

New research identifies air pollution's role in childhood cancers—and how greenness might help mitigate it

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In a new study led by the University of Minnesota's Masonic Cancer Center and the U of M Medical School, researchers found that exposure

to air pollution and vegetation may impact childhood cancer development. The study was [published](#) in the *Journal of the National Cancer Institute*.

The population-based study, led by U of M Medical School Assistant Professor Lindsay Williams, MPH, Ph.D., in collaboration with U of M Institute for Health Informatics Assistant Professor David Haynes, Ph.D., examined over 6,000 children with cancer and 109,000 children without cancer in Texas.

The study found that from 1995-2011 increasing exposure to [fine particulate matter](#) (PM2.5) during the birth year increased the risk of developing any [childhood cancer](#) and specifically lymphoid leukemia, lymphoma, ependymoma, retinoblastoma and thyroid carcinoma.

"As a childhood cancer epidemiologist, I am always concerned with identifying factors that increase risk of cancer development in kids," said Dr. Williams. "There is growing evidence that [air pollution](#) during pregnancy and [fetal development](#) increases the risk of developing some diseases in children, including cancer." Williams noted that identifying particular exposures that could decrease the risk for developing childhood cancer has proven challenging in the past as there are very few of these that have been identified to date.

To that end, her team decided to examine environmental exposures that might reduce the risk of developing childhood cancers. To do so, they examined the association between residential greenness—or vegetation density around the home—and childhood cancer risk, as plants can remove up to 20% of PM2.5 from the air.

Findings indicate that increasing exposure to residential greenness reduced the risk of developing ependymoma and medulloblastoma—the two most commonly diagnosed malignant brain tumors in children.

These associations for PM_{2.5} and greenness also remained after accounting for both co-exposures in the team's statistical models, suggesting that these exposures independently modulate risk for some childhood cancers.

Williams and team stress that these exposures to air pollution, and conversely to greenness, are potentially modifiable risk factors that could be targeted as risk reduction and prevention strategies through policy measures and/or through changes in environment, such as planting more trees and vegetation.

Future work is underway to examine more specific timing of exposures during pregnancy and other air pollutants to better understand how the composition of air pollution, which is a complex chemical mixture, impacts childhood cancer development.

More information: Lindsay A Williams et al, PM_{2.5}, vegetation density, and childhood cancer: a case-control registry-based study from Texas 1995-2011, *JNCI: Journal of the National Cancer Institute* (2024). [DOI: 10.1093/jnci/djae035](https://doi.org/10.1093/jnci/djae035)

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