Climate change could increase ER visits for allergy-related asthma

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More children could wind up in hospital emergency rooms suffering from allergy-induced asthma if greenhouse gas emissions continue to rise and cause longer oak pollen seasons, according to a new study. Credit: CC0 Public Domain

More children could wind up in hospital emergency rooms suffering from allergy-induced asthma if greenhouse gas emissions continue to rise and cause longer oak pollen seasons, according to a new study.

The new research finds that if greenhouse gas emissions continue to increase through the end of this century, the oak pollen season in some areas could extend by up to eight days. People with oak pollen allergies, particularly children, will have longer exposure to pollen that can induce allergic asthma. That could increase the associated hospital emergency room visits for allergic asthma by 10 percent in the Midwest, Southeast,

and Northeast combined, the new study finds.

Allergic asthma associated with oak pollen sends more than 20,000 people to emergency rooms every year, and the increase in pollen could result in a 10 percent increase in hospital ER visits by 2090, according to the study's authors.

These additional ER visits would add an estimated $10.4 million to the $346.2 million cost that would be expected under baseline conditions through 2090, according to the new study published in *GeoHealth*, a publication of the American Geophysical Union.

"We found that the severe climate change scenario had a substantial impact on public health," said Susan Anenberg, an environmental scientist at Environmental Health Analytics, LLC, in Washington, D.C., and lead author of the new study.

The study is part of a growing area of research on the health impacts of climate change and the economic burden to individuals. Previous research has already shown that increased carbon dioxide in the atmosphere has caused ragweed, another strong allergen, to produce higher concentrations of pollen, according to the study's authors.

The new study could help doctors anticipate changes in allergic asthma as the climate changes, said Samantha Ahdoot, a pediatrician in Alexandria, Virginia, and assistant professor of pediatrics at Virginia Commonwealth University School of Medicine, who was not involved in the study.

"I would hope that this research would help the public and policymakers to understand that changes that occur in the environment, whether it is plant life or climate, trickle down and ultimately affect the health of people," she said.

In the new study, Anenberg and her colleagues calculated the number of emergency room visits for allergic asthma across the Southeast, Midwest, and Northeast today and in the future using observed relationships between oak pollen and asthma ER visits in Atlanta, Cincinnati, and New York City.

They found that there were 21,200 oak pollen-related allergic asthma ER visits in 2010. Of those visits, 70 percent were children under the age of 18, indicating that children may be more vulnerable to climate change-related health impacts, according to Anenberg.

The study's authors used climate models and known relationships between temperature, precipitation, and oak pollen to estimate the oak pollen season length under both a moderate climate change scenario and a severe climate change scenario.

Combining the emergency room visit and climate model information, the study's authors found that the most severe climate change scenario would increase ER visits in the three regions by 5 percent in 2050 and by 10 percent in 2090. Under a moderate climate change scenario, the number of visits would only increase by 4 percent, avoiding more than half of the emergency incidents in the severe scenario, the study found.

"The impact of oak pollen on human health in the United States is extensive and likely worsening over time with climate change," Anenberg said. "Our results could be underestimating a much bigger problem, since environmental changes could also affect other pollen types and other health outcomes."

More information: Susan C. Anenberg et al. Impacts of oak pollen on allergic asthma in the United States and potential influence of future climate change, *GeoHealth* (2017). DOI: 10.1002/2017GH000055

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