

## RESEARCH LETTER

## Use of contraband cigarettes among adolescent daily smokers in Canada

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### ABSTRACT

Current tobacco-control strategies seek to inhibit and reduce smoking among adolescents. However, such strategies are probably undermined by the contraband tobacco market. Using data from Canada's 2006/2007 Youth Smoking Survey, we found that 13.1% of respondents who were daily smokers reported that contraband cigarettes were their usual brand. They consumed significantly more cigarettes than respondents who smoked other brands. Contraband cigarettes accounted for about 17.5% of all cigarettes smoked by adolescent daily smokers in Canada overall, and for more than 25% in the provinces of Ontario and Quebec.

A thriving contraband tobacco market has emerged in Canada, especially in Ontario and Quebec.<sup>1,2</sup> Recent studies have estimated that 14% to 49% of all cigarettes bought by adult smokers in Ontario are illicit (i.e., purchased without the requisite provincial and federal taxes applied), originating primarily from First Nations reserves. Study methods have included population surveys of cigarette purchasing on reserves,<sup>1</sup> interviews with smokers (sponsored by the tobacco industry)<sup>3</sup> and discrepancy analyses of taxation revenues against reported cigarette consumption.<sup>4</sup>

Whereas the existing literature has focused on adults, an assessment of youth involvement in the contraband market may be even more important. Contemporary tobacco-control policies seek to inhibit and reduce smoking among adolescents through price mechanisms (e.g., taxation) and minimum-age purchasing restrictions,<sup>5</sup> strategies that the contraband market probably undermines. However, little is known about adolescents' use of contraband cigarettes.

### Methods

We used data from 41 886 high school students in grades 9 to 12 (ages 14–18 years) during the 2006/2007 school year who participated in Canada's 2006/2007 Youth Smoking Survey, a nationally representative classroom-based survey of public and private elementary and secondary school students in all 10

Canadian provinces. The survey sampled high schools using a multistage design based on stratification by smoking prevalence in each health region. Within each stratum, schools were randomly selected according to probabilities proportional to the total enrolment in their respective school boards. From the selected schools, 61% of eligible students participated.

We defined students as current daily smokers if they had smoked at least 100 cigarettes in their lifetime and reported smoking at least 1 cigarette per day on each of the 30 days preceding the survey.

Data about cigarette consumption were generated from the following survey question: "Thinking back over the last 30 days, on the days that you smoked, how many cigarettes did you usually smoke each day?" which had the following response categories: "a few puffs," 1, 2–3, 4–5, 6–10, 11–20, 21–29, 30 or more. To construct a quantitative estimate of monthly consumption, we used the midpoint for each range and 35 for "30 or more."

To determine respondents' usual cigarette brand, the survey asked the question, "What brand of cigarettes do you usually smoke?" Respondents selected their responses from an alphabetical list of popular cigarette brands, which included "cigarettes from First Nations/Native brands" as the last option. We classified individuals who indicated "First Nations/Native brands" as their usual brand as current smokers of contraband cigarettes. We classified all other current daily smokers, including the 5% who reported no usual brand, as current smokers of noncontraband cigarettes. For our analyses, we assumed that smokers of contraband cigarettes consumed only contraband brands and that smokers of

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noncontraband cigarettes smoked only noncontraband brands.

The Youth Smoking Survey used a complex analytical design. To account for unequal probability of selection among respondents, we bootstrapped all analyses using a set of replicate weights supplied with the survey data file.

## Results

Among students in grades 9 to 12, 5.2% (95% confidence interval [CI] 5.0%–5.3%) were classified as current daily smokers. Of these, 13.1% (95% CI 11.9%–14.3%) reported First Nations/Native cigarettes as their usual brand. This proportion varied significantly by province ( $p < 0.001$ ), with the highest rates in Ontario (21.8%) and Quebec (22.4%) (Table 1). Rates in the Prairie provinces were below 2.5% (the level below which, in the current study, exact reporting was prohibited by small cell sizes).

Smokers of First Nations/Native brand cigarettes reported significantly higher levels of consumption than other daily smokers (16.8 v. 11.9 cigarettes per day,  $p < 0.001$ ). As a result, we estimated that First Nations/Native cigarettes accounted for about 17.5% (95% CI 16.1%–18.9%) of all cigarettes smoked by daily smokers in secondary school in Canada.

## Interpretation

Although the use of illicit substances by adolescents is well known, the use of contraband cigarettes in this age group is striking. Canadian tobacco-control policies have concentrated on preventing youths from starting to smoke. Given that adolescents' initiation and continuation of smoking behaviour are related to the availability and price of tobacco products,<sup>6,7</sup> the availability of untaxed First Nations/Native cigarette brands, which typically sell for about \$3–\$4 per pack (about one-third the price of legiti-

mate brands), undermines key tobacco-control strategies. The lower price and widespread availability of contraband cigarettes may also have clinical consequences, because smokers of contraband cigarettes are less likely than smokers of legitimate brands to attempt to quit or to achieve smoking cessation.<sup>8</sup>

A 2008 study by the Canadian Convenience Stores Association examined discarded cigarette butts at locations near 155 high schools in Ontario and Quebec. It concluded that 36% of those in Quebec and 26% of those in Ontario were untaxed, counterfeit or foreign brands.<sup>9</sup> Our study has added to this evidence by surveying students directly (to generate estimates of the number of young people involved) and by providing national estimates. In addition, our use of a population survey avoided possible selection effects inherent in the prior study, which was unable to determine whether the butts had actually been discarded by youths. Also, that study could not take into account other possible biases, such as differences between smokers of contraband cigarettes and smokers of other brands in terms of propensity to smoke in the surveyed locations or to dispose of butts improperly.

Our study had limitations. Individuals were assigned to groups on the basis of their choice of usual cigarette brand. Also, in our analyses we assumed that youths only smoked cigarettes within their preferred brand group. The students might have smoked a variety of brands; however, there are no data available on the extent of brand-switching between the contraband and noncontraband groups. In addition, the survey sampled only students. If the likelihood of smoking, and of using contraband cigarettes, differs for adolescents not enrolled in school, the accuracy of our estimates would be reduced.

The widespread use of First Nations/Native brand cigarettes, especially in Ontario and Quebec, presents a serious challenge to tobacco-control strategies, which attempt to use accessibility and price mechanisms to influence adolescents'

**Table 1:** Consumption of cigarettes and preference for contraband First Nations/Native brands among high school daily smokers in Canada

Province	No. of daily smokers	% (95% CI) of daily smokers reporting First Nations/Native as "usual brand"	Brand group; no. (95% CI) of cigarettes smoked daily		First Nations/Native brand cigarettes as % (95% CI) of all cigarettes smoked*
			First Nations/Native brands	Other brands	
Newfoundland and Labrador	205	2.1 (1.7–2.5)	17.2 (16.2–18.2)	11.1 (10.8–11.3)	3.3 (2.8–3.9)
Prince Edward Island	221	4.7 (3.5–5.9)	11.3 (10.9–11.8)	13.8 (13.3–14.4)	3.9 (2.8–5.0)
Nova Scotia	274	7.8 (6.7–8.9)	13.7 (12.8–14.7)	13.6 (13.3–13.9)	7.9 (6.9–9.0)
New Brunswick	1107	11.1 (10.3–11.8)	16.4 (15.8–17.0)	13.9 (13.8–14.1)	12.6 (11.7–13.5)
Quebec	299	22.4 (18.4–26.3)	20.9 (19.4–22.3)	13.7 (12.7–14.8)	30.0 (26.1–33.9)
Ontario	384	21.8 (19.4–24.1)	15.4 (14.2–16.7)	12.1 (11.5–12.6)	26.3 (23.5–29.2)
Manitoba	153	NR	NR	10.9 (10.6–11.2)	NR
Saskatchewan	36	NR	NR	11.1 (9.7–12.5)	NR
Alberta	31	NR	NR	12.5 (10.7–14.2)	NR
British Columbia	139	3.5 (2.5–4.5)	15.9 (10.2–21.5)	9.8 (9.0–10.6)	5.5 (4.1–7.0)
All of Canada	2849	13.1 (11.9–14.3)	16.8 (15.9–17.7)	11.9 (11.6–12.3)	17.5 (16.1–18.9)

Note: CI = confidence interval, NR = not reportable because of small cell size.

\*For daily smokers.

smoking behaviour. Although the complex issues of First Nations jurisdiction would have to be recognized in any policy changes,<sup>10</sup> Canadian tobacco-control strategies will need to address this issue.

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**Competing interests:** None declared.

**Contributors:** Russell Callaghan and Scott Veldhuizen conceived of the study and oversaw all aspects of its completion. Scott Leatherdale, Donna Murnaghan and Steve Manske contributed to conceptualizing ideas, interpreting the findings and reviewing all versions of the manuscript. All of the authors approved the final version submitted for publication.

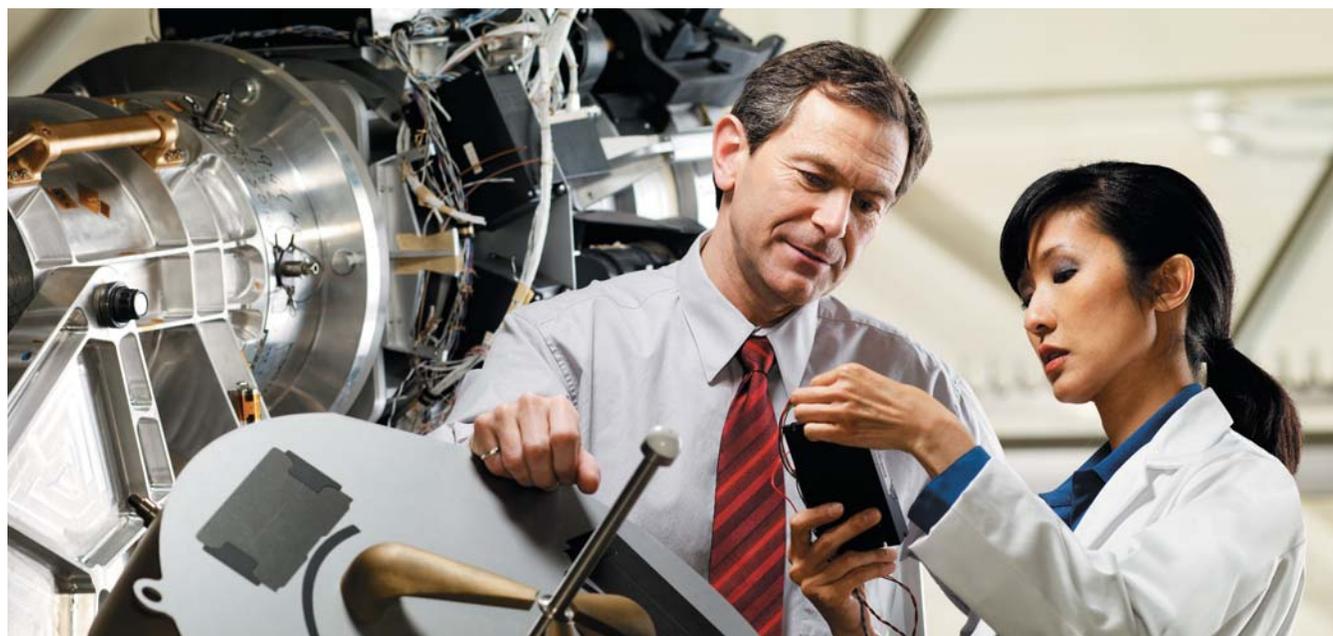
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