Ethics and ENDS

Elizabeth Fenton [1], Lindsay Robertson [2], Janet Hoek [3]

[1]Bioethics Centre, University of Otago, Dunedin, New Zealand
[2]Department of Preventive and Social Medicine, University of Otago, Dunedin, New Zealand
[3]Department of Public Health, University of Otago, Wellington, New Zealand

Correspondence to
Dr Elizabeth Fenton, Bioethics Centre, University of Otago, Dunedin 9016, New Zealand; elizabeth.fenton@otago.ac.nz

Received 26 September 2021
Accepted 2 March 2022
Published Online First 25 March 2022

To cite: Fenton E, Robertson L, Hoek J. *Tob Control* 2023;**32**:e243–e246.

ABSTRACT

As debate persists over regulating electronic nicotine delivery systems (ENDS), those favouring liberal ENDS policies have advanced rights-based arguments privileging harm reduction to people who smoke over harm prevention to children and never-smokers. Recent ethical arguments advocate regulating ENDS to prioritise their harm reduction potential for people who currently smoke over any future harm to young never-smokers. In this article, we critically assess these arguments, in particular, the assumption that ethical arguments for prioritising the interests of young people do not apply to ENDS. We argue that, when the appropriate comparators are used, it is not clear the weight of ethical argument tips in favour of those who currently smoke and against young never-smokers. We also assert that arguments from a resource prioritisation context are not appropriate for analysing ENDS regulation, because ENDS are not a scarce resource. Further, we reject utilitarian arguments regarding maximising net population health benefits, as these do not adequately consider vulnerable groups' rights, or address the population distribution of benefits and harms. Lastly, we argue that one-directional considerations of harm reduction do not recognise that ENDS potentially increase harm to those who do not smoke and who would not otherwise have initiated nicotine use.

INTRODUCTION

Rapid growth in sales of electronic nicotine delivery systems (ENDS) from 2010 has been reflected in rising youth and adult use.[1–3] Amidst this rise, debate about ENDS' impact on population health has persisted.[2 4 5] Evidence suggests ENDS are less harmful than smoking[3 6]; nonetheless, uncertainty over their long-term risks to users, and the effects of sustained exposure to secondhand ENDS aerosol, continues.[3 7–10] Proponents of ENDS as a harm reduction tool argue these devices are safer nicotine alternatives that facilitate transitions away from smoking[4]; they thus rationalise evidence of ENDS' appeal to youth.[11] Public health researchers and advocates cautious about ENDS' impacts have noted high dual use of ENDS and tobacco[12–15]; sustained dual use may stall rather than aid complete switching from smoking to ENDS.

Aggressive marketing has encouraged uptake of ENDS by never-smoking young people,[16 17] giving rise to concerns about possible 'gateway' effects, where ENDS use is associated with smoking uptake.[18–20] Others have noted the potential adverse health effects of adolescent nicotine exposure.[21 22] Patterns in youth vaping vary across countries. For example, the 2020 US National Youth Tobacco Survey reported that, after a period of rising ENDS use among youth, current use had declined significantly between 2019 and 2020 from 27.5% to 19.6% and from 10.5% to 4.7% among high school and middle school students, respectively.[23] Usage frequency showed fewer changes (with only one significant change in frequency reported (ENDS use on 1–5 days in the past 30 days among high school users decreased from 46.4% to 41.5%)). Moreover, the authors concluded that current use and usage frequency remained high and merited continued action to reduce prevalence, a point reiterated in an accompanying commentary.[24] Other countries report different trends. For example, in Aotearoa New Zealand, youth vaping has increased and, among 15–17 year-olds, daily use rose from 2.3% in 2019/2020 to 5.8% in 2020/2021, and from 5.0% in 2019/2020 to 15.3% in 2020/2021 for 18–24 year-olds.[25] These differences no doubt reflect policy variations and different diffusion stages, and highlight the need for careful monitoring of usage patterns among this key population group.

The appeal and potential health risks ENDS pose to young people have become a lightning rod for public debate on their availability and regulation. For example, some public health advocates call for restrictions on the sale and marketing of youth-oriented flavours to protect never-smoking young people from ENDS uptake and the potential health risks they would then face.[17 21 26 27] However, others claim flavour diversity helps people who smoke make a full and sustained transition to ENDS use, which presents fewer health risks than continued smoking.[4] Some have argued that flavour restrictions could trigger relapse to smoking, where people's movement to a reduced harm alternative would not be sustained.[28]

Given the strong links between human rights and public health,[29 30] it is unsurprising that harm reduction arguments for ENDS are often couched in these terms. For example, some argue that accurate information and access to less harmful products, such as ENDS, promotes the autonomy of people who smoke and advances the right to health.[31 32] However, the language of rights may pit the rights of one group against those of another. A 2020 report released by Knowledge-Action-Change, a tobacco harm reduction organisation that receives funding from the Foundation for a Smoke-Free World, which is fully funded by Philip Morris International, asserted that, while public health was once concerned with non-smokers'—including children's—right to health, 'those whose rights need protecting now are those who want to switch away from smoking and towards the use of safer products' (p 137).[3] The report claims governments that regulate or restrict access to ENDS are 'illegitimately interfering with an individual's right to health' (p 138).[33]

These adversarial arguments often privilege the rights and interests of adult smokers over those of children and young people, and make little (if any) reference to population groups for which ENDS use has not been positive. These groups include people who smoke and who did not successfully switch to ENDS use, which may undermine their confidence in quitting; parents whose never-smoking children initiated ENDS use, or children themselves who have never smoked but who have become ENDS users; and people exposed involuntarily to secondhand ENDS aerosols. Moreover, rights-based arguments used to resist ENDS regulation focus on negative rights and freedoms (rights to be free from interference) and ignore government interventions that protect positive rights and freedoms. Positive freedom requires autonomy, or the ability to make free and informed choices that reflect personal values and motivations. Government interventions are often required to create the conditions for exercising autonomy. Regulation of tobacco industry marketing, for example, and the provision of impartial safety information, supports people who smoke to make autonomous (free and informed) choices about their use of ENDS.[34]

Recent scholarship considers ethical arguments for regulating ENDS to maximise their potential as a harm reduction strategy for people who smoke.[35–37] These arguments focus on the tension between young never-smokers' interests and those of people currently smoking. The former are at risk of nicotine dependence and face health risks if they begin using ENDS; the latter could potentially reduce the significant health risks of tobacco smoking if they switch completely to using ENDS. In this analysis, we critically review some of the assumptions made in these ethical arguments.

ETHICAL ARGUMENTS: BORROWING FROM RESOURCE ALLOCATION

One way to resolve the tension between the interests of young never-smokers and people who smoke is to look to other contexts in which ethical decisions have to be made about whose interests to prioritise, such as resource prioritisation. In this context, the weight of ethical argument tends to land in favour of the young. For example, the 'save the most life-years' argument prioritises the young on the grounds that doing so will maximise healthy life-years saved overall; the 'fair innings' argument prioritises the young on fairness grounds, since young people have had less chance to live a full life. Yet, recently, commentators have advanced ethical arguments for prioritising the interests of people who smoke.[35 36] These authors argue that neither the 'save the most life-years' nor the 'fair innings' argument justifies ENDS regulation prioritising the interests of young never-smokers.

The 'fair innings' argument

Both Eyal[35] and Magalhaes[36] reject the 'fair innings' argument as they assume that any negative health consequences of ENDS use, like those of smoking, are likely to occur later in life. According to their reasoning, young people who take up ENDS do not stand to miss out on their fair innings of life-years any more than older people who smoke. However, this reasoning is problematic in two ways. First, the argument compares the healthy life-years of young ENDS users with those of people who smoke and concludes that young ENDS users are not disadvantaged in that comparison; however, this comparison is only one of those available to an ethical analysis. An alternative comparison could compare the healthy life-years young ENDS users may enjoy before the onset of any potential health risks arising from ENDS use with the healthy life-years that these young people *would have had*, if they had not begun using ENDS. The fact that that young people who use ENDS will get roughly the same 'innings' as older people who smoke does not imply that that innings is fair; nor does it imply young people are not entitled to a longer or better quality innings than they would have had, if they had not become dependent on nicotine. The argument supporting harm reduction for older smokers does not negate the argument advocating harm prevention for young people.

The second problem for the fair innings argument is its applicability. This argument is typically deployed when allocating a scarce but highly valued resource. All things being equal, the resource should go to younger candidates, on the grounds they have had less chance than older candidates to live a full life. However, this reasoning has significant limitations when applied to public health policy, which involves balancing interests over the long term rather than deciding who lives and who dies in, as Eyal describes it, situations of 'short term death' (p 27).[35] Despite both authors noting these limitations, they nevertheless take the defeat of the fair innings argument as strengthening the ethical case for prioritising the interests of people who smoke when developing ENDS regulations. If the fair innings argument does not apply to ENDS policy development, then defeating it does not resolve the apparent tension between the interests of young never-smokers and those of people who smoke. Certainly, it provides no ethical grounds for favouring the latter over the former.

The 'save the most life-years' argument

In the context of scarce resource allocation, the 'save the most life-years' argument favours prioritising a younger over an older candidate, because doing so maximises the number of life-years saved. Magalhaes argues that since both young never-smokers and people who smoke will experience any adverse health effects later in life, this reasoning does not justify prioritising the young in the context of ENDS regulation.[36] Because young never-smokers will no longer be young when any negative health effects of ENDS use emerge, their youth provides no reason to prioritise them. Following this reasoning, Magalhaes argues that policies protecting the health of young would-be ENDS users will not save more life-years than policies that reduce harm to people who smoke. However, this argument is problematic for at least two reasons. First, as with the fair innings argument, it overlooks the fact that for any young ENDS user, we should compare the healthy life-years they will have with those they would have had, if not dependent on nicotine. Using this comparison, preventing young people from developing a nicotine dependence may generate or save as many or even more healthy life-years than reducing harm among those who smoke. At the very least, this comparison suggests Magalhaes is too quick to conclude that the quantity of life-years saved will tip the balance in favour of harm reduction for people who smoke.

The second problem is that this reasoning assumes the ethical permissibility of imposing future harms on young people to reduce the current harms faced by those who smoke. For example, Magalhaes concludes that: 'any reasons for prioritizing the current cohort of young people at risk from vaping will equally apply to current adult smokers, who are overwhelmingly likely to have become nicotine-dependent in their own youth' (p 32).[36] This conclusion suggests perpetuating the same cycle of nicotine dependence originating in childhood is ethically preferable to preventing that same dependence in the long term. While resource allocation tends to favour the certainty of immediate over more distant future health benefits when requiring

trade-offs, discounting future benefits (or harms) in this way raises ethical concerns about fair distribution, as it disadvantages prevention programmes whose benefits occur further into the future.[38] As others have noted in the context of ENDS regulation, this approach implies an intergenerational trade-off, as any future health benefits or harms imposed by current policy will be experienced by young people.[22]

Benefits over harms

A final challenge should be raised against arguments that favour ENDS' potential benefits to those who currently smoke over the potential harms to young never-smokers, and claim the potential net benefits to population health are likely to be larger than the potential net harms. Eyal's claim that 'we should employ the majority of net-beneficial public health and policy interventions—primarily because many more people would benefit from them' (p 30)[35] seems intuitively appealing, yet ignores legitimate claims from those who will experience a net harm from such interventions that their interests also deserve protection. In the context of ENDS, young never-smokers have a significant interest in avoiding a lifetime of nicotine dependence they otherwise might not have had. It is not clear this interest should simply be over-ridden in the name of greater net benefit (especially if we count, as we should, children's health as part of general population health). More fundamentally, perhaps, this argument assumes the benefits ENDS arguably bring to people who currently smoke will contribute to population health in a way that preventing harm to young people will not. This assumption is neither supported nor warranted, without a questionable attachment to immediate over future health benefits.

Thomas *et al* also reject broadly utilitarian arguments like these to justify ENDS as harm reduction tools, in part because these arguments fail to account for important ethical constraints on maximising population health, including rights and the distribution of benefits and harms in the population.[37] In particular, when Thomas *et al* acknowledge that young people 'should be afforded stronger welfare protections than competent adults' (p 6), they accept those protections can be provided without necessarily forgoing ENDS' potential benefits for people who smoke. This ethically appealing middle ground position suggests situations *compelling* us, in Eyal's phrasing (p 27),[35] into an ethical trade-off between the interests of young never-smokers and adults who smoke will be few and far between. The use of ethical arguments from cases of scarce resource allocation, such as 'fair innings' and 'save the most lives', propels this reasoning by treating ENDS as if they were a scarce resource for which we have to choose the ethically best recipient. Thomas *et al*'s analysis, which is not constrained by a resource prioritisation framework, justifies a more plausible position where ENDS are available as a harm reduction tool yet are also regulated to prevent harm to the 'health-related well-being' of young people (p 6).[37]

Nonetheless, Thomas *et al*'s careful ethical analysis of ENDS as a harm reduction tool is limited by its one-directional interpretation of harm. ENDS may reduce the harms faced by people currently smoking; however, from the perspective of other population groups, ENDS may initiate or even promote harm. Thomas *et al*'s argument turns on the apparently uncontroversial assumption 'that e-cigarettes are significantly less harmful than combustible cigarettes' (p 7), but this assumption raises the question, 'less harmful *to whom*?', since its truth depends on taking for granted the perspective of those for whom ENDS will reduce rather than increase harm.[22] For those currently using combustible cigarettes, this assumption seems uncontroversial, at least in terms of physical harm.[3 4] Yet physical risks are not the only concerns that require consideration. We suggest it is also important to recognise the potential, among people who currently smoke, for increased nicotine dependency (via dual use, continuous use (sometimes called 'grazing') and some users' difficulty in adjusting to the self-regulation ENDS use requires of them). Risk reduction needs also to consider psychological harm that may follow from continuing or increased nicotine dependence, even where physical harms have decreased.

Moreover, from the perspective of young non-smokers who begin using ENDS and who may never have taken up combustible tobacco smoking, ENDS are not 'less harmful' than the relevant comparator, which is no nicotine use at all. Although Thomas *et al* note the ethical challenges of identifying and defining harms,[39] they do not recognise how competing interpretations of harm challenge their overall ethical defence of ENDS as a harm reduction tool. A similar challenge might be raised against their claim that ENDS are the least restrictive alternative strategy to reduce smoking prevalence. 'Least restrictive' refers to whether the strategy restricts the liberty of those affected by it. For people already smoking and addicted to nicotine, ENDS potentially promote rather than restrict liberty, to the extent that they offer a genuine alternative to tobacco smoking.[34] However, for young never-smokers, uptake of a highly addictive substance will arguably restrict their liberty by undermining their autonomy. From an overall public health perspective, ENDS are not, therefore, the least restrictive alternative. Just as for harm, we must ask, least restrictive *for whom*?

CONCLUSION

Recently advanced ethical arguments favouring the interests of people who currently smoke over those of young never-smokers fail to fully convince. Several of these arguments are constrained by a resource prioritisation framework that is neither appropriate to nor adequate for the analytical task, since ENDS are not a scarce resource for which we have to find the ethically best recipient. Arguments that assume ENDS are less harmful than combustible cigarettes, or the least restrictive alternative, do not adequately consider young never-smokers' perspectives; ENDS will be more rather than less harmful and restrictive than no nicotine use at all for this group. Both the interests of those

What this paper adds

- ⇒ Rising use of electronic nicotine delivery systems (ENDS) has led to debate over their potential risks and benefits to population health; arguments tend to emphasise either ENDS' potential to cause harm to children and never-smokers or their potential to reduce harm among those who smoke.
- ⇒ Ethical arguments have advocated maximising ENDS' potential as a harm reduction tool among people who currently smoke, and prioritising the interests of those who smoke over those of children and never-smokers.
- ⇒ This paper evaluates these ethical arguments and their underlying assumptions. We argue that the reasoning in these arguments does not support prioritising the interests of people who smoke over the interests of young never-smokers in this context.
- ⇒ Further analyses of ENDS from an ethical perspective will foster more robust debate and promote a deeper appreciation of the interests at stake.

who smoke in reducing the risks they face and the interests of young people in avoiding nicotine dependence and protecting their health are weighty. The ethical analyses examined in this commentary contribute to the significant public health policy question of how to weigh these different interests, but do not satisfactorily settle that question.

Contributors EF, LR and JH conceptualised and framed the paper. EF led the manuscript and wrote the first draft with contributions from LR. LR also contributed to editing and revising the manuscript. JH provided critical feedback and contributed to editing and revising the manuscript. EF and JH responded to the reviewers' comments. The final version of the manuscript has been reviewed and approved by all authors.

Funding The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

Competing interests None declared.

Patient consent for publication Not required.

Provenance and peer review Not commissioned; externally peer reviewed.

ORCID iDs
Elizabeth Fenton http://orcid.org/0000-0003-1106-0589
Lindsay Robertson http://orcid.org/0000-0001-8383-9116
Janet Hoek http://orcid.org/0000-0003-4362-1539

REFERENCES

1 Marynak KL, Gammon DG, King BA, *et al*. National and state trends in sales of cigarettes and e-cigarettes, U.S., 2011-2015. *Am J Prev Med* 2017;53:96–101.
2 Grana R, Benowitz N, Glantz SA. E-cigarettes: a scientific review. *Circulation* 2014;129:1972–86.
3 National Academies of Science, Engineering, and Medicine. Public health consequences of e-cigarettes. Washington, DC: national academies press, 2018. Available: http://nationalacademies.org/hmd/Reports/2018/public-health-consequences-of-e-cigarettes.aspx [Accessed 24 Aug 2021].
4 Balfour DJK, Benowitz NL, Colby SM, *et al*. Balancing consideration of the risks and benefits of e-cigarettes. *Am J Public Health* 2021;111:1661–72.
5 Bozier J, Chivers EK, Chapman DG, *et al*. The evolving landscape of e-cigarettes: a systematic review of recent evidence. *Chest* 2020;157:1362–90.
6 McNeill A, Brose LS, Calder R. E-Cigarettes: an evidence update. A report commissioned by public health England. London: public health England 2015. Available: https://www.gov.uk/government/publications/e-cigarettes-an-evidence-update [Accessed 24 Aug 2021].
7 Kaur G, Pinkston R, Mclemore B, *et al*. Immunological and toxicological risk assessment of e-cigarettes. *Eur Respir Rev* 2018;27:170119.
8 Fernández E, Ballbè M, Sureda X, *et al*. Particulate matter from electronic cigarettes and conventional cigarettes: a systematic review and observational study. *Curr Environ Health Rep* 2015;2:423–9.
9 Tzortzi A, Teloniatis S, Matiampa G, *et al*. Passive exposure of non-smokers to e-cigarette aerosols: sensory irritation, timing and association with volatile organic compounds. *Environ Res* 2020;182:108963.
10 Boakye E, Obisesan OH, Osei AD, *et al*. The promise and peril of Vaping. *Curr Cardiol Rep* 2020;22:155.
11 Beaglehole R, Bates C, Youdan B, *et al*. Nicotine without smoke: fighting the tobacco epidemic with harm reduction. *Lancet* 2019;394:718–20.
12 Owusu D, Huang J, Weaver SR, *et al*. Patterns and trends of dual use of e-cigarettes and cigarettes among U.S. adults, 2015-2018. *Prev Med Rep* 2019;16:101009.
13 El Dib R, Suzumura EA, Akl EA, *et al*. Electronic nicotine delivery systems and/or electronic non-nicotine delivery systems for tobacco smoking cessation or reduction: a systematic review and meta-analysis. *BMJ Open* 2017;7:e012680.
14 Patil S, Arakeri G, Patil S, *et al*. Are electronic nicotine delivery systems (ENDs) helping cigarette smokers quit?-Current evidence. *J Oral Pathol Med* 2020;49:181–9.
15 Brown J, Beard E, Kotz D, *et al*. Real-world effectiveness of e-cigarettes when used to aid smoking cessation: a cross-sectional population study. *Addiction* 2014;109:1531–40.
16 Padon AA, Maloney EK, Cappella JN. Youth-targeted e-cigarette marketing in the US. *Tob Regul Sci* 2017;3:95–101.
17 Hoek J, Freeman B. BAT(NZ) draws on cigarette marketing tactics to launch Vype in New Zealand. *Tob Control* 2019;28:e162–3.
18 Khouja JN, Suddell SF, Peters SE, *et al*. Is e-cigarette use in non-smoking young adults associated with later smoking? A systematic review and meta-analysis. *Tob Control* 2021;30:8–15.
19 Soneji S, Barrington-Trimis JL, Wills TA, *et al*. Association between initial use of e-cigarettes and subsequent cigarette smoking among adolescents and young adults: a systematic review and meta-analysis. *JAMA Pediatr* 2017;171:788–97.
20 Chapman S, Bareham D, Maziak W. The gateway effect of e-cigarettes: reflections on main criticisms. *Nicotine Tob Res* 2019;21:695–8.
21 Barrington-Trimis JL, Leventhal AM. Adolescents' Use of "Pod Mod" E-Cigarettes - Urgent Concerns. *N Engl J Med* 2018;379:1099–102.
22 Samet JM, Barrington-Trimis J. E-Cigarettes and harm reduction: an artificial controversy instead of evidence and a well-framed decision context. *Am J Public Health* 2021;111:1572–4.
23 Wang TW, Gentzke AS, Neff LJ, *et al*. Characteristics of e-cigarette use behaviors among US youth, 2020. *JAMA Netw Open* 2021;4:e2111336.
24 Choi BM, Abraham I. The decline in e-cigarette use among youth in the United States-An encouraging trend but an ongoing public health challenge. *JAMA Netw Open* 2021;4:e2112464.
25 Edwards R, Ball J, Hoek J. Key findings on smoking and e-cigarette use prevalence and trends in the 2020/21 NZ Health Survey. Public Health Expert [blog], 2021. Available: https://blogs.otago.ac.nz/pubhealthexpert/key-findings-on-smoking-and-e-cigarette-use-prevalence-and-trends-in-the-2020-21-nz-health-survey/ [Accessed 14 Jan 2022].
26 Tackett AP, Hébert ET, Stevens EM, *et al*. E-Cigarette regulation: a delicate balance for public health. *Addiction* 2020;115:2197–9.
27 Hoek J, Wilson N, Edwards R. New e-liquid flavour restrictions: Potential impacts on young people and people who smoke. Public Health Expert [blog], 2021. Available: https://blogs.otago.ac.nz/pubhealthexpert/new-e-liquid-flavour-restrictions-potential-impacts-on-young-people-and-people-who-smoke/#_ftnref1 [Accessed 28 Aug 2021].
28 Gendall P, Hoek J. Role of flavours in vaping uptake and cessation among New Zealand smokers and non-smokers: a cross-sectional study. *Tob Control* 2021;30:108–10.
29 Mann JM, Gostin L, Gruskin S, *et al*. Health and human rights. *Health Hum Rights* 1994;1:6–23.
30 Annas GJ, Mariner WK. (public) health and human rights in practice. *J Health Polit Policy Law* 2016;41:129–39.
31 Kozlowski LT. Harm reduction, public health, and human rights: smokers have a right to be informed of significant harm reduction options. *Nicotine Tob Res* 2002;4 Suppl 2:55–60.
32 Meier BM, Shelley D. The fourth Pillar of the framework convention on tobacco control: harm reduction and the International human right to health. *Public Health Rep* 2006;121:494–500.
33 Shapiro H. *Burning issues: global state of tobacco harm reduction 2020*. London: Knowledge-Action-Change, 2020.
34 van der Eijk Y. Ethics of tobacco harm reduction from a liberal perspective. *J Med Ethics* 2016;42:273–7.
35 Eyal N. Rescuing vapers versus rescuing smokers: the ethics. *Nicotine Tob Res* 2021;23:26–31.
36 Magalhaes M. Is priority to the young justified? *Nicotine Tob Res* 2021;23:32–5.
37 Thomas R, Parker LS, Shiffman S. The ethics of tobacco harm reduction: an analysis of e-cigarette availability from the perspectives of utilitarianism, bioethics, and public health ethics. *Nicotine Tob Res* 2021;23:3–8.
38 Brock D, Wikler D. Ethical issues in resource allocation, research, and new product development. In: Jamieson DT, Breman JG, Measham AR, eds. *Disease control priorities in developing countries*. 2nd edn. Washington, DC; New York, NY: World Bank and Oxford University Press, 2006: 259–70.
39 Kleinig J. The ethics of harm reduction. *Subst Use Misuse* 2008;43:1–16.