

Thyroid Cancer in Iredell County

The Mission of the Iredell County Health Department is to promote and protect community, personal and environmental health. Below is a timeline concerning how and when Iredell County Health Department became aware that the observed number of thyroid cancer cases were higher than expected in the 28117 and 28115 zip codes. The timeline also includes highlights of the work currently being done by County leaders, the health department, local and state elected officials, the North Carolina Department of Health & Human Services (NC DHHS)- Division of Public Health and other public and private organizations to address this important public health concern.

10/20/17- The Iredell County Health Director received an e-mail report from the NC Central Cancer Registry (CCR) related to a citizen inquiry about cancer incidence rates in the zip code of 28677. The report had been given to the citizen and shared with the Health Director and NC DHHS per protocol. The Health Director followed up on the same day with the North Carolina Department of Health and Human Services (NC DHHS) to see if they identified any data of concern in the report. NC DHHS believed that the report warranted a request for an additional 20 years of breast and endocrine cancer data (thyroid cancer is an endocrine cancer) because the rates for this zip code were higher than the state rates for the past 5 years.

10/27/17- NC DHHS received additional cancer data from the State Center for Health Statistics (SCHS). There were two sets of data. Cancer diagnosis from 2010-2014 and 1995-2015. Both of these data sets included breast and endocrine cancer. Iredell County had the 12th highest breast cancer rate and the 5th highest endocrine cancer rate in North Carolina from 2010 to 2014. In the 1995 to 2015 timeframe, Iredell County had the 38th highest breast cancer rate and the 6th highest endocrine cancer rate in North Carolina. Iredell County is the 15th largest county in population according to the North Carolina State Demographer. NC DHHS asked the SCHS to study 28677 zip code cancer data to see if the increased cancer rates should be of public health concern.

11/8/17-. The Iredell Health Director is told that the observed increase in endocrine cancer rate is related specifically to thyroid cancer. The Health Director, in consultation with NCDHHS, requested thyroid cancer data for the County and the 28677 zip code.

1/29/18-The Iredell County Health Department receives additional data from NC DHHS. The Iredell County thyroid cancer rate was 14 compared to the State rate of 9.3 for 1995-2015. The number of cases identified in the 28677 zip code during that time period was 71.

2/1/18- The Iredell Health Director emails NC DHHS to request thyroid cancer rate information for the 28677 zip code. At this point, the focus shifts to other areas of Iredell County as the Health Director sees that only 2% of thyroid cancer cases are in the 28677 zip code. The small number of thyroid cases in 28677 leads the Iredell Health Director to believe that thyroid cancer must be elevated somewhere else in Iredell County.

3/16/18-The Iredell County Health Director was told by the NC Central Cancer Registry (CCR) that

information related to addresses of cases could not be shared with her as it was protected health information but they were able to develop a report that was shared with the Health Director regarding the number of Iredell County cases by zip code ranging from 1996-2015. This data showed that cases in the 28115 and 28117 zip codes were higher than the rest of the county during this time period. The Iredell Health Director emails DHHS for an expert review of the data. NC DHHS wants to study the data before making any recommendations for follow-up.

3/23/18 DHHS completes the review of the data and recommends that the CCR complete a Standardized Incidence Ratio Analysis (SIR) to see if there were more thyroid cancer cases in these zip codes because of the population growth in that area of the County.

4/2/18- NC DHHS and Iredell County agree that a Standardized Incidence Ratio Analysis should be done for those two zip codes to see if the incidence rate is higher than is expected based on the population.

4/13/18- A business partner contacted the Iredell County Health Director to see if the Iredell County Health Department was involved in an investigation regarding the number of individuals diagnosed with thyroid cancer who live in the Brawley School Road area. The Health Director informed the business partner that Iredell County was currently waiting on a Standardized Incidence Ratio report from the Central Cancer Registry because of concerns that had been identified when recently reviewing the number of thyroid cancer cases by zip code within the County. The Iredell County Health Director also shared that the Iredell County Health Department had not received any citizen complaints regarding thyroid cancer cases within the Mooresville zip codes. The Iredell County Health Director requested that the business partner share any information they had regarding media attention being given to this topic for her review.

4/16/18 – The business partner shares a clip of a WSOC news story about thyroid cancer in the Mooresville area with the Health Director. The Health Director is able to identify a concerned citizen from this media clip.

4/17/18- The Iredell County Manager approves for the Iredell Health Department to reach out to the concerned citizen by letter, per the Iredell County Health Director's request.

4/23/18- The Iredell Health Director has a telephone conversation with the concerned citizen to hear information regarding the citizen's concerns related to the thyroid cancer rates in the Mooresville area. The concerned citizen informed the Health Director that she had been busy securing resources to fund a research study with Duke University regarding thyroid cancer incidents in the Mooresville area. The Health Director informed the concerned citizen that Iredell County was waiting on a Standardized Incidence Ratio report from the Central Cancer Registry. Iredell County requested this information as a result of continued follow-up to a report the Iredell County Health Department had received last fall from the Central Cancer Registry from a Statesville citizen inquiry about cancer rates in their zip code. The Health Director informed the concerned citizen that Iredell County would be glad to share this report once it is received and offered to assist the citizen in thoroughly investigating these concerns. The concerned citizen stated that they had turned in paperwork to the CCR requesting a geospatial analysis of diagnosed thyroid cases for 28115 and 28117.

5/29/18- The Iredell Health Director receives the requested **Standardized Incidence Ratio Report** from CCR. The Health Director holds a conference call with DHHS and CCR to discuss findings.

6/6/18- Iredell Health Department again holds a conference call with NC DHHS and CCR to get more detail on the SIR for the Health Director to accurately communicate this information to the concerned citizen.

The Health Director also coordinated a meeting with the concerned citizen and the concerned citizen's researchers for 6/19/18. Representatives from the CCR and NC DHHS were also invited to the meeting.

6/19/18- The Health Director and Environmental Health Director meet with the concerned citizen, her researchers and representatives from NC DHHS and CCR at Government Center South in Mooresville to discuss the findings from the Standardized Incidence Ratio Report from CCR. The meeting was also an opportunity for Iredell County and NC DHHS to learn about the work being done by the concerned citizen and her researchers.

6/20/18- The Iredell County Health Department sends out a press release to inform the public about the SIR and the elevated thyroid cancer rates in the 28115 and 28117 zip codes as

7/19/2018 – The Iredell County Health Director attended a meeting at the Department of Public Health in Raleigh, NC with the State Center for Health Statistics, Central Cancer Registry, Occupational Environmental Epidemiology Branch, and the State Epidemiologist to discuss next steps in regards to addressing concerns related to the elevated thyroid cancer rates in the 28115 and 28117 zip codes. Two Duke University researchers were also in attendance. Duke will be submitting the appropriate research request to the Central Cancer Registry allowing them to receive the name and contact information for individuals diagnosed with thyroid cancer within the last few years. They plan to contact these individuals and ask them to complete a comprehensive survey to see if there are any common exposures that would steer them in regards to environmental testing. The Health Director offered the assistance of the health department in distributing and collecting surveys or in coordinating a community meeting to discuss their research.

September 2018- A local work group was established to include representatives from Iredell County, Iredell County Health Department, Iredell County Board of Commissioners, Town of Mooresville and locally elected state officials. The concerned citizen also met with this group for the first few meetings to share her thoughts on this issue. Meetings were scheduled as needed to address pertinent issues.

10/24/18 – The Iredell County Health Department participated in a conference call with NC DHHS to discuss the Frequently Asked Questions (FAQ) document and next steps in regards to public information.

11/7/18: Initially, weekly conference calls were scheduled between Iredell County, NC DHHS and NC DEQ to facilitate communication and collaboration between these local and state organizations.

12/18/18 – Iredell County Health Department (ICHD) developed a media release that provided a general update on what had transpired since the last press release (June 20, 2018). ICHD worked closely with NC DHHS and NC DEQ on this release. Simultaneously with the release, ICHD released an updated version of the NC DHHS FAQ document. The Media Release and FAQ document were faxed to all medical providers, dental providers, and veterinarians in Iredell County.

1/3/19 – NC DHHS refers the Environmental Health Director to Dr. Kelsey Pieper at Virginia Tech to discuss the possibility of providing Iredell County residents with free well water testing for private well users. The Environmental Health Director speaks with Dr. Pieper about a water sample project in Iredell County. Virginia Tech had funding from the United States Environmental Protection Agency and the National Science Foundation for the detection and control of water lead risks and the examination of well water quality and recovery after Hurricanes Florence and Michael. Virginia Tech agreed to partner with Iredell County Health Department and Dr. Andrew George from the Institute for the Environment at the

University of North Carolina at Chapel Hill to implement this water quality study in Iredell County that would consist of testing inorganic parameters such as arsenic, chromium, and lead in well water. As part of the project, well owners would also be educated about their individual water quality results and would be invited to a Community Forum to learn about the overall Iredell County results. Well kits were going to be distributed at the Mooresville and Statesville Environmental Health offices in mid -February with the water samples being collected later on in the month.

1/25/19 – NC DHHS released a report entitled **Thyroid Cancer in Iredell County 1995-2016**. The report concluded that *“The Central Cancer Registry does not collect detailed information about potential environmental exposures; therefore, no conclusion can be drawn from this report about the association between any environmental contaminant and thyroid cancer. Many factors can contribute to local and regional differences in the rates of thyroid cancer diagnosis to include changes in the population and changes in medical care or screening. No community level exposures to radiation were identified in the report although there are several chemicals that have possible association with thyroid cancer. Only a comprehensive research study could determine whether exposure to these or other factors might be associated with rates of thyroid cancer diagnosis. Next steps outlined in the report included: 1) Monitor geographic variations in occurrence and also examine occurrence in other areas of NC with high incidence rates above the state level. 2) Work with hospitals and clinicians to confirm that all cases are being reported to the NC Central Cancer Registry. 3) Provide data to researchers and others working to investigate potential causes for thyroid cancer in Iredell County and elsewhere throughout the state.* The report was placed on the Iredell County Health Department website.

2/12/19– NC DHHS and NC DEQ did a presentation for locally elected state officials from the 11 counties (Brunswick, Cabarrus, Carteret, Catawba, Durham, New Hanover, Onslow, Pender, Randolph, Rowan, and Watauga) that have thyroid cancer rates above the state average at the request of Representative Fraley and Senator Sawyer. Their presentation included information on the role of the Central Cancer Registry, what is known about thyroid cancer, State and National incidence rates, what has been found and what has been done in Iredell County, water monitoring results, air emission monitoring results, waste management program monitoring, and next steps which included convening a panel of state and national experts in thyroid cancer.

2/13/2019 – A Press Release developed by Virginia Tech was sent to local media outlets from ICHD about the Virginia Tech water sampling project. The document informed citizens about how to participate in the project and have their well water tested free for health based quality parameters (antimony, arsenic, barium, boron, chromium, hexavalent chromium, cobalt, fluoride, selenium, thallium, uranium, vanadium, cadmium, copper, lead & nickel), nuisance-based water quality standards (aluminum, chloride, iron, manganese, sulfate, total dissolved solids and zinc), and unregulated water quality parameters (calcium, hardness, magnesium, molybdenum, potassium, sodium and strontium).

2/15/2019 – The Iredell County Board of Commissioners adopted a resolution at their Winter Retreat related to the coal ash at the Marshall Steam Plant. This resolution requested Governor Cooper and the General Assembly to take action to require Duke Energy to excavate the coal ash from the unlined basin at the Marshall Steam Plant for off-site removal by rail car to a lined hazardous waste landfill away from the Catawba River and Lake Norman.

2/20/2019 – Both Environmental Health locations begin distributing water sampling kits with instructions

on how to collect the water samples. 931 kits were distributed.

2/27/2019 – 2/28/2019 – A partnership team was organized by the health department consisting of Environmental Health Staff, the Emergency Preparedness Coordinator, Iredell County Sheriff's Office, Iredell County Emergency Management, UNC, Virginia Tech, NC Department of Transportation and Rocky Mount United Methodist Church to implement the Virginia Tech water sample collection initiative. Virginia Tech collected water samples from 5:30AM – 10:00AM at Rocky Mount United Methodist Church in Mooresville with the assistance of environmental health and other community partners. 786 well water sample kits were returned for analysis (out of 931) for a return rate of 84%. This water sample return rate was the highest return rate Virginia Tech had ever experience. It exceeded the return rate of the Flint Michigan water crisis in 2014. Results were mailed to owners of the private drinking wells within 3-4 weeks of collection. These free water sample tests would have cost our residents over \$350,000 if they had paid for testing out of pocket.

3/13/19- Senator Vickie Sawyer, NC District 34 (Yadkin, Iredell) is a Primary Sponsor of Senate Bill 297 (**Cancer Research Advisory Panel Bill**) that directs the NC Policy Collaboratory at UNC-CH to assemble a research advisory panel to study and develop recommendations on strategies for implementation of a research program to determine whether any clusters or cancer incidents exist in the state.

3/21/19 – The Health Department helped coordinate a **Thyroid Cancer Informational Meeting** for Iredell County medical providers that was held at 6:00PM at the Mooresville Town Hall. Local and state elected officials, NC DHHS, NC DEQ, Duke University, and UNC-CH representatives presented data and information on this topic and answered questions. There were 75 individuals in attendance.

4/2/2019 – NC DEQ announced through a press release that all coal ash in Duke Energy's remaining unlined sites in the state would have to be excavated and moved to lined landfills. Duke Energy will have until August 1st, 2019 to submit a final excavation plan that must include where the coal ash will go and how long the entire process will take. Final closures must be completed by December 31st, 2029. Duke estimates the excavation expense to be between \$10 and \$11 billion.

4/18/19 – Virginia Tech and UNC-CH hosted a **Community Meeting** at Mooresville High School for the 786 households that participated in the water quality study. Information was shared with the attendees related to what was found in the water samples, what it means, and how it could be treated. Local and state elected officials, NC DHHS and NC DEQ participated in this meeting. Virginia Tech also distributed a press release to local media outlets regarding the overall results of the testing. Iredell County Health Department combined the Inorganic and Coal Ash Panel water sample tests reducing our fees from \$500 to \$250 to help defray the expense for residents paying for this expense privately.

5/9/2019 – A **Community Meeting on Thyroid Cancer and Coal Ash Facilities** was hosted by the Iredell County Health Department at South Iredell High School to share information with residents on these two topics. Residents were also given an opportunity to ask questions about these important public health concerns. Over 150 citizens attended the meeting to hear from local and state elected officials, learn about the NC DHHS report on thyroid cancer in Iredell County, NC DEQ work related to the monitoring of coal ash facilities, the research being conducted by Duke University and the NC Thyroid Cancer Advisory Panel. The Thyroid Cancer Advisory Panel solicited citizen comments online from May 9th until May 31st regarding thyroid cancer research. The health department posted a link on their website for citizens to provide feedback to the Thyroid Cancer Advisory Panel.

5/13/19 – The Health Director and Environmental Health Director attended the morning part of the **Thyroid Cancer Advisory Panel Meeting on Research** that was held at the UNC Lineberger Comprehensive Cancer Center in Chapel Hill. The panel included representatives from UNC-CH, Duke University, the National Cancer Institute and the Geisel School of Medicine at Dartmouth. The purpose of the meeting was to assemble an expert panel of epidemiologists, clinicians and environmental scientists to review past research in NC and elsewhere and consider approaches to investigating the epidemiology of thyroid cancer, including patterns and causes in NC. The panel also plans to develop a set of recommendations for research that could provide new evidence to explain the elevated rates of thyroid cancer in North Carolina. The panel is sponsored by the NC Policy Collaboratory, the UNC Center for Environmental Health and Susceptibility & the UNC Lineberger Comprehensive Cancer Center.

7/2/18- A thyroid cancer link was established on the Iredell County Health Department website. A press release was sent to all local media outlets informing the public that all thyroid cancer information would be posted to this link including information a Frequently Asked Question document and a timeline for health department involvement.

7/8/19 – The NC Thyroid Cancer Advisory Panel published their **Report on Recommendations for Research** that identified research needs related to thyroid cancer incidence in North Carolina. Their recommendations for research included potential additional environmental, clinical, biologic, and epidemiology monitoring that needed to be done in North Carolina provide evidence that might help explain the elevated rates of thyroid cancer in several NC counties and to identify prospective resources needed to provide a basis for future investigations. The document included three key recommendations:

- *Leveraging New Data Resources*
 1. *Develop NC thyroid cancer patient study*
 2. *Analyze health care claims data to better understand clinical practice and detection patterns*
 3. *Analyze health care claims data for benign thyroid disease patterns*
 4. *Leverage existing data from epidemiologic cohort studies to inform the NC situation*
- *Expanding Ongoing Analyses*
 1. *Investigate potential associations between exposure to coal ash, coal burning emissions and papillary thyroid cancer*
 2. *Conduct geospatial analysis of thyroid cancer in states neighboring NC*
 3. *Conduct comparative analysis of other cancers in Iredell County and other NC counties with elevated rates of thyroid cancer*
- *Methods, Infrastructure Enhancement and Collaborations*
 1. *Host a workshop to consult with local and national experts on rate and geospatial analysis methods*
 2. *Enhance NC Central Cancer Registry's case ascertainment and staging of thyroid cancer*
 3. *Increase collaboration with epidemiologists in other states who have investigated elevated cancer rates*

This report was placed on the Iredell County Health Department webpage.

7/19/19- Senate Bill 297 (Cancer Research Advisory Panel Bill) becomes **State Law 2019-145**.

8/1/19- NC DHHS releases a document in response to the NC Thyroid Cancer Panel Report and recommendations. The document outlines what activities could be conducted or facilitated by DHHS with existing resources, which could be conducted if additional resources were available; and which would be better suited to an academic center or other research entity with support from NC DHHS.

8/12/19 – The Health Director, Deputy County Manager, and Environmental Health Director attended a meeting in Chapel Hill, along with local and state-level elected officials, NC DHHS, NC DEQ, UNC Chapel Hill and Duke University to review the Thyroid Cancer Advisory Panel Report and develop a plan of action related to the report recommendations. There were three priority initiatives discussed:

- *Cancer Research Advisory Panel:* Senate Bill 297 sponsored by Sen. Sawyer (now State Law 2019-145) directs the development of this panel. Dr. Olshan, UNC Lineberger Comprehensive Cancer Center and Dr. Jeff Warren, NC Policy Collaboratory will be coordinating the development of this panel that will develop recommendations on strategies for implementation of a research program to determine whether any clusters or cancer incidents exist in the state.
- *Iredell County Exposure Assessment Workgroup:* Representative Fraley requested the development of an Iredell County Exposure Assessment Workgroup to develop a study design that would use a systematic approach with a control group. Exposure levels would need to be measurable. Existing data could also be used as part of the study. The goal would be to do further environmental assessments in Iredell County in an attempt to identify any direct environmental links to cancer. Requested funding would be based on the study design. Dr. Olshan would be convening this group.
- *Data review* to include the review of health care claims and cancer registry data that could be mapped to a geographic area. This may be a Collaboratory Activity in partnership with the Central Cancer Registry and UNC.
- *Local Soil Testing:* There was mention of the need to do some soil testing at several Iredell County Schools in the southern part of the County. Dr. Warren mentioned that he had resources that could fund this project. He will be in touch with Iredell County officials to discuss this further.

10/9/19- Thyroid Cancer State & Local Workgroup Call was held with participants from Iredell County, NC DEQ, NC DHHS and UNC. Updates on current initiatives included:

- *Cancer Research Advisory Panel:* This panel has been identified and includes 25 individuals representing Gillings School of Global Public Health-UNC, UNC School of Medicine, Occupational & Environmental Epidemiology-NC DHHS, NC Central Cancer Registry-NC DHHS, Brody School of Medicine-ECU, Wake Forest School of Medicine, Nicholas School of the Environment-Duke University, Duke University School of Medicine, North Carolina State University, the National Institutes of Health (NIH) and the Centers for Disease Control (CDC) and Prevention. This group will have their first meeting in early December.
- *Iredell County Exposure Assessment Workgroup:* Dr. Olshan is coordinating this group that is comprised of individuals from UNC, Duke University and NC DHHS. They have a scheduled call today and hope to have a study design developed within the next few months.

- Iredell County Soil Testing: The UNC-Collaboratory will fund and coordinate this project that will be led by Dr. Xiaoming Liu, UNC-CH Geological Sciences. A senior will utilize this project for their senior thesis. They will be testing the soil for coal ash residuals at 5 schools that were built, added to or renovated between 1995-2001. These years have been identified by NC DEQ as when a high volume of coal ash was used as a soil filler for construction projects. Dr. Liu will also be collaborating with Duke University researchers on this project.

12/11/19- The Cancer Research Advisory Panel met in Chapel Hill at the UNC Gillings School of Public Health to begin their work. Their next meeting will be in January of 2020.

12/12/19- Dr. Zack Moore, State Epidemiologist-NC DHHS, Dr. Andrew Olshan, Cancer Epidemiologist-UNC Lineberger Cancer Center, Rep. Jeffrey McNeely-NC House- District 84, Rep. John Fraley-NC House-District 95 and Sen. Vickie Sawyer-NC Senate- District 34 (by telephone) presented information related to Thyroid Cancer to the Iredell County Board of Health. The Board of Health has been periodically updated on health department activities related to this serious public health concern over the last two years. Dr. Moore's presentation focused on a historical overview of thyroid cancer in Iredell County, North Carolina and the United States, the provider reporting requirements and data collection and dissemination procedures of the NC Central Cancer Registry and the **NC DHHS Report on Thyroid Cancer in Iredell County, 1995-2016**. Dr. Olshan focused on the **NC Thyroid Cancer Panel Report**, Senate Bill 297 that was sponsored by Senator Sawyer that required the development of the **NC Research Advisory Panel** and the **Iredell County Environmental Working Group**. Rep. Fraley and Sen. Sawyer also mentioned the upcoming NC Policy Collaboratory soil testing project that will be conducted at 5 Iredell County Schools in collaboration with research labs at UNC-CH and Duke University. Rep. Fraley, Sen. Sawyer and Rep. McNeely all mentioned the need to take a scientific approach to this investigation that will take time. Collaboration will continue between Iredell County, the Town of Mooresville, local and state elected officials, NC DHHS, NC DEQ, national organizations (CDC & NIH) and academic and research partners. Rep. Fraley, Sen. Sawyer and Rep. McNeely are all committed to seeking the appropriate funding from the General Assembly when a research study design has been developed. All present at the meeting acknowledged the rightful concerns of the community and discussed the need for communication to the public regarding the work that is being done to address this public health concern. Communication will be discussed at next week's local Thyroid Cancer Workgroup meeting.

12/16/19 & 12/17/19- Dr. Liu from UNC-CH and her team will be in Iredell County to collect soil samples from 5 Iredell County Schools. Several borings will be done at each school. Soil samples will be collected at various depths at each boring. A sample will be collected at a local park to be utilized as a control. Duke University is collaborating on the study and will be running their own tests on the soil samples in addition to the tests being run by the UNC-CH lab. Once the results of the study are received, the researchers will determine whether or not additional soil testing should be done related to coal ash residuals.

