

The rise of cannabis vaping: implications for survey design

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Until about 2010, smoking of cannabis (in a joint, pipe or bong) was by far the dominant mode of use, globally and in New Zealand. Whether a survey investigated prevalence of ‘smoking’ or ‘using’ cannabis, the results would be expected to be virtually the same. That is no longer the case.

Vaporisers are now available in New Zealand that allow users to vape (rather than smoke) dried cannabis leaf or buds.^{1,2} Additionally, in jurisdictions where cannabis has been legalised, vaping of e-liquids containing THC (the psychoactive component in cannabis) and edible cannabis products have become increasingly popular, particularly among young people.³⁻⁵ In some countries where cannabis use remains illegal, THC e-liquids and edibles are available on the black market (eg, they were widely used in Canada before legalisation of recreational cannabis in 2018).⁶

In New Zealand, little is known about how the evolution of cannabis products and devices has affected mode of administration at the population level.

Aims

Our aim was to investigate changing modes of cannabis administration in New Zealand and inform question design in New Zealand health surveys.

The Youth Insights Survey is unusual among health surveys in this country in that it includes questions on both the smoking and vaping of cannabis. We used Youth Insights Survey data to investigate the proportion of Year 10 students who reported past month vaping of cannabis, smoking of cannabis and use of both modes.

Methods

The Youth Insights Survey is a biennial nationally representative survey of Year 10 students (aged 14–15 years).^{7,8} It was run by Te Hiringa Hauora/Health Promotion Agency as part of the New Zealand Youth Tobacco Monitor until 2018, when it was discontinued. To increase statistical precision, we pooled data from the 2016 and 2018 years (N=5,573).

Past month vaping of cannabis was based on the question: ‘During the last 30 days (one month) how often did you use e-cigarettes (e-cigs, vapes) that had marijuana or hash oil in it?’ (Never tried/I don’t know whether there was marijuana or hash oil in the vapour/In the past but not in the past 30 days/Once in the past 30 days/2–3 times/About once a week/Several times a week/Most days).

Past month smoking of cannabis was based on the question: ‘During the last 30 days (one month) how often did you smoke marijuana (pot, weed, grass, cannabis)?’ (Never/In the past but not in the past 30 days/Once in the past 30 days/2–3 times/About once a week/Several times a week/Most days).

Analysis was limited to participants who answered both questions (N=5,334). Descriptive statistics gave the proportion of the population, and of past month cannabis users, who vaped cannabis, smoked cannabis, vaped cannabis exclusively (ie, vaped and did not smoke cannabis), smoked cannabis exclusively and used both modes. Population estimates were adjusted for sample selection and non-response and weighted to the ethnicity and gender distribution of the Year 10 student population.

Results

As shown in Table 1, about 9% of Year 10 students reported using cannabis in the past month. Smoking remained the most common mode of administration, with over 90% of past month users reporting they smoked cannabis in the past month. However, vaping of cannabis was also relatively common, with about a quarter of past month users reporting they vaped cannabis in the past month. Those who vaped exclusively made up about 7% of past month users.

Discussion

Our findings show that, although smoking remained the dominant mode of cannabis use among Year 10 students (14–15 years) in 2016–2018, vaping of cannabis was also relatively common in this age group. About a quarter of past month cannabis users reported vaping cannabis, and about 7% of reported vaping exclusively. A limitation of the study was lack of any data on ingestion of cannabis products.

Our findings, and those from North American studies, suggest that survey questions that only ask about ‘smoking’ of cannabis are increasingly likely to underestimate cannabis use. We recommend that questions in future surveys ask about any

cannabis ‘use’, with a follow-up question on product type (eg, dried herb, oils, solid concentrates, edibles) and mode of administration. Modes investigated should include: (i) smoking cannabis by itself, (ii) smoking cannabis mixed with tobacco, (iii) vaping and (iv) ingestion.

Vaporisers for cannabis use were relatively new to New Zealand in 2018 (and typically quite expensive), so use among adolescents would be expected to be low. That a quarter of past month users in this age group had vaped cannabis was therefore surprising. The proportion of adolescents vaping cannabis is likely to have grown since 2018, given the increasing availability of low-cost vaporisers and the general growth of vaping (eg, vaping of nicotine) in this age group. According to the ASH Year 10 Snapshot survey, regular e-cigarette use (monthly or more often) in New Zealand Year 10 students increased from 7% in 2018 to 12% in 2019.⁹

The rise in cannabis vaping also has implications for tobacco and e-cigarette research. Cannabis vaping is seldom acknowledged in such research, where questions about ‘vaping’ or ‘e-cigarette use’ seldom explicitly specify whether cannabis vaping is included in the definition.¹⁰ For example, the 2019/20 New Zealand Health Survey explicitly excluded cannabis smoking when asking

Table 1: Prevalence of past month cannabis use in Year 10 students, 2016–2018 (pooled), N=5,334.

		Past month cannabis use	Vaped cannabis	Smoked cannabis	Vaped cannabis exclusively ^a	Smoked cannabis exclusively ^b	Both smoked and vaped cannabis
n		453	124	418	35	329	89
Year 10 population	Unweighted	8.5%	2.3%	7.9%	0.7%	6.2%	1.7%
	Weighted (95% CI)	8.6% (7.6, 9.6)	2.5% (2.0, 3.0)	7.9% (7.0, 8.9)	0.7% (0.5, 0.9)	6.1% (5.3, 7.0)	1.8% (1.4, 2.3)
Past month cannabis users	Unweighted	-	27.4%	92.3%	7.7%	72.6%	19.6%
	Weighted (95% CI)	-	24.4% (19.4, 30.3)	93.3% (90.3, 95.5)	6.7% (4.5, 9.7)	75.6% (69.7, 80.6)	17.8% (13.5, 23.0)

^a Defined as past month vaping of cannabis, in the absence of past month smoking of cannabis.

^b Defined as past month smoking of cannabis, in the absence of past month vaping of cannabis.

whether participants smoked tobacco, but no explicit exclusion was made in questions about vaping. As a result, there is a lack of clarity about what e-cigarette/vaping questions are measuring, since respondents may interpret them differently. Overseas research suggests that using photographs of devices to define what researchers mean by 'vaping' is likely to lead to more accurate estimates of use¹¹ and that follow-up questions are needed about the substance(s) being vaped (nicotine, cannabis/THC, or neither).

In 2019, both cannabis and e-cigarette use were more common than tobacco smoking in New Zealand adolescents.¹² Technologies and products are changing rapidly, necessitating careful design of surveillance surveys to capture changing substance use behaviours. Although changing the wording of questions or definitions may limit comparability with past survey years when considering trends, comparability is also

compromised when question wording does not reflect the changing reality of use.

Conclusions

There is a need for careful population-based monitoring of substance use, particularly among young people. The discontinuation of the Youth Insights Survey in 2018 has left a gap that is yet to be filled. It is important that survey questions capture and differentiate use of differing substances (eg, nicotine and cannabis) and modes (eg, smoking, vaping and ingestion). To ensure estimates of substance use are accurate, and to aid research into evolving modes of use, both adult and youth surveys should include questions on mode of cannabis administration. Survey questions about 'vaping' or 'e-cigarette use' should explicitly include or exclude cannabis, and questions about substances vaped should be included, where relevant.

Competing interests:

Nil.

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