

E-cigarettes significantly raise risk of chronic lung disease, first long-term study finds

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E-cigarette use significantly increases a person's risk of developing chronic lung diseases like asthma, bronchitis, emphysema or chronic obstructive pulmonary disease, according to new UC San Francisco

research, the first longitudinal study linking e-cigarettes to respiratory illness in a sample representative of the entire U.S. adult population.

The study also found that people who used e-cigarettes and also smoked [tobacco](#)—by far the most common pattern among adult [e-cigarette](#) users—were at an even higher risk of developing [chronic lung disease](#) than those who used either product alone.

The findings were published Dec. 16, 2019 in the *American Journal of Preventive Medicine* and are based on an analysis of publicly available data from the Population Assessment of Tobacco and Health (PATH), which tracked e-cigarette and tobacco habits as well as new lung disease diagnoses in over 32,000 American adults from 2013 to 2016.

Though several earlier population studies had found an association between [e-cigarette use](#) and lung disease at a [single point](#) in time, these so-called cross-sectional studies provided a snapshot that made it impossible for researchers to say whether lung disease was being caused by e-cigarettes or if people with lung disease were more likely to use e-cigarettes.

By starting with people who did not have any reported lung disease, taking account of their e-cigarette use and smoking from the start, and then following them for three years, the new longitudinal study offers stronger evidence of a causal link between adult e-cigarette use and lung diseases than prior studies.

"What we found is that for e-cigarette users, the odds of developing lung disease increased by about a third, even after controlling for their tobacco use and their clinical and demographic information," said senior author Stanton Glantz, Ph.D., a UCSF professor of medicine and director of the UCSF Center for Tobacco Control Research and Education.

"We concluded that e-cigarettes are harmful on their own, and the effects are independent of smoking conventional tobacco," Glantz said.

Though current and former e-cigarette users were 1.3 times more likely to develop chronic lung disease, tobacco smokers increased their risk by a factor of 2.6. For dual users—people who smoke and use e-cigarettes at the same time—these two risks multiply, more than tripling the risk of developing lung disease.

"Dual users—the most common use pattern among people who use e-cigarettes—get the combined risk of e-cigarettes and conventional cigarettes, so they're actually worse off than tobacco smokers," said Glantz.

This finding is particularly relevant as the debate continues to rage over whether e-cigarettes should be promoted as a harm-reduction tool for smokers. While the authors found that switching from smoked tobacco to e-cigarettes lowered the risk of developing lung disease, fewer than 1 percent of the smokers had completely switched to e-cigarettes.

"Switching from conventional cigarettes to e-cigarettes exclusively could reduce the risk of lung disease, but very few people do it," said Glantz. "For most smokers, they simply add e-cigarettes and become dual users, significantly increasing their risk of developing [lung disease](#) above just smoking."

Importantly, the results reported in this study are unrelated to EVALI (E-cigarette or Vaping Product Use-Associated Lung Injury), the acute [lung disease](#) first reported last summer, severe cases of which sent several e-cigarette users to the hospital and others to an early grave. Though scientists are still working to determine the cause of EVALI, prior physiological studies in both animals and humans found that e-cigarettes suppress the immune system and increase the levels of stress-related

proteins in the lungs. And chemical analyses showed that e-cigarettes contain higher levels of certain toxic chemicals than conventional cigarettes. But the new study shows that these are not the only health threats posed by e-cigarettes.

"This study contributes to the growing case that e-cigarettes have long-term adverse effects on health and are making the tobacco epidemic worse," said Glantz.

More information: *American Journal of Preventive Medicine* (2019). [www.ajpmonline.org/article/S07 ... \(19\)30391-5/fulltext](http://www.ajpmonline.org/article/S07... (19)30391-5/fulltext)

Provided by University of California, San Francisco

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