Georgia Ovarian Cancer Report

2009 - 2013

DPH
Georgia Department of Public Health

Acknowledgments

The authors of this report would like to thank the following for their contribution and assistance in planning and review:

What is Ovarian Cancer?

Ovarian cancer is a malignant (cancerous) tumor that begins in the tissues of the ovary. The ovaries are paired organs in the female reproductive system. They are located in the pelvis, one on each side of the uterus. Each ovary is about the size and shape of an almond. The ovaries have two functions: they produce eggs (ova) and female hormones (estrogen and progesterone). These hormones influence the development of a woman's breasts, body shape, and body hair. They also regulate the menstrual cycle and pregnancy.
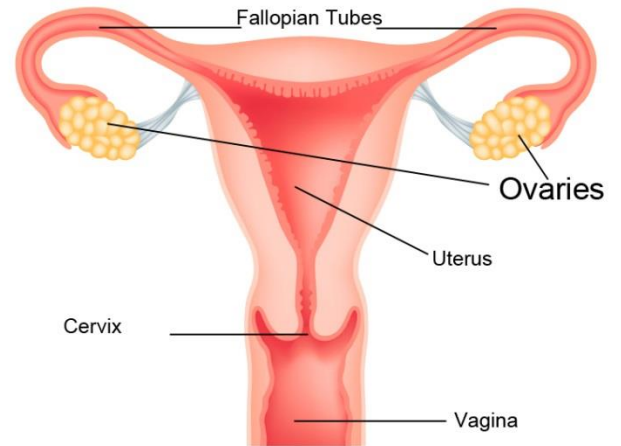
Tumors in the ovary are named for the kinds of cells the tumor started from and whether the tumor is benign or cancerous. There are three main types of tumors:

Epithelial ovarian cancer is the most common type of ovarian cancer. These tumors arise from the cells that cover the outer surface of the ovary. They are further defined by grade (low versus high) and histologic type (serous, clear cell, endometrioid, and mucinous) depending on how the tumor cells look under a microscope.

Sex cord-stromal tumors arise from cells that hold the ovary together and produce the female hormones. Sex cord-stromal tumors can be either benign or malignant. More than half are found in women over age 50, but they can also be found in young girls. These tumors often produce hormones.

Germ cell tumors arise from the cells that form the eggs. Most germ cell tumors are not cancer, but some can be. Germ cell tumors are rare. As a rule, the treatment prognosis is good, with about 9 out of 10 patients surviving at least 5 years after the tumor is found.

Figure 1. Invasive Ovarian Cancer Incidence by Histology, Georgia, 2009-2013
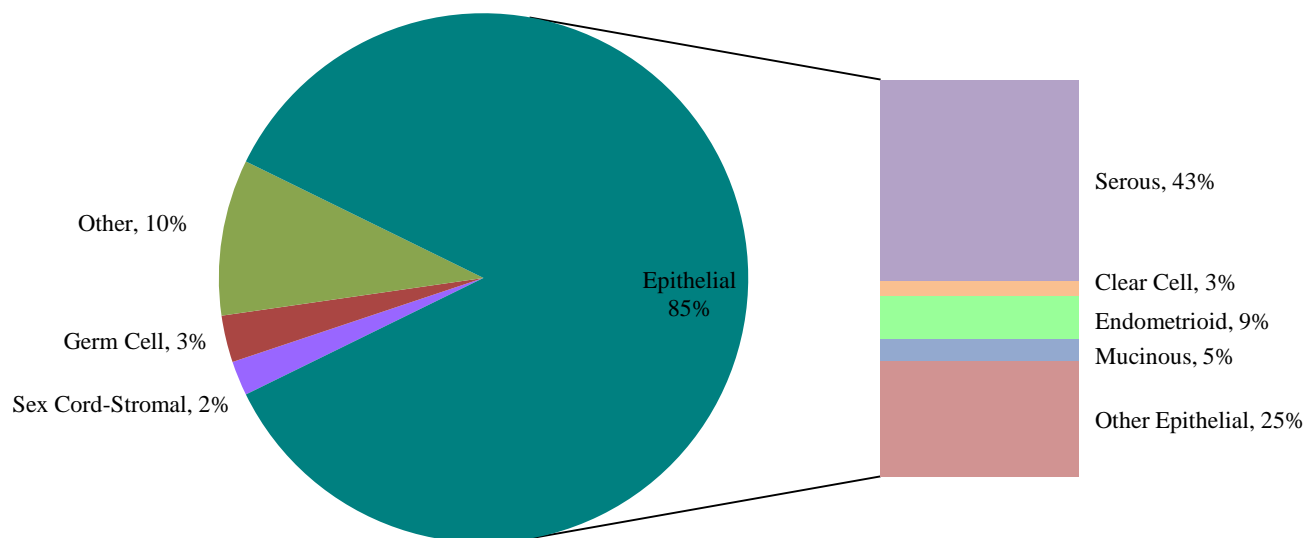
What are the Leading Types of Cancer in Women?

Table 1. Top Ten Cancer Incidence Sites (2009-2013) and
Cancer-Related Deaths (2008-2013*), Females, Georgia

Cases	Deaths
1. Breast	1. Lung and Bronchus
2. Lung and Bronchus	2. Breast
3. Colon and Rectum	3. Colon and Rectum
4. Uterine Corpus	4. Pancreas
5. Melanoma	**5. Ovary**
6. Thyroid	6. Leukemia
7. Non-Hodgkin Lymphoma	7. Uterine Corpus
8. Ovary	8. Non-Hodgkin Lymphoma
9. Pancreas	9. Brain and Other NS
10. Kidney and Renal Pelvis	10. Multiple Myeloma

Ovarian cancer is the eighth most common cancer diagnosed and the fifth leading cause of cancer death among women in Georgia.

Who Develops Ovarian Cancer?

Every year in Georgia, about 615 females are diagnosed with ovarian cancer. Non-Hispanic (NH) white females are 21% more likely than NH black females and 42% more likely than Hispanic females to be diagnosed with the disease.

About 395 females die from ovarian cancer each year in Georgia. White females are 23% more likely than black females to die from the disease.

Georgia's ovarian cancer incidence and mortality rates are similar to those for the United States.

Figure 2. Age-Adjusted Ovarian Cancer Incidence (2009-2013) and Mortality (2008-2013*) Rates by Race, Females, Georgia and the United States
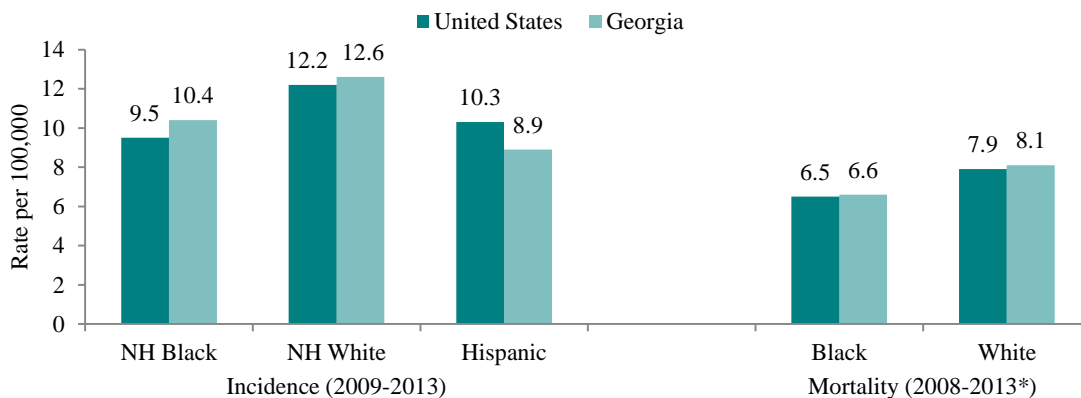
* Because of data quality issues, 2009 mortality data are not used for anlaysis.

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How Does Georgia Compare with the United States over Time?

Figure 3. Trends in Ovarian Cancer Incidence by Race, Georgia and the United States, 2000-2013

During 2000-2013, ovarian cancer incidence rates among NH black females decreased by 0.6% per year in Georgia and 0.7% per year in the United States. Among NH white females in Georgia, rates increased by 0.7% per year during 2000-2008 and then decreased by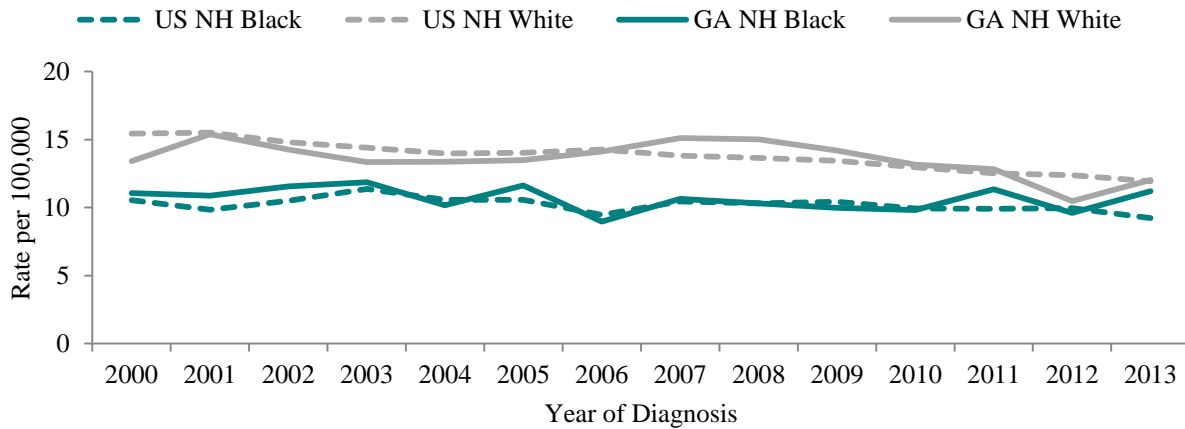 5.0% per year during 2008-2013. Among NH white females in the United States, rates decreased by 1.8% per year during 2000-2013.

Figure 4. Trends in Ovarian Cancer Mortality by Race, Georgia and the United States, 2000-2013*
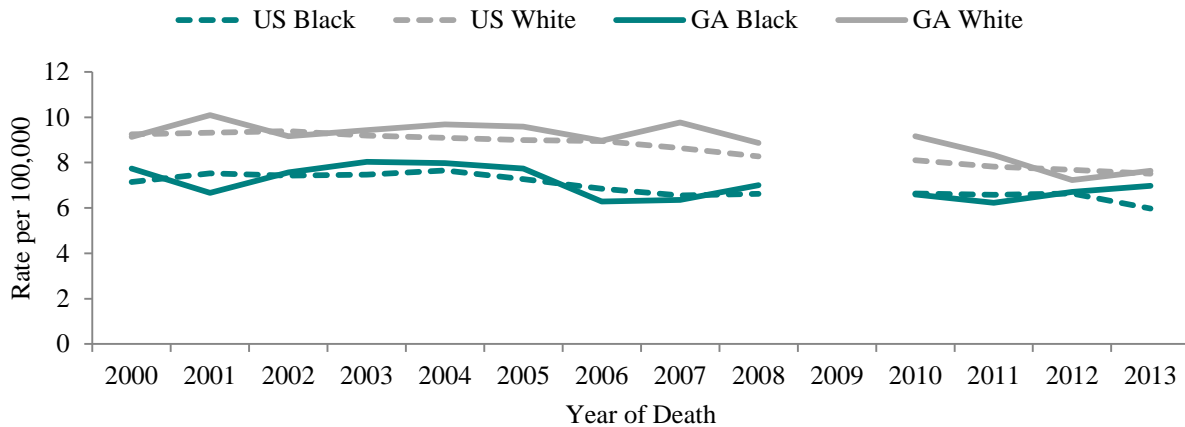
* Because of data quality issues, 2009 mortality data are not used for analysis.

During 2000-2013, ovarian cancer mortality rates among black females decreased by 1.2% per year in Georgia and 1.5% per year in the United States. Among white females in Georgia, rates decreased by 0.6% per year during 2000-2010 and by 7.1% per year during 2010-2013. Among white females in the United States, rates decreased by 0.7% per year during 2000-2005 and by 2.3% per year during 2005-2013.

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Signs and Symptoms of Ovarian Cancer

Ovarian cancer often shows no obvious signs or symptoms until late in its development. Signs and symptoms of ovarian cancer may include:

- General abdominal discomfort and/or pain (gas, indigestion, pressure, swelling, bloating, cramps)
- Nausea, diarrhea, constipation, or frequent urination.
- Loss of appetite
- Feeling of fullness even after a light meal
- Weight gain or loss with no known reason
- Abnormal bleeding from the vagina
- Feeling very tired all the time

These symptoms may be caused by ovarian cancer or by other, less serious conditions. It is important to check with a doctor about any of these symptoms.

How is Ovarian Cancer Detected?

The earlier ovarian cancer is found and treated, the better a woman's chance for recovery. Unfortunately, there is no standard or routine screening test for ovarian cancer. There has been a lot of research to develop a screening test for ovarian cancer, but there hasn't been much success so far. Scientists are exploring the usefulness of measuring the level of tumor marker CA-125. Transvaginal ultrasound (TVUS) has also been under evaluation as a potential screening tool, but the test can't actually tell whether a mass is cancerous or benign.

> **CA-125** is a protein in the blood. A CA-125 assay measures the level of this protein in the blood. An increased CA-125 level is sometimes a sign of ovarian cancer, but is more often caused by common conditions other than cancer. Also, not everyone who has ovarian cancer has a high CA-125 level.

> **Transvaginal ultrasound (TVUS)** is a procedure used to examine the uterus, fallopian tubes, and ovaries. An ultrasound wand is inserted into the vagina and used to bounce high-energy sound waves off internal tissues or organs and make echoes. The echoes form a picture of body tissues called a sonogram.

In studies of women at average risk for ovarian cancer, using CA-125 or TVUS for screening led to more testing and sometimes more surgeries, but did not lower the number of deaths caused by ovarian cancer. For this reason, the U.S. Preventive Services Task Force **does not recommend routine screening** for ovarian cancer. Though women with BRCA1 and BRCA2 genetic mutations, Lynch syndrome (hereditary nonpolyposis colon cancer), or a family history of ovarian cancer should be considered for genetic counseling to further evaluate their potential risks.

Are there Genetic Counseling and Testing Resources in Georgia?

The Georgia Hereditary Breast and Ovarian Cancer (HBOC) Genomics Project is a partnership between the Georgia Department of Public Health (DPH) and the Georgia Center for Oncology Research and Education (CORE). Its goal is to screen and identify women at high risk for HBOC. Women are screened using an online tool which contains six simple questions related to personal and family history of breast and ovarian cancer, and provides instant results about the client's level of HBOC risk. A positive (or high-risk) result on the screening tool indicates a 5-10% or higher probability for a BRCA1 or BRCA2 gene mutation. Women who screen positive and provide consent will be contacted by an advanced practice nurse in genetics for counseling and possible referral for genetic testing. Many county health departments in Georgia currently screen all clients presenting for women's health services (such as family planning or the Breast and Cervical Cancer Program), although anyone can access the screening tool and other resources at www.breastcancergenescreen.org.

Between November 2012 and September 2016 over 7,500 genomic screenings were performed through public health clinics in DPH using the online tool, and of those, 543 were positive screens. Genetic testing was performed on 116 of those clients, and ultimately seven BRCA gene mutations were discovered (along with several other cancer and non-cancer gene mutations).

What are the Causes and Risk Factors for Ovarian Cancer?

We do not yet know exactly what causes ovarian cancer, but we do know that certain risk factors are linked to the disease. A risk factor is anything that indicates a person has a higher than normal chance of getting a disease such as cancer. Different cancers have different risk factors. Some risk factors, such as obesity, can be controlled. Others, like a person's age or family history, cannot be controlled. But having a risk factor, or even several, does not mean that a person will get the disease.

There are many theories about the causes of ovarian cancer. Some of them came from looking at the conditions that change the risk for ovarian cancer. For example, pregnancy and taking birth control pills both lower the risk of ovarian cancer. Since both reduce the number of times the ovary releases an egg, some researchers think that there may be a link between the release of eggs and the risk for ovarian cancer. Also, we know that women who have had their tubes tied or who have had a hysterectomy have a lower risk for ovarian cancer. One theory to explain this is that some cancer-causing substances may enter the

body through the vagina and pass through the uterus and fallopian tubes to reach the ovaries.[1] While all women are at risk for ovarian cancer, the following factors can increase a woman's chances of having the disease.

Risk Factors That Can Be Controlled

- Childbearing: Women who have never had children, or waited until age 35 to start having children, are more likely to develop ovarian cancer than women who had children at a younger age. In fact, the more children a woman has, the less likely she is to develop ovarian cancer.
- Breastfeeding: Women who breastfeed have a decreased risk for ovarian cancer. And the longer she breastfeeds, the greater the protection.
- Birth control: Women who have used oral contraceptives (birth control pills) have a lower risk for ovarian cancer. The

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[1] Cibula, D., et al., *Underlying mechanisms of ovarian cancer risk reduction after tubal ligation*. Acta Obstet Gynecol Scand, 2011. **90**: p. 559-63.

reduced risk is seen within months of starting the pill, continues to decrease the longer the pill is used, and continues for many years after the pill is stopped.
- Menopausal hormone therapy: Some studies have suggested that women who take estrogen (without progesterone) for many years (at least 5 or 10) may have an increased risk for ovarian cancer.
- Fertility drugs: Some studies have found that use of the fertility drug Clomid for longer than one year, especially if no pregnancy took place, may increase the risk for ovarian cancer.
- Obesity: Several studies have shown an increased risk for ovarian cancer among women with a body mass index above 30.
- Gynecologic surgery: tubal ligation (having your tubes tied) and hysterectomy have been shown to greatly reduce the risk for ovarian cancer, but experts agree that these operations should only be done for valid medical reasons – not for their effect on ovarian cancer risk.

Risk Factors That Cannot Be Controlled

- Age: Most ovarian cancers develop after menopause. Half of all cases are found in women aged 63 or older.
- Family history: First-degree relatives (mother, daughter, or sister) of a woman who has had ovarian cancer are at increased risk for developing the disease themselves. The likelihood increases if two or more first-degree relatives have had the disease. About 5 to 10% of ovarian cancers are part of family cancer syndromes such as the BRCA1 and BRCA2 mutations. A personal or family history of breast, uterine, or colorectal cancer may also increase the risk for ovarian cancer.
- Menstrual periods: Studies have shown that women who started menstruating at an early age (before age 12) and/or experience menopause after age 50 are at an increased risk for ovarian cancer.

At What Age is Ovarian Cancer Most Often Diagnosed?

Although ovarian cancer incidence and mortality rates are highest in older women, ovarian cancer may also occur in younger women. In Georgia, nearly two-thirds of ovarian cases occur among women aged 60 and older. Incidence and mortality rates steadily increase with age; the highest rates are seen in women 80 years of age and older. In all age groups, white women have higher incidence and mortality rates than black women. Before the age of 40, ovarian cancer deaths are very rare, but they do occur occasionally. Every year, about seven Georgia women under 40 years of age die from ovarian cancer.

Figure 5. Age-Specific Ovarian Cancer Incidence Rates by Race, Females, Georgia, 2009-2013
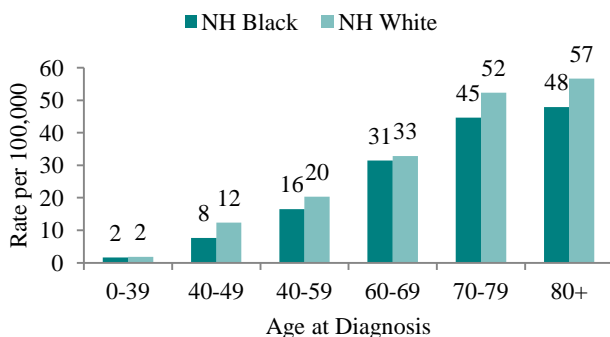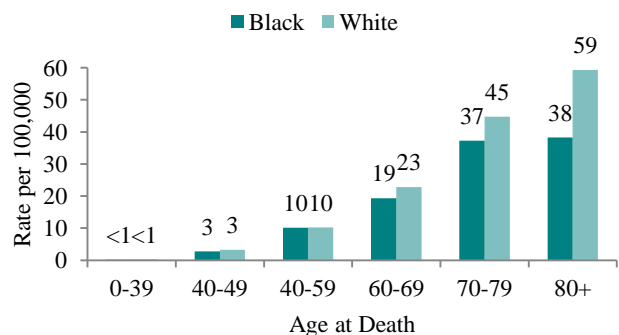

Figure 6. Age-Specific Ovarian Cancer Mortality Rates by Race, Females, Georgia, 2008-2013*

* Because of data quality issues, 2009 mortality data are not used for analysis

How Does Ovarian Cancer Vary by Region in Georgia?

Georgia Public Health Districts

Fulton (3-2) and Southwest (8-2) Public Health Districts have significantly higher incidence rates than the state rate, while Northwest (1-1), East Central (6), and Coastal (9-1) Public Health Districts have significantly lower rates.

North Georgia (1-2), North (2), Fulton (3-2), DeKalb (3-5), and Southwest (8-2) Public Health Districts have significantly higher mortality rates than the state rate. No Public Health District has a significantly lower rate.

Figure 7. Age-Adjusted Ovarian Cancer Incidence Rates by Public Health District, Georgia, 2009-2013
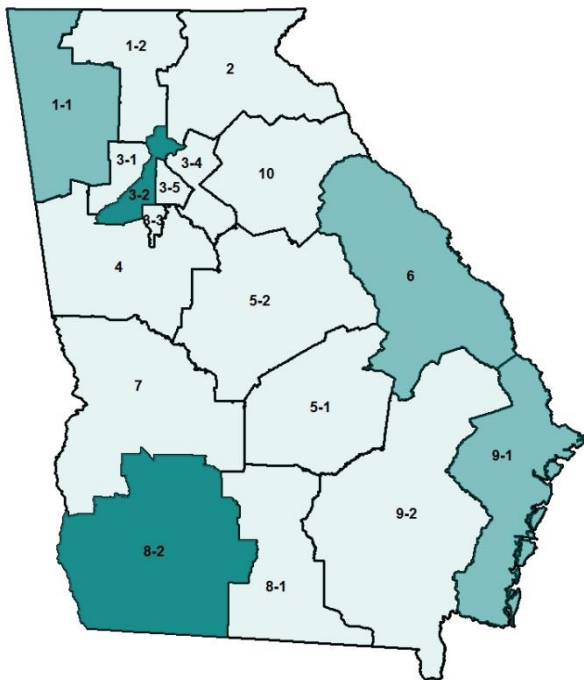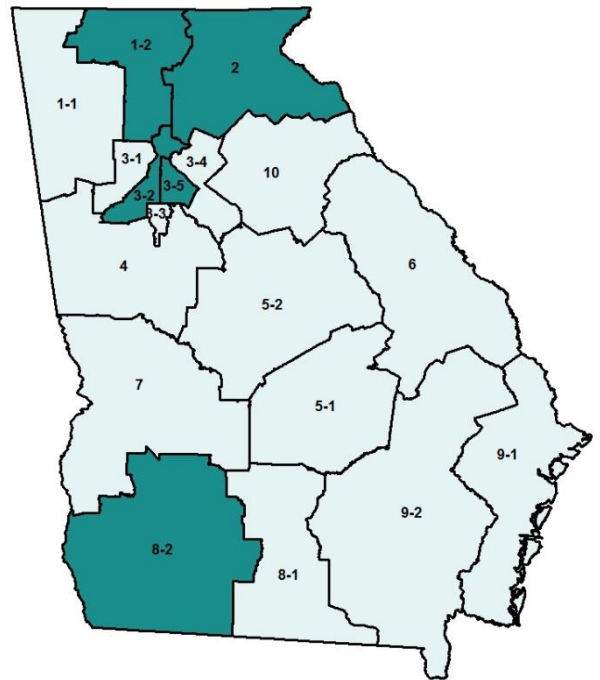
Georgia Rate: 11.7 per 100,000 females

Figure 8. Age-Adjusted Ovarian Cancer Mortality Rates by Public Health District, Georgia, 2008-2013*
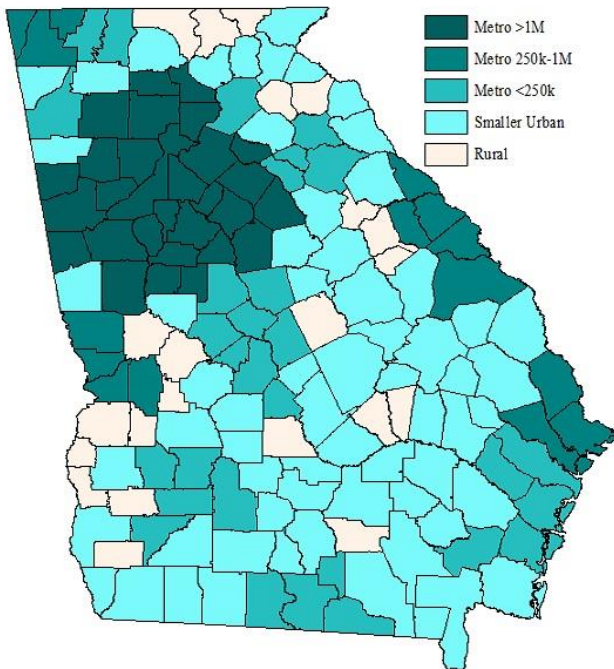
Georgia Rate: 7.7 per 100,000 females

* Because of data quality issues, 2009 mortality data are not used for analysis

■ Significantly higher than state rate

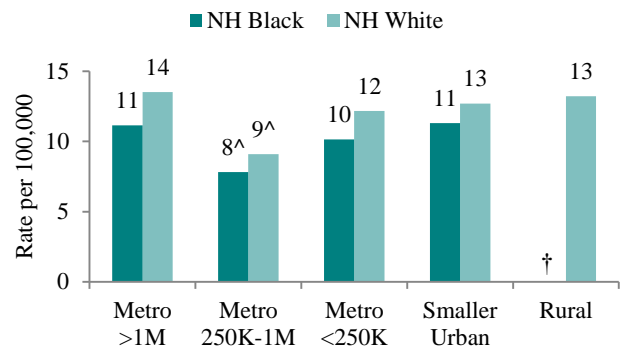□ No significant difference

■ Significantly lower than state rate

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Urban/Rural Classification

Figure 9. Metro, Urban, and Rural Counties in Georgia, RUCC, 2013

Classification	Number of Counties
Metro >1M	29
Metro 250k-1M	15
Metro <250k	30
Smaller Urban	63
Rural	22

Figure 10. Age-Adjusted Ovarian Cancer Incidence Rates by Race and Geography, Georgia, 2009-2013

† Rate could not be calculated due to fewer than 16 cases reported

^ Rate is significantly lower than the state rate

Figure 11. Age-Adjusted Ovarian Cancer Mortality Rates by Race and Geography, Georgia, 2008-2013*
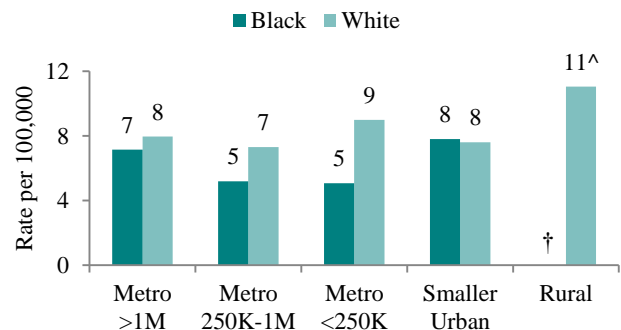
* Because of data quality issues, 2009 mortality data are not used for analysis

† Rate could not be calculated due to fewer than 16 deaths reported

^ Rate is significantly higher than the state rate

The ovarian cancer incidence rate was highest among Non-Hispanic (NH) white females living in high-density (>1M population) metropolitan counties (14 per 100,000 females) and lowest among NH black women living in medium-density (250K-1M population) metropolitan counties (8 per 100,000). The rates for both NH black and NH white females living in medium-density metropolitan counties were significantly lower than the state rates for NH black and NH white females respectively (p<.05).

The ovarian cancer mortality rate was highest among white females living in rural counties (11 per 100,000) and lowest among black females living in medium- and low-density (<250K population) metropolitan counties (5 per 100,000). The rate for white females living in rural counties was significantly higher than the state rate for white females (p<.05).

What is the Treatment for Ovarian Cancer?

Each type of treatment has benefits and side effects. Age, overall health, and the stage of the cancer are all factors that need to be considered. Staging is a standardized way to summarize information about how far a cancer has spread from its point of origin. In situ ovarian cancers are those in which the tumor has not invaded or penetrated surrounding tissue. In the localized stage, the tumor is confined to the ovary. In the regional stage, the tumor has spread to the surrounding tissues such as the fallopian tubes and uterus. Distant ovarian cancers have spread to sites such as the liver, lung, spleen, and brain.
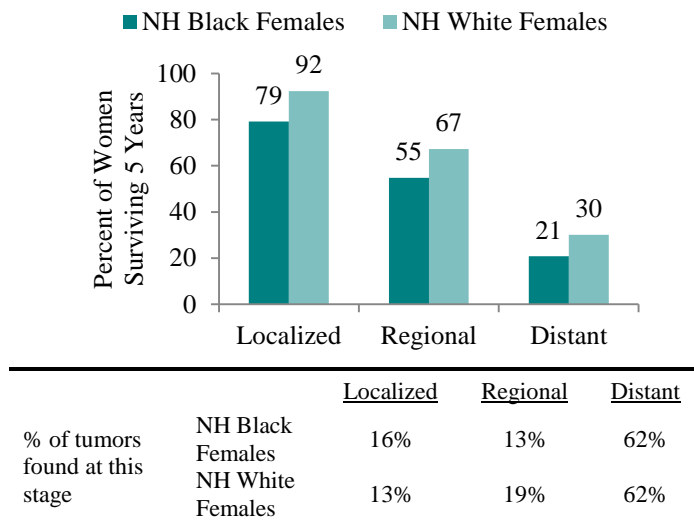
There are three main types of treatment for ovarian cancer: surgery, chemotherapy, and radiation therapy. Most women have surgery and chemotherapy; radiation therapy is rarely used for treating ovarian cancers. Depending on the stage of cancer, multiple treatment modalities may be used at the same time or one after another.

- **Surgery** is the usual initial treatment for women diagnosed with ovarian cancer. The ovaries, the fallopian tubes, the uterus, and the cervix are usually removed. This operation is called a hysterectomy with bilateral salpingo-oophorectomy. Staging during surgery generally involves removing lymph nodes, samples of tissue from the diaphragm and other organs in the abdomen, and fluid from the abdomen. If the cancer has spread, the surgeon usually removes as much of the cancer as possible in a procedure called tumor debulking to be treated later with chemotherapy or radiation therapy.
- **Chemotherapy** can be given directly into the abdomen and pelvis through a thin tube (intraperitoneal chemotherapy). Systemic chemotherapy is given using anti-cancer drugs that are injected into a vein or taken by mouth. These drugs reach all areas of the body through the bloodstream, making them potentially useful against cancers that have metastasized to other parts of the body.
- **Radiation therapy** uses x-rays or other types of radiation to kill cancer cells. There are two types of radiation therapies: external and internal. External radiation comes from a machine and is directed to the cancer. Internal radiation involves radioactive implants that are put directly into or near the cancer.

Research into treatment includes testing methods now in use, as well as finding new treatments. New chemotherapy combinations which may help treat cancers that resist current treatments are always being studied. Also, new drugs are being developed to help in treating patients with ovarian cancer. Another treatment currently under study is the production of an ovarian cancer vaccine, which will help the immune system to better spot cancer and to make monoclonal antibodies, which are similar to those produced by our bodies to fight infection.

Who Survives Ovarian Cancer?

Figure 12. Survival by Race/Ethnicity and Stage* at Diagnosis, Ovarian Cancer, Georgia, 2006-2012.

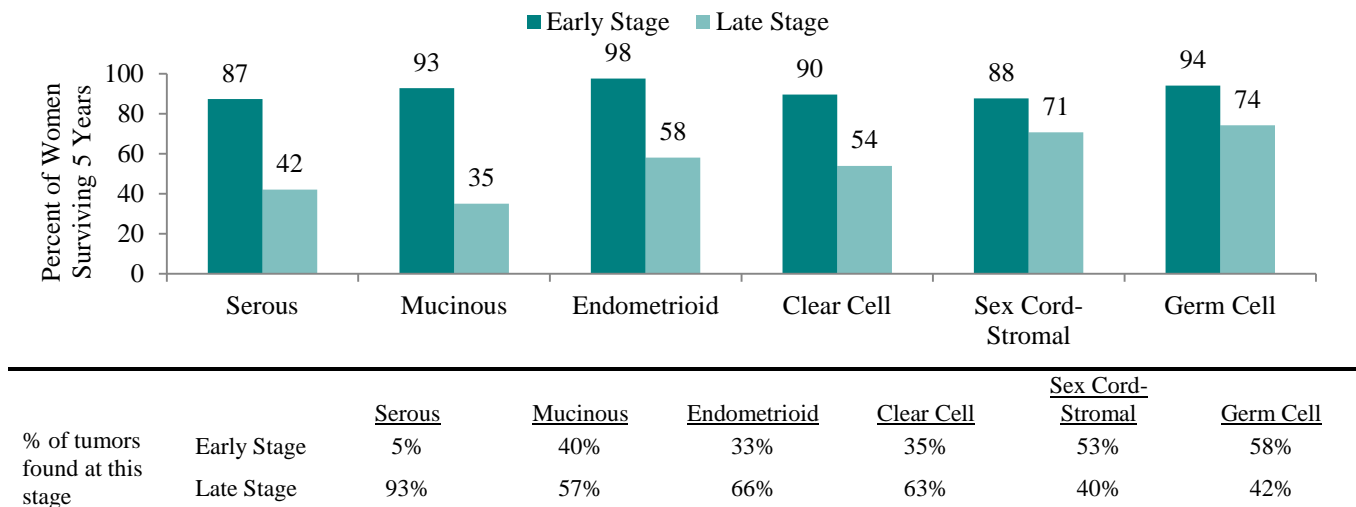|		Localized	Regional	Distant
% of tumors found at this stage	NH Black Females	16%	13%	62%
	NH White Females	13%	19%	62%

* Unstaged tumors are not shown.

Stage of disease refers to the extent to which cancer has spread when diagnosed. In general the earlier the stage, the better the chance of survival. For ovarian cancer, the overall five-year survival rate among Georgia women is 44%. If the cancer is discovered at a local stage, the survival rate is 90%, but only 67% when discovered at a regional stage and 28% when discovered at a distant stage.

In Georgia from 2006-2012, 15% of ovarian cancers were diagnosed at an early stage (in situ and localized) compared to 79% at a late stage (regional and distant). Among both NH black females and NH white females, nearly two thirds of ovarian cancers are diagnosed at a distant stage. However, NH white females have better survival than NH black females at every stage both in Georgia and at the national level.

Figure 13. Survival by Histologic Subtype and Stage† at Diagnosis, Ovarian Cancer, Georgia, 2006-2012.

		Serous	Mucinous	Endometrioid	Clear Cell	Sex Cord-Stromal	Germ Cell
% of tumors found at this stage	Early Stage	5%	40%	33%	35%	53%	58%
	Late Stage	93%	57%	66%	63%	40%	42%

† Early stage is defined as in situ and localized; late stage as regional and distant. Unstaged tumors are not shown.

Five-year survival for each histologic subtype is nearly 90% or better when the cancer is discovered at an early stage. These rates drop to 35-74% when found at a late stage. Serous tumors, the most common subtype of ovarian cancer, are nearly always found at a late stage when survival is about 42%. Sex cord-stromal and germ cell tumors are more often found at an early stage and have a better prognosis than all other subtypes when found at a late stage; nearly 3 in 4 women survive five years or more after a late-stage diagnosis with these rare tumors.

Self-Reported Obesity Prevalence among Georgia Women

Obesity (BMI greater than or equal to 30) has been linked to an increased risk for developing ovarian cancer and for dying from the disease. According to the 2014 Georgia Behavioral Risk Factor Surveillance System, 32% of Georgia women aged 18 and older were considered obese.

- Obesity rates varied among Public Health Districts, ranging from 20% in Cobb-Douglas (3-1) to 44% in Southwest (8-2).
- NH black women were more than 50 percent more likely than NH white women or Hispanic women to be obese.
- Women aged 45-64 were most likely to be obese. More than half of NH black women in this age group are obese.

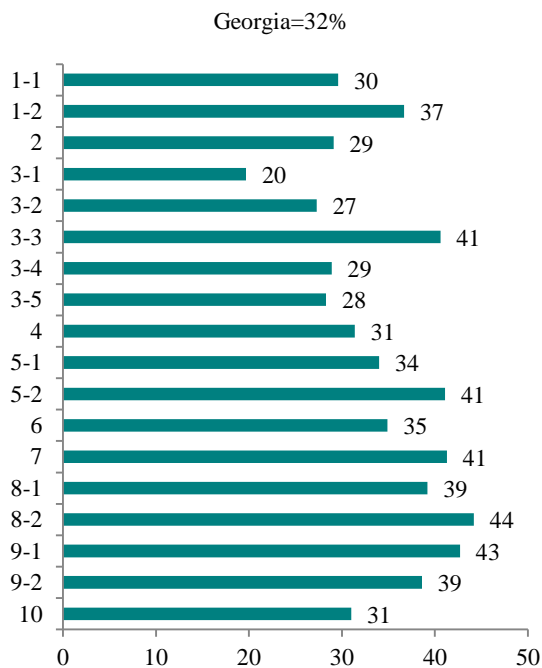Figure 14. Percentage of Obese Adult Women by Public Health District, Georgia, 2014

Georgia=32%

District	Percentage
1-1	30
1-2	37
2	29
3-1	20
3-2	27
3-3	41
3-4	29
3-5	28
4	31
5-1	34
5-2	41
6	35
7	41
8-1	39
8-2	44
9-1	43
9-2	39
10	31

Figure 16. Percentage of Obese Adult Women by Age, Georgia, 2014

Age	Percentage
18-24	18
25-34	34
34-44	33
45-54	40
55-64	39
65+	29
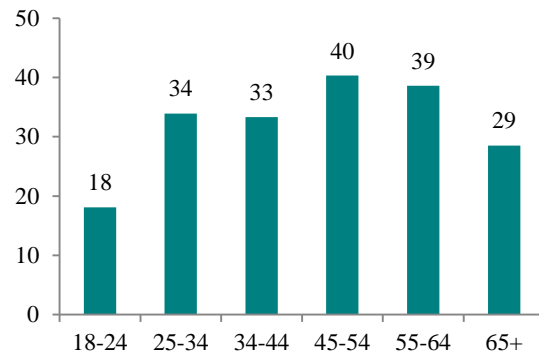
Figure 17. Percentage of Obese Adult Women by Age and Race/Ethnicity, Georgia, 2014

Age	NH Black	NH White
18-24	22	15
25-34	48	27
35-44	44	29
45-54	51	36
55-64	53	31
65+	41	25

Figure 15. Percentage of Obese Adult Women by Race and Ethnicity, Georgia, 2014

Race/Ethnicity	Percentage
NH Black	43
NH White	28
Hispanic	27
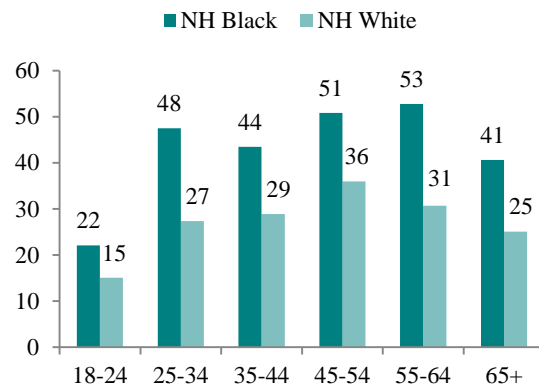
Where Can I Find Out More about Ovarian Cancer?

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

American Cancer Society
Telephone: 1-800-ACS-2345 (1-800-227-2345)
Internet Address: www.cancer.org

National Cancer Institute, Cancer Information Service
Telephone: 1-800-4-CANCER (1-800-422-6237)
Internet Address: www.cancer.gov

National Coalition for Cancer Survivorship
Telephone: 1-877-NCCS-YES (1-877-622-7937)
Internet Address: www.canceradvocacy.org

National Ovarian Cancer Coalition
Telephone: 1-888-OVARIAN (1-888-682-7426)
Internet Address: www.ovarian.org

Georgia Hereditary Breast and Ovarian Cancer Referral Screening Tool
Telephone: 404-523-8735
Internet Address: www.breastcancergenescreen.org

Technical Notes

Definitions:

Age-adjusted rate: A rate calculated in a manner that allows for the comparison of rates derived from populations with different age structures.

Cancer incidence: The number of new cancer cases occurring in a population during a specified period of time, often expressed as a rate per 100,000 population.

Cancer mortality: The number of cancer deaths occurring in a population during a specified period of time, often expressed as a rate per 100,000 population.

Relative survival rate: A net survival measure representing cancer survival in the absence of other causes of death, often expressed as a percent.

Prevalence: The number of people with a disease or risk factor out of the total number of persons in a population, often expressed as a percent.

2013 Rural-Urban Continuum Codes: 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 five categories:
    1 = Metro >1M
    2 = Metro 250K-1M
    3 = Metro <250K
    4, 5, 6, 7 = Smaller Urban
    8, 9 = Rural

Data Sources:

The number of new cases and incidence rates for the state of Georgia for 2009-2013 were obtained from the Georgia Department of Public Health, Division of Health Protection, Epidemiology Program, Georgia Comprehensive Cancer Registry. Incidence data were coded using ICD-O-3 codes. The ICD-O-3 code used for ovarian cancer is C56.9.

Incidence rates for the United States for 2009-2013 were obtained from NAACCR Fast Stats: An interactive tool for quick access to key NAACCR cancer statistics. North American Association of Central Cancer Registries (www.naaccr.org).

Incidence trend and survival data for Georgia and incidence trend data for the United States were obtained from the SEER Program (www.seer.cancer.gov) SEER*Stat Database: Incidence - SEER 18 Regs Research Data + Hurricane Katrina Impacted Louisiana Cases, Nov 2015 Sub (2000-2013) <Katrina/Rita Population Adjustment> - Linked To County Attributes - Total U.S., 1969-2014 Counties, National Cancer Institute, DCCPS, Surveillance Research Program, Surveillance Systems Branch, released April 2016, based on the November 2015 submission. Survival data were age-adjusted to the International Cancer Survival Standard 1.

The number of deaths and mortality rates for the state of Georgia for 2008 and 2010-2013 were obtained from the Georgia Department of Public Health, Office of Vital Records. Mortality data were coded using ICD-10 codes. The ICD-10 code used for ovarian cancer is C56.9.

Mortality rates for the United States for 2008 and 2010-2013 were obtained from the Centers for Disease Control and Prevention, National Center for Health Statistics. Compressed Mortality File 1999-2015 on CDC WONDER Online Database, released December 2016. Data are from the Compressed Mortality File 1999-2015 Series 20 No. 2U, 2016, as compiled from data provided by the 57 vital statistics jurisdictions through the Vital Statistics Cooperative Program (www.wonder.cdc.gov).

Mortality trend data for Georgia and for the United States were obtained from the SEER Program (www.seer.cancer.gov) SEER*Stat Database: Mortality - All COD, Aggregated With State, Total U.S. (1969-2013) <Katrina/Rita Population Adjustment>, National Cancer Institute, DCCPS, Surveillance Research Program, Surveillance Systems Branch, released April 2016. Underlying mortality data provided by NCHS (www.cdc.gov/nchs). Cause of death was categorized using the SEER Cause of Death Recode 1969+.

Population estimates for 2008-2013 and the 2000 U.S. standard million population were obtained from the U.S. Bureau of the Census, available at http://www.census.gov/.

Health risk and screening behavior data were obtained from the Behavioral Risk Factor Surveillance System (BRFSS), a telephone health survey administered by the Georgia Department of Public Health, in collaboration with the CDC (Centers for Disease Control and Prevention).

Methods:
Incidence rates were calculated per 100,000 population and age-adjusted by the direct method to the 2000 U.S. standard million population. Except where calculated to show trends, the incidence rates are five-year average annual rates for the period 2009 through 2013.

Mortality rates were calculated per 100,000 population and age-adjusted by the direct method to the 2000 U.S. standard million population. Because of data quality issues, 2009 Georgia cancer death data are not used for analysis. Except where calculated to show trends, the mortality rates are five-year average annual rates including data for 2008 and 2010-2013 combined.

Annual percent change computations for the incidence and mortality trends were calculated using Joinpoint Regression Program, Version 4.3.1.0 – April 2016; Statistical Methodology and Applications Branch, Surveillance Research Program, National Cancer Institute.