Evidence brief 3: ENDS use and youth

ENDS use as a youth risk behaviour. No one concerned with public health recommends or welcomes youth nicotine use. The same applies to alcohol and illicit drug use, premature or risky sexual practices, dangerous driving, and a range of other youth risk behaviours.[1] Nevertheless, such behaviours are a real part of society and require a response to reduce the harm they cause. Many are concerned about youth ENDS use, especially regarding potential "gateway" effects and signs of nicotine dependence. However, it is essential to place ENDS use in the broader context of youth risk behaviours, including smoking. For most adolescents, ENDS use would not be particularly harmful, and for some, it would be an alternative to smoking and beneficial.

Causes of youth tobacco use. Evidence suggests that a wide range of psycho-social factors drive nicotine use. For example, these are characteristics of the individual (genetic, mental health, rebellious outlook, etc.) and their circumstances (household, peer group, marketing, etc). One systematic review identified *ninety-eight* conceptually different predictors of smoking onset.[2] Studies of ENDS users suggest use arises from seeking an "alternative to cigarettes", the "wider social environment",[3] and curiosity.[4]

The danger for policymakers. It is not possible (or desirable) to make straightforward cause-and-effect claims about youth smoking or vaping, such as attribution of youth use to factors such as flavours, packaging, or marketing to vaping uptake. The danger of designing policy based on a simplistic understanding of causes will leave the underlying demand intact and cause users to find alternative ways to use nicotine, including switching to smoking.[5] [6] ENDS use is one of a range of youth risk behaviours that a subset of young people will engage in, even if adults disapprove related to substance use, violence, sexual behaviour, and risk-taking.[7] The public health challenge is to reduce the risks to these young people to the extent possible – including the risks arising from the unintended consequences of poorly designed policy.

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1 See, for example, the U.S. Centers for Disease Control and Prevention (CDC) Youth Risk Behavioral Surveillance System [link].

2 Wellman, R. J et al. (2016). Predictors of the Onset of Cigarette Smoking: A Systematic Review of Longitudinal Population-Based Studies in Youth. In American Journal of Preventive Medicine (Vol. 51, Issue 5, pp. 767–778). Elsevier Inc. [link]

3 Nicksic, N. E., Snell, L. M., & Barnes, A. J. (2019). Reasons to use e-cigarettes among adults and youth in the Population Assessment of Tobacco and Health (PATH) study. *Addictive Behaviors*, *93*, 93–99. [link]

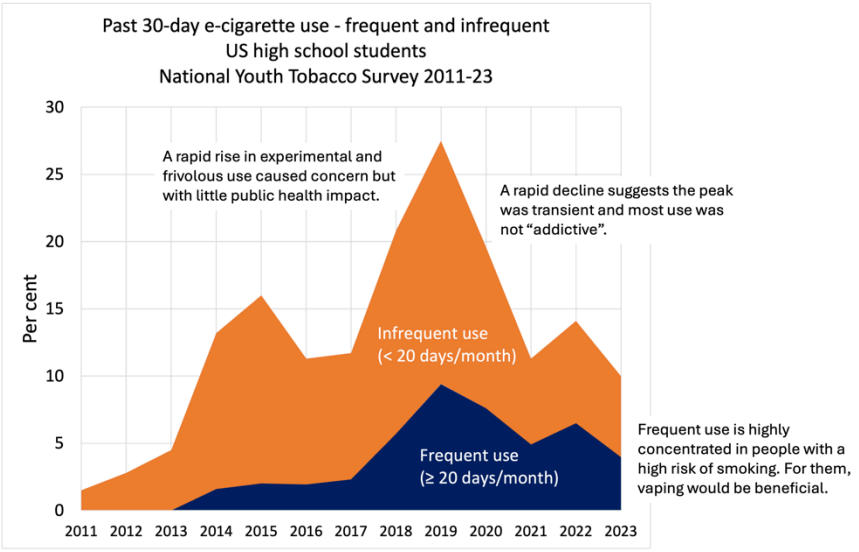
4 Wang TW, Gentzke AS, Creamer MLR, et al. Tobacco product use and associated factors among middle and high school students-United States, 2019. *MMWR Surveill Summ* 2019;68(12):1–22. [link]

5 Posner, H., et al. (2022). Reactions to Sales Restrictions on Flavored Vape Products or All Vape Products Among Young Adults in the United States. *Nicotine & Tobacco Research*, *24*(3), 333–341. [link]

6 Friedman, A. S. (2021). A Difference-in-Differences Analysis of Youth Smoking and a Ban on Sales of Flavored Tobacco Products in San Francisco, California. *JAMA Pediatrics*, *175*(8), 863–865. [link]

7 US Youth Risk Behavior Surveillance Survey, 2021. Data explorer. [link]

Understanding youth vaping. The annotated chart below provides a basis for understanding youth ENDS use. It is based on US data from the National Youth Tobacco Survey as it developed over the last 12 years, peaking in 2019.[8] Many themes will be common with other countries.



Youth ENDS use has declined or plateaued in many countries. In the US, the proportion of high school-aged youth who used ENDS in the past 30 days peaked in 2019 at 27.5%[9] but has since declined by almost two-thirds to 10.0%.[10] In the UK, occasional or weekly ENDS use plateaued between 2021 and 2022,[11] as did past-30-day ENDS use in Canada.[12] There may be different types of use. Firstly, relatively frivolous use based on youthful experimentation, fads, and fashion is unlikely to persist – this is of little serious public health consequence. Secondly, more intensive and longer-term use – but this is most likely to be displacing smoking. There is reasonable evidence to support this model.

- **Most youth ENDS use is experimental and temporary.** Most youth who ever try ENDS do not persist in using them currently. In both the US and the UK, just under half of youth who had ever tried ENDS continued to use them 1+ times in the past 30 days. [11] [13] Similarly, in the UK, over 60% of youth who used ENDS had either used them only once or twice or had used them more but discontinued them. [10]

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8 Centers for Disease Control and Prevention (CDC). National Youth Tobacco Survey, 2011-23. [link]

9 Wang, T. W., et al. (2019). Tobacco Product Use and Associated Factors Among Middle and High School Students — United States, 2019. *MMWR. Surveillance Summaries*, *68*(12). [link]

10 Birdsey, J. et al. (2023). Tobacco Product Use Among U.S. Middle and High School Students — National Youth Tobacco Survey, 2023. *MMWR. Morbidity and Mortality Weekly Report*, *72*(44), 1173-1182 [link]

11 Use of e-cigarettes among young people in Great Britain (Action on Smoking and Health) (2023). [link]

12 Canadian Tobacco and Nicotine Survey, 2022 (Statisics Canada) [link]

13 Park-Lee E, et al. Tobacco Product Use Among Middle and High School Students - United States, 2022. *MMWR Morb Mortal Wkly Rep*. Nov 11 2022;71(45):1429-1435. [link]

These patterns of temporary experimentation align with youths' stated reasons for *ever* using ENDS, which are most often curiosity/experimentation, boredom, and social reasons.[14] [15] [16]

- **ENDS use is concentrated in youth who had (or would have) used other nicotine products.** US youth with an *established* history of other nicotine product use were over five times as likely to have used ENDS in the past 30 days.[17] 70% of UK youth who currently used ENDS had a history of cigarette smoking.[10] ENDS use that is frequent and/or is accompanied by nicotine dependence is even more strongly concentrated in those who had already used cigarettes or other nicotine products: approximately 98% of US youth who used ENDS frequently had used another nicotine product.[16] Youth who vape have risk factors that also predispose them to smoke cigarettes,[18] suggesting that they would have otherwise been cigarette smokers.[19]
- **Higher youth ENDS use is accompanied by larger declines in smoking, suggesting displacement rather than gateway.** If ENDS were a gateway to cigarette smoking, then youth smoking trends would be higher than otherwise expected as ENDS use increases. However, population-level studies show the opposite: youth and young adult smoking prevalence declined *faster* after ENDS use became common,[20] and this pattern is remarkably consistent across countries, including the US,[19] [21] [22] UK,[23] [24]

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[14] Gentzke AS, et al. Tobacco Product Use and Associated Factors Among Middle and High School Students—National Youth Tobacco Survey, United States, 2021. *MMWR Surveillance Summaries*. 2022;71(5):1. [link]

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Canada,[25] and New Zealand.[26] [27] These declines have been drastic and unexpected: in the US, actual youth smoking in 2020 was far lower (3.3%)[28] than what was thought possible in 2010 according to the US Healthy People target for 2020 (16%).[29] These trends are consistent with ENDS diverting youth with a predisposition for nicotine use away from more harmful combustible cigarettes.[21] [25]

Evidence for the gateway hypothesis is better explained by a "common liability" to nicotine use. Claims that ENDS are a gateway to smoking are based on a misunderstanding of the evidence (i.e. that youth who use ENDS are also more likely to smoke cigarettes). Rather than ENDS *causing* youth to also smoke cigarettes (which confuses correlation and causation), it is more likely that ENDS use and smoking are both explained by pre-existing characteristics which predispose some youth to use nicotine. There are dozens of these "common liability" factors (e.g., other substance use, poor mental health, risk-seeking personality) which are not accounted for in most studies.[17] The apparent gateway association becomes successively weaker as more common liability factors are accounted for[30] [31] – in some cases becoming not statistically significant[29] [32] – suggesting that it is better explained by pre-existing propensity to use nicotine.

References

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