

# 2022 NPCR TENNESSEE SUCCESS STORY

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## Cluster Investigation Involving a Sterilization Facility in Tennessee

### National Program of Cancer Registries SUCCESS STORY

#### SUMMARY

Ethylene oxide is a volatile organic compound that is a flammable, colorless gas at room temperature. It is cancerous to humans typically associated with blood cancers (i.e., leukemia and lymphomas), breast cancer, and stomach cancers.<sup>1</sup> A cluster investigation was performed to assess whether individuals in communities around a sterilization facility in Shelby County, TN that uses ethylene oxide were at higher risk of developing the cancers.

#### CHALLENGE

Completion of cluster investigation studies has been very challenging for the Tennessee Cancer Registry (TCR) staff. Another challenge was designing an appropriate cluster investigation without knowledge of the demography and geography of the area under investigation.

#### SOLUTION

TCR staff reclassified an existing position to an Epidemiologist 1 position and successfully hired an individual who recently completed her public health training at the University of Tennessee. This allowed the TCR to complete the preliminary stages of this cluster investigation in a timely manner in collaboration with staff from the Shelby County Health Department. The Shelby County Health Department staff was very helpful selecting the census tracts evaluated to satisfy demographic and geographic requirements of the cluster investigation study by TCR staff.

#### RESULTS

Age-adjusted rates for all leukemia cases were calculated and they ranged from 0 to 44.39/100,000 population. The median age-adjusted rate across all 30 census tracts was 13.70/100,000 population. When this was compared to 13.8/100,000 population for all of Tennessee, the observed median age-adjusted rate among the 30 census tracts was like the state rate. Hot spot analysis using ArcGIS geospatial software indicated that there was no clustering of leukemia cases. Age-adjusted rates for all Non-Hodgkin Lymphoma (NHL) cases were calculated and they ranged from 0 to 44.59/100,000 population. The median age-adjusted rate across all 30 census tracts was 15.93/100,000 population. When this was compared to 18.2/100,000 population for all of Tennessee, the observed median age-adjusted rate among the 30 census tracts was below the state rate. Hot spot analysis using ArcGIS indicated that there was no clustering of NHL cases. Age-adjusted rates for all breast cancers, male and female, were calculated and they ranged from 22.24/100,000 population to 125.56/100,000 population. The median age-adjusted rate across the 30 census tracts was 66.86/100,000 population. When this was compared to 66.2/100,000 population for all of Tennessee, the observed median age-adjusted rate among the 30 census tracts was like the state rate.

Hot spot analysis using ArcGIS indicated hot spots of breast cancer in 4 census tracts to the south and southwest of the census tract containing the sterilization facility. Census tracts to the north of the census tract containing the sterilization facility were largely cold spots (see Figure 1 in the Appendix; please note that hot spots are represented by areas shaded red, while cold spots are areas shaded blue). Age-adjusted rates for all stomach cancer cases were calculated and they ranged from 0 to 27.67/100,000 population. The median age-adjusted rate across all 30 census tracts was 10.40/100,000 population. When this was compared to 5.7/100,000 population for all of Tennessee, the observed median age-adjusted rate among the 30 census tracts was higher than the state rate. Hot spot analysis using ArcGIS indicated that there was no clustering of stomach cancer cases.

These results do not suggest a larger than expected incidence rate of individual cancers associated with the Ethylene Oxide sterilization facility in Shelby County.

#### SUSTAINING SUCCESS

Retaining staff, particularly the relatively new Epidemiologist 1 position, allowed for successful completion of a cluster investigation and other important data use tasks to enhance and assess the health of Tennesseans. In addition, continued collaboration with the Shelby County Health Dept. to assess relevancy of breast cancer findings was important. Shelby County is in the top-rated counties in TN for female breast cancer incidence (24 among all 95 Tennessee counties).<sup>2</sup>

#### STORY QUOTE

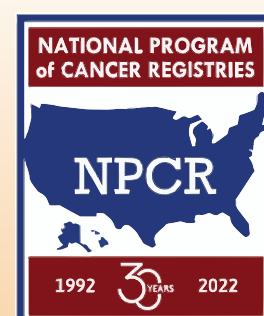
“What we do know about EtO (ethylene oxide) is that in other communities across the country, they have found a higher incidence of cancer in communities that are affected by this substance,” said Michelle Taylor, MD, DrPH, MPA, Director, Shelby County Health Department, Tennessee Registry. “Usually, blood cancers like leukemia or breast cancer or stomach cancer.”<sup>3</sup>

#### REGISTRY CONTACT INFORMATION

1-800-547-3558  
Tennessee Cancer Registry Website

#### REFERENCES

1. Anonymous; National Cancer Institute; Updated: 2018-12-28; Accessed: 2022-10-28; <https://www.cancer.gov/about-cancer/causes-prevention/risk/substances/ethylene-oxide>
2. U.S. Cancer Statistics Working Group. U.S. Cancer Statistics Data Visualizations Tool, based on 2021 submission data (1999-2019); U.S. Department of Health and Human Services, Centers for Disease Control and Prevention and National Cancer Institute; [www.cdc.gov/cancer/dataviz](http://www.cdc.gov/cancer/dataviz), released in June 2022.
3. Oates, Zaria; ABC24 News, Memphis, TN; Published: 2022-10-18; Accessed: 2022-10-28; <https://www.localmemphis.com/article/news/health/keeping-you-healthy/cancer-memphis-epa-meeting-oxide-eto-sterilization-environmental-the-epa-is-in-town-and-memphians-are-concerned/522-9d882ee4-1026-4c97-91de-a6c7723fee02>



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