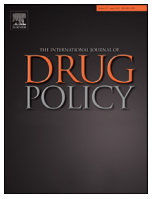
International Journal of Drug Policy 117 (2023) 104064

Contents lists available at ScienceDirect

International Journal of Drug Policy

journal homepage: www.elsevier.com/locate/drugpo



Commentary

What are the harms of vaping in young people who have never smoked?

Colin Paul Mendelsohn [a,*], Wayne Hall [b]

[a] 11 Carlotta Road, Double Bay NSW 2028, Australia
[b] National Centre for Youth Substance Use Research, The University of Queensland, St Lucia, Queensland 4067, Australia

Recent increases in nicotine vaping by adolescents have understandably alarmed parents and school communities. Concerns have been greatest about the uptake of vaping by young people who have never smoked.

A reasonable fear is that vaping by people who have never smoked may cause potential new harms, such as nicotine dependence, effects on the developing brain and a transition to cigarette smoking, the most harmful way of obtaining nicotine. Vaping among young people who already smoke may be beneficial if it diverts them away completely from cigarette smoking.

Youth vaping is the key driver of media debates and vaping policy in many countries, such as Australia and the United States. An objective assessment of the risks and benefits of vaping in young people is important to understand its impact on public health and inform evidence-based policy. This requires an analysis of the prevalence of vaping by young people who have never smoked and a review of the evidence on the risks it poses to health.

How common is frequent vaping in never-smokers?

Most vaping by never-smoking adolescents is occasional and transient (Action on Smoking and Health UK, 2022; ASH New Zealand, 2022; Glasser, Johnson, Niaura, Abrams, & Pearson, 2021; Hammond et al., 2019; Jarvis, Jackson, West, & Brown, 2020; NHS Digital, 2022). Frequent vaping by young people who have never smoked is uncommon in western countries with a prevalence mostly under 2%. (Table 1) Vaping rates are substantially higher in current or former smokers, ranging from 18-89% (Action on Smoking and Health UK, 2022; ASH New Zealand, 2022; Glasser et al., 2021; Hammond et al., 2019; Jarvis et al., 2020; NHS Digital, 2022).

The most detailed data on youth vaping are from England and demonstrate a strong association between vaping and smoking (NHS Digital, 2022) (Table 2). In 2021, only 1% of 11-15-year-olds who had never smoked cigarettes vaped regularly (once or more weekly), although a proportion of these may take up smoking later. In comparison, 61% of those who smoke regularly (at least one cigarette per week) also vaped regularly.

Measures of lifetime vaping ("even a puff") or current vaping (at least once in the past 30-days) overestimate the prevalence of frequent vaping by those who have never-smoked because they include experimental and infrequent vaping which is the most common pattern of use in this group (Action on Smoking and Health UK, 2022; Glasser et al., 2021; Hammond et al., 2019; Jarvis et al., 2020).

Does vaping increase the risk of taking up smoking?

It is well established that young people who try vaping are more likely to later try smoking (Soneji et al., 2017). There is a tendency in policy discussions to assume that this association is causal (the gateway hypothesis) (Chan et al., 2021). However, it is not the only possible or the most plausible explanation. A more likely explanation is that the association is explained by shared risk factors for vaping and smoking, such as a genetic liability to develop nicotine addiction (Hall & Chan, 2021) and environmental, psychological and social causes e.g., peer group or parental smoking (Cambron & Thackeray, 2022) that create a 'common liability' for risk taking (Vanyukov et al., 2012). In studies that adjust for these confounders, most of the association between vaping and subsequent smoking has disappeared (Kim & Selya, 2019; Lee, Coombs, & Afolalu, 2018; Sun, Mendez, & Warner, 2022).

The gateway hypothesis also predicts that increased vaping will increase cigarette smoking among youth. However, increases in youth vaping have been accompanied by an accelerated decline in smoking since vaping became popular in the US, UK and New Zealand, suggesting either no overall gateway effect or at most, a small gateway effect that is outweighed by the much larger number moving from smoking to vaping (Centers for Disease Control and Prevention, 2021; Levy et al., 2019; Meza, Jimenez-Mendoza, & Levy, 2020; NHS Digital, 2022) (Fig. 1).

Population and modelling studies also suggest that vaping and smoking are substitutes and that vaping is displacing smoking at a population level (Foxon & Selya, 2020; Selya & Foxon, 2021; Sokol & Feldman, 2021; Walker et al., 2020). Studies of the effects of tax increases on vaping products also support a diversion effect. Higher taxes on vapes are associated with increased cigarette smoking while higher cigarette prices are associated with increased vaping (Abouk et al., 2023; Cantrell et al., 2020; Chan et al., 2022; Pesko & Warman, 2022), (Fig. 2).

Bans or purchasing restrictions on the sale of vapes to teens are also associated with increased adolescent smoking (Dave, Feng, & Pesko, 2019; Friedman, 2015; Pesko, Hughes, & Faisal, 2016). One study estimated that establishing a minimum legal sale age for e-cigarettes in

* Corresponding author.
E-mail addresses: mendel@bigpond.net.au (C.P. Mendelsohn), w.hall@uq.edu.au (W. Hall).

https://doi.org/10.1016/j.drugpo.2023.104064

Table 1
Frequent or daily vaping by never-smoking youth.

Country	Vaping frequency	Year	Never smokers	Current smokers	Age	Ref
England	≥ once weekly	2021	1%	61% of regular smokers (at least one cigarette per week) were regular vapers	11-15	(NHS Digital, 2022)
	> once weekly	2022	0.5%	55.4% of current smokers (occasional or more frequent) were current vapers	11-17	(Action on Smoking and Health UK, 2022)
	≥ 15 days in the last 30	2018	0.1%	13.4% of current smokers (at least 100 cigarettes in lifetime and smoked in past 30 days) vaped frequently	16-19	(Hammond et al., 2019)
United States	≥ 20 days in the last 30	2018	0.4%	88.9% of frequent vapers were current (smoked in the past 30 days) or past smokers	9-19	(Glasser, Johnson, Niaura, Abrams, & Pearson, 2021)
		2019	2.1%	48.8% of frequent vapers had smoked >100 cigarettes	14-18	(Jarvis, Jackson, West, & Brown, 2020)
	≥ 15 days in the last 30	2018	1.5%	23.4% of current smokers (at least 100 cigarettes in lifetime and smoked in past 30 days) vaped frequently	16-19	(Hammond et al., 2019)
Canada	≥ 15 days in the last 30	2018	0.6%	18% of current smokers (at least 100 cigarettes in lifetime and smoked in past 30 days) vaped frequently	16-19	(Hammond et al., 2019)
New Zealand	Daily	2022	4.3%	86.6% of daily smokers vaped daily	15	(ASH New Zealand, 2022)

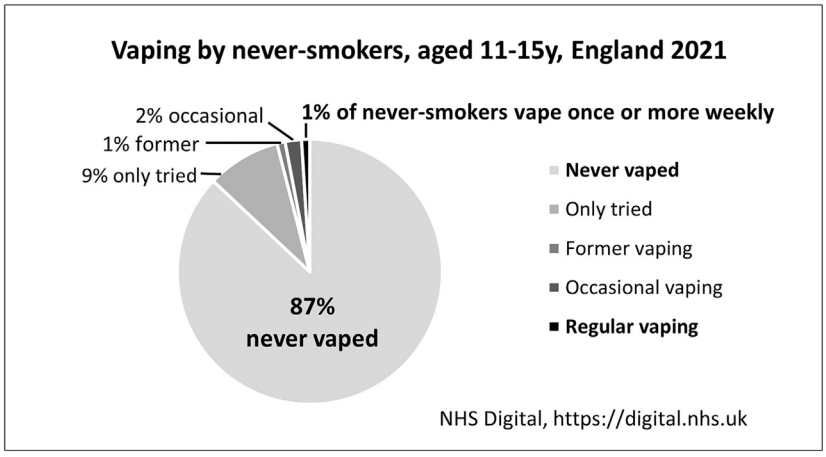


Fig. 1. Vaping by never-smokers, aged 11-15y, England 2021.

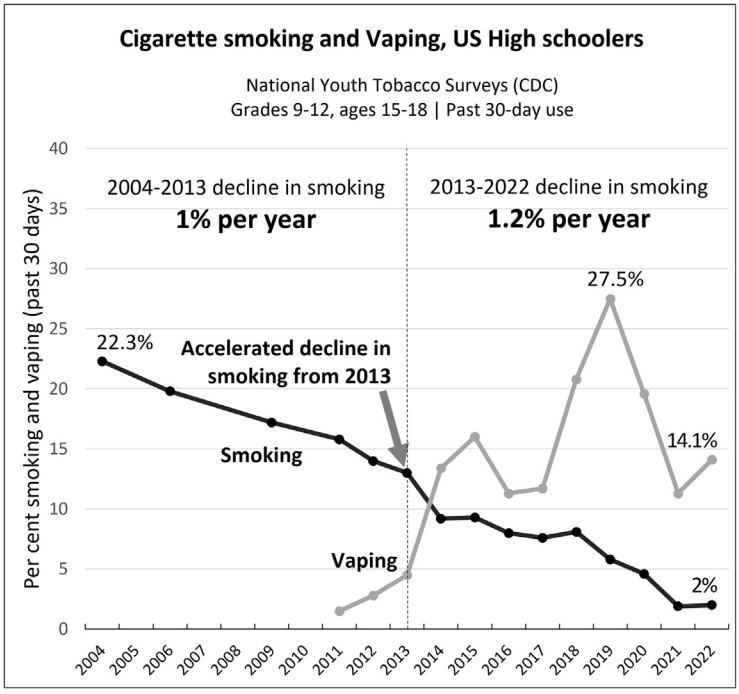


Fig. 2. Decline in youth smoking in the US as vaping increased (Centers for Disease Control and Prevention, 2021).

the US between 2010-2016 reduced e-cigarette use but increased daily smoking by approximately 35% (Pesko, 2023).

Approximately 25-50% of adolescents who experiment with vaping are non-smokers at the time (Legleye, Aubin, Falissard, Beck, & Spilka, 2021; Mus, Monzon, Islam, Thrasher, & Barnoya, 2023; Shahab, Beard, & Brown, 2021; Watts et al., 2022). There is growing evidence that those who vape first (before smoking) are less likely to smoke later, compared to those who smoke first (Chyderiotis, Benmarhnia, Beck, Spilka, & Legleye, 2020; Legleye et al., 2021; Mus et al., 2023; Shahab et al., 2021; Sokol & Feldman, 2021; Xu et al., 2022).

Importantly, in cross-sectional (Kim & Selya, 2019; Levy et al., 2019; Shahab et al., 2021) and longitudinal studies (Sun, Méndez, & Warner, 2023) it does not appear that youth vaping leads to increases in sustained cigarette use which is the major public health concern. Studies that measure experimentation with smoking overestimate smoking uptake because only a small fraction of ever or infrequent cigarette smokers progress to become persistent lifetime users (Glasser et al., 2021).

What are the known health effects of vaping by never-smokers?

Young people who have never smoked should not vape as this exposes them to toxic chemicals and unnecessary health risks. The precise long-term effects of vaping nicotine will not be fully known for decades. Effects from long-term vaping may include cardiovascular (Benowitz & Fraiman, 2017) and respiratory effects (Polosa, O'Leary, Tashkin, Emma, & Caruso, 2019). Ongoing monitoring and long-term studies are essential to detect any problems that may arise in the future, particularly from sustained frequent vaping.

Furthermore, most vaping by young people who have never smoked is infrequent and short-term (Action on Smoking and Health UK, 2022; Glasser et al., 2021; Hammond et al., 2019; Jarvis et al., 2020). This pattern is associated with lower levels of toxic exposure and so is likely to have fewer adverse health effects than frequent or sustained use. The most commonly reported adverse short-term effects of vaping are throat and mouth irritation, headache, cough and nausea, effects which tend to dissipate with continued use (Hartmann-Boyce et al., 2022).

Vaping has been associated with respiratory symptoms in young people in cross-sectional studies, but many young people who vape have also smoked tobacco so the significance of these findings is uncertain (McConnell et al., 2017; Schweitzer et al., 2015; Wang, Ho, Leung, & Lam, 2016). Other studies have found no functionally-important respiratory symptoms in young people who vape after account is taken of past cigarette smoking (Stevens et al., 2022; Tanski et al., 2022). A meta-analysis of ten cross-sectional studies found an association between vaping and asthma in young people but it was unclear if the association is causal (Li et al., 2022). A large, longitudinal study found that exclusive e-cigarette use was not associated with the onset of asthma (Mattingly et al., 2023).

There is evidence from animal studies that high doses of nicotine cause harmful effects on the adolescent brain but it is uncertain if these findings can be extrapolated to adolescent humans (Balfour et al., 2021). Studies have not found large difference in IQ (Wennerstad et al., 2010), educational achievement (Treur et al., 2015) or cognitive abilities (Corley, Gow, Starr, & Deary, 2012) in adulthood between those who have smoked in the past and those who have never smoked.

There is some evidence that nicotine may in the short-term improve attention, memory (Heishman, Kleykamp, & Singleton, 2010) and cognitive function (Gil & Metherate, 2019), relieve anxiety (Morissette, Tull, Gulliver, Kamholz, & Zimering, 2007) and improve mood (Picciotto, Brunzell, & Caldarone, 2002).

Nicotine itself represents minimal risk of serious harm in the doses commonly used in vaping (McNeill, Brose, Calder, Bauld, & Robson, 2018; McNeill et al., 2022). Nicotine does not cause cancer (International Agency for Research on Cancer, 2012) or lung disease (US Department of Health and Human Services, 2014) and it has only a minor role in cardiovascular disease (Benowitz & Burbank, 2016). A recent meta-analysis of 42 studies with a median duration of 10 weeks found with moderate certainty that there are no significant associations between the use of nicotine and the risk of clinically diagnosed adverse cardiovascular events (Kim et al., 2023).

However, nicotine withdrawal can cause short-term symptoms such as irritability, restlessness, anxiety, difficulty concentrating and depression (Benowitz, St Helen, & Liakoni, 2021).

To date, there have been no identified health risks of passive vaping to bystanders due to the low levels of toxicants emitted (McNeill et al., 2018; Royal College of Physicians, 2016).

There is no evidence that vaping nicotine causes the serious lung disease E-cigarette or Vaping Associated Lung Injury (EVALI) (Mendelsohn, Wodak, & Hall, 2023) or seizures (Benowitz, 2020) EVALI was caused by vaping illicit cannabis oils contaminated with vitamin E acetate (Krishnasamy et al., 2020). There is a rare risk of burns and injuries from lithium-battery explosions, but none have been reported from disposables, the most popular type of device used by young people (Tattan-Birch, Jackson, Kock, Dockrell, & Brown, 2022; Watts et al., 2022).

Vaping is likely to be far less harmful than smoking (Committee on Toxicity of Chemicals in Food Consumer products and the Environment (COT), 2020; McNeill et al., 2018; McNeill et al., 2022; National Academies of Sciences Engineering and Medicine, 2018; Royal College of Physicians, 2016). There are substantially fewer harmful and potentially harmful constituents (HPHC) in vapour than in tobacco smoke and those that are present occur at far lower concentrations (McNeill et al., 2022). Further research is needed to assess the potential toxicity of inhaled flavoring additives and their thermal degradation products (Committee on Toxicity of Chemicals in Food Consumer products and the Environment (COT), 2020).

Do never-smokers who vape become dependent on nicotine?

Vaping can cause nicotine dependence in some young people who have never smoked. The evidence suggests however, that this is a minority of cases, not, as the media often claim, a "new generation addicted to nicotine" (Jackson, Brown, & Jarvis, 2021).

An analysis of the 2018 US National Youth Tobacco Survey found that <4% of young people who had vaped in the past 30 days but had never smoked had signs of nicotine dependence (Jarvis et al., 2020). This low incidence is consistent with the dominant pattern of occasional and short-term use of vapes.

Nicotine dependence is concentrated in young people who have previously or currently smoke (Hammond et al., 2019; Jackson, Kotz, West, & Brown, 2019; Liu, Wasserman, Kong, & Foulds, 2017). In the US, there was a 50% decline in youth vaping from 2019-2021 suggesting that many young people who vaped were readily able to stop. This period included the COVID pandemic, although its influence on this decline is unclear (Chen-Sankey, Bover Manderski, Young, & Delnevo, 2022) (Fig. 1).

Nicotine dependence in the US youth population has not increased overall from 2012-19 despite the rise in youth vaping (Jackson et al., 2021). This may be partly attributable to a shift away from cigarettes (on which users are most dependent) to vaping products (on which users are less dependent).

Not all young people who vape use nicotine. Thirty to fifty percent report not using nicotine, or not knowing if they had used it or not (Gorini et al., 2020; Miech, Johnston, O'Malley, Bachman, & Patrick, 2019; Watts et al., 2022).

As with adults, nicotine dependence is lower in young people who vape compared to those who smoke (Hammond et al., 2021; Jarvis et al., 2020). Some young people may need support to stop vaping using strategies such as counselling, a gradual reduction in nicotine concentration or abrupt cessation, switching to a nicotine replacement product and re-

lapse prevention (National Centre for Smoking Cessation and Training, 2022).

The development of nicotine dependence in adolescence is unlikely to increase the risk of later use of other drugs (Lynskey & Agrawal, 2018). However, research has not been able to discount the possibility of a causal link.

What about the risks for young smokers who take up vaping?

The vast majority of young people who experiment with both vaping and smoking had smoked before they tried vaping (Berry et al., 2019; Chyderiotis, Spilka, & Beck, 2019; de Lacy, Fletcher, Hewitt, Murphy, & Moore, 2017; Jarvis et al., 2020). Many teens who smoke use e-cigarettes to quit smoking or as a safer alternative (Australian Institute of Health and Welfare, 2020; Camenga, Kong, Cavallo, & Krishnan-Sarin, 2017; Kong, Morean, Cavallo, Camenga, & Krishnan-Sarin, 2015). However, studies so far have not found an association between e-cigarette use and subsequent smoking cessation in this population (Lin et al., 2022; Saller, Agaku, & Filippidis, 2022; Wang, Li, Wu, Lam, & Chan, 2017).

There is also little evidence of effectiveness of nicotine replacement therapy for adolescent smoking (Myung & Park, 2019) which may be partly explained by poor compliance (Scherphof, van den Eijnden, Lugtig, Engels, & Vollebergh, 2014).

Vaping is not harmless, but is likely to be far less harmful than smoking and those who switch from smoking to vaping are likely to see health benefits (McNeill et al., 2022). Switching to exclusive vaping is recommended for optimal benefit as dual use (vaping and smoking) is associated with greater toxicant exposure than vaping alone and greater health risk (Anic et al., 2022).

Modelling studies suggest a net benefit from vaping to population health under all plausible scenarios. These models take into account harms from vaping (uptake by never-smoking youth and adults, the potential to increase smoking, inhibit smoking cessation and promote relapse) and benefits (cessation of smoking and diversion of those who would have otherwise have taken up smoking) (Levy et al., 2021; Summers, Ait Ouakrim, Wilson, & Blakely, 2022).

Policy measures to reduce youth vaping

Vaping policy needs to balance the substantial and more immediate benefits for adults who smoke against the smaller and delayed risks of uptake among non-smoking youth (Balfour et al., 2021). A tightly regulated, risk-proportionate consumer model with strict age verification would make regulated vaping products more available for adults who smoke, reduce illicit sales and reduce youth access (Mendelsohn, Wodak, & Hall, 2023). Nicotine liquids should be available from licensed retail outlets, such as specialist vape shops, pharmacies and general retail outlets, as for cigarettes and alcohol. Strict age verification at the time of purchase should be required with harsh penalties for breaches such as fines and loss of licence. Consideration could be given to mandatory CCTV recording of sales as a condition of a sales licence. Some leakage to youth through social sources is inevitable and controlling this would need further regulatory measures.

Strict age verification at the time of sale is essential and can be enforced under a licensing scheme for retail outlets. Breaches of age-of-sale limits should result in severe penalties and loss of licence. A third-party verification service is required for online purchases with age verification on delivery.

We need to recognize that overly restrictive policies intended to reduce youth vaping can have counterproductive results. Vaping products and cigarettes are substitutes among nicotine users. Restrictions on youth access to e-cigarettes are associated with higher adolescent cigarette smoking (Dave, Feng, et al., 2019; Friedman, 2015; Pesko et al., 2016).

Young people enjoy flavored products and longitudinal studies have found that the initial use of flavors is associated with continued vaping (Notley et al., 2022). Flavors may also contribute to the diversion of young people from smoking and as an aid to smoking cessation. There is no evidence to date that flavored e-liquid use specifically is associated with tobacco smoking uptake or cessation (Notley et al., 2022) but more research is needed to clarify the overall impact of flavors.

Flavor bans can also have unintended harmful effects. A ban on flavored tobacco and vaping products in San Francisco in 2020 was associated with a more than doubling of cigarette smoking by high school students relative to concurrent changes in other districts (Friedman, 2021). A ban on flavors in pod-based products other than tobacco and menthol in the US resulted in a shift to disposable products by adolescents. Vaping and smoking behaviours remained unchanged (Hammond et al., 2022). The effects of these policies need further evaluation. However, flavor names that specifically appeal to young people should be prohibited.

Taxation should be kept to a minimum and proportionate to risk to incentivize switching by adults who smoke (Royal College of Physicians, 2016). Increased taxation of vaping products to reduce youth vaping is associated with increased smoking by youth (Abouk et al., 2023; Pesko & Warman, 2022) and shifts the source of vapes from retail to social sources (Abouk et al., 2023).

Disposable devices are popular with young people (Tattan-Birch et al., 2022). However, a disposable ban could simply similarly shift usage from disposables to another nicotine product (Khouja & Munafò, 2022). Disposables also play an important role as a transition model for adults who smoke and a ban may have unintended consequences for adults (Russell, McKinney, & Fearon, 2023).

Advertising to adults who smoke at the point-of-sale helps raise awareness of vaping as a safer alternative and may encourage them to switch (Dave, Dench, Grossman, Kenkel, & Saffer, 2019). There is also an association between viewing advertisements and youth vaping (Dai & Hao, 2016; Padon, Lochbuehler, Maloney, & Cappella, 2018). It is not clear if this association is causal or if adolescents who are interested in vaping are more likely to notice advertisements (attentional bias) (Dai & Hao, 2016). The impact of advertising on adolescents can be minimised by enforcing socially responsible advertising and controlling the content and placement of advertisements (UK Advertising Code, 2016).

Packaging should not include images that appeal to youth. However, the one study of graphic images found that they were not effective in deterring youth vaping (Wojtecka et al., 2023). A recent study found that adolescents considered their peers would be less interested in plain, standardised green packs for vape products compared to fully branded packaging (Taylor et al., 2023). Plain packaging is appropriate for smoking products but in our view may be disproportionate to the risk involved from vaping.

Australia's current prescription-only model for vaping has primarily been justified to minimise youth uptake of vaping (Therapeutic Goods Administration, 2022). However, since the introduction of this policy in October 2021, the illicit vaping market has grown rapidly and probably contributed to a significant increase in youth vaping (Watts et al., 2022).

Strategies to reduce youth vaping are listed in (Table 2).

Table 2
Policy measures to reduce youth vaping.

- Legal vaping products sold only from licensed retail outlets
- Strict age verification at the time of sale
- A third-party age verification service for online purchases and on delivery
- Advertising restricted and regulated to prevent marketing to adolescents
- Substantially increased fines and loss of licences for illegal sales
- Banning flavour names, images and packaging which appeal to young people
- Education programs for young people should provide accurate information about the absolute and relative risks of vaping and smoking.

Conclusion

Frequent vaping of nicotine by young people who have never smoked is uncommon and there is limited evidence so far that vaping has caused significant harms in this population. At a population level, the net benefits of vaping to adult and youth who smoke are likely to outweigh the feared harms of vaping to youth.

Very few nicotine-naïve young people who vape develop nicotine dependence. There is weak evidence that vaping leads to smoking. In fact, the evidence suggests that vaping is diverting more young people away from smoking. It is also likely to be beneficial to young people who smoke who switch to vaping.

A balanced, risk-proportionate approach to regulation is needed to restrict the uptake of vaping by young people who do not smoke while allowing easier access for adults who smoke, for whom it is an effective and popular quitting aid.

Author contributions

Each author certifies that their contribution to this work meets the standards of the International Committee of Medical Journal Editors.

Ethics approval

The authors declare that the work reported herein did not require ethics approval because it did not involve animal or human participation.

Funding sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Declaration of Competing Interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Colin Paul Mendelsohn

C.P.M. was an unpaid board member of the Australian Tobacco Harm Reduction Association (ATHRA), a registered health promotion charity, from October 2017 to January 2021. ATHRA accepted unconditional seed funding from the vape retail industry to become established. Funding ceased in March 2019. C.P.M. was a Director of ATHRA in March 2018 when it received a donation from KAC Communications.

The donation was sourced from a surplus arising from the Global Forum on Nicotine conference in May 2017.

C.P.M. is the author of *Stop Smoking Start Vaping*, published by Aurora Press. C.P.M. has never received payments from electronic cigarette or tobacco companies.

Wayne Hall

No competing interests.

CRediT authorship contribution statement

Colin Paul Mendelsohn: Conceptualization, Project administration, Writing – original draft, Writing – review & editing. **Wayne Hall:** Writing – review & editing.

References

Abouk, R., Courtemanche, C., Dave, D., Feng, B., Friedman, A. S., Maclean, J. C., & Safford, S. (2023). Intended and unintended effects of e-cigarette taxes on youth tobacco use. *Journal of Health Economics, 87*, Article 102720. 10.1016/j.jhealeco.2022.102720.

Action on Smoking and Health UK. (2022). *Use of e-cigarettes (vapes) among young people in Great Britain, 2021*. Retrieved from https://ash.org.uk/wp-content/uploads/2022/07/Use-of-e-cigarettes-among-young-people-in-Great-Britain-2022.pdf

Anic, G. M., Rostron, B. L., Hammad, H. T., van Bemmel, D. M., Del Valle-Pinero, A. Y., Christensen, C. H., & Chang, C. M. (2022). Changes in biomarkers of tobacco exposure among cigarette smokers transitioning to ENDS use: The population assessment of tobacco and health study, 2013-2015. *International Journal of Environmental Research and Public Health, 19*(3). 10.3390/ijerph19031462.

ASH New Zealand. (2022). *ASH year 10 Snapshot survey 2022*. Retrieved from https://assets.nationbuilder.com/ashnz/pages/357/attachments/original/1670892009/2022_ASH_Y10_Snapshot_Topline_smoking_and_vaping_FINAL.pdf?1670892009.

Australian Institute of Health and Welfare. (2020). *National drug strategy household survey 2019. Drug Statistics series no.32. PHE 270. Canberra AIHW*. Retrieved from https://www.aihw.gov.au/reports/illicit-use-of-drugs/national-drug-strategy-household-survey-2019/contents/summary.

Balfour, D. J. K., Benowitz, N. L., Colby, S. M., Hatsukami, D. K., Lando, H. A., Leischow, S. J., & West, R. (2021). Balancing consideration of the risks and benefits of e-cigarettes. *American Journal of Public Health, 111*(9), 1661–1672. 10.2105/AJPH.2021.306416.

Benowitz, N. L. (2020). Seizures after vaping nicotine in youth: A canary or a red herring? *Journal of Adolescent Health, 66*(1), 1–2. 10.1016/j.jadohealth.2019.10.016.

Benowitz, N. L., & Burbank, A. D. (2016). Cardiovascular toxicity of nicotine: Implications for electronic cigarette use. *Trends in Cardiovascular Medicine, 26*(6), 515–523. 10.1016/j.tcm.2016.03.001.

Benowitz, N. L., & Fraiman, J. B. (2017). Cardiovascular effects of electronic cigarettes. *Nature Reviews Cardiology, 14*(8), 447–456. 10.1038/nrcardio.2017.36.

Benowitz, N. L., St Helen, G., & Liakoni, E. (2021). Clinical pharmacology of Electronic Nicotine Delivery Systems (ENDS): Implications for benefits and risks in the promotion of the combusted tobacco endgame. *Journal of Clinical Pharmacology, 61*(2) *Suppl*S18-s36. 10.1002/jcph.1915.

Berry, K. M., Fetterman, J. L., Benjamin, E. J., Bhatnagar, A., Barrington-Trimis, J. L., Leventhal, A. M., & Stokes, A. (2019). Association of electronic cigarette use with subsequent initiation of tobacco cigarettes in US youths. *JAMA Network Open, 2*(2), Article e187794. 10.1001/jamanetworkopen.2018.7794.

Cambron, C., & Thackeray, K. J. (2022). Socioeconomic differences in lifetime and past 30-day e-cigarette, cigarette, and dual use: A state-level analysis of Utah youth. *International Journal of Environmental Research and Public Health*, (13), 19. 10.3390/ijerph19137557.

Camenga, D. R., Kong, G., Cavallo, D. A., & Krishnan-Sarin, S. (2017). Current and former smokers' use of electronic cigarettes for quitting smoking: An exploratory study of adolescents and young adults. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 19*(12), 1531–1535. 10.1093/ntr/ntw248.

Cantrell, J., Huang, J., Greenberg, M. S., Xiao, H., Hair, E. C., & Vallone, D. (2020). Impact of e-cigarette and cigarette prices on youth and young adult e-cigarette and cigarette behaviour: Evidence from a national longitudinal cohort. *Tobacco Control, 29*(4), 374–380. 10.1136/tobaccocontrol-2018-054764.

Centers for Disease Control and Prevention. (2021). Smoking & tobacco use; Historical NYTS data and documentation, 1999-2021. Retrieved from https://www.cdc.gov/tobacco/data_statistics/surveys/nyts/data/index.html.

Chan, G. C. K., Gartner, C., Lim, C., Sun, T., Hall, W., Connor, J., & Leung, J. (2022). Association between the implementation of tobacco control policies and adolescent vaping in 44 lower-middle, upper-middle, and high-income countries. *Addiction, 117*(8), 2296–2305. 10.1111/add.15892.

Chan, G. C. K., Stjepanovic, D., Lim, C., Sun, T., Shanmuga Anandan, A., Connor, J. P., & Leung, J. (2021). Gateway or common liability? A systematic review and meta-analysis of studies of adolescent e-cigarette use and future smoking initiation. *Addiction, 116*(4), 743–756. 10.1111/add.15246.

Chen-Sankey, J., Bover Manderski, M. T., Young, W. J., & Delnevo, C. D. (2022). Examining the survey setting effect on current e-cigarette use estimates among high school students in the 2021 national youth tobacco survey. *International Journal of Environmental Research and Public Health*, (11), 19. 10.3390/ijerph19116468.

Chyderiotis, S., Benmarhnia, T., Beck, F., Spilka, S., & Legleye, S. (2020). Does e-cigarette experimentation increase the transition to daily smoking among young ever-smokers in France? *Drug and Alcohol Dependence, 208*, Article 107853. 10.1016/j.drugalcdep.2020.107853.

Chyderiotis, S., Spilka, S., & Beck, F. (2019). [Use of electronic cigarette in France among adolescents aged 17: Results from the ESCAPAD 2017 survey]. *Bulletin Du Cancer, 106*(12), 1132–1143. 10.1016/j.bulcan.2019.06.016.

Committee on Toxicity of Chemicals in Food Consumer products and the Environment (COT). (2020). *Statement on the potential toxicological risks from electronic nicotine (and non-nicotine) delivery systems (E(N)NDS – e-cigarettes)*. Retrieved from https://cot.food.gov.uk/sites/default/files/2020-09/COT%20E%28N%29NDS%20statement%202020-04.pdf.

Corley, J., Gow, A. J., Starr, J. M., & Deary, I. J. (2012). Smoking, childhood IQ, and cognitive function in old age. *Journal of Psychosomatic Research, 73*(2), 132–138. 10.1016/j.jpsychores.2012.03.006.

Dai, H., & Hao, J. (2016). Exposure to advertisements and susceptibility to electronic cigarette use among youth. *Journal of Adolescent Health, 59*(6), 620–626. 10.1016/j.jadohealth.2016.06.013.

Dave, D., Dench, D., Grossman, M., Kenkel, D. S., & Saffer, H. (2019). Does e-cigarette advertising encourage adult smokers to quit? *Journal of Health Economics, 68*, Article 102227. 10.1016/j.jhealeco.2019.102227.

Dave, D., Feng, B., & Pesko, M. F. (2019). The effects of e-cigarette minimum legal sale age laws on youth substance use. *Health Economics, 28*(3), 419–436. 10.1002/hec.3854.

de Lacy, E., Fletcher, A., Hewitt, G., Murphy, S., & Moore, G. (2017). Cross-sectional study examining the prevalence, correlates and sequencing of electronic cigarette

and tobacco use among 11-16-year olds in schools in Wales. *BMJ Open, 7*(2), Article e012784. 10.1136/bmjopen-2016-012784.

Foxon, F., & Selya, A. S. (2020). Electronic cigarettes, nicotine use trends and use initiation ages among US adolescents from 1999 to 2018. *Addiction, 115*(12), 2369–2378. 10.1111/add.15099.

Friedman, A. S. (2015). How does electronic cigarette access affect adolescent smoking? *Journal of Health Economics, 44*, 300–308. 10.1016/j.jhealeco.2015.10.003.

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. 10.1001/jamapediatrics.2021.0922.

Gil, S. M., & Metherate, R. (2019). Enhanced sensory-cognitive processing by activation of nicotinic acetylcholine receptors. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 21*(3), 377–382. 10.1093/ntr/nty134.

Glasser, A. M., Johnson, A. L., Niaura, R. S., Abrams, D. B., & Pearson, J. L. (2021). Youth vaping and tobacco use in context in the United States: Results from the 2018 National Youth Tobacco Survey. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 23*(3), 447–453. 10.1093/ntr/ntaa010.

Gorini, G., Gallus, S., Carreras, G., De Mei, B., Masocco, M., Faggiano, F., & Pacifici, R. (2020). Prevalence of tobacco smoking and electronic cigarette use among adolescents in Italy: Global Youth Tobacco Surveys (GYTS), 2010, 2014, 2018. *Preventive Medicine, 131*, Article 105903. 10.1016/j.ypmed.2019.105903.

Hall, W., & Chan, G. (2021). The "gateway" effect of e-cigarettes may be explained by a genetic liability to risk-taking. *PLoS Medicine, 18*(3), Article e1003554. 10.1371/journal.pmed.1003554.

Hammond, D., Reid, J. L., Burkhalter, R., Bansal Travers, M., Gravely, S., Hyland, A., & McNeill, A. (2022). E-cigarette flavors, devices, and brands used by youths before and after partial flavor restrictions in the United States: Canada, England, and the United States, 2017–2020. *American Journal of Public Health, 112*(7), 1014–1024. 10.2105/ajph.2022.306780.

Hammond, D., Reid, J. L., Rynard, V. L., Fong, G. T., Cummings, K. M., McNeill, A., & White, C. M. (2019). Prevalence of vaping and smoking among adolescents in Canada, England, and the United States: Repeat national cross sectional surveys. *BMJ, 365*, l2219. 10.1136/bmj.l2219.

Hammond, D., Reid, J. L., Rynard, V. L., O'Connor, R. J., Goniewicz, M. L., Piper, M. E., & Bansal-Travers, M (2021). Indicators of dependence and efforts to quit vaping and smoking among youth in Canada, England and the USA. *Tobacco Control*. 10.1136/tobaccocontrol-2020-056269.

Hartmann-Boyce, J., Lindson, N., McRobbie, H., Butler, A. R., Bullen, C., Begh, R., & Hajek, P. (2022). Electronic cigarettes for smoking cessation. *Cochrane Database of Systematic Reviews*. Retrieved from https://www.cochranelibrary.com/cdsr/doi/10.1002/14651858.CD010216.pub7/full.

Heishman, S. J., Kleykamp, B. A., & Singleton, E. G. (2010). Meta-analysis of the acute effects of nicotine and smoking on human performance. *Psychopharmacology, 210*(4), 453–469. 10.1007/s00213-010-1848-1.

International Agency for Research on Cancer. (2012). Tobacco smoking and carcinogenic risk to humans. IARC Monograph 100E. Retrieved from http://monographs.iarc.fr/ENG/Monographs/vol100E/mono100E-6.pdf.

Jackson, S. E., Brown, J., & Jarvis, M. J. (2021). Dependence on nicotine in US high school students in the context of changing patterns of tobacco product use. *Addiction, 116*(7), 1859–1870. 10.1111/add.15403.

Jackson, S. E., Kotz, D., West, R., & Brown, J. (2019). Moderators of real-world effectiveness of smoking cessation aids: A population study. *Addiction, 114*(9), 1627–1638. 10.1111/add.14656.

Jarvis, M., Jackson, S., West, R., & Brown, J. (2020). *Epidemic of youth nicotine addiction? What does the National Youth Tobacco Survey 2017-2019 reveal about high school e-cigarette use in the USA?*. Qeios Retrieved from https://www.qeios.com/read/745076.5/pdf.

Khouja, J. N., & Munafò, M. R. (2022). Commentary on Tattan-Birch et al.: How might the rise in popularity of disposable vapes among young adults impact policy in the United Kingdom? *Addiction*. 10.1111/add.16067.

Kim, M. M., Steffensen, I., Miguel, R. T. D., Babic, T., Johnson, A. D., Carlone, J., & Junker, C. S. (2023). Study title: A systematic review of RCTs to examine the risk of adverse cardiovascular events with nicotine use. *Frontiers in Cardiovascular Medicine, 10*, Article 1111673. 10.3389/fcvm.2023.1111673.

Kim, S., & Selya, A. S. (2019). The relationship between electronic cigarette use and conventional cigarette smoking is largely attributable to shared risk factors. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco*. 10.1093/ntr/ntz157.

Kong, G., Morean, M. E., Cavallo, D. A., Camenga, D. R., & Krishnan-Sarin, S. (2015). Reasons for electronic cigarette experimentation and discontinuation among adolescents and young adults. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 17*(7), 847–854. 10.1093/ntr/ntu257.

Krishnasamy, V. P., Hallowell, B. D., Ko, J. Y., Board, A., Hartnett, K. P., Salvatore, P. P., & Ellington, S. (2020). Update: Characteristics of a Nationwide Outbreak of E-cigarette, or Vaping, Product use-associated lung injury - United States, August 2019-January 2020. *MMWR Morbidity and Mortality Weekly Report, 69*(3), 90–94. 10.15585/mmwr.mm6903e2.

Lee, P. N., Coombs, K. J., & Afolalu, E. F. (2018). Considerations related to vaping as a possible gateway into cigarette smoking: An analytical review. *F1000Research, 7*, 1915. 10.12688/f1000research.16928.3.

Legleye, S., Aubin, H. J., Falissard, B., Beck, F., & Spilka, S. (2021). Experimenting first with e-cigarettes versus first with cigarettes and transition to daily cigarette use among adolescents: The crucial effect of age at first experiment. *Addiction, 116*(6), 1521–1531. 10.1111/add.15330.

Levy, D. T., Tam, J., Sanchez-Romero, L. M., Li, Y., Yuan, Z., Jeon, J., & Meza, R. (2021). Public health implications of vaping in the USA: The smoking and vaping simulation model. *Population Health Metrics, 19*(1), 19. 10.1186/s12963-021-00250-7.

Levy, D. T., Warner, K. E., Cummings, K. M., Hammond, D., Kuo, C., Fong, G. T., & Borland, R. (2019). Examining the relationship of vaping to smoking initiation among US youth and young adults: a reality check. *Tobacco Control, 28*(6), 629–635. 10.1136/tobaccocontrol-2018-054446.

Li, X., Zhang, Y., Zhang, R., Chen, F., Shao, L., & Zhang, L. (2022). Association between e-cigarettes and asthma in adolescents: A systematic review and meta-analysis. *American Journal of Preventive Medicine, 62*(6), 953–960. 10.1016/j.amepre.2022.01.015.

Lin, L. Y., Chien, Y. N., Chen, Y. H., Shean, R., Wu, C. Y., Huang, S. C., & Chiou, H. Y. (2022). E-cigarettes and smoking cessation among adolescent smokers. *Scientific Reports, 12*(1), 19489. 10.1038/s41598-022-22344-4.

Liu, G., Wasserman, E., Kong, L., & Foulds, J. (2017). A comparison of nicotine dependence among exclusive E-cigarette and cigarette users in the PATH study. *Preventive Medicine, 104*, 86–91. 10.1016/j.ypmed.2017.04.001.

Lynskey, M. T., & Agrawal, A. (2018). Denise Kandel's classic work on the gateway sequence of drug acquisition. *Addiction, 113*(10), 1927–1932. 10.1111/add.14190.

Mattingly, D. T., Cook, S., Hirschtick, J. L., Patel, A., Arenberg, D. A., Barnes, G. D., & Fleischer, N. L. (2023). Longitudinal associations between exclusive, dual, and polytobacco use and asthma among US youth. *Preventive Medicine*, Article 107512. 10.1016/j.ypmed.2023.107512.

McConnell, R., Barrington-Trimis, J. L., Wang, K., Urman, R., Hong, H., Unger, J., & Berhane, K. (2017). Electronic cigarette use and respiratory symptoms in adolescents. *American Journal of Respiratory and Critical Care Medicine, 195*(8), 1043–1049. 10.1164/rccm.201604-0804OC.

McNeill, A., Brose, L. S., Calder, R., Bauld, L., & Robson, D. (2018). *Evidence review of e-cigarettes and heated tobacco products 2018. A report commissioned by Public Health England*. Retrieved from https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/684963/Evidence_review_of_e-cigarettes_and_heated_tobacco_products_2018.pdf.

McNeill, A., Simonavicius, E., Brose, L. S., Taylor, E., East, K., Kuilova, E., & Robson, D. (2022). *Nicotine vaping in England: an evidence update including health risks and perceptions, September 2022. A report commissioned by the Office for Health Improvement and Disparities*. London: Office for Health Improvement and Disparities Retrieved from https://www.gov.uk/government/publications/nicotine-vaping-in-england-2022-evidence-update.

Mendelsohn, C. P., Wodak, A., & Hall, W. (2023). How should nicotine vaping be regulated in Australia? *Drug & Alcohol Review (in press)*. 10.1111/dar.13663.

Mendelsohn, C. P., Wodak, A., & Hall, W. (2023). Nicotine vaping was not the cause of e-cigarette, or vaping, product use-associated lung injury in the United States. *Drug and Alcohol Review, 42*(2), 258–261. 10.1111/dar.13533.

Meza, R., Jimenez-Mendoza, E., & Levy, D. T. (2020). Trends in tobacco use among adolescents by grade, sex, and race, 1991-2019. *JAMA Network Open, 3*(12), Article e2027465. 10.1001/jamanetworkopen.2020.27465.

Miech, R., Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Patrick, M. E. (2019). The national prevalence of adolescent nicotine use in 2017: Estimates taking into account student reports of substances vaped. Supplementary Appendix: trends in adolescent vaping 2017-2019. *New England Journal of Medicine*. Retrieved from https://www.nejm.org/doi/suppl/10.1056/NEJMc1910739/suppl_file/nejmc1910739_appendix.pdf.

Morissette, S. B., Tull, M. T., Gulliver, S. B., Kamholz, B. W., & Zimering, R. T. (2007). Anxiety, anxiety disorders, tobacco use, and nicotine: A critical review of interrelationships. *Psychological Bulletin, 133*(2), 245–272. 10.1037/0033-2909.133.2.245.

Mus, S., Monzon, J., Islam, F., Thrasher, J. F., & Barnoya, J. (2023). First tobacco product tried and current use of cigarettes and electronic cigarettes among adolescents from Guatemala City. *Salud Publica De Mexico, 65*(1), 46–53 ene-feb. 10.21149/13972.

Myung, S. K., & Park, J. Y. (2019). Efficacy of pharmacotherapy for smoking cessation in adolescent smokers: A meta-analysis of randomized controlled trials. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 21*(11), 1473–1479. 10.1093/ntr/nty180.

National Academies of Sciences Engineering and Medicine. (2018). *Public health consequences of e-cigarettes*. Washington, DC: The National Academies Press Retrieved from http://nap.edu/24952.

National Centre for Smoking Cessation and Training. (2022). Supporting clients who want to stop vaping. ISBN 978-0-9565243-8-6. Retrieved from https://www.ncsct.co.uk/publication_Support_stop_vaping.php.

NHS Digital. (2022). *Smoking, drinking and drug use among young people in England, 2021*. Retrieved from https://digital.nhs.uk/data-and-information/publications/statistical/smoking-drinking-and-drug-use-among-young-people-in-england/2021.

Notley, C., Gentry, S., Cox, S., Dockrell, M., Havill, M., Attwood, A. S., & Munafò, M. R. (2022). Youth use of e-liquid flavours-a systematic review exploring patterns of use of e-liquid flavours and associations with continued vaping, tobacco smoking uptake or cessation. *Addiction, 117*(5), 1258–1272. 10.1111/add.15723.

Padon, A. A., Lochbuehler, K., Maloney, E. K., & Cappella, J. N. (2018). A randomized trial of the effect of youth appealing e-cigarette advertising on susceptibility to use e-cigarettes among youth. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 20*(8), 954–961. 10.1093/ntr/ntx155.

Pesko, M. F. (2023). Effects of e-cigarette minimum legal sales ages on youth tobacco use in the United States. *Journal of Risk and Uncertainty Online first*. 10.1007/s11166-022-09402-y.

Pesko, M. F., Hughes, J. M., & Faisal, F. S. (2016). The influence of electronic cigarette age purchasing restrictions on adolescent tobacco and marijuana use. *Preventive Medicine, 87*, 207–212. 10.1016/j.ypmed.2016.02.001.

Pesko, M. F., & Warman, C. (2022). Re-exploring the early relationship between teenage cigarette and e-cigarette use using price and tax changes. *Health Economics, 31*(1), 137–153. 10.1002/hec.4439.

Picciotto, M. R., Brunzell, D. H., & Caldarone, B. J. (2002). Effect of nicotine and nicotinic receptors on anxiety and depression. *Neuroreport, 13*(9), 1097–1106. 10.1097/00001756-200207020-00006.

Polosa, R., O'Leary, R., Tashkin, D., Emma, R., & Caruso, M. (2019). The effect of e-cigarette aerosol emissions on respiratory health: A narrative review. *Expert Review of Respiratory Medicine, 13*(9), 899–915. 10.1080/17476348.2019.1649146.

Royal College of Physicians. (2016). *Nicotine without smoke: Tobacco harm reduction*. London: RCP Retrieved from https://www.rcplondon.ac.uk/projects/outputs/nicotine-without-smoke-tobacco-harm-reduction-0.

Russell, C., McKinney, W. J., & Fearon, I. M. (2023). Behavioral intentions assessment of a disposable e-cigarette among adult current, former, and non-smokers in the United States. *Drug Testing and Analysis*. 10.1002/dta.3467.

Saller, F. S., Agaku, I. T., & Filippidis, F. T. (2022). Association between e-cigarette use initiated after cigarette smoking and smoking abstinence: A cross-sectional study among adolescent established smokers in the USA. *Tobacco Control, 31*(3), 416–423. 10.1136/tobaccocontrol-2020-055943.

Scherphof, C. S., van den Eijnden, R. J., Lugtig, P., Engels, R. C., & Vollebergh, W. A. (2014). Adolescents' use of nicotine replacement therapy for smoking cessation: Predictors of compliance trajectories. *Psychopharmacology, 231*(8), 1743–1752. 10.1007/s00213-014-3511-8.

Schweitzer, K. S., Chen, S. X., Law, S., Van Demark, M., Poirier, C., Justice, M. J., & Petrache, I. (2015). Endothelial disruptive proinflammatory effects of nicotine and e-cigarette vapor exposures. *American Journal of Physiology. Lung Cellular and Molecular Physiology, 309*(2), L175–L187. 10.1152/ajplung.00411.2014.

Selya, A. S., & Foxon, F. (2021). Trends in electronic cigarette use and conventional smoking: quantifying a possible 'diversion' effect among US adolescents. *Addiction, 116*(7), 1848–1858. 10.1111/add.15385.

Shahab, L., Beard, E., & Brown, J. (2021). Association of initial e-cigarette and other tobacco product use with subsequent cigarette smoking in adolescents: A cross-sectional, matched control study. *Tobacco Control, 30*(2), 212–220. 10.1136/tobaccocontrol-2019-055283.

Sokol, N. A., & Feldman, J. M. (2021). High school seniors who used e-cigarettes may have otherwise been cigarette smokers: Evidence from monitoring the Future (United States, 2009-2018). *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 23*(11), 1958–1961. 10.1093/ntr/ntab102.

Soneji, S., Barrington-Trimis, J. L., Wills, T. A., Leventhal, A. M., Unger, J. B., Gibson, L. A., & Sargent, J. D. (2017). Association between initial use of e-cigarettes and subsequent cigarette smoking among adolescents and young adults: A systematic review and meta-analysis. *JAMA Pediatrics, 171*(8), 788–797. 10.1001/jamapediatrics.2017.1488.

Stevens, E. R., Xu, S., Niaura, R., Cleland, C. M., Sherman, S. E., Mai, A., & Jiang, N. (2022). Youth e-cigarette use and functionally important respiratory symptoms: The Population Assessment of Tobacco and Health (PATH) study waves 3 and 4. *International Journal of Environmental Research and Public Health*, (22), 19. 10.3390/ijerph192215324.

Summers, J. A., Ait Ouakrim, D., Wilson, N., & Blakely, T. (2022). Updated health and cost impacts of electronic nicotine delivery systems, using recent estimates of relative harm for vaping compared to smoking. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 24*(3), 408–412. 10.1093/ntr/ntab178.

Sun, R., Mendez, D., & Warner, K. E. (2022). Is adolescent e-cigarette use associated with subsequent smoking? A new look. *Nicotine & Tobacco Research: Official Journal of the Society for Research on Nicotine and Tobacco, 24*(5), 710–718. 10.1093/ntr/ntab243.

Sun, R., Méndez, D., & Warner, K. E. (2023). Association of electronic cigarette use by US adolescents with subsequent persistent cigarette smoking. *JAMA Network Open, 6*(3), Article e234885. 10.1001/jamanetworkopen.2023.4885.

Tanski, S., Halenar, M. J., Edwards, K. C., Emond, J., Woloshin, S., Brunette, M., & Sargent, J. (2022). Tobacco product use and functionally important respiratory symptoms among US adolescents/young adults. *Academic Pediatrics, 22*(6), 1006–1016. 10.1016/j.acap.2022.03.001.

Tattan-Birch, H., Jackson, S. E., Kock, L., Dockrell, M., & Brown, J. (2022). Rapid growth in disposable e-cigarette vaping among young adults in Great Britain from 2021 to 2022: A repeat cross-sectional survey. *Addiction*. 10.1111/add.16044.

Taylor, E., Arnott, D., Cheeseman, H., Hammond, D., Reid, J. L., McNeill, A., & East, K. (2023). Association of fully branded and standardized e-cigarette packaging with interest in trying products among youths and adults in Great Britain. *JAMA Network Open, 6*(3), Article e231799. 10.1001/jamanetworkopen.2023.1799.

Therapeutic Goods Administration. (2022). *Nicotine vaping product access*. Retrieved from https://www.tga.gov.au/products/medicines/prescription-medicines/nicotine-vaping-products-hub/nicotine-vaping-product-access.

Treur, J. L., Willemsen, G., Bartels, M., Geels, L. M., van Beek, J. H., Huppertz, C., & Vink, J. M. (2015). Smoking during adolescence as a risk factor for attention problems. *Biological Psychiatry, 78*(9), 656–663. 10.1016/j.biopsych.2014.06.019.

UK Advertising Code. (2016). UK code of non-broadcast advertising. Retrieved from https://www.cap.org.uk/Advertising-Codes/Non-Broadcast/CodeItem.aspx?cscid=%7B49028fdc-fc22-4d8a-ba5b-ba7ccc3df99a%7D#.V83uWDU6x0x.

US Department of Health and Human Services. (2014). *The health consequences of smoking - 50 years of progress. A report of the Surgeon General.* Retrieved from https://www.surgeongeneral.gov/library/reports/50-years-of-progress/full-report.pdf.

Vanyukov, M. M., Tarter, R. E., Kirillova, G. P., Kirisci, L., Reynolds, M. D., Kreek, M. J., & Ridenour, T. A. (2012). Common liability to addiction and "gateway hypothesis": Theoretical, empirical and evolutionary perspective. *Drug and Alcohol Dependence, 123*(1) *Suppl*S3-17. 10.1016/j.drugalcdep.2011.12.018.

Walker, N., Parag, V., Wong, S. F., Youdan, B., Broughton, B., Bullen, C., & Beaglehole, R. (2020). Use of e-cigarettes and smoked tobacco in youth aged 14-15 years in New Zealand: Findings from repeated cross-sectional studies (2014-19). *The Lancet Public Health, 5*(4), e204–e212. 10.1016/s2468-2667(19)30241-5.

Wang, M. P., Ho, S. Y., Leung, L. T., & Lam, T. H. (2016). Electronic cigarette use and respiratory symptoms in Chinese adolescents in Hong Kong. *JAMA Pediatrics, 170*(1), 89–91. 10.1001/jamapediatrics.2015.3024.

Wang, M. P., Li, W. H., Wu, Y., Lam, T. H., & Chan, S. S. (2017). Electronic cigarette use is not associated with quitting of conventional cigarettes in youth smokers. *Pediatric Research, 82*(1), 14–18. 10.1038/pr.2017.80.

Watts, C., Egger, S., Dessaix, A., Brooks, A., Jenkinson, E., Grogan, P., & Freeman, B. (2022). Vaping product access and use among 14-17-year-olds in New South Wales: A cross-sectional study. *Australian and New Zealand Journal of Public Health, 46*(6), 814–820. 10.1111/1753-6405.13316.

Wennerstad, K. M., Silventoinen, K., Tynelius, P., Bergman, L., Kaprio, J., & Rasmussen, F. (2010). Associations between IQ and cigarette smoking among Swedish male twins. *Social Science & Medicine, 70*(4), 575–581. 10.1016/j.socscimed.2009.10.050.

Wojtecka, A., Kalinowska-Beszczyńska, O., Tyrańska-Fobke, A., Kaleta, D., Wojnarowska, M., Robakowska, M., & Balwicki, Ł. (2023). Adolescents' perceptions and attitudes towards traditional and electronic cigarettes-results of focus group interviews. *International Journal of Environmental Research and Public Health, 20*(2). 10.3390/ijerph20021438.

Xu, S., Coffman, D. L., Liu, B., Xu, Y., He, J., & Niaura, R. S. (2022). Relationships between e-cigarette use and subsequent cigarette initiation among adolescents in the PATH study: An entropy balancing propensity score analysis. *Prevention Science, 23*(4), 608–617. 10.1007/s11121-021-01326-4.