

An Environmental Health Lifeline

As a medical resident, **Lisa Maier, MD**, saw firsthand the cost of unsafe work environments. A factory caught fire, and the workers could not get out. "There were deaths, and there were also a lot of smoke inhalation injuries," Dr. Maier recalled. Seeing the toll on her patients made her wonder how she could combine her interest in workplace safety with lung health and immunology.



Lisa Maier, MD

Dr. Maier and her team apply their medical and research expertise to understand the effects of environmental exposures — and help make workplaces safer for our lungs. Her early work focused on

Now chief of the Division of Environmental and Occupational Health Sciences (DEOHS), Dr. Maier has spent the last 30 years improving understanding of the health impacts of exposures — from beryllium (a metal widely used in defense, energy and electronics industries) to coal dust and wildfire smoke.

beryllium. In the 1990s, the federal allowance of beryllium exposure in workplaces was the same standard set by the Atomic Energy Commission (AEC) in 1949. "We knew that standard wasn't protective," she said. Dr. Maier and others at National Jewish Health gathered data over decades, and in January 2017, the Occupational Safety and Health Administration (OSHA) passed an updated standard using this data.

Along with research, DEOHS works with specialties across the institution to help patients better understand what factors may be influencing their health. "Very few of the diseases we treat and diagnose don't have a relationship to an exposure," Dr. Maier said. "We provide a unique lens into the pieces of a person's life — and the exposures they may have had — that could aggravate, cause or worsen their disease."

This holistic approach has made DEOHS a one-of-a-kind resource for patients, industry and the medical science community. Because of this unique expertise, DEOHS has received prestigious recognitions and designations from the World Association for Sarcoidosis and Other Granulomatous Diseases and OSHA.





Recently, Dr. Maier led the launch of the Center for Environment, Climate and Health (CECH) at National Jewish Health. The new effort builds on our understanding of exposure-driven lung disease and is bringing clarity to the same question that DEOHS has been asking for decades, but on a bigger scale: *How is our environment affecting our health?*

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“We want to have a scientific rigor to make a connection,” she said. “You’ve got to be a bit of a detective.”

The challenge of connecting specific exposures to health outcomes is just an obstacle to making a life-changing difference for patients — whether they are miners, firefighters, factory workers or the rest of us. We now have the expertise to meet that challenge.

Evaluating the Health Effects of Indoor Air Quality

To evaluate how replacing gas with electric influences respiratory health, the Center for Environment, Climate and Health (CECH) at National Jewish Health is partnering with the city of Denver on its Healthy Homes project. The city is renovating 100 low-income households that have someone with respiratory disease, replacing gas-powered systems and appliances with electric, and the CECH is analyzing subsequent changes in health markers. Results will show whether gas-free homes are healthier homes, as previous studies have suggested.

“We know that the kinds of modifications we’re doing should improve air quality in the home, and we know that bad air quality hurts people, but connecting all these dots hasn’t been done before,” said **James Crooks, PhD**, director of data science and ambient exposure for the CECH.



James Crooks, PhD

Drs. Crooks and Maier will measure health markers before and after the home renovations, and follow up a year after to see what long-term changes participants experience. Dr. Crooks also plans to expand this research to evaluate the outcomes of different levels of interventions. For example, instead of full renovations, some participants would receive an indoor air filter, while others

would learn how to manage respiratory symptoms related to air quality. He hopes other cities and communities will apply this model to continue gaining insight into how much our health could improve by reducing or eliminating air pollution from homes.

