

Are Australian smokers interested in using low-nitrosamine smokeless tobacco for harm reduction?

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ABSTRACT

Aims To determine (1) whether Australian smokers are aware of low-nitrosamine smokeless tobacco (LNSLT) products and (2) whether they would be interested in using LNSLT either as a long-term substitute for smoking or as an aid to quitting, if these products were to become legally available.

Methods 401 daily smokers were recruited by a market research company to complete an internet questionnaire about their smoking history, knowledge of smokeless tobacco and intentions to purchase LNSLT under different scenarios.

Findings Just under half (48%) indicated they were willing to buy an LNSLT product. Predictors of an interest in purchasing LNSLT were low income, poorer health, prior SLT use, belief that SLT is less harmful than cigarettes, switching to a lower tar cigarette in the past year, ever using nicotine replacement therapy products for quitting or other reasons, having made a failed cessation attempt in the previous year and not planning to quit smoking. Analysis of quitting and LNSLT purchasing intentions under different scenarios suggest that making LNSLT available at a much lower cost than smoked cigarettes while increasing taxes on cigarettes could provide a greater reduction in the number of smokers than the same tax increase alone. These results support further examination of the potential for LNSLT to reduce smoking-related harm in Australia.

There is good evidence, based largely on evaluation of Swedish snus, that low-nitrosamine smokeless tobacco (LNSLT) products have fewer adverse health consequences than cigarette smoking.¹ Although large-scale clinical trials of LNSLT as a cessation aid are needed, there is compelling epidemiological evidence that increased LNSLT use in the form of snus among Swedish men has contributed to their low rates of smoking and tobacco-related disease.² Oral moist Swedish snus is manufactured in such a way to produce low levels of tobacco-specific nitrosamines, the major carcinogens responsible for oral cancers among SLT users in the USA and South Asia.^{3 4}

Traditionally prepared SLT products considerably increase the risk of oral and pancreatic cancers,³⁻⁵ but these risks are larger than those of LNSLT products such as snus and newer products (eg, Ariva) manufactured to contain low levels of carcinogenic tobacco-specific nitrosamines.⁴ Studies in Sweden where men have used snus for two decades have by and large shown no increase in the residual risks of cardiovascular disease or oral cancers.² An elevated risk of pancreatic cancer has

been reported in snus users compared with never tobacco users in some studies, but this risk is lower than that of smoking.^{6 7}

In Sweden, the increased use of snus for the past 20 years has coincided with significant declines in smoking and tobacco-related mortality among Swedish men.² Many former smokers in Sweden have quit smoking tobacco by using snus,^{8 9} suggesting that it increases smoking cessation while also providing a long-term alternative to cigarettes. Although pharmaceutical nicotine can also be used for these purposes, SLT products such as snus may be more attractive to some inveterate smokers because their nicotine delivery is similar to that of smoking.¹⁰

Opponents of LNSLT use argue that any health gains for the individual smoker who switches to LNSLT will be outweighed by its adverse effects on the health of the population. These products, they argue, could discourage smokers from quitting and persuade former smokers to recommence tobacco use. They could also increase smoking if substantial proportions of adolescent users of these products went on to smoke cigarettes.^{11 12}

Epidemiological modelling suggests there are only small differences in life expectancy and mortality rates between smokers who quit and smokers who switch to LNSLT. These products would substantially reduce tobacco-related mortality and morbidity among smokers who switched to using them.¹³

Proposals that existing bans on the sale of LNSLT in Australia should be lifted¹ have been criticised on the grounds that Australian smokers will not be interested in using LNSLT products in the absence of a history of traditional use in Australia. The purpose of the current study was to determine (1) whether Australian smokers are aware of these products and (2) whether they would be interested in using LNSLT either as a long-term substitute for smoking or as an aid to quit smoking cigarettes, if these products were legally available for sale in Australia.

METHODS

Respondents

A sample of 401 daily smokers aged 20 years or older was recruited by a market research company (Roy Morgan Research). The company recontacted participants in earlier market research via email if they (1) smoked cigarettes and (2) were prepared to participate in further research. Respondents completed an internet-based questionnaire until a target of 400 respondents was reached.

Measures

The survey asked participants about their smoking behaviour, previous quit attempts, current interest in quitting, knowledge of smokeless tobacco and nicotine replacement products and intentions to use LNSLT if these products were available in Australia.

Demographics

Age was measured in 5-year age bands and grouped into four categories (20–29, 30–39, 40–49, 50+). Education level was grouped into low (high school certificate or less), middle (trade certificate, technical/commercial college or some university) and high (university degree, including postgraduate). The annual income of the household's main income earner was grouped into the categories of <\$30 000, \$30 000–\$59 999 and \$60 000+. Respondents were asked to rank their current health as "excellent," "very good," "good," "fair" or "poor."

Smoking and quitting behaviour

Respondents were asked about (1) cigarettes smoked per day, time to first cigarette, amount spent on cigarettes and age started smoking; (2) their interest in quitting within 30 days, after 30 days but within 3 months, after 3 months or not planning to quit; (3) any quitting assistance used in the last 12 months (eg, rung the quitline, used nicotine replacement therapy (NRT), etc) and changes in smoking in last 12 months (eg, quit for a month or more, unsuccessful quit attempt, reduced the amount smoked, etc); and (4) their knowledge and lifetime use of NRT (including their reasons for using NRT).

A heaviness-of-smoking index was calculated from the sum of the scores for cigarettes per day (0 for 0–10, 1 for 11–20, 2 for 21–30 and 3 for >30) and time to first cigarette (0 for >60 min, 1 for 31–60 min, 2 for 6–30 min and 3 for ≤5 min).¹⁴

Response to cigarette price increase

Respondents were asked to choose their most likely response from the following to a 50% increase in the price of cigarettes:

1. Continue smoking the same cigarettes and amount as currently
2. Try to reduce the amount smoked
3. Try to switch to a cheaper brand of cigarettes
4. Try to quit smoking

This question was repeated for a 100% price increase on cigarettes.

Smokeless tobacco knowledge and use

Respondents were asked about their awareness of and any use of SLT. They were asked to select whether they thought SLT products were "a lot more," "a little more," "about equally," "a little less" or "a lot less" harmful than cigarettes. We then provided photos and brief individual descriptions of three LNSLT products (portion snus, Ariva dissolvable tobacco lozenges and Oliver Twist chewing tobacco bits). We gave participants the following information about their harmfulness compared with cigarettes.

"The following three products all contain nicotine, like cigarettes. However, they are not smoked. All of the products are placed in the mouth between gum and cheek. None of these products cause the user to spit. They do not produce passive smoke. All of these products are a lot less harmful than cigarettes as determined by the Royal College of Physicians (for further details see <http://www.rcplondon.ac.uk/pubs/brochure.aspx?e=234>)."

Respondents were then asked (1) if they were interested in purchasing one or more of the LNSLT products, (2) how much

they were willing to pay for an amount of LNSLT equivalent to 20 cigarettes and (3) how they would intend to use it ("as a complete long-term substitute for cigarettes," "as a short-term substitute for cigarettes when I cannot smoke and continue smoking when I can," "to help me quit smoking" or "to help me cut down on the number of cigarettes I smoke").

Respondents were asked to choose their most likely response from the following to a 50% increase in the price of cigarettes if an equivalent quantity of the three LNSLT products was available for half the price of cigarettes:

1. Continue smoking the same cigarettes and amount as currently
2. Try to reduce the amount smoked
3. Try to switch to a cheaper brand of cigarettes
4. Try to quit smoking
5. Try to switch to one of the LNSLT products

This question was repeated for a 100% price increase on cigarettes.

Analyses

We report prevalence percentages weighted to the Australian smoker population using the 2007 National Drug Strategy Household Survey (NDSHS) on age, sex and residential state. Counts are presented unweighted. Factors that were likely to be associated with willingness to purchase LNSLT were selected a priori and examined bivariately using logistic regression. Factors that were associated with the outcome variable in bivariate analyses were included in a multivariable logistic regression model along with demographic factors as potential confounders. The factors included in the multivariable regression model were sex, age, household main income, education, general health, intentions to quit smoking, heaviness-of-smoking index, perception of relative harm of SLT compared with that of cigarettes, prior use of SLT, prior use of NRT products, done something to help quit smoking in the last 12 months and changed or attempted to change to low tar cigarettes in the last 12 months. All factors were entered into the regression model simultaneously. The bivariate and multivariable analyses were performed on unweighted data.

We calculated the difference in predicted tobacco use under the hypothetical scenarios of cigarette price increases (50% and 100%) when (1) LNSLT is not available for purchase (current policy) and (2) if LNSLT could be purchased for half the price of cigarettes. McNemar test was used to test statistical significance of these differences. All analyses were performed in SPSS v.17.

RESULTS

Sample

There were some slight differences between smokers in the sample and in the 2007 NDSHS. Men (42% vs 54%) and younger smokers (16% vs 22%) were under-represented in the sample. Smokers in the sample reported similar personal and household incomes to those in the NDSHS except there were slightly more smokers in the highest household income group (\$100 000+ per annum) in the current sample (26% vs 18%). Respondents in the current survey also smoked more cigarettes per day than smokers in the 2007 NDSHS (mean (SD) 19.7 (10.9) vs 16.3 (12.4)). Nine per cent (95% confidence interval (CI) 6% to 12%) of our respondents reported use of SLT compared with 5% (95% CI 4% to 6%) of smokers in the 2007 NDSHS.

SLT knowledge and use

Sixty-nine per cent of the smokers (n=268) had heard of SLT, and 13% of these smokers (9% overall) had used SLT previously.

None were current users, and only five had used SLT in the past year.

Willingness to buy LNSLT

Forty-eight per cent of the smokers ($n=184$) said they were willing to buy an LNSLT product. Tobacco lozenges were the most popular choice (79% were willing to buy and 74% preferred; table 1). Overall, 53% of the respondents were willing to pay the same price as a pack of 20 cigarettes (\$A8–11)¹⁵ for an equivalent quantity of LNSLT, 28% would pay less, and 20% would pay more.

Predictors of willingness to buy LNSLT

The only sociodemographic variables related to willingness to purchase LNSLT in bivariate analyses were low income and poorer health (see table 2). Only low income was statistically significant. Those interested in purchasing LNSLT were more likely to have no plans to quit smoking but were more likely to have tried and failed to quit in the previous year. They were also more likely to have switched to a lower tar cigarette in the past year and to have used NRT products for quitting and for non-cessation reasons. Unsurprisingly, they were more likely to have used SLT and more likely to believe it was less harmful than smoking.

Effect of LNSLT availability on quitting intentions

Forty-two per cent of the smokers who had plans to quit were interested in purchasing LNSLT (table 2). Most of these (74% of those who would buy LNSLT and 32% of all smokers who planned to quit) said that they would use LNSLT as a quitting aid, rather than as a long-term substitute for cigarettes, a short-term substitute or to cut down the number of cigarettes (table 3). A similar proportion (31%) of those without plans to quit indicated that if they could purchase LNSLT in Australia, they would use it to quit smoking (table 3).

Responses to the four hypothetical scenarios of price and availability of LNSLT suggested that allowing LNSLT to be sold at a lower price than cigarettes produced a greater reduction in the number of smokers who believed they would continue smoking than an increase in the price of cigarettes alone (see table 4). The net effect of LNSLT on predicted behaviour was similar for both a 50% and 100% price increase. The difference in net effect under the two price increases was only significant for self-predicted quitting (McNemar–Bowker test, $p=0.011$). Overall, there was only a small decrease in the percentage who predicted they would quit if LNSLT was available for purchase (table 4). The smallest reduction in self-predicted continued smoking occurred among those who were unlikely to purchase LNSLT (table 5).

Table 1 Preferences among those reporting a willingness to buy SLT ($n=184$)

	Portion Snus	Lozenges	Chewing bits*	Any LNSLT*
Willing to buy†	13%	79%	37%	100%
Preferred product %	5%	74%	21%	—
Price for preferred product \$				
N	12	130	41	183
Price willing to pay, mean (SD)	\$9.33 (3.06)	\$9.52 (3.62)	\$9.41 (4.83)	\$9.49 (3.87)
Median price	\$10	\$10	\$8	\$10
Range	\$4–\$15	\$2–\$25	\$2–\$25	\$2–\$25

*One outlier (\$40) removed.

†Respondents could select more than one product.

Self-predicted quitting decreased among those who were likely to purchase LNSLT (table 5). Unsurprisingly, the largest effects of LNSLT on self-predicted smoking, quitting and switching were among those who were likely to purchase LNSLT (table 5). Although self-predicted quitting in response to cigarette price increases decreased substantially among those who were likely to purchase LNSLT (–21% for 50% price increase and –14% for 100% price increase), there was a greater reduction in self-predicted smoking in this group (–24% for 50% price increase and –36% for 100% price increase). Furthermore, switching to LNSLT seems to be seen as a step towards quitting for some of these smokers because most (65% of those who would switch to LNSLT in response to a 50% cigarette price increase and 59% of those who indicated they would switch in response to 100% cigarette price increase) said that they would use LNSLT to quit rather than as a long-term substitute for smoking or for dual use.

DISCUSSION

Around half of current smokers in our sample expressed an interest in trying LNSLT after being briefly informed about its lower harm profile than that of cigarettes. Two other studies on smokers' interest in switching to less harmful tobacco products have reported conflicting results. Heavner *et al*¹⁶ reported that 75% of a convenience sample of smokers recruited from an outdoor area in Edmonton, Alberta (Canada), were interested in switching to a less harmful tobacco product. These results are likely to overestimate smokers' interest in LNSLT, as their survey described a hypothetical less harmful tobacco product but did not include information on how the product was to be used. In contrast, Timberlake¹⁷ reported that only 13% of daily smokers who completed the California Tobacco Survey indicated they would 'definitely' or 'probably' replace their cigarettes with SLT if they thought it had fewer health consequences. Timberlake's results are more consistent with our findings because only 3.5% of our sample said that they were interested in switching to LNSLT as a complete long-term substitute and a further 11% were interested in using LNSLT to replace some of their cigarettes.

On average, those smokers in our sample who were willing to purchase LNSLT were less interested in quitting, unhealthier and generally more economically disadvantaged. They were also more likely to have tried switching to so-called Lights that many smokers still believe to be less harmful.¹³ They were also more likely to have a history of recent quit attempts. This suggests LNSLT may be an option that is attractive to those who feel that they are unable to quit but are still concerned about the adverse health effects of smoking. Consistent with this is the finding that most smokers (regardless of their current interest in quitting) expressed a preference for using LNSLT to quit rather than as a long-term substitute for smoking or as a means of reducing cigarette consumption. Having attempted (and failed) to quit smoking and poorer self-rated health were also associated with an interest in switching to LNSLT in Timberlake's study.¹⁷

Prior knowledge and use of SLT

Awareness of SLT was relatively high among these Australian smokers, but few of them were aware that some forms of SLT are much less harmful than smoking tobacco. Similar results were reported from the International Tobacco Control-4 survey,¹⁸ which included Australian smokers. Those smokers who were aware that SLT was less harmful than smoking were more likely to report having used SLT in the past and were more willing to purchase one of the three products described in the survey. If LNSLT is to be used for harm reduction in Australia,

Table 2 Factors associated with willingness to purchase LNSLT

	Total N = 401	Would buy LNSLT	Crude OR* (95% CI)	Adjusted OR† (95% CI)
Sex				
Female	233	44%	1.00	1.00
Male	168	49%	1.23 (0.82 to 1.82)	1.22 (0.77 to 1.92)
Age, yr				
20–29	63	49%	1.00	1.00
30–39	83	43%	0.79 (0.41 to 1.53)	0.85 (0.40 to 1.81)
40–49	131	47%	0.90 (0.49 to 1.64)	0.92 (0.46 to 1.85)
50+	124	45%	0.85 (0.46 to 1.56)	0.80 (0.41 to 1.57)
Education <university degree	327	45%	1.00	1.00
University degree	74	50%	1.22 (0.74 to 2.03)	1.57 (0.89 to 2.78)
Income				
≥\$30 000	281	42%	1.00	1.00
<\$30 000	120	55%	1.69 (1.10 to 2.60)	1.96 (1.18 to 3.24)
General health				
Good—excellent	290	43%	1.00	1.00
Fair—poor	110	54%	1.53 (0.98 to 2.37)	1.47 (0.90 to 2.40)
Heaviness-of-smoking index				
Low	74	37%	1.00	1.00
Medium	263	46%	1.51 (0.89 to 2.56)	1.11 (0.60 to 2.03)
High	64	55%	2.10 (1.06 to 4.16)	1.24 (0.56 to 2.74)
Plans to quit smoking				
Yes	239	42%	1.00	1.00
No	162	52%	1.50 (1.00 to 2.24)	1.97 (1.22 to 3.18)
Believe SLT is less harmful than cigarettes				
No	327	43%	1.00	1.00
Yes	74	59%	1.96 (1.17 to 3.27)	1.94 (1.07 to 3.52)
Have used SLT previously				
No	367	43%	1.00	1.00
Yes	34	76%	4.30 (1.90 to 9.75)	3.55 (1.48 to 8.54)
Ever used NRT No NRT use	147	35%	1.00	1.00
For quitting only	154	47%	1.70 (1.07 to 2.70)	1.65 (0.97 to 2.81)
Non-standard use	100	60%	2.82 (1.67 to 4.77)	2.82 (1.56 to 5.08)
Changed or attempted to change to a low tar cigarette in the last 12 months				
No	338	44%	1.00	1.00
Yes	63	56%	1.59 (0.92 to 2.73)	1.89 (1.02 to 3.51)
Did something to help you quit in the last 12 months				
No	117	38%	1.00	1.00
Yes	284	49%	1.61 (1.04 to 2.51)	1.47 (0.88 to 2.47)

*Bivariate analyses.

†All variables adjusted for sex, age, education, income, general health, heaviness-of-smoking Index, plans to quit smoking, belief that SLT is less harmful than cigarettes, prior use of SLT, prior use of NRT, changed to a low tar cigarette in last 12 months and did something to assist quitting in the last 12 months in a standard multivariable logistic regression model.

then smokers will need to be better informed about the comparative harmfulness of these products and cigarettes. Thus, any plans to increase the availability of LNSLT would need to be accompanied by health education about its risk profile compared with that of cigarettes. This could be done via mandated health warnings on packaging.

Forty-three per cent of smokers who did not initially believe that SLT is less harmful than cigarettes also indicated they were interested in purchasing one of the products. The reason for this is

not clear, but our brief information on LNSLT may have convinced these smokers that these products were less harmful than smoking. Alternatively, there may be factors other than relative harmfulness that made these products attractive to these smokers, such as the ability to use them anywhere, perceived lower cost or an interest in trying new tobacco products.

Impact on cessation

Our results suggest that making LNSLT available would have minimal impact on quitting. Those with plans to quit smoking had the least interest in using these products. Consistently, Timberlake¹⁷ also found that intention to quit smoking was inversely associated with interest in switching to LNSLT. In our survey, both smokers with and without plans to quit smoking indicated that they would use LNSLT as a cessation aid rather than for any other purpose. This has also been the experience in Sweden where snus is the most commonly used smoking cessation aid among men.¹⁹

In Sweden, until recently, snus was substantially less expensive than cigarettes because it was taxed as a food rather than a tobacco product. This price difference probably contributed to

Table 3 Intended LNSLT use according to plans to quit smoking

	Not planning to quit smoking n = 162	Planning to quit smoking n = 239
As a complete long-term substitute for cigarettes	4%	3%
As a short-term substitute for cigarettes	9%	3%
To cut down on the number of cigarettes I smoke	7%	5%
To help me quit smoking	32%	31%
Cannot say how they would intend to use LNSLT	1%	3%
Would not consider buying LNSLT	48%	55%

Table 4 Intended smoking behaviour with changes in cigarette prices

	Price increase without LNSLT, %	Price increase with LNSLT available at half the cost of cigarettes, %	Net effect of LNSLT % change	p Value*
Intended smoking behaviour if cigarette price increases by 50%				
Keep smoking	53%	36%	-17%	<0.001
Quit smoking	41%	39%	-2%	0.374
Cannot say	6%	7%	+1%	0.487
Switch to LNSLT	—	18%	+18%	—
Intended smoking behaviour if cigarette price increases by 100%				
Keep smoking	37%	21%	-16%	<0.001
Quit smoking	59%	53%	-6%	0.006
Cannot say	5%	7%	+2%	0.150
Switch to LNSLT	—	20%	+20%	—

*McNemar test (two-sided) of effect of LNSLT on intended behaviour; binomial distribution used.

the popularity of snus among Swedish men and may explain the differences in patterns of SLT use between Sweden and the USA.²⁰ Our comparison of smokers' responses to a hypothetical cigarette price increase with and without LNSLT available at lower cost suggests that the addition of low-cost LNSLT could result in a greater reduction in smoking than would be achieved by only increasing the price of cigarettes.

Dual use

Critics are concerned that the promotion of LNSLT to smokers could result in dual use of cigarettes and LNSLT rather than complete switching to LNSLT.^{21, 22} Tobacco industry documents indicate that the dual use of cigarettes and SLT is an industry marketing goal.²³ However, dual use of cigarettes and SLT seems to be an uncommon and unstable behaviour in both Sweden and the USA.^{9, 20} In this sample, very few smokers indicated that they would use these products either for short-term use during smoking bans or to cut down the number of cigarettes smoked, if they could purchase them. Those most likely to report an interest in dual use with cigarettes were those who had no plans to quit smoking. Although indoor smoking bans are a powerful motivator to quit smoking, they are not the only reason that smokers want to quit. The availability of a smokeless product that can be used indoors may only marginally reduce motivations for quitting, whereas personal health and fitness, financial reasons and social desirability remain as strong motives. Indoor smoking bans may also be a relatively minor motivational factor

Table 5 Net effect of low-cost LNSLT availability on intended smoking behaviour in response to 50% and 100% cigarette price increases by interest in trying LNSLT (percentage change from price increase alone)

	Likelihood of trying one of the LNSLT products if they were available for sale in Australia			
	Unlikely/ very unlikely n=214	Uncertain n=87	Likely/ very likely n=100	Total N=401
Intended smoking behaviour if cigarette price increases by 50%				
Keep smoking	-6%	-31%	-24%	-17%
Try to quit	+2%	+11%	-21%	-2%
Cannot say	+1%	+2%	0%	+1%
Try to switch to LNSLT	+3%	+18%	+45%	+18%
Intended smoking behaviour if cigarette price increases by 100%				
Keep smoking	-2%	-22%	-36%	-16%
Try to quit	-1%	-7%	-14%	-6%
Cannot say	+1%	+8%	0%	+2%
Try to switch to LNSLT	+2%	+21%	+50%	+20%

in Australia where a mild climate makes outdoor smoking a minor inconvenience. There was no increased dual use of SLT and cigarettes observed in response to workplace smoking bans in the USA, where SLT is freely available.²⁴

Limitations

The main limitation of this study is that it only measured stated intentions, not actual behaviour. In practice, intentions may differ substantially from behaviour. For example, experience of LNSLT use might change interest in these products. Most of the survey respondents had no prior experience of using SLT (92%), so their responses were not based on the experienced effects of these products. Nonetheless, nearly half of our sample was open to trying these products after reading a short description of them.

Further, although only a small number of smokers in the sample had previously used SLT (n=34), 76% of these smokers said that they were willing to try one of the LNSLT products. Previous use of SLT was the factor most strongly associated with willingness to try one of the LNSLT products in the regression analysis. If use of SLT had been an unpleasant or unrewarding experience for most of these smokers, we would expect the opposite to be true. These findings contrast with those of a recent experiment on the acute effects of oral nicotine and tobacco products in smokers that suggested that the products (which included Camel snus, Marlboro snus and Ariva) were not satisfying or ranked as "pleasant" by smokers.²⁵ In this regard, initial experiences with smoking cigarettes are typically noxious, so initial reactions may not be a strong indicator of continued use. Future research needs to look at the impact of varying levels of LNSLT experience on interest in using these products. It also needs to more directly assess whether smokers who tried these products are interested in continuing to use them to quit smoking or as an alternative to smoking.²⁵

The second limitation of the study was that the respondents were not a random sample of Australian smokers. This may affect the generalisability of our results. Some differences were noted between the sample and smokers in the 2007 NDSHS, Australia's largest population-based survey of smoking and other drug use. We attempted to account for these differences by weighting the data to the national population of smokers as estimated by the 2007 NDSHS. Weighting did not substantially change the results. As the survey was delivered via a web-based survey, only smokers with internet access were included. Similar to other population surveys, the poorest (eg, less likely to have internet access) were likely to have been missed from the sample. Our sample also had slightly more participants from households in the highest income range than smokers in the 2007 NDSHS and slightly more participants with prior experience with SLT. However, the regression results did not change substantially when recalculated with past SLT users excluded. Weighting the data to adjust for the greater prevalence of past SLT use compared with the NDSHS also had little effect on the net effect of LNSLT on predicted behaviour (table 4). There may also be other differences between smokers who respond to market surveys and those who do not, such as a greater interest in trying new products.

Third, this study did not assess interest in LNSLT among non-smokers. We think it is unlikely that a significant number of adult non-smokers would be interested in LNSLT because most tobacco use is commenced in adolescence. Studies of adolescents' interest in using these products compared with cigarettes are needed to assess if they are attractive to non-smoking adolescents. In Sweden, initiation of snus use among young men has displaced initiation of smoking and has resulted in lower

What this study adds

- Outside Sweden, the use of LNSLT is rare, and little is known about whether smokers are interested in purchasing these products in countries that ban their sale. This study measured smokers' interest in purchasing LNSLT and the net effect of increasing taxes on smoked tobacco while providing LNSLT at lower cost on self-predicted behaviour in a sample of Australian smokers.
- Although nearly half of the smokers surveyed were willing to purchase an LNSLT product, most were interested in using these products for cessation rather than as a long-term substitute or for dual use with cigarettes. A policy that made LNSLT available at a much lower cost than smoked cigarettes and increased taxes on cigarettes could provide a greater reduction in the number of smokers than a tax increase alone.

smoking prevalence in this population, which is a positive outcome.²⁶ However, as one of the main determinants of youth interest in products is community use, even more caution might be needed in generalising from respondent beliefs about potential effects to actual behaviour.

Fourth, our sample size of 401 smokers may have been insufficient to examine some factors with subtle effects on willingness to buy LNSLT. This may account for the non-significant effects observed for some factors in our analyses.

In conclusion, this study provides important preliminary information suggesting moderate interest among Australian smokers in using LNSLT products. LNSLT products were more often seen as potential cessation aids than as substitutes for cigarettes. The results suggest that a policy that combined an increased availability of LNSLT at a much lower cost than smoked cigarettes with an increased tax on cigarettes could produce a greater reduction in the number of smokers than the same tax increase alone. These results support clinical research on the potential to use LNSLT to increase smoking cessation in Australia.

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