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Smoking and vaping among Canadian youth and adults in 2017 and 2019 | East, K., Reid, J., Hammond, D.

METHODS

Survey designs and samples

Data for 2019 are from the Canadian Tobacco and Nicotine Survey (CTNS), a survey of the general population of Canada age 15+ years (n=8,600) conducted by Statistics Canada. CTNS used probability-based sampling methods. Data were collected in November and December 2019, primarily via online surveys, with telephone surveys for those who did not respond online. Further information about the 2019 CTNS is available online via Statistics Canada (<https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=5305>).

Data for 2017 are from the 2017 Canadian Tobacco, Alcohol and Drugs Survey (CTADS), a now-defunct survey of the general population of Canada age 15+ years (n=16,349) conducted by Statistics Canada. CTADS also used probability-based sampling methods. Data were collected between February and December 2017 via telephone interviews. Further information about the 2017 CTADS is available online via Statistics Canada (<https://www23.statcan.gc.ca/imdb/p2SV.pl?Function=getSurvey&SDDS=4440>).

Both CTADS and CTNS excluded residents of the three Canadian territories (Yukon, Northwest Territories and Nunavut), as well as full-time residents of institutions.

Measures

The vaping and smoking measures from each survey are shown in Table S1 below. There were some differences in wording between surveys. For example, past 30-day and daily vaping and smoking status were based on a measure of past 30-day use in the 2019 CTNS, but based on a measure of use ‘at the present time’ in the 2017 CTADS.

We did not explore reasons for e-cigarette use in the 2017 CTADS sample because the measures were not comparable with the 2019 CTNS. In the 2017 CTADS, reasons for use consisted of “select all that apply” response options, whereas the 2019 CTNS data were mutually exclusive (see measures below).

Analyses

First, we report (in the manuscript text) prevalence estimates for smoking (never, former, current) for each survey year, overall and by age group. Second, we report prevalence estimates for vaping (ever, past 30-day, daily) for each survey year, overall and by age group and smoking status (Table 1). Third, we report prevalence estimates for smoking status (current, former, never smoker) among vapers (ever, past 30-day, daily) in the 2019 CTNS sample only, split by age group (Table S2). Fourth, among past 30-day vapers in the 2019 CTNS sample only, we report prevalence estimates for reasons for e-cigarette use, split by age group, smoking status, and daily vaping (Table S3). Fifth, we report (in the manuscript text) use of nicotine-containing e-cigarettes among past 30-day vapers. Sixth, we report (in the manuscript text) quit attempts and success among current smokers and former smokers who quit in the past year, by survey year.

Analyses were conducted in Stata v16. All estimates are reported with 95% confidence intervals. Stata’s svy command with bootstrap survey weights (provided by Statistics Canada) was used to calculate nationally representative population estimates (% and n). The contributions of different age and smoking status groups to changes in vaping between 2017 and 2019 were calculated in two steps: 1) subtracting the number of vapers in 2017 from the number of vapers in 2019 overall and per age and smoking status group; 2) dividing the change

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in number of vapers per group by the change in number of vapers overall. The coefficients of variance (CVs) for each estimate were also explored using Stata's `svy` command. Estimates were suppressed where CVs were $>33.3\%$. Estimates were accompanied with a warning where CVs were 16.6%-33.3% inclusive, consistent with Statistics Canada's recommendations. Due to low cell sizes ($n < 30$) and/or large CVs ($>33.3\%$), we grouped all age groups for adults 25 and older (25-34, 35-44, 45-54, 55-64, 65+) together for analyses.

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Table S1. Measures used in the 2019 CTNS and the 2017 CTADS surveys.

	CTNS 2019	CTADS 2017
VAPING		
Ever vaped	Responded “Yes” to “Have you ever tried vaping?” (other response option: “No”)	Responded “Yes” to “Have you ever tried an e-cigarette, also known as an electronic cigarette?” (other response option: “No”)
Past 30-day vaping	Responded “Yes” to “Have you ever tried vaping?” (other response option: “No”) AND responded “Daily”, “Less than daily, but at least once a week”, or “Less than once a week, but at least once in the past month” to “During the past 30 days, how often did you vape?” (other response option: “Not at all”)	Responded “Yes” to “Have you ever tried an e-cigarette, also known as an electronic cigarette?” (other response option: “No”) AND responded “Yes” to “In the past 30 days did you use an e-cigarette?” (other response option: “No”) OR responded “Every day” to “At the present time, do you use an e-cigarette (also known as an electronic cigarette) every day, occasionally or not at all?” (other response options: “occasionally”, “not at all”)
Daily vaping	Responded “Yes” to “Have you ever tried vaping?” (other response option: “No”) AND responded “Daily” to “During the past 30 days, how often did you vape?” (other response option: “Not at all”)	Responded “Yes” to “Have you ever tried an e-cigarette, also known as an electronic cigarette?” (other response option: “No”) AND responded “Yes” to “During the past 30 days, did you use an e-cigarette every day?” (other response option: “No”) OR responded “Every day” to “At the present time, do you use an e-cigarette (also known as an electronic cigarette) every day, occasionally or not at all?” (other response options: “occasionally”, “not at all”)
Reasons for vaping (among past 30-day vapers only)	Currently, what is your main reason for vaping? <ul style="list-style-type: none"> • To quit smoking cigarettes • To avoid returning to smoking cigarettes • To cut down on smoking cigarettes • By curiosity, you just wanted to try it • Because you enjoy it • To reduce stress or calm you down • To use when you cannot/are not allowed to smoke cigarettes • cigarettes • Other 	Not included as not comparable.
Vaped nicotine-containing e-cigarettes (among past 30-day vapers only)	Responded “1-30” when asked “During the past 30 days, on how many days did you vape the following products? An e-liquid with nicotine” (other response option: “0”)	Responded “Yes” to “The last time you used an e-cigarette, did it contain nicotine?” (other response options: “no”, “uncertain”, “refused”)

Table S1 continued below.

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Table S1 (continued). Measures used in the 2019 CTNS and the 2017 CTADS surveys

	CTNS 2019	CTADS 2017
SMOKING		
Current smoker	Responded “Yes” to “Have you ever smoked a whole cigarette?” (other response option: “No”) AND responded “Daily” or “Less than daily, but at least once in the past month” to “During the past 30 days, how often did you smoke cigarettes?” (other response options: “not at all”)	Responded “Every day” or “Occasionally” to “At the present time do you smoke cigarettes every day, occasionally, or not at all?” (other response options: “not at all”)
Former smoker	Responded “Yes” to “Have you ever smoked a whole cigarette?” (other response option: “No”) AND responded “Yes” to “Have you smoked at least 100 cigarettes (about 4 packs) in your life?” (other response option: “No”) AND responded “Not at all” to “During the past 30 days, how often did you smoke cigarettes?” (other response options: “daily”, “Less than daily, but at least once in the past month”)	Responded “Yes” to “Have you smoked at least 100 cigarettes in your life?” (other response option: “No”) AND Responded “Not at all” to “At the present time do you smoke cigarettes every day, occasionally, or not at all?” (other response options: “every day”, “occasionally”)
Never smoker	Responded “No” to “Have you ever smoked a whole cigarette?” (other response option: “No”) -- OR Responded “Yes” to “Have you ever smoked a whole cigarette?” (other response option: “No”) AND responded “No” to “Have you smoked at least 100 cigarettes (about 4 packs) in your life?” (other response option: “Yes”) AND responded “Not at all” to “During the past 30 days, how often did you smoke cigarettes?” (other response options: “daily”, “Less than daily, but at least once in the past month”)	Responded “No” to “Have you smoked at least 100 cigarettes in your life?” (other response option: “yes”) AND Responded “Not at all” to “At the present time do you smoke cigarettes every day, occasionally, or not at all?” (other response options: “every day”, “occasionally”)
Quit attempts (among former smokers who quit <1 year ago and all current smokers)	Responded “1 time”, “2 or 3 times”, or “4 or more times” to “During the past 12 months, how many times have you stopped smoking cigarettes for one day or longer because you were trying to quit smoking?” (other response option: “0 times”)	Responded “1 time”, “2 or 3 times”, or “4 or more times” to “In the past year, how many times did you stop smoking for at least 24 hours because you were trying to quit?” (other response option: “0 times”)
Quit success (among those who had made a quit attempt)	Had made a quit attempt (see above) and were former smokers at the time of the survey.	Had made a quit attempt (see above) and were former smokers at the time of the survey.

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Table S2. Smoking status of ever vapers, past 30-day vapers, and daily vapers overall and by age group among Canadians age 15+ in 2019 (CTNS). Data are % (95% confidence intervals). All data except n (unweighted sample size) are weighted.

	Ever vapers (n=1,598)			Past 30-day vapers (n=508)			Daily vapers (n=220)		
	Never smoker (n=804)	Former smoker (n=294)	Current smoker (n=500)	Never smoker (n=217)	Former smoker (n=116)	Current smoker (n=175)	Never smoker (n=51)	Former smoker (n=94)	Current smoker (n=75)
ALL	45.7 (42.5-49.0)	19.6 (17.2-22.3)	34.7 (31.4-38.1)	36.7 (31.6-42.1)	25.0 (20.3-30.3)	38.3 (32.8-44.2)	18.7 (13.8-24.7)	47.0 (38.5-55.6)	34.4 (27.0-42.7)
15-19 years	83.0 (78.7-86.6)	-	12.8 (9.6-16.9)	73.9 (66.5-80.1)	-	19.6 (14.1-26.6)	63.4 (48.9-75.8)	-	-
20-24 years	66.2 (61.2-70.9)	10.3 (7.5-14)	23.5 (19.4-28.1)	41.1 (32.6-50.3)	^a 21.0 (14.4-29.4)	37.9 (29.7-46.9)	-	-	-
25+ years*	28.1 (23.8-32.8)	27.1 (23.4-31.2)	44.8 (39.9-49.8)	-	36.8 (28.6-45.7)	48.9 (39.5-58.4)	-	60.5 (48.5-71.3)	35.9 (25.5-47.9)

- Estimate unreportable due to high variation (N<30 or coefficient of variance >33.3)

^a Caution, variation for estimate (coefficient of variance 16.6-33.3%).

*Age categories grouped due to low cell sizes and/or the large number of unreportable estimates

CTNS 2019. **Ever vaper:** responded "yes" to "have you ever tried vaping?"**Past-30-day vaper:** responded "daily", "less than daily, but at least once a week", OR "less than once a week, but at least once in the past month" to "during the past 30 days, how often did you vape?"**Daily vaper:** responded "daily" to "during the past 30 days, how often did you vape?"**Current smoker:** responded "daily" OR "less than daily, but at least once in the past month" to "during the past 30 days, how often did you smoke cigarettes?"**Former smoker:** responded "yes" to "have you smoked at least 100 cigarettes (about 4 packs) in your life?" AND responded "not at all" to "during the past 30 days, how often did you smoke cigarettes?"**Never smoker:** responded "no" to "have you ever smoked a whole cigarette?" – OR responded "yes" to "have you ever smoked a whole cigarette?" AND responded "no" to "have you smoked at least 100 cigarettes (about 4 packs) in your life?" AND responded "not at all" to "during the past 30 days, how often did you smoke cigarettes?"

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Table S3. Reasons for e-cigarette use among Canadians age 15+ in 2019 (CTNS) who vaped in the past 30 days, overall and by smoking status and age group, and among daily users. Data are % (95% confidence intervals). All data except n (unweighted sample size) are weighted. N=580.

	*To quit/avoid returning to/reduce smoking	*To quit/avoid returning to smoking	Curiosity	Because you enjoy it	Reduce stress or calm down	To use when cannot smoke	Other
Overall	37.1 (31.7-42.9)	27.9 (22.8-33.5)	19.6 (15.6-24.3)	19.5 (14.8-25.3)	13.3 (10.2-17.2)	-	9.1 (6.6-12.4)
By age group							
15-19 years	-	-	29.5 (22.9-37.0)	29.0 (22.4-36.6)	21.2 (15.4-28.4)	-	-
20-24 years	28.5 (20.7-37.7)	^a 21.9 (15.1-30.8)	27.1 (19.8-35.8)	-	-	-	-
25+ years	56.3 (46.6-65.5)	41.7 (32.6-51.3)	-	-	-	-	-
By smoking status							
Current smoker	54.4 (44.1-64.3)	30.9 (22.3-41.1)	-	^a 18.1 (10.3-29.8)	-	-	-
Former smoker	64.2 (52.2-74.6)	63.0 (51.2-73.4)	-	-	-	-	-
Never smoker	-	-	39.2 (31.2-47.8)	25.4 (18.4-33.9)	22.8 (16.8-30.1)	-	-
Daily vapers only	^a 56.4 (48.1-64.3)	^a 49.0 (40.8-57.4)	-	^a 17.7 (12.4-24.5)	^a 16.2 (11.2-22.8)	-	-

- Estimate unreportable due to high variation (N<30 or coefficient of variance >33.3)

^a Caution, variation for estimate (coefficient of variance 16.6-33.3%).

*Grouped reasons

CTNS 2019. Reasons for vaping: "currently, what is your main reason for vaping?" with response options: "To quit smoking cigarettes," "To avoid returning to smoking cigarettes," "To cut down on smoking cigarettes," "By curiosity, you just wanted to try it," "Because you enjoy it," "To reduce stress or calm you down," "To use when you cannot/are not allowed to smoke cigarettes," "Other"

Daily vaper: responded "daily" to "during the past 30 days, how often did you vape?"

Current smoker: responded "daily" OR "less than daily, but at least once in the past month" to "during the past 30 days, how often did you smoke cigarettes?"

Former smoker: responded "yes" to "have you smoked at least 100 cigarettes (about 4 packs) in your life?" AND responded "not at all" to "during the past 30 days, how often did you smoke cigarettes?"

Never smoker: responded "no" to "have you ever smoked a whole cigarette?" – OR responded "yes" to "have you ever smoked a whole cigarette?" AND responded "no" to "have you smoked at least 100 cigarettes (about 4 packs) in your life?" AND responded "not at all" to "during the past 30 days, how often did you smoke cigarettes?"