Charlotte AHEC	26,919	479.5	6,099	459.4
Greensboro	3,313	76.2	697	70.4	Greensboro	20,907	484.2	5,214	507.1

Female Breast				
Region	Whites		Minorities	
	Cases	Rate¹	Cases	Rate¹
Eastern AHEC	2,863	151.9	1,150	159.6
Coastal AHEC	1,469	146.2	340	147.7
Southern Regional	1,991	142.1	1,041	174.0
Wake AHEC	3,855	157.0	1,370	166.1
Area L AHEC	861	162.4	564	150.8
Mountain AHEC	3,352	146.4	150	165.1
Northwest AHEC	5,271	138.3	582	132.0
Charlotte AHEC	4,731	152.4	1,103	145.6
Greensboro	3,409	146.2	832	147.4

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 7: Five Most Frequently Diagnosed Cancers By Age Group, Sex, and Race, 2002-2006

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	180	4.3	Leukemia	68	3.8
Brain/CNS	152	3.6	Brain/CNS	42	2.4
Non-Hodgkin Lymphoma	60	1.4	Non-Hodgkin Lymphoma	27	1.5
Testis	49	1.2	Soft Tissue	19	1.1
Hodgkins Disease	46	1.1	Hodgkins Disease	17	1.0
Ages 20-44			Ages 20-44		
Type	Cases	Rate ¹	Type	Cases	Rate ¹
Testis	706	12.0	Non-Hodgkin Lymphoma	173	8.9
Melanoma	648	11.0	Colon/Rectum	151	7.8
Colon/Rectum	419	7.1	Lung/Bronchus	122	6.3
Non-Hodgkins Lymphoma	330	5.6	Prostate	95	4.9
Lung/Bronchus	301	5.1	Testis	91	4.7
Ages 45-64			Ages 45-64		
Type	Cases	Rate ¹	Type	Cases	Rate ¹
Prostate	8,401	210.1	Prostate	3,610	342.0
Lung/Bronchus	4,834	120.9	Lung/Bronchus	1,617	153.2
Colon/Rectum	3,105	77.6	Colon/Rectum	979	92.8
Melanoma	1,628	40.7	Oral Cavity	525	49.7
Urinary Bladder	1,494	37.4	Kidney	467	44.2
Ages 65 and older			Ages 65 and older		
Type	Cases	Rate ¹	Type	Cases	Rate ¹
Prostate	12,973	729.1	Prostate	4,037	1,206.0
Lung/Bronchus	10,080	566.5	Lung/Bronchus	1,772	529.3
Colon/Rectum	4,925	276.8	Colon/Rectum	1,041	311.0
Urinary Bladder	3,943	221.6	Urinary Bladder	341	101.9
Melanoma	1,916	107.7	Pancreas	284	84.8

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 7 (continued) : Five Most Frequently Diagnosed Cancers By Age Group, Sex, and Race, 2002-2006

<u>WHITE FEMALE</u> s			<u>MINORITY FEMALE</u> s		
Ages 0-19			Ages 0-19		
Type	Cases	Rate¹	Type	Cases	Rate¹
Leukemia	158	4.0	Brain/CNS	37	2.1
Brain/CNS	132	3.4	Leukemia	36	2.1
Endocrine	84	2.1	Endocrine	23	1.3
Melanoma	45	1.1	Kidney	19	1.1
Hodgkins Disease	43	1.1	Bone and Joint	16	0.9
Ages 20-44			Ages 20-44		
Type	Cases	Rate¹	Type	Cases	Rate¹
Female Breast	3,130	56.2	Female Breast	1,241	57.8
Melanoma	1,021	18.3	Endocrine	273	12.7
Endocrine	1,004	18.0	Cervix Uteri	182	8.5
Cervix Uteri	544	9.8	Colon/Rectum	179	8.3
Colon/Rectum	385	6.9	Non-Hodgkin Lymphoma	129	6.0
Ages 45-64			Ages 45-64		
Type	Cases	Rate¹	Type	Cases	Rate¹
Female Breast	12,953	310.4	Female Breast	3,599	286.6
Lung/Bronchus	3,660	87.7	Colon/Rectum	914	72.8
Colon/Rectum	2,240	53.7	Lung/Bronchus	850	67.7
Corpus Uteri	1,957	46.9	Corpus Uteri	420	33.4
Melanoma	1,156	27.7	Endocrine	259	20.6
Ages 65 and older			Ages 65 and older		
Type	Cases	Rate¹	Type	Cases	Rate¹
Female Breast	11,841	473.1	Female Breast	2,320	412.6
Lung/Bronchus	7,591	303.3	Colon/Rectum	1,303	231.8
Colon/Rectum	5,152	205.9	Lung/Bronchus	1,123	199.7
Non-Hodgkin Lymphoma	1,904	76.1	Corpus Uteri	508	90.4
Corpus Uteri	1,732	69.2	Pancreas	392	69.7

¹ Rates 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 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

Table 8: 2002-2006 Cancer Incidence Rates by Race and Ethnicity

Site	Whites		African Americans		American Indians		Hispanics		Total	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
ALL CANCERS	165,280	473.4	37,891	495.1	1,436	341.7	2,708	315.7	207,251	477.0
Oral Cavity	3,794	10.8	985	12.0	29	6.0	63	7.2	4,877	11.0
Esophagus	1,571	4.5	485	6.3	14	3.2	12	1.8	2,084	4.8
Stomach	1,711	4.9	749	10.3	18	4.9	64	9.4	2,536	5.9
Colon/Rectum	16,231	46.5	4,274	57.3	123	29.7	193	28.6	20,843	48.4
Liver	1,540	4.4	415	5.1	23	6.1	54	8.2	2,062	4.7
Gallbladder	286	0.8	107	1.5	*	*	7	1.0	402	0.9
Pancreas	3,639	10.4	1,110	15.4	21	5.6	52	8.5	4,810	11.2
Larynx	1,478	4.1	520	6.6	8	2.3	15	1.9	2,019	4.6
Lung/Bronchus	26,749	76.2	5,182	69.6	242	59.5	189	32.9	32,376	75.0
Bone	296	0.9	65	0.7	*	*	26	0.9	373	0.9
Soft Tissue	939	2.8	263	3.1	13	2.7	37	2.1	1,236	2.9
Melanoma (Skin)	7,517	21.9	60	0.8	10	2.3	38	3.5	7,683	17.7
Female Breast	27,926	148.5	6,555	142.7	229	91.0	473	109.0	35,163	147.2
Cervix Uteri	1,276	7.4	454	9.8	18	6.9	109	18.0	1,818	8.0
Corpus Uteri	3,988	20.8	907	20.6	42	18.7	69	17.2	5,018	20.7
Ovary	2,475	13.0	432	9.5	16	6.7	50	11.8	2,970	12.3
Prostate	21,488	135.8	7,235	241.4	297	164.6	246	89.8	29,403	153.2
Testes	915	5.6	74	1.7	9	3.4	88	4.0	1,025	4.8
Bladder	7,438	21.4	769	10.9	32	10.0	48	10.0	8,302	19.5
Kidney	5,267	15.0	1,329	16.8	53	13.2	111	14.2	6,710	15.3
Endocrine	3,471	10.3	728	8.5	22	4.5	164	10.5	4,343	10.0
Multiple Myeloma	1,703	4.9	782	10.7	14	3.3	29	4.0	2,527	5.9
Leukemia	3,887	11.5	651	8.3	30	6.9	136	6.9	4,672	11.0
Brain/Other CNS (excludes benign brain/CNS)	2,519	7.5	366	4.3	23	4.7	69	4.6	2,962	6.8
Hodgkin Disease	849	2.6	215	2.3	9	1.6	33	1.2	1,094	2.5
Non-Hodgkin lymphoma	6,431	18.6	1,045	13.1	37	7.8	143	15.6	7,641	17.8
Other Cancers	9,896	28.6	2,134	28.5	102	25.8	190	23.9	12,302	28.8

¹ Rates 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.

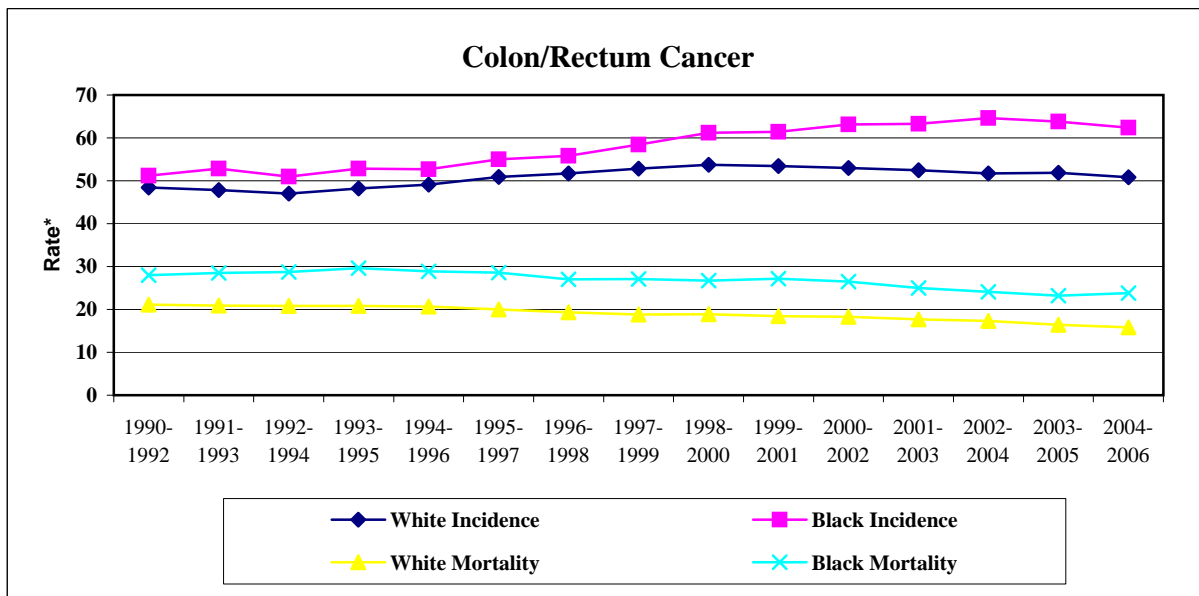
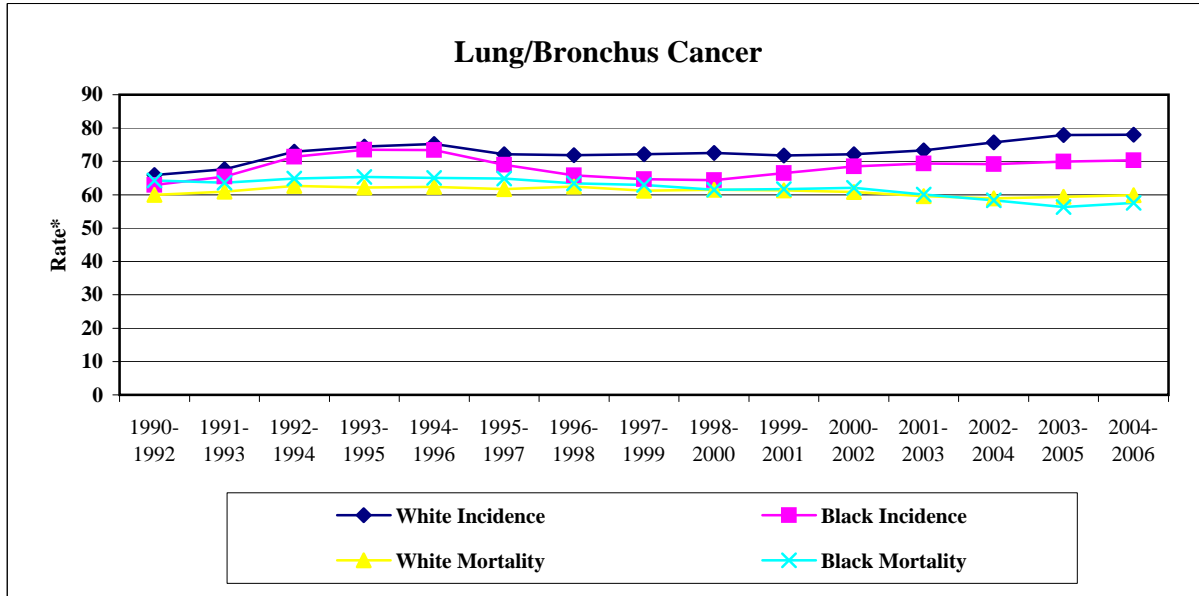
Hispanic ethnicity is independent of race, so the counts will not sum to the total.

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

American Indian rate 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.

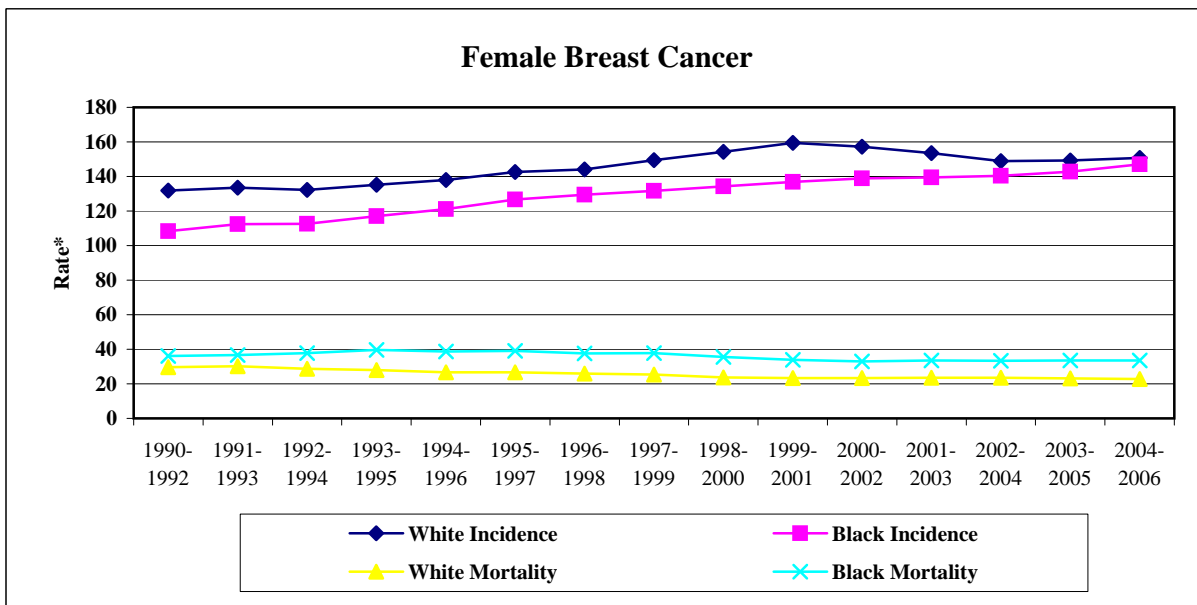
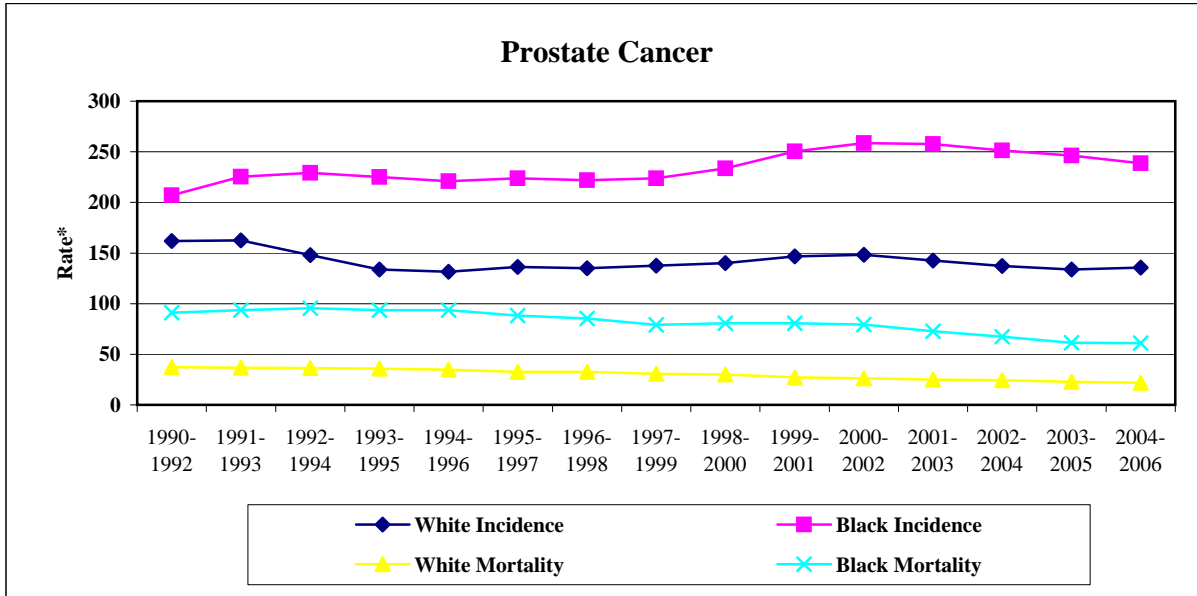
Incidence rates for 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

**Chart 1: Incidence Trends by Race for Selected Cancers
1990-2006**



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

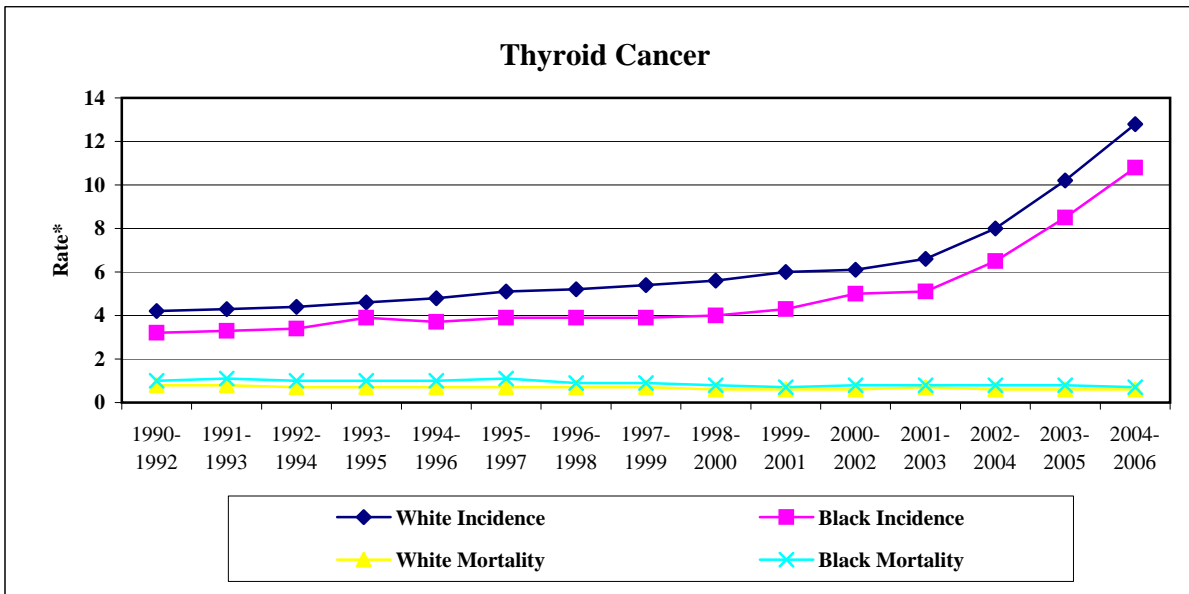
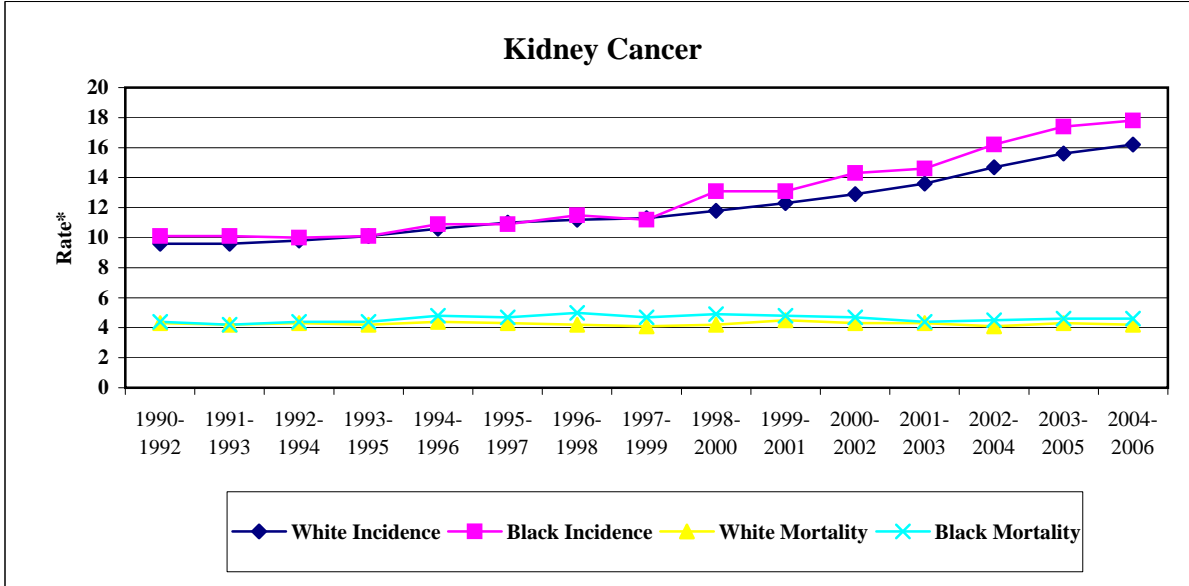
**Chart 1: Incidence Trends by Race for Selected Cancers
1990-2006 (continued)**



Includes in situ breast cancers.

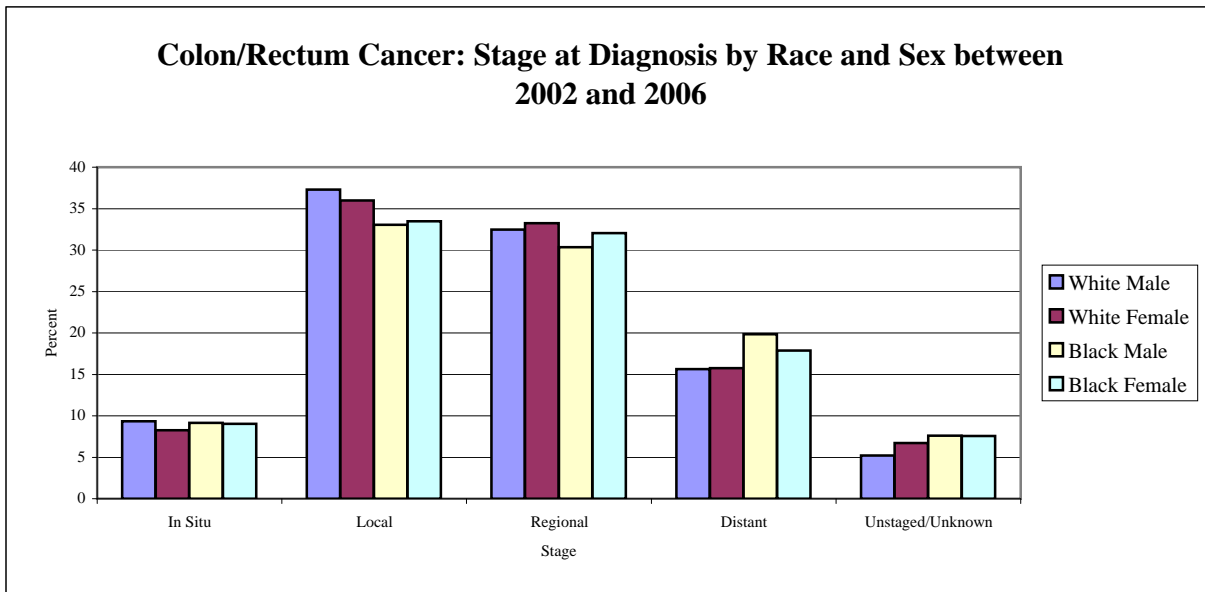
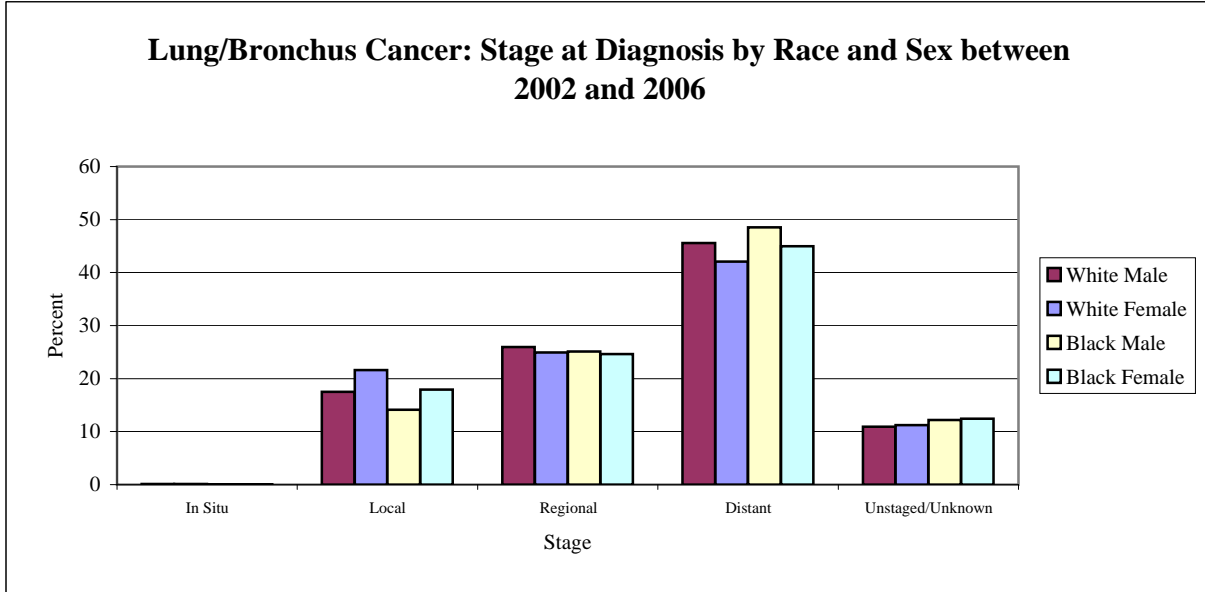
* Rates per 100,000 Population
Age-Adjusted to the 2000 U.S. Census

**Chart 1: Incidence Trends by Race for Selected Cancers
1990-2006 (continued)**

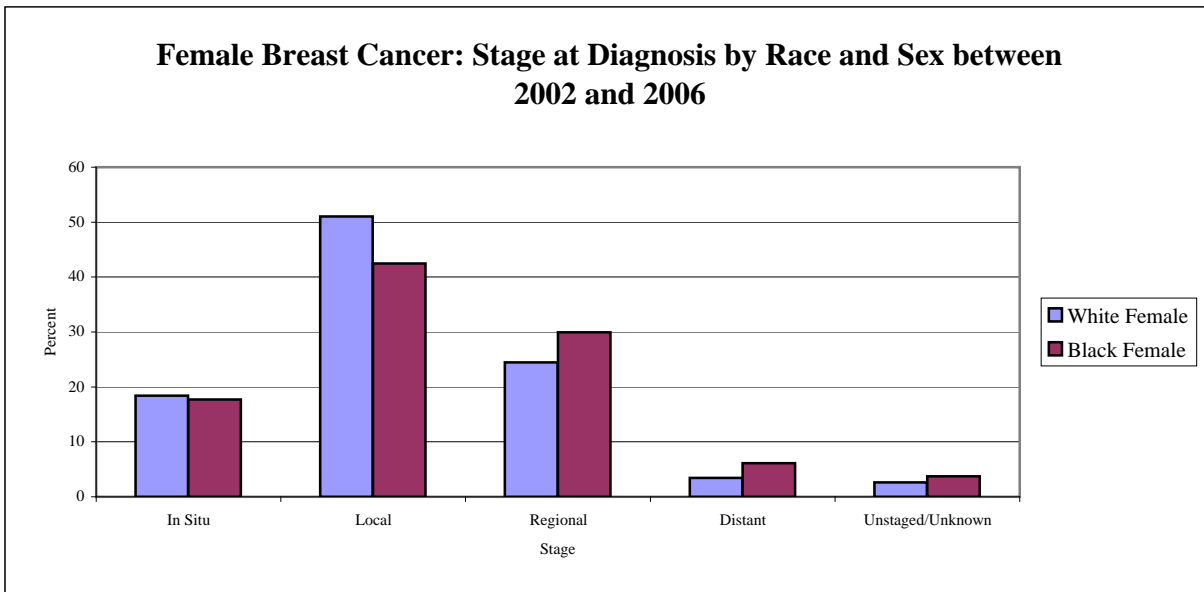
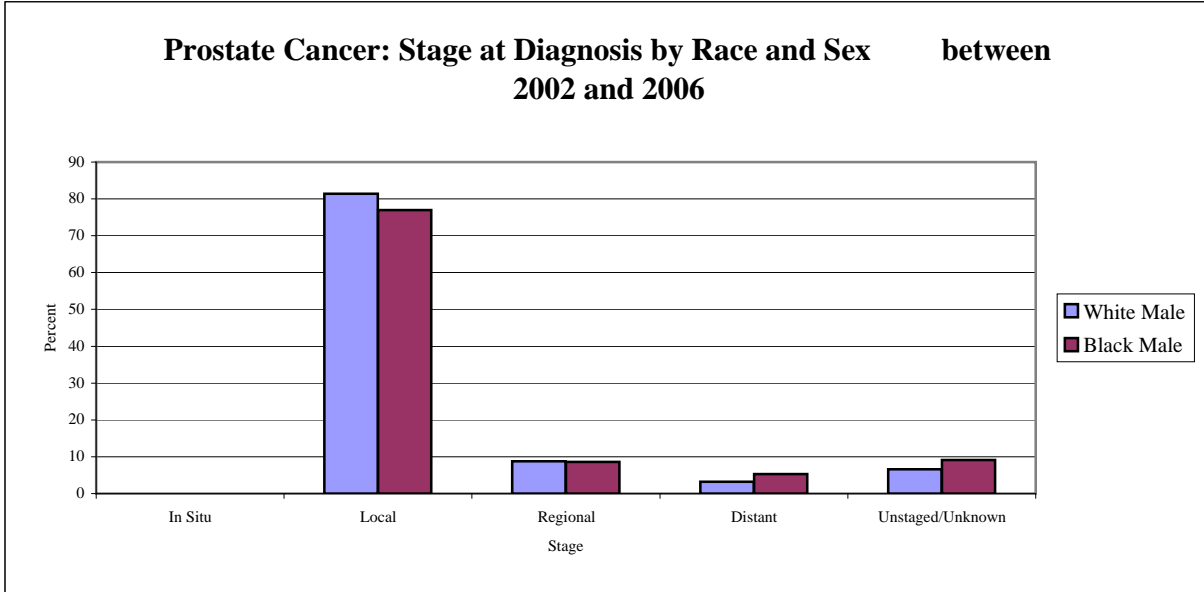


* Rates per 100,000 Population
Age-Adjusted to the 2000 U.S. Census

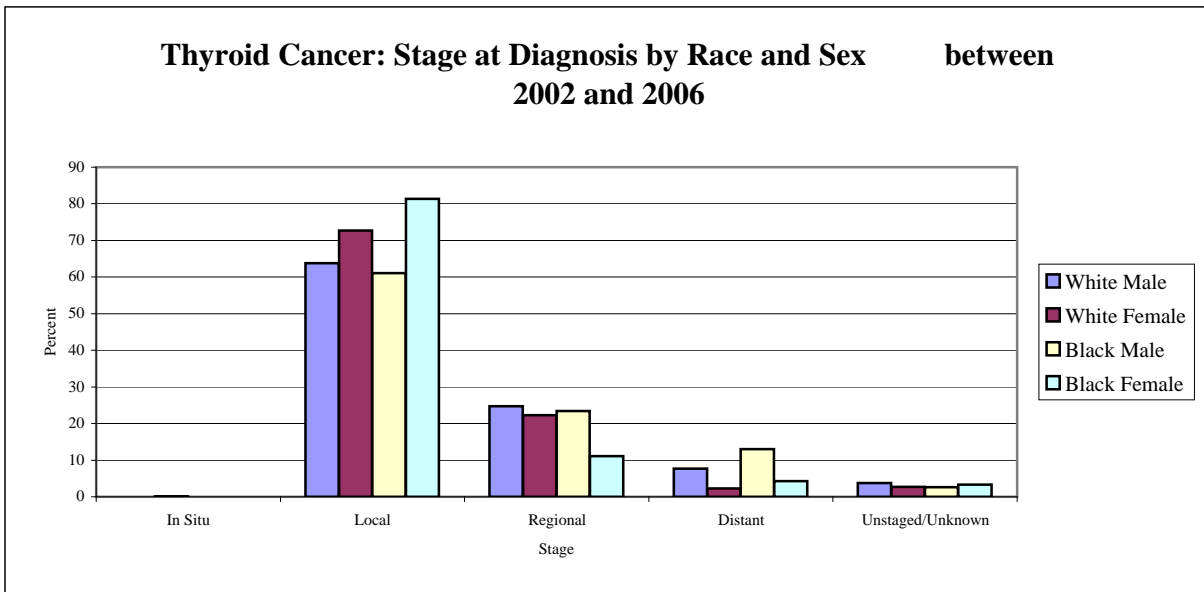
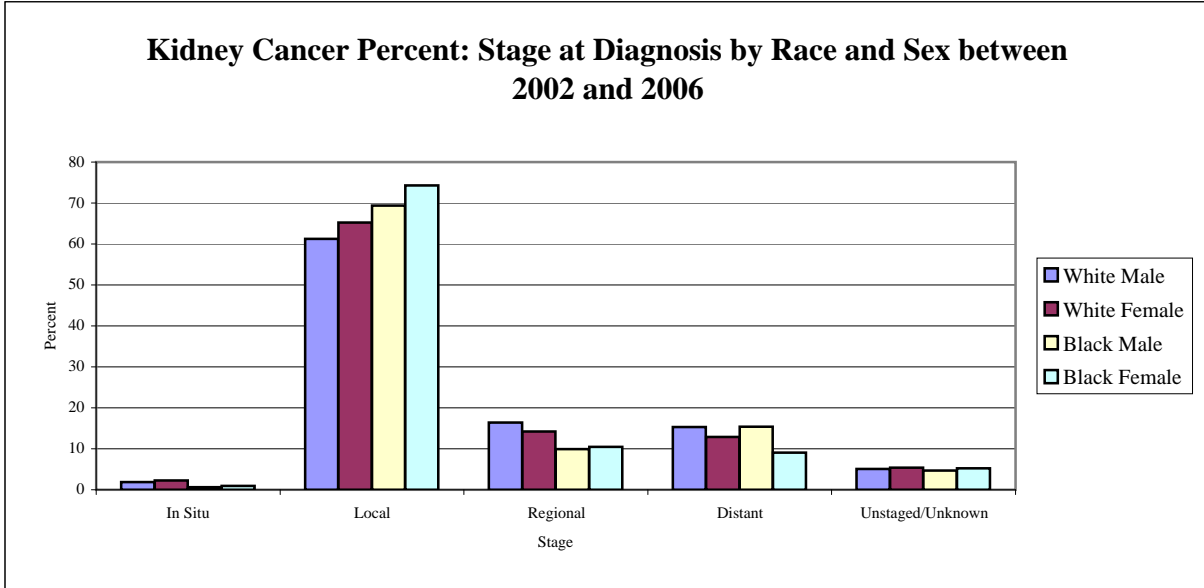
**Chart 2: Stage at Diagnosis by Race and Sex
2002-2006 for Selected Sites**



**Chart 2: Stage at Diagnosis by Race and Sex
2002-2006 for Selected Sites (continued)**



**Chart 2: Stage at Diagnosis by Race and Sex
2002-2006 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:	C530-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-M9717
❖ 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	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 www.seer.cancer.gov/siterecode.

Note: Except for lymphoma, multiple myeloma, and leukemia, all categorized sites exclude M9590-M9989 unless otherwise stated.

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, 2006**

County	White Males	White Females	Minority Males	Minority Females
NORTH CAROLINA	3,297,128	3,307,538	1,072,800	1,182,875
<i>Alamance</i>	54,146	56,315	13,609	15,716
<i>Alexander</i>	17,036	17,044	1,078	1,138
<i>Alleghany</i>	5,351	5,460	126	75
<i>Anson</i>	6,304	6,222	6,453	6,392
<i>Ashe</i>	12,641	12,737	215	181
<i>Avery</i>	8,972	8,219	883	100
<i>Beaufort</i>	16,097	16,862	6,115	7,272
<i>Bertie</i>	3,400	3,603	5,711	6,641
<i>Bladen</i>	9,918	9,848	6,088	7,016
<i>Brunswick</i>	39,961	40,818	6,754	7,431
<i>Buncombe</i>	96,827	103,891	10,054	10,548
<i>Burke</i>	38,363	38,912	6,321	5,067
<i>Cabarrus</i>	67,282	67,398	10,768	11,731
<i>Caldwell</i>	36,620	37,295	2,724	2,659
<i>Camden</i>	3,878	3,962	699	745
<i>Carteret</i>	28,445	29,769	2,647	2,697
<i>Caswell</i>	7,794	7,396	4,331	4,002
<i>Catawba</i>	65,244	65,566	9,918	10,400
<i>Chatham</i>	24,128	24,046	4,473	5,060
<i>Cherokee</i>	12,541	13,167	540	568
<i>Chowan</i>	4,336	4,688	2,573	3,067
<i>Clay</i>	4,894	5,106	66	78
<i>Cleveland</i>	36,610	38,455	10,107	11,542
<i>Columbus</i>	17,510	17,946	9,066	10,134
<i>Craven</i>	35,188	33,475	13,119	13,776
<i>Cumberland</i>	89,828	82,957	64,361	69,399
<i>Currituck</i>	10,815	10,997	795	911
<i>Dare</i>	16,874	16,470	674	656
<i>Davidson</i>	68,118	70,070	8,015	9,145
<i>Davie</i>	18,291	18,728	1,367	1,450
<i>Duplin</i>	19,801	18,275	6,746	7,888
<i>Durham</i>	66,229	65,456	53,383	61,756
<i>Edgecombe</i>	10,576	10,987	14,116	16,965
<i>Forsyth</i>	116,016	120,789	43,672	51,382
<i>Franklin</i>	19,889	19,394	7,690	8,342
<i>Gaston</i>	80,544	83,842	15,281	17,565
<i>Gates</i>	3,571	3,636	2,109	2,286
<i>Graham</i>	3,629	3,811	316	353
<i>Granville</i>	18,542	16,668	10,370	8,260
<i>Greene</i>	6,321	5,808	4,533	4,171
<i>Guilford</i>	141,399	146,894	75,188	85,597
<i>Halifax</i>	10,911	11,990	15,624	17,081
<i>Harnett</i>	38,967	38,462	12,656	13,629
<i>Haywood</i>	26,571	28,657	681	753
<i>Henderson</i>	46,500	48,975	2,293	2,339
<i>Hertford</i>	4,302	4,522	6,642	8,412
<i>Hoke</i>	11,348	10,283	10,025	10,546
<i>Hyde</i>	1,801	1,664	1,236	810
<i>Iredell</i>	61,192	61,668	10,458	11,916
<i>Jackson</i>	15,381	16,009	2,472	2,450
<i>Johnston</i>	63,987	62,782	12,106	12,714
<i>Jones</i>	3,349	3,321	1,697	1,951

Incidence rates for 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

**Appendix C (continued) : Population By County And Race/Sex
North Carolina, 2006**

County	White Males	White Females	Minority Males	Minority Females
NORTH CAROLINA	3,297,128	3,307,538	1,072,800	1,182,875
<i>Lee</i>	22,114	21,425	5,531	6,212
<i>Lenoir</i>	16,479	17,056	11,412	13,225
<i>Lincoln</i>	33,310	33,115	2,369	2,508
<i>McDowell</i>	20,339	20,584	1,626	1,083
<i>Macon</i>	15,473	16,880	420	303
<i>Madison</i>	9,939	10,209	176	130
<i>Martin</i>	6,186	6,748	5,067	6,395
<i>Mecklenburg</i>	277,468	268,434	132,372	148,619
<i>Mitchell</i>	7,776	7,949	87	94
<i>Montgomery</i>	10,732	10,488	3,232	3,054
<i>Moore</i>	33,554	35,218	6,262	7,258
<i>Nash</i>	28,359	29,367	16,333	18,161
<i>New Hanover</i>	74,437	76,579	15,231	17,873
<i>Northampton</i>	4,193	4,365	6,101	6,865
<i>Onslow</i>	68,686	53,863	20,115	18,548
<i>Orange</i>	48,454	51,362	11,007	12,943
<i>Pamlico</i>	4,895	4,877	1,845	1,480
<i>Pasquotank</i>	11,080	11,276	8,595	9,005
<i>Pender</i>	19,340	18,586	5,446	5,352
<i>Perquimans</i>	4,428	4,714	1,493	1,807
<i>Person</i>	13,184	13,548	4,969	5,747
<i>Pitt</i>	45,445	47,534	24,301	29,123
<i>Polk</i>	8,560	9,338	554	628
<i>Randolph</i>	63,924	64,312	5,043	5,307
<i>Richmond</i>	15,136	15,223	7,935	8,406
<i>Robeson</i>	23,333	22,230	40,197	43,288
<i>Rockingham</i>	35,943	37,379	8,761	9,747
<i>Rowan</i>	55,449	55,367	11,701	12,023
<i>Rutherford</i>	26,676	28,646	3,844	4,012
<i>Sampson</i>	22,346	21,392	9,945	10,374
<i>Scotland</i>	8,957	9,672	8,459	9,906
<i>Stanly</i>	25,065	25,352	4,488	4,223
<i>Stokes</i>	21,593	22,348	1,139	1,255
<i>Surry</i>	34,058	34,809	2,044	2,079
<i>Swain</i>	4,457	4,824	2,247	2,410
<i>Transylvania</i>	13,669	14,965	854	872
<i>Tyrrell</i>	1,294	1,183	1,090	673
<i>Union</i>	75,868	74,161	10,712	11,346
<i>Vance</i>	10,484	10,852	10,343	12,241
<i>Wake</i>	300,412	292,623	93,518	103,454
<i>Warren</i>	4,063	4,034	5,874	5,998
<i>Washington</i>	3,182	3,267	3,128	3,783
<i>Watauga</i>	21,103	20,997	664	646
<i>Wayne</i>	36,559	36,693	19,958	21,720
<i>Wilkes</i>	31,516	32,083	1,649	1,677
<i>Wilson</i>	22,519	22,732	14,870	17,347
<i>Yadkin</i>	17,916	18,341	752	801
<i>Yancey</i>	8,937	9,223	97	111

Incidence rates for 2006 used the bridged-race population estimates obtained from the National Center for Health Statistics (Vintage 2007, available online at www.cdc.gov/nchs/about/major/dvs/popbridge/datadoc.htm#vintage2007).

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.