

Regarding the study:

Possible association of oil and gas activity and childhood leukemia

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Statements from:

Dr. Larry Wolk, Chief Medical Officer and Executive Director of the Colorado Department of Public Health and Environment (CDPHE)

We support studies that evaluate the potential impact of environmental contaminants on public health, and certainly, Benzene exposure has been proven to increase risk of certain types of cancers, including leukemia. However, this study's conclusions are misleading in that the study questions a possible association between oil and gas operations and childhood leukemia; it does not prove or establish such a connection. The lack of a conclusive association is as a result of many limitations:

- 1) The study design relies on administrative data and does not take individual exposures to other potential cancer-causing substances into account.
- 2) The study compared leukemia cases to other cancer cases, rather than comparison to healthy people which makes findings more difficult to interpret.
- 3) The findings are driven by only 16 cases which significantly limits the strength of the finding.
- 4) The study did not adequately address additional or alternate explanations for findings, specifically differences in population demographics, smoking history and exposure to other environmental factors such as agricultural chemicals and traffic emissions.
- 5) The study did not account for resident mobility or full-address history during exposure time period - which could be as high as 66 percent based on previous studies.

As with all chemicals the critical factors are the exposure concentration and the length of time exposed. This is one of the main reasons CDPHE has been studying air quality in oil and gas basins for many years. CDPHE's analysis of air quality data in high oil and gas areas of Colorado spanning the last six years and encompassing more than 10,000 individual samples indicate benzene exposures are within EPA's generally acceptable cancer risk range and are similar to those of Denver. Exposure to benzene is among the reasons oil and gas emissions regulations were strengthened in 2014 making Colorado's the most stringent regulations in the country.

We evaluate all studies related to oil and gas activities and health in a systematic way to ensure we provide accurate, unbiased information to the public and stakeholders. At this point, CDPHE has evaluated two studies related to oil and gas exposure and childhood cancer, including this study. There is mixed evidence for whether or not living in proximity to oil and gas operations is associated with childhood hematological cancers, including leukemia. This means there is both supporting and opposing scientific evidence for this association.

This study highlights the continued need for measurements and analysis of air emissions in communities with a large oil and gas presence in order to further understand whether or not there is a risk for health effects. CDPHE is doing just that.

- There is a department program established to collect health concerns reported to us by people throughout the state. These health concerns are analyzed to evaluate trends.

- CDPHE investigates health concerns while working with local communities and the Colorado Oil and Gas Conservation Commission to ensure Colorado's high regulatory standards are being met by oil and gas operators.
- CDPHE performs air sampling of many substances, including benzene, in communities where O&G activity may be actively occurring and health concerns have been reported.
- CDPHE is using air emissions data from a recent Colorado State University study to perform a comprehensive health risk assessment.
- CDPHE evaluates scientific literature pertaining to oil and gas and health to provide accurate, unbiased information to citizens and stakeholders.

Citizens with health concerns or questions about oil and gas and health can contact the department Oil and Gas Health Information and Response Program at 303-389-1687 or online at www.colorado.gov/oghealth.