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New Report Shows Need to Reduce Exposure to Outdoor Air Pollutants in Children Residing in the Monongahela Valley, Allegheny County, Pa.

Air quality affects daily school absenteeism in students with asthma

Pittsburgh, Pa., - A recently published study that examines the influence of air quality on daily school absenteeism rates in the Mon Valley, Allegheny County, an environmental justice community, shows a significant increase in school absenteeism among students with asthma when outdoor air pollution levels are elevated.

The study, "<u>School absenteeism linked to PM2.5 and SO2 exposure in students with asthma from</u> <u>environmental justice areas with elevated AQI risk,</u>" was published in the International Journal of Environmental Health Research on April 22, 2025.

Preliminary results of the study were first reported at the 2021 annual meeting of the American Academy of Allergy, Asthma and Immunology and published in abstract form in the <u>Journal of Allergy</u> and <u>Clinical Immunology</u>.

"The significant impact of air pollution on increased school absenteeism in children with asthma found in our study underscores the importance of directing efforts to reduce exposure to outdoor air pollution in at-risk populations," said pediatric asthma specialist Dr. Deborah Gentile. "Inequities in childhood exposure to environmental pollutants can persist throughout life and disproportionately impact marginalized populations."

The study was conducted to evaluate the relationship between outdoor air pollution exposure and school absenteeism in children with asthma living near the U.S. Steel Clairton Coke Works in

Allegheny County. Daily absence rates were obtained from school records across three academic years, from 2015/2016 to 2017/2018. Student asthma diagnosis was obtained through a written parent/guardian report to the school nurse. The analysis was adjusted to account for confounding factors including the day of week, season, school closings/vacations, pollen counts and high heat index days.

The findings showed that students were exposed to fine particulate matter <2 ug diameter (PM2.5) levels surpassing the prior threshold for good air quality (>12 ug/m3) on more than one-third of the school days.

Additionally, there was an association between increased exposure to higher levels of sulfur dioxide (SO2) and PM2.5 and a risk of daily absenteeism among students with asthma. The relative risk of absenteeism in students with asthma was approximately 80% higher on days with higher SO2 exposure and 20% higher on the days following higher PM2.5 exposure. Chronic exposure to high levels of PM2.5 over the preceding month was also associated with a 20% relative risk of absenteeism in students with asthma.

The findings also showed an increased risk of school absenteeism in students with and without asthma on days with high heat index and pollen exposure, both of which have been increasing due to global warming.

The findings underscore the importance of directing efforts to reduce exposure to outdoor air pollution in at risk populations. Short-term and long-term exposure to air pollutants, particularly PM2.5 and SO2, significantly impacts school attendance among children with asthma in an underserved community with elevated exposure risk.

U.S. Steel Clairton Coke Works is home to the largest coke works facility in the United States and is located 0.6 miles from the Clairton school building which houses all elementary, middle school and high school students. Over 6,600 residents in Clairton live within two linear miles of the coke plant.

A <u>previous study</u> by Dr. Gentile showed high rates of asthma prevalence and poor disease control among elementary school students residing near point sources of outdoor air pollution, including the Clairton Coke Works.

Clairton is classified as an environmental justice community, which is an area disproportionately burdened by environmental hazards and pollution, often impacting the health and well-being of residents. Environmental justice communities are typically composed of people of color and those living in poverty, who face greater risks from environmental pollution and other injustices.

Authors of the Study

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