

Exposure to wildfire smoke late in pregnancy may raise autism risk in children

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ayawn@tulane.edu

985-285-7689



A study led by Tulane University found that children whose mothers were exposed to wildfire smoke during the third trimester had a higher risk of being diagnosed with autism before the age of 5. (Photo by Shutterstock)

Exposure to wildfire smoke during the final months of pregnancy may raise the risk that a child is later diagnosed with autism, according to a [new study](#) led by Tulane University researchers.

The study, published in [Environmental Science & Technology](#), analyzed more than 200,000 births in Southern California from 2006 to 2014. Researchers found that

children whose mothers were exposed to wildfire smoke during the third trimester were more likely to be diagnosed with autism by age 5.

The strongest association was observed among mothers exposed to more than 10 days of wildfire smoke during the final three months of pregnancy. In that group, children had a 23% higher risk of autism diagnoses compared to those whose mothers were never exposed to smoke from wildfires during pregnancy.

The study is the first to examine the potential link of prenatal wildfire smoke exposure and autism. The findings do not establish a conclusive link between prenatal wildfire exposure and autism but add to growing evidence of the adverse impact of air pollutants on fetal neurological development.

“Both autism and wildfires are on the rise, and this study is just the beginning of investigating links between the two,” said corresponding author Mostafijur Rahman, assistant professor of environmental health sciences at the Celia Scott Weatherhead School of Public Health and Tropical Medicine at Tulane University. “As climate change increases the frequency and intensity of wildfires in many parts of the world, understanding their relationship with autism is important to being able to develop preventive policy and interventions that will protect pregnant women and their children.”

The study focused solely on California, which leads the nation in both yearly acres burned by wildfire and rates of childhood autism diagnoses. It also comes one year after the Eaton and Palisades fires destroyed more than 16,000 structures in the second- and third-most destructive California wildfires on record, respectively.

Autism is a condition characterized by a range of divergent communicative, behavioral, and learning traits. Since 2000, the prevalence of autism diagnoses has increased each year, a trend often attributed in part to greater awareness and screening. Additionally, a growing body of research has linked prenatal exposure to air pollution with autism risk, with heavy metals in particles being a commonly theorized culprit.

Wildfires can cause high-concentration spikes of air pollution in a short amount of time. Burning vegetation and buildings release toxic metals and other pollutants that can be inhaled. Additionally, the fine particles that comprise smoke and air pollution can pose a threat regardless of toxicity. Inhalation of smoke can cause inflammation and stress.

In the study, mothers of children diagnosed with autism tended to be older, more likely to never have had a previous pregnancy, and had a higher prevalence of pre-pregnancy diabetes and obesity. Four times as many boys were diagnosed with autism as girls.

The potential association in the third trimester aligns with a [2021 Harvard University study](#) that also found a higher risk of autism in children linked to air pollution exposure during late pregnancy, a period marked by rapid fetal brain growth and development.

“Further study is needed to understand how wildfire smoke exposure to pregnant mothers could cause autism in their children, and to determine how exposure may interact with biology, genetics and other environmental exposures,” said lead author David Luglio, a post-doctoral fellow with the Celia Scott Weatherhead School of Public Health and Tropical Medicine. “This study is just one piece of a much larger puzzle, and the findings tell us there are more pieces to be put together.”

The study was conducted in collaboration with Kaiser Permanente Southern California, University of Southern California, Harvard University, and Sonoma Technology, Inc.