# 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 secondhand vapor (SHV) compared with secondhand smoke (SHS) in four countries: Canada, United States (US), 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 (OR=2.86 in Canada, OR=1.82 in the US, 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 under 18

years old (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, US, 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 secondhand vapor is less harmful than secondhand smoke.

**Key words:** Electronic cigarettes, Vaping, risk perceptions, smoking restrictions

# 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 over the past decade (1). For example, in Great Britain between 2012 and 2015 VD use among adults increased more than four- fold from 700,000 to 2.9 million adults (2). Between 2010 and 2013 in the United States, VD use increased seven-fold 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 cigarettes smoking (4-6). By extension one might also assume that exposure to secondhand vapor (SHV) would pose a lower risk to health compared to exposure to secondhand 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. (2017) 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 restriction 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 18 years old or older (3,733 in CA, 2,733 in the US, 4,324 in EN, and 1,504 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 lifetime and currently smoking cigarettes at least monthly. Former smoking was defined as having smoked at least 100 cigarettes per lifetime 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 supplemental table 1.

# 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 vs 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 years, 25-39 years, 40-54 years, 55+ years), sex (i.e., male vs female), race (i.e., white vs non-white), household income (i.e., low = less than 30000 CAD, moderate = 30000-59999 CAD, and high = 60000 CAD or more for CA; similarly for US and AU in their respective currencies. For EN, low = less than 30000 GBP, moderate = 30000-45999 GBP, and high = 45000 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 9.4 (SAS Institute, Cary, NC). All percentages and measures of association were weighted (19).

# 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% vs 19.7% in CA, 76.7% vs 29.6% in the US, 84.2% vs 38.2% in EN, and 55.1% vs 18.6% in AU; p<.001 for all comparisons. Similar results were observed for concurrent users, except in AU (Figure 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 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 under 18 years of age. 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 odds ratios 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 n 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, 1.42-5.11in 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 under 18 years of age 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 under 18 years of age (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.

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. Second, the question on vaping inside the home was only asked of current vapers, so we can’t comment on whether or not non-vapers allow vaping inside their home or not.

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.

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**Ethics approval:** The survey protocols and all materials, including the survey questionnaires, were cleared for ethics by Institutional Review Board, Medical University of South Carolina; Research Ethics Office, King’s College London, UK; Office of Research Ethics, University of Waterloo, Canada; and Human Research Ethics, Cancer Council Victoria, Australia.

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| **Table 1. Characteristics of sample by country.** |
| **Characteristic** | **Canada** | **United States** | **England** | **Australia** | **Total** |
| **N** | **3733** | **2733** | **4324** | **1504** | **12,294** |
|  | **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, nevervapers | 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 ) | 10519 ( 91.1) |
| **Age** |  |  |  |  |  |
| 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 ) |



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| --- | --- | --- | --- | --- | --- |
| 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 ) | 10405 ( 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 ) |
| **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 ) | 11136 ( 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 |  |  |  |  |



|  |
| --- |
| **Table 2. Adjusted and weighted odds ratios of smoking rules at home by country.** |
| **Smoking allowed at home** |
| **Characteristics** | **Canada** | **United States** | **England** | **Australia** |
| **N** | **3340** | **2614** | **3752** | **1371** |
|  | **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, formervapers | 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, nevervapers | **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** |  |  |  |  |
| 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. |



|  |
| --- |
| **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** | **1372** | **1951** | **372** |
|  | **OR (95% CI)** | **OR (95% CI)** | **OR (95% CI)** | **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** |  |  |  |  |
| 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. |

Figure 1. Percent (weighted) allowing smoking and vaping in the home by smoking/vaping behavior and country.

90

84.2

76.7

80

70

57.8

60

55.1

52.4

50.2

50

45.6

38.3

38.0

44.1

44.0

43.1

38.2

42.9

39.6

38.2

40

35.3

29.6

27.3

30

23.1

22.5

21.4

19.7

18.6

18.6

20

15.7

15.7

12.4

10

0

\*

\*

\*

\*

\*

\*

\*

\*

Canada

United States

England

Australia

Smoking allowed in home (%)

Vaping allowed in home (%)

\* p< .001

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Weighted %

Concurrent users Exclusive cigarette smokers

Exclusive vapers Former smokers, former vapers Former smokers, never vapers

Concurrent users Exclusive cigarette smokers

Exclusive vapers Former smokers, former vapers Former smokers, never vapers

Concurrent users Exclusive cigarette smokers

Exclusive vapers Former smokers, former vapers Former smokers, never vapers

Concurrent users Exclusive cigarette smokers

Exclusive vapers Former smokers, former vapers Former smokers, never vapers