Frequently Asked Questions — Thyroid Cancer

Overview of Thyroid Cancer, Epidemiology, Detection, Diagnosis

What is thyroid cancer?

Thyroid cancer is a disease in which cancer cells form in the thyroid gland, an organ at the base of the throat. The thyroid gland makes hormones that help control heart rate, blood pressure, body temperature, and weight.

Is there more than one type of thyroid cancer?

There are several different types of thyroid cancer, which are classified based on how similar they look to normal thyroid cells under a microscope and by the type of cells from which they develop. There are three types of cancer in the well differentiated category and they are the papillary, follicular and Hürthle cell.

- The **Papillary thyroid cancer** is the most common type of thyroid cancer, accounting for approximately 8 out of 10 cases. Papillary carcinomas are slow growing that can develop in one or both lobes of the thyroid gland. This type of cancer may spread to nearby lymph nodes in the neck, but it is generally treatable with a good outlook for survival.
- The **Follicular thyroid cancer** is the second most common type of thyroid cancer, and accounts for approximately 1 out of 10 cases. This type is usually found in countries with inadequate dietary intake of iodine. Follicular carcinoma is typically associated with a good outlook for survival, although it is somewhat more aggressive than papillary cancer. Follicular carcinomas do not usually spread to nearby lymph nodes, but they are more likely than papillary cancers to spread to other organs, like the lungs or the bones. Onset of this type of cancer is typically 40 – 60 years of age but not always.
- The **Hürthle cell thyroid cancer,** also is a subtype of follicular carcinoma, and accounts for approximately 3% of all thyroid cancers.

Another type is the **Medullary thyroid cancer** and it is more aggressive but makes up only 4% of all thyroid cancers. Approximately 25% of this type is inherited. These cancers are more likely to spread to lymph nodes and other organs.

Then there is **Anaplastic thyroid cancer,** which is the most advanced and aggressive thyroid cancer and is found in less than 2% of patients with thyroid cancer. It most commonly occurs in people over the age of 60 years old. This type of thyroid cancer can quickly spread to other parts of the neck and body.

How common is thyroid cancer?

The American Cancer Society estimates that 53,990 cases of thyroid cancer will be diagnosed in the United States in 2018, making it the 12th most common cancer in the United States.
Thyroid cancer rates are increasing throughout the United States. From 1999-2015, the age-adjusted incidence rate of thyroid cancer increased from 6.8 per 100,000 people to 14.5 per 100,000 people.

It is unclear why thyroid cancer incidence has been increasing. One possibility is that increased screening of the thyroid gland using ultrasound may be detecting small thyroid nodules that might not otherwise have been found in the past.

Thyroid cancer is more common in females and most cases (62 percent) are diagnosed between ages 35-64. The median age at diagnosis is 51 years old.

How common is thyroid cancer in children?

Thyroid cancer is rare in children less than 10 years old. There is approximately one case of thyroid cancer diagnosed per 100,000 children 10-14 years old per year, and there are approximately 3.2 cases per 100,000 15-19-year-olds per year.

What are risk factors for thyroid cancer?

According to the American Cancer Society, exposure to radiation is a known risk factor for thyroid cancer. Radiation treatments to the head or neck during childhood can increase the risk of developing thyroid cancer. This risk is generally higher among those who have larger doses of radiation or have treatments at younger ages. Imaging tests, including x-rays and CT scans, can also lead to exposure of low doses of radiation. However, it remains unclear how much exposure to low dose radiation increases risk of thyroid cancer.

The American Cancer Society and the U.S. Centers for Disease Control and Prevention (CDC) also say that girls and women tend to have a higher risk of developing papillary thyroid cancer than their male counterparts. Additionally, people with a history of thyroid cancer or certain genetic diseases, women in their 40s and 50s, and men in their 60s and 70s are at a higher risk, according to the two agencies.

The following websites provide information on risk factors for thyroid cancer:

www.cancer.org/cancer/thyroid-cancer/causes-risks-prevention/risk-factors.html

www.cdc.gov/cancer/thyroid/index.htm

What are signs and symptoms of thyroid cancer?

Thyroid cancer may not cause any signs or symptoms. It is sometimes found during a routine physical exam or during examination for other conditions. Signs and symptoms may occur as the tumor gets bigger. However, other conditions may cause the same signs or symptoms.

Check with your doctor if you have any of the following:

- A lump (nodule) or swelling in the neck
- Trouble breathing
- Trouble swallowing
- Pain when swallowing
- Hoarseness or other voice changes that do not go away
- A constant cough that is not due to a cold

What tests are used to diagnose thyroid cancer?

There is no recommended screening test to find thyroid cancer early. Some doctors recommend that people examine their necks twice a year to look and feel for any growths or lumps. If there is a reason to suspect thyroid cancer, your doctor may order certain tests, such as an ultrasound, an imaging study, or a biopsy.

The North Carolina Central Cancer Registry

What is a cancer registry?

A cancer registry is a systematic collection of data about cancer. Cancer registries capture a complete summary of patient history, diagnosis, stage, treatment, and status on patients diagnosed with cancer and/or benign brain/central nervous system tumors.

What is the North Carolina Central Cancer Registry and what does it do to evaluate cancers in North Carolina?

The North Carolina Central Cancer Registry (CCR) is a program within the North Carolina Department of Health and Human Services (NCDHHS). The CCR is the cancer data center for the population of North Carolina. The CCR collects data on all types of cancers, and performs analyses of those cancers at a statewide level. Routine county-level analyses are performed on the more common cancers (lung/bronchus, female breast, prostate & colorectal).

CCR staff respond to questions and concerns and publish facts about cancer in North Carolina. They also analyze reported cancer data to estimate the burden of cancer types in North Carolina to help focus cancer education and screening activities in areas where they are most needed and provide data to researchers working to find causes and cures that may save lives in the future.

What is the role of the NC CCR?

The CCR's role is to collect, process, and analyze data on all cancer cases diagnosed among North Carolina residents to inform the planning and evaluation of cancer control efforts. Some analyses are conducted on a statewide basis, while others are done at the county level.

The data are used by:

- State and county health departments to target resources for health education and screening services
- Researchers for investigations into the causes and treatment of cancers
- Public health advocates for focusing attention on the risk and burden of cancer
- CCR and other public health staff to educate the public and provide evaluations of geographic and behavioral risk
- The Centers for Disease Control and Prevention National Program of Cancer Registries and other national organizations that pool the data for national estimates of cancer incidence. These data submissions are also used to evaluate the quality of the CCR data.

Where does the CCR data come from?

North Carolina state law (as in nearly all other states) requires that all health care providers report detailed information to the CCR about all cancer cases and benign brain/central nervous system tumors diagnosed in North Carolina.

Because most patients are diagnosed or treated at hospitals, all hospitals in North Carolina report eligible cancer cases to the state cancer registry as required by law. Hospitals report more than 80 percent of eligible cancer cases. The CCR supplements hospital data with reports from physician offices and treatment centers that manage cancer cases not seen in a hospital.

CCR also uses North Carolina death certificates, pathology laboratories, and other databases to help identify cancer cases not reported through physician offices or hospitals.

When does data become available for public use?

NCDHHS wants to ensure that the CCR has complete data, including the diagnosis, stage, and demographics and treatment information for as many cases as possible. Because treatment can span the course of months and years, this typically means the data collection process is not instantaneous. CCR data goes through an extensive quality control process before being released to the public. Information about diagnoses is usually available 12 months after the end of the diagnosis year. Physicians must have time to complete the diagnostic work-up to determine the extent of the disease and develop a plan of action for treating the cancer. Full information including demographics and treatment is usually available 24 months after the end of the diagnosis year.

Does the NCDHHS or local health departments monitor data to identify cancer clusters?

NCDHHS routinely monitors data to identify significantly elevated rates of the most common cancers (e.g., lung/bronchus, female breast, prostate, colorectal) at the county level. For less common types of cancer, NCDHHS collects state level data but does not actively look for trends in smaller geographic areas because of the large amount of random variation in cancer rates. When concerns are identified by physicians, hospitals, or concerned citizens, NCDHHS and local health departments will partner with community members and researchers to provide available data, share information with the community, and investigate concerns further. Once the locations of thyroid cancer occurrences are obtained, NCDEQ can work with the utilities to sample public drinking water sources, soil, water, air and other sources that may be linked to thyroid cancer. This information will not only help guide the DHHS investigation, it will also reassure communities that are concerned about chemicals in their drinking water by confirming that a water supply is safe.

Cancer Clusters

What is a Cancer Cluster?

The term "cancer cluster" is used in several ways and can mean different things. The CDC and the National Cancer Institute (NCI) refer to a cancer cluster as a "greater-than-expected number of cancer cases that occurs within a group of people in a defined geographic area over a period of time." The CDC and NCI definition uses statistics to determine whether the number of cancer cases is higher than expected during a particular time and in a particular geographic area. Their definition does not require the identification of a common environmental risk factor or exposure. However, understanding factors such, age, gender, race/ethnicity of people diagnosed with cancer and knowing how long they have resided in that geographic area can be important in understanding whether and why rates are truly greater than expected.

It is important to note that defining a situation as a cancer cluster does not trigger any specific actions or make additional resources available for an investigation. Additionally, this designation does not trigger any changes to what health insurance companies cover or change their prior approval criteria for a given test or procedure. A cancer cluster designation does not include an authorization for, or access to, new research funds.

A greater-than-expected number of cancer cases can occur within a given population without an identifiable cause and might be due to factors such as changes in the population, changes in medical care or screening, or a chance occurrence. In a recent review of over 400 cancer cluster investigations in the United States, only three investigations identified a link to an environmental risk factor and only one of these identified a risk factor that was considered a cause of the cancer cluster. Similarly, the CDC reports that, even after thorough investigation of a potential cancer cluster, typically no cause is identified.

Is there a thyroid cancer cluster in Iredell County?

The North Carolina Central Cancer registry has identified a higher rate of thyroid cancer in the southwestern and southeastern parts of Iredell County compared to the overall state rate during 2005-2016 (see the graph below). This is being actively investigated by state agencies. The goal of this investigation is to learn more about who is developing thyroid cancer, and to advocate for DEQ and other agencies to identify and address potential exposures to contaminants in the environment.

While the state has not completed its investigation or determined whether this should be defined as a cancer cluster, it is important to know that we share the community's concerns and are actively engaged in trying to understand and respond to higher rates of thyroid cancer in southern Iredell County. Regardless of how the increase in thyroid cancer is defined, the maximum available resources are being made available for this investigation.

Does something specific happen after a cancer cluster designation is made?

No. It is important to note that defining a situation as a cancer cluster does not trigger any specific actions or make additional resources available for an investigation. Additionally, this designation does not mandate any changes to what health insurance companies cover or change their prior

approval criteria for a given test or procedure. A cancer cluster designation does not include an authorization for, or access to, new research funds.

How are suspected cancer clusters investigated?

Using established criteria, local health departments seek direction from NCDHHS to conduct collaborative investigations of cancer clusters. NCDHHS follows guidance from the CDC to investigate suspected cancer clusters. (www.cdc.gov/mmwr/preview/mmwrhtml/rr6208a1.htm).

In accordance with these guidelines, NCDHHS:

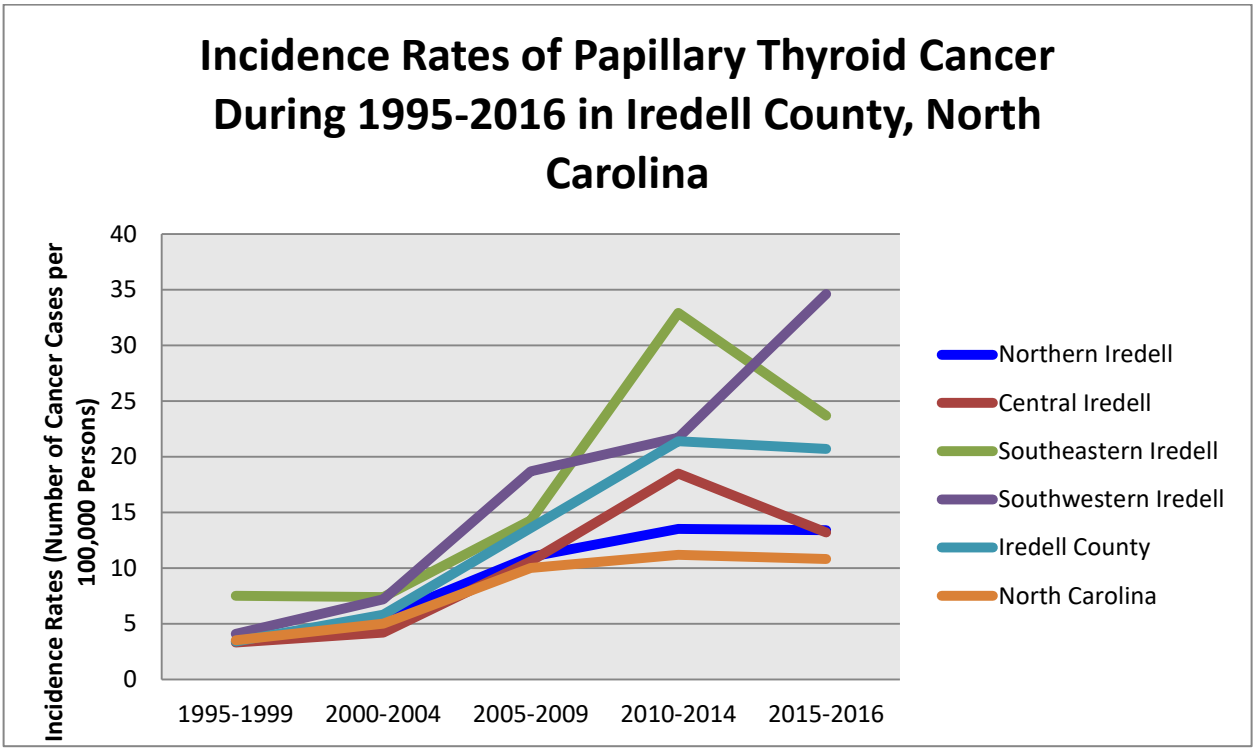
- Gathers information from the person reporting a concern including the type(s) of cancer, number of cases, age and gender of the people with cancer, and the area and time period over which the cancers were diagnosed. To proceed, the cancers should either be all of the same type or types of cancer that are known to have the same cause.
- If the information suggests the need for further evaluation, the CCR conducts an analysis to determine if there is an excess of cancer in the area. This analysis can require verifying diagnoses and addresses, following up with hospitals to make sure cases are reported, and obtaining the correct population information.
- If an excess of cancer cases is observed, investigators determine the feasibility of gathering more information to determine if cases are occurring among a specific group of people (e.g., age, gender, race/ethnicity), clustered in time and space, have a common exposure or risk factors in common, and if a study can be done. Sometimes, even if there is a clear excess of cancer cases, it is not possible to conduct a study or no common exposure or link is found.

Thyroid Cancer in Iredell County

What are the thyroid cancer rates in Iredell County?

In the entire state of North Carolina, the rate of thyroid cancer rose from 3.5 cases per 100,000 people in 1995-1999 to 10.8 cases per 100,000 people in 2015-2016. In comparison, the rate of thyroid cancer in southeastern Iredell County increased from 7.5 cases per 100,000 in 1995-1999 to 23.7 cases per 100,000 in 2015-2016. In southwestern Iredell, the rate increased from 4.1 cases per 100,000 in 1995-1999 to 34.6 cases per 100,000 in 2015-2016.

Below is a graph and table of thyroid cancer rates from 1995-2016 in Iredell County and statewide. The cancer rates presented are estimates and include 95 percent confidence intervals, meaning that the true incidence rate is somewhere between these two values. Differences were considered statistically significant if 95 percent confidence intervals for the region did not overlap the confidence interval of the state rate.



Age-adjusted incidence rates (95% confidence intervals) per 100,000 population during 1995-2016 for North Carolina, Iredell County, and 4 regions of Iredell County

	1995-1999[1]	2000-2004[1]	2005-2009[2]	2010-2014[2]	2015-2016[2]
North Carolina	3.5 (3.3, 3.7)	5.0 (4.7, 5.2)	10.0 (9.7, 10.3)	11.2 (10.9, 11.5)	10.8 (10.3, 11.2)
Iredell County	3.4 (2.1, 5.3)	5.8 (4.1, 8.0)	13.6 (11.2, 16.4)	21.4 (18.3, 24.8)	20.7 (16.1, 26.3)
Northern Iredell	*	5.6 (2.7, 10.4)[3]	11.0 (6.9, 16.7)	13.5 (8.8, 19.8)	13.4 (6.8, 24.0)[3]
Central Iredell	3.3 (1.2, 7.1)[3]	4.2 (1.8, 8.2)[3]	10.6 (6.6, 16.1)	18.5 (13.0, 25.4)	13.2 (6.5, 23.9)[3]
Southeast Iredell	7.5 (3.4, 14.3)[3]	7.4 (3.4, 14.1)[3]	14.3 (9.7, 20.5)	32.9 (25.3, 42.0)	23.7 (14.2, 37.1)
Southwest Iredell	4.1 (1.3, 10.0)[3]	7.2 (3.4, 13.7)[3]	18.7 (12.8, 26.4)	21.7 (15.8, 29.1)	34.6 (22.2, 51.5)

Numbers are subject to change as CCR data is updated

Shaded cells indicate rates with 95% confidence intervals that do not overlap the confidence interval of the state rate for that time-period and are considered higher than expected.

*Rate is based on less than 5 cases and is suppressed per CCR standard procedure and for confidentiality

[1]Rates are calculated using the 2000 census population and regions in Iredell County

[2]Rates are calculated using the 2010 census population and regions in Iredell County

[3]Rates are based on fewer than 16 cases and should be interpreted with caution

What is being done to investigate thyroid cancer in Iredell County?

Based on the results of this analysis and community concerns, NCDHHS and Iredell County Health Department are taking the following actions to investigate further.

- The CCR is continuing to analyze data to provide breakdowns by demographics (e.g. age and sex) and to learn more about who is developing thyroid cancer in Iredell County.
- NCDHHS is working with the Department of Environmental Quality (DEQ) and others to gather and analyze data about environmental contaminants in the region to better understand if

there are possible health risks to individuals in these communities who may be exposed to environmental factors.

- With strong support from advocates in the community, a Duke University research team is also working to learn more about who is developing cancer, when they are being diagnosed, where they have lived over time, and if common risk factors or exposures exist. NCDHHS Central Cancer Registry is providing data to support this research. It is uncertain if this research will identify the exact cause of the higher incidence rate of thyroid cancer in Iredell County. If prior research is a guide, the task of determining a link between environmental exposures and cancers spans several years and typically does not identify the cause for a higher incidence.
- NCDHHS is following-up with hospitals and clinicians in the area to confirm that all cases of thyroid cancer are being reported to the CCR.
- Both agencies are coordinating plans for public communication (e.g., press releases, community meetings) and involvement in the investigation process as more information becomes available.
- Our elected state and local officials have initiated a collaboration with UNC Healthcare - Lineberger Cancer Center for further assessment and advice on this matter.

When will the investigation be completed?

Investigations into the causes of cancer in a community are not easy and can take many months to complete. NCDHHS cannot provide a specific date when this investigation will be completed. However, NCDHHS and investigation partners will share information with the community as they move through the investigation. It's important to know that it is very difficult for science to clearly identify an underlying cause for higher cancer rates.

What can I do?

How can I reduce my risk of thyroid cancer?

One way to lower your risk of thyroid cancer is to avoid unnecessary exposure to radiation, including radiation from medical imaging procedures that involve the head and neck area. This is especially true for young children. More information about radiation from medical imaging procedures is available on the CDC's website: www.cdc.gov/nceh/radiation/ionizing.htm.

What if I am concerned about my risk for thyroid cancer?

If you have concerns about your thyroid or developing thyroid cancer, you should discuss these concerns with your medical provider. Anyone with signs or symptoms of thyroid cancer should see a doctor. The United States Preventive Services Task Force recommends against screening for individuals who do not have any signs or symptoms. This recommendation is available on the US Preventive Services Task Force website: www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/thyroid-cancer-screening1

Should I use a water purifier, filter, or have my drinking water tested?

At this time, NCDHHS has not identified an environmental exposure related to thyroid cancer risk. Therefore, NCDHHS does not recommend any specific water testing or filtration to reduce your risk of thyroid cancer. Private well water owners should routinely test their water to protect themselves and their families against other health effects. Guidance from NCDHHS is available at https://epi.publichealth.nc.gov/oee/wellwater/whentotest.html.

Is it safe to swim in Lake Norman?

At this time, NCDHHS has not identified an environmental exposure related to thyroid cancer risk. Therefore, there are no recreational water advisories for Lake Norman or any other body of water in the area.

Where can I find more information about thyroid cancer and cancer clusters?

More information about thyroid cancer can be found on the following web sites:

National Cancer Institute:
www.cancer.gov/types/thyroid

Centers for Disease Control and Prevention:
www.cdc.gov/cancer/thyroid/index.htm

American Cancer Society:
www.cancer.org/cancer/thyroid-cancer.html
www.cancer.org/cancer/cancer-causes/general-info/cancer-clusters.html

Where can I find more information about cancer statistics and prevention efforts in North Carolina?

North Carolina Central Cancer Registry:
https://schs.dph.ncdhhs.gov/units/ccr/

Reducing the Burden of Cancer in North Carolina: A Data and Resource Guide for Communities to Fight Cancer
https://publichealth.nc.gov/chronicdiseaseandinjury/cancerpreventionandcontrol/docs/ReducingtheBurdenofCancerResourceGuide.pdf

For questions about the public health investigation, contact the NC Department of Health and Human Services Occupational and Environmental Epidemiology Branch at (919) 707-5900, or NC Department of Environmental Quality at (919) 707-8217, or the Iredell County Health Department – Environmental Health at (704) 878-5305 Ext 3456.

For questions about the NC CCR, contact the State Center for Health Statistics at (919) 715-7289.

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