

Believe It or Not, 1 Vape has 20 Cigarettes Worth of Nicotine

Vape cartridges can easily have the nicotine content of three cartons or 600 cigarettes. Does this mean vaping is worse than smoking? A UCSF professor unpacks the topic and other surprising facts.

January 14, 2025 By University of California San Francisco and Laura López González

More than 1.6 million U.S. middle and high school students reported vaping in 2023, and nearly 90% used flavored vapes. But America's youth vaping epidemic may be no accident.

UC San Francisco Professor of Medicine [Pamela Ling](#), MD, MPH, is the Director of the [UCSF Center for Tobacco Control Research and Education](#). The center studies tobacco, including industry marketing to understand how its tactics shape people's health. Big tobacco owns many of the top vape manufacturers.

Ling explains why vapes are more addictive than ever before – and why regulating them is so tough.

How potent are vapes?

Almost a decade ago, the average vape cartridge had the nicotine content of about a pack of cigarettes or 20 cigarettes. These days, popular vapes can easily have the nicotine content of three cartons or 600 cigarettes.

To make it possible to inhale such strong concentrations of nicotine, vape maker Juul Labs added acids to its vapes in 2015 to make “nicotine salts.” The salts reduce adverse reactions like throat burning and coughing. Today, the most popular disposable vapes use that technology, so vapes are stronger than ever.

Is vaping safer than smoking cigarettes?

We don't know for sure. I think we can feel pretty confident that vaping exposes you to fewer chemicals and toxins than smoking cigarettes.

Observational studies have found that for lung disease, the risk associated with vaping does seem

to be reduced when compared to cigarettes. But for cardiovascular disease the risks were no different than smoking.

And we don't have definitive data on whether vaping causes less lung cancer than cigarettes. We hope that it does, but it takes 10 to 20 years for someone to develop lung cancer, so it's too soon to have this kind of data.

Why are so many people worried about vaping in kids and young adults?

In the U.S., rates of vaping are higher among youth than older adults. We're concerned about adolescents or kids vaping in part because we know vapes deliver nicotine exceptionally efficiently. The earlier you are exposed to nicotine, the more likely you are to become addicted – and that's true of all substances because your brain is still developing up until 25 years old.

Courtesy of ucsf.edu

How does vaping affect young people's health?

Teens who vape are 3 to 5 times more likely to start smoking cigarettes than their peers. They also have higher rates of asthma-like respiratory symptoms and report more mental health challenges.

You study how marketing shapes vaping in America. What makes vapes so attractive to kids and young adults?

For decades, cigarette ads were designed to appeal to targeted audiences like women, people of color and young people. Cigarette companies would sponsor concerts and sporting events so that young people would associate smoking with social life. Today, thanks to regulation, cigarette brands can't sponsor those types of events. But because vapes are not cigarettes, they've been able to do sponsorships, giveaways and other kinds of really appealing advertising that's no longer allowed for cigarettes.

And vapes, for a long time, have been marketed like pieces of technology to escape the negative connotations young people have towards traditional cigarettes.

Lastly, a lot of vapes are advertised on social media, where it's very hard to regulate. Juul is a great example: That company deliberately sought out social media influencers to talk about their products and use them; the company gave away thousands of free Juuls at parties — they manufactured a trend.

Why are flavored vapes bad?

Vapes come in thousands of flavors, and some are really appealing, like bubble gum, crème brûlée, and chicken and waffles. Even if teens aren't interested in nicotine, just curiosity about the flavors can be enough to entice them. Because vapes deliver nicotine efficiently, it doesn't take long to get addicted.

How has the FDA tried to reduce kids' access to vapes?

Currently, the U.S. Supreme Court is grappling with the latest in a string of court cases brought by vape and e-cigarette makers to challenge the Food and Drug Administration's (FDA) ability to regulate the products.

When the FDA started regulating tobacco in 2009, it had no authority over electronic cigarettes. It took until 2016 for the FDA to gain the authority to regulate the sale, advertising and distribution of e-cigarettes.

Technically, the FDA must approve all vapes before they can be marketed. But the FDA has only approved 34 vape products out of the hundreds publicly available.

The FDA sends warning letters to companies doing particularly bad things, like those selling vapes that looked like toys, video games and highlighter markers. But it's challenging because there are so many kinds of vapes. Companies exploit loopholes in regulations, and regulations haven't kept up.

UCSF is home to the Truth Tobacco Industry Documents, the world's largest archive of previously secret Big Tobacco papers. How are researchers using these to uncover new insights into tobacco industry tactics?

Right now, the Center for Tobacco Control Research and Education is one of the first research bodies to begin digging into the recently acquired Juul documents. We're looking at those papers and other companies' collections housed in the archive to uncover how companies' tactics exacerbate health inequalities using targeted marketing or attempts to influence community leaders.

We're also examining papers to see how the industry influenced scientific research and policies and how that impacted communities that are already disproportionately affected by tobacco's health impacts.

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