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Scott County, VA
Suspected Pediatric Cancer Cluster Investigation Report
Update with Preliminary 2024 Data
By Virginia Cancer Registry

Introduction

In April 2025, the Virginia Cancer Registry (VCR) received an inquiry regarding a potential pediatric cancer cluster in Scott County, submitted through the Lenowisco Health District. VCR conducted a comprehensive investigation of pediatric cancer cases reported between 2014-2023 in collaboration with the Environmental Public Health Tracking Program, the local health department, and other VDH partners. Findings and recommendations were released in a final report posted on the VDH website and presented at a Scott County town hall meeting in January 2026.

Although findings did not suggest a pediatric cancer cluster in Scott County between 2014-2023, the published report recommended continued monitoring of pediatric cancer cases of 2024 and 2025 in light of community concerns. VCR recently completed and submitted its preliminary 2024 cancer data to the National Program of Cancer Registries (NPCR) and the North American Association of Central Cancer Registries (NAACCR), achieving approximately 90% data completeness. Therefore, this updated report examines cancer cases in the ten-year period between 2015-2024 in Scott County to determine if there is an increased incidence of pediatric cancer.

What is a Cancer Cluster?
According to CDC's *Guidelines for Examining Unusual Patterns of Cancer and Environmental Concerns,*[1] updated in 2022 after the passage of Trevor's Law, a cancer cluster is defined as a greater than expected number of the ***same or etiologically related cancer*** cases that occur within a group of people in a geographic area over a defined period of time. To be a cancer cluster, a group of cancer cases must meet all of the following criteria:

- **A greater than expected number:** When the number of observed cases is greater than typically observed in a similar setting.
- **Of the same or etiologically related cancer cases:** Cases are of the same type, are within a family of tumors (e.g., Ewing's family of tumors), or have a known or suggested link to the same specific environmental or chemical exposures. It is possible to consider

multiple cancer types when such a known exposure (e.g., radiation or a specific chemical) is linked to more than one cancer type or when more than one contaminant or exposure type has been identified.

- **Within a group of people:** The population in which the cancer cases are occurring is defined by its demographic factors (e.g., race, ethnicity, age, and sex).
- **In a geographic area:** The geographic area may be based upon pre-existing geopolitical boundaries (e.g., census tract, county, or ZIP code/ZIP code tabulation area).
- **Over a period of time:** The time frame used to establish the beginning and end dates for analysis. The time period chosen for analysis will affect both the total cases observed and the calculation of the expected incidence of cancer in the population.

Until these parameters are met, the group of cancer cases is often referred to as a **suspected cancer cluster.** When investigations of a suspected cancer cluster are undertaken, there are three main possible outcomes:

- In most cases, an investigation will show that the suspected cluster is not a true cancer cluster.
- Less often, an investigation finds a true cancer cluster, but no cause can be found.
- Rarely, an investigation finds a cancer cluster where the cause can be determined.

In a scientific review of over 500 cancer cluster investigations done over 20 years, only about 1 in 8 found a true increase in cancer rates, and in only one case was a clear cause for the increase found.[2]

Who conducts cancer cluster investigations?

The VCR conducts cancer cluster investigations, in close partnership with the relevant local health district, when a request is made by a local resident or local health district. The VCR also conducts routine cancer surveillance to monitor trends over time, including any increases in cancer rates. The VCR also collaborates with the Virginia Department of Health Environmental Public Health Tracking (EPHT) Program and Public Health Toxicology Program to address environmental concerns when needed.

Methodology

To provide a thorough evaluation of the unusual pattern of pediatric cancer in Scott County, cancer records from the Tennessee Cancer Registry were obtained in February 2026. Because the Surveillance, Epidemiology, and End Results (SEER) Program has not yet released 2024 population estimates in its software, VCR used 2024 population data from the U.S. Census Bureau for the cancer statistical analyses. With these data sources available, newly diagnosed pediatric cancers in 2024 were analyzed and the updated results are present in this report. Three new pediatric cancer cases were identified in 2024 using VCR's database, with diagnosis in Scott County, VA: two leukemia cases, and one pineal gland cancer case, which is a brain tumor. These three cases were reported in the community survey conducted by Lenowisco Health District. Previously investigated pediatric cancer types were not included as they did not meet

criteria for a cancer cluster nor were additional cases of those previous types found in VCR's database or the community survey in 2024. Therefore, this analysis focused on pediatric leukemia and brain and central nervous system (CNS) cancers. The updated 10-year study period for this report examines 2015–2024. In line with the 2022 CDC Guidelines, 10-year intervals are used to enhance statistical stability due to the small number of annual events in smaller geographic areas.

As per the previous report, the VCR applied the Standardized Incidence Ratio (SIR) test—recommended by the CDC —to each pediatric cancer site (type) in Scott County. Cancer sites are examined separately and are only combined when a strong environmental risk or other underlying cause has been identified to link them, in line with the 2022 CDC Guidelines. The SIR test is used to evaluate a potential cancer cluster by comparing the number of observed cases in a specific population, Scott County for this analysis, to the number of cases expected based on similar and broader population data, the Commonwealth of Virginia in this case.

Analysis Findings

A total of five cases were identified during 2015-2024 that met inclusion for the analyses. Of these, four cases were reported in the survey, and one additional was identified in VCR's database. The following describes the five cases included in the analyses:

- The age at diagnosis ranged from 1-12 years old
- 80% of patients are males
- 1 self-reported positive genetic findings that are associated with an increased risk of cancer.
- 75% of the leukemia cases were of the acute lymphoblastic leukemia (ALL) subtype.

Table 1 presents SIR results for each cancer type from 2015–2024. Each cancer site was analyzed independently, and then together due to some evidence for shared environmental risk factors for childhood leukemia and brain cancers (described further in the 'Environmental Concerns' section).

Table 1: Leukemia and Childhood Brain Cancer Cases, Age 0-19, Scott County, 2015-2024

Cancer Site	Observed Number of Cases in County*	Expected Cancer Cases*	SIR	95% CI
Leukemia	4	2	2.30	(0.10, 5.30)
Brain/CNS (including pineal)	1	2	0.84	(0.01, 4.30)
Combined Leukemia and Brain	5	3	1.70	(0.50, 7.30)
Data source: Cancer incidence data from VCR live database 1995-2024, extracted in March 2026; Population 2015-2023 from Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov); Population 2024 from U.S. Census Bureau, 2024 population estimate.				

*Rounded up to the nearest integer

All confidence intervals include 1, indicating no statistically significant excess for any cancer site and showing that the number of observed cases was not higher than what was expected. Because both observed and expected counts are small, the SIR is not recommended for interpretation, as the resulting estimates are unstable and imprecise. To strengthen verification, and consistent with the initial report, the Fisher's Exact Test was applied on the cancer counts, an approach that is best suited for data with fewer than five observations. Table 2 provides results from Fisher's Exact Test. The p-values exceed 0.05, indicating that the odds of developing pediatric leukemia and brain cancers in Scott County from 2015–2024 do not differ significantly from the odds for the rest of Virginia.

Table 2: Fisher's Exact Test for Leukemia and Childhood Brain Cancers

Fisher's Exact Test		
Cancer Site	**Odds Ratio**	**P-value**
Leukemia	2.30	0.10
Brain/CNS (including pineal)	0.84	1.00
Combined Leukemia and Brain	1.69	0.23
Data source: Cancer incidence data from VCR live database 1995-2024, extracted in March 2026; Population 2015-2023 from Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov); Population 2024 from U.S. Census Bureau, 2024 population estimate.		

Environmental Concerns

Since the conclusion of the January 2026 report, a map of previous addresses, where available, for 2015-2024 cases was reviewed to assess for unusual spatial patterns of cancer incidence to determine potential hypotheses for environmental exposures. Reported cancer cases were not concentrated in any specific area based on residency location. Additional community questions about the local environment (air quality, sewage sludge, Clinch River, etc.) were answered and posted in an updated FAQ. Based on a literature review showing some evidence of shared environmental risk factors, such as large doses of ionizing radiation and possibly pesticide exposure, contributing to the development of leukemia and brain/CNS cancer, the VCR combined childhood leukemia and brain/CNS cancer types for analysis. Given that evidence for environmental causes of brain tumors remain mixed, and the specific pediatric brain tumor in this analysis, a pineal gland tumor, is not known to be linked to clear environmental causes, the brain/CNS cancer and leukemia cases were also analyzed separately.[3–5] The VCR also considered looking at childhood leukemia cases separately, given the different risk profiles for acute lymphoblastic leukemia (ALL) and acute myeloid leukemia (AML). However, given that 75% of the leukemia cases in this investigation were of the ALL subtype, this finding is consistent with the prevalence of childhood leukemia subtypes. The American Cancer Society provides additional information about risk factors for childhood leukemia and brain tumors.

No epidemiological studies of potential environmental exposures have been conducted for the Scott County investigation, consistent with best practices for cancer cluster assessments when no common environmental exposure is suspected. We continue to follow the recommendation made in the January 2026 report: that the VDH does not advise additional environmental testing at this

time. If future circumstances warrant a review of environmental testing results related to nearby industrial facilities, the VDH Public Health Toxicology Program (toxicology@vdh.virginia.gov) is available to assist.

Interpretation

The goal of this investigation by the VCR and VDH was to determine whether there was an increased incidence of pediatric cancer in Scott County, and if so, to assess whether additional investigation to determine a common cause, such as an environmental exposure, should be undertaken. Although two additional leukemia cases and one new brain cancer were reported in 2024, statistical analysis of the cases reviewed showed that pediatric cancer rates for the cancer types analyzed in Scott County are not elevated, when assessed as individual cancer types or when cancer types were combined for analysis. Therefore, the cases assessed from 2015-2024 do not meet the definition of a cancer cluster.

Published literature and data were re-reviewed for potential environmental exposures impacting pediatric cancer rates. Review of the literature did not identify environmental risk factors that are strongly linked to the development of pineal gland tumors, the brain/CNS cancer assessed in this analysis. Review of the literature noted shared environmental risk factors, including high doses of ionizing radiation and pesticide exposure, associated with the development of leukemia and brain/CNS cancers. However, given that pediatric cancer rates for the cancer types analyzed in Scott County were not higher than expected, additional epidemiological investigation into a common environmental exposure was not pursued. More research is needed to better understand risk factors of childhood cancers. Cases were mapped geographically to assess for potential shared environmental exposure, but mapping did not show that cases were concentrated in any particular area.

Limitations

There are several issues that make cancer cluster investigations challenging. In this case, analyzing a small number of cases in the identified geographic area of Scott County impacted the precision of the standardized incidence ratio (SIR), the standard statistical analysis used in cancer cluster investigations. This limitation was addressed by performing a second statistical analysis, the Fisher's Exact test, to assess whether the odds of developing the cancer type in Scott County was higher than the rest of Virginia; however, this test did not show statistical significance (i.e., p-value >0.05). This cancer cluster investigation was limited to preliminary 2015-2024 data and did not include an assessment of cases from 2025, due to the normal lag in cancer registry data completeness. This limitation will be addressed through ongoing review of cases as 2025 data achieves completeness. Additionally, since cancers can have multiple causes, including genetic causes and one or more environmental exposures, identifying a causal exposure or risk factor across a group of cancers can be challenging.

Conclusions and Recommendations

Consistent with the findings from the initial report evaluating 2014–2023 data, the updated analysis of 2015–2024 pediatric cancer types showed no elevation of pediatric cancer rates. Therefore, there is no evidence of a pediatric cancer cluster or unusual pattern of pediatric cancer in Scott County. All recommendations from the January report remain, which are as follows:

1. VDH recommends continued assessment of Scott County pediatric cancer cases occurring in 2025 as part of this ongoing cancer cluster investigation. VDH expects 2025 cancer registry data to be 90% complete in spring 2027 and intends to update this report with preliminary 2025 data during that time. VDH will coordinate with state environmental and toxicology experts to monitor and respond to any additional environmental concerns. VDH will further engage federal partners, such as the CDC and/or Agency for Toxic Substances and Disease Registry (ATSDR) and pursue epidemiological investigation of environmental exposures as appropriate and in alignment with existing guidance on cancer cluster investigations. VDH intends to provide updates to the Scott County community as data analysis is completed for 2025.
2. VDH recommends community members follow the VDH recommended schedule for testing private well water and EPA recommendation for testing radon.
3. VDH does not recommend further epidemiological study of potential environmental exposures at this time, consistent with best public health practice for cancer cluster investigation.

VDH continues to thank the Scott County community during the ongoing assessment. VDH recognizes that each case reviewed represents a valued member of the Scott County community. To support access to information and services, resources listed below are taken from the January 2026 report. Community members may continue to contact the Lenowisco Health District at scottcancerinfo@vdh.virginia.gov for additional assistance.

Resources

American Cancer Society: Childhood Leukemia
https://www.cancer.org/cancer/types/leukemia-in-children.html

American Cancer Society: Brain Tumors in Children
https://www.cancer.org/cancer/types/brain-spinal-cord-tumors-children.html

ASK Childhood Cancer Foundation
https://www.askccf.org/

Blood Cancer United (formally Leukemia and Lymphoma Society):
https://bloodcancerunited.org/

Coalition Against Childhood Cancer https://www.cac2.org/ National Cancer Institute: Childhood Cancers
https://www.cancer.gov/types/childhood-cancers

National Cancer Institute, Childhood Cancer Data Initiative
https://www.cancer.gov/research/areas/childhood/childhood-cancer-data-initiative

National Cancer Institute: State Cancer Profiles (includes childhood cancer data)
https://statecancerprofiles.cancer.gov/

VDH Directory of Licensed Septic System and Private Well Service Providers
https://www.vdh.virginia.gov/environmental-health/onsite-sewage-water-services updated/septic-system-and-private-well-service-providers/

VDH Division of Onsite Water and Wastewater Services
https://www.vdh.virginia.gov/environmental-health/environmental-health-services/onsite sewage-water-services/

VDH Indoor Radon Program
https://www.vdh.virginia.gov/radiological-health/indoor-radon-program/

References

1. CDC. Cancer Characteristics, Definitions, and Recent Investigations. Unusual Patterns of Cancer, the Environment, and Community Concerns. January 31, 2025. Accessed December 5, 2025. https://www.cdc.gov/cancer-environment/php/guidelines/characteristics.html

2. Goodman M, Naiman JS, Goodman D, LaKind JS. Cancer clusters in the USA: What do the last twenty years of state and federal investigations tell us? *Crit Rev Toxicol*. 2012;42(6):474-490. doi:10.3109/10408444.2012.675315

3. Wachtel A. Pineal Tumors. Barrow Neurological Institute. Accessed April 27, 2026. https://www.barrowneuro.org/condition/pineal-tumors/

4. Pineoblastoma - Symptoms and causes. Mayo Clinic. Accessed April 28, 2026. https://www.mayoclinic.org/diseases-conditions/pineoblastoma/symptoms-causes/syc-20577723

5. Medulloblastoma - Symptoms and causes. Mayo Clinic. Accessed April 28, 2026. https://www.mayoclinic.org/diseases-conditions/medulloblastoma/symptoms-causes/syc-20579268