

E-CIGARETTES

Evidence and Health Harms

At a time when many countries are seeing declines in tobacco use, electronic cigarettes (e-cigarettes or electronic nicotine delivery systems [ENDS]) increasingly undermine progress in reducing tobacco consumption by hooking another generation of young people and adult non-users on nicotine.^{1,2}

E-cigarettes are battery-powered devices that heat e-liquid, typically derived from tobacco and containing nicotine, to create an aerosol that the user inhales.³ ENDS vary greatly in terms of shape, size, and functionality, with nearly 16,000 e-liquid flavors available in some markets, and more than 30,000 brands sold in the EU.² Given the relative newness in comparison with conventional cigarettes, rapid growth, and diversity of the e-cigarette market, research on the health harms of e-cigarette use and the impact on public health is ongoing and evolving.

Tobacco companies claim that e-cigarettes are less harmful and are tools to help smokers quit, while also using these claims to oppose common sense regulation of these products for public health. As evidence for these claims is far from clear, e-cigarettes are increasingly designed and successfully marketed to young people, most of whom are non-smokers. The likely impact of these products without regulation is negative. Countries that allow these products on the market should apply the tobacco control provisions outlined in the WHO Framework Convention on Tobacco Control (WHO FCTC) to these ever evolving and multiplying products to ensure they are only marketed and sold to existing smokers — as the tobacco companies claim is their goal.

Health Harms

Research funded by industry interests produces results that depict e-cigarettes as less harmful, while independent research not funded by tobacco and/or e-cigarette industries has shown more serious dangers.⁴ While the long-term health effects of e-cigarette use are unclear, current evidence demonstrates that e-cigarettes are not harmless, particularly among adult non-smokers and youth, as well as dual users.^{1,2,3} Furthermore, e-cigarette use significantly increases the risk of conventional cigarette smoking among youth and young adults.^{1,5}

- Because adolescent brains are still developing, e-cigarette use can be especially harmful to young users, increasing the risk of addiction among youth⁶, and negatively impacting children's and young adults' brain development and learning.²
- E-cigarettes, such as VUSE and Juul, deliver large doses of nicotine, putting adolescents at an increased risk of addiction. A single JUULpod, which is a cartridge of nicotine, can contain as much nicotine as a pack of cigarettes.⁷
- Even short-term use of e-cigarettes has been associated with cardiovascular harm and increased risk of developing asthma and COPD.²

- Growing evidence indicates that ENDS use promotes adverse respiratory symptoms, such as irritation and wheezing, as well as inflammation in the respiratory system.^{8,9}
- While there's no definitive causal proof yet, the Clinical Oncology Society of Australia (COSA) concluded from its review that nicotine-based e-cigarettes are likely to be found carcinogenic and specifically to cause lung and oral cancer.¹⁰
- Although the health effects from exposure to secondhand emissions from ENDS are not fully understood, secondhand aerosol exposure is not risk free, and the levels of particulate matter and potential carcinogens in secondhand aerosols exceed the maximum levels set out by the WHO daily mean standards for air quality.^{2,11} Human exposure to particulate matter generated during the use of ENDS– including fine and ultra fine particles (which may penetrate the alveoli), volatile organic compounds, heavy metals and nicotine– have been associated with increased risk of heart and lung disorders.²

Youth Marketing and Initiation

Far from exclusively targeting adult smokers to quit, as claimed by the industry, product design and marketing tactics for e-cigarettes often follow the tobacco industry's playbook and target young people. The industry appeals to youth with lifestyle marketing, candy, beverage, and fruit flavored products, sleek and modern product design, and engineered smooth nicotine delivery using nicotine salts that makes it easier for new users to start and develop addiction.²

- E-cigarettes can create a new generation of nicotine users. Across nine countries, including the United Kingdom, United States, and Canada, there is evidence that shows e-cigarette users are three times more likely to go on to smoke conventional cigarettes compared to non-e-cigarette users.¹
- Recent market trends show an increase in the sale of e-cigarettes that use nicotine salts to deliver high levels of nicotine more efficiently and with less irritation, making it easier for young people to initiate and become addicted.^{2,12}
- More than 16,000 unique ENDS flavors are available on the market, many of which are attractive to youth and increase the likelihood of children's use. Research shows adolescents consider flavor as one of the most important factors when trying e-cigarettes and are more likely to initiate e-cigarette use with flavored products.^{2,11} Approximately nine in ten (89.4%) youth e-cigarette users in the US used flavored e-cigarettes, including flavors like fruit, candy, desserts, other sweets, and mint.¹³
- E-cigarettes are the most commonly used tobacco and nicotine product among high school and middle school students in the US.¹⁴ In the US in 2024, 5.9% of youth (1.63 million total US youth) reported current e-cigarette use.¹⁵ In Canada, 5.8% of youth aged 12 to 17 reported using an e-cigarette in the past 30 days 2023.^{16,17} In the UK, current e-cigarette use has increased from 2021 to 2024 among youth aged 16–17 (5.9%, 14%) and aged 18 (9.5%, 17%).¹⁸ Use of e-cigarettes is also greatest in young people in Australia, with over one-third of current e-cigarette users under the age of 25 and half under the age of 30.¹

Evidence of E-cigarettes for Cessation is Inconclusive

While tobacco and e-cigarette companies claim their e-cigarette brands help smokers quit and use a harm reduction argument to lobby for limited regulations on these products, the WHO reported in their 2021 Report on the Global Tobacco Epidemic that, “evidence on the use of ENDS as a cessation aid is inconclusive.” The research, including Cochrane reviews, shows e-cigarette effectiveness in quitting comes only from managed, clinical settings, and population studies conducted in uncontrolled settings¹⁹ do not indicate that these products assist smokers in quitting.^{19,20}

To date, there is no e-cigarette on the market worldwide that has been medicinally licensed and sold as a smoking cessation product. E-cigarettes may have benefits for smokers who switch completely from conventional cigarettes to e-cigarettes; however, many e-cigarette users are either dual users or never smokers. Initiation of e-cigarettes among youth due to the marketing of these products also offsets potential population-wide public health benefits.

- Smokers who continue to smoke, even if they smoke fewer cigarettes per day, and also use e-cigarettes (dual use) may increase their individual risk if this delays or prevents complete cessation from conventional cigarettes.^{2,8}
- Many e-cigarette users report using both e-cigarettes and conventional cigarettes. In the US, the 2022 National Health Interview Survey found that 29.4% of adult e-cigarette users were also current cigarette smokers (dual users) while 30.3% had never been smokers.²¹ Research shows that, depending on the degree of continued smoking, dual users may not be exposed to lower levels of toxicants compared to exclusive cigarette smokers.²²
- Evidence suggests that former smokers using ENDS as a cessation aid are two times as likely to relapse to conventional cigarette smoking compared to former cigarette smokers not using ENDS in their quit attempt.¹

Current research continues to show insufficient evidence that e-cigarettes are an effective cessation tool.^{23,24} The WHO stated: “[e]lectronic cigarettes as actually used in the population as consumer products have not been proven to be effective for cessation at the population level and may lead to ongoing nicotine dependence.”

Key Takeaways

- E-cigarettes are not harmless, and the relative newness and incredible diversity of products makes any definitive determination of harm difficult.
- Youth-targeted product design and marketing is resulting in high rates of youth initiation, and these users are more likely to become conventional cigarette smokers.
- Evidence for the effectiveness of e-cigarettes for cessation is inconclusive, especially under real world conditions.
- The way e-cigarettes are designed, marketed, and used is unlikely to produce any potential benefits, even if they are ultimately shown to be less harmful than conventional cigarettes to an individual smoker.
- If allowed on the market, ENDS should be regulated like other tobacco and nicotine products, in adherence to the WHO FCTC and to ensure they are only marketed and sold to existing smokers.

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