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## Big Study to Explore Long-Term Impact of Vaping, Pollution

— NHLBI puts up \$25 million to identify risk factors for chronic lung disease

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The long-term impact of vaping on the lungs and the impact of early-life air pollution exposures will be among the key focuses of a first-of-its kind federally funded, longitudinal study of lung health among millennials.

Researchers from Northwestern Medicine in Chicago, in partnership with the American Lung Association, plan to follow 4,000 healthy adults from the ages of 25 to 35 in an effort to gain further insights into the causes of chronic respiratory diseases common in later life.

The first 6 years of the study will be funded by a \$24.8-million grant from the National Heart, Lung, and Blood Institute.

A major goal will be to follow people from the time of peak lung health -- typically from the mid-20s to early-30s -- to better understand currently relevant risk factors for respiratory disease, said the study's principal investigator, Ravi Kalhan, MD, of Northwestern Medicine and Northwestern University Feinberg School of Medicine.

"One of the explicit scientific goals of our study is to evaluate exposures relevant today, as opposed to the late 1970s when prior studies were done," Kalhan told *MedPage Today*.

He noted that the landscape of tobacco product use and other exposures has changed dramatically since then. For example, cigarette smoking among adults in the U.S. dropped to 14% in 2017, which was the lowest level ever recorded; in 1980, that rate was approximately 33.2%.

Conversely, the use of electronic cigarettes has exploded within the last decade in the U.S. among teens and young adults. Use among teens increased by 78% in 1 year alone from 2017 to 2018.

"Vaping is one thing, but it's not the only thing," Kalhan said. "How millennials exercise, how they eat, pretty much everything they do is different. So we need to think about the future of public health in the context of 21st century behaviors."

The study will include young adults from across the U.S. who will undergo baseline chest imaging and low-dose CT scan. Participants will also complete questionnaires designed to examine early-life and contemporary environment and lifestyle, including smoking, vaping, marijuana use, alcohol consumption, exercise, and dietary intake.

Kalhan said early-life air pollution exposures will be assessed by matching information about where the subjects lived at various times with satellite estimates of air quality at those locations at these time points.

The subjects will also wear physical activity monitors at various times and self-report symptoms such as poor sleep and fatigue.

Although the initial grant is for 6 years, Kalhan said he expects the cohort to be followed for many more years and possibly throughout their entire lives.

Recruitment for the study is projected to begin in a little over a year, in late summer 2020.

Even though chronic lung disease is the fourth leading cause of death in the U.S., the cohort study will be among the first to examine "what someone who has a respiratory lung disease like COPD at age 60 actually looked like at age 30," Kalhan said.

"We check cholesterol because when we do that people have fewer heart attacks," he said. "We have developed a comprehensive public health agenda around prevention for cardiovascular disease. In respiratory disease, the only agenda for prevention we have had is telling people to stop smoking, and that is not enough."