



OPEN ACCESS

It's Just Steam: a qualitative analysis of New Zealand ENDS users' perceptions of secondhand aerosol

Kerri Haggart,¹ Lindsay Robertson ,^{2,3} Mei-Ling Blank ,^{1,4} Lucy Popova,⁵ Janet Hoek ^{1,6}

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/tobaccocontrol-2019-055368>).

¹Public Health, University of Otago, Wellington, New Zealand
²Preventive and Social Medicine, University of Otago, Dunedin, Otago, New Zealand
³Department for Health, University of Bath, Bath, UK
⁴Marketing, University of Otago, Dunedin, New Zealand
⁵School of Public Health, Georgia State University, Atlanta, Georgia, USA
⁶Institute of Advanced Study, Durham University, Durham, UK

Correspondence to

Professor Janet Hoek, Public Health, University of Otago, Wellington, New Zealand; janet.hoek@otago.ac.nz

Received 6 September 2019
Revised 13 December 2019
Accepted 16 December 2019
Published Online First
11 February 2020

ABSTRACT

Introduction Many smokers who begin using electronic nicotine delivery systems (ENDS) report vaping in settings where they would not have smoked and believe secondhand aerosol (SHA) is simply steam. However, current understanding of how ENDS users differentiate between secondhand smoke and SHA, or how vaping norms develop, is limited.

Methods We conducted in-depth, semi-structured interviews with 39 current ENDS users (dual users and former smokers, now exclusive ENDS users) from New Zealand to explore participants' perceptions of SHA. We probed how these perceptions arose and examined implications for vaping practices and policy. We managed the data using NVivo V.11 and used a thematic analysis approach to interpret the transcripts.

Results Participants had limited understanding of SHA, its constituents or its possible effects on others. They drew on the absence of harm information, and their sensory experiences and perceptions of others' views of vaping, to support the conclusion that SHA posed few, if any, risks to bystanders. Yet despite this perception, some felt they should recognise others' rights to clean air and most would not vape around children to avoid setting an example.

Conclusions In the absence of trusted information, participants used sensory heuristics to rationalise their ENDS practices. Policy-makers face the challenge of correcting misperceptions about SHA without deterring full transition from smoking to ENDS use. They could consider including vaping in current smoke-free area policies; this measure would signal that SHA is not harmless, and could protect clean-air settings and reduce potential normalisation of vaping among non-smokers.

INTRODUCTION

Knowledge of harms caused by exposure to secondhand smoke (SHS) has informed campaigns promoting smoke-free homes and policies mandating smoke-free cars when children are present, which in turn shape norms, the informal rules that guide social practices.^{1–3} Smoke-free home norms reduce non-smokers' exposure to SHS, increase the likelihood that smokers will make a quit attempt, and foster the success of those attempts.^{4,5} However, while norms regarding SHS are becoming established,⁶ it is not clear whether smokers who start vaping apply those norms to the secondhand aerosol (SHA) created by electronic nicotine delivery systems (ENDS). As ENDS use grows, exposure to SHA also increases,⁷ with a recent analysis of 2015–2018 National Youth

Tobacco Survey data showing around a quarter of US youth had been exposed to SHA.⁸

While smokers who transition completely from smoking to ENDS use may decrease their exposure to toxins created by combusting tobacco, ENDS use is not risk-free.⁹ Recent studies suggest daily ENDS users may face increased cardiovascular and respiratory risks,¹⁰ with dual users (DUs) of combustible cigarettes and ENDS facing even greater risks than combustible-only users.¹¹ Analyses of e-liquid flavourings and SHA report these contain particulate matter and nicotine,¹² as well as cytotoxic organic compounds that may cause mutations and future health problems.^{13–15} Systematic reviews have found that passive exposure to SHA may pose a risk to those exposed, although a lower risk than exposure to SHS.^{16,17} However, others regard the evidence as unclear.¹⁸ For example, while the National Academies of Science, Engineering and Medicine found conclusive evidence that most ENDS 'emit numerous toxic substances' it also found conclusive evidence that 'these emissions vary substantially, depending on the device and how it is used'.¹⁹

There is thus considerable debate over where vaping should be permitted,^{20,21} with members of the public holding varied and sometimes contradictory perceptions of SHA, and often knowing little about its constituents. A study of Californian adolescents (76% neither used ENDS nor smoked tobacco) found nearly 20% regarded SHA as water vapour, though two-thirds thought it could harm children and babies.²² A similar study of American adults (88% never tried ENDS) found 58% did not know whether SHA comprised only water vapour; 63% and 75%, respectively, did not know whether SHA contained tar or formaldehyde.²³ Surveys exploring perceived risk and regulatory measures also report mixed findings, which typically differ according to ENDS use status.^{24–28}

Overall, the difficulty of finding information on vaping's effects or the contents of SHA, and diverging interpretations of existing research, raise questions about how ENDS users view SHA.²⁹ Few studies have examined this question or explored how perceptions of SHA arise and influence norms regarding ENDS use.^{30,31} Probing how ENDS users negotiate norms with respect to SHA could inform more nuanced education campaigns and help policy-makers balance the potential benefits of harm reduction against the public's right to breathe clean air. We therefore explored how ENDS users perceived SHA and the factors shaping these perceptions.



© Author(s) (or their employer(s)) 2021. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

To cite: Haggart K, Robertson L, Blank M-L, et al. *Tob Control* 2021;**30**:30–35.

METHODS

Setting, sample and recruitment

We undertook the study in New Zealand (NZ) where, at the time of data collection, ENDS and e-liquids containing nicotine could not legally be sold. Nonetheless, several stores sold nicotine-delivering devices and e-liquids, which consumers could also purchase online. Online supplementary file 1 contains further information on ENDS regulation in NZ.

As part of a larger project examining ENDS use in NZ, we recruited 39 current ENDS users (used ENDS at least once a month) aged 18 and over who had smoked at least 100 cigarettes in their lifetime and were either exclusive ENDS users ($n=19$) or DUs (ie, also smoked tobacco at least once a month; $n=20$). Our sample comprised Māori (NZ's indigenous peoples), Pacific peoples and NZ Europeans, and was recruited from three NZ urban centres. We used social media and community advertising, and whanaungatanga (kinship) and professional networks to recruit a demographically diverse sample. Participants received a NZ\$40 gift voucher to offset any costs they incurred from participating in the study.

Interview guide

Our semistructured interview guide explored participants' perceptions of ENDS' aerosol, particularly its components and effects on others (see online supplementary file 2). We retained flexibility in question wording and sequencing to maintain conversational interviews and allow detailed probing. The interview guide followed a general-to-specific question sequence to minimise priming effects. Following each interview, participants completed a brief background questionnaire that collected information on their smoking and ENDS use, and demographics. Interviews lasted approximately 60–70 min (range: 45–75 min). All participants provided written consent before the interview commenced.

Data analysis

With participants' consent, we recorded the interviews, which an online service subsequently transcribed verbatim. We analysed the transcripts using a thematic analysis approach, which involves frequent reading and re-reading of the transcripts, abstraction of themes, and identification of sub-themes.³² Two authors (KH and JH) each read the transcripts and used a line-by-line approach to code two of these; we then reviewed these codes and prepared an initial coding structure that KH used to code the remaining transcripts. We met regularly to review and discuss the codes, compare participants' accounts and ensure themes reflected divergent views. We used NVivo V.11 to manage the data; all participants have been assigned a pseudonym. online supplementary file 3 contains a codebook containing quotes associated with the themes presented below.

FINDINGS

Participants' characteristics

The sample comprised 16 women and 23 men aged 19–65 years (median age 34 years). Table 1 contains details of participants' demographics, and their smoking and ENDS use. Most participants used ENDS daily ($n=32$) and were relatively recent ENDS users, reporting at least weekly ENDS use for between 1 month and a year. Among DUs, 14 smoked daily; four smoked at least weekly and two smoked less than weekly. Most participants owned either a second-generation (vape pen) or third-generation (tank) device. Nine participants identified as Māori, five as Pacific, two as Māori and Pacific, three as 'Other', and

the remainder as NZ European. We describe participants using pseudonyms and according to whether they were DU or former smokers and now exclusive ENDS users (EUFS).

Thematic analysis

Participants knew little about SHA's constituents and few could explain how SHA affected bystanders. When probed, most drew on comparative heuristics, sensory experiences, or perceptions of others' views to conclude that SHA posed few, if any, risks to bystanders, and that vaping should be allowed in areas where smoking is not permitted. Yet at the same time as asserting this opinion, some participants felt reluctant to impose their choices on others, particularly children, and subordinated their views to an overarching courtesy norm that privileged others' rights to clean air. The following sections outline these themes.

Uncertainty about SHA's health effects

Participants found it difficult to locate independent information about ENDS' long-term health effects or the constituents of SHA, and most felt unsure what 'vape clouds' comprised. Mike's (EUFS) uncertainty was clear as he slowly outlined his view: 'Some people think ... that there's chemicals coming out of them, I'm not 100% sure on that... um, my information is it's just water vapour and yeah ... I'm not sure if there's nicotine in it coming out but um, yeah, other than that.' High uncertainty reflected the difficulty of locating information; as Russell (DU) noted: 'I don't know if it [SHA] sort've gets passed on, there's bugger all information on it about anything like that yeah, so it's sorta hard to find.'

Nor did participants know how the aerosol inhaled affected them. Oliver's (EUFS) struggle to articulate what he has heard illustrates a pervasive uncertainty: 'Um, yeah. I don't have too much understanding of what—what it is. Um, yeah. I don't know. I've heard it's something that is some sort of ... One of the, uh, I'm not too sure what it's called, but some of the—the liquid in it is also used on, like, I think it's called on the butter and popcorn sort of thing... There's a bit of ... Yeah. There's a bit of, um, questioning about, like, whether, you know, it being vaporised, it's still harmful sort of thing.'

Most also puzzled over SHA's potential effects on others. Patrick (DU) asked: 'It's not going to harm that person next to you, but is that proven? I don't know', while Henry (DU) posed more direct questions: 'how much of the nicotine is going into me and is there any going into the air? You know, is there a second-hand effect from the steam?' Despite searching online and talking with friends and family, participants found it hard to answer these questions. They managed this uncertainty by using SHA's pleasant taste and smell, and its tendency to disappear quickly, as signals it was less harmful than SHS. The following sections explore this reasoning.

Comparative logic

Several participants compared the lack of official information available on SHA to the well-established, widely promoted, information on harms caused by SHS. Tilly (EUFS) noted: 'They know a lot about cigarettes and that they're bad, but I don't think there's enough education out there about e-cigarette smoking' and Kate (DU) commented: '...like a normal cigarette, second-hand smoke, it can cause, um, cancers and stuff, but there's nothing...to say what the vapour from these [ENDS] do.' Participants recalled receiving information about the risks SHS posed—sometimes over many years—yet none had seen information about the potential risks SHA presented.

Table 1 Participant characteristics

Pseudonym	Gender	Age	Ethnicity	Vaping frequency	Length of time vaping weekly	Smoking frequency (CPD)
Amy	F	35	Pacific	Daily	4 months	Exclusive ENDS user
Angie	F	40	NZE	Daily	4 months	Daily (30)
Anthony	M	21	NZE	Weekly	3 months	Weekly (0–2)
Brett	M		NZE	Daily	3 months	Exclusive ENDS user
Caro	F	57	NZE	Daily	4 years	Exclusive ENDS user
Charlie	M	19	NZE	Daily	5 months	Weekly (2)*
Cindy	F	26	Māori	Daily	3 months	Exclusive ENDS user
Damian	M	23	NZE	Daily	3 months	Daily (3)
David	M	25	Māori	Daily	5 months	Exclusive ENDS user
Dean	M	45	Māori	Daily	5 months	Exclusive ENDS user
Ewan	M	27	NZE	Daily	6 months	Exclusive ENDS user
Fiona	F	37	NZE	Daily	1 year	Daily (10–12)
Gina	F	49	Other	Daily	1 year	Exclusive ENDS user
Hannah	F	48	NZE	Daily	1 year	Daily (25)
Hayley	F	34	NZE	Daily	1 month	Exclusive ENDS user
Hector	M		NZE	Weekly	4 months	Exclusive ENDS user
Henry	M	63	Māori	Daily	3 months	Weekly (1–2)*
James	M	43	NZE	Daily	7 months	Daily (5–8)
Jamie	M	20	Māori	Daily	1 year	Daily (3)
Jane	F	52	NZE	Daily	1 month†	Daily (16)
Jayden	M	20	Māori/Pacific	Daily	1 year	Weekly (1)*
Kate	F	56	NZE	Weekly	6 months	Daily (24–30)
Kelvin	M	22	NZE	Daily	4 months	<Weekly (4)*
Kurt	M	32	NZE	Daily	1 year	Exclusive ENDS user
Marie	F	45	Māori	Daily	15 months	Exclusive ENDS user
Matt	M	26	Other	<Weekly	n/a	<Weekly (1)*
Meg	F	65	Māori	Daily	8 months	Daily (10–14)
Mike	M	44	NZE	Daily	4 years	Exclusive ENDS user
Neal	M	19	NZE	Weekly	4 months	Daily (4–5)
Oliver	M		NZE	Weekly	4 months	Exclusive ENDS user
Paikia	F	31	Māori	Daily	1 month	Daily (>20)
Patrick	M	42	Pacific	Daily	9 months	Daily (8)
Penelope	F	60	Māori	Daily	7 months	Exclusive ENDS user
Pete	M	43	Pacific	Daily	8 months	Exclusive ENDS user
Russell	M	28	NZE	Daily	1 year	Daily (3–4)
Steve	M	39	Māori/Pacific	Daily	2 years	Exclusive ENDS user
Tilly	F	20	Māori	Daily	4 months	Exclusive ENDS user
Toby	M	20	NZE	Weekly	3 months	Daily (10)
Val	F	33	Pacific	Daily	6 months	Exclusive ENDS user
Range and mean					Range 1–24 months	13.5 cpd (among dual users)

*Cigarettes per day on smoking days for non-daily smokers.

†Had been using a vape intermittently for 1 year.

CPD, cigarettes per day; ENDS, electronic nicotine delivery systems.

Some saw the lack of risk information about SHA as akin to a declaration of safety; Kelvin (DU) summarised this reasoning: ‘it’s fine until proven otherwise’ and believed that SHA did not pose any risks. Overall, participants saw the lack of formal evidence about SHA’s effects on bystanders as a sign the aerosol they inhaled and exhaled posed little or no risk to others. They also relied on their own sensory experiences of SHS and SHA to establish the relative risks each presented.

Sensory perceptions

Many participants interpreted exhaled clouds as ‘steam’ rather than an aerosol containing nicotine, flavourings, carrier products and, potentially, heavy metals, in addition to water. Russell (DU) concluded: ‘At the end of the day it’s not smoke, um, it’s

just, vapour, it’s just steam, that’s all it is.’ To manage the lack of information, participants relied on perceptions of what SHA was not (ie, *not* SHS), rather than knowledge of what it actually contained. Jayden (DU) epitomised this approach: ‘To be honest, I don’t see what’s the big harm with it aye? It’s, it’s not a cigarette. Uh, actually you won’t even probably get any nicotine out of it, when they blow it out because it’s not even effective, eh, I don’t reckon.’ Asserting ‘it’s not a cigarette’, created a fundamental distinction that enabled him to believe it posed no ‘big harm’.

Beliefs that SHA comprised only water rested on visual and olfactory heuristics. The speed at which SHA dispersed reinforced perceptions it was simply ‘steam’; Damian (DU) commented: ‘[it was]...just like water. So it just... all evaporates into nothing’. Pete (EUFS) reiterated this reasoning: ‘I mean like,

vape is...it's like water, isn't it? It's like steam, so it pretty much evaporates quite quickly.' SHA's rapid disappearance supported perceptions it was safe, particularly when compared with SHS and other pollutants, such as car exhaust and industrial smoke, which lingered. Participants observed these latter pollutants in the air and contrasted them to SHA, as Jane (DU) explained: 'It's vapour and it's disappearing. You're getting more from that car that's going past out of its exhaust so, you know...You go through town and you see those big chimneys that are supposed to be... really good for the air, but it sits there for ages, it doesn't just suddenly disappear. Well, that's probably worse...you know, at least the vapour it's there for a second, but then it's gone.' Beliefs that harmful elements would remain visually discernible allowed participants to interpret impermanence as a lack of harm. Participants' frequent use of words such as 'evaporate', 'dissipate' and 'disappear' to describe SHA reinforce their reliance on visual heuristics.

SHA's lack of a persisting smell led participants to consider it more acceptable to others than SHS. Pete (EUFs) compared the tainting smell of smoking with the discretion vaping afforded: 'a cigarette... it lingers around. [SHA] doesn't stink... it wouldn't stick to your clothes...you can't really tell when someone's been vaping or not... whereas cigarettes, if you smoke next to somebody, then that's going to be all over their clothes and that's probably half the reason why they hate it.' Unlike SHS, which attaches itself to people and pollutes them, SHA appeared lighter, less pungent and persistent, and more pleasant than SHS. Toby (DU) commented: 'when someone's near me and they use an e-cigarette, it's a nicer smell than someone smoking a cigarette or something'. These sensory experiences supported perceptions that SHA was less harmful than smoke; Paikia (DU) explained: '...cigarettes have that foul smell, the foul taste... But the e-cigarette is pleasant, it smells good, it tastes good... there's no nasty, you know, side effects to it, it's actually really nice.' The absence of an objectionable smell supported beliefs that SHA did not pose serious health risks.

Third-party reinforcement

Others' apparent indifference to SHA confirmed perceptions of SHA as (at most) a trivial inconvenience, particularly when compared with SHS. Steve (EUFs) explained: 'Um, people, aren't actually uh ... they're not offended or afraid of it. Unlike cigarettes, they literally walk around you, like, in the distance (laughs). With vape they'll just walk straight through.' Fiona (DU) expanded on this experience; while strangers had actively disapproved of her smoking, no one had displayed similar reactions to her vaping. 'Nobody's ever kind of come up to me and said, 'Ooh that's disgusting' or 'That smells gross'. Like you get people that will come up to you on the street when you're smoking a cigarette and say 'oh can you put that thing out, it's disgusting'... you don't get that with e-cigarettes really.' Just as the absence of information about SHA's health risks became a sign of safety, so the absence of complaints confirmed SHA as benign.

However, while many participants' saw SHA as acceptable to others, a small group reported being challenged. Jayden (DU) described assertively defending vaping by contrasting it to smoking: '... (sighs) I really, um it really sucks like that, 'cause I know, there's people that like don't want you to vape around them but it is better than smoking eh? Vapour, I will ... If I had a [e-] cigarette and they told me to stop vaping, I will pull out my cigarette and puff it in front of them, blow it in front of them, just to change it around. Which one would you prefer, the

vape or the cigarette?' His comments illustrate one approach to how participants navigated where and around whom they vaped. Although reports of challenges were infrequent and participants did not believe SHA troubled others, they nonetheless navigated where and around whom they vaped.

Courtesy, choice and protection

Despite their widely held view that SHA was substantially less harmful, and therefore more acceptable than SHS, some participants acknowledged that others may not distinguish between SHS and SHA, and so may wish to avoid SHA exposure. Pete (EUFs) explained: 'Just out of respect of others, pretty much... it still blows bloody a lot of smoke and um, you know... there still is a lot of people that don't know what e-cigarettes are. They'll, they, they all you know, get paranoid and you don't want to ... You know, just out of respect of others you know, pretty much. You don't want to blow bloody clouds and just smoke bomb them or something you know, like that (chuckles).' Russell (DU) also explained why he privileged respect for others over his own convenience. 'Um, I think they should be allowed to use them anywhere but um ... you know, it's um, sorta gotta use your own sort've discretion like you know, you can't go to a restaurant and use it although you probably could but um, you know, um, just having respect for other people I guess.' While he clearly saw SHA as benign and openly debated his own view as he articulated it, he nonetheless accepted that others had a right to choose what they were exposed to in their immediate environment. Cindy (EUFs) explained this reasoning further: 'partly because I'm being courteous of other people. But also, I don't enjoy that'; Gina (EUFs) argued 'the same etiquette holds; you know, you don't vape when people are eating or ask if they mind you vaping, um, that includes in the home as well.' Courtesy and respect were common metaphors, though participants varied in how they balanced reduced harm arguments against reciprocity principles.

Many also privileged children's rights to freedom from exposure to SHA. The uncertainty that led them to see vaping as less harmful than smoking with respect to themselves became problematic when considering children, where doubt about SHA's components necessitated a more cautious approach. Paikia (DU) explained: 'Uh, well, cos you know, I actually really don't know what's inside these vapours. I actually don't know what's inside these liquids. And I—I don't feel like our pepi [babies] or our children should be around any of it.'

Several participants took a similar cautious stance and felt it inappropriate to role-model vaping (or smoking) around children. Fiona (DU) commented: 'I don't think that's acceptable in any form because I, well I smoke, I want to give up smoking because I don't want people younger than me to see it as something that they should be proud or something that's cool, so whether it's a vape or a cigarette, I don't think it should be smoked around children'. Gina (EUFs) re-iterated these views: 'especially if there is children around and stuff, you really don't want children thinking anything like cigarette smoking or vaping is a good idea, because it is better not to start'.

Amy (EUFs) differed slightly and felt children would have to make their own choice 1 day, but should be protected to that point: 'You know, they'll find out, like, if ... When they get to that stage, when they're going out clubbing or, you know, or through other influences. But not, like, showcasing it, like, in a family environmental place, kind of thing.' A small group differed further, arguing that role-modelling vaping could provide children with alternatives to smoking. Ewan (EUFs) commented: 'I

think it's better off that they um, saw vaping as an option rather than just solely seeing people smoking cigarettes outside ... if they saw people vaping as well they may be like 'hey, that's an option as well'. And that's probably better for them to see.'

For many participants, the balance between courtesy, choice and protection depended not only on the space itself but also on who else was in that space. Even those who saw SHA as unlikely to pose risks to others, felt vaping should not be allowed in confined public spaces, including buildings and transport vehicles, or around children. For these participants, vaping's social acceptance depended as much on vapers' courtesy as it did on asserting their perceived rights.

DISCUSSION

Our finding that participants lacked information on SHA's constituents and effects reflects earlier research documenting the paucity of reliable information about SHA.^{29,33} Participants drew on their wider environment, redolent with warnings about SHS and conspicuously devoid of cautions regarding SHA, to fill this information lacuna. Heuristics based on sensory perceptions, and interpretations of others' reactions, informed beliefs about SHA and shaped norms that guided vaping practices. The absence of information documenting SHA's potential risks led participants to extrapolate that it was not only safer than SHS, but carried few, if any, risks and was therefore safe to bystanders.³⁴ While many scientists treat inadequate information conservatively and call for cautious and protective regulation, our participants interpreted the information vacuum as a sign of SHA's safety. Instead, sensory heuristics guided belief that SHA was simply 'steam', a view largely reinforced by the social reactions they had received when vaping.

Some participants outlined vaping etiquette norms that limited where they would vape; they reported feeling hesitant about exposing others, particularly children, to SHA and were eager to position themselves as mindful and polite vapers. This tension between vapers' and non-vapers' rights has appeared in earlier studies,³¹ including surveys that have reported weaker support for externally imposed vaping area restrictions among vapers relative to non-vapers.²⁴⁻²⁷

However, reliance on 'vaping etiquette' is reminiscent of tobacco companies' tactics to avoid smoke-free space restrictions, and their calls on smokers to be 'considerate' and 'courteous'.^{35,36} These tactics delayed comprehensive policies creating smoke-free spaces and relied instead on individual smokers respecting others' preferences.³⁶ Relics of this discourse were evident in participants' comments, which focused less on the potential risks SHA may pose and bystanders' right to breathe clean air, and more on social conventions, such as respecting others' preferences. Because perceptions of SHA as harmless, quick to disappear and pleasant to smell, diminished the perceived need to recognise others' preferences, 'vaping etiquette' may be as unlikely as tobacco companies' 'considerate smoker' logic to ensure clean-air spaces.

Our findings have several policy implications. First, because information deficits foster misperceptions, governments have a responsibility to communicate the knowledge that does exist and reduce doubt over SHA. Correcting misperceptions about SHA without deterring full transition from smoking to ENDS use will require nuanced communications that balance encouragement and uncertainty. Recent findings suggest relative risk messages that compare smoking and vaping may foster more cautious beliefs, though these require testing with more diverse samples.^{24-26,37}

Second, given the challenge of communicating this complex messaging, policy-makers should also consider how other measures could reflect ongoing uncertainty about ENDS' impact and effects. NZ's current approach of allowing individual business and local authorities to develop their own rules has led to diverse practice. A more consistent approach, such as maintaining smoke-free indoor areas as vape-free and, cautiously allowing ENDS use in outdoor smoke-free areas, could reinforce the message that SHA is not merely 'steam'.³⁸ For example, some UK hospitals disallow both smoking and vaping inside buildings, but allow vaping within hospital grounds and smoking only outside these. Graduated responses such as these may also recognise public opinion surveys, which show large majority support for vape-free indoor spaces.^{24,25,27}

Future research could examine whether the benefits following introduction of smoke-free outdoor policies support extending these spaces to include vaping and what the impact on ENDS users would be. Smoke-free outdoor policies are associated with reductions in youth smoking initiation.^{39,40} Vape-free areas could reduce exposure to ENDS and decrease perceptions of vaping as 'normal'. Given concerns about vaping uptake among young non-smokers, studies must also examine associations between exposure to vaping and ENDS use among adolescents and young adults who have neither smoked nor vaped.^{41,42}

Our study has some limitations. Because we used a small non-probability sample to probe how perceptions of SHA arose, we cannot estimate what proportion of the population holds these perceptions. Our sample did not allow us to compare whether former smokers who are now exclusive ENDS users and DUs vary in how they perceive SHA; future studies could use survey-based approaches to address these questions. Future work could also explore whether people who smoke and vape in different spaces vary in their perceptions of SHS and SHA, and their support for vaping restrictions. Longitudinal approaches, such as ecological momentary assessments, could also extend our findings by examining the speed at which perceptions of SHS and SHA evolve.⁴³

Despite these limitations, our study explains how ENDS users develop beliefs about SHA when they cannot access trusted health information. Beliefs arising from sensory perceptions guide ENDS use and support new practices, which may deviate from norms that shape smoking practices. Our findings also suggest how policy-makers could correct and manage these beliefs, and highlight how misperceptions arise when norms are based not on knowledge but on sensory heuristics alone.

What this paper adds

- ▶ While several studies have outlined how smokers develop smoke-free norms, including smoke-free homes and cars, we know little about how norms regarding secondhand aerosol (SHA) arise.
- ▶ We found that electronic nicotine delivery systems users relied strongly on the absence of harm information and sensory heuristics to interpret SHA as inert and posing no harm to bystanders.
- ▶ Information campaigns and public knowledge repositories may dispel misbeliefs about SHA; however, measures differentiating between smoke-free, vape-free, and smoke-and-vape-free areas, could clarify that SHA is neither inert nor benign.

Acknowledgements We thank Pam Ling and Philip Gendall for their thoughtful advice on the study design and MS. We appreciate the time our research participants gave when providing the data reported on in this manuscript. We thank Anna Latu and Kale Fruean who assisted with data collection, and Stephanie Erick and Zoe Hawke who assisted with participant recruitment. JH completed work on the MS while a Fellow at the Institute of Advanced Study, Durham University, UK.

Contributors JH conceptualised and designed the project, obtained research funding and is senior author. LR and LP provided feedback on the funding application. JH, M-LB and LR designed the interview guide. LP provided feedback on this guide. LR, JH and M-LB conducted the fieldwork. KH and JH led analysis of the transcripts. JH developed the manuscript with assistance from KH, and led the revisions; all authors provided feedback on draft versions of the manuscript. All authors have seen and approved the final version. JH is guarantor of the manuscript.

Funding This research was funded by the Health Research Council of New Zealand (grant 16/149).

Competing interests None declared.

Patient consent for publication Not required.

Ethics approval The University of Otago Human Ethics Committee (reference 16/132) approved the study. Māori consultation: University of Otago Ngāi Tahu Research Consultative Committee.

Provenance and peer review Not commissioned; externally peer reviewed.

Data availability statement All data relevant to the study are included in the article or uploaded as supplementary information.

Open access This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

ORCID iDs

Lindsay Robertson <http://orcid.org/0000-0001-8383-9116>

Mei-Ling Blank <http://orcid.org/0000-0003-0728-4598>

Janet Hoek <http://orcid.org/0000-0003-4362-1539>

REFERENCES

- Öberg M, Jaakkola MS, Woodward A, *et al.* Worldwide burden of disease from exposure to second-hand smoke: a retrospective analysis of data from 192 countries. *The Lancet* 2011;377:139–46.
- Semple S, Apsley A, Galea KS, *et al.* Secondhand smoke in cars: assessing children's potential exposure during typical journey conditions. *Tob Control* 2012;21:578–83.
- Freeman B, Chapman S, Storey P. Banning smoking in cars carrying children: an analytical history of a public health advocacy campaign. *Aust N Z J Public Health* 2008;32:60–5.
- Borland R *et al.* Determinants and consequences of smoke-free homes: findings from the International tobacco control (ITC) four country survey. *Tob Control* 2006;15:iii42–50.
- Mills AL, Messer K, Gilpin EA, *et al.* The effect of smoke-free homes on adult smoking behavior: a review. *Nicotine Tob Res* 2009;11:1131–41.
- Brown A, Moodie C, Hastings G. A longitudinal study of policy effect (smoke-free legislation) on smoking norms: ITC Scotland/United Kingdom. *Nicotine Tob Res* 2009;11:924–32.
- Schripp T, Markewitz D, Uhde E, *et al.* Does e-cigarette consumption cause passive vaping? *Indoor Air* 2013;23:25–31.
- Tan ASL, Bigman CA, Mello S, *et al.* Trends in the prevalence of exposure to e-cigarette aerosol in public places among US middle and high school students, 2015 to 2018. *JAMA Netw Open* 2019;2:e1910184.
- National Academies of Sciences, Engineering and Medicine. *Public health consequences of e-cigarettes*. National Academies Press, 2018.
- Alzahrani T, Pena I, Temesgen N, *et al.* Association between electronic cigarette use and myocardial infarction. *Am J Prev Med* 2018;55:455–61.
- Osei AD, Mirbolouk M, Orimoloye OA, *et al.* Association between e-cigarette use and cardiovascular disease among never and current Combustible-Cigarette smokers. *Am J Med* 2019;132:949–54.
- Kaufman P, Dubray J, Soule EK, *et al.* Analysis of secondhand e-cigarette aerosol compounds in an indoor setting. *Tobacco Regulatory Science* 2018;4:29–37.
- Behar RZ, Luo W, Lin SC, *et al.* Distribution, quantification and toxicity of cinnamaldehyde in electronic cigarette refill fluids and aerosols. *Tob Control* 2016;25:ii94–102.
- Behar RZ, Wang Y, Talbot P. Comparing the cytotoxicity of electronic cigarette fluids, aerosols and solvents. *Tob Control* 2018;27:325–33.
- Geiss O, Bianchi I, Barahona F, *et al.* Characterisation of mainstream and passive vapours emitted by selected electronic cigarettes. *Int J Hyg Environ Health* 2015;218:169–80.
- Hess I, Lachireddy K, Capon A. A systematic review of the health risks from passive exposure to electronic cigarette vapour. *Public Health Res & Pr* 2016;26:e2621617.
- Pisinger C, Døssing M. A systematic review of health effects of electronic cigarettes. *Prev Med* 2014;69:248–60.
- Glasser AM, Collins L, Pearson JL, *et al.* Overview of electronic nicotine delivery systems: a systematic review. *Am J Prev Med* 2017;52:e33–66.
- National Academies of Science Engineering and Medicine. *Public health consequences of E-Cigarettes*. Washington, DC: The National Academies Press, 2018.
- Bauld L, McNeill A, Hajek P, *et al.* E-Cigarette use in public places: striking the right balance. *Tob Control* 2017;26:e5–6.
- Chapman S, Daube M, Maziak W. Should e-cigarette use be permitted in smoke-free public places? No. *Tob Control* 2017;26:e3–4.
- Gorukanti A, Delucchi K, Ling P, *et al.* Adolescents' attitudes towards e-cigarette ingredients, safety, addictive properties, social norms, and regulation. *Prev Med* 2017;94:65–71.
- Tan ASL, Mello S, Sanders-Jackson A, *et al.* Knowledge about chemicals in e-cigarette secondhand vapor and perceived harms of exposure among a national sample of U.S. adults. *Risk Analysis* 2017;37:1170–80.
- Mello S, Bigman CA, Sanders-Jackson A, *et al.* Perceived harm of secondhand electronic cigarette vapors and policy support to restrict public vaping: results from a national survey of US adults. *NICTOB* 2016;18:686–93.
- Wang TW, Marynak KM, Gentzke AS, *et al.* U.S. adult attitudes about electronic vapor product use in indoor public places. *Am J Prev Med* 2019;56:134–40.
- Laverty AA, Filippidis FT, Fernandez E, *et al.* E-cigarette use and support for banning e-cigarette use in public places in the European Union. *Prev Med* 2017;105:10–14.
- Brose LS, McNeill A, Arnott D, *et al.* Restrictions on the use of e-cigarettes in public and private places—current practice and support among adults in Great Britain. *Eur J Public Health* 2017;27:729–36.
- Volesky KD, Maki A, Scherf C, *et al.* Characteristics of e-cigarette users and their perceptions of the benefits, harms and risks of e-cigarette use: survey results from a convenience sample in Ottawa, Canada. *Health Promot Chronic Dis Prev Can* 2016;36:130–8.
- Robertson L, Hoek J, Blank M-L, *et al.* A qualitative exploration of information-seeking by electronic nicotine delivery systems (ENDS) users in New Zealand. *BMJ Open* 2018;8:e023375.
- Weishaar H, Trevisan F, Hilton S. 'Maybe they should regulate them quite strictly until they know the true dangers': a focus group study exploring UK adolescents' views on e-cigarette regulation. *Addiction* 2016;111:1637–45.
- Farrimond H. E-Cigarette regulation and policy: UK vapers' perspectives. *Addiction* 2016;111:1077–83.
- Braun V, Clarke V. Using thematic analysis in psychology. *Qual Res Psychol* 2006;3:77–101.
- Kadowaki J, Vuolo M, Kelly BC. A review of the current geographic distribution of and debate surrounding electronic cigarette clean air regulations in the United States. *Health Place* 2015;31:75–82.
- Twyman L, Watts C, Chapman K, *et al.* Electronic cigarette use in New South Wales, Australia: reasons for use, place of purchase and use in enclosed and outdoor places. *Aust N Z J Public Health* 2018;42:491–6.
- Poland BD. The 'considerate' smoker in public space: the micro-politics and political economy of 'doing the right thing'. *Health Place* 2000;6:1–14.
- Bialous SA, Mochizuki-Kobayashi Y, Stillman F. Courtesy and the challenges of implementing smoke-free policies in Japan. *Nicotine Tob Res* 2006;8:203–16.
- Owusu D, Lawley R, Yang B, *et al.* 'The lesser devil you don't know': a qualitative study of smokers' responses to messages communicating comparative risk of electronic and combusted cigarettes. *Tob Control* 2020;29:217–3.
- Wilson N, Hoek J, Thomson G, *et al.* Should e-cigarette use be included in indoor smoking bans? *Bull World Health Organ* 2017;95:540–1.
- Lemstra M, Neudorf C, Opondo J. Implications of a public smoking ban. *Can J Public Health* 2008;99:62–5.
- Dessaix A, Maag A, McKenzie J, *et al.* Factors influencing reductions in smoking among Australian adolescents. *Public Health Research & Prac* 2016;26:e2611605.
- Hoffman SJ, Tan C. Overview of systematic reviews on the health-related effects of government tobacco control policies. *BMC Public Health* 2015;15:744.
- King AC, Smith LJ, McNamara PJ, *et al.* Passive exposure to electronic cigarette (e-cigarette) use increases desire for combustible and e-cigarettes in young adult smokers. *Tob Control* 2015;24:501–4.
- McQuoid J, Thrul J, Ling P. A geographically explicit ecological momentary assessment (GEMA) mixed method for understanding substance use. *Soc Sci Med* 2018;202:89–98.

Supplementary File 1: ENDS Regulation in New Zealand

The Smokefree Environments Act 1990 (SFEA), Section 29 (2) of which reads: “No person shall import for sale, sell, pack, or distribute any tobacco product labelled or otherwise described as suitable for chewing, or for any other oral use (other than smoking)” was initially assumed to cover ENDS products.

Yet despite this assumption, sales of e-liquid containing nicotine occurred and were not prosecuted by the NZ Ministry of Health because of the difficulty in establishing the e-liquids sold contained nicotine manufactured from tobacco, as required by the Act. Online e-liquid purchases (for personal use) from international sites were permitted, with three months’ supply assumed to imply personal use rather than on-selling. Vaping was not illegal in New Zealand and vaping uptake became established, albeit more slowly than in countries without similar legislation.

In 2018, the NZ Ministry of Health prosecuted Philip Morris International (PMI) for advertising iQOS and alleged sales of iQOS breached Section 29(2) of the SFEA. PMI responded by arguing Parliament did not intend the SFEA to apply to products consumed via inhalation. The judge agreed and held that the SFEA was not intended to apply to a product such as HEETS; his decision has subsequently been interpreted to mean that the SFEA does not cover ENDS or e-liquids containing nicotine.

The Ministry of Health has summarised the implications of this decision on their website (<https://www.health.govt.nz/our-work/preventative-health-wellness/tobacco-control/vaping-and-smokeless-tobacco>):

“The Medicines Act 1981 and the Smoke-free Environments Act 1990 (SFEA) regulate the sale, advertising and use of vaping products, including nicotine liquids.”

Nicotine is a scheduled substance under the Medicines Act. It is illegal to sell a vaping product (with or without nicotine) while making a therapeutic claim, unless the product has been approved for that purpose by Medsafe.

Vaping products are tobacco products, regulated under the SFEA, if they are manufactured from tobacco.

In *Philip Morris v Ministry of Health* [2018] NZDC 4478, the District Court found that all tobacco products (except types that are chewed or otherwise absorbed through the oral mucosa e.g. snus) may be lawfully imported, sold and distributed under the SFEA. The Crown has not appealed the decision.

An implication of the Court's decision is that the same SFEA regulatory controls apply to smoked tobacco, heated tobacco and vaping products that are manufactured from tobacco. This includes the ban on sales to minors and restrictions on advertising.

Despite assuming the restrictions on advertising that apply to smoked tobacco also apply to heated tobacco and vaping products manufactured from tobacco, it has been difficult to establish whether promoted products are 'manufactured from tobacco'. This ambiguity has seen marketing for vaping products increase since the 2018 judgment; these products are now promoted via mass and social media, and at the point of sale, and use alliances with influencers and events popular with young people.

The NZ Government is currently preparing legislation that will regulate ENDS marketing and sales and hopes to introduce a new Bill in 2019. Information about ENDS has been made available from a new website: "Vaping Facts", developed and co-hosted by the NZ Health Promotion Agency (a crown entity) and the NZ Ministry of Health, and online since mid-2019. The introduction to the site is available here: <https://www.hpa.org.nz/vaping> and the information site is here: <https://www.vapingfacts.health.nz/>.



INTERVIEW GUIDE: PHASE ONE

Supporting informed e-cigarette use: A mixed methods study

Introduction (Five minutes)

Hello I'm [interviewer name]; I arranged to meet with you to talk about the research I'm doing into e-cigarettes and smoking. Before we start I'd like to show you some information about the interview and check to see whether you have any questions about my work. Here's another copy of the information sheet you were sent when you indicated you were interested in the project; please take a few moments to look through this sheet.

- **PROVIDE PARTICIPANT WITH AN INFORMATION SHEET AND OUTLINE THE KEY POINTS IN THIS. ALLOW TIME TO READ THE INFORMATION SHEET.**

Do you have any questions about the study?

- **EXPLAIN RECORDING OF THE INTERVIEW AND PARTICIPANT'S RIGHTS IN RELATION TO THIS. ONCE PARTICIPANT HAS AGREED TO INTERVIEW BEING RECORDED, TURN RECORDER ON AND NOTE THAT IT IS NOW ON.**

READ OUT WHILE RECORDER IS ON:

As a participant in the research, you have the right to ask questions at any time, to decide if you would prefer not to answer some questions, to receive a copy of the findings, and to withdraw from the research at any time. Please note that your responses will be confidential to the research team members.

- **CHECK AGAIN WHETHER PARTICIPANT HAS ANY QUESTIONS ABOUT THE INTERVIEW.**
- **IF NO QUESTIONS, ASK THE PARTICIPANT TO SIGN AND DATE THE CONSENT FORM.**

Smoking History (Five minutes – just an introduction)

I'd like to start by asking you some questions about your smoking:

1. Can you tell me about how you first started smoking tobacco? **Probe: How old were you? Where did you get the cigarettes from? Who were you with? Where were you? What do you remember about that first experience of smoking?**
2. And how did your smoking develop since those first cigarettes? **Probe: About how many cigarettes do you now smoke each day (or week, if non-daily)? When do you normally smoke? Are there any times when you smoke more or less during the day? Do you ever use other forms of tobacco, like shish or waterpipe tobacco? Tell me about your use of these types of tobacco. Probe: Explore increased smoking in social settings and when drinking.**

Smoking Day and Night Grids (Five minutes)

3. Could you look at this form please [GIVE RESPONDENT THE **SMOKING WEEKDAY GRID HERE**]. It has rows that show each hour of the day. I'd like you to think about an **average weekday day** and write in what you're doing and when you are smoking please. Please take as much time as you need to fill it in.
4. Now here's a similar night time grid [GIVE RESPONDENT THE **SMOKING SOCIAL NIGHT GRID HERE**]. This time I'd like you to think about evenings when you're out socialising and when you smoke then.

E-cigarette Uptake (Ten minutes)

5. Now I'd like to ask you about e-cigarettes. When did you first see an e-cigarette being used? And when did you first use an e-cigarette? Who were you with? Was it your own e-cigarette? **Probe: if not, where did you get the e-cigarette from?**
6. What type of EC was it? [Show images of different EC options, including first and second and third generation e-cigarettes]. Do you know if it had nicotine? Do you remember what flavour it was? What was that first experience like? How did it compare to smoking?
7. What got you thinking about using an e-cigarette more regularly? What kind of information did you want to know about them? Where did you try to find this information? **Probe: explore all sources of information, including websites, vape stores, and word of mouth. Where did you look? What did you find? What did it say? How helpful was that information?**
8. Have you seen e-cigarettes advertised? **What did the advertising say? What did you think of those claims? Probe: Explore benefits such as reduced harm, help quitting among existing smokers.**

E-Cigarette On-going Use (Five to ten minutes)

9. When did you start using an e-cigarette more regularly? What sort did you use? Did it have nicotine? How did you find using it? Have you tried any others? Did the other ECs you have tried have nicotine? **Probe: Explore history of e-cigarette use. [Show images of different EC options, including first and second and third generation e-cigarettes].**
10. [Where relevant] What led you to move from one e-cigarette to another? **How did you find out about different options? Where did you get information from? For each source mentioned, probe what details were ascertained and how useful these were.**
11. What sort of e-cigarette are you using now? Is this your own EC? What made you decide to buy this particular EC? Do you recall how much it cost? **Probe: What features did it have? What made these important to you? If multiple ECs used, probe when different devices used.**
12. Does your EC or vaporiser have nicotine? What about the flavours you use, what are they? What sort of PG /VG mix do you use? What is it about this mix that you like? **How long have you been using this e-cigarette? How do you find it?**

Smoking Day and Night Grids (Five minutes)

13. Could you look at this form please [GIVE RESPONDENT **THE E-CIGARETTE WEEK DAY GRID HERE**]. It has rows that show each hour of the day and I'd like you to think about an **average weekday day** and write in what you're doing and when you are using it please. Please take as much time as you need to fill it in.
14. Now here's a similar night time grid [GIVE RESPONDENT **THE E-CIGARETTE SOCIAL NIGHT GRID HERE**]. This time I'd like you to think about evenings when you're out socialising and when you use your e-cigarette smoke then.

E-Cigarette and Smoking Use Patterns (Five to ten minutes)

15. Are you still smoking tobacco as well as vaping? **REVIEW DAY GRIDS HERE** Let's look at a normal day and when you vape and smoke? **Probe – can you tell me why you smoke or vape at these times? Are you just smoking or vaping, or both? REVIEW NIGHT GRIDS HERE** And what about when you are out socialising, when are you smoking and vaping?
16. About how long have you been smoking and vaping? Just thinking about an average day [summarise charts] about how many times a day would you smoke? And how often would you vape each day? **Probe: Is this a stable pattern of smoking and vaping, or has it changed over time (If yes, probe how it has changed).**
17. Now thinking about a night when you are out socialising, about how many times a night when you're out would you smoke? And how often would you vape? **Probe: Is this a stable pattern of smoking and vaping, or has it changed over time (If yes, probe how it has changed).**
18. Overall, how do you see your smoking and vaping developing? **Probe: Would you like to stop smoking completely? IF YES: What is it that keeps you smoking instead of just vaping? IF NO: What got you vaping if you don't want to stop smoking?**
19. If you're just vaping now, how often do you vape compared to how often you used to smoke? **Probe differences – can you tell me a bit about these differences?**

Experiences of EC Use and Perceived Risks and Benefits (Ten minutes)

20. How does the experience of vaping compare to smoking? **Probe, which did they prefer (check throat hit, light head feelings and whether these were present or missed).** What are the pros and cons compared to smoking tobacco? If someone asked you the best thing about vaping, what would you say? Is there anything you miss about smoking? **Probe source and basis of information.**
21. How do you think the potential harm of using e-cigarettes compares to the potential harm from smoking? What makes you think that? **Probe source and basis of information; probe specific details where possible.**
22. What about for people who are using e-cigarettes as well as smoking? Do you think they face any potential harm? What would that be? How do you think it compares to smoking? What makes you think that?

23. How addictive do you think e-cigarettes with nicotine are? What makes you think that? What about e-cigarettes without nicotine? Overall, how addictive do you think vaping is compared to smoking? **Probe source and basis of information.**
24. How do you think using e-cigarettes affects people nearby? What makes you think that? Where did you get that information from? **Probe source and basis of information.**
25. How have non-vapers around you reacted when you have been vaping? **Probe: what sorts of things have happened? How did you feel about these? What did you do?**
26. Where do you think people should be allowed to use e-cigarettes? **Probe: Inside their home (where)? Outside their home? Inside workplaces? Inside cars? What about outside places where smoking might not be allowed, such as sports grounds? How about inside places where smoking is not allowed, such as bars and restaurants? Anywhere else you think people should be allowed to use e-cigarettes? Any other places where you think they should not be allowed to use e-cigarettes?**

Information (Ten minutes)

Some countries require e-cigarette manufacturers to provide information on their packaging. I'd like to get your views on some of that information and how useful you think it would be. **Please look at these messages.**

- **E-cigarette liquid containing nicotine is addictive.**
 - **To get maximum benefit from e-cigarettes, you must stop smoking completely.**
 - **Swallowing nicotine e-liquid is harmful to children.**
 - **The long-term effects of using e-cigarettes are not known and may be harmful.**
 - **The long-term effects of using e-cigarettes are not known and may be harmful, but are likely to be much less harmful than smoking.**
 - **Nicotine overdose may result in headaches, nausea, excessive sweating or difficulty sleeping.**
 - **Using e-cigarettes while pregnant may harm your unborn baby**
 - **Using e-cigarettes while pregnant may harm your unborn baby, but is likely to be much less harmful than smoking.**
27. For each question, probe the message interpretation, explore ambiguities, check understanding and language used. **What do you think that message means? How easy is it to understand? How believable do you think it is? How do you think a young person who doesn't smoke but who is thinking of trying e-cigarettes would feel after reading this message? What about someone who is thinking of using e-cigarettes to try and quit? How helpful is this information? Is there anything you would do to clarify this message or make it more useful?**
 28. Is there any information you think should be provided on packaging to help consumers? **Probe responses. Clarify how information could be presented. Where should it be (external pack, internal leaflet, other format)?**

Vaporisers and other substances (Five minutes)

29. Finally, I'd like to ask you whether you've ever used an electronic cigarette or vaporiser with any other substances? What were these? **Probe marijuana.** What made you start vaping these substances rather than smoking them? How did the experience of vaping those substances compare to smoking them?

Summary

30. These are all the questions I wanted to ask you. Do you have any other comments you'd like to make?
31. Finally, I just have a short questionnaire for you to complete. Like the rest of our discussion, the information you provide will be completely confidential and only members of the research team will be able to access it. **PROVIDE RESPONDENT WITH DEMOGRAPHIC QUESTIONNAIRE AND COLLECT AND CHECK ON COMPLETION**

Supplementary File 3: Sample Codebook

Theme	Sub-theme	Quotes
Uncertainty about health effects	General lack of information	<p>“yeah I don’t know what’s in it really, yeah” (Fiona, DU)</p> <p>“don't think anybody really knows if it is healthier or not.” (Kelvin, DU)</p> <p>“from what they can see that vaping does look much healthier than smoking, but, um, I th- yeah. I think it also says something about, you know, that, yeah. They can r- I don't know. Maybe. There was no, like, concrete answer that they had. They couldn't say this was much healthier. Yeah.” (Oliver, EUFS)</p> <p>“Um, yeah. I don't have too much understanding of what- what it is. Um, yeah. I don't know. I've heard it's something that is some sort of ... One of the, uh, I'm not too sure what it's called, but some of the- the liquid in it is also used on, like, I think it's called on the butter and popcorn sort of thing... There's a bit of ... Yeah. There's a bit of, um, questioning about, like, whether, you know, it being vaporised, it's still harmful sort of thing.” (Oliver, EUFS)</p>
	Lack of information relative to smoking	<p>“I don’t know, that’s why – there’s nothing to tell you what, you know, like a normal cigarette, second hand smoke, it can cause um, cancers and stuff but there’s nothing ... to say what the vapour from these do.” (Kate, DU)</p>
	Constituents and impact on self and others	<p>“I’d just like to know ... what they do- what exactly I am inhaling into my lungs and, and what it’s doing to me and it’s probably the moisture that concerns me the most.” (Angie, DU)</p> <p>“Some people think ... that there’s chemicals coming out of them, I’m not 100% sure on that. There’s some people who – a woman who was pregnant who didn’t want me to vape around her. ‘Cos she had heard that ... there was ... ah something in the, in the passive smoke ... ah, I don’t actually believe that. I’m not sure on that ... um, my information is it’s just water vapour and yeah ... I’m not sure if there’s nicotine in it coming out but um ... yeah other than that.” (Mike, EUFS)</p> <p>“...I actually don’t think it has sort’ve, any sort’ve effects apart from the nicotine – I don’t know if that can be passed on through sort’ve smoking around the kids</p>

		<p>while using the vaper around the kids, I don't know if it sort've gets passed on, there's bugger all information on it about anything like that yeah, so it's sorta hard to find." (Russell, DU)</p>
Comparative logic	Lack of information interpreted as "safe" relative to tobacco	<p>"It's just gotta be healthier than um cigarettes, which is why they exist. Is what I think, but I'm not sure why. I'm not sure why or what the other disadvantages of it are. ...I think it's just really positive, I guess." (Damian, DU)</p> <p>"I feel like the smoke is worse for you. Smoke's bad for your lungs. Steam, I don't know. It could be bad for your lungs, but I feel like it isn't as bad as smoke." (Hector, EUFS)</p> <p>"I feel like it would be less harmful, but, um, that's only 'cause, you know, we're told there's 40 chemicals that are bad for you in a cigarette and, you know, you see pictures of lungs of people that smoke and they are black. And I don't really hear much about that from the e-cigarettes, so I feel like that makes it better. And since it's vapour, not smoke. Now, I know that smoking's bad for your lungs, bad for the environment, and stuff like that, I feel like, just vapour feels like a better thing." (Hector, EUFS)</p> <p>"There's like an, you know, well-defined, well-established potential harm from cigarettes, whereas with e-cigarettes, it's not quite as ... You know, it's not well-understood what happens. But, I guess it's easier, it's easy to assume that it's a lot safer....Or a lot healthier for you than cigarettes." (Kelvin, DU)</p> <p>"Um ... well, the one that I use doesn't emit a lot of smoke so it's ... um, a lot better if I'm around other – I try not to smoke around other people. I've become very conscious of that in recent years, um ... um ... it wouldn't affect other people so much ... the smoke isn't as toxic as it would be from a cigarette." (Meg, DU)</p> <p>"So she [classmate] brought up the fact that she doesn't smoke cigarettes and here's this vapour, but she doesn't know what's in the vapour either....You know, which brought to my attention, actually I don't know what's inside a vapour....But I know it's good for you. Which was my argument....It's not bad, it's not a cigarette." (Paikia, DU)</p>

Sensory perceptions	SHA as "steam"	<p>"...what I've known, you know, it's just water. That, that thing that makes the smoke ... You know, that makes the smoke ... And nicotine if you got the nicotine in your thing. That's all that I know that's in the juices. So I don't know how it could be any harmful when it's just actual water." (Amy, EUFS)</p> <p>"99% of it is pretty much water. Um and when you breathe it out, it makes cloud of smoke, ah, a cloud of steam" (Brett, EUFS)</p> <p>"It is, it is comprised of steam and whatever the carrier is so if it's you know, if you've got VG then it's steam and VG. If you've got VG and PG it's, it's um steam plus that um, that's all that's in it as far as I know." (Caro, EUFS)</p> <p>"Some people think its second hand smoke going into their system but, that's really, you know, that's, that's pretty much just like water. So, it's just, you know, all evaporates into nothing." (Damian, DU)</p> <p>"from everything I've read on line ... and all the research I've done on line, um, it would suggest that there's no ... side effects from anything that's exhaled, that it's purely water vapour and that it's not gonna affect them in any way." (Ewan, EUFS)</p> <p>"when you look at what's in an actual cigarette, that's doing damage, because potentially from, well from what I believe when you're vaping is basically just vapour that you're exhaling so yeah....just, yeah I can't see any disadvantages or any way that it's gonna harm anybody." (Fiona, DU)</p> <p>"Um, in general, I feel like, you know, steam isn't really bad for anything that's vapour, whereas smoke is, kind of, bad; but also, like, a cigarette and just inhaling the smoke is a lot, sort of, rougher than inhaling the vapour as well. So, you can also, like, feel the difference in your throat and stuff." (Hector, EUFS)</p> <p>"my information is it's just water vapour and yeah ... I'm not sure if there's nicotine in it coming out but um ... yeah other than that ...I think it's safe so" (Mike, EUFS)</p> <p>"I've said it's-it's harmless, just steam, just vape, you know." (Patrick, DU)</p>
---------------------	----------------	---

		<p>"I mean like, vape is, is a ... It's like water, isn't it? It's like steam, so it pretty much evaporates quite quickly. You know, not like a cigarette, they're quite ... It lingers around. It doesn't stink. You know, it um, it wouldn't stick to your clothes, you know." (Pete, EUFS)</p> <p>"Um ... I think it should sorta be alright um ... at the end of the day it's not smoke, um, it's just ... um ... vapour, it's just steam that's all it is." (Russell, DU)</p> <p>"One thing I heard from friend who vapes, she said that it's water vapour and I thought, "Is it really water vapour?" One of the things I wanted to know was what is actually in the liquid. I did do a little bit of research into e-cigarettes and what I found was that because they are quite relatively a new kind of thing. There wasn't actually a lot of research done out there, especially on long-term effects just because they are relatively new. That was one thing I was a bit iffy about was just the long-term effects of it." (Tilly, EUFS)</p>
	Visual disappearance	<p>"Smoke is gonna just dissipate, it's not really like a serious smoke." (Anthony, DU)</p> <p>Um, vape, vape, vapour, evaporates extremely quickly... One second it's there, next it's gone. There's no lingering smell...." (Brett, EUFS)</p> <p>"So you could blow a cloud and that's from here, you know, and um it'd be gone within ten seconds tops, we wouldn't see it anyway. But if it was a real cigarette, then that would just linger and sit there in the air for like hours and hours and hours." (Damian, DU)</p> <p>"Cause with the cigarette smoke, like, if you smoke in a room that's just a thick-as smoke and you can still see it. With the vaper smoke, it just vanishes." (David, EUFS)</p> <p>"Cause it vanishes faster than cigarette smoke and -...Plus it leaves a good odour, so." (Dean, EUFS)</p> <p>"...it's disappearing you know, you get, you know, you're always gonna get somebody who's gonna – 'oh, you're smoking' well excuse me, it's vapour and it's</p>

		disappearing, you're getting more from that car that's going past out of its exhaust so ... you know?" (Jane, DU)
	Pleasant smell / no smell	<p>"Oh, they probably look at it the same as smoking because there's like smoke or vape coming out your mouth, um, and it has a smell to it like ... But it's not a nasty smell. It's quite a nice smell. Um, I don't think it would affect them, like there wouldn't be second hand vape or anything like that because it does ... It, or it did like as soon as you blow it out, within seconds it's kind of ... It doesn't linger. It just kind of disappears. Unless you like, have like a huge draw, and like, you can literally look like a train. You can get some, quite a big clouds, vape clouds they call them.... But um, no I don't think it would affect anyone." (Cindy, EUFS)</p> <p>"Um, I don't think there will be [<i>an impact on others</i>] – it doesn't smell nearly as bad as what cigarettes do..." (Hayley, EUFS)</p> <p>"Um, well far less [<i>impact on others</i>] than cigarettes, you know. Um, people can't smell it. Well they can only smell the flavour, so they're not smelling smoke... so there's no second hand smoke and therefore, you know, no second hand smoke clinging to clothes or, inside cars or anything like that. Yeah." (Henry, DU)</p> <p>"Cause with a cigarette, even after the smoke is gone the smell is still there, like ... A vape, just disappears." (Jamie, DU)</p>
Third party reinforcement	Others' indifference	<p>"I haven't really, uh, really, heard any complaints about vaping....Eh, but uh, yeah, like I said it's only me and my family that I know of that does it." (Dean, EUFS)</p> <p>"you know like, when you're smoking a cigarette, people are kind of like oh gross but you know, they kind of don't try and move away from you, you don't smell as bad and, yeah" (Fiona, DU)</p> <p>nobody's ever kind of come up to me and said ooh that's disgusting or that smells gross or you know, like you get people that will come up to you on the street when you're smoking a cigarette and say oh can you put that thing out, it's disgusting, yeah you don't get that with E-cigarettes really" (Fiona, DU)</p> <p>"I think it's much more positive than traditional cigarettes. Um, I think it's quite accepted now," (Matt, DU)</p>

		<p>"Um, people that I've never been around, yes. And then as soon as they actually got a whiff of it they're like, "Oh that's actually nice. You don't ... So that's actually not a cigarette?" I'm like, "No, it's more of a healthier version of it."...And they actually accepted it." (Steve, EUFS)</p>
	Possible stigma associated with vaping	<p>"Out in public I can definitely see a lot of people, you know, looking at you funny or not liking it, whereas with smoking, you know every now and then you get the odd person. But, most people don't blink an eye just like...You know, and so many do it." (Kelvin, DU)</p>
Courtesy and choice	Annoyance of others / others' rights	<p>"Like it is kind of offensive. Like you're breathing out large clouds of smoke that kind of smells. Like it kind of smells pleasant, but still, like, if you're sitting at a football game and someone was next to you, that would be kind of annoying." (Charlie, DU)</p> <p>"I fear it can be a nuisance to people having clouds being puffed into their faces and having me invade their space, so to me it is more of a courtesy thing [affirmation from I], I wouldn't want it to happen to me, why should I do it to other people." (David, EUFS)</p> <p>"common sense you don't do it in front of people while they're eating ... because I wouldn't like you know, someone blowing vapour or cigarette smoke in my face ... but yeah." (Hayley, EUFS)</p> <p>"You know, I think it's just about having respect for people. I think if it's as safe as everyone says it is and it's making no impact on the air around anybody, I think ... there's no reason why it couldn't be smoked anywhere....And we breathe out vapour all the time, there's no limit about where we can go and not do that, so ..." (Henry, DU)</p> <p>"Ah, pretty much anywhere as long as it doesn't annoy people 'cos you can put a lot of vapour in the air and it might just bother people generally." (Mike, EUFS)</p> <p>"So when I'm smoking, vaping outside a public place I am still aware of non-smokers and even though I know what I'm using isn't going to harm them, I still ... don't stand near them." (Penelope, EUFS)</p>

		<p>"I, I make sure that I don't you know, vape around people that don't smoke and stuff like that, just, just ... Even though it's not bad or you know, I just ... Out of courtesy, don't want to blow smoke in their faces or you know ... So it's like, yeah." (Pete, EUFS)</p> <p>"Like I wouldn't go to a restaurant and start vaping inside the restaurant 'cause you know, just out of you know, respect of other people there, you know. Yeah." (Pete, EUFS)</p> <p>"I think they should be allowed to use them anywhere but um ... you know, it's um, sorta gotta use your own sort've discretion like you know, you can't go to a restaurant and use it although you probably could but um, you know, um, just having respect for other people I guess." (Russell, DU)</p> <p>"I vape outside for them just because they don't, they're not a fan of it. They accept that people do it, but it's not their thing. They don't want a part of it." (Tilly, EUFS)</p>
	Effects on children (avoiding vaping near children)	<p>"in homes, if you got kids, definitely a no-no." (Brett, EUFS)</p> <p>"And so my anti second hand smoke is a direct response to, to my experiences as a child which is why I just wouldn't ever do that with my kids, um, and you know, even now, I wouldn't be in a closed vehicle with anybody unless it's my older son who vapes as well, you know, we vape together quite happily but you know, if the other kids were in the car I wouldn't sit there in the car with them and, and vape even just in case it bothered them" (Caro, EUFS)</p> <p>"that's just like to a kid growing up in like a playground setting for example, and they'll see that, they'll see the smoke coming out of the end of your mouth and they'll think that, you know, they can get that graphic image and think that that's like a normal cigarette. And that's uh, they will grow up not knowing any better and a normality to use, just thinking smoking around playgrounds is like, okay. So, they would probably not really know the difference at the time." (Damian, DU)</p> <p>"I don't think that's acceptable in any form because I, well I smoke, I want to give up smoking because I don't want people younger than me to see it as something</p>

		<p>that they should be proud or something that's cool, so whether it's a vape or a cigarette, I don't think it should be smoked around children." (Fiona, DU)</p> <p>"I think it needs to have restrictions on it in some ways where you do it just for the fact of these like young kids that see that thinking, oh yeah ... they wanna try it." (Jane, DU)</p> <p>"Um if I knew if there were side-effects towards it then I wouldn't let it happen in a place full of children and people that aren't like for it and stuff like that. Small rooms and um yeah." (Neal, DU)</p> <p>"Uh, well, cos you know, I actually really don't know what's inside these vapours. I actually don't know what's inside these liquids. And I- I don't feel like our pepi or our children should be around any of it." (Paikia, DU)</p>
	Effects on children – vaping as preferable to smoking	<p>"I guess if I was a regular vaper and I was using it in place of cigarettes than I guess you'd probably vape in front of children, better than smoking in front of them" (Charlie, DU)</p> <p>"I think it's better off that they um, saw vaping as an option rather than just solely seeing people smoking cigarettes outside or at play centres – like you can't smoke at a play centre but yeah, outside influences like going down the street and stuff they will see people smoking, whereas if they saw people vaping as well they may be like 'hey, that's an option as well'." (Ewan, EUFS)</p>
	Role modelling	<p>"...I don't- I've sort've changed my whole ... thing around smoking – I don't think it's good for any adult to um, be mirroring smoking behaviour around young people or children. Um... so um... for myself, um, to be as inconspicuous as possible." (Meg, DU)</p>