Prostate Cancer in Georgia, 2004-2008

Georgia Department of Public Health

Acknowledgements

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Introduction

Prostate cancer is cancer of the glandular cells of the prostate gland. The prostate gland is part of the male reproductive system, which includes the penis, prostate, and testicles and surrounds the neck of the bladder and urethra. Glandular cells of the prostate contribute secretions to the seminal fluid that nourishes and transports the sperm. Ninety-nine percent of prostate cancers develop from these glandular cells. Cancer originating in the glandular cells is termed 'adenocarcinoma'.

The urethra, a narrow tube which runs through the length of the penis and prostate, carries both urine and semen out of the body (Figure 1). The rectum or the lower end of the bowel lies just behind the prostate and the bladder. Sitting directly above the prostate are two small glands called the seminal vesicles, which secrete substances that contribute significantly to the seminal fluid. Nerves run on either side of the prostate gland that controls the erectile function of the penis. A healthy prostate is similar in size to that of a walnut. As males age, the gland tends to grow in size. This can cause the urethra to narrow and decrease urine flow.

Figure 1. Male Reproductive Tract

Prostate cancer usually occurs in older males. It is the leading cause of cancer incidence among males in the U.S., across all races. It is also the second most common cause of death due to cancer in the U.S. among black and white males. In Georgia, prostate cancer is the leading cause of cancer incidence and the second most common cause of cancer death among males. The Georgia Comprehensive Cancer Registry estimates that nearly 7,000 new cases of prostate cancer were diagnosed in 2010 and over 800 Georgians died from this disease.

Screening and Diagnosis

Screening tests for cancer allow the disease to be detected at its earliest stages, before any symptoms develop. Typically, when males are screened and prostate cancer is detected, the disease is found at an early stage and can be treated most effectively. Since 1990, screening for early detection of prostate cancer has become popular and death rates of prostate cancer have declined. However, studies are still underway to determine whether screening tests or better treatment options are responsible for the decrease in prostate cancer death rates.

Currently, the American Cancer Society (ACS) does not recommend routine screening for prostate cancer. However, ACS does emphasize that doctors discuss benefits and limitations of early detection and treatment of prostate cancer with males at average or high risk of developing prostate cancer so that they may make an informed decision about screening.

If males choose to be tested, annual screening tests for prostate cancer are advised beginning at age 50 for those who have a life expectancy of at least 10 years. Males at high risk (i.e. black males and those with a strong family history of one or more first-degree relatives diagnosed with prostate cancer at an early age) should begin testing as early as age 40. The two screening tests offered are:

- **Prostate-Specific Antigen (PSA) Test:** PSA is a protein produced by the prostate and released in very small amounts into the bloodstream. When prostate cancer develops and grows, it releases PSA in increased amounts into the bloodstream, reaching a level where it can be detected by a laboratory blood test. Levels less than 4 ng/mL are considered normal, between 4 -10 ng/mL are considered intermediate, and more than 10 ng/mL are considered high.
- **Digital Rectal Examination (DRE):** During a DRE, the physician inserts a gloved finger in the rectum to feel for any irregular or firm areas in the prostate gland that might be cancerous.

However, these tests are not 100% accurate. A PSA test can be elevated due to benign conditions such as benign prostatic hyperplasia (enlargement of the prostate gland) and prostatitis (infection or inflammation of the prostate gland). PSA and DRE tests can detect only an abnormality of the prostate and cannot show whether the problem is cancer or a less serious condition. If the tests are abnormal, the doctor may suggest other tests to confirm a diagnosis. They include:
- **Urine Test:** Urine testing is used to detect blood or an infection.
- **Transrectal Ultrasound (TRUS):** The doctor inserts a probe into the rectum to detect abnormal areas in the prostate. TRUS uses sound waves to create an image of the prostate on a video screen.
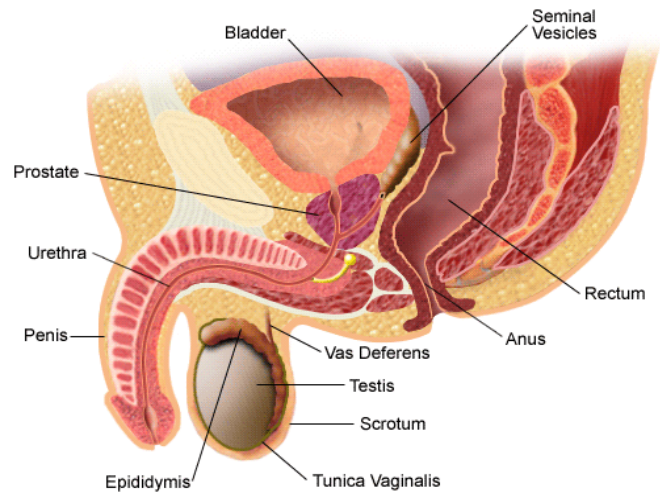
- **Transrectal Biopsy:** The doctor removes small tissue samples of the prostate to look for cancer cells. During this procedure, the doctor inserts a needle through the rectum into the prostate with or without the guidance of TRUS. It is the only way prostate cancer can be definitively diagnosed.

Figure 2. Percent of Men Age 40+ Who Had a Prostate-Specific Antigen (PSA) Test in the Past Two years, by Race, Georgia, 2002-2008

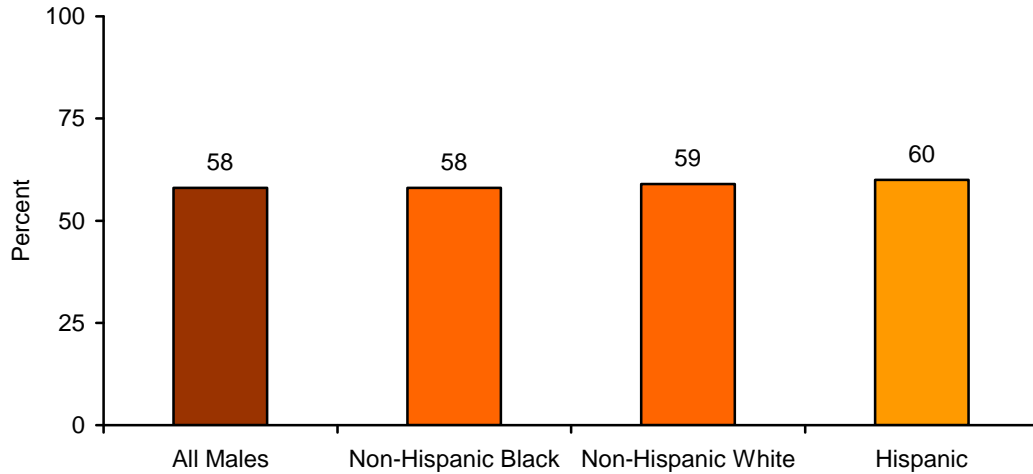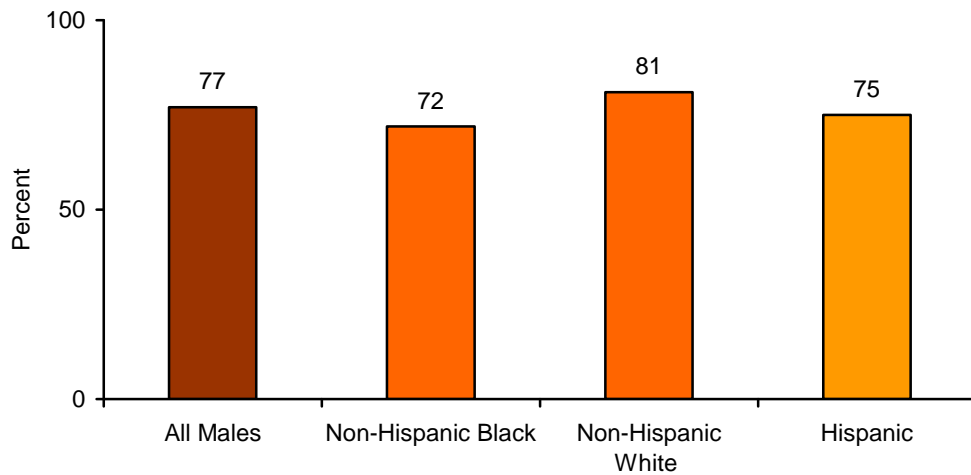| Category	Percent
All Males	58
Non-Hispanic Black	58
Non-Hispanic White	59
Hispanic	60

Figure 3. Percent of Men Age 40+ Who Ever had a Digital Rectal Examination (DRE), by Race, Georgia, 2002-2008

Category	Percent
All Males	77
Non-Hispanic Black	72
Non-Hispanic White	81
Hispanic	75

Incidence and Mortality

- The overall age-adjusted prostate cancer incidence rate in Georgia is 167 per 100,000 population. The overall age-adjusted prostate cancer mortality rate in Georgia is 28 per 100,000 population.

Figure 4. Age-adjusted Incidence and Mortality Rates by Race, 2004-2008

Incidence

Mortality
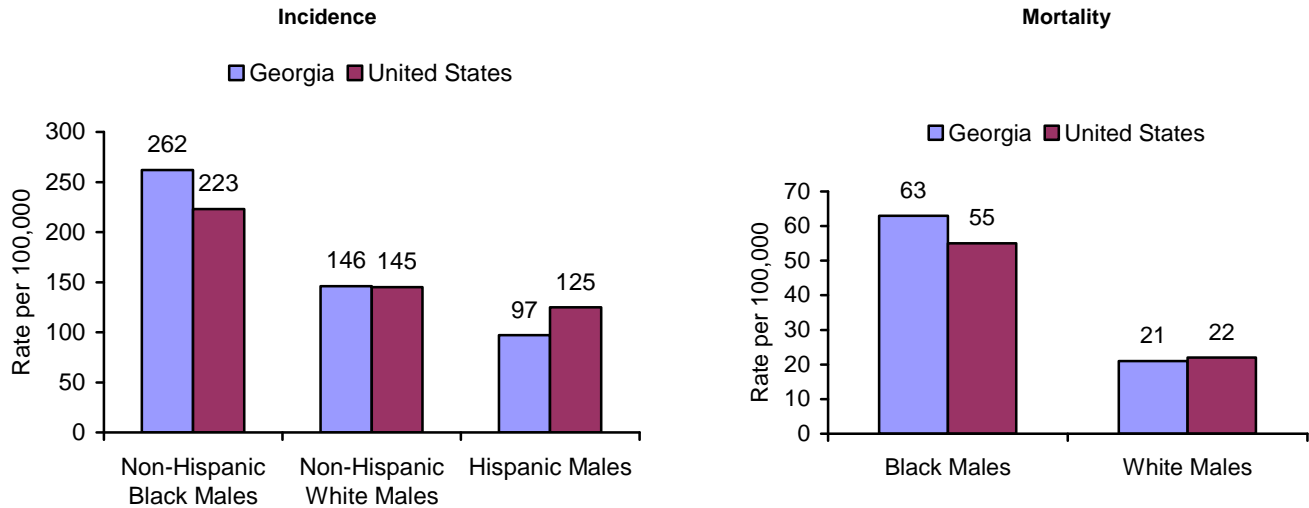
- In Georgia and the U.S., non-Hispanic black males are more likely to be diagnosed with prostate cancer than non-Hispanic white males and Hispanic males (Figure 4). Similarly, black males are more likely than white males to die of prostate cancer in both Georgia and the U.S. In Georgia, this difference is threefold (Figure 4).
- Non-Hispanic black males in Georgia are 17% more likely to be diagnosed with prostate cancer than non-Hispanic black males in the U.S. (age-adjusted rate 262/100,000 vs. 223/100,000).
- Hispanic males in the U.S. are almost 29% more likely to be diagnosed with prostate cancer than Hispanic males in Georgia (age-adjusted rate 125/100,000 vs. 97/100,000).
- Overall, Georgia males have higher prostate cancer incidence and mortality rates than U.S. males.

Leading Causes of Cancer Incidence and Mortality in Males

Table 1: Leading Causes of Cancer Incidence and Mortality in Males, Georgia 2004-2008		
	Top 5 Causes of Cancer Incidence	**Top 5 Causes of Cancer Mortality**
1.	**Prostate**	Lung & Bronchus
2.	Lung & Bronchus	**Prostate**
3.	Colorectal	Colorectal
4.	Bladder	Pancreas
5.	Melanoma	Leukemia

Prostate cancer is the leading cause of non-skin cancer incidence and second leading cause of cancer death among males in Georgia.

Causes and Risk Factors

The exact cause of prostate cancer has not been identified. However, research suggests that a combination of factors such as age, race, ethnicity, heredity, hormones, diet, and environment may be linked to the development of prostate cancer. While all males are at risk for prostate cancer, the following factors may increase a person's risk of getting the disease:

- **Age:** The risk of prostate cancer increases with age. Prostate cancer is rare before the age of 45, but the probability of being diagnosed with prostate cancer in the United States increases after the age of 50.
- **Race & Ethnicity:** Prostate cancer is more common among black males than white or Hispanic males.
- **Family History:** Men with a father or brother who has had prostate cancer are at a greater risk for getting the disease than an average person. The risk increases further if several relatives have had the disease, especially if they were young when the cancer was diagnosed.
- **Genetics:** It has been found that specific regions on certain chromosomes are linked to an increased risk of prostate cancer. Changes in these genes can lead to the development of prostate cancer. They account for a small number of cases. Certain genes, such as BRCA1 and BRCA2 associated with the occurrence of breast and ovarian cancers, are also known to increase the risk of prostate cancer.
- **Certain Prostate Changes:** Males who have prostate cells with high-grade prostatic intraepithelial neoplasia (abnormal cells) may be at an increased risk of developing prostate cancer.

Symptoms

Prostate cancer diagnosed in its early stages usually does not produce any noticeable symptoms. Signs and symptoms of prostate cancer depend on the extent of the disease. Most often signs and symptoms are caused by less serious prostate problems, such as an enlarged prostate (benign prostatic hyperplasia), prostate infection, or other health problems. For men who do have symptoms, the most common are:

- Difficulty starting or stopping urination
- Needing to urinate often
- Weak or interrupted flow of urine
- Not being able to pass urine
- Blood in urine or semen
- Difficulty having an erection
- Discomfort and persistent pain in the hips, legs, and lower back

Age at Diagnosis

Figure 5. Age-specific Prostate Cancer Incidence and Mortality Rates by Race, Georgia 2004-2008
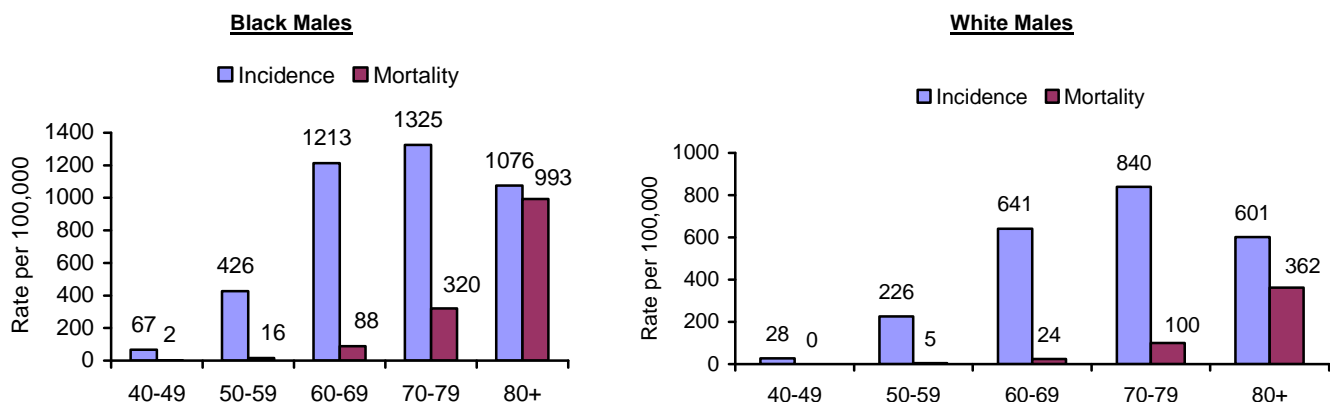
- The risk of being diagnosed with prostate cancer increases with age for both non-Hispanic black and non-Hispanic white males until 79 years of age. The risk increases sharply between ages 50-59 years of age and decreases at ages 80 years and above (Figure 5).
- The mortality rate of prostate cancer increases with age for both black and white males. The risk of dying from prostate cancer increases sharply between 50-59 years of age for black males and between 60-69 years of age for white males (Figure 5).

Treatment

There are different types of treatment available for patients with prostate cancer. The choice of treatment depends on a number of factors such as age and expected life span of the patient, co-existing medical conditions, stage and grade of the cancer, personal feelings about the need to treat the cancer, doctor's opinion, and the benefits and side effects of each type of treatment.

The standard types of treatment available for patients with prostate cancer are:

Watchful Waiting/Active Surveillance: Because prostate cancer often grows very slowly, some men (especially those who are older or who have other major health problems) may choose not to treat their cancer. Instead, their doctor may suggest an approach called watchful waiting or active surveillance. The doctor watches the patient closely with regular PSA tests, rectal exams, and ultrasounds to see if the cancer is growing. If the cancer does seem to be growing or getting worse, the doctor may suggest starting treatment.

Surgery: Surgery is an option for men with early (Stage I or II) prostate cancer. The surgeon may remove the whole prostate or only part of it. Patients in good health are usually offered surgery as treatment for prostate cancer. Before the surgeon removes the prostate, the lymph nodes in the pelvis may be removed. If prostate cancer cells are found in the lymph nodes, the disease may have spread to other parts of the body. In this case, the surgeon may decide not to remove the prostate and may suggest other types of treatment.

> **Public Health in Action**
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> In August 2011, the 100 Black Men of Rome- Northwest Georgia held their annual Health Initiative for Men (H.I.M.) health screening fair. Partnerships with the Northwest Georgia Regional Cancer Coalition, hospitals, health departments, and clinics have allowed this successful event to reach its ten year milestone. The main purpose of the health fair is to bring awareness to men about prostate cancer and to also provide prostate cancer screenings. During the health fair, there are over 12 screenings available, including vision, diabetes, skin cancer, and blood pressure. Multiple health vendors and organizations participate in the event which is held on the third Saturday in August from 8am to noon in Floyd County, Georgia.
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>

Radical Prostatectomy: Radical prostatectomy is surgery that is performed to cure prostate cancer. It is used most often if it is thought that the cancer has not spread outside of the gland. In this operation, the surgeon removes the whole prostate gland plus some of the tissue around it, including the seminal vesicles.

❖ *Retropubic approach:* The prostate gland is taken out through an incision in the lower abdomen. Lymph nodes may also be removed during the procedure.

❖ *Perineal approach:* The prostate gland is taken out through an incision made between the anus and the scrotum. Nearby lymph nodes may be removed through a separate incision in the abdomen.

❖ *Laparoscopic radical prostatectomy (LRP):* The surgeon removes the entire prostate through small cuts, rather than a single long cut in the abdomen. A thin, lighted tube (a laparoscope) helps the surgeon remove the prostate. This procedure may also be performed with robotic assistance.

Transurethral Resection of the Prostate (TURP): This procedure may be done to relieve symptoms. The surgeon inserts a long, thin scope through the urethra. A cutting tool at the end of the scope removes tissue from the inside of the prostate. TURP may not remove all of the cancer, but it can remove tissue that blocks the flow of urine. The same operation is used more often to relieve symptoms of non-cancerous benign prostatic hyperplasia.

Radiation Therapy: Radiation therapy is an option for men with any stage of prostate cancer. Men with early stage prostate cancer may choose radiation therapy instead of surgery. It also may be used after surgery to destroy any cancer cells that remain in the area. In later stages of prostate cancer, radiation treatment may be used to help relieve pain. Radiation therapy (also called radiotherapy) uses high-energy rays to kill cancer cells. It affects cells only in the treated area. Doctors use two types of radiation therapy to treat prostate cancer. Some men receive both types:

External Beam Radiation Therapy (EBRT): The radiation comes from a large machine outside the body. Treatment occurs in a hospital or clinic. Treatments are usually five days a week for several weeks. Today, standard EBRT is used less often than in the past. Newer methods, such as three-dimensional conformal radiation therapy, intensity modulated radiation therapy, and conformal proton beam radiation therapy, allow doctors to be more accurate in treating the prostate gland while reducing the radiation exposure to nearby healthy tissues.

Brachytherapy (Internal Radiation): The radiation comes from radioactive material placed directly into the prostate.

❖ *Permanent or low dose brachytherapy:* Dozens of radioactive seeds are placed inside needles, which are inserted into the prostate. The needles are removed, leaving the seeds behind which gives off radiation for months. Once therapy is complete, the seeds do not need to be removed.

❖ *Temporary or high dose brachytherapy:* Needles are used to place catheters in the prostate. A strong radioactive substance is placed in these catheters for five to fifteen minutes and then taken out (catheters are left in place). Usually three treatments are given over a couple of days during a hospital stay. After the last treatment, the catheters are removed. This treatment is often combined with external radiation, given at a lower dose than if it were used alone.

Hormone Therapy: The goal of hormone therapy (also called androgen deprivation) is to lower the levels of the male hormones (or androgens), such as testosterone. Androgens, which are made mostly in the testicles, cause prostate cancer cells to grow. Lowering androgen levels often makes prostate cancer cells shrink or grow more slowly. Drugs, surgery, and/or other hormones are used to reduce the production of androgens or block them from working. Orchiectomy is a surgical procedure to remove one or both testicles to reduce hormone production. Hormone therapy can control, but will not cure the cancer. It does not take the place of treatments aimed at curing the cancer.

For additional treatment information visit the National Cancer Institute'S website at: http://www.cancer.gov/

New types of treatments are being studied in clinical trials for their long term benefits. Some of them are:

- **Cyrotherapy:** Surgeons are studying a tool that freezes and kills prostate tissue in men with early state prostate cancer.
- **Chemotherapy:** Researchers are testing drugs and combining them with hormone therapy or biological therapy. Chemotherapy allows some men to live longer and with a better quality of life. It is not a standard treatment for early prostate cancer, but some studies are looking to see if chemotherapy could be helpful if given for a short time after surgery.
- **Biological Therapy:** This treatment uses the patient's immune system to fight cancer with the help of substances made in the body or laboratory. For example, doctors are testing cancer vaccines that help the immune system kill cancer cells.
- **High-Intensity Focused Ultrasound (HIFU):** Doctors are testing HIFU in men with early prostate cancer. A probe is placed in the rectum that gives off high-intensity ultrasound waves. These waves heat up and destroy the prostate tumor.
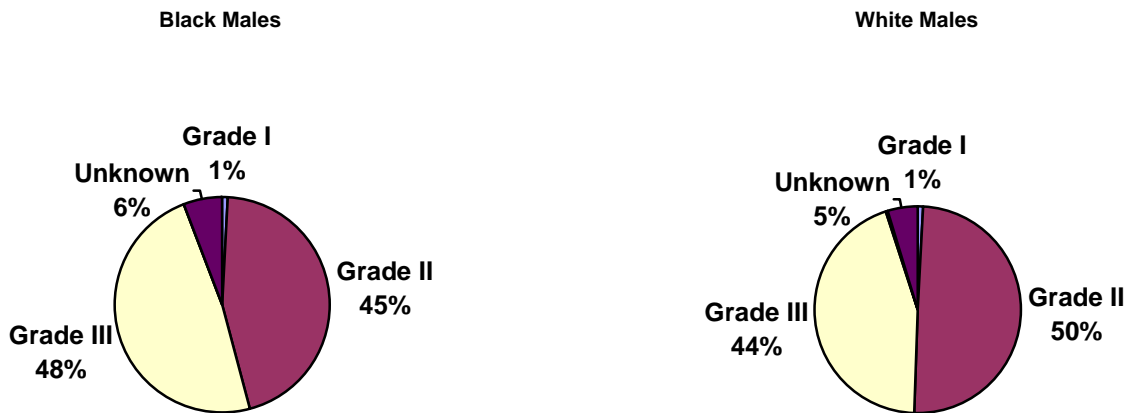
Grade

Most pathologists grade prostate cancer using the Gleason's score or pattern. The Gleason's pattern is based on a five-component system (5 histologic patterns) ranging from one to five. Prostate cancer generally shows two main histological patterns. The primary pattern occupies greater than 50% of the cancer and is indicated by the first number of the Gleason's grade and the secondary pattern is indicated by the second number. These two numbers are added together to create a pattern score, ranging from two to ten.

Gleason's score is a system of grading prostate cancer tissue based on how the tissue looks under a microscope. It indicates how likely the tumor is to spread. A low Gleason's score indicates that the cancer tissue is similar to normal prostate tissue and the tumor is less likely to spread. A high Gleason's score indicates that the cancer tissue is very different from normal prostate tissue (more similar to cancerous tissue) and the tumor is more likely to spread. For the purpose of data analysis, the Georgia Comprehensive Cancer Registry converts the Gleason's score and Gleason's pattern into three different categories with a terminology and histological grade describing the degree of differentiation of the prostate cancer.

Table 2: Prostate Cancer Grade Conversion			
Gleason Score	Gleason Pattern	Terminology	Histological Grade
2,3,4	1,2	Well Differentiated	I
5,6,7	3	Moderately Differentiated	II
8,9,10	4,5	Poorly Differentiated	III
Undifferentiated and anaplastic corresponds to "grade IV"			
Cell type not determined , not stated or not applicable corresponds to "Unknown"			

The cells of Histological Grade I tumors resemble normal cells and tend to grow and multiply slowly. Conversely, the cells of Grade III or Grade IV tumors do not look like normal cells. They tend to grow rapidly and spread faster than tumors with a lower grade. Doctors use the cancer grade and many other factors, including cancer stage, to develop an individual treatment plan for the patient and to predict the patient's prognosis.

Figure 6. Percent of Prostate Cancer Cases by Race and Grade, Georgia 2004-2008

Black Males

Grade I 1%
Unknown 6%
Grade II 45%
Grade III 48%

White Males

Grade I 1%
Unknown 5%
Grade II 50%
Grade III 44%

- Among all males, the majority of tumors are grade II or III (Figure 6). Among white males, the greatest percentage is Grade II, while Grade III is more common among black males.
- The percent of Grade IV prostate cancer among back males and white males of Georgia is less than 0.5%.

Survival

The five-year relative survival rate refers to the percent of patients who live at least five years after their cancer is diagnosed. It estimates the effect of cancer to create a standard way of discussing prognosis.

Early detection saves lives. Individuals diagnosed at an early stage (localized) have a better chance of surviving five years after diagnosis than those diagnosed at a later (distant) stage.

Overall in U.S., the five-year survival rate is similar among black and white males for all stages of prostate cancer (Figure 7). Black (100%) and white males (100%) have similar five-year survival rates when diagnosed at a localized or regional stage. The rates drop significantly for both black (28%) and white (28%) males when diagnosed at a distant stage. The largest difference in five-year relative survival occurs in males with unstaged cancer. The five-year relative survival rate in black males (59%) is lower than white males (69%).

Figure 7. Prostate Cancer Five-Year Relative Survival Rates by Stage of Disease and Race, United States 2001-2007

Table 3: Percent of Prostate Cancer diagnosed by Race and Stage of Disease, United States and Georgia			
	Localized	**Regional**	**Distant**
U.S. Black*	80%	11%	6%
U.S. White*	81%	12%	4%
Georgia Black*	86%	5%	5%
Georgia White*	88%	6%	3%
* U.S. data is for years 2001-2007 and Georgia data is for years 2004-2008			

Urban vs Rural Georgia

Figure 8. Metro, Metro Adjacent, and Rural Counties, Georgia 2003

Legend:
- Metro >1M
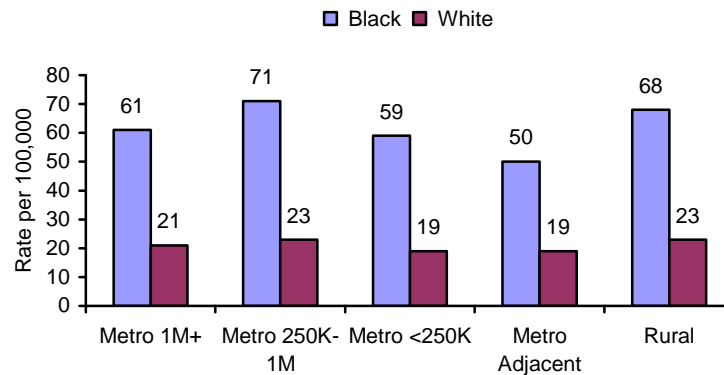- Metro 250k-1M
- Metro <250k
- Metro-Adjacent
- Rural
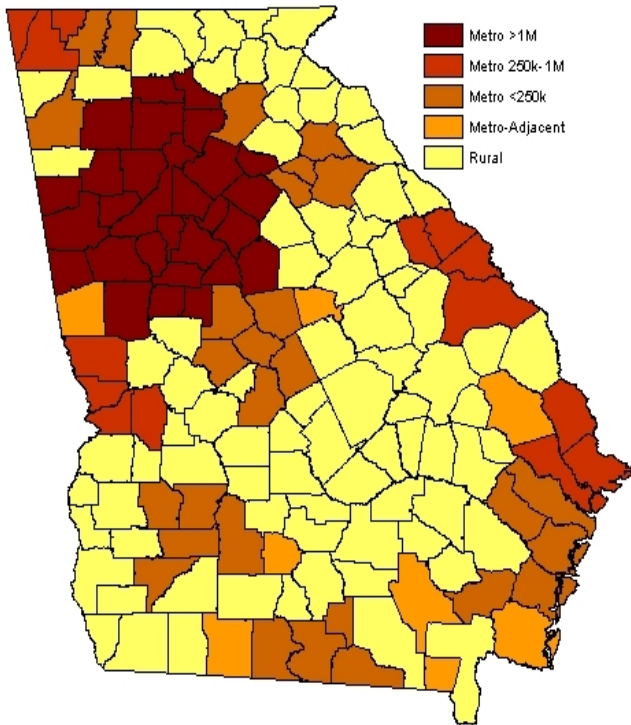
*For a more specific description, please refer to the technical notes

Figure 9. Age-adjusted Prostate Cancer Incidence Rates by Geography and Race, Georgia 2004-2008

□ Non-Hispanic Black ■ Non-Hispanic White
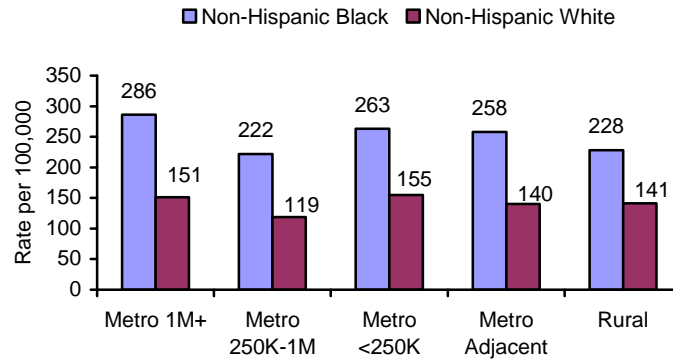
- Age-adjusted incidence rates are consistently higher among non-Hispanic black males than among non-Hispanic white males regardless of geographical area (Figure 9).
- Among non-Hispanic black males, incidence rates are highest in metropolitan counties (1 million or more).
- Among non-Hispanic white males, incidence rates are highest in metropolitan counties (less than 250,000).
- The lowest incidence rates for both non-Hispanic black and white males occur in metro counties (250,000 to 1M). The greatest disparity in incidence rates between both non-Hispanic white and black occurs in metro (1 million or more) and metro adjacent counties.

Figure 9. Age-adjusted Prostate Cancer Mortality Rates by Geography and Race, Georgia 2004-2008

□ Black ■ White

- Age-adjusted mortality rates are consistently higher among black males than among white males regardless of geographical area (Figure 9).
- The highest mortality rates occur in metro (250,000 to 1 million) counties and rural counties for both black and white males.
- The lowest mortality rates for both black and white males occur in metro counties (adjacent) and metro counties (less than 250,000) for white males. The greatest disparity in mortality rates between white and black occurs in metro (250,000 to 1 million) and rural counties.

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Variation by Race and Geography

| Table 4: Age-adjusted Prostate Cancer Incidence and Mortality Rates by Public Health District and Race, Georgia 2004-2008				
Health Districts	**Incidence Rate (per 100,000)**		**Mortality Rate (per 100,000)**	
	Non-Hispanic Black Males	**Non-Hispanic White Males**	**Black Males**	**White Males**
State of Georgia	262	146	63	21
1-1 Northwest (Rome)	287	145	46	23
1-2 North Georgia (Dalton)	337	151	***	22
2 North (Gainesville)	267	182**	***	24
3-1 Cobb-Douglas	271	156**	41*	18*
3-2 Fulton	267	158**	63	22
3-3 Clayton (Jonesboro)	272	127*	73	14*
3-4 East metro (Lawrenceville)	297**	148	52	21
3-5 DeKalb	282**	140	67	19
4 La Grange	312**	142	58	22
5-1 South Central (Dublin)	157*	103*	60	22
5-2 North Central (Macon)	245	147	65	21
6 East Central (Augusta)	237*	114*	71	25
7 West Central (Columbus)	253	125*	85**	22
8-1 South (Valdosta)	259	154	62	19
8-2 Southwest (Albany)	302**	150	53	21
9-1 Coastal (Savannah)	187*	135*	56	20
9-2 Southeast (Waycross)	207*	120*	78	24
10 Northeast (Athens)	262	151	58	18
* Rates are significantly lower than the state rate (p< .05) ** Rates are significantly higher than the state rate (p< .05) *** Rates are not calculated for districts with number of cases below 20				

Figure 10. Age-adjusted Prostate Cancer Incidence Rates by Race and Public Health District, Georgia 2004-2008

Non-Hispanic Black Males

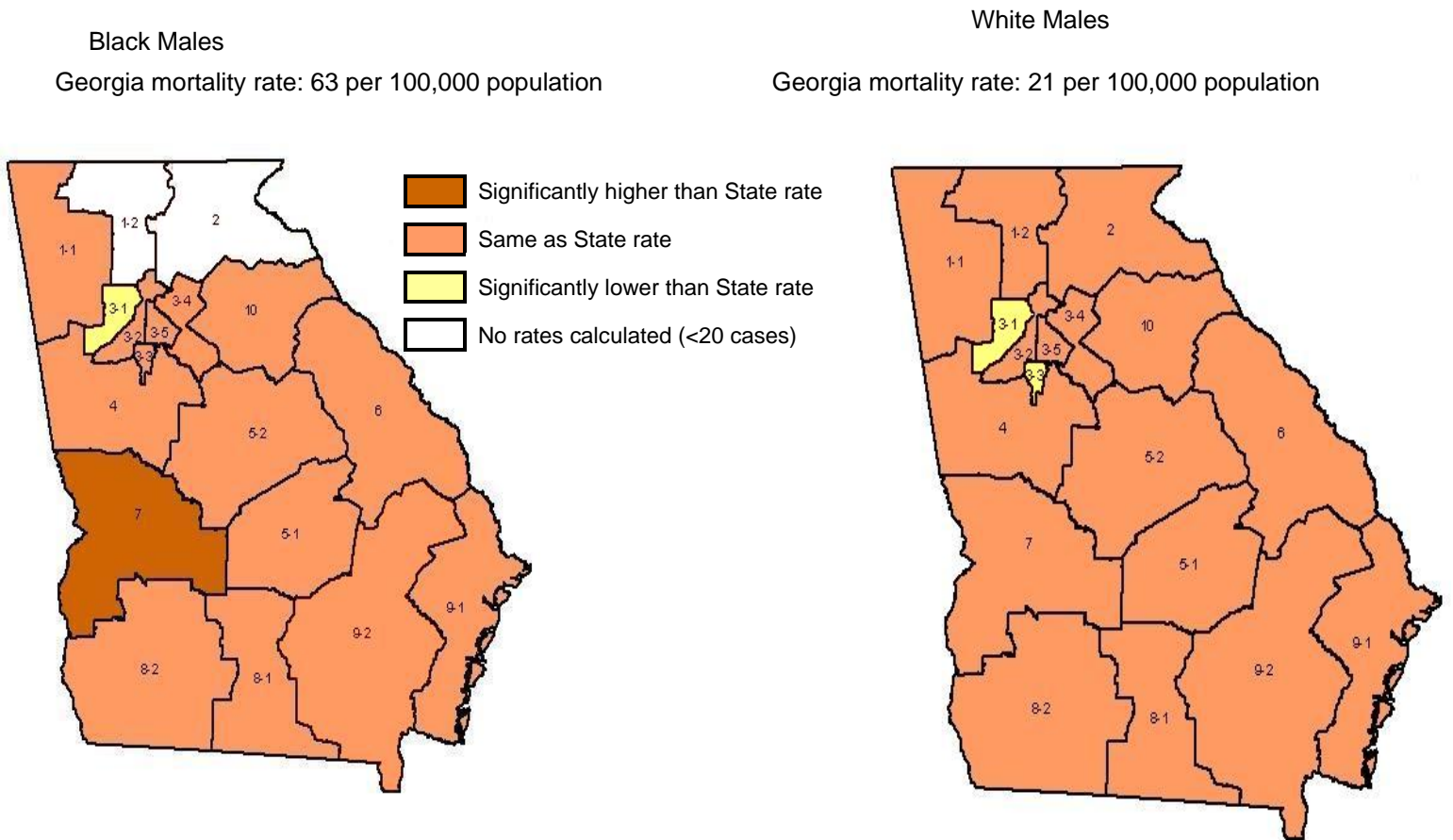Georgia incidence rate: 262 per 100,000 population

Non-Hispanic White Males

Georgia incidence rate: 146 per 100,000 population

Significantly higher than State rate

Same as State rate

Significantly lower than State rate
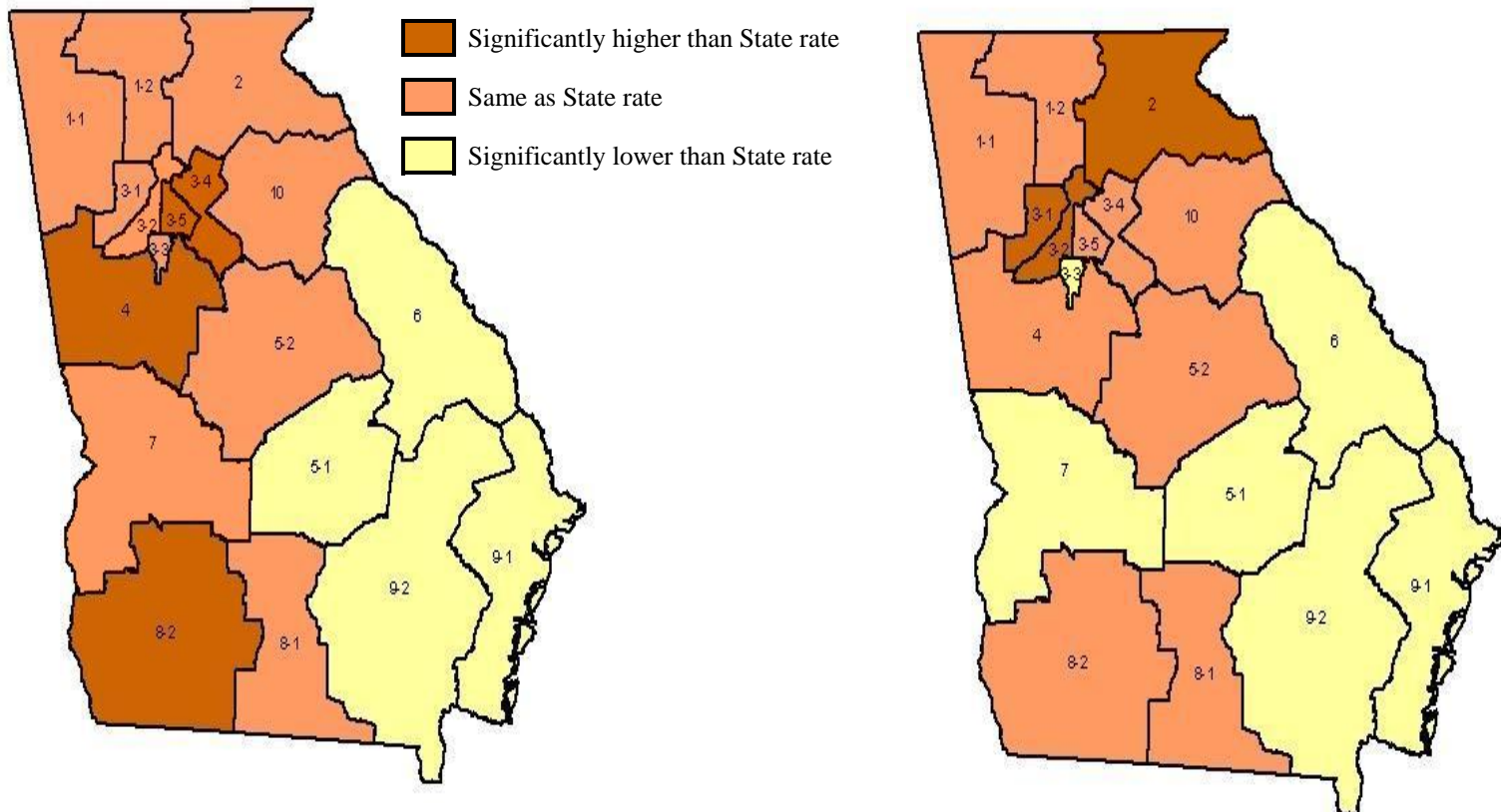
- Non-Hispanic black males living in East Metro (Lawrenceville), DeKalb, LaGrange and Southwest (Albany) health districts have significantly higher incidence rates than the state average, whereas those living in South Central (Dublin), East Central (Augusta), Southeast (Waycross) and Coastal (Savannah) have significantly lower incidence rates than the state average (Figure 10).
- Non-Hispanic white males living in North (Gainesville), Cobb-Douglas and Fulton health districts have significantly higher incidence rates than the state average, whereas those living in Clayton (Jonesboro), West Central (Columbus), South Central (Dublin), East Central (Augusta) ,Southeast (Waycross), and Coastal (Savannah) have significantly lower incidence rates than the state average (Figure 10).

Figure 11. Age-adjusted Prostate Cancer Mortality Rates by Race and Public Health District, Georgia 2004-2008

Black Males

Georgia mortality rate: 63 per 100,000 population

White Males

Georgia mortality rate: 21 per 100,000 population

Legend:
- Significantly higher than State rate
- Same as State rate
- Significantly lower than State rate
- No rates calculated (<20 cases)

- Black males living in West Central (Columbus) health district have significantly higher mortality rates than the state average, whereas those living in Cobb-Douglas health district have significantly lower mortality rates than the state average (Figure 11).
- White males living in Cobb-Douglas and Clayton (Jonesboro) health districts have significantly lower mortality rates than the state average (Figure 11).

Mortality Trends

Figure 12. Age-adjusted Prostate Cancer Mortality Rates by Race, United States vs. Georgia (1980-2008)
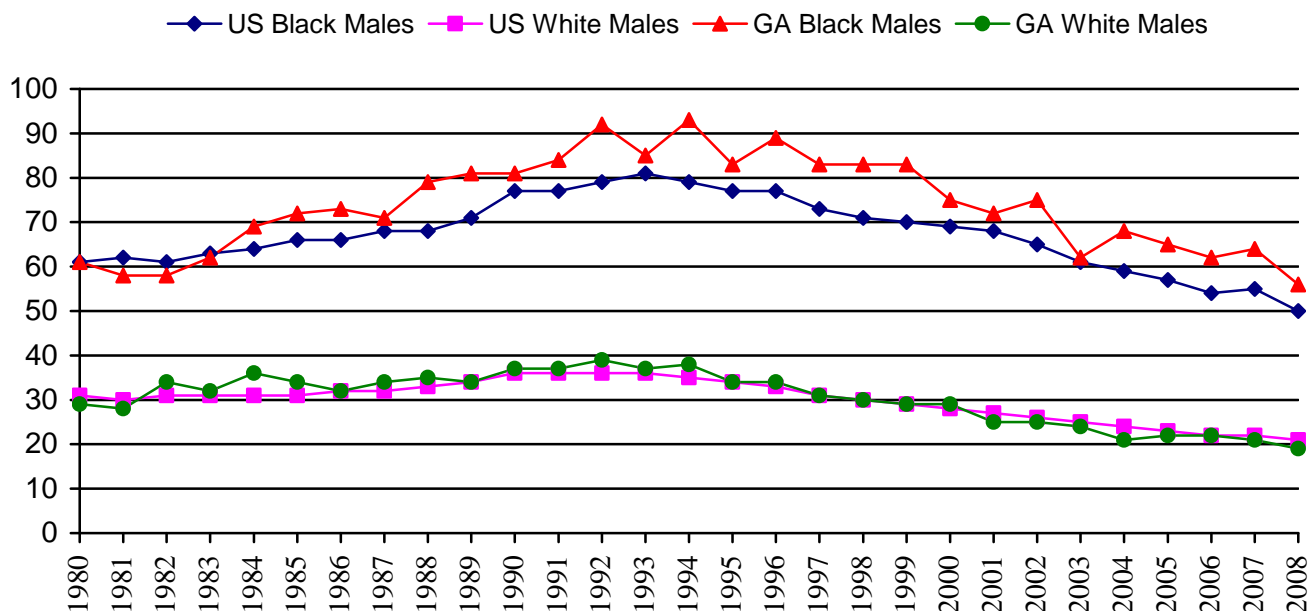
- Mortality rates among white males are generally lower than those among black males, both in Georgia and in the U.S. (Figure 12).
- Among U.S. black males, from 1980 to 1994 mortality rates significantly increased by 2.3% per year. From 1994 to 2008, mortality rates declined significantly by 3.1% per year.
- From 1980 to 1987, mortality rates for U.S. white males increased significantly by 0.8% per year. From 1987 to 1992 there was a significant increase of 3.1% per year. Since 1992, mortality rates have significantly declined by 3.5% per year.
- Among black males in Georgia, mortality rates significantly increased by 3.3% per year from 1980 to 1994. Since 1994, mortality rates have significantly declined by 3.2% per year.
- Among white males in Georgia, mortality rates significantly increased by 1.8% per year from 1980 to 1993. Since 1994, mortality rates have significantly declined by 4.5% per year.

Prostate Cancer: Resources

You can learn more about prostate cancer from the following organizations:

American Cancer Society
Telephone: 1-800-ACS-2345
Internet Address: www.cancer.org

Centers for Disease Control & Prevention
Telephone: 1-800-CDC-INFO
Internet Address: www.cdc.gov

National Cancer Institute, Cancer Information Service
Telephone: 1-800-4-CANCER
Internet Address: http://www.nci.nih.gov

American Urological Association Foundation
Telephone: 1-800-828-7866
Internet Address: http://www.urologyhealth.org/

Prostate Cancer Foundation
Telephone: 1-800-757-CURE
Internet Address: www.prostatecancerfoundation.org

Cancer Control Planet
Internet Address: http://cancercontrolplanet.cancer.gov/

Us TOO International
Telephone: 1-800-80-USTOO
Internet Address: www.ustoo.org

Fertile Hope
Telephone: 1-888-994-HOPE
Internet Address: www.fertilehope.org.

Technical Notes

Definitions:

Age-Adjusted Rate is calculated in a manner that minimizes the effects of differences in age composition when comparing rates derived from populations with different age structures. It is expressed per 100,000 population.

Cancer Incidence Rate is a measure of the development of new cancer cases in a population within a specified period of time. It is expressed as a rate per 100,000 population.

Cancer Mortality Rate is defined as the number of deaths, due to cancer, occurring in a specified population during a specified period of time. It is also expressed as a rate per 100,000 population.

Average Risk Population includes most people who develop prostate cancer and have no identifiable risk factors. People at increased risk of prostate cancer consist of black males and those with a strong family history of one or more first-degree relatives diagnosed with prostate cancer at an early age.

2003 Rural-Urban Continuum Codes form a classification scheme that distinguishes metropolitan (metro) counties by the population size of their metro area, and nonmetropolitan (nonmetro) counties by degree of urbanization and adjacency to a metro area or areas:

    1 = Counties in metro areas of 1 million population or more
    2 = Counties in metro areas of 250,000 to 1 million population
    3 = Counties in metro areas of fewer than 250,000 population
    4 = Urban population of 20,000 or more, adjacent to a metro area
    5 = Urban population of 20,000 or more, not adjacent to a metro area
    6 = Urban population of 2,500 to 19,999, adjacent to a metro area
    7 = Urban population of 2,500 to 19,999, not adjacent to a metro area
    8 = Completely rural or less than 2,500 urban population, adjacent to a metro area
    9 = Completely rural or less than 2,500 urban population, not adjacent to a metro area

The above codes were regrouped into the following categories:

    1 = Metro >1M
    2 = Metro 250K-1M
    3 = Metro <250K
    4 = Metro-Adjacent
    5 = there are no counties in Georgia that fit category 5
    6, 7, 8 and 9 = Rural

Data Sources:

The number of new cases, incidence rates, and percent distribution of cancer grade for the state of Georgia were obtained from the Georgia Department of Pubic Health, Georgia Comprehensive Cancer Registry. The number of new cases and incidence rates for the United States were obtained from the North American Association of Central Cancer Registries (NAACCR).

The number of deaths and mortality rates for the State of Georgia were obtained from the Georgia Department of Public Health, Vital Records Branch. The number of deaths and mortality rates for the United States were obtained from the Centers for Disease Control and Prevention (CDC), National Center for Health Statistics and the North American Association of Central Cancer Registries (NAACCR).

Prevalence of screening for prostate cancer (average of years 2002, 2004, 2005, 2006, 2008) in Georgia was analyzed from the Georgia Department of Public Health, Epidemiology Program, Georgia Behavioral Risk Factor Surveillance System.

Cancer stage and survival data for the United States were obtained from the National Cancer Institute, Surveillance, Epidemiology, and End Results (SEER) program.

Population estimates were obtained from the U.S. Census Bureau.

Clinical information on prostate cancer was retrieved from the Mayo Clinic at www.mayoclinic.com , National Cancer Institute at www.cancer.gov , and the American Cancer Society at www.cancer.org.

Methods:

Incidence rates were calculated per 100,000 population and age-adjusted by the direct method to the 2000 US standard population. Rates were calculated for 2004-2008. Incidence data were coded using ICD-O-3 codes. The ICD-O-3 code used for prostate cancer is C61.9, excluding types 9050:9055, 9140, and 9590:9899.

Mortality rates were calculated per 100,000 population and age-adjusted by the direct method to the 2000 US standard population. Except where calculated to show trends, the mortality rates are five-year average annual rates for the period 2004 through 2008. Mortality data were coded using ICD-9 codes (1980-1998) and ICD-10 codes (1999-2008). The ICD-9 code for prostate cancer is 185, while the ICD-10 code for prostate cancer is C61.

The estimated number of cases for 2010 was calculated by multiplying age-specific incidence rates for 2003-2007 by age-specific population projections for 2010. The estimated number of deaths for 2010 was calculated by multiplying age-specific mortality rates for 2003-2007 by age-specific population projections for 2010.

Trend analysis was performed using the Joinpoint Regression Program Software. Mortality rates for the United States used in the trend analysis were obtained from the CDC Wonder database.

The Rural-Urban classification of Georgia counties was based on the 2003 Rural-Urban Continuum Codes from the United States Department of Agriculture, Economic Research Service. Information about the Rural-Urban Continuum Codes can be retrieved from http://www.ers.usda.gov/Data/RuralUrbanContinuumCodes/.