Title: Differences in norms towards the use of nicotine vaping products among adult smokers, former smokers and nicotine vaping product users : Cross-sectional findings from the 2016 ITC Four Country Smoking and Vaping Survey

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ABSTRACT

Aims To examine whether norms towards nicotine vaping product (NVP) use varied between Australia, Canada, England and the United States and by sociodemographics, smoking and NVP status.

Design Cross-sectional data from the 2016 ITC Four Country Smoking and Vaping Survey.

Setting Four countries with distinct regulatory policies relating to the sale and advertising of NVPs: Australia (most restrictive), Canada (restrictive), England and United States (least restrictive).

Participants 10,900 adult (age 18+) current smokers, former smokers, or at least weekly NVP users. Respondents were from Australia (n=1,366), Canada (n=3,309), England (n=3,835) and the United States (n=2,390).

Measurements Questions permitted the categorization of respondents as current smokers, former smokers, NVP users and sociodemographic categories (sex, age, country, ethnicity, income and education). Further questions were asked regarding the frequency of exposure to NVPs in public, whether they had a partner or close friends who vaped and whether they believed society or those considered important to them approved of NVPs.

Findings Adjusting for relevant covariates, compared with Australian respondents, those in England, Canada and United States were more likely to report frequent exposure to NVPs in public (83.1%, 57.3% and 48.3% respectively, compared to 19.8% in Australia; $p<0.0001$), having a partner who vaped (13.8%, 7.1% and 7.7% respectively, compared to 2.1% in Australia; $p<0.0001$) and having close friend(s) who vaped (31.7%, 25.3%, 20.9% respectively, compared to 10.0% in Australia; $p<0.0001$). Compared with Australian respondents, respondents from England were more likely to report that society (27.6% , compared to 12.3% in Australia; $p<0.0001$) and people important to them approved of NVP use (28.9% compared to 14.3% in Australia; $p<0.0001$).

Conclusions Norms towards nicotine vaping product (NVP) use appear to vary among countries with different regulatory contexts regarding sales and advertising.

Key words: norms, nicotine vaping products, adults

BACKGROUND

Nicotine Vaping Products (NVPs) are quickly rising in popularity in many countries, resulting in considerable discussion about how to regulate these products (1,2). On the one hand, some have advocated for the use of NVPs as part of a harm reduction strategy, particularly among adult smokers, given the evidence that NVPs are considerably safer than combustible cigarettes (3,4). In contrast, others have noted the unknown long-term effects of NVPs and raised concerns that NVPs may promote smoking uptake among youth, thus undermining tobacco control efforts that have sought to de-normalize smoking behaviours (5–8).

Various studies to date have examined the role of smoking norms in predicting smoking behaviours (9–14). However, less research has focused on examining social norms towards NVPs. Norms can be conceptually divided into descriptive and injunctive norms (15–17). Descriptive norms refer to beliefs about the prevalence of a behaviour (e.g., perceptions of number of close friends who vape) (15). Injunctive norms refer to beliefs about whether the behaviours are considered acceptable by others (e.g., perceived acceptability of vaping) (15). Recent research has shown that NVPs are viewed as more socially acceptable than cigarettes by youth and young adults (18,19). Specifically, individuals who reported quitting smoking, using NVPs, and believing that vaping was less harmful than cigarette use were more likely to hold positive norms towards NVP use (20).

The NVP regulatory environment is expected to restrict specific behaviours and communicate messages about societal norms towards NVP use, as suggested by the Theory of Triadic Influence (TTI) (21). In this way, the NVP regulatory environment may influence attitudes and subsequent norms towards NVPs (21). However, recent studies examining social norms towards NVPs across different policy environments have yielded mixed findings (20,22). A recent ITC study (International Tobacco Control Survey) using data from 2014 found that adult current and former smokers from England (less restrictive policy environment) were more likely to view NVPs as socially acceptable, compared to their counterparts in Australia (more restrictive NVP policy environment) (20). In contrast, a recent evaluation of adult current smokers in seven European countries found that public approval of NVP use did not align with country-level policies and prevalence rates. (22). Apart from these two studies, no other studies to date have conducted cross-country comparisons to evaluate differences in social norms towards NVPs as a function of varying regulatory contexts.

Currently, the debate around NVPs has resulted in countries adopting distinct regulatory policies. For instance, Canada had very restrictive policies that prevented the sale and marketing of NVPs during the time of the study. Recently, Canada regulated the sale and marketing of NVPs through the Tobacco and Vaping Products Act (TVPA), which included measures to ban the sale of NVPs to minors and restrictions on marketing considered appealing to youth (23). Australia has had very restrictive regulations, which have been more strictly enforced than Canada's regulations (24),

whereby NVPs could not be legally sold and could only be acquired through a doctor's prescription (25). In contrast to Canada and Australia, the United States and England have had fewer regulations on the sale and marketing of NVPs. Within the United States, the sale and advertising of NVPs was permitted through all channels during the time of the study. In England, local advertising of NVPs was permitted through a number of channels including billboards, posters and point-of-sale. Furthermore, under the Tobacco and Related Products Regulations, NVPs were regulated as consumer products and subject to minimum standards to ensure the safety and quality of all NVPs (26).

The objective of this study was to examine if descriptive and injunctive norms towards NVPs differed among current smokers, former smokers and NVP users across Australia, Canada, England and United States. We also examined whether these norms varied by sociodemographics, smoking and NVP status.

METHODS

Sample Design and Participants

The ITC Four Country Smoking and Vaping Survey Wave 1 (4CV1) sample was an expansion of the ITC Four Country (ITC 4C) Survey and involved harmonized data collection in Australia, England, the United States and Canada between July and November 2016 (27,28). The analytic sample consisted of : (1) re-contacted smokers and quitters who participated in the previous wave of the ITC 4C Project; (2) newly recruited current smokers and recent quitters (i.e., quit ≤ 2 years) from country-specific panels, and (3) newly recruited NVP users (at least weekly) from country-specific panels. The sample in each country was designed to be representative of cigarette smokers, former smokers and NVP users. Individuals were recruited via random-digit-dialling (RDD) sampling frames, web-based or address-based panels, or a combination of these frames. Additional details regarding the methods used can be found elsewhere (28). For the current study, all respondents who reported being unaware of NVPs (n=82) , reported being never smokers (n=54) or had missing data for any covariates (described below) were excluded, resulting in an analytic sample of 10,900 individuals.

Outcome Measures

Descriptive Norms

Frequency of exposure to NVP use in public

Participants were asked 'In the last 30 days, how often, if at all, have you seen anyone vaping (using e-cigarettes) in public?' Responses were classified as *frequent exposure* ('every day', 'most days' or 'some days') versus *infrequent exposure* ('rarely' or 'not at all'). Participants who responded don't know (n=191) or refused to answer (n=14) were excluded from analyses.

NVP use amongst friend(s)

Participants were asked (1) 'How many friends or acquaintances do you spend time with on a regular basis?' Depending on the number [X] of friends respondents reported having, they were further asked (2) 'Of the [X] friends or acquaintances that you spend time with on a regular basis, how many of them use e-cigarettes/vaping devices?' Responses were classified as binary responses: *at least one friend* versus *none*, due to the small percentage of participants who reported having more than one friend who used NVPs. Participants who refused to answer (n=80) or responded don't know (n=599) were excluded from analyses.

Partner NVP use

Participants were asked (1) 'Do you currently live with a partner or spouse?' Those who reported having a partner were further asked (2) 'Does your partner or spouse currently use e-cigarettes/vaping devices?' Responses were categorized as binary responses: *Partner uses* versus *partner does not use NVPs*. Participants who responded don't know or refused to answer (n=9) were excluded from analyses.

Injunctive Norms

Perceived societal approval of NVP use

Participants were asked 'What do you think the general public's attitude is towards vaping/ using e-cigarettes?' Responses were classified into three categories: *society approves of NVP use* ('strongly approves' or 'somewhat approves'), *society does not approve of NVP use* ('neither approves or disapproves', 'somewhat disapproves' or 'strongly disapproves'), or *don't know*. Participants who refused to answer (n=14) were excluded from analyses.

Perceived approval of NVP use by those important to the participant

Participants were asked 'What do/would people who are important to you think about you using e-cigarettes/ vaping devices?' Responses were classified into three categories: *approves of NVP use* ('strongly approve' or 'somewhat approve'), *does not approve of NVP use* ('neither approves nor disapproves', 'somewhat disapproves' or 'strongly disapproves'), or *don't know*. Participants who refused to answer (n=30) were excluded from analyses.

Predictors

Sociodemographics

The following sociodemographics were included in analyses: country (Australia, Canada, England or United States), age (18-24, 25-39, 40-54 or 55+), sex (female, male), ethnicity (majority, minority), income (high, medium, low, No information), and education (high, medium, low). Categorization of ethnicity, income and education was consistent with previous ITC manuscripts (29–31).

Smoking and vaping behaviours

Two smoking related variables were included in analyses: smoking status (daily smoker, less than daily smoker, recently quit [quit ≤ 2 years] , long term quitter [quit > 2 years]), and NVP use status (daily use , less than daily use, quit using [at least weekly previous user], tried using [once/occasionally], never used).

ANALYSIS

Descriptive statistics were used to examine the characteristics of respondents within the unweighted and weighted sample. Chi squared (X^2) tests were used to examine whether country samples differed by sociodemographics, smoking and NVP use status.

Three weighted binary logistic regression models were used to examine country differences in: (1) perceived exposure to NVP use in public (frequent vs. non-frequent [reference group]); (2) vaping status of partner [conditional upon having a partner; N=6,106], and (3) vaping status of close friends [conditional upon having at least one close friend; N=9,307].

Two weighted multinomial logistic regression models were used to examine country differences in: (1) societal approval of NVP use (approves vs. disapproves of NVPs [reference group]/ I don't know vs. disapproves of NVPs [reference group]); and (2) approval of NVP use by those important to participant (approves vs. disapproves of NVP use [reference group]/I don't know vs. disapproves of NVPs [reference group]). 'I don't know' was retained as a separate category within these two models due to the large proportion of respondents who chose this response option.

After testing for the main effects in each of the models described above, interactions were tested using the method described by Jaccard (2001) to determine whether the relationship between NVP use status and each of the five norms examined, differed across countries (32).

All models adjusted for sociodemographics, smoking status and NVP use status. Sample weights were constructed based on population-level estimates of NVP and cigarette use derived from national surveys (33). Furthermore, the sampling design was accounted for in all models. All analyses were conducted using SAS 9.4.

RESULTS

Sample Characteristics

Table 1 presents the sociodemographics and smoking/NVP use status of the unweighted sample by country (N=10,900). The findings demonstrated evidence of differences present in

sociodemographics, smoking status and NVP use status between Australia, Canada, England and United States ($p<0.0001$). Supplementary Table 1 presents characteristics of the weighted sample by country ($N=10,900$).

Descriptive Norms

Exposure to NVP use in public

After adjusting for sociodemographics and smoking/NVP use status, respondents from England were more likely to report frequent exposure to NVP use in the last 30 days, compared with respondents in any other country; the most pronounced differences were seen between respondents in England versus Australia (Table 2; $AOR=20.09$, $p<0.0001$). Compared with respondents from Australia and the United States (US), Canadian respondents were more likely to report frequent exposure to NVP use in public; greater differences were reported between Canadian and Australian respondents ($AOR=5.39$, $p<0.0001$). Multivariate models also showed that males, younger respondents and those with a medium/high household income were more likely to report frequent exposure to NVP use in public (Table 2). Compared to never users, those who had any experience using NVPs were more likely to report frequent exposure to NVP use in public.

NVP use among close friend(s)

After adjusting for relevant correlates, respondents in England were more likely to report having at least one friend who used NVPs compared to respondents from any other country; the largest differences were observed between England and Australia (Table 2; $AOR=2.92$, $p<0.0001$). Compared with Australian respondents, Canadian respondents were more likely to report having at least one friend who used NVPs ($AOR=2.30$, $p<0.0001$). Compared with Australian respondents, US respondents were more likely to report having at least one friend who used NVPs ($AOR=1.98$, $p<0.0001$). Multivariate models also showed that younger individuals and those with a medium education (vs. low) were more likely to report having at least one friend who used NVPs. Compared to long-term quitters, less than daily and daily smokers were less likely to report having close friends that used NVPs.

Partner NVP use status

After adjusting for sociodemographics and NVP/smoking status, respondents in England were more likely to report having a partner who used NVPs, compared to any other country; the largest differences observed were between England and Australia (Table 2; $AOR=4.35$, $p<0.0001$). Compared to Australian respondents, Canadian respondents were more likely to report having a partner who used NVPs ($AOR=2.72$, $p=0.005$). Compared to Australian respondents, US respondents were more likely to report having a partner who used NVPs ($AOR=2.44$, $p=0.014$). Multivariate models also indicated that females and those between the age of 25-39 (vs. 55+) were more likely to report having a partner that uses NVPs. Compared to never users, respondents who reported any

level of experience with NVPs were more likely to report having a partner that vaped, with daily vapers having the greatest odds (AOR=36.2 , $p<0.0001$).

Injunctive norms

Perceiving that society approved of NVP use

After adjusting for relevant correlates, respondents in England were more likely to report that society approved of NVP use, compared to any other country; the most pronounced differences were observed between England and Australia (Table 3; AOR=2.10, $p<0.0001$). Compared to Australian respondents, Canadian respondents were more likely to perceive that society approved of NVP use (AOR=1.37, $p=0.04$). Multivariate models also showed that younger respondents and ethnic minorities were more likely to perceive that society approved of NVP use. Respondents with a medium education were less likely to perceive that society approved of NVP use, compared to those with a low education. Compared to never users of NVPs, those who reported daily use, less than daily use or having quit were more likely to perceive that society approved of NVP use.

Percieving that those important to you approve of NVP use

After adjusting for sociodemographics and smoking/NVP use status, respondents in England were more likely to percieve that people important to them approved of NVP use, compared to respondents from any other country. Multivariate models also showed that respondents with a high household income and medium/high education were less likely to perceive that people important to them approved of NVP use. Daily smokers and individuals who reported any previous experience using NVPs were more likely to perceive that people important to them approved of NVP use.

Interactions between NVP use and country

Interactions were tested to examine whether the association between NVP use and the five norms examined differed by country. These analyses adjusted for the multiple comparisons conducted through the use of the Bonferroni correction. No significant interactions were observed between NVP use and country for each of the five norms examined.

DISCUSSION

The results demonstrated systematic differences between respondents in Australia, Canada, United States and England for all five norms examined. Within the study sample, a sequential gradient was observed whereby respondents from England displayed the most positive social norms, followed by Canada and the United States, with Australia displaying the least positive norms. With respect to the descriptive norms examined within our study, the greatest level of cross-country variability was observed in the prevalence of perceived exposure to NVP use in public, which ranged from 20-83%.

In contrast, less pronounced country differences were observed when examining injunctive norms towards NVP use, including perceived approval of NVP use by society and those considered important to the participant.

When examining descriptive norms, respondents from England had over twenty times the odds of reporting frequent exposure to NVP use in public, compared to Australian respondents. These findings are likely due to the greater prevalence of NVP use within England versus Australia(20). Another plausible explanation is that less restrictive regulatory environments may facilitate greater opportunities to use NVPs in public (21). In conjunction with previous work demonstrating that the trial and use of NVPs may be influenced by distinct regulatory contexts (1,2), our findings suggest that NVP regulations may be associated with norms towards NVP use.

With respect to injunctive norms, respondents from England were more likely to report that society approved of NVP use, compared to Australian respondents. However, no differences in the perceived societal approval of NVP use were observed between Australia (more restrictive policy environment) and United States (less restrictive policy environment). Similarly, no differences were reported in perceived approval of NVP use by those considered important to the participant between Australia, US and Canada. These discrepancies may be attributable to other contextual factors, aside from the regulatory environment, influencing norms towards NVP use. When considering the US context, media reporting by dominant US news agencies has generally cast a negative light on NVP use in recent years; this type of messaging may have played a role in shaping perceptions of societal approval of NVP use among US respondents (34–36). This is quite different from the context in England, where public endorsements of NVP use from multiple prominent health organizations has resulted in more consistent and positive messaging around NVPs (37–39); this is likely to have generated positive perceptions of NVP use within England.

Our findings appear to suggest that distinct regulatory environments may have had an influence on levels of uncertainty about the acceptability of NVP use. For instance, Australian respondents were more likely to report not knowing whether society approved of NVP use, compared to respondents from England (30.7% vs. 11.5%). These findings were consistent with prior research demonstrating differences in levels of certainty around the social acceptability of NVP use among respondents from Australia versus England (20,40).The greater level of uncertainty reported by Australian respondents may be the result of relatively lower levels of public engagement within Australia and lower exposure to NVP use , given its highly restrictive NVP regulatory environment (40). This suggests that differences observed may be a consequence of limited access to information , lower levels of NVP awareness and experience. The uncertainty around the social acceptability of NVP use may also be the result of ongoing public discussions about NVPs within various countries.

Our findings showed that individuals that reported having any level of experience with NVPs were consistently more likely to report positive descriptive and injunctive norms towards NVP use,

compared to never users; specifically, a dose-response association was observed between NVP use and all five measures of social norms examined. Extensive research to date has demonstrated the role of social norms in predicting smoking behaviours (9–14). For instance, prior work has demonstrated how shifts in attitudes and public perceptions of smoking within the 1960s ultimately led to declines in smoking behaviour within the United States (12). Our findings appear to suggest that similar social processes may be in effect with respect to NVPs. In other words, observing social cues from a partner, and/or close friends that engage in NVP use may play a role in influencing NVP use. However, given the cross-sectional nature of this study which limits our ability to assess the directionality of these associations, we cannot test this theory. Furthermore, given the limited evidence to date examining the potential influence of social norms towards NVP use on subsequent NVP use, additional longitudinal studies are needed to explore this relationship.

With respect to socio-demographics, younger age groups were more likely to report positive norms towards NVP use. This may be explained by the higher prevalence of NVP use among younger populations (41–43). They may also reflect the greater adoption of new technologies by younger individuals (34). Interestingly, individuals with higher income/education levels were more likely to perceive that those important to them disapproved of NVP use; these findings may reflect differences in social circles among low versus high SES groups. Prior work has shown that low SES groups are more likely to report having a greater number of smoking friends; differences in the composition of social networks among low versus high SES groups may influence injunctive norms towards NVP use (44).

Study strengths and limitations

The strengths of the study included the use of data from four countries with divergent NVP policy environments, thus providing a more definitive evaluation of associations between differing regulatory contexts and norms towards NVP use. Furthermore, the study used data from large nationally representative samples. Our study was also subject to various limitations. First, we relied on cross-sectional data; thus, the directionality of associations examined cannot be established from our study findings. The study also relied on self-reported data which may be subject to social desirability bias, resulting in under-reporting of smoking or NVP use (45). Lastly, the analytic sample did not include never smokers and was solely comprised of smokers and quitters; current smokers have generally been shown to perceive greater social acceptability of NVPs, when compared to non-smokers (46). As such, our findings may not generalize to non-smokers.

CONCLUSION

This study demonstrated variability in norms towards NVP use across Australia, Canada, England and the United States. These findings appear to be largely attributable to differences in the regulatory environment. They may also reflect differences in messaging around NVP use communicated by

public health organizations and media outlets. Moving forward, additional work is needed to assess how distinct norms towards NVP use may influence the subsequent use of NVPs and combustible cigarettes.

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Table 1: Sample characteristics, N=10,900

Variables		Australia ^a , N=1,366 (13%)		Canada ^a , N=3,309 (30%)		England ^a , N=3,835 (35%)		US ^a , N= 2,390 (22%)		p-value ^b
Demographics										
		N	(%)	N	(%)	N	(%)	N	(%)	
Sex	Female	663	48.5	1,761	53.2	1,813	47.3	1,154	48.3	<0.0001
	Male	703	51.5	1,548	46.8	2,022	52.7	1,236	51.7	
Age	18-24	40	2.9	744	22.5	780	20.3	445	18.6	<0.0001
	25-39	257	18.8	834	25.2	941	24.5	630	26.4	
	40-54	526	38.5	925	28.0	1,038	27.1	421	17.6	
	55+	543	39.8	806	24.3	1,076	28.1	894	37.4	
Ethnicity	Majority	1,228	89.9	2,730	82.5	3,586	93.6	1,904	79.7	<0.0001
	Minority	138	10.1	579	17.5	247	6.4	486	20.3	
Income	Low	276	20.2	710	21.4	783	20.4	723	30.3	<0.0001
	Medium	337	24.7	932	28.2	1,126	29.4	703	29.4	
	High	663	48.5	1,443	43.6	1,635	42.6	942	39.4	
	Missing Information	90	6.6	224	6.8	291	7.6	22	0.9	
Education	Low	457	33.5	942	28.5	1,091	28.5	740	31.0	<0.0001
	Medium	548	40.1	1,502	45.4	1,559	40.7	890	37.2	
	High	361	26.4	865	26.1	1,185	30.9	760	31.8	
Participant Smoking & NVP Status										
Smoking Status	Daily use	1,096	80.2	1,992	60.2	2,553	66.6	1,637	68.5	<0.0001
	Less than daily use	116	8.5	874	26.4	882	23.0	395	16.5	
	Recently Quit	141	10.3	343	10.4	312	8.1	202	8.5	

	Long Term Quit	13	1.0	100	3.0	88	2.3	156	6.5	
NVP use status	Daily use	109	8.0	341	10.3	550	14.3	523	21.8	<0.0001
	Less than daily use	246	18.0	1447	43.7	1,414	36.9	713	29.8	
	Quit using	149	10.9	249	7.5	403	10.5	272	11.4	
	Previously Tried	179	13.1	321	9.7	389	10.1	307	12.9	
	Never used	683	50.0	951	28.8	1,097	28.2	575	24.1	
^a Percentages are based on unweighted data.										
^b p-values based on Chi-squared tests.										

Table 2: Logistic regression assessing correlates of frequency of exposure to NVP use in public in last 30 days, NVP use among close friend(s) and partner use of NVPs

		Frequent exposure to NVP use in public (N=10,900)			NVP use among close friend(s) (N=9,307) ^a			Partner uses NVPs (N=6,106) ^b		
		%	AOR (95% CI)	p-value	%	AOR (95% CI)	p-value	%	AOR (95% CI)	p-value
Country	Australia	19.8	Ref.	--	10.0	Ref.	--	2.1	Ref.	--
	Canada	57.3	5.39 (4.20– 6.92)	<0.0001	25.3	2.30 (1.67- 3.15)	<0.0001	7.1	2.72 (1.36-5.42)	0.005
	England	83.1	20.09 (15.47 – 26.12)	<0.0001	31.7	2.92 (2.13- 4.00)	<0.0001	13.8	4.35 (2.19-8.62)	<0.0001
	United States	48.3	4.04 (3.09 – 5.27)	<0.0001	20.9	1.98 (1.41-2.78)	<0.0001	7.7	2.44 (1.19-4.98)	0.014
Sex	Female	43.1	Ref.	--	22.8	Ref.	--	10.7	Ref.	--
	Male	56.9	1.37 (1.20 – 1.57)	<0.0001	22.1	1.14 (0.98- 1.32)	0.086	6.1	0.52 (0.39-0.69)	<0.0001
Age	55+	39.1	Ref.	--	16.9	Ref.	--	5.4	Ref.	--
	40-54	52.7	1.74 (1.49-2.03)	<0.0001	22.6	1.33 (1.09-1.66)	0.006	6.8	1.36 (0.94-1.99)	0.106
	25-39	59.9	2.12 (1.83-2.59)	<0.0001	25.7	1.45 (1.19-1.77)	0.0002	9.1	1.50 (1.05-2.14)	0.024
	18-24	68.0	2.45 (1.92-3.12)	<0.0001	26.7	1.31 (1.03-1.66)	0.026	17.9	1.35 (0.87-2.09)	0.188
Ethnicity	Majority	53.5	Ref.	--	22.7	Ref.	--	8.6	Ref.	--
	Minority	49.7	1.00 (0.82- 1.23)	0.950	21.1	1.02 (0.82-1.28)	0.83	6.1	1.26 (0.83-1.91)	0.278
Income	Low	46.4	Ref.	--	21.2	Ref.	--	10.5	Ref.	--
	Medium	51.9	1.25 (1.04-1.51)	0.014	19.7	0.98 (0.79-1.21)	0.858	6.4	0.79 (0.49-1.27)	0.324

	High	58.9	1.49 (1.24-1.78)	<0.0001	25.8	0.96 (0.79-1.18)	0.716	8.4	0.71 (0.43-1.16)	0.167
	No Answer	54.9	1.12 (0.82-1.52)	0.474	19.0	0.70 (0.47-1.04)	0.08	8.2	0.85 (0.39-1.84)	0.685
Education	Low	46.1	Ref.	--	17.5	Ref.	--	6.7	Ref.	--
	Medium	57.7	1.07 (0.92-1.25)	0.373	27.0	1.25 (1.05-1.48)	0.014	9.0	1.21 (0.88-1.66)	0.249
	High	57.9	1.11 (0.91-1.35)	0.290	22.7	1.16 (0.94-1.42)	0.163	10.3	0.98 (0.67-1.44)	0.927
Smoking Status	Long term Quit	52.7	Ref.	--	31.0	Ref.	--	8.6	Ref.	--
	Recently quit	54.0	0.94 (0.66-1.34)	0.727	23.5	0.70 (0.47-1.04)	0.079	10.8	1.16 (0.63-2.13)	0.635
	Less than daily use	61.6	1.21 (0.86-1.70)	0.277	26.9	0.67 (0.46-0.98)	0.037	10.6	1.13 (0.62-2.06)	0.679
	Daily use	50.3	1.00 (0.73-1.38)	0.986	19.6	0.60 (0.42-0.86)	0.005	6.5	0.99 (0.56-1.73)	0.959
NVP use status	Never used	39.0	Ref.	--	10.4	Ref.	--	1.1	Ref.	--
	Previously tried	46.9	1.46 (1.19-1.79)	0.0003	16.9	1.62 (1.23-2.12)	0.0005	6.3	4.60 (2.46-8.61)	<0.0001
	Quit using	54.2	1.89 (1.52-2.37)	<0.0001	18.8	1.47 (1.09-1.98)	0.011	2.7	4.09 (2.07-8.06)	<0.0001
	Less than daily user	70.2	2.54 (2.15-3.00)	<0.0001	38.6	4.17 (3.44-5.05)	<0.0001	11.9	8.79 (5.28-14.65)	<0.0001
	Daily user	76.0	4.39 (3.29-5.85)	<0.0001	48.6	5.80 (4.43-7.60)	<0.0001	37.9	36.2 (20.1-65.0)	<0.0001
<p>*Note: Data are weighted; Bolded estimates are significant at p<0.05; AOR, Odds Ratios adjusted for country, sex, age, ethnicity, income, education, smoking status and NVP status.</p> <p>^a This analysis excluded individuals who reported having no close friends, 'don't know' or refused to answer (N=1593), resulting in a sample of 9,307 individuals.</p> <p>^b This analysis excluded individuals who reported not having a partner (N=4,796), resulting in a final sample of 6,106 individuals.</p>										

Table 3: Logistic regression assessing correlates of societal approval of NVP use , N=10,900

		Perception of societal approval of NVP use (%)			Society approves of NVP use vs. Society does not approve		I don't know vs. Society does not approve ^a	
		Society approves	Society does not approve	Don't Know ^a	AOR (95% CI)	p-value	AOR (95% CI)	p-value
Country	Australia	12.3	56.9	30.7	Ref.	--	Ref	--
	Canada	19.5	67.2	13.4	1.37 (1.02-1.84)	0.038	0.41 (0.33-0.51)	<0.0001
	England	27.6	60.9	11.5	2.10 (1.57-2.82)	<0.0001	0.43 (0.34-0.54)	<0.0001
	United States	17.7	64.9	17.4	1.14 (0.83-1.56)	0.417	0.48 (0.38-0.62)	<0.0001
Sex	Female	20.3	62.7	17.9	Ref.	--	Ref	--
	Male	18.0	65.2	16.8	0.93 (0.81-1.08)	0.349	0.85 (0.72-0.99)	0.043
Age	55+	13.3	63.3	23.4	Ref.	--	Ref	--
	40-54	17.2	63.9	18.9	1.31 (1.10-1.57)	0.003	0.94 (0.78-1.12)	0.471
	25-39	21.7	65.9	12.4	1.59 (1.32-1.92)	<0.0001	0.69 (0.55-0.86)	0.001
	18-24	31.3	61.0	7.7	1.80 (1.43-2.26)	<0.0001	0.34 (0.23-0.51)	<0.0001
Ethnicity	Majority	18.1	65.1	16.8	Ref.	--	Ref	--
	Minority	23.3	59.2	17.5	1.46 (1.18-1.80)	0.0004	1.42 (1.08-1.88)	0.013
Income	Low	21.6	59.1	19.3	Ref.	--	Ref	--
	Medium	16.2	67.1	16.7	0.96 (0.80-1.17)	0.737	0.90 (0.72-1.13)	0.365
	High	19.5	66.0	14.5	0.89 (0.74-1.08)	0.086	0.74 (0.59-0.92)	0.009
	No Answer	17.8	59.5	22.7	0.62 (0.44-0.89)	0.009	1.31 (0.93-1.84)	0.128

Education	Low	18.5	59.7	21.8	Ref.	--	Ref	--
	Medium	18.6	66.7	14.7	0.81 (0.69-0.95)	0.013	0.79 (0.66-0.94)	0.008
	High	21.5	68.4	10.1	0.84 (0.69-1.02)	0.085	0.68 (0.54-0.85)	0.0008
Smoking Status	Long Term Quit	15.4	75.6	9.0	Ref.	--	Ref	--
	Recently Quit	14.6	71.0	14.3	1.33 (0.90-1.97)	0.149	0.94 (0.57-1.54)	0.806
	Less than daily use	21.5	64.2	14.3	1.43 (0.98-2.09)	0.065	1.05 (0.65-1.70)	0.832
	Daily use	20.7	59.7	19.6	1.92 (1.35-2.75)	0.0003	1.42 (0.91-2.21)	0.124
NVP use status	Never used	11.9	61.3	26.8	Ref.	--	Ref	--
	Previously tried	15.2	69.1	15.7	1.06 (0.82-1.37)	0.656	0.60 (0.46-0.76)	<0.0001
	Quit using	18.8	67.1	14.1	1.38 (1.07-1.77)	0.014	0.53 (0.40-0.69)	<0.0001
	Less than daily use	27.7	64.4	7.9	1.51 (1.27-1.80)	<0.0001	0.38 (0.31-0.47)	<0.0001
	Daily user	35.1	57.0	7.9	2.55 (1.99-3.25)	<0.0001	0.32 (0.21-0.49)	<0.0001
<p>Note: Data are weighted; Bolded estimates are significant at p<0.05; AOR, Odds Ratios adjusted for country, sex, age, ethnicity, income, education, smoking status and NVP status;</p> <p>^a I don't know was retained as a separate category within this model, given the high proportion of individuals that chose this response option.</p>								

Table 4: Logistic regression assessing correlates of perceptions of approval of NVP use among people important to you, N=10,900

		Approval of NVP use among people 'important to you' (%)			People important to you approve vs. People important to you don't approve		'I don't know' vs. People important to you don't approve ^a	
		Approve of NVP use	Do not approve of NVP use	Don't know ^a	AOR (95% CI)	p-value	AOR (95% CI)	p-value
Country	Australia	14.3	46.3	39.4	Ref.	--	Ref.	--
	Canada	18.1	58.4	23.5	0.97 (0.74-1.27)	0.838	0.55 (0.44-0.69)	<0.0001
	England	28.9	46.0	25.1	1.77 (1.36-2.31)	<0.0001	0.81 (0.61-1.09)	0.06
	United States	18.0	52.7	29.3	0.81 (0.61-1.01)	0.168	0.69 (0.54-0.88)	0.003
Sex	Female	19.0	51.8	29.2	Ref.	--	Ref.	--
	Male	19.8	51.8	28.4	0.97 (0.83-1.12)	0.659	0.89 (0.77-1.01)	0.08
Age	55+	16.5	44.2	39.3	Ref.	--	Ref.	--
	40-54	21.0	47.2	31.8	0.97 (0.81-1.16)	0.746	0.77 (0.66-0.91)	0.002
	25-39	18.4	59.7	21.9	0.84 (0.69-1.02)	0.075	0.54 (0.45-0.65)	<0.0001
	18-24	26.3	59.9	13.8	0.78 (0.61-1.00)	0.04	0.35 (0.27-0.45)	<0.0001
Ethnicity	Majority	19.6	50.7	29.7	Ref.	--	Ref.	--
	Minority	18.5	57.0	24.5	1.07 (0.84-1.36)	0.595	0.87 (0.70-1.08)	0.205
Income	Low	21.3	46.4	32.3	Ref.	--	Ref.	--
	Medium	17.6	53.5	28.9	0.87 (0.71-1.07)	0.191	0.83 (0.68-1.00)	0.052

	High	19.4	54.9	25.7	0.73 (0.60-0.90)	0.003	0.78 (0.64-0.95)	0.009
	No Answer	21.1	50.2	28.7	0.72 (0.5-1.04)	0.08	1.11 (0.81-1.52)	0.508
Education	Low	20.7	46.7	32.6	Ref.	--	Ref.	--
	Medium	18.1	55.1	26.8	0.68 (0.57-0.80)	<0.0001	0.82 (0.70-0.96)	0.011
	High	19.5	56.3	24.2	0.68 (0.56-0.84)	0.0003	0.78 (0.64-0.95)	0.015
Smoking Status	Long Term Quit	22.9	60.6	16.5	Ref.	--	Ref.	--
	Recently Quit	15.2	60.9	23.9	1.13 (0.77-1.66)	0.522	1.36 (0.86-2.14)	0.191
	Less than daily use	15.2	63.4	21.4	0.95 (0.65-1.38)	0.781	1.77 (1.14-2.75)	0.01
	Daily use	21.6	44.2	34.2	2.06 (1.45-2.92)	<0.0001	2.66 (1.75-4.04)	<0.0001
NVP use status	Never used	8.7	48.9	42.4	Ref.	--	Ref.	--
	Previously tried	13.8	59.6	26.6	1.40 (1.07-1.82)	0.014	0.69 (0.56-0.86)	0.0008
	Quit using	19.0	52.9	28.1	2.19 (1.69-2.86)	<0.0001	0.65 (0.52-0.81)	0.0001
	Less than daily use	26.2	55.2	18.6	2.29 (1.88-2.78)	<0.0001	0.47 (0.40-0.56)	<0.0001
	Daily use	59.4	34.2	6.4	9.59 (7.39-12.5)	<0.0001	0.18 (0.12-0.27)	<0.0001

Note: Data are weighted; Bolded estimates are significant at p<0.05; AOR, Odds Ratios adjusted for country, sex, age, ethnicity, income, education, smoking status and NVP status.

^a I don't know was retained as a separate category within this model, given the high proportion of individuals that chose this response option.

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