

Researchers identify connection between air pollutants and allergic diseases

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A study by researchers at National Jewish Health [published](#) in the *Annals of Allergy, Asthma & Immunology* reports that air pollutants—including particulate matter, pollen, greenhouse gases, and other harmful substances—can contribute to the development and exacerbation of allergic diseases by disrupting the skin barrier.

"People are aware of the connection between pollution and respiratory disease, but we wanted to take the next step and investigate how [global warming](#) is damaging our skin," said Donald Leung, MD, Ph.D., head of Pediatric Allergy & Clinical Immunology at National Jewish Health and senior author of the study. "We found that pollutants can damage the skin barrier and contribute to allergic diseases that can be passed on to future generations."

National Jewish Health researchers have long studied the individual diseases associated with the atopic march, a term that refers to the progression of allergic diseases that often begin with very young children having [atopic dermatitis](#) (eczema) and then developing food allergies, asthma, and [hay fever](#) over the years. This recent study builds on [previous research](#) from National Jewish Health that found a connection between a child's proximity to roads with high volumes of traffic and the development of atopic dermatitis.

"A baby's skin is susceptible to environmental hazards as its continuing to develop and adjust to its new environment outside of the womb," said Michael Nevid, MD, pediatric allergist and immunologist at National Jewish Health, and an author on the study. "Our research found that highly trafficked roads may have adverse ramifications on skin health in children, raising the risk of developing atopic dermatitis. This highlights the importance of having environmental interventions designed to decrease exposure to traffic in young children."

"Climate change and pollution have led to increased hay fever with longer allergy seasons and more allergenic plants. Pollens can be triggers for not only hay fever, but eczema and asthma too," said Jessica Hui, MD, pediatric allergist and immunologist at National Jewish Health, and author on the study. "Our skin barrier protects us from external threats and the best way to treat the atopic march is to take preventive measures."

Research has led to treatment advancements at National Jewish Health aimed at sealing the skin barrier and stopping the atopic march in its tracks—including [early biomarker identification](#) and "soak and seal" treatments that involve thoroughly moisturizing the skin in a warm bath, then trapping the moisture in with ointment.

While researchers continue to make progress in treating these conditions, the most effective approach to prevent allergic diseases resulting from [air pollutants](#) is to minimize exposure to these pollutants from an early age, keeping in mind that pollutants are not only present outdoors but also indoors as well. Researchers warn that there is a pressing need for a global policy initiative that prioritizes efforts to reduce air pollutant emissions and extremes of temperature.

More information: Byung Eui Kim et al, Air pollutants contribute to epithelial barrier dysfunction and allergic diseases, *Annals of Allergy, Asthma & Immunology* (2023). [DOI: 10.1016/j.anai.2023.11.014](https://doi.org/10.1016/j.anai.2023.11.014)

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