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HEALTH

Disposable vapes more toxic and carcinogenic than cigarettes, study shows

Researchers found hazardous levels of lead, nickel and antimony in popular disposable e-cigarettes



By Ashley J. DiMella · Fox News

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Illegal disposable e-cigarettes, also known as vapes, may present a greater danger than traditional cigarettes, according to a study from the University of California (UC) Davis.

The research, published in the journal ACS Central Science, found that hazardous levels of several toxic heavy metals in illegal vapes could present a high [cancer risk](#).

Researchers used a special instrument to test the puffs from three popular vape brands — ELF Bar, Flum Pebble and Esco — that are not FDA-authorized for use in the U.S., but are widely sold by retailers.

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Three heavy metals — lead, nickel and antimony — were detected in all heavily flavored and lightly flavored devices that were tested.

These metals are classified as carcinogens, potentially leading to various types of cancers, such as skin, lung and kidney, according to the National Institutes of Health (NIH).



UC Davis researchers have discovered high levels of toxic metals in some popular disposable vape brands. (iStock)

All vapors exceeded the cancer risk limits for nickel, which has been linked to [cardiovascular disease](#), asthma, lung fibrosis and respiratory tract cancer, per NIH.

Brett Poulin, senior study author and assistant professor at the UC Davis Department of Environmental Toxicology, told Fox News Digital that he was shocked at the levels of toxic metals.

"When I analyzed the first samples, the lead concentrations were so high that I genuinely thought the instrument was broken," he said. "The levels far exceeded anything in our past data, or even the published literature."

YOUR FAVORITE ALCOHOLIC BEVERAGE COULD BE LINKED TO DEADLY FORM OF CANCER, STUDY FINDS

One of the brands tested exposes users to as much lead [as smoking](#) 19 packs of cigarettes, the researchers discovered.

Additionally, most of the disposable e-cigarettes tested in the study were found to contain greater levels of metals and metalloids than older refillable vapes.



After evaluating about a week's worth of puffs, the researchers determined that lead, nickel and antimony were detected in all tested vapes. (iStock)

At one point, Poulin said, he physically opened a device and discovered that it was using leaded copper alloys, which are metals made primarily of copper with small amounts of lead.

"These materials leached dangerous levels of lead into the e-liquid, even without the device being used," Poulin told Fox News Digital.

"It remains unclear whether this was an intentional design choice, a cost-cutting measure or a manufacturing oversight."

"This neurotoxin poses serious health risks, particularly to children and adolescents."

There is no known safe level of lead exposure, according to Poulin.

"This neurotoxin poses serious health risks, particularly to [children and adolescents](#), who are especially vulnerable."

Daniel Stermann, M.D., director of the Pulmonary Oncology Program at the NYU Langone Perlmutter Cancer Center, told Fox News Digital that the study "clearly" demonstrates high concentrations of metal.



Men were found to be more likely to vape than women, according to the CDC. (iStock)

"There are several health risks of vaping that we enumerate for our patients and their family members, [such as] risks of various [lung diseases](#), including asthma, COPD and lung cancer," said Sterman, who was not involved in the study.

The doctor noted that while it is challenging to establish a direct link of causation between disposable vapes and cancer, he does see [cancer patients](#) who use the devices.

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"Disposable vapes should be highly regulated by local, state and federal agencies, and restricted to those individuals 21 years or older," Sterman recommends.

The doctor also called for the packaging on disposable vapes to clearly outline the many health risks, "particularly to teenagers and young adults."

Potential limitations

One of the primary limitations of the study was that only three disposable e-cigarette brands were tested out of the hundreds currently on the market.

There are distinct differences in the metal leaching and profiles across all three brands, Poulin shared.



The Center for Disease Control (CDC) found that the percentage of adults who used electronic cigarettes increased from 4.5% in 2019 to 6.5% in 2023. (iStock)

"We still know very little about the metal content in the vast majority of untested disposable e-cigarette products," he said. "This gap in knowledge poses a significant [public health](#) concern, especially given the popularity of these devices."

A spokesperson for the China-based brand, ELFBAR, told Fox News Digital that they refute the results of the study, claiming that they stopped shipments in May 2023.

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Due to ongoing trademark litigation, they are unable to market or sell products in the U.S., the company stated.

"This market void has led to a surge in counterfeits, imitations and illicit variations misusing our brand name," the spokesperson said. "As such, we have every reason to believe the devices tested in this study are not genuine and were not manufactured by ELFBAR."



Many disposable vapes that are not FDA-authorized for use in the U.S. are widely sold by retailers. (Mike Kemp/In Pictures via Getty Images)