

Date: Saturday, June 23, 2018 02:05PM

Subject: AUSTRALIA FINES eCIG COMPANIES A\$175K FOR MAKING FALSE HEALTH CLAIMS

Legco
Panel Health Services

Dear Hon Members,

To date no electronic cigarette device nor e-juice has been submitted to, nor approved by, nor certified by any Government Regulatory Body worldwide.

The latest West et al longitudinal study report from UK, which studied the (non) effectiveness of e-cig use by almost 200,000 adults over a ten year period shows e-cigs were ineffective in reducing smokers' use and prevalence of cigarettes.

Other reports from McNeil et al in UK and McRobbie et al in New Zealand showed that e-cigarettes were not effective for smoking cessation.

Yet West, McNeil and McRobbie are avid promoters of e-cigarettes for reasons best known to themselves. They should read their own studies which prove e-cigarettes are ineffective for smoking cessation.

Industry use of Human Lab Rats for profit

The industry seeks to profit by BS marketing their defective and dangerous non-explosion-proof nor fire-safe products as being 'less harmful' than cigarettes - without any independent proof or evidence to show that the additional toxins created by thermal decomposition of e-juice flavors into aldehydes, glycidol, acetaldehyde, formaldehyde, acrolein, propylene oxide, high levels of nickel and chromium heavy metals and other dodgy emissions can be safe for human consumption and inhalation, where in fact evidence exists to show use of these unsafe products can lead to DNA mutations, bladder cancer, endothelial cell wall damage, CVD, COPD and numerous respiratory diseases, that will end up being treated at taxpayer expense as well as renormalizing smoking.

The reality is that the vaping industry knows its products are toxic and knows they can never pass any NRT testing, nor legally advertise 'smoking cessation' or 'harm reduction' claims.

The available independent scientific evidence proves the opposite.

Given the current level of freely available scientific evidence on e-cigarette dangers, proven youth Gateway to combustibles and joint usage, it would be criminally remiss and a breach of duty of care for any regulatory health body to condone or licence the usage of such unsafe products. Indeed the Health Bureau seems to be ignoring the guidance of the Chief Executive on **health prevention**.(attached)

The head-in-the-sand Health Bureau needs to listen to the voices of the medical professionals and the available scientific evidence and ban electronic cigarettes; meanwhile do their job and transpose the requirements of the FTC Treaty into local legislation. Then apply the Treaty requirements fully and find some political will.

Yours sincerely,

James Middleton
Chairman
<http://cleartheair.org.hk>



RTHK Radio 3 Back Chat Transcript

7 March 2017 between 0830-0900 http://podcast.rthk.hk/podcast/item_epi.php?pid=177
Starting at 23.55 on the podcast. 2338-8266/backchat@rthk.hk

RTHK Hosts: Hugh Chiverton and Aida Wong

Dr Judith Mackay:

I would like to ask Mrs Lam about her health platform.

The problem is that in the past, and for example in the budgets, many have seen improvements of health in terms of more hospital beds, which of course will never solve the problem of improving Hong Kong's health.

I am particularly interested in Carrie's manifesto on the **provision of preventive health (and of course in my case, particularly that of tobacco control!)**

Carrie Lam:

Thank you very much, Judith, for that observation on my manifesto.

In fact, it also relates to my new fiscal philosophy, **because in my new fiscal philosophy I advocate that how we spend money actually helps to relieve future fiscal burden.**

So, I actually gave the example of medical services. I said that in fiscal terms, **if we are more willing and ready to spend money on the preventive side it actually reduces the need for subsequent hospital costs. That has been proven all over the world, and there is no reason why Hong Kong should not adopt that practice. In fact, I was a bit disappointed that we have not moved more to the preventive side.**

In 1990, 27 years ago, I helped to produce a report on the review of Hong Kong's Primary Health Care called Health for All by the Year 2000. **We already then advocated that more money, more resources, more attention should be shifted from secondary and tertiary care to primary care. But unfortunately, that has happened a bit, but not enough.**

So, my health manifesto is really to change that whole approach in order to put more attention on (versus) health promotion and disease prevention. And secondly is to promote cross-sector, cross-discipline collaboration.

For example, we are going to shortly introduce a programme on a pilot basis, to look after dementia elderly. Not in a hospital setting, not in a specialist clinic setting, but in a community care setting, by inviting the NGOs in the welfare sector, making use of their network of district elderly community centres, to take care of dementia elderly, with some supervision from the Hospital Authority psychiatric doctors and so on. I see a lot of potential in that sort of collaboration model, and also to do more in terms of community and also home care.

That is why in my manifesto, not exactly in the medical section, I have suggested that where I could find land in the various districts, I want to build more community centres for healthy ageing.

So young elders are more than welcome to come into the community centres to do exercise, to learn more about good diet, maybe to cease the smoking habit, and so on and so on, so as to keep them as healthy as possible in the community.

Hugh Chiverton, RTHK: Dr Mackay, thank you very much. [END]

CARRIE LAM QUOTE ON HEALTH PREVENTION MEASURES



ELECTRONIC CIGARETTES AND YOUTH

A significant number of youth are using electronic cigarettes (e-cigarettes)*, which provide a relatively new way to deliver the addictive substance nicotine without burning tobacco. The number of youth using e-cigarettes is alarming and raises serious concerns that e-cigarettes could be an entryway to nicotine addiction and use of regular cigarettes for some kids. While it is still an open scientific question whether e-cigarettes might be able to help adult smokers give up cigarettes, kids should not be using any tobacco product, including e-cigarettes. A 2016 report of the Surgeon General stated that “e-cigarette use among U.S. youth and young adults is now a major public health concern.” The Surgeon General noted that while we continue to learn more about e-cigarettes, “we currently know enough to take action to protect our nation’s young people from being harmed by these products.”

E-Cigarette Use Among Youth

According to the National Youth Tobacco Survey (NYTS), released by the U.S. Centers for Disease Control and Prevention (CDC) and the Food and Drug Administration (FDA), e-cigarettes have been the most commonly used tobacco product among youth since 2014. In 2017, 11.7 percent of high schoolers and 3.3 percent of middle schoolers reported current use of e-cigarettes. Among high school students, e-cigarette use increased from 1.5 percent in 2011 to 11.7 percent in 2017, peaking at 16.0 percent in 2015. According to the 2017 NYTS, over 1.7 million high school students and 390,000 middle school students currently use e-cigarettes. Since the survey also found that over 1.3 million youth smoke cigarettes, this means that at least 750,000 current e-cigarette users do not smoke cigarettes.¹

The same survey found that among those students who had used e-cigarettes in the past 30 days in 2014, 15.5 percent of high schoolers and 11.8 percent of middle schoolers were frequent users of e-cigarettes, using e-cigarettes on at least 20 of the preceding 30 days. This amounts to an estimated 340,000 middle and high school students who were frequent users of e-cigarettes. More than a quarter of high school e-cigarette users had used e-cigarettes on at least ten days in the previous month.²

Data from the 2015 NYTS shows that 13.1 percent[†] of high school students who have never used another tobacco product have tried e-cigarettes.³ Similar patterns exist for young adults; the 2014 NHIS data found that nearly 10 percent of 18 to 24 year olds who have never smoked cigarettes had tried an e-cigarette.⁴

There is concern that use of e-cigarettes may function as a gateway to the use of more dangerous, combustible tobacco products. In 2016, the Surgeon General concluded that while more research is needed, evidence from several longitudinal studies suggests that e-cigarette use is “strongly associated” with the use of other tobacco products among youth and young adults, including conventional cigarettes.⁵ Reviewing a more recent and larger evidence base, a 2018 report by the National Academies of Science, Engineering and Medicine (NASEM) found the effect of e-cigarette use on cigarette smoking initiation to be causal, concluding that “There is substantial evidence that e-cigarette use increases risk of ever using combustible tobacco cigarettes among youth and young adults.” The NASEM report also concluded, “There is moderate evidence that e-cigarette use increases the frequency of subsequent combustible tobacco cigarette use” among youth and young adults.⁶ In addition, several studies find that the link between e-cigarette use and smoking initiation was stronger for those who had *lower* risk factors for smoking at baseline.⁷

The e-cigarette marketplace continues to change rapidly. According to the 2015 NYTS, the majority (53.4%) of youth e-cigarette users report using a rechargeable or refillable e-cigarette.⁸ More recently, sales of e-cigarettes with replaceable nicotine pods (such as [JUUL](#)) have increased dramatically.⁹ Some

* The term “electronic cigarette” covers a wide variety of products now on the market, from those that look like cigarettes or pens to somewhat larger products like “tank systems” and “closed system” products like JUUL.

† Based on earlier data, CDC researchers reported that the number of youth who had used e-cigarettes, *but had never smoked a regular cigarette*, increased from 79,000 in 2011 to more than 263,000 in 2013. These same data for 2016 have not been released for youth.

other e-cigarette devices allow the user to modify the device and nicotine content of the e-liquid used. While national data are not available, a recent study found that more than a quarter (26.1%) of Connecticut high school students who have ever used e-cigarettes have tried “dripping,” a process by which the users drips e-liquid directly onto the atomizer’s coil and inhales the vapor produced. Youth who had tried dripping reported doing so to produce bigger clouds of vapor, make the flavor taste better, or create a stronger throat hit.¹⁰

Flavored E-Cigarettes Attract Youth

The 2016 Surgeon General report stated that, “E-cigarettes are marketed by promoting flavors and using a wide variety of media channels and approaches that have been used in the past for marketing conventional tobacco products to youth and young adults.”¹¹ Cigarettes with specific characterizing flavors were prohibited in the U.S. on September 22, 2009, as part of the Family Smoking Prevention and Tobacco Control Act. However, this prohibition did not apply to other tobacco products, including e-cigarettes, which come in flavors with obvious youth appeal such as gummy bear, cotton candy, and fruit punch.¹² As of 2017, researchers had identified more than 15,500 unique e-cigarette flavors available online.¹³ An earlier study of e-cigarette flavors found that among the more than 400 brands available online in 2014, 84 percent offered fruit flavors and 80 percent offered candy and dessert flavors.¹⁴ In addition to the vast selection available online, thousands of “vape” shops have now opened throughout the country that allow consumers to sample and purchase refill liquids, including a combination of flavors chosen by the user.¹⁵

Research shows that flavored products are not only popular among youth, but may play a role in initiation and uptake of tobacco products. Data from FDA’s 2013-2014 Population Assessment of Tobacco and Health (PATH) survey found that 81 percent of youth aged 12-17 who had ever used e-cigarettes had used a flavored e-cigarette the first time they tried the product, and that 85.3 percent of current youth e-cigarette users had used a flavored e-cigarette in the past month. Moreover, 81.5 percent of current youth e-cigarette users said they used e-cigarettes “because they come in flavors I like.”¹⁶ While the methodology is not comparable to the PATH study, an analysis of the 2015 NYTS found that 44.6 percent of middle and high school e-cigarette users—totaling 1.26 million youth—had used a flavored e-cigarette in the past month.¹⁷

E-Cigarette Marketing Reaches and Appeals to Youth

The Surgeon General concluded that, “Themes in e-cigarette marketing, including sexual content and customer satisfaction, are parallel to themes and techniques that have been found to be appealing to youth and young adults in conventional cigarette advertising and promotion.”¹⁸ By mimicking the tobacco industry’s strategies, including celebrity endorsements, slick TV and magazine advertisements, and sports and music sponsorships, e-cigarette advertising has effectively reached youth and young adults. The 2016 NYTS found that 78.2 percent of middle and high school students—20.5 million youth—had been exposed to e-cigarette advertisements from at least one source, an increase from 68.9 percent in 2014.¹⁹ Another study found that 82 percent of 12-17 year olds and 88 percent of 18-21 year olds reported seeing e-cigarette advertising in 2015.²⁰ The investment in e-cigarette marketing has been coupled with an increase in use among youth and young adults. A 2016 study in *Pediatrics*, analyzing 2014 NYTS data, found that exposure to e-cigarette advertising is associated with current e-cigarette use among youth and that greater exposure to e-cigarette advertising is associated with higher odds of use.²¹

Unlike cigarette and smokeless tobacco companies, e-cigarette companies are not currently required to report their marketing and promotional expenditures to the U.S. Federal Trade Commission (FTC), so the exact amount spent to advertise and promote these products is uncertain. However, e-cigarette marketing expenditures are estimated to have increased dramatically in the early years, from \$12 million in 2011 to \$125 million in 2014.²² Other studies have also documented this significant increase in spending.²³ These figures likely underestimate the true extent of e-cigarette advertising, as the available marketing data are not comprehensive (e.g., social media and sponsored events—strategies widely used by numerous e-cigarette companies—are not included).

An investigative report released in April 2014 by 11 members of Congress²⁴ provided detailed evidence that e-cigarette manufacturers resurrected the marketing practices used by tobacco companies for

decades to attract kids to smoking – including some tactics that have been prohibited for tobacco companies precisely because they appealed to kids. While cigarette advertising has been absent from TV and radio since 1971, TV advertising was the second highest tracked marketing expense among e-cigarette manufacturers in 2014. According to the Truth Initiative report, expenditures on e-cigarette television advertising totaled \$25.5 million in 2014.²⁵ These ads were strategically targeted to reach youth through network placement on television stations with clear youth appeal such as Comedy Central, ABC Family and MTV.²⁶ A study in *Pediatrics* found that from 2011 to 2013, exposure of youth aged 12-17 to e-cigarette advertisements on TV increased by 256 percent.²⁷ This same study estimated that e-cigarette advertisements may have reached an audience of up to 24 million youth. Research shows that these ads are effective—a randomized trial exposing adolescent e-cigarette non-users to such ads showed that they led to 50 percent higher intentions to use e-cigarettes.²⁸

In addition, youth are exposed to e-cigarette marketing at the point of sale. In 2012, nearly one-third of retailers sold e-cigarettes, with availability greatest in convenience stores and drug stores.²⁹ According to the 2016 NYTS, over two-thirds (68.0%) of middle and high school students had been exposed to e-cigarette advertisements in retail stores, the most common source of exposure to e-cigarette marketing.³⁰

Other tactics used by e-cigarette manufacturers to reach youth have included magazine ads that reach youth audiences; sponsorships and free samples at youth-oriented events such as auto races and music festivals; celebrity spokespeople who depict e-cigarette smoking as glamorous; and sweet, kid-friendly flavors with names like Cherry Crush, Chocolate Treat, Gummy Bear and Cotton Candy. The Congressional report found that many of the e-cigarette companies have also used social media to promote their products. E-cigarette companies market extensively on product websites and maintain a strong presence on social media sites popular among youth, like Facebook, YouTube, Instagram, and Twitter.³¹ One study found nearly 74,000 tweets about e-cigarettes in just a two month period, most of which were sent by a few commercial enterprises.³² E-cigarette manufacturers have also placed ads on search engines and websites that focus on music, entertainment, and sports and which often have substantial youth and young adult audiences.³³ The companies rarely take steps to effectively prevent access to these websites by minors, as evidenced by data from the 2016 YTS, which found that 40.6 percent of high school students had been exposed to e-cigarette advertisements online.³⁴ Another research study found that 40 percent of teens (ages 13-17) had seen e-cigarette advertisements online always, most or some of the time.³⁵

Health and Public Health Concerns

Under the right circumstances, e-cigarettes could benefit public health if they help significantly reduce the number of people who use conventional cigarettes and die of tobacco-related disease. However, many questions remain about the long-term health effects of these products and their effectiveness in helping smokers quit.³⁶ While we have much to learn about these new products, the evidence is already clear that it is unsafe for young people to use e-cigarettes or any other product containing nicotine.

As stated by the Surgeon General, “E-cigarette use poses a significant – and avoidable – health risk to young people in the United States. Besides increasing the possibility of addiction and long-term harm to brain development and respiratory health, e-cigarette use is associated with the use of other tobacco products that can do even more damage to the body.”³⁷

Poisoning and Exposure to Liquid Nicotine. Delivered in high doses, nicotine can be lethal. The Surgeon General's report and the NASEM report both found that contact with e-liquids can cause adverse health effects and ingesting e-liquids can lead to death.³⁸ Exposure to liquid nicotine found in e-cigarettes has resulted in thousands of calls to poison control centers in recent years, peaking in 2014, according to the American Association of Poison Control Centers (AAPCC).³⁹ In 2014, more than half of these calls to poison hotlines were to report exposures among children under the age of six.⁴⁰ To begin to address the poisoning risk that e-cigarettes and liquid nicotine pose to young children, in 2016 Congress passed the Child Nicotine Poisoning Prevention

Number of calls to poison control centers involving exposures to e-cigarette devices and liquid nicotine.*

2011	271
2012	460
2013	1,543
2014	4,023
2015	3,774
2016	2,907
2017	2,477
Through May, 2018	1,208

* Preliminary data, as poison centers continue to update their reports.

Act, which gave the Consumer Product Safety Commission authority to enforce child resistant packaging standards for e-cigarette products. This law went into effect in July 2016.

E-cigarette ingredients and constituents. There is insufficient research on the long-term effects of using e-cigarettes, which involves regular inhalation of nicotine, glycerin or some other solvent, and other additives.⁴¹ According to the Surgeon General, “E-cigarette aerosol is not harmless. It can contain harmful and potentially harmful constituents, including nicotine.”⁴² The nicotine present in e-cigarette aerosol is absorbed by users and bystanders.⁴³ Studies have found other chemicals and toxins present in some e-cigarettes, including formaldehyde, acrolein, volatile organic compounds like toluene, tobacco-specific nitrosamines, and metals like nickel and lead.⁴⁴ These compounds are generally present at levels much lower than in cigarette smoke, although the compounds themselves are found on FDA’s list of harmful or potentially harmful substances.⁴⁵ A study of current adolescent e-cigarette users and dual users (e-cigarettes and cigarettes) found significantly higher levels of volatile organic compounds, some of which are carcinogenic, in those users compared to non-users.⁴⁶ Of note, similar levels of some these compounds were found in users of non-nicotine e-cigarettes, increasing the concern that even non-nicotine e-cigarettes increases exposure to harmful chemicals.⁴⁷ Because FDA has just begun to regulate e-cigarettes, which are available in hundreds of different brands⁴⁸, there is no way for consumers to know for sure yet what is in the products or the aerosol.⁴⁹

In addition, while some of the other substances, such as flavorings, used in e-cigarettes might be labeled as “generally recognized as safe,” some researchers as well as the organization primarily responsible for granting that designation⁵⁰ have noted that it applies to ingestion, not for other exposures such as inhalation. The NASEM report committee expressed concern about flavor additives because even to-date, they “have not been widely tested for sensitizing, toxic, or irritating potency.”⁵¹ In its 2016 report, the Surgeon General stated that, “while some of the flavorings used in e-cigarettes are generally recognized as safe for ingestion as food, the health effects of their inhalation are generally unknown” and noted that some of the flavorings found in e-cigarettes have been shown to cause serious lung disease when inhaled.⁵² An article in the *Journal of the American Medical Association* raised concerns that the chemical flavorings found in some e-cigarettes and e-liquids could cause respiratory damage when the e-cigarette aerosol is inhaled deeply into the lungs.⁵³

Impact of Nicotine. E-cigarettes and refill liquids contain widely varying levels of nicotine, and the nicotine delivered through the aerosol can also vary depending on the device characteristics and user practices.⁵⁴ While e-cigarettes can be used for non-nicotine products, including marijuana, more than two-thirds of youth e-cigarette users report using e-cigarettes exclusively for nicotine-containing products.⁵⁵ Nicotine is a highly addictive drug that can have lasting damaging effects on adolescent brain development and has been linked to a variety of adverse health outcomes for the developing fetus.⁵⁶ Nicotine also impacts the cardiovascular system.⁵⁷ The Surgeon General concluded that, “The use of products containing nicotine poses dangers to youth, pregnant women, and fetuses. The use of products containing nicotine in any form among youth, including in e-cigarettes, is unsafe.”⁵⁸

Campaign for Tobacco-Free Kids, June 19, 2018 / Laura Bach

¹ CDC, “Tobacco Use Among Middle and High School Students—United States, 2011-2017,” *MMWR*, 67(22): 629-633, June 7, 2018, <https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6722a3-H.pdf>. Current use defined as any use in the past month.

² CDC, “Frequency of Tobacco Use Among Middle and High School Students — United States, 2014,” *MMWR*, 64(38):1061-1065, October 2015 <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6438a1.htm>

³ HHS, *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.

⁴ Schoenborn, CA & Gindi, RM, “Electronic Cigarette Use Among Adults: United States, 2014,” National Center on Health Statistics (NCHS) Data Brief, No. 217, October 2015, <http://www.cdc.gov/nchs/data/databriefs/db217.htm>.

⁵ HHS, *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016. See also, Leventhal, AM, et al., “Association of Electronic Cigarette Use With Initiation of Combustible Tobacco Product Smoking in Early Adolescence,” *Journal of the American Medicine Association*, 314(7): 700-707, 2015. Wills, Thomas A, et al., “Longitudinal study of e-cigarette use and onset of cigarette smoking among high school students in Hawaii,” *Tobacco Control*, published online first January 25, 2016. Wills, TA, et al., “E-cigarette use is differentially related to smoking onset among lower risk adolescents,” *Tobacco*

Control, published online August 19, 2016. Barrington-Trimis, JL, et al., "E-Cigarettes and Future Cigarette Use," *Pediatrics*, 138(1), published online July 2016.

⁵ Barrington-Trimis, JL, et al., "E-Cigarettes and Future Cigarette Use," *Pediatrics*, 138(1), published online July 2016. Wills, TA, et al., "E-cigarette use is differentially related to smoking onset among lower risk adolescents," *Tobacco Control*, published online August 19, 2016.

⁶ National Academies of Sciences, Engineering, and Medicine. 2018. *Public health consequences of e-cigarettes*. Washington, DC: The National Academies Press. <http://nationalacademies.org/hmd/Reports/2018/public-health-consequences-of-e-cigarettes.aspx>.

⁷ Barrington-Trimis, JL, et al., "E-Cigarettes and Future Cigarette Use," *Pediatrics*, 138(1), published online July 2016. Wills, TA, et al., "E-cigarette use is differentially related to smoking onset among lower risk adolescents," *Tobacco Control*, published online August 19, 2016.

⁸ CDC, "Characteristics of Electronic Cigarette Use Among Middle and High School Students—United States, 2015," *MMWR*, 65(50-51): 1425-1429, <https://www.cdc.gov/mmwr/volumes/65/wr/pdfs/mm65051a2.pdf>.

⁹ Nielsen Total US xAOC/Convenience Database & Wells Fargo Securities, LLC, in Wells Fargo Securities, Nielsen: Tobacco 'All Channel' Data 12/30, January 9, 2018.

¹⁰ Krishnan-Sarin, S, et al., "E-Cigarettes and "Dripping" Among High-School Youth," *Pediatrics*, 139(3), 2017.

¹¹ HHS, *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.

¹² See U.S. Food and Drug Administration's Flavored Tobacco webpage at

<http://www.fda.gov/TobaccoProducts/GuidanceComplianceRegulatoryInformation/FlavoredTobacco/default.htm>.

¹³ Zhu, S-H, et al., "Evolution of Electronic Cigarette Brands from 2013-2014 to 2016-2017: Analysis of Brand Websites," *Journal of Medical Internet Research*, 20(3), published online March 12, 2018.

¹⁴ Zhu, S-H, et al., "Four Hundred and Sixty Brands of E-cigarettes and Counting: Implications for Product Regulation," *Tobacco Control*, 23(Suppl 3):iii3-iii9, 2014.

¹⁵ Johnson, A, "Up in smoke? Alamanca e-cigarette store operators concerned about proposed regulations," *Times-News*, April 30, 2014, <http://www.thetimesnews.com/news/top-news/up-in-smoke-alamanca-e-cigarette-store-operators-concerned-about-proposed-regulations-1.313005>. The website for VapeRite ATL also notes that customers can "mix well over 100,000 possible flavor and mix type combinations" [<https://atlanta.vaperite.com/#vape-bar>, accessed May 30, 2014].

¹⁶ Ambrose, BK, et al., "Flavored Tobacco Product Use Among US Youth Aged 12-17 Years, 2013-2014," *Journal of the American Medical Association*, published online October 26, 2015.

¹⁷ HHS, *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.

¹⁸ HHS, *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.

¹⁹ Marynak, K., et al., "Exposure to Electronic Cigarette Advertising Among Middle and High School Students—United States, 2014-2016," *MMWR* 67(10): 294-299, March 16, 2018, <https://www.cdc.gov/mmwr/volumes/67/wr/pdfs/mm6710a3-H.pdf>.

²⁰ Truth Initiative, *Vaporized: Youth and Young Adult Exposure to E-Cigarette Marketing*, November 2015, <http://truthinitiative.org/sites/default/files/VAPORIZED%20-%20FINAL%20VERSION.pdf>.

²¹ Singh, T, et al., "Exposure to Advertisements and Electronic Cigarette Use Among US Middle and High School Students," *Pediatrics*, published online April 25, 2016. See also Dai, H and Hao, J, "Exposure to Advertisements and Susceptibility to Electronic Cigarette Use Among Youth," *Journal of Adolescent Health*, published online August 12, 2016.

²² HHS, *E-Cigarette Use Among Youth and Young Adults. A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2016.

²³ Kornfield, R, et al., "Rapidly increasing promotional expenditures for e-cigarettes," *Tobacco Control*, Published Online First, doi: 10.1136/tobaccocontrol-2014-051580, April 30, 2014. See also: Dutra, L, *Adolescent E-cigarette Use: What We Already Know*. 2014 data from Kantar Media. Presentation at the FDA "Electronic Cigarettes and the Public Health: A Public Workshop," June 1, 2015. Legacy, *Vaporized: E-Cigarettes, Advertising, and Youth*, April 2014, http://legacyforhealth.org/content/download/4542/63436/version/1/file/LEG-Vaporized-E-cig_Report-May2014.pdf. Truth Initiative, *Vaporized: Youth and Young Adult Exposure to E-Cigarette Marketing*, November 2015, <http://truthinitiative.org/sites/default/files/VAPORIZED%20-%20FINAL%20VERSION.pdf>.

²⁴ "Gateway to Addiction? A Survey of Popular Electronic Cigarette Manufacturers and Marketing to Youth," April 14, 2014, <http://democrats.energycommerce.house.gov/sites/default/files/documents/Report-E-Cigarettes-Youth-Marketing-Gateway-To-Addiction-2014-4-14.pdf>

²⁵ Truth Initiative, *Vaporized: Youth and Young Adult Exposure to E-Cigarette Marketing*, November 2015, <http://truthinitiative.org/sites/default/files/VAPORIZED%20-%20FINAL%20VERSION.pdf>.

²⁶ Duke, JC, et al., "Exposure to Electronic Cigarette Television Advertisements Among Youth and Young Adults," *Pediatrics* 134(1):e29-36, July 2014.

²⁷ Duke, JC, et al., "Exposure to Electronic Cigarette Television Advertisements Among Youth and Young Adults," *Pediatrics* 134(1):e29-36, July 2014.

²⁸ Farrelly, M. *A Randomized Trial of the Effect of E-cigarette Television Ads on Intentions to Use E-Cigarettes*. Presentation at the FDA "Electronic Cigarettes and the Public Health: A Public Workshop," June 1, 2015.

- ²⁹ Giovenco, DP, et al., "E-Cigarette Market Trends in Traditional U.S. Retail Channels, 2012–2013," *Nicotine & Tobacco Research* advance access, doi:10.1093/ntr/ntu282, January 15, 2015; Rose, SW, et al., "The availability of electronic cigarettes in US retail outlets, 2012: results of two national studies," *Tobacco Control*, 23:iii10–iii16, 2014.
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- ³¹ "Gateway to Addiction? A Survey of Popular Electronic Cigarette Manufacturers and Marketing to Youth," April 14, 2014, <http://democrats.energycommerce.house.gov/sites/default/files/documents/Report-E-Cigarettes-Youth-Marketing-Gateway-To-Addiction-2014-4-14.pdf>. See also, Noel, JK, Rees, VW, & Connolly, GN, "Electronic cigarettes: a new 'tobacco' industry?" *Tobacco Control* 20:81, 2011.
- ³² Huang, J, et al., "A cross-sectional examination of marketing of electronic cigarettes on Twitter," *Tobacco Control* 23:iii26–iii30, 2014.
- ³³ Richardson, A, et al., "Tobacco on the web: surveillance and characterization of online tobacco and e-cigarette advertising," *Tobacco Control*, Published Online First: February 14, 2014.
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April 18, 2018

Dr. Scott Gottlieb
Commissioner
U.S. Food and Drug Administration
10903 New Hampshire Avenue
Silver Spring, MD 20993

Re: Need for immediate FDA action to protect young people from Juul electronic cigarettes

Dear Dr. Gottlieb:

The Campaign for Tobacco-Free Kids, Truth Initiative, American Academy of Pediatrics, American Cancer Society Cancer Action Network, American Heart Association and American Lung Association urge you to take immediate action to protect the nation's young people, and the public health, from the dramatic rise in teen usage of Juul electronic cigarettes.

According to widespread news reports, Juul electronic cigarettes have skyrocketed in popularity with teens across the United States. Educators and students report an alarming level of Juul use in middle and high schools, making this an urgent public health problem. Recent news coverage includes stories by [The New York Times](#), [Wall Street Journal](#) and [NBC Today Show](#).

Several factors have contributed to Juul's rising popularity with teens:

- Juul e-cigarettes are sleek, high tech and easy to hide. They look just like USB flash drives and can be charged in the USB port of a computer. They don't look anything like a traditional tobacco product. A Juul is also small enough to fit in a closed hand.
- Juul comes in sweet flavors that appeal to youth, including mango, fruit medley, crème brulee, cool mint and cool cucumber. The evidence is clear that flavors play a key role in youth use of tobacco products, including e-cigarettes. FDA's own Population Assessment of Tobacco and Health (PATH) study found that 85 percent of current e-cigarette users aged 12-17 had used a flavored product in the past month and 81.5 percent of those young users cited flavors as the reason for their use of the product.
- Juul appears to deliver nicotine more quickly, more effectively and at higher doses than other e-cigarettes, increasing users' risk of addiction. The manufacturer claims each Juul cartridge of nicotine liquid (called a "Juul pod") contains as much nicotine as a pack of cigarettes (about 200 puffs). The manufacturer also claims that Juul "delivers a nicotine experience truly akin to a cigarette, with two times the nicotine strength ... of leading competitive products" (April 21, 2015, press release). However, research conducted by Truth Initiative and newly published in *Tobacco Control* found that 63 percent of Juul

users aged 15-24 did not know that the product always contains nicotine. This finding may in part be explained by the fact that the same research also found that a significant portion of those who recognized Juul (25 percent) reported that use of the product is called “juuling,” indicating they may not realize it is an e-cigarette or tobacco product.

Juul sales have grown dramatically and now make up more than half the e-cigarette market. A 2018 report by the National Academies of Sciences, Engineering and Medicine, *Public Health Consequences of E-Cigarettes*, concluded that there is “substantial evidence” that e-cigarette use increases the risk of ever using combustible tobacco cigarettes among youth and young adults. Juul is putting kids at risk of nicotine addiction and threatens to undermine decades of progress in reducing youth tobacco use.

The alarming increase in youth use of Juul makes this an urgent public health problem that requires strong and immediate action by the Food and Drug Administration to protect kids. The FDA is responsible for regulating tobacco products, including e-cigarettes, and it is unacceptable that the FDA has yet to take action to address the skyrocketing youth use of Juul.

The FDA should take immediate steps to protect kids including, but not limited to, the following:

- The FDA should immediately order the removal of any Juul flavors, including the highly popular “mango” and “cool cucumber” flavors, which were introduced after August 8, 2016, without first seeking the required FDA authorization. Such flavors violate FDA’s Deeming Rule that extended the agency’s regulatory authority to additional tobacco products, including e-cigarettes, and prohibits the introduction of new or changed e-cigarettes after the August 8, 2016 effective date of the Rule, without prior FDA review and authorization. According to Juul’s own social media posts, the “mango” and “cool cucumber” flavors were not introduced until 2017.
- As Juul’s popularity has grown, new products that look and are alleged to perform like Juul have been introduced without first seeking FDA review. FDA should order the removal of these products unless and until they comply with the law by going through FDA review.
- The FDA should suspend internet sales of Juul until adequate rules are established to prevent those sales to kids by requiring effective age verification both at the time of sale and delivery. At the same time, FDA should dramatically step up its enforcement of the ban on underage sales of Juul by brick-and-mortar retailers.
- The FDA should reverse its unlawful 2017 decision that allows e-cigarettes that were already on the market as of August 8, 2016, to stay on the market until at least 2022 without filing applications and undergoing a public health review by the FDA. The rapid growth in Juul’s popularity with kids underscores the public health importance of requiring manufacturers of these products to undergo agency review and to demonstrate that the sale of these products is appropriate for the protection of public health, including specifying the safeguards being implemented to protect kids. The FDA should be reviewing these products and taking action to protect kids now, not waiting until 2022.

- Merchandise with the Juul name and using Juul trademarks, including t-shirts, hoodies and Juul “wraps” or “skins,” are being sold on the internet and have helped fuel the brand’s popularity with kids. FDA rules prohibit cigarette brand names from being used on other products because of the impact on kids. FDA should apply the same rule to Juul.

The rapid growth in Juul use by high school students demonstrates that the FDA and Juul’s manufacturer must do more to prevent the marketing and sale of the product to kids and ensure it is marketed and sold responsibly, consistent with the company’s own stated mission of providing “an alternative to smoking” for adults. If Juul fails to take the steps necessary to curtail youth use before the start of the next school year in fall 2018, the FDA should take strong, additional enforcement action, up to and including suspension of Juul sales until it does so.

Thank you for your attention to this urgent threat to public health.

Campaign for Tobacco-Free Kids

Truth Initiative

American Academy of Pediatrics

American Cancer Society Cancer Action Network

American Heart Association

American Lung Association

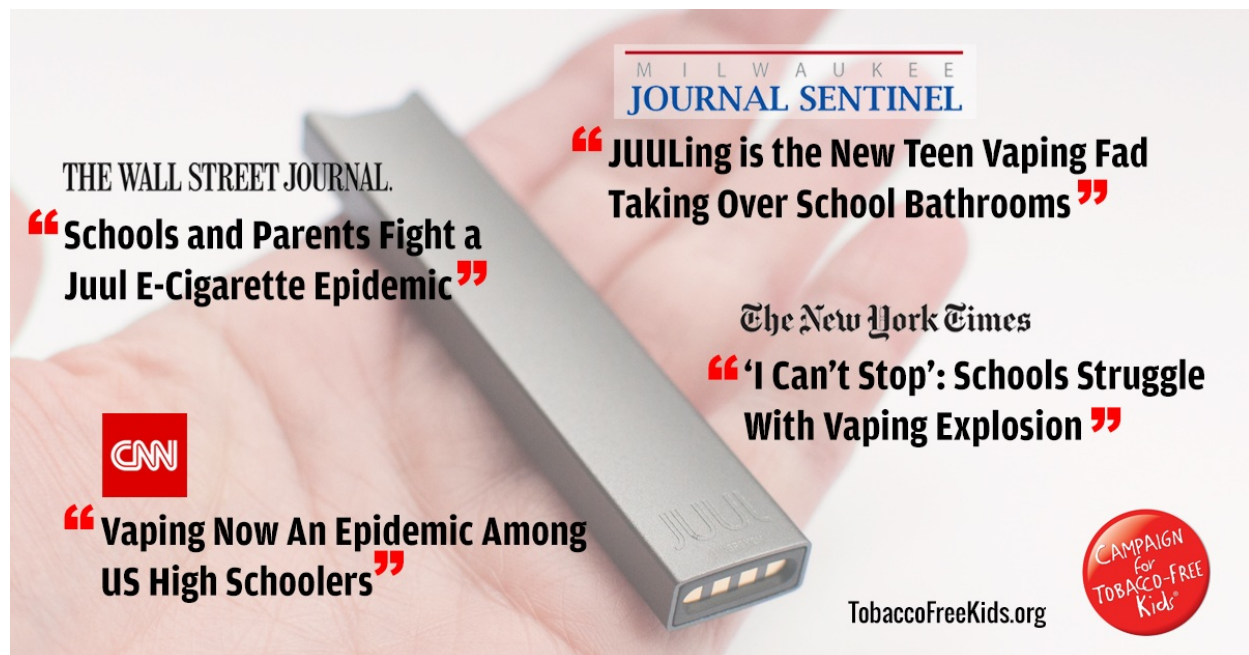
EACH JUUL CAPSULE HOLDS 59 mg NICOTINE SALTS

Juul E-Cigarettes: A New Threat to Kids

 tobaccofreekids.org/what-we-do/industry-watch/e-cigarettes

April 6, 2018

Introduced in 2015, Juul electronic cigarettes have quickly skyrocketed in popularity among teens and college students across the United States, according to widespread news reports. Educators and students report an alarming level of Juul use in middle and high schools, making this an urgent public health problem.



Several factors have contributed to Juul's rising popularity with teens:

- Juul e-cigarettes are sleek, high tech and easy to hide. They look just like USB flash drives and can be charged in the USB port of a computer. They don't look anything like a traditional tobacco product. A Juul is also small enough to fit in a closed hand.
- Juul comes in sweet flavors that appeal to youth, including mango, fruit medley, crème brulee, cool mint and cool cucumber. Research has shown that flavors play a key role in youth use of tobacco products, including e-cigarettes.
- Juul appears to deliver nicotine more quickly, more effectively and at higher doses than other e-cigarettes, increasing users' risk of addiction. The manufacturer claims each Juul cartridge of nicotine liquid (called a "Juul pod") contains as much nicotine as a pack of cigarettes (about 200 puffs). However, research has found that many Juul users don't know the product always contains nicotine, and many teens call use of the product "juuling," indicating they may not realize it is an e-cigarette or tobacco product.

Juul sales have grown dramatically and now make up more than half the e-cigarette market.

Juul is putting kids at risk of nicotine addiction and threatens to undermine decades of progress in reducing youth tobacco use:

- A 2016 Surgeon General's report concluded that youth use of nicotine in any form, including e-cigarettes, is unsafe, can cause addiction and can harm the developing adolescent brain.
- A January 2018 report by the National Academies of Sciences, Engineering and Medicine concluded, "There is substantial evidence that e-cigarette use increases risk of ever using combustible tobacco cigarettes among youth and young adults."

The alarming increase in youth use of Juul requires strong and immediate action by the Food and Drug Administration to protect kids. The FDA is responsible for regulating tobacco products, including e-cigarettes, and the FDA must take action to address the skyrocketing youth use of Juul.

Scientists say flavoured e-cigarettes 250 times more toxic than recommended safety level

mirror.co.uk/lifestyle/health/scientists-say-flavoured-e-cigarettes-9374556

December 2, 2016

By
Mark Waghorn

- 18:47, 1 DEC 2016
- Updated 11:42, 2 DEC 2016



Flavoured e-cigarettes 'expose smokers to high levels of cancer causing chemicals'
(Image: Getty)

One puff of a flavoured e-cigarette can expose a smoker to cancer causing chemicals that are more than 250 times the recommended safety level, say scientists.

When converted into a vapour, some additives break down into toxic compounds that dramatically exceed guidance for occupational health, according to the study.

Previous research has identified the ingredients in vapour flavourings, but very little has been done to determine what happens when they are transformed inside the device.

A growing body of evidence has shown the heat that converts e-liquids into vapour decomposes its contents.

This chemical breakdown produces toxic aldehydes, including formaldehyde, during the rapid heating process that happens inside the devices.

Aldehydes are members of a class of organic chemical compounds used in the textile, food, rubber, plastics, leather, chemical and health care industries.

So Dr Andrey Khlystov and colleague analysed vapours created from both unflavoured and flavoured e-liquids loaded into three popular types of e-cigarettes.

The tests for 12 different aldehydes showed the amount of potentially harmful compounds varied widely across e-liquid brands and flavours.

But in general one puff of flavoured vapour contained levels of aldehydes 1.5 to 270 times above the safe thresholds for occupational exposure set by the American Conference of Governmental Industrial Hygienists.

Vapours from unflavored e-liquids contained aldehydes at significantly lower levels, reports the journal Environmental Science & Technology.

Dr Khlystov, of the Desert Research Institute, Nevada, said: "The growing popularity of electronic cigarettes raises concerns about the possibility of adverse health effects to primary users and people exposed to e cigarette vapours.

Read More

[E-cigarette explodes 'like a firework' in shop worker's trouser pocket in dramatic CCTV footage](#)

Sales of e-cigarettes have been rising steadily since they first went on sale (Image: Getty)

"E-cigarettes offer a very wide variety of flavours, which is one of the main factors that attract new, especially young, users.

"How flavouring compounds in e-cigarette liquids affect the chemical composition and toxicity of e-cigarette vapors is practically unknown.

"Although e-cigarettes are marketed as safer alternatives to traditional cigarettes, several studies have demonstrated formation of toxic aldehydes in e-cigarette vapours during vaping."

Sales of e-cigarettes have been rising steadily since they first went on sale in the UK, in 2007. They are now used by nearly three million people in the UK.

In the past few years, they have replaced nicotine patches and gum to become the most popular choice of smoking cessation aid in England.

It is illegal to sell e-cigs to under-18s in the UK - but their use among teenagers is growing.

Use of e-cigarettes among under-18s rose from 5 per cent in 2013 to 8 per cent in 2014 - and some experts are concerned that they may act as a 'gateway' to smoking tobacco.

Added Dr Khlystov: "So far, aldehyde formation has been attributed to thermal decomposition of the main components of e-cigarette e-liquids (propylene glycol and

glycerol), while the role of flavouring compounds has been ignored.

"In this study, we have measured several toxic aldehydes produced by three popular brands of e-cigarettes with flavoured and unflavoured e-liquids.

"We show that, within the tested e-cigarette brands, thermal decomposition of flavouring compounds dominates formation of aldehydes during vaping, producing levels that exceed occupational safety standards.

"Production of aldehydes was found to be exponentially dependent on concentration of flavouring compounds.

"These findings stress the need for a further, thorough investigation of the effect of flavouring compounds on the toxicity of e-cigarettes."

E-cigarette liquids are marketed in nearly 8,000 different flavours, according to a 2014 report by the [World Health Organisation](#) .

Recent reports show many of these flavours, such as Gummy Bear, Tutti Fruity, and Bubble Gum, are especially appealing to teens and kids, encouraging them to use the devices.

The Electronic Cigarette Industry Trade Association said the results reflected "dry puff", when too little liquid reaching the heating element causes overheating.

E-cigarettes may be as addictive as traditional ones

 [medicalxpress.com/news/2015-07-e-cigarettes-addictive-traditional.html](https://www.medicalxpress.com/news/2015-07-e-cigarettes-addictive-traditional.html)

A photo of 117mm e-cigarette. Image:
Wikipedia.

Electronic cigarettes or "e-cigs" have been touted as a tool smokers can use to wean themselves off of traditional cigarettes, which many believe are more harmful than their "e" counterparts. But because e-cig liquid also contains nicotine and emits carcinogens, is that perception really true? One team now reports in the ACS journal *Chemical Research in Toxicology* that much of the nicotine in e-cigarettes is the addictive form of the compound.



Although e-cigs don't burn tobacco, they heat and vaporize a liquid that contains nicotine, flavorings and other substances. Out of concern for the potential effects that inhaling this mixture could have on the health of young people, many states have banned their sale to minors. Some experts say the nicotine content could lead users to become addicted to e-cigs, or that it could even serve as a gateway to conventional cigarettes and other drugs. But not all nicotine is created equal, and studies had yet to investigate what kind of nicotine was in the liquids. Out of three forms, scientists believe "free-base" nicotine is the only one that gets absorbed by the body, making it the most addictive kind. Najat Saliba and colleagues wanted to find out which nicotine forms are in e-cigs.

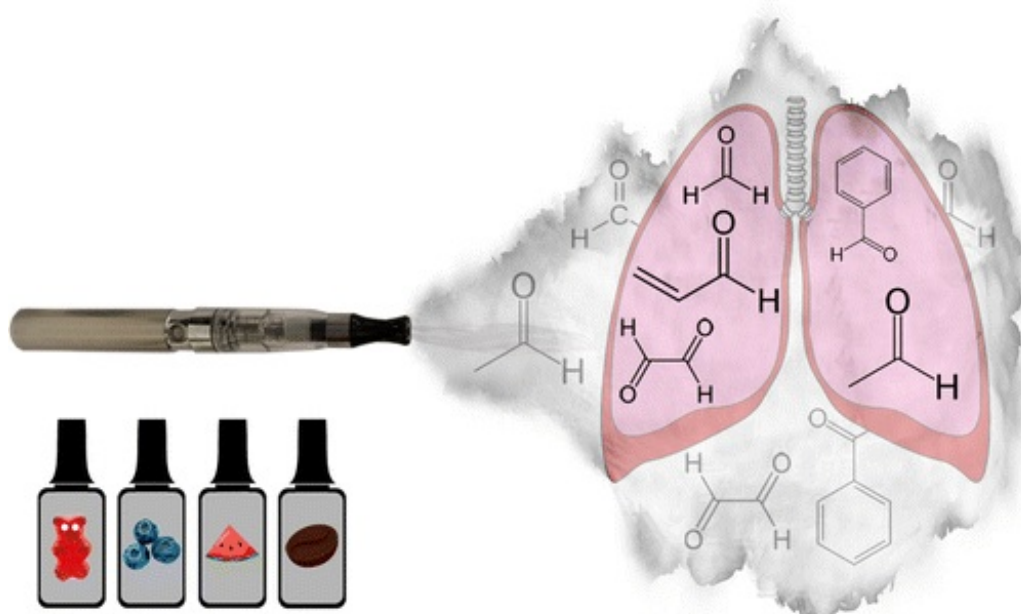
The researchers tested commercial samples of liquids made for the devices and found that, by and large, the nicotine was in the most addictive form. **They also determined that the concentration of nicotine varied and often didn't match the concentrations the labels claimed.**

Explore further: [E-cigarettes less addictive than cigarettes, according to study](#)

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Vapors from some flavored e-liquids contain high levels of aldehydes

medicalxpress.com/news/2016-11-vapors-flavored-e-liquids-high-aldehydes.html



Credit: American Chemical Society

Traditional cigarettes pose a well-established risk to smokers' health, but the effects of electronic cigarettes are still being determined. Helping to flesh out this picture, researchers are reporting in the ACS journal *Environmental Science & Technology* what happens to e-liquid flavorings when they're heated inside e-cigarettes or electronic nicotine-delivery systems. The study found that when converted into a vapor, some **flavorings break down into toxic compounds** at levels that exceed occupational safety standards.

Since electronic cigarettes were first introduced to the market in 2003, health officials have been tracking usage and studying potential health effects. A 2015 survey by the National Center for Health Statistics reported that 3.7 percent of adults used the devices regularly, and 12.6 percent had tried them at least once. Some studies have identified the ingredients in e-liquid flavorings, but very little research has been done to determine what happens to them when they are transformed inside the device. A growing body of research on e-cigs has shown that the **heat that converts e-liquids into vapor decomposes its contents, producing aldehydes and other toxic compounds** that can potentially cause health problems. Andrey Khlystov and colleagues wanted to investigate the specific role that flavorings play in these reactions.

The researchers analyzed vapors created from both unflavored and flavored e-liquids loaded into three popular types of e-cigarettes. The tests for 12 different aldehydes showed that the amount of potentially harmful compounds varied widely across e-liquid brands and flavors. However, the study also showed that in general, **one puff of flavored vapor**

contained levels of aldehydes exceeding the safe thresholds for occupational exposure—set by the American Conference of Governmental Industrial Hygienists—by factors of 1.5 to 270. Vapors from unflavored e-liquids contained aldehydes at significantly lower levels.

Explore further: [Hazardous chemicals discovered in flavored e-cigarette vapor](#)

More information: Andrey Khlystov et al. Flavoring Compounds Dominate Toxic Aldehyde Production during E-Cigarette Vaping, *Environmental Science & Technology* (2016). DOI: [10.1021/acs.est.6b05145](https://doi.org/10.1021/acs.est.6b05145)

Abstract

The growing popularity of electronic cigarettes (e-cigarettes) raises concerns about the possibility of adverse health effects to primary users and people exposed to e-cigarette vapors. E-Cigarettes offer a very wide variety of flavors, which is one of the main factors that attract new, especially young, users. How flavoring compounds in e-cigarette liquids affect the chemical composition and toxicity of e-cigarette vapors is practically unknown. Although e-cigarettes are marketed as safer alternatives to traditional cigarettes, several studies have demonstrated formation of toxic aldehydes in e-cigarette vapors during vaping. So far, aldehyde formation has been attributed to thermal decomposition of the main components of e-cigarette e-liquids (propylene glycol and glycerol), while the role of flavoring compounds has been ignored. In this study, we have measured several toxic aldehydes produced by three popular brands of e-cigarettes with flavored and unflavored e-liquids. We show that, within the tested e-cigarette brands, thermal decomposition of flavoring compounds dominates formation of aldehydes during vaping, producing levels that exceed occupational safety standards. Production of aldehydes was found to be exponentially dependent on concentration of flavoring compounds. These findings stress the need for a further, thorough investigation of the effect of flavoring compounds on the toxicity of e-cigarettes.

[Tweet](#)

'Healthier alternative' status of e-cigarettes challenged in new study

medicalnewstoday.com/articles/319820.php

By Catharine Paddock PhD

A new study that looked at immune changes in the airways of the lungs has challenged the idea that e-cigarettes are less harmful to health than conventional tobacco cigarettes.



Researchers find that e-cigarettes might harm the lungs just as much as conventional cigarettes do.

In a paper about to be published in the *American Journal of Respiratory and Critical Care Medicine*, researchers from the University of North Carolina at Chapel Hill report what they believe to be the first study to use human airway samples to examine the effects of electronic cigarettes (e-cigarettes).

E-cigarettes are battery-operated devices that produce an inhalable aerosol mixture of chemicals that includes nicotine, flavorings, and other substances. Some mixtures do not include nicotine.

At present, there are more than 460 different e-cigarette brands for sale in the United States.

Devices come in many different forms, several of which resemble conventional cigarettes, pipes, and cigars, while others resemble pens and USB memory sticks. Others may look quite different, such as those with fillable tanks.

'Confusion' about e-cigarette safety

A recent population study that found that e-cigarette use is linked to smoking cessation suggests that around 2.4 percent of U.S. adults are regular users.

E-cigarette use has been growing particularly quickly among teenagers. Between 2011 and 2015, the proportion of U.S. high-school students using e-cigarettes rose from 1.5 to 16.0 percent, while among middle-school students, it rose from 0.6 percent to 5.3 percent.

In 2016, there were more than 2 million middle- and high-school students using e-cigarettes.

"There is confusion about whether e-cigarettes are 'safer' than cigarettes because the potential adverse effects of e-cigarettes are only beginning to be studied," explains senior study author Mehmet Kesimer, Ph.D., an associate professor of pathology.

For their investigation, Prof. Kesimer and his colleagues tested sputum samples taken from 15 regular users of e-cigarettes, 14 current smokers of conventional cigarettes, and 15 non-smokers who had never used either type of cigarette. They confirmed the smoking status of the participants from tests of blood and urine samples.

'Signature of harm' in the lungs

Results showed that e-cigarettes produce a unique immune response in the lungs that "indicate[s] that the effects of e-cigarettes are overlapping with yet distinct from those observed in otherwise healthy cigarette smokers."

The airway samples from the e-cigarette users had markers of abnormal "neutrophilic response and altered mucin secretion," note the authors.

Neutrophils are an abundant type of white blood cell that play an important role in maintaining and protecting the airways. However, if disrupted, they can raise the risk of inflammation-related lung diseases such as cystic fibrosis and chronic obstructive pulmonary disease.

□ Teens who vape more likely to become heavy smokers

Learn how e-cigarette use by teenagers may raise the likelihood of them becoming tobacco smokers.

Read now

Users of both e-cigarettes and conventional cigarettes also showed significant increases in mucin secretions, particularly of mucin 5AC. Mucins are proteins in the mucus that lines the airways and protects their cells from damage. The overproduction of mucin 5AC has been linked to chronic bronchitis, asthma, and other such lung conditions.

The study's results also showed that both e-cigarette users and conventional smokers showed considerable increases in markers of oxidative stress and more active defense mechanisms that are typical of lung disease. These markers included "aldehyde-

detoxification and oxidative-stress-related proteins, thioredoxin (TXN), and matrix metalloproteinase-9 (MMP9)."

The researchers point out that a weakness of their study is the fact that among the 15 e-cigarette users, there were five who said that they occasionally smoked conventional tobacco cigarettes, and 12 who said that they had smoked them in the past.

The team concludes, nevertheless, that e-cigarettes have a "signature of harm" in the lungs that, although it has some unique features, shares some similarities with that of conventional cigarettes.

"Our results suggest that e-cigarettes might be just as bad as cigarettes."

Prof. Mehmet Kesimer

Lilo H. Stainton | June 22, 2018

Organic compounds known as 'aldehydes' are primary source of damage to DNA and also suppress its ability to repair that damage

When it comes to cancer caused by cigarette smoke, experts may have misplaced the bulk of the blame.

According to a new study, scientists at NYU School of Medicine and Rutgers University have found that chemicals called **aldehydes** — present in tobacco smoke in high quantities — **are the primary cause of damage to DNA and suppress its ability to repair damage.**

And ongoing, related work at Rutgers suggests consumption of certain healthy foods may help reduce the impact of these damaging compounds.



Breakdown in a person's DNA, or genetic code, is a major cause of cancer, according to the study; tobacco smoke has been linked to more than 80 percent of bladder cancers and half of lung cancers.

While smoking rates have declined to less than 14 percent of Garden State adults, each year roughly 2,500 residents are diagnosed with bladder cancer and nearly 6,000 with lung cancer, according to [federal data](#).

Shifting scientific focus

In the past, researchers had focused on certain hydrocarbons and nitrosamines — organic compounds that are known carcinogens — present in cigarette smoke as the link to cancer. But the study suggests that while these chemicals are carcinogenic, **they did not result in the same level of DNA harm as the aldehydes,** which are also present in some foods in far lower levels.

Chung S. Yang

The study by Moon-shong Tang, an environmental medicine and pathology professor at NYU, and co-author Chung S. Yang, a distinguished professor of pharmacy at Rutgers University and director of the university's Center for Cancer Prevention Research, was [published online](#) Tuesday in the Proceedings of the National Academy of Sciences.



The findings suggest that instead of focusing only on hydrocarbons and nitrosamines, researchers must also consider the impact of aldehydes. “Our findings provide the correct targets for both therapy and prevention of tobacco smoke-induced cancer,” Tang said.

The scientists hope their work will help generate better methods to assess cancer risks, as well as ways to reduce the damage caused by tobacco smoke. That’s where work by Yang and his Rutgers colleague, food scientist Chi-Tang Ho, comes in. They are looking at how green tea, apples and other fruits, and some vegetables can strip these aldehydes from the body, cutting the risk for cancer.

“In theory, this could work” to address the aldehydes generated through cigarette smoking, Yang said, “and a lot of other compounds from our diet could do the same.”

‘Practical implications’ for preventing disease

The ability to reduce the impact of reactive aldehydes could have a “large practical implication in the prevention of disease,” Yang added, but he stressed that nothing is more effective in reducing cancer risk than quitting smoking.

The research echoes findings published two years ago in JAMA Oncology by scientists at the M.D. Anderson Cancer Center at Cooper, in Camden. They found that nearly half of all cancers could be prevented in the United States if people quit smoking, reduced their alcohol intake, lost weight, got more exercise, and ate healthier food — factors they found reduced the rate of cell mutations caused by breakdowns in DNA.

The organic compounds known as aldehydes can also be found in trace amounts in certain baked or fried foods, Yang said, since they are a common result of the chemical reactions that take place when fats or meat gristle is heated to a certain point. In fact, he said studies in China have shown higher levels of aldehydes in individuals who frequently cook over a wok, which heats oil to an extremely high temperature, especially in poorly ventilated homes or restaurants.

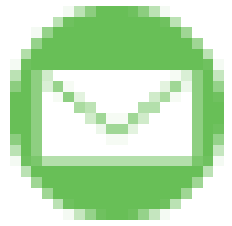
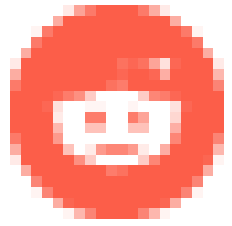
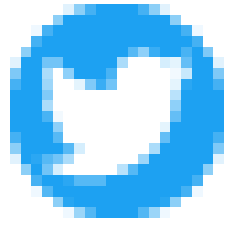
“Aldehydes exist in many places in small quantities,” Yang said. “It’s the quantity that counts,” he added, saying that the level in food does not present much of a concern, “whereas in cigarette (smoke), it’s a very high concentration.”

While the study focused on cigarettes, Yang said in theory the process of heating oils infused with tobacco or other substances in a smokeless device, or vape pen, could also generate aldehydes, but he has not seen data on this.

See

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Higher formaldehyde risk in e-cigarettes than previously thought

 sciencedaily.com/releases/2018/05/180521184653.htm

Portland State University researchers who published an article three years ago in the *New England Journal of Medicine* about the presence of previously undiscovered forms of formaldehyde in e-cigarette vapor revisited their research and found that **formaldehyde risks were even higher than they originally thought.**

The 2015 study by PSU chemistry professors David Peyton, Robert Strongin, James Pankow and others revealed that e-cigarette vapor can contain the new forms of formaldehyde at levels five to 15 times higher than the formaldehyde in regular cigarettes. The chemicals were detected when the vaping device used in their experiments was set at the high end of its heat settings.

Formaldehyde is a known carcinogen. Unlike gaseous formaldehyde, the newly discovered compounds are **bound to particulates in the e-cigarette aerosols, enabling them to be deposited more deeply in the lungs than gaseous formaldehyde.**

The 2015 study drew criticism from e-cigarette advocates, who said that the high settings would produce an unpleasant taste and therefore would be avoided by the vast majority of people who use e-cigarettes.

In their new study, published in *Scientific Reports*, Peyton and Strongin found that both gaseous formaldehyde and the new formaldehyde compounds were detectable at levels above OSHA workplace limits even when e-cigarettes were operated at lower, more commonly used heat settings. Strongin said this raises concerns about the overall risks of e-cigarette use.

"In 2016, more than 9 million Americans were current e-cigarette users, including more than 2 million U.S. middle and high school students," he said. "It is thus concerning if even a minority of users cannot properly control e-cigarette-derived intake of formaldehyde and related toxins."

Story Source:

Materials provided by **Portland State University**. *Note: Content may be edited for style and length.*

Journal Reference:

1. James C. Salamanca, Jiries Meehan-Atrash, Shawna Vreeke, Jorge O. Escobedo, David H. Peyton, Robert M. Strongin. **E-cigarettes can emit formaldehyde at high**

levels under conditions that have been reported to be non-averse to users.

Scientific Reports, 2018; 8 (1) DOI: [10.1038/s41598-018-25907-6](https://doi.org/10.1038/s41598-018-25907-6)

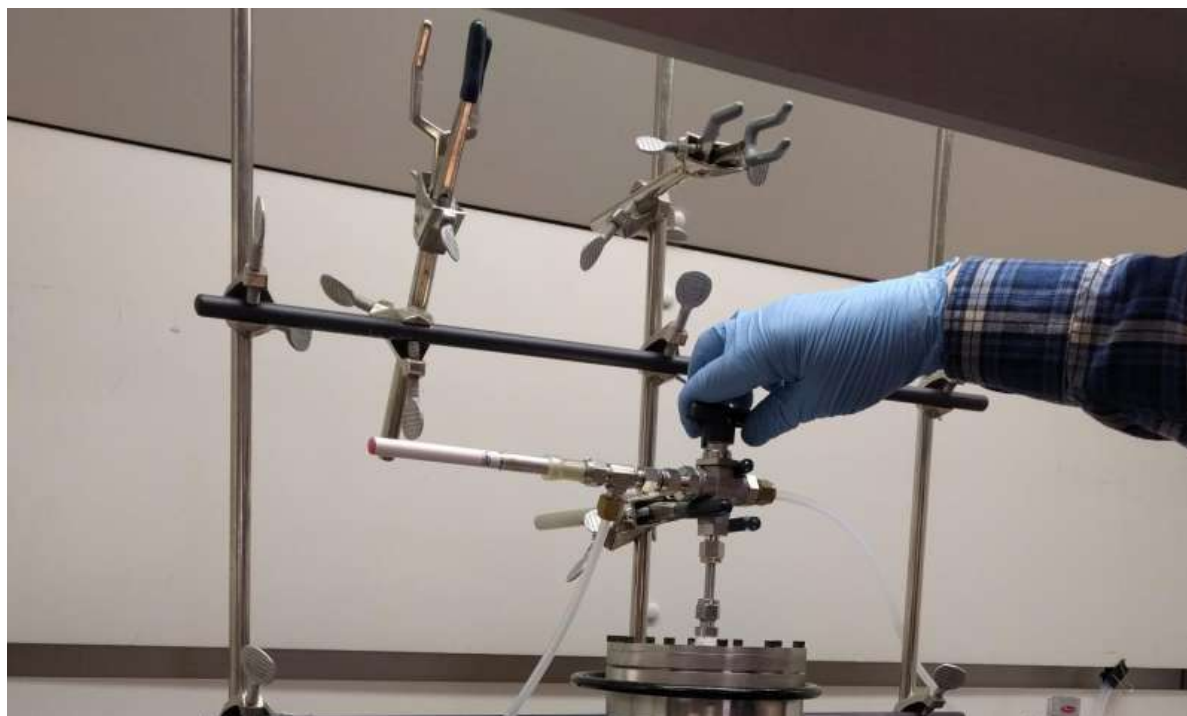
Cite This Page:

Portland State University. "Higher formaldehyde risk in e-cigarettes than previously thought." ScienceDaily. ScienceDaily, 21 May 2018.

www.sciencedaily.com/releases/2018/05/180521184653.htm.

Hazardous chemicals discovered in flavored e-cigarette vapor

phys.org/news/2016-11-hazardous-chemicals-flavored-e-cigarette-vapor.html



DRI scientists used a controlled sampling system to simulate the most common vaping conditions. E-cigarette vapor was produced from each device by a four-second, 40-ml controlled puff, with 30-second resting periods between puffs. Credit: DRI

Building on more than 30 years of air quality research in some of the most polluted urban environments on Earth, a team of atmospheric scientists at the Desert Research Institute (DRI) have turned their attention toward the growing e-cigarette industry and the unidentified effects of vaping on human health.

New research published this week in *Environmental Science & Technology*, a journal of the American Chemical Society, reports that the aerosols (commonly called vapors) produced by flavored e-cigarettes liquids contain dangerous levels of hazardous chemicals known to cause cancer in humans.

The study "Flavoring compounds dominate toxic aldehyde production during e-cigarette vaping" confirms that these toxic aldehydes, such as formaldehyde, are formed not by evaporation, but rather during the chemical breakdown of the flavored e-liquid during the rapid heating process (pyrolysis) that occurs inside e-cigarettes or electronic nicotine delivery systems (ENDS).

"How these flavoring compounds in e-cigarette liquids affect the chemical composition and toxicity of the vapor that e-cigarettes produce is practically unknown," explained Andrey Khylstov, Ph.D., an associate research professor of atmospheric sciences at DRI. "Our results show that production of toxic aldehydes is exponentially dependent on the concentration of flavoring compounds."

E-cigarette liquids have been marketed in nearly 8,000 different flavors, according to a 2014 report from the World Health Organization. Recent reports have shown that many flavors, such as Gummy Bear, Tutti Fruitty, Bubble Gum, etc., were found to be especially appealing to adolescents and young adults.

The U.S. Food and Drug Administration (FDA) reports that 16-percent of high school and 5.3-percent of middle school students were current users of e-cigarettes in 2015, making e-cigarettes the most commonly used tobacco product among youth for the second consecutive year. In 2014, 12.6-percent of U.S. adults had ever tried an e-cigarette, and about 3.7-percent of adults used e-cigarettes daily or some days.



DRI scientists measured concentrations of 12 aldehydes in aerosols produced by three common e-cigarette devices shown here. To determine whether the flavoring additives affected aldehyde production during vaping, five flavored e-liquids ...[more](#)

Khylstov and his colleagues measured concentrations of 12 aldehydes in aerosols produced by three common e-cigarette devices. To determine whether the flavoring additives affected aldehyde production during vaping, five flavored e-liquids were tested in each device. In addition, two unflavored e-liquids were also tested.

"To determine the specific role of the flavoring compounds we fixed all important parameters that could affect aldehyde production and varied only the type and concentration of flavors," explained Vera Samburova, Ph.D., an assistant research professor of chemistry at DRI.

Samburova added that the devices used in the study represented three of the most common types of e-cigarettes - bottom and top coil clearomizers, and a cartomizer.

The study avoided any variation in puff topography (e.g., puff volume, puff velocity, interval between puffs) by utilizing a controlled sampling system that simulated the most common vaping conditions. E-cigarette vapor was produced from each device by a four-second, 40-

ml controlled puff, with 30-second resting periods between puffs. The e-cigarette devices were manually operated to replicate real-life conditions and all samples were collected in triplicate to verify and confirm results. Specific care was taken to avoid "dry puff" conditions.

To provide further proof that the flavoring compounds, not the carrier e-liquid solvents (most commonly propylene glycol and/or vegetable glycerin) dominated production of aldehydes during vaping, the authors performed a series of experiments in which a test flavored e-liquid was diluted with different amounts of the unflavored e-liquid. Liquids with higher flavor content produced larger amounts of aldehydes due to pyrolysis of the flavoring compounds.

In all experiments, the amount of aldehydes produced by the flavored e-cigarette liquids exceeded the American Conference of Governmental Industrial Hygienists Threshold Limit Values (TLVs) for hazardous chemical exposure.

"One puff of any of the flavored e-liquids that we tested exposes the smoker to unacceptably dangerous levels of these aldehydes, most of which originates from thermal decomposition of the flavoring compounds," said Khylstov. "These results demonstrate the need for further, thorough investigations of the effects of flavoring additives on the formation of aldehydes and other toxic compounds in e-cigarette vapors."

Explore further: [Study identifies two additional carcinogens not previously reported in e-cigarette vapor](#)

More information: Andrey Khylstov et al, Flavoring Compounds Dominate Toxic Aldehyde Production during E-Cigarette Vaping, *Environmental Science & Technology* (2016). DOI: [10.1021/acs.est.6b05145](https://doi.org/10.1021/acs.est.6b05145)

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Quantitative study of aldehyde content in electronic cigarettes

phys.org/news/2017-04-quantitative-aldehyde-content-electronic-cigarettes.html



Credit: CC0 Public Domain

(Phys.org)—Electronic cigarettes have had their share of both detractors and advocates since they hit the market in 2004. Many people believe that they are healthier than cigarettes, but others say that the effects of e-cigarette vapors are largely unknown.

Medical organizations have generally taken a cautious approach and do not specifically recommend e-cigarettes for stopping smoking or as a healthier alternative to smoking.

One area of concern is the amount of aldehydes present in e-cigarette smoke. These aldehydes are present in tobacco cigarettes in larger quantities than in e-cigarettes, but the levels in e-cigarettes are still not known. Additionally, the amount that is considered dangerous for cardio vascular disease (CVD) is a topic of debate. Some studies have shown that even small amounts of certain aldehydes can lead to progression of CVD.

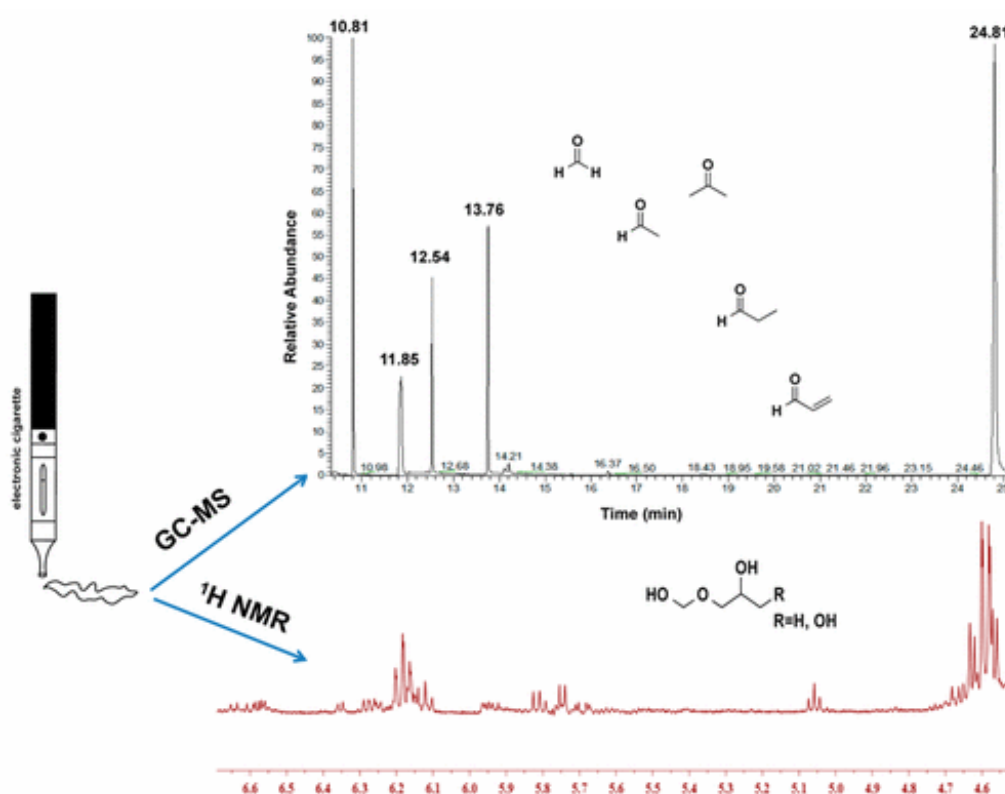
Researchers from the University of Louisville's Tobacco Regulation and Addiction Center conducted quantitative analyses of both older (first generation) and newer-model e-cigarette cartridges using a variety of flavors. They used a new method for trapping reactive carbonyls that are then subsequently stabilized using an oximation reaction. They found that newer devices produced more harmful aldehydes than first generation e-cigarettes. Their work appears in *ACS Omega*.

E-cigarettes cartridges contain battery-powered coils that serve to heat and vaporize e-Liquid. Based on this study, the amount of reactive aldehydes in e-cigarette vapor are largely due to the cartridge's battery power. The higher the battery power, the higher the aldehyde levels. While e-cigarette aerosols contain aldehydes that are known to contribute

to CVD, the exact levels have not been definitively determined largely because of the difficulties associated with trapping and studying reactive aldehydes.

New models, or "next-generation," e-cigarettes have a higher battery power than older ones. Furthermore, older models have a fixed battery output (4.6 W) while the next-generation ones have variable output (9.1 W, 11.7 W, 14.7 W, 16.6 W). The authors wanted to look at this next-generation of e-cigarettes to quantitatively determine aldehyde levels as well as determine if e-Liquid flavor makes a difference in aldehyde formation. In order to do this, they took into account the formation of hemiacetals from aldehydes, something that prior studies did not address.

The aldehydes that are of greatest concern are **acetaldehyde, acrolein, and formaldehyde**. **Acrolein, in particular, has been shown to advance CVD, even when a person is exposed to low levels**. Formaldehyde has also been associated with CVD in low concentrations.



Credit: ACS

E-Liquids are usually comprised of glycerin and propylene glycol along with a flavor additive. **Glycerin, when heated, predominantly forms acrolein and formaldehyde, while propylene glycol predominantly forms acetone and acetaldehyde. Certain flavor additives have shown enhanced aldehyde formation, as well.**

Ogunwale et al. used a microreactor-capture approach that they had previously developed to obtain an accurate look at aldehyde levels in e-cigarette vapor. This method employs a 4-(2-aminoxyethyl)-morpholin-4-ium chloride (AMAH) coating on a silicon base. Aldehydes selectively react with AMAH to form an oxime, which is more stable and easier to study than an aldehyde.

Aerosols were generated using a cigarette-smoking robot and were collected in Tedlar bags. The robot allowed for control over puff duration, puff volume, and puff frequency. The aerosols flowed through the microreactors from the bags using an evacuation process and then reacted with AMAH. The AMAH oxime compound was neutralized to form an AMA adduct that was then studied using gas chromatography.

Both the first generation and next generation e-cigarettes produced some amount of acetaldehyde, acrolein, and formaldehyde, but acetaldehyde and formaldehyde were in higher concentrations than acrolein. All of the aldehydes were present in lower concentrations than what is found in cigarette smoke using Health Canada Intense Puffing Regime. Notably, the next-generation e-cigarettes, which have a tank-type atomizer, produced higher levels of aldehydes and acetone. The authors attribute this to the higher battery output.

To understand the puffing topology, Ogunwale et al., used 60-mL syringes to manually vary puff duration and volume to more accurately replicate real-life usage. Puffing duration and the particular flavor contributed to the formation of reactive aldehydes, although these factors played a smaller role than battery output in the amount of aldehydes present. If puffing duration was around 4.0 seconds/puff, more aldehydes were present compared to shorter or longer puffing. The average user puffs for 3.5 to 4.3 seconds.

Finally, Ogunwale et al. used ^1H NMR to detect and quantify the presence of hemiacetals formed from aldehydes. They found that hemiacetals did not form in any of the first-generation e-cigarettes flavors, and they did not form in three of the next-generation flavors tested. Only one flavor that was tested formed hemiacetals within a battery output that was within the range of normal use.

This study provides valuable information on the safety of e-cigarettes. In general, the higher the battery output, the higher the aldehyde levels in the vapor. Certain aldehydes, such as acrolein, acetaldehyde, and formaldehyde, have been shown to contribute to CVD even in low levels. All of the e-cigarettes tested in this study had some amount of these aldehydes present.

Explore further: [Hazardous chemicals discovered in flavored e-cigarette vapor](#)

More information: Mumiye A. Ogunwale et al. Aldehyde Detection in Electronic Cigarette Aerosols, *ACS Omega* (2017). DOI: [10.1021/acsomega.6b00489](#)

Abstract

Acetaldehyde, acrolein, and formaldehyde are the principal toxic aldehydes present in cigarette smoke and contribute to the risk of cardiovascular disease and noncancerous pulmonary disease. The rapid growth of the use of electronic cigarettes (e-cigarettes) has raised concerns over emissions of these harmful aldehydes. This work determines emissions of these aldehydes in both free and bound (aldehyde–hemiacetal) forms and other carbonyls from the use of e-cigarettes. A novel silicon microreactor with a coating phase of 4-(2-aminoxyethyl)-morpholin-4-ium chloride (AMAH) was used to trap carbonyl compounds in the aerosols of e-cigarettes via oximation reactions. AMAH–aldehyde adducts were measured using gas chromatography–mass spectrometry. ^1H nuclear magnetic resonance spectroscopy was used to analyze hemiacetals in the aerosols. These

aldehydes were detected in the aerosols of all e-cigarettes. Newer-generation e-cigarette devices generated more aldehydes than the first-generation e-cigarettes because of higher battery power output. Formaldehyde–hemiacetal was detected in the aerosols generated from some e-liquids using the newer e-cigarette devices at a battery power output of 11.7 W and above. The emission of these aldehydes from all e-cigarettes, especially higher levels of aldehydes from the newer-generation e-cigarette devices, indicates the risk of using e-cigarettes.

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Singapore bans purchase, use and possession of imitation tobacco products like e-cigarettes

- [ASEAN/East Asia](#)
- Friday, 26 Jan 2018

SINGAPORE: From Feb 1, it will be illegal to buy, use and possess emerging and imitation tobacco products such as smokeless tobacco products, chewing tobacco and shisha, as the first phase of amendments to Singapore's Tobacco (Control of Advertisements and Sale) Act kick in.

With the new amendments, anyone caught buying, possessing or using such products can be fined up to S\$2,000 (RM5,930), the Ministry of Health (MOH) said in a statement on Friday (Jan 26).

Currently, only importation, sale and distribution of such products are illegal.

Those found guilty of carrying out such acts can be jailed for up to six months and/or fined up to S\$10,000 (RM29,640) for the first offence.

Repeat offenders face twice those penalties.

The Act also prohibits any device or article that resembles tobacco products, including vaporisers such as electronic cigarettes, electronic pipes, electronic cigars and the like.

Amendments to the Act were passed in Parliament in November last year.

Other moves that will be carried out in further phases under the amended Act include gradually raising the minimum legal age for the purchase, use, possession, sale and supply of tobacco products from 18 to 21.

The age will be raised from 18 to 19 on Jan 1 next year (2019). It will be further raised to 20 on Jan 1, 2020, and to 21 on Jan 1, 2021.

MOH said it "strongly urges smokers to quit smoking to reduce the risk of developing smoking-related illnesses".

The law will also ban people from buying, using and owning imitation tobacco products, such as e-cigarettes, e-cigars and e-pipes.

It said it remains committed to lowering the prevalence of smoking in Singapore "through a comprehensive, multi-pronged approach to discourage and reduce the use of tobacco products".

This includes imposing restrictions on tobacco advertising and promotion, offering smoking

cessation services and fiscal policies such as taxes, and providing public education on the harms of tobacco use. - The Straits Times/Asia News Network

Vaping flavoured e-cigarettes 'leads to heart disease, strokes and heart attacks', scientists warn

[mirror.co.uk/science/beware-flavoured-e-cig-scientists-12703518](https://www.mirror.co.uk/science/beware-flavoured-e-cig-scientists-12703518)

June 14, 2018

A new study by researchers from Boston University has revealed that the flavour additives using in e-cigarettes can impair blood vessel function, and inhaling them can lead to heart damage

By

Shivali Best

- 10:00, 14 JUN 2018
- Updated 11:42, 15 JUN 2018

Science



(Image: Getty)

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They're often portrayed as 'healthier' alternatives to cigarettes, but scientists have warned about the dangers of e-cigarettes.

A new study by researchers from Boston University has revealed that the flavour additives using in e-cigarettes can impair blood vessel function, and inhaling them can lead to heart damage .

Dr Jessica Fetterman, who led the study, said: "Increased inflammation and a loss of nitric oxide are some of the first changes to occur leading up to cardiovascular disease and events like heart attacks and stroke, so they are considered early predictors of heart disease.

"Our findings suggest that these flavoring additives may have serious health consequences."

The flavour additives using in e-cigarettes can impair blood vessel function, and inhaling them can lead to heart damage (Image: Getty)

In the study, the researchers looked at the effects of nine chemical flavourings often used in e-cigarettes on endothelial cells - the cells that line the blood vessels and the inside of the heart.

Flavours tested included menthol, burnt flavour, vanilla, cinnamon, clove, butter, strawberry, banana and spicy cool.

Their analysis revealed that all nine flavours had detrimental effects on endothelial cells.

Dr Fetterman said: "Our work and prior research have provided evidence that flavorings induce toxicity in the lung and cardiovascular systems.

"Flavorings are also a driver of youth tobacco use and sustained tobacco use among smokers."

The researchers hope their findings will lead to new regulations to prevent access, sales and marketing of e-cigarettes to youth.

Calls For Ban On E-Cig Flavoring And Misleading Advertising

 [worldhealth.net/news/calls-ban-e-cig-flavoring-and-misleading-advertising](https://www.who.int/news/calls-ban-e-cig-flavoring-and-misleading-advertising)

Posted on Jun 05, 2018, 4 p.m.

Global respiratory scientists and **doctors from 6 continents warn of the dangers posed to adolescents by electronic cigarettes**, calling for a ban on flavorings and misleading marketing of e-cigarettes as low risk alternatives, as published in the European Respiratory Journal.

There is a growing body of evidence mounting **that e-cigarettes damage health and are highly addictive, yet they are still marketed by manufacturers as healthier cigarettes** and they are experiencing growing popularity among the younger populations. As a result the groups is calling for an immediate ban on flavourings and on misleading marketing as a lower risk alternative to adolescents.

The group has published a globally collaborative paper bringing together a wide range of global findings highlighting evidence of adolescents and children being highly susceptible to nicotine addiction, and the use of e-cigarettes is rising steeply in this age group, becoming the most common used tobacco product among adolescents in most countries. The paper also lays out sets of evidence based recommendations for protecting youths from the harmful effects of nicotine addiction.

The risks of e-cigarettes and rising youth popularity has been under recognised and in some cases ignored for profit. The paper was published in collaboration to bring much need attention to address the growing public health concern of youth e-cigarette use.

E-cigarette product design, marketing, flavours, and perception of safety combined with readiness and ease of access and acceptability have added to the appeal of e-cigs to youths, as the products are advertised in a manner to normalise smoking that leads to new generations addicted to nicotine, which there is growing evidence showing that e-cigs act as a gateway to regular cigarette smoking, especially in youths. Exposure to harmful ingredients for e-cigs may be lower than traditional cigarettes, but that far from means they are harmless.

The globally collaborative paper calls for a ban on flavoured products with evidence showing flavouring draws youths to the products. Recent studies **show flavoring added to e-cigs which are food safe alter regarding e-cig use and become harmful**. Currently there are upwards of 7,500 different flavoured e-cigs and refills available. The paper also recommends further research be conducted on the effects of flavoured e-cigs as there is growing evidence of harmful effects, and surveillance of use across different countries.

E-cig regulations vary greatly worldwide, legislation on a minimum age for purchasing e-cigs is not enforced or non-existing in most countries. In low and middle income countries e-cigs are largely unregulated. E-cigs are marketed as smoking cessation tools and as a

safer alternative to traditional tobacco cigarettes, growing evidence shows this is not true and evidence shows that nicotine has many long term adverse effects including addiction.

This paper was made because in global collaboration according to the group because it's time to recognize e-cigarettes are a growing health concern. Inhaling something other than air into the lungs such as nicotine is never a good or safe thing, especially in youths and children, and there is a growing body of evidence to support it.

Materials provided by **European Lung Foundation**.

Note: Content may be edited for style and length.

Journal Reference:

Thomas W. Ferkol, Harold J. Farber, Stefania La Grutta, Frank T. Leone, Henry M. Marshall, Enid Neptune, Charlotta Pisinger, Aneesa Vanker, Myra Wisotzky, Gustavo E. Zabert, Dean E. Schraufnagel. **Electronic cigarette use in youths: a position statement of the Forum of International Respiratory Societies**. *European Respiratory Journal*, 2018; 51 (5): 1800278 DOI: [10.1183/13993003.00278-2018](https://doi.org/10.1183/13993003.00278-2018)

Vaping 'stronger e-cigarettes means ex-smokers inhale FEWER cancer-causing toxins'

 [thesun.co.uk/news/6474189/stronger-e-cigarettes-fewer-cancer-causing-toxins](https://www.thesun.co.uk/news/6474189/stronger-e-cigarettes-fewer-cancer-causing-toxins)

June 8, 2018

SMOKE SCREEN

Vapers using low nicotine e-cigarettes puff harder, for longer and more often - so inhale more cancer-causing chemicals

By Lizzie Parry, Digital Health Editor

8th June 2018, 12:01 am

Updated: 7th June 2018, 6:55 pm

SMOKERS trying to quit **should use stronger e-cigarettes,** to PROTECT their health, experts said today.

Opting for low nicotine e-cigs **means they will inhale more cancer-causing toxins,** they found.

That's because while trying get the same hit as a high-nicotine e-cigarette, you have to puff harder, and for longer.

And doing that exposes you to more of the dangerous chemicals produced by the devices, Cancer Research UK has warned.

To top it off, their experiments showed trying to get that high nicotine hit, from a weaker device doesn't work.

Dr Lynne Dawkins, from London South Bank University, said: "Some vapers might believe that starting out on a low nicotine strength is a good thing.

Vapers using low nicotine devices puff for longer and harder, exposing them to higher levels of chemicals like formaldehyde, which has been linked to cancer

"But they should be aware that reducing their nicotine concentration is likely to result in the use of more e-liquid.

"This obviously comes with a financial cost but also possibly with a health cost.

"The results of our study suggest that smokers who want to switch to vaping may be better to start with higher, rather than lower, nicotine levels to reduce compensatory behaviour and the amount of e-liquid used."

Dr Dawkins said while e-cigarettes are "much less harmful" than smoking regular cigarettes, she warned it's not without its risks.

While there is a risk from e-cigarettes, the experts are agreed, it's still better than smoking

"The vapour can still contain some potentially harmful chemicals that present a higher risk to health than nicotine, which is relatively safe" she warned.

"Our research shows that more intense vaping behaviour associated with using low nicotine e-liquid has the potential to increase users' exposure to some of these chemicals."

Dr Dawkins and her team studied 20 vapers to reach their conclusions.

Our research shows that more intense vaping behaviour associated with using low nicotine e-liquid has the potential to increase users' exposure to some of these chemicals

Dr Lynne Dawkins, London South Bank University

As well as puffing harder and for longer, ex-smokers using lower strength e-cigarettes were more likely to turn up the power of their device to get their hit.

But failed to achieve their nicotine high.

However, doing so, exposed them to higher levels of toxins, including formaldehyde - which is formed when the e-cigarette is heated.

Raising the temperature inside the device can cause the glycerine and glycol found in most e-liquids, to break down into these potentially dangerous chemicals.

Dr Dawkins said while e-cigarettes expose vapers to fewer toxins, it should always be minimised where possible.

VAPE AWAY

Vaping helps smokers quit even if they don't want to, because it's MORE enjoyable

VAPING HEART DANGER

'Deadly' flavoured e-cigarettes can lead to strokes and heart attacks

BITTER FOR YOU

Campaigners call for all e-cigarette flavours to be BANNED to protect kids

VAPING BAD

The laws on e-cigarettes changed this year - here's all you need to know

SOUR TASTE

Flavoured e-cigs 'have more cancer-causing toxins' - the worst ones revealed

Vaping fears

E-cigarettes will do more harm than good by 'introducing teens to smoking'

SMOKE SCREEN

SMORE SCREEN

Using e-cigarettes 'increases your cancer risk - even if there's NO nicotine'

VAPE AWARE

Toxic metals linked to brain damage 'can LEAK from e-cigarettes into vapour'

VAPING BAD

People who use e-cigarettes are 'more likely to get pneumonia'

GOING VAPE?

More than a million adults use e-cigs to stop smoking — but is vaping safe?

WHAT A DRAG

These popular e-cigarette flavours could be TOXIC for your heart

She also noted the low-nicotine vapers had a stronger urge to vape, suffered more acute withdrawal symptoms and were less satisfied using e-cigarettes.

Alison Cox, director of prevention at Cancer Research UK, said: "Let's be clear, while there are potentially harmful chemicals present in the e-cigarette vapour, there are far more in tobacco smoke.

"The best thing smokers can do for their health is to stop smoking, and switching to e-cigarettes is one way to do this."

She said tailored help from local Stop Smoking services gives smokers the best chance of quitting.

But she added: "This research suggests that a low nicotine approach may not be the best for everyone or the safest path to a successful attempt to give up.

"First time vapers should be prepared to experiment to find what suits them best and helps them to give up for good."

The findings are published in the journal *Addiction*.

One recent study found flavoured e-cigarettes contain "more cancer-causing chemicals", while campaigners have called for all e-cigarette flavours to be banned to protect kids

PRESS RELEASE

 tobaccofreekids.org/press-releases/2018_04_24_juul-enforcement

April 25, 2018

FDA Takes Important Steps to Address Youth Use of Juul E-Cigarettes, but Must Do More – **Agency Should Prevent Introduction of Kid-Friendly Tobacco Products Instead of Acting After the Fact**

Statement of the American Academy of Pediatrics, American Cancer Society Cancer Action Network, American Heart Association, Campaign for Tobacco-Free Kids and Truth Initiative

April 24, 2018

WASHINGTON, D.C. – The Food and Drug Administration (FDA) today has taken important initial steps to address the dramatic rise in youth use of Juul e-cigarettes. We commend the FDA and Commissioner Scott Gottlieb for recognizing the seriousness of the problem and taking enforcement action to prevent Juul sales to youth. However, the FDA must do more by taking off the market Juul flavors like mango and cool cucumber that clearly appeal to children and adolescents, preventing the introduction of look-alike products and subjecting e-cigarettes to FDA review of their public health impact, as required by law.

While a positive step forward, today's action does not address one of the most important actions the FDA can take to protect youth, which is to enforce existing law and the FDA's existing rules prohibiting the introduction of new or changed tobacco products – including e-cigarettes – without prior FDA review and authorization.

Without such FDA review, mango and cool cucumber-flavored Juul products should never have been allowed for sale and their current sale is illegal. The same is true for other newly-introduced tobacco products, possibly including the current version of two products mentioned by Commissioner Gottlieb, myblu and KandyPens. The FDA can and should take immediate action to address these issues and, moving forward, the FDA should utilize this authority **to prevent the introduction of child-friendly tobacco products in the first place, rather than taking action after they become popular with young people.**

The FDA should be commended for taking these important steps today, but the problem can't be solved if the FDA doesn't enforce its own rules requiring prior review of new or changed products. The rise in youth use of Juul is due in part to the FDA's failure and delay in enforcing this critical regulation.

These problems will also continue unless FDA reverses its decision that allows e-cigarettes that were on the market as of August 8, 2016, to stay on the market until at least 2022 without undergoing review by the FDA. Leading public health and medical organizations filed suit last month challenging the FDA's delay, arguing it is unlawful and harms public

health by leaving on the market products that appeal to youth. These organizations also wrote to the FDA last week, urging the agency to take strong and immediate action to address the dramatic rise in teen use of Juul e-cigarettes.

E-Cig Flavors Found to be Toxic When Inhaled

 legalreader.com/e-cig-flavors-found-toxic-inhaled

Sara E.
Teller

June 22, 2018

Researchers examined the impact of nine flavorings commonly added to e-cigarettes, cigars, hookahs and other products and found that short-term exposure to these additives can be toxic to endothelial cell function. This means, that flavorings could impair blood vessel function over time and lead to heart damage. They impair nitric oxide production, which inhibits inflammation and clotting while regulating blood vessel enlargement in response to blood flow.

Vanillin (vanilla), cinnamaldehyde (cinnamon), eugenol (clove), and acetylpyridine (burnt flavor) impair A23187-induced nitric oxide production and increase expression of the proinflammatory mediator interleukin(IL)-6 across all concentrations tested, “suggesting that the endothelium is particularly sensitive to these flavors,” Jessica Fetterman, PhD, of Boston University School of Medicine, and her colleagues wrote of their findings.

There are more than 7,000 different flavors of e-cigarettes on the market. Although many of the flavorings used have been determined to be safe in food products, the long-term safety for inhalation into the lungs is not yet known.

“When we eat something, the stomach has a lot of mechanisms to detoxify, but the lungs and blood vessels are largely unprotected,” Fetterman said. “People aren’t meant to inhale a lot of stuff into their lungs other than air.”

In addition to examining vanillin, cinnamaldehyde, eugenol, and acetylpyridine, the researchers also investigated the impact of diacetyl (butter), dimethylpyrazine (strawberry), isoamyl acetate (banana), and eucalyptol (spicy cooling) on endothelial cell function. Isolated endothelial cells from participants who use non-menthol- or menthol-flavored tobacco cigarettes showed impaired A23187-stimulated nitric oxide production compared with those from nonsmokers.

Treatment of endothelial cells isolated from nonsmoking participants with either menthol (0.01 mmol/L) or eugenol (0.01 mmol/L) decreased A23187-stimulated nitric oxide production.

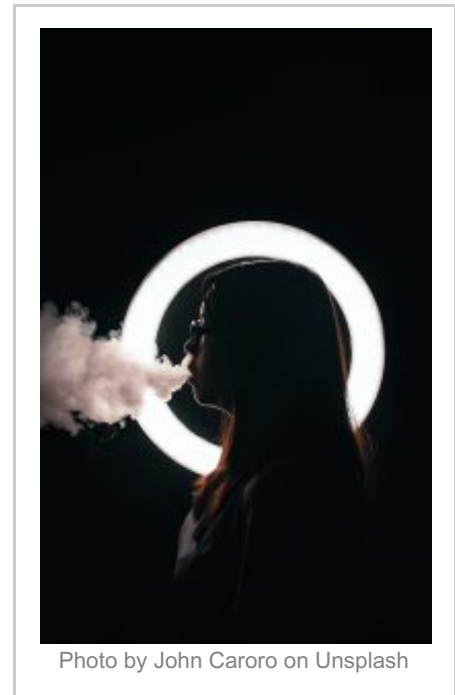
The researchers incubated commercially available human aortic endothelial cells with vanillin, menthol, cinnamaldehyde, eugenol, dimethylpyrazine, diacetyl, isoamyl acetate, eucalyptol, and acetylpyrazine (0.1–100 mmol/L) for 90 minutes. They then measured cell death, reactive oxygen species production, expression of IL-6, and nitric oxide production.

“Cell death and reactive oxygen species production were induced only at high concentrations unlikely to be achieved in vivo. Lower concentrations of selected flavors (vanillin, menthol, cinnamaldehyde, eugenol, and acetylpyridine) induced both inflammation and impaired A23187-stimulated nitric oxide production consistent with endothelial dysfunction,” according to the report.

Tobacco flavoring additives were found to restrict stimulated nitric oxide production and inflammation, “suggestive of endothelial dysfunction across a range of concentrations likely to be achieved in vivo.”

Fetterman said future studies are needed to better understand the short-term and long-term cardiovascular impact of exposure to inhaled tobacco product flavorings. The limitations of their procedure included that flavoring compounds were suspended in media without heating or the addition of other typical electronic liquid constituents, such as the solvents propylene glycol and glycerol. “Heating or combustion of the flavoring compounds likely alters the compounds, making them more or less toxic.”

Still, the study findings overall “provide quantitative support for the regulatory prohibition or the establishment of limitations on allowable levels of these flavorings in electronic liquids and other tobacco products.” The U.S. Food and Drug Administration is currently considering a ban on toxic flavors added to e-cigarettes and other tobacco products.



Sources:

[E-Cigarette Flavorings May Harm Blood Vessels: Cell studies show short-term endothelial disruption with exposure](#)

[Not All Vape Flavors are Created Equal. K-Dawn’s Dr. Daliah Explains](#)

Join the Discussion

New chemicals add concern over e-cigarettes' health impact

 cen.acs.org/articles/94/web/2016/08/New-chemicals-add-concern-over.html

Latest News

Web Date: August 2, 2016

Two potential carcinogens detected for the first time in electronic cigarette vapor and liquid

By [Deirdre Lockwood](#)

Vaporizing the solvents in e-cigarette liquid can produce harmful chemicals including glycidol, formaldehyde, and acrolein.

Two new chemicals of concern have been connected to electronic cigarettes: Glycidol, a probable carcinogen, is found in e-cigarette vapor; and propylene oxide, a respiratory irritant and possible carcinogen, is found in the flavored liquid heated by the device to produce the vapor. [Hugo Destailats](#) of Lawrence Berkeley National Laboratory and his colleagues also confirmed the presence of the probable carcinogens formaldehyde and acetaldehyde, as well as the strong respiratory and eye irritant acrolein, in the vapor (*Environ. Sci. Technol.*, DOI: [10.1021/acs.est.6b01741](https://doi.org/10.1021/acs.est.6b01741)).



Glycidol is a probable carcinogen found in e-cigarette vapor. Propylene oxide is a respiratory irritant and possible carcinogen found in e-cigarette liquid.

Notably, the researchers conclude that several of these compounds come from heating the liquid's solvents, propylene glycol and glycerin. Glycidol, acrolein, and formaldehyde are thermal by-products of glycerin, and propylene glycol degrades into acetaldehyde and formaldehyde.

The team tested two different brands of e-cigarettes with three different liquids, analyzing the liquid and vapor using gas chromatography-mass spectrometry and high-performance liquid chromatography. Propylene oxide was not detectable in the vapor in their HPLC analysis, but because it was found at relatively high levels in the liquid, the researchers speculate that it may be present in the vapor.

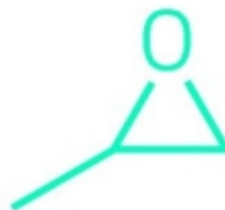
Several factors increased the amount of thermal degradation products delivered per puff, including repeated puffs within a half hour and increasing the e-cigarette voltage, both of which result in heating the liquid at a higher temperature. "As you increase the temperature, the amount of acrolein formed increases almost exponentially," Destailats says—by an order of magnitude for a voltage increase from 3.3 to 4.8 V. Minimizing the voltage could help e-cigarette users limit their exposure to these compounds, he says.

Most compounds of concern were detected at 0.3 to 70 µg per puff. The researchers estimate that e-cigarettes emit a quarter or less acrolein than a conventional cigarette for the equivalent number of puffs. However, the team's calculations also indicate that at least two compounds in e-cigarette vapor exceed limits for chronic exposure—both secondhand and for vapers themselves—set by the California Office of Environmental Health Hazard Assessment by up to an order of magnitude or more, Destailats says. The team's conclusions on health implications will appear in a forthcoming paper.

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**Propylene
oxide**



Glycidol

Three e-cigarette companies cop fines over misleading health claims in world-first

 [news.com.au/finance/business/manufacturing/three-ecigarette-companies-cop-fines-over-misleading-health-claims-in-worldfirst/news-story/33e47b6e1488e3d18c227d488edfcc7b](https://www.news.com.au/finance/business/manufacturing/three-ecigarette-companies-cop-fines-over-misleading-health-claims-in-worldfirst/news-story/33e47b6e1488e3d18c227d488edfcc7b)

May 8, 2017

[news.com.au](https://www.news.com.au)

THREE e-cigarette companies have been ordered to pay penalties for misleading consumers about the presence of harmful toxins in their products.

[news.com.au](https://www.news.com.au) May 8, 2017 11:32am

- [Video](#)

E-cigarette explodes while charging

THREE e-cigarette companies have been ordered to pay a total of \$175,000 in penalties for making false and misleading health claims, following legal action launched by the consumer watchdog.

In separate proceedings against online retailers Jostick, Social-Lites and Elusion, the Federal Court found all three companies misled consumers by claiming their products did not contain harmful carcinogens and toxins, when this was not the case.

The Australian Competition and Consumer Commission says it is the first time any regulator globally has successfully taken action for false and misleading claims about the presence of carcinogens in e-cigarettes.

The court found that the directors of Joystick and Elusion, and the chief executive of Social-Lites, were knowingly concerned in the contravening conduct of their respective companies.

Joystick was ordered to pay a penalty of \$50,000 and its director a penalty of \$10,000, Social-Lites a penalty of \$50,000 and its CEO a penalty of \$10,000, and Elusion a penalty of \$40,000 and its director a penalty of \$15,000.

“Consumers were led to believe by this conduct that when using these e-cigarette products, they would not be exposed to the harmful chemicals found in ordinary cigarettes,” ACCC acting chair Delia Rickard said. “In fact, they were exposed to the same chemicals, including a known carcinogen that has no safe level of exposure.”

“Businesses must ensure that they provide accurate information to customers, and have a reasonable basis for making any representations. This is particularly important for products that may cause harm to the health of consumers.”

The watchdog said it had written to more than 30 Australian e-cigarette suppliers reminding of their obligations under the law, in particular to ensure information provided to consumers is accurate.

The court action against Elusion and Social-Lites was launched in June last year, while the action against Joystick and its director came after the company failed to pay infringement notices issued by the ACCC.

The ACCC's case was based on independent testing which identified the presence of carcinogens and toxic chemicals, such as formaldehyde, acetaldehyde and acrolein in the products of Joystick, Social-Lites and Elusion, as well as acetone in Social-Lites' products.

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