



PA HEALTH AND ENVIRONMENT STUDY: CHILDHOOD CANCER

WHO CONDUCTED THIS STUDY?

This observational epidemiological study was conducted by researchers from the University of Pittsburgh School of Public Health, contracted by the Pennsylvania Department of Health.

WHAT DID WE STUDY?

We studied the association between various environmental risk factors, such as unconventional natural gas development activities, and childhood cancer.

WHY WAS THIS STUDY DONE?

This study was done to add to Pennsylvanians' knowledge about the role of environmental risk factors in childhood cancer. It was specifically requested by residents in Southwestern Pennsylvania who have concerns about the risk of childhood cancer, including Ewing sarcoma, and unconventional natural gas development in their area.

WHO WAS IN THE STUDY AND WHERE WAS IT DONE?

We did not have to contact anyone for the primary arm of this study because we used existing health records. We specifically looked at records from eight counties in Southwestern Pennsylvania: Allegheny, Armstrong, Beaver, Butler, Fayette, Greene, Washington and Westmoreland. Records for people living within the City of Pittsburgh were excluded because the city does not allow unconventional natural gas development and, being a heavy urban environment, may have other risks factors dissimilar from the rest of Southwestern Pennsylvania.

WHAT INFORMATION DID WE USE FOR THIS STUDY?

We examined existing records provided by the Pennsylvania Department of Health on births from 1990 through 2019 and cancer from 2010 through 2019. We looked at records on four specific types of cancer in children: leukemia, lymphoma, brain tumors and bone cancers, which included Ewing sarcoma. We connected all of the data to proximity to unconventional natural gas development activities and other potential sources of environmental pollutants.

HOW MANY PEOPLE WERE IN THE STUDY?

Our study included records on 498 cancer cases in children born in the eight counties within the study area, each matched to a child of the same age, race and sex without cancer in the same county.

WHEN WAS THIS STUDY DONE?

We conducted our study from 2021 to 2023. We considered birth data from 1990 through 2019 and cancer diagnosis data from 2010 through 2019.

HOW WAS THIS STUDY CONDUCTED?

Each childhood cancer case identified within the eight-county region during the timespan in question was matched through birth certificate records to a child without cancer living in the same county. We then looked at how close each child lived to unconventional natural gas development and the density of active wells near their homes over time, as well as other activities, including impoundment ponds, compressor stations, toxic release inventory sites, and facilities accepting

oil and gas waste. We considered a child to be "unexposed" if they lived more than 5 miles from a well or other activity. Children living in various zones of proximity between 0.5 and 5 miles were analyzed as "exposed" groups. We used statistical analytics to compare outcomes between children with and without cancer and their level of exposure.

WHAT WERE THE RESULTS OF THE STUDY?

There were no associations between unconventional natural gas development activities and childhood leukemia, brain and bone cancers, including Ewing's family of tumors. Results indicated that children who lived within 1 mile of one or more wells had approximately 5 to 7 times the chance of developing lymphoma, a relatively rare type of cancer, compared to children who lived in an area without wells within 5 miles. Data suggest that those who lived closer to greater intensity of unconventional natural gas development activities had the highest risk. For perspective, the incidence of lymphoma is, on average, 0.0012% in U.S. children under 20 years of age. Our study estimates that rate would be 0.006% to 0.0084% for children living within 1 mile of a well.

There were also no associations between the other environmental hazards examined and any childhood cancers except for a suggestion of an association between Uranium Mill Tailing Remedial Action sites and brain tumors.

WHO PAID FOR THIS STUDY?

This study was funded by the Pennsylvania Department of Health.