

# The effect of tobacco tax cuts on cigarette smoking in Canada

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## Abstract

**Objective:** To assess the effect of the tobacco tax cuts made in 1994 on the smoking habits of Canadians.

**Design:** Population-based retrospective cohort study.

**Data:** Data from the Survey on Smoking in Canada conducted by Statistics Canada on 11 119 respondents 15 years of age and older, who were interviewed about their smoking habits on 4 occasions, approximately every 3 months from January 1994 to February 1995.

**Outcome measures:** Changes in smoking prevalence, incidence, quit rates and mean number of cigarettes smoked per day in the provinces where tobacco taxes were cut and in those where taxes were not cut.

**Results:** During the survey, smoking prevalence decreased in all provinces, whether or not cigarette taxes had been cut. However, the prevalence of smoking was greater in the provinces where tobacco taxes had been cut than in those where they had not, and this difference increased from 2.0% at the beginning of the survey to 3.4% by the end ( $p < 0.001$ ). In addition, rates of starting cigarette smoking were higher and smoking quit rates were lower in the provinces where taxes had been cut than in those where taxes had not been cut.

**Conclusion:** Although smoking rates are declining in Canada, tobacco tax cuts appear to have slowed the rate of decline by inducing more nonsmokers to take up smoking and leading fewer smokers to quit.

## Résumé

**Objectif :** Évaluer l'effet des réductions de la taxe sur le tabac mise en oeuvre en 1994 sur les habitudes tabagiques des Canadiens.

**Conception :** Étude rétrospective de cohortes stratifiées représentatives.

**Données :** Données tirées de l'Enquête sur le tabagisme au Canada effectuée par Statistique Canada auprès de 11 119 répondants de 15 ans et plus, qui ont été interviewés au sujet de leurs habitudes tabagiques à 4 reprises, aux 3 mois environ, de janvier 1994 à février 1995.

**Mesures des résultats :** Changements de la prévalence du tabagisme, incidence, taux d'abandon et nombre moyen de cigarettes fumées par jour dans les provinces où les taxes sur le tabac ont été réduites et dans celles où elles ne l'ont pas été.

**Résultats :** Au cours de l'enquête, la prévalence du tabagisme était à la baisse dans toutes les provinces, que l'on y ait réduit ou non les taxes sur la cigarette. La prévalence du tabagisme était toutefois plus forte dans les provinces où les taxes sur le tabac avaient été réduites que dans celles où elles ne l'avaient pas été, et cet écart est passé de 2,0 % au début de l'enquête à 3,4 % à la fin de celle-ci ( $p < 0,001$ ). En outre, les taux d'adoption de la cigarette étaient plus élevés et les taux d'abandon plus bas dans les provinces où les taxes avaient été réduites que dans celles où elles ne l'avaient pas été.

**Conclusion :** Même si les taux de tabagisme sont à la baisse au Canada, les réductions des taxes sur le tabac semblent en avoir ralenti le fléchissement en incitant davantage de non-fumeurs à commencer à fumer et moins de fumeurs à cesser de fumer.



## Evidence

## Études

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As a result of the rise in cigarette taxes during the 1980s and early 1990s, Canadian retail prices reached a level that significantly increased demand for tobacco smuggled across the border from the United States. In order to curb this burgeoning underground trade, the federal government and some provinces cut tobacco taxes. The federal government cut its excise tax (levied at the manufacturer's end) from \$10.36 to \$5.36 per carton of 200 cigarettes in February 1994. After the federal tax cut, several provinces dropped their provincial tax rates (levied at the retailer's end) as well. Quebec dropped its tax rate in February 1994, and it was soon followed by New Brunswick, Ontario, Prince Edward Island and Nova Scotia. The federal government then cut the cigarette excise tax even further in these 5 provinces. By April 1994, the combined federal and provincial cuts had reduced tax rates in these provinces by between \$14 and \$21 per carton (Table 1).

After the tax rollback on cigarettes, health care professionals and antismoking lobby groups expressed alarm and concern about the negative health consequences of increased smoking by existing smokers and inducements to start smoking for nonsmokers.<sup>13,14</sup> Although tax increases have been shown to reduce cigarette consumption,<sup>15</sup> we have little knowledge to date of the effect of substantial tax rollbacks on smoking behaviour.

To improve this knowledge, Health Canada commissioned Statistics Canada to develop a survey to measure changes in smoking habits and behaviour resulting from

these marked changes in the price of cigarettes. We used data from the Statistics Canada Survey on Smoking in Canada to assess the effect of the 1994 tobacco tax cuts on the smoking habits of Canadians between January 1994 and February 1995.

## Methods

### Data

The Survey on Smoking in Canada employed a technique called random-digit dialing, in which respondents are sampled on the basis of a sequence of random telephone numbers generated by computer. Details of the survey questions and sampling techniques are available from the Special Surveys Division of Statistics Canada.<sup>16</sup> The survey was conducted in 4 cycles. In the first cycle, a sample of the Canadian population 15 years of age and older in all provinces, excluding those living in institutions, was surveyed between Apr. 20 and June 1, 1994. Respondents were asked their smoking status in January 1994 (before the federal and provincial tax cuts) as well as their current smoking status. In addition, respondents were asked whether they had quit or started smoking since January 1994. All surveys in cycle 1 were performed *after* the provincial and federal tax cuts had been enacted. In the second cycle, the respondents from the first cycle were reinterviewed between Aug. 16 and Sept. 16, 1994. In cycle 3, they were reinterviewed between Nov. 14 and Dec. 16, 1994, and, in cycle 4, they were again interviewed between Feb. 15 and Mar. 16, 1995. In cycles 2, 3 and 4, respondents were asked their current smoking status as well as whether they had quit or started smoking since the previous survey.

In the first cycle, 15 804 people were surveyed. During the remaining cycles, 4685 respondents were lost to follow-up. We used the data on the 11 119 survey subjects who responded to all 4 cycles. In extrapolating the survey results to the entire Canadian population, we used the weight variables supplied in the data set by Statistics Canada to adjust the calculations appropriately. According to the sampling variability guidelines accompanying the data, which account for the multistage sampling design of the survey, all of our extrapolations qualify for general, unrestricted release.

### Descriptive analysis

To explore the effect of the February 1994 tobacco tax rollback on the smoking habits of Canadians we analysed, for each period between survey cycles, (1) the change in the incidence of new smokers, (2) the change in the quit rate and (3) the change in cigarette consumption by

**Table 1: Cigarette tax rates per carton of 200 cigarettes<sup>1-12</sup>**

Province	Year; tax rate, \$		
	1993	1994	Date of change
<b>Provinces where provincial taxes were cut</b>			
Quebec	29.61	8.61	February 1994*
New Brunswick	29.45	15.45	February 1994
Ontario	28.85	9.65	February 1994†
Prince Edward Island	35.45	21.20	March 1994‡
Nova Scotia	29.45	15.45	April 1994
<b>Provinces where provincial taxes were not cut</b>			
Newfoundland	36.41	31.41	NA§
Manitoba	31.85	26.85	NA
Saskatchewan	31.85	26.85	NA
Alberta	29.85	24.85	NA
British Columbia	37.85	32.85	NA

\*The tax rate in Quebec subsequently increased, reaching \$10.81 in May 1995.

†The tax rate in Ontario subsequently increased, reaching \$10.85 in February 1995.

‡The tax rate in PEI was further reduced to \$19.20 in June 1994.

§NA = not applicable.



smokers, expressed as means and standard deviations. We then analysed the data in terms of the provinces where provincial tobacco taxes had been cut and those where taxes had not been cut. We tested for a significant difference in smoking prevalence between these 2 groups of provinces with Student's *t*-test. The *t*-test was derived from the tables of approximate sampling variability provided by Statistics Canada, which are adjusted for the multistage sampling design of the survey when calculating standard errors of the mean.

## Results

### Smoking prevalence

The population of Canadians aged 15 years and older in the provinces where tobacco taxes were cut was estimated at 15 770 100, whereas the population in the provinces without tobacco tax cuts was 7 019 200. Table 2 shows the prevalence of smoking in January 1994 (before the tobacco tax cuts) and during each survey cycle for the 2 groups of provinces. Provinces where taxes were cut had a higher prevalence of smoking at the start of the survey. Smoking prevalence declined during the entire survey period in both groups of provinces. However, the rate of decline was greater in the provinces where taxes were not cut (from 29.0% to 24.9%) than in the provinces where taxes were cut (from 31.0% to 28.3%). Thus, the difference in smoking prevalence between the 2 groups of provinces increased from 2.0 per-

centage points in January 1994 to 3.4 percentage points between February and March 1995 ( $t = 7.0, p < 0.001$ ).

### Smoking incidence

Table 3 shows the percentage of respondents to each cycle of the survey who had started smoking since the previous cycle. The rate for cycle 1 was calculated from the respondents' self-declared smoking status in January 1994. The reductions in the federal cigarette excise tax rate appear to have contributed to an increase in the rate of starting smoking, both in the provinces where provincial taxes had been cut and in those provinces where they had not. Rates of starting smoking in the provinces with provincial tax cuts were equal to those in the other provinces in cycle 2 and higher than those in the other provinces in cycles 1, 3 and 4. Thus, the difference in the rate of starting smoking between these 2 groups of provinces widened from 0.2 percentage points at the beginning of the survey period to 0.5 percentage points by the end.

This difference in the smoking incidence rate between the 2 groups of provinces (0.5 percentage points in cycle 4) may seem small. However, the absolute number of new smokers provides a different impression. We used the weights in the survey to estimate the difference in the number of new smokers in the 2 groups of provinces during the survey period. The estimated number of Canadians who took up smoking after January 1994 and did not stop smoking by February 1995 was 502 700 in the

**Table 2: Smoking prevalence in provinces with and without provincial cuts to cigarette taxes\***

Date of survey†	Prevalence, %		Difference, percentage points
	In provinces with tax cut	In provinces without tax cut	
January 1994	31.0	29.0	2.0
April to June 1994	31.0	28.0	3.1
August to September 1994	30.3	27.3	3.0
November to December 1994	30.3	27.0	3.3
February to March 1995	28.3	24.9	3.4

\*In all tables, survey results were extrapolated to the entire population with the use of weights supplied by Statistics Canada.  
†January 1994 figures are based on self-report.

**Table 3: Rate of starting smoking since previous survey or, for first cycle, since January 1994**

Date of survey	Incidence rate, %		Difference, percentage points
	In provinces with tax cut	In provinces without tax cut	
April to June 1994	0.9	0.7	0.2
August to September 1994	3.0	3.0	0.0
November to December 1994	3.1	2.5	0.6
February to March 1995	1.7	1.2	0.5



provinces where taxes had been cut and 460 600 in the provinces where taxes had not been cut.

### Smoking quit rates and amount smoked

Table 4 shows the rate at which Canadians ceased smoking during each survey cycle. Again, quit rates for cycle 1 were calculated on the basis of respondents' self-declared smoking status in January 1994. Although the quit rate increased during the survey period in both groups of provinces, it was lower in each cycle in the provinces where taxes had been cut than in those where they had not been cut. The most sizeable differences in quit rates between the 2 groups of provinces occurred in cycles 1 and 2, just after the tax rates had been reduced.

Table 5 presents the mean number of cigarettes smoked daily by smokers during each survey cycle. We included the number of cigarettes smoked by both daily smokers and smokers who did not smoke daily but reported having smoked at least once in the 7 days before the survey. The mean number of cigarettes smoked declined only slightly in both groups of provinces. However, the decline in the mean number of cigarettes smoked was greater in the provinces where taxes had not been cut than in the provinces where the taxes had been cut in both absolute terms (0.5 v. 0.1, respectively) and percentage terms (2.9% v. 0.6%, respectively).

### Discussion

We show that, despite the cigarette tax cuts in 1994, smoking prevalence declined in all Canadian provinces from January 1994 to February 1995. In addition, the

mean number of cigarettes smoked per day declined slightly in Canada during this period. These reductions in smoking may have been due to government efforts to limit smoking through regulations and antismoking campaigns.<sup>17</sup>

However, the rate of decline in smoking prevalence was lower in provinces in which provincial governments had supplemented the federal government's tax cuts with their own tax reductions. This lesser decrease in prevalence was due to a higher rate of starting smoking among former nonsmokers as well as to lower quit rates among current smokers. In addition, the mean number of cigarettes smoked per day declined more slowly in the provinces where provincial taxes had been cut than in those where taxes had not been cut.

It could be argued that the slower decline in prevalence in the provinces where taxes had been cut (2.7 v. 4.1 percentage points in the provinces where taxes had not been cut) is inconsequential. However, if the provinces with tax cuts had experienced the greater decrease in smoking prevalence observed in the other provinces, the provinces with tax cuts would have had an estimated 68 000 fewer smokers by the end of the survey period. Thus, small differences in prevalence translate into large differences in the number of smokers in Canada. Moreover, smoking prevalence might have declined even further during the survey period in all provinces if the federal government had not rolled back taxes in February 1994.

Approximately 30% of the respondents to cycle 1 of the Statistics Canada survey were lost to follow-up and were therefore excluded from the analysis. To determine how this sample attrition may have affected our results, we compared the smoking behaviour of the 4685 respon-

**Table 4: Quit rate since previous survey or, for first cycle, since January 1994**

Date of survey	Quit rate, %		Difference, percentage points
	In provinces with tax cut	In provinces without tax cut	
April to June 1994	2.5	5.7	3.2
August to September 1994	9.1	10.1	1.0
November to December 1994	7.9	8.1	0.2
February to March 1995	10.3	10.7	0.4

**Table 5: Number of cigarettes smoked per day**

Date of survey	Mean no. of cigarettes smoked per day (and standard deviation)		Difference in mean no.
	In provinces with tax cut	In provinces without tax cut	
April to June 1994	16.5(10.31)	17.0(10.88)	0.5
August to September 1994	16.3 (9.44)	17.5(12.10)	1.2
November to December 1994	16.2 (9.22)	16.9(10.98)	0.7
February to March 1995	16.4 (9.06)	16.5(10.81)	0.1



dents in cycle 1 who were subsequently lost to follow-up with that of the 11 119 subjects who completed the 4 survey cycles. We found that the respondents lost to follow-up were more likely to be smokers in cycle 1 (37.7% were smokers) than the respondents who completed the 4 cycles (of whom 30.1% were smokers).

However, the respondents lost to follow-up living in the provinces where taxes were not cut reported a greater decline in smoking prevalence between January 1994 and the cycle 1 survey (0.4%) than those living in the provinces where taxes were cut (0.2%). This result is similar to that for the sample. Moreover, the higher rate of starting smoking between January 1994 and cycle 1 in the provinces where taxes were cut than in the other provinces among the sample of respondents was also reported among the respondents lost to follow-up (1.7% in the provinces with tax cuts v. 1.1% in the other provinces). Likewise, the higher propensity to quit smoking between January 1994 and cycle 1 in the provinces where taxes were cut than in the other provinces among the sample of respondents was also reported among the respondents lost to follow-up (3.6% in the provinces with tax cuts v. 3.5% in the other provinces). Thus, although the respondents lost to follow-up were more likely to be smokers than those who completed the entire survey, their differential changes in smoking behaviour observed in cycle 1 were similar to those in the sample we used for analysis. In fact, if there was any effect due to attrition, we think it may have caused an underestimate of the negative effects of the tax cuts on smoking.

Any inferences drawn from the effects of the tax rollback should be tempered by the fact that the data we analysed covered only the period between January 1994 and February 1995. We did not determine whether the effects observed during this period have persisted. In addition, the prevalence of smoking in the provinces with tax cuts may have declined more slowly for reasons other than the 1994 tax rollback. However, data from the Statistics Canada General Social Surveys of 1985 and 1991 indicate that, during this early 6-year period, smoking prevalence was declining faster in the provinces that implemented tax cuts in 1994 (from 35.3% in 1985 to 31.2% in 1991) than in the provinces that did not (from 34.7% in 1985 to 31.0% in 1991). Thus, the subsequent reversal in these trends in the decline of smoking prevalence between these 2 groups of provinces during the survey period is consistent with the hypothesis that the 1994 tax rollbacks slowed the reduction in smoking prevalence in Canada.

When considering the benefits of the February 1994 tobacco tax rollback in reducing cigarette smuggling, policy-makers and health care professionals must also consider the health consequences of this intervention. The benefits of reduced smuggling must be weighed against

the costs of illness and health care expenditures due to increased smoking. Given the long-term nature of many smoking-related illnesses, the health and cost consequences of this increase in smoking are likely to be felt for many years to come.

Further analysis of the effect of the tobacco tax cuts on particular subgroups, including the youth population and low-income people, are also of interest. These subgroups are more responsive to changes in cigarette prices than the general population, according to studies conducted in the United States and the United Kingdom.<sup>18,19</sup> Only with continued surveillance and monitoring of smoking trends will we be able to assess the long-term costs to Canadians' health and our health care system.

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