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Rules about smoking and vaping in the home: findings from the 2016 International Tobacco Control Four Country Smoking and Vaping Survey

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ABSTRACT

Aims To examine rules about smoking and vaping in the home in relation to beliefs about the relative harm of second-hand vapor (SHV) compared with second-hand smoke (SHS) in four countries: Canada, United States, England and Australia. **Design** Data were available from 12 294 adults (18+) who participated in the 2016 (wave 1) International Tobacco Control Four Country Smoking and Vaping (ITC 4CV1) Survey. **Participants** All participants were current or recent former adult smokers. **Measurements** Data were analyzed by weighted logistic regression on rules about smoking and vaping in the home; odds ratios and 95% confidence intervals were reported, adjusted for demographic and behavioral variables. **Findings** Of all respondents, 37.4% allowed smoking inside their home. Among a subset who were current vapers (n = 6135), 60.4% allowed vaping in their homes. After controlling for demographic and behavioral characteristics, beliefs about the harm of SHV compared with SHS was not associated with allowing smoking in the home, but was associated with allowing vaping in the home [odds ratio (OR) = 2.86 in Canada, OR = 1.82 in the United States and OR = 1.68 in England]. Characteristics that were associated with rules about vaping inside the home included daily vaping (OR = 2.95, 2.04–4.26; OR = 7.00, 4.12–11.87; OR = 5.50, 3.40–8.88; OR = 7.78, 1.90–31.80), living with a spouse who vapes (OR = 2.48, 1.54–3.98; OR = 2.69, 1.42–5.11; OR = 4.67, 2.74–7.95; OR = 21.82, 2.16–220.9) and living with children aged under 18 years (OR = 0.50, 0.37–0.68; OR = 0.89, 0.48–1.65; OR = 0.76, 0.53–1.09; OR = 0.26, = 0.11–0.61) in Canada, the United States, England and Australia, respectively. Similar characteristics were associated with rules about smoking inside the home. **Conclusions** Among current and former smokers in 2016 in Canada, the United States, England and Australia, 37.4% allowed smoking in the home; 60.4% of current vapers allowed vaping. Both concurrent users and exclusive vapers were more likely to allow vaping than smoking inside the home. Allowing vaping inside the home was correlated with the belief that second-hand vapor is less harmful than second-hand smoke.

Keywords Risk perception, secondhand vaping, smoking, smoking rules at home, vaping, vaping rules at home.

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[Correction added on 8 October 2019, after first online publication: Changes have been made to the article to improve clarity.]

INTRODUCTION

Vaping devices (VD) are battery-operated hand-held devices that heat liquids that may contain nicotine as well as flavorings and humectants into an aerosol for delivery to a user's lungs. Use of these devices has been increasing rapidly in high-income countries during the past decade [1]. For example, in Great Britain, between 2012 and 2015 VD use among adults increased more than fourfold, from 700 000 to 2.9 million adults [2]. Between 2010 and 2013 in the United States, VD use increased sevenfold among cross-sectional samples of adults, from 1.8 to 13% [3].

Studies have found that smokers who completely substitute cigarettes with VDs reduce their exposure to many toxicants found in cigarette smoke, suggesting that switching completely to VDs might reduce a person's risk of adverse health outcomes related to cigarette smoking [4–6]. By extension, one might also assume that exposure to second-hand vapor (SHV) would pose a lower risk to health compared to exposure to second-hand smoke (SHS). Studies quantifying the potential harms of exposure to SHV compared to SHS found that exposure to harmful constituents were overall lower for VDs, but varied by type of VD and vaping liquid used [6,7].

It has been shown that beliefs about the health risks of smoking are predictive of product use [8–11]. Those who perceive a lower risk from smoking are more inclined to smoke and less likely to stop smoking [8,12]. Recent studies

have found that the same association holds for vaping with those who perceive a lower risk from using a VD more likely to engage in vaping compared to those who perceive a higher risk relative to smoking cigarettes [13–15]. Also, where one lives might impact beliefs about the relative dangers of vaping. Yong *et al.* reported that beliefs about the health risks of vaping differed in current and former smokers living in England and Australia, consistent with how VDs are regulated in the two countries [8,13]. In Australia, where nicotine-containing VDs are prohibited for sale in retail shops, there was more skepticism about the relative health benefits of vaping compared to smoking, compared to respondents in England, where no such retail marketing restrictions exist [8].

Previous studies have shown that smoking behavior and beliefs about the health risks of SHS were predictive of having rules prohibiting smoking inside the home [16–18]. Herein, we examine how rules about smoking and vaping inside the home are related to beliefs about the relative health risks of SHV compared to SHS, and how these outcomes differ in Australia (AU), Canada (CA), England (EN) and the United States (US) and within-country by smoking and vaping behaviors. At the time of the study, both AU and CA restricted the retail sale of nicotine VDS while EN and the US did not.

METHODS

Data were available from 12 294 individuals who were aged 18 years or older (3733 in CA, 2733 in the US, 4324 in EN and 1504 in AU) and participated in the 2016 (wave 1) International Tobacco Control Four Country Smoking and Vaping (ITC 4CV1). Methodological details for the survey are available via the ITC website (https://www.itcproject.org/files/4CV1_Technical_Report_20July2018.pdf) [19].

Rules about smoking and vaping in the home

All participants were asked: 'Which of the following best describes smoking cigarettes inside your home?', with the possible answers: 'smoking is allowed anywhere in your home', 'smoking is never allowed anywhere in your home', 'something in between' and 'don't know'. Those who answered 'something in between' were considered to allow smoking in the home. Those who vaped at least monthly were asked: 'Do you ever use an EC or vaping device inside your home?', with response categories of: 'yes', 'never' and 'don't know'.

Beliefs about SHV compared to SHS

All participants were asked: 'Thinking about the vapor from e-cigarettes and second-hand smoke from ordinary cigarettes, is VAPOR ...? '. Response categories were 'less harmful than second-hand smoke', 'equally harmful to second-hand smoke', 'more harmful than second-hand smoke' and 'don't know'.

Smoking/vaping status

Current smoking was defined as having smoked at least 100 cigarettes per life-time and currently smoking cigarettes at least monthly. Former smoking was defined as having smoked at least 100 cigarettes per life-time and not currently smoking cigarettes. Current vaping was defined as using a VD with or without nicotine. Former vaping was defined as having used a VD in the past but stopped within the previous 24 months. Participants were grouped into five categories based on their smoking and vaping behavior; these categories were: (1) concurrent users (smoked cigarettes and vaped at least monthly for both), (2) exclusive cigarette smokers (smoked cigarettes at least monthly and currently do not vape at all), (3) exclusive vapers (vape at least monthly and currently do not smoke cigarettes at all), (4) recent former smokers former vapers (smoked cigarettes and vaped in the past, but currently do neither) and (5) recent former smokers never vapers (smoked cigarettes in the past but currently do not and have never vaped). Details about such grouping are described in the Supporting information, Table S1.

Data analyses

The two outcomes (smoking and vaping rules in the home) were modeled separately by weighted logistic regression for survey data (i.e. proc surveylogistic) accounting for missing data being missing not at random (i.e. nomcar option). Smoking rules in the home were categorized to whether smoking was allowed or not allowed; vaping rules were categorized similarly. Perception of harm of SHV versus SHS was the main exposure of interest and was categorized into less harmful versus other (more harmful, equally as harmful and don't know). Smoking rules in the home model was adjusted for smoking/vaping status (i.e. concurrent users, exclusive cigarette smokers, exclusive vapers, recent former smokers former vapers and recent former smokers never vapers), daily smoking (i.e. yes or no), age (i.e. 18–24, 25–39, 40–54, 55+ years), sex (i.e. male versus female), race (i.e. white versus non-white), household income (i.e. low = less than 30 000 CAD, moderate = 30 000–59 999 CAD and high = 60 000 CAD or more for CA; similarly for US and AU in their respective currencies. For EN, low = less than 30 000 GBP, moderate = 30 000–45 999 GBP and high = 45 000 GBP or more), educational level (i.e. low = high school or less, moderate = technical degree or some university, high = completed university), living with a spouse who

smokes (i.e. 'yes' or 'no') and living with children under 18 years old (i.e. 'yes' or 'no'). Rules about vaping in the home model was adjusted for daily vaping (i.e. 'yes' or 'no') instead of daily smoking and living with a spouse who vapes (i.e. 'yes' or 'no') instead of living with a spouse who smokes. Those who refused to answer or did not answer all questions were excluded from the adjusted analyses. Data analyses were performed in SAS version 9.4 (SAS Institute, Cary, NC, USA). All percentages and measures of association were weighted [19].

Ethics approval

The survey protocols and all materials, including the survey questionnaires, were cleared for ethics by the Institutional Review Board, Medical University of South Carolina; the Research Ethics Office, King's College London, UK; the Office of Research Ethics, University of Waterloo, Canada; and Human Research Ethics, Cancer Council Victoria, Australia. All participants provided consent to participate.

RESULTS

Table 1 summarizes the characteristics of the sample in each country. The majority of participants had rules prohibiting smoking in their home. Overall, of the whole sample, 37.4% allowed smoking in the home; 31.7% in CA, 37.8% in the US, 39.6% in EN and 32.8% in AU. Among a subset who were current vapers-only, current vapers ($n = 6135$) were asked about rules allowing vaping inside the home; 60.4% allowed vaping. In CA, 48.9% of current vapers allowed vaping inside their home, 71.5% in the US, 60.4% in EN and 56.4% in AU. Exclusive vapers were more likely to allow vaping than smoking in the home in all countries, 44.1 versus 19.7% in CA, 76.7 versus 29.6% in the US, 84.2 versus 38.2% in EN and 55.1 versus 18.6% in AU; $P < 0.001$ for all comparisons. Similar results were observed for concurrent users, except in AU (Fig. 1). When asked about the relative harm of SHV compared to SHS, the majority of participants believed that SHV was less harmful compared to SHS; 56.4% in CA, 47.6% in the US, 63.7% in EN and 44.3% in AU (Table 1).

Table 2 shows the demographic and behavioral characteristics associated with allowing cigarette smoking inside their home, presented by odds ratios (OR) and 95% confidence intervals. Factors associated with allowing smoking inside the home included: smoking/vaping status, smoking daily, age, household income, living with a spouse who smokes and living with children aged under 18 years. Daily smokers were more likely to allow smoking in the home compared to non-daily smokers in CA (OR = 2.79, 2.19–3.56), the US (OR = 2.15, 1.48–3.12), EN (OR = 2.63, 2.08–3.33) and AU (OR = 2.41, 1.28–4.53). In the US (OR = 1.96, 1.44–2.67), EN (OR = 1.55, 1.18–2.04) and AU (OR = 2.19, 1.31–3.69), low household income was associated with allowing smoking in the home in the US (OR = 1.96, 1.44–2.67), EN (OR = 1.55, 1.18–2.04) and AU (OR = 2.19, 1.31–3.69). Living with a spouse who smokes was associated with allowing smoking in the home in all countries; OR = 1.67, 1.31–2.14 in CA, OR = 1.55, 1.13–2.12 in the US, OR = 1.69, 1.30–2.20 in EN and OR = 1.66, 1.06–2.60 in AU. Living with children under 18 years of age was associated with not allowing smoking in the home in CA (0.35, 0.28–0.45), EN (OR = 0.38, 0.28–0.51) and AU (OR = 0.40, 0.26–0.61). Belief that SHV is less harmful than SHS was not associated with allowing smoking in the home.

Table 3 shows the demographic and behavioral characteristics of current vapers associated with allowing vaping inside the home, presented by ORs and 95% confidence intervals. Except for AU, belief that SHV is less harmful than SHS was significantly associated with allowing vaping inside the home (OR = 2.86, 2.14–3.83 in CA, OR = 1.82, 1.15–2.88 in the US and OR = 1.68, 1.16–2.44 in EN). Compared to non-daily vapers, daily vapers were more likely to allow vaping inside the home in all countries; OR = 2.95, 2.04–4.26 in CA, OR = 7.00, 4.12–11.87 in the US, OR = 5.50, 3.40–8.88 in EN and OR = 7.78, 1.90–31.80 in AU. Participants living with a spouse who vapes were also more likely to allow vaping in the home; OR = 2.48, 1.54–3.98 in CA, OR = 2.69, 1.42–5.11 in the US, OR = 4.67, 2.74–7.95 in EN and OR = 21.82, 2.16–220.9 in AU. Those living with children aged under 18 years were less likely to allow vaping in the house in CA (OR = 0.50, 0.37–0.68), EN (OR = 0.76, 0.53–1.09) and AU (OR = 0.26, 0.11–0.61).

DISCUSSION

Participants were more likely to allow vaping (60.4%) than smoking in the home (37.4%). Among current vapers (i.e. those who currently vaped at least monthly), one's belief about the dangers of SHV was associated with whether vaping was allowed inside their home. The rules about smoking and vaping in the home were similar in all four countries, although slightly higher among respondents in the US and EN compared to AU and CA. Rules about allowing smoking and/vaping in the home were primarily related to the respondent's smoking/vaping patterns and whether or not they lived with a spouse who smoked/vaped (i.e. more likely to allow smoking/vaping) or had children aged under 18 years (i.e. less likely to allow smoking/vaping). Despite the differences in policies regulating the sales of nicotine-containing VD, the belief that SHV is less harmful than SHS was associated with allowing vaping inside the home but not associated with allowing smoking, suggesting that such beliefs could be mediated through smoking/vaping status.

Table 1 Characteristics of sample by country.

Characteristic	*Canada*	*United States*	*England*	*Australia*	*Total*
	3733	*2733*	*4324*	*1504*	*12 294*
n	*n (weighted%)*	*n (weighted%)*	*n (weighted%)*	*n (weighted%)*	*n (weighted%)*
Smoking allowed in the home					
Yes	1336 (31.7)	1216 (37.8)	1955 (39.6)	598 (32.8)	5105 (37.4)
No	2369 (67.8)	1467 (60.2)	2321 (59.2)	895 (66.2)	7052 (60.9)
Refused	11 (0.2)	19 (1.0)	13 (0.3)	2 (0.1)	45 (0.8)
Don't know	17 (0.3)	31 (1.0)	35 (0.8)	9 (1.0)	92 (0.9)
Vaping allowed in the home*					
Yes	999 (17.0)	1018 (17.6)	1354 (26.5)	225 (7.5)	3596 (18.4)
No	1025 (21.6)	385 (9.4)	857 (15.3)	170 (11.1)	2437 (11.2)
Not asked	1679 (60.8)	1302 (72.0)	2072 (57.5)	1106 (81.3)	6159 (69.5)
Refused	11 (0.2)	8 (0.2)	10 (0.1)	0 (0)	29 (0.2)
Don't know	19 (0.4)	20 (0.8)	31 (0.6)	3 (0.1)	73 (0.7)
SHV compared to SHS is					
less harmful	2208 (56.4)	1496 (47.6)	2676 (63.7)	716 (44.3)	7096 (50.5)
Equally harmful to second-hand smoke	770 (21.5)	588 (23.9)	693 (14.1)	264 (19.8)	2315 (22.1)
More harmful	201 (4.5)	184 (5.3)	219 (4.2)	65 (4.6)	669 (5.1)
Not asked	23 (0.7)	25 (1.5)	27 (0.7)	11 (0.8)	86 (1.3)
Refused	4 (0.1)	7 (0.3)	8 (0.1)	2 (0.1)	21 (0.2)
Don't know	527 (16.9)	433 (21.4)	701 (17.3)	446 (30.4)	2107 (20.9)
Smoking/vaping status					
Concurrent users	1825 (29.5)	1257 (20.2)	2021 (29.1)	348 (14.9)	5451 (21.9)
Exclusive cigarette smokers	1390 (37.6)	1070 (50.4)	1865 (39.6)	991 (58.1)	5316 (48.2)
Exclusive vapers	229 (9.8)	174 (7.8)	231 (13.4)	50 (3.4)	684 (8.5)
Recent former smokers, former vapers	137 (10.4)	119 (12.6)	99 (8.6)	45 (10.4)	400 (11.7)
Recent former smokers, never vapers	152 (12.8)	113 (9.0)	108 (9.3)	70 (13.2)	443 (9.6)
Daily smoking					
Yes	2220 (47.1)	1850 (57.4)	2880 (51.6)	1215 (66.0)	8165 (56.2)
No	1513 (52.9)	883 (42.6)	1444 (48.4)	289 (34.0)	4129 (43.8)
Daily vaping					
Yes	403 (5.7)	605 (8.9)	648 (12.7)	119 (2.8)	1775 (8.9)
No	3330 (94.3)	2128 (91.1)	3676 (87.3)	1385 (97.2)	10 519 (91.1)
Age (years)					
18–24	877 (13.4)	528 (10.6)	924 (15.5)	45 (12.4)	2374 (11.6)
25–39	947 (29.0)	731 (32.1)	1106 (34.0)	290 (37.3)	3074 (32.4)
40–45	1035 (30.6)	476 (28.8)	1130 (26.0)	578 (27.5)	3219 (28.5)
55+	874 (27.0)	998 (28.5)	1164 (24.5)	591 (22.9)	3627 (27.5)
Sex					
Male	1988 (41.7)	1320 (44.8)	1996 (46.7)	732 (44.4)	6258 (55.2)
Female	1745 (58.3)	1413 (55.2)	2328 (53.3)	772 (55.6)	6036 (44.8)
Race					
Non-white	674 (15.5)	598 (21.9)	294 (5.8)	163 (10.3)	1729 (18.5)
White	2999 (83.1)	2124 (77.7)	3944 (92.1)	1338 (89.6)	10 405 (80.8)
Refused	48 (1.2)	11 (0.4)	31 (0.9)	3 (0.1)	93 (0.5)
Don't know	12 (0.2)	0 (0)	53 (1.2)	0 (0)	65 (0.2)
No answer	0 (0)	0 (0)	2 (0.0)	0 (0)	2 (0.0)
Household income					
High	1568 (46.1)	1064 (31.5)	1823 (41.8)	720 (50.3)	5175 (35.0)
Moderate	1052 (26.8)	793 (32.0)	1246 (28.5)	369 (24.5)	3460 (30.8)
Low	827 (19.2)	849 (35.5)	899 (20.4)	306 (17.9)	2881 (31.2)
No answer	286 (7.9)	27 (1.0)	356 (9.3)	109 (7.4)	778 (3.1)
Educational level					
High	966 (25.8)	857 (16.2)	1345 (16.1)	396 (23.7)	3564 (17.2)
Moderate	1647 (45.6)	1019 (35.1)	1725 (63.4)	595 (36.9)	4986 (40.2)
Low	1091 (28.1)	856 (48.7)	1179 (17.7)	498 (38.5)	3624 (42.1)
No answer	29 (0.5)	1 (0.0)	75 (2.8)	15 (1.0)	120 (0.5)

(***Continues***)

Table 1. (Continued)

Characteristic	*Canada*	*United States*	*England*	*Australia*	*Total*
n	*3733* *n (weighted%)*	*2733* *n (weighted%)*	*4324* *n (weighted%)*	*1504* *n (weighted%)*	*12 294* *n (weighted%)*
Lives with a spouse who smokes					
Yes	820 (19.6)	694 (23.4)	889 (20.4)	338 (24.6)	2741 (22.7)
No	2858 (79.5)	1982 (74.1)	3343 (78.0)	1148 (74.1)	9331 (75.1)
Refused	15 (0.3)	24 (1.2)	19 (0.2)	10 (0.8)	68 (1.0)
Don't know	40 (0.6)	33 (1.3)	73 (1.3)	8 (0.5)	154 (1.2)
Lives with a spouse who vapes					
Yes	246 (4.4)	310 (4.8)	308 (7.3)	33 (1.1)	897 (5.0)
No	3423 (94.5)	2354 (91.9)	3914 (91.0)	1445 (96.9)	11 136 (92.2)
Not asked	8 (0.2)	13 (1.0)	16 (0.4)	5 (0.5)	42 (0.8)
Refused	15 (0.3)	22 (1.1)	17 (0.2)	11 (0.9)	65 (0.9)
Don't know	41 (0.7)	34 (1.3)	69 (1.1)	10 (0.6)	154 (1.2)
Lives with children < 18					
Yes	1088 (30.5)	438 (7.7)	1116 (28.6)	437 (35.3)	3079 (13.8)
No	2612 (68.7)	2289 (92.1)	3181 (70.6)	1062 (64.1)	9144 (85.9)
Refused	26 (0.7)	4 (0.1)	19 (0.6)	5 (0.6)	54 (0.2)
Don't know	7 (0.1)	2 (0.0)	8 (0.2)	0 (0)	17 (0.1)

*Asked only of current vapers. SHV = second-hand vapor; SHS = second-hand smoke.

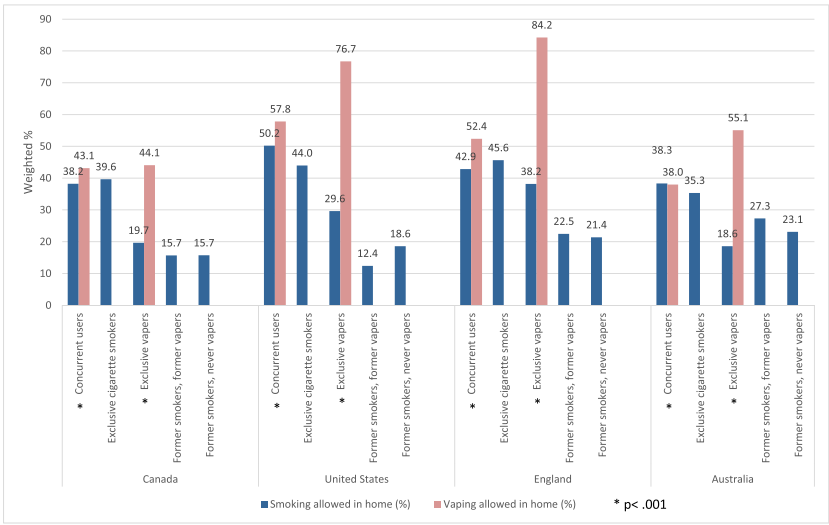

Figure 1 Percentage (weighted) allowing smoking and vaping in the home by smoking/vaping behavior and country [Colour figure can be viewed at wileyonlinelibrary.com]

There are some limitations to the current study. First, these data are cross-sectional, making it impossible to say whether it is vaping that leads to a more favorable belief about the dangers of SHV or vice versa. Secondly, the question on vaping inside the home was only asked of current vapers, so we cannot comment on whether or not non-vapers allow vaping inside their home.

In summary, this is the first study we are aware of that has examined how smoking and vaping in the home relates to the belief about the dangers of SHV compared to SHS. Current smokers mostly allowed smoking inside the home and current vapers mostly allowed vaping. Both concurrent users and exclusive vapers were more likely to allow vaping than smoking inside the home. Not surprisingly, allowing vaping inside the home was correlated with the belief that SHV is less harmful than SHS. In this cross-sectional analysis, it is not possible to know the direction of the relationship between behavior, beliefs and rules; however, this would be possible to determine, as longitudinal data are being collected. In general, the results have a similar pattern across the four countries; individual-level factors, behavioral and demographic characteristics were associated with rules about allowing smoking and vaping inside the home.

Table 2 Adjusted and weighted odds ratios of smoking rules at home by country.

	Smoking allowed at home			
Characteristics	*Canada*	*United States*	*England*	*Australia*
	3340	*2614*	*3752*	*1371*
n	*OR (95% CI)*	*OR (95% CI)*	*OR (95% CI)*	*OR (95% CI)*
SHV is less harmful than SHS				
Yes	0.84 (0.69–1.04)	1.02 (0.79–1.32)	0.85 (0.68–1.06)	0.91 (0.63–1.30)
No	Ref.	Ref.	Ref.	Ref.
Smoking/vaping status				
Concurrent users	Ref.	Ref.	Ref.	Ref.
Exclusive cigarette smokers	**0.77 (0.63–0.96)**	**0.70 (0.53–0.94)**	0.98 (0.80–1.19)	0.63 (0.40–1.01)
Exclusive vapers	0.88 (0.56–1.38)	0.84 (0.41–1.74)	**1.66 (1.04–2.67)**	0.78 (0.21–2.95)
Recent former smokers, former vapers	0.63 (0.36–1.13)	**0.29 (0.13–0.62)**	0.99 (0.49–2.00)	1.13 (0.36–3.60)
Recent former smokers, never vapers	**0.46 (0.27–0.78)**	**0.46 (0.22–0.96)**	0.57 (0.32–1.02)	0.80 (0.28–2.25)
Daily smoking				
Yes	**2.79 (2.19–3.56)**	**2.15 (1.48–3.12)**	**2.63 (2.08–3.33)**	**2.41 (1.28–4.53)**
No	Ref.	Ref.	Ref.	Ref.
Age (years)				
18–24	**0.55 (0.40–0.75)**	0.66 (0.39–1.13)	0.75 (0.52–1.09)	0.62 (0.27–1.42)
25–39	**0.59 (0.44–0.80)**	**0.38 (0.27–0.54)**	**0.67 (0.50–0.89)**	**0.53 (0.33–0.83)**
40–45	0.81 (0.61–1.07)	0.74 (0.54–1.01)	1.13 (0.86–1.47)	1.06 (0.75–1.50)
55+	Ref.	Ref.	Ref.	Ref.
Sex				
Female	Ref.	Ref.	Ref.	Ref.
Male	0.87 (0.72–1.06)	1.15 (0.89–1.50)	1.08 (0.87–1.34)	1.01 (0.71–1.44)
Race				
Non-white	0.84 (0.64–1.11)	1.19 (0.86–1.66)	1.57 (1.00–2.49)	1.08 (0.60–1.97)
White	Ref.	Ref.	Ref.	Ref.
Household income				
High	**0.48 (0.38–0.61)**	0.72 (0.50–1.01)	**0.64 (0.50–0.81)**	0.98 (0.66–1.45)
Moderate	Ref.	Ref.	Ref.	Ref.
Low	1.28 (0.99–1.66)	**1.96 (1.44–2.67)**	**1.55 (1.18–2.04)**	**2.19 (1.31–3.69)**
Educational level				
High	0.94 (0.73–1.22)	0.91 (0.64–1.29)	1.21 (0.92–1.58)	0.95 (0.61–1.48)
Moderate	Ref.	Ref.	Ref.	Ref.
Low	1.17 (0.92–1.47)	1.01 (0.76–1.34)	1.16 (0.93–1.44)	1.07 (0.73–1.58)
Lives with a spouse who smokes				
Yes	**1.67 (1.31–2.14)**	**1.55 (1.13–2.12)**	**1.69 (1.30–2.20)**	**1.66 (1.06–2.60)**
No	Ref.	Ref.	Ref.	Ref.
Lives with children < 18				
Yes	**0.35 (0.28–0.45)**	1.03 (0.66–1.60)	**0.38 (0.28–0.51)**	**0.40 (0.26–0.61)**
No	Ref.	Ref.	Ref.	Ref.

CI = confidence interval; OR = odds ratio; SHV = second-hand vapor; SHS = second-hand smoke.

Declaration of interests

K.M.C. has received payment as a consultant to Pfizer, Inc., for service on an external advisory panel to assess ways to improve smoking cessation delivery in health care settings. K.M.C also has served as paid expert witness in litigation filed against the tobacco industry. G.T.F. has served as an expert witness on behalf of governments in litigation involving the cigarette industry. All other authors have no conflicts of interest to declare.

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Table 3 Adjusted and weighted odds ratios of vaping rules at home among current vapers by country.

	Vaping allowed at home			
Characteristics	*Canada*	*United States*	*England*	*Australia*
n	*1838* OR (95% CI)	*1372* OR (95% CI)	*1951* OR (95% CI)	*372* OR (95% CI)
SHV is less harmful than SHS				
Yes	**2.86 (2.14–3.83)**	**1.82 (1.15–2.88)**	**1.68 (1.16–2.44)**	1.95 (0.73–5.25)
No	Ref.	Ref.	Ref.	Ref.
Smoking/vaping status				
Concurrent users	Ref.	Ref.	Ref.	Ref.
Exclusive vapers	0.99 (0.67–1.48)	1.83 (0.83–4.06)	**2.56 (1.43–4.56)**	0.75 (0.16–3.43)
Daily vaping				
Yes	**2.95 (2.04–4.26)**	**7.00 (4.12–11.87)**	**5.50 (3.40–8.88)**	**7.78 (1.90–31.80)**
No	Ref.	Ref.	Ref.	Ref.
Age (years)				
18–24	**0.53 (0.35–0.82)**	**0.51 (0.27–0.95)**	**0.23 (0.14–0.38)**	0.24 (0.03–1.88)
25–39	0.69 (0.45–1.07)	**0.40 (0.21–0.76)**	**0.39 (0.25–0.59)**	1.48 (0.41–5.33)
40–45	0.79 (0.51–1.21)	1.17 (0.64–2.13)	0.71 (0.46–1.10)	1.57 (0.42–5.91)
55+	Ref.	Ref.	Ref.	Ref.
Sex				
Female	Ref.	Ref.	Ref.	Ref.
Male	**0.76 (0.58–0.99)**	0.83 (0.53–1.31)	0.82 (0.60–1.10)	1.22 (0.53–2.80)
Race				
Non-white	0.93 (0.65–1.32)	**0.54 (0.32–0.90)**	1.90 (1.06–3.41)	1.53 (0.43–5.42)
White	Ref.	Ref.	Ref.	Ref.
Household income				
High	**0.69 (0.50–0.96)**	0.71 (0.40–1.24)	0.76 (0.54–1.08)	0.60 (0.24–1.52)
Moderate	Ref.	Ref.	Ref.	Ref.
Low	**1.46 (1.01–2.11)**	1.31 (0.78–2.18)	1.05 (0.69–1.59)	**2.69 (1.04–6.97)**
Educational level				
High	**0.65 (0.47–0.89)**	1.74 (0.97–3.12)	**0.52 (0.36–0.77)**	1.04 (0.38–2.84)
Moderate	Ref.	Ref.	Ref.	Ref.
Low	0.96 (0.69–1.33)	1.46 (0.91–2.35)	0.82 (0.57–1.18)	0.85 (0.37–1.94)
Lives with a spouse who vapes				
Yes	**2.48 (1.54–3.98)**	**2.69 (1.42–5.11)**	**4.67 (2.74–7.95)**	**21.82 (2.16–220.9)**
No	Ref.	Ref.	Ref.	Ref.
Lives with children < 18				
Yes	**0.50 (0.37–0.68)**	0.89 (0.48–1.65)	0.76 (0.53–1.09)	**0.26 (0.11–0.61)**
No	Ref.	Ref.	Ref.	Ref.

CI = confidence interval; OR = odds ratio; SHV = second-hand vapor; SHS = second-hand smoke.

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Supporting Information

Additional supporting information may be found online in the Supporting Information section at the end of the article.

Table S1 Classification of use by smoking and vaping behavior.