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# Risks Associated with Tobacco Use in Youth Aged 15–19



*Analysis drawn from the 2004 Canadian Addiction Survey*

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## Abstract

This report examines the prevalence and correlates of tobacco use among youth aged 15–19 using data from the Canadian Addiction Survey (2004), a telephone survey of Canadians 15 years of age and older. It is estimated that 26.7% of youth were using tobacco in the 12 months prior to the survey, which is higher than 18–19% estimated by the Canadian Tobacco Use Monitoring Survey for the same period. The data indicate that use of tobacco by youth is associated with more frequent use of alcohol, cannabis and other illicit drugs, relative to youth who do not smoke and to adults who do or do not smoke.

## Introduction

Use of tobacco increases risk of a variety of diseases, including cancers of various sites, respiratory infections, diabetes, and coronary heart disease. Campaigns to inform the public of these risks have resulted in a general decrease in smoking prevalence among all age groups in Canada (Health Canada, 2005). Despite these efforts, and laws that restrict access to tobacco by those under the age of 18, a significant number of Canadians under the age of 25 continue to take up smoking every year (Hammond, 2005).

In addition to the well-known health risks of using tobacco, research indicates that people who use tobacco are also likely to use other addictive and illicit substances. For instance, Australian researchers have shown that cigarette smokers are more likely to use cannabis, and that use of either substance is associated with past-year use of sedatives (e.g., barbiturates), stimulants (e.g., amphetamine, ecstasy), or opiates (e.g., heroin) (Degenhardt, Hall, & Lynskey, 2001a, 2001b). Similarly, research on American youth indicates that users of tobacco and/or alcohol are more likely to use

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marijuana, and that use of marijuana significantly increases the odds of subsequently using cocaine (Wagner & Anthony, 2002). Other American research indicates that cigarette use in youth predicts subsequent alcohol and drug abuse and dependence (Lewinsohn et al., 1999) and that people who meet the criteria for cannabis abuse or dependence disorders are likely to also have alcohol abuse or dependent disorders (Kessler et al., 1997). In summary, these studies indicate that people who smoke cigarettes are more likely than those who do not smoke to use, abuse, and become dependent on other illicit substances.

In this report, we examine the extent to which use of tobacco is associated with use of alcohol, cannabis and other illicit drugs, and we contrast these associations in youth (ages 15–19) to those in adults since use of these substances in youth may have special significance. For instance, prior research indicates that youth who smoke cigarettes and also use alcohol are more likely to binge drink (i.e., drink five or more drinks per occasion) (Adlaf & Racine, 2005; Plant, Miller, & Plant, 2005), and youth who smoke cigarettes and also use cannabis are more likely to develop early dependency on the drug (i.e., meet criteria for cannabis dependency within two years of onset) (Chen, O'Brien, & Anthony, 2005; DeWit et al., 2000).

Since most of those who take up smoking are youth, and since tobacco use is associated with use of alcohol, cannabis and other drugs, we examine the prevalence of tobacco use in youth in the Canadian Addiction Survey (CAS), and the extent to which use of tobacco is associated with use of alcohol, cannabis and other drugs. Although tobacco is often referred to as a “gateway” drug—insofar as its use is thought to increase the likelihood of subsequently trying more serious drugs—our data do not speak to the order in which these drugs are taken up.

## Method

The CAS is a telephone survey conducted in late 2003 and early 2004. It is based on a two-stage (telephone household, respondent) random sample of 13,909 people 15 years of age and older, stratified by 21 regional areas defined by Statistics Canada’s Census Metropolitan Areas and also comprising non-CMA areas within each province. Weights have been applied to data based on 252 population classes, stratified by the 21 regional areas by six age groups and by sex to yield a sample that is representative of the Canadian population aged 15 and older. Questions on tobacco use (i.e., smoking cigarettes) were asked of one panel representing a random one-third of the sample. Cigarette smokers in this report were defined as those who indicated that they smoked “daily” or “occasionally” when asked the question: “At the present time do you smoke cigarettes daily, occasionally, or not at all?”<sup>1</sup> Detailed information on the sample and methods has been published elsewhere (Adlaf & Rehm, 2005). Interviews were conducted in French or English. Response rate was 47%.

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<sup>1</sup> Some researchers make a distinction between current smokers and former smokers. Among the 15–19 year olds, less than 5% indicated that they were former smokers—too small a group for meaningful analyses. Nevertheless, this small group, compared to current and non-smokers in both youth and adult subsamples, generally scored closer to non-smokers than to current smokers. For this reason, they are combined in our analyses with non-smokers.

## Results

### Rates of Tobacco Use

Data from the CAS indicate that 26.7% of Canadian youth aged 15–19 reported smoking cigarettes at least occasionally. This is not significantly higher than the proportion of the 20+ population who reported smoking (24.7%). According to the CAS, 30.7% of males under age 20 reported that they smoke, whereas 22.8% of females under age 20 reported that they smoke. Although the prevalence estimate for those aged 20 and older is consistent with the Canadian Tobacco Use Monitoring Survey, the prevalence estimate for youth is higher than the CTUMS estimate for 2004 of 18–19%.<sup>2</sup> Of those youth who reported smoking, 78% described themselves as regular smokers.

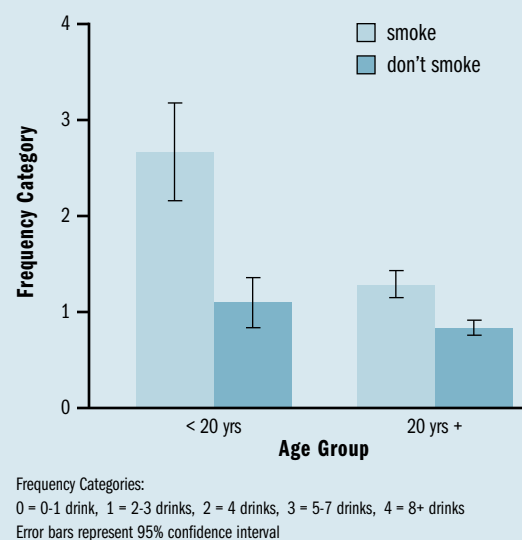
### Risks Associated with Smoking

#### 1. ALCOHOL USE

Across all age groups, smokers were somewhat more likely than non-smokers to report consuming alcohol in the past year (84.6% of smokers vs. 78.6% of non-smokers). Interestingly, this association of smoking with drinking varied by age group, with the strongest link among those in the under-20 age group. That is, among those under age 20, smokers were 14 times more likely to consume alcohol than were their non-smoking peers. This effect was consistent across both sexes, and applied to those under the legal drinking age (15–17 year olds) as well as those at the drinking age (18–19 year olds). Based on the CAS data, we estimate that 97.7% of smokers aged 15–19 had consumed alcohol in the past year compared to 75.3% of non-smokers in this age group.

Smoking youth were also more likely to engage in binge drinking. On days when they drank alcoholic beverages, smokers in the 15–19 age range averaged about five drinks, compared to their non-smoking peers, who averaged two or three drinks (see Figure 1). Smokers under the legal drinking age (15–17) drank as frequently as those at the legal drinking age (18–19). Although males tended to drink more than females, the difference between smokers and non-smokers was consistent across the sexes.

**Figure 1: Typical Alcohol Consumption on Drinking Days**



Recounting the number of drinks consumed in the past week, teenage smokers (males and females, and those under the legal drinking age and those at the legal drinking age) averaged five drinks, which was more than twice the number of drinks non-smoking teens consumed in the past week. Of greater concern, however, is the finding that almost 60% of youth who smoked met criteria for hazardous drinking, as defined by a score of eight or higher on the World Health Organization's Alcohol Use Disorder Identification Test (AUDIT) (Saunders, Aasland et al., 1993; Babor, Higgins-Biddle et al., 2001), compared to 23.7% for non-smoking youth.

<sup>2</sup> The CAS prevalence rates for tobacco use are comparable to those reported in the 2005 Ontario Student Drug Use Survey, which ranged from 18% for Grade 10 students to 24% for Grade 11 students (Adlaf & Paglia-Boak, 2005).

## 2. CANNABIS USE

There was a significant association between tobacco smoking and cannabis use: among tobacco smokers (all ages), 29.5% reported using cannabis in the past 12 months whereas among non-smokers, only 10% reported using cannabis in the past 12 months.

Breaking this down by age, however, there was a clear difference in the likelihood of cannabis use for smokers versus non-smokers as a function of age. Specifically, those smokers (males and females) in the under-20 age range were more than 20 times more likely to use cannabis than their non-smoking peers, whereas the odds ratios for those in other age ranges never exceeded 4.0. Table 1 shows the proportion of past-year cannabis users among

smokers and non-smokers. Note that collapsing across the 15–17 and 18–19-year-old groups, as is summarized in Table 2, we find that whereas 91% of smokers in this age group also reported using cannabis in the past 12 months, only 28.8% of non-smokers in this age group reported using cannabis.

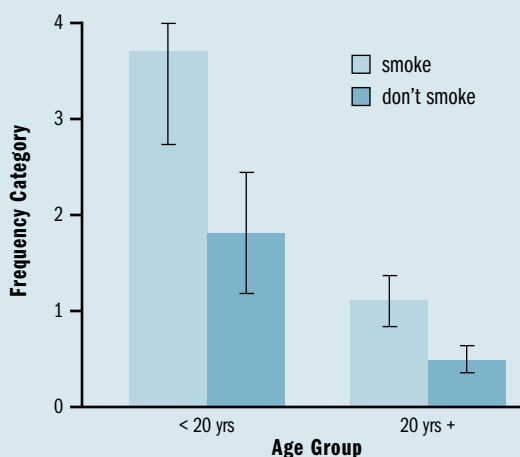
Young smokers also reported using cannabis more frequently. The mean frequency of cannabis use in the past three months among young smokers who have tried cannabis was between “weekly” and “daily”, compared to a rate of “monthly” among non-smoking youth (see Figure 2). This effect was consistent across males and females.

**Table 1: Cannabis Use (Past 12 Months) as a Function of Smoking Status by Age Group**

Age Group	% Cannabis Users Among Smokers	% Cannabis Users Among Non-smokers	Odds Ratio
15-17	87.0	21.2	24.9*
18-19	93.0	39.7	20.2*
20-24	56.8	28.2	3.4*
25-34	36.8	12.8	4.0*
35-44	20.3	10.2	2.2*
45-54	12.6	5.5	2.5*
55-64	S	S	S
65+	S	S	S

\* indicates Odds Ratio is statistically significant ( $p < .05$ )

S indicates estimate suppressed due to unacceptably high sampling variability

**Figure 2: Frequency of Cannabis Use in Past 3 Months Among Lifetime Cannabis Users**

Frequency Categories:  
0 = never 1 = once/twice, 2 = monthly, 3 = weekly, 4 = daily

### 3. OTHER DRUGS USE

Teenage smokers were much more likely than teenage non-smokers to report using illicit drugs (other than cannabis). Whereas only 3.5% of non-smoking youth reported using cocaine, heroin, amphetamine, ecstasy or hallucinogens in the past year, 31% of smoking youth reported using one or more of these drugs (See Table 2).

**Table 2: Alcohol, Cannabis and Other Drug Use as a Function of Smoking Status by Age Group**

Substance	Age Group <sup>2</sup>	Smokers <sup>1</sup>		Non-smokers		Odds Ratio
		%	[95% CI]	%	[95% CI]	
Alcohol Use	< 20 yrs	97.7	[94.1, 99.1]	75.3	[65.3, 83.2]	14.1*
	past 12 months	83.4	[79.0, 87.0]	78.9	[76.2, 81.3]	1.3
Alcohol: AUDIT <sup>3</sup> 8+	< 20 yrs	59.5	[40.0, 76.3]	23.7	[15.9, 33.7]	4.7*
	20 yrs +	21.8	[17.6, 26.7]	9.6	[7.8, 11.8]	2.6*
Cannabis Use	< 20 yrs	91.0	[84.6, 94.9]	28.8	[20.0, 39.5]	25.0*
	past 12 months	23.8	[19.7, 28.6]	8.5	[6.8, 10.5]	3.4*
Other Drug Use	< 20 yrs	31.0	[16.2, 51.1]	3.5	[1.5, 7.7]	12.5*
	past 12 months	5.1	[3.4, 7.7]	0.7	[0.4, 1.3]	7.6*

<sup>1</sup> Currently smoke at least occasionally.

<sup>2</sup> Age group of "< 20" includes participants aged 15-19.

<sup>3</sup> AUDIT is Alcohol Use Disorders Identification Test, an instrument developed by the World Health Organization to screen for drinking problems. Scores of 8+ are conventionally considered indicative of a hazardous and harmful drinking pattern.

\* Odds Ratio is significant,  $p < .05$

## Discussion

It is well known that use of tobacco increases risk for a number of diseases, and the recent report, *The Costs of Substance Abuse in Canada 2002* (Rehm et al., 2006), indicates that social costs of tobacco use are substantial. The data presented here suggest that tobacco use in youth is correlated with use of a variety of other illicit or harmful substances, each of which is linked to problems with mental (e.g., decreased memory and problem-solving abilities, substance abuse and dependency, depression, conduct disorders, psychosis) and physical health (e.g., liver disease, stroke, heart disease) as well as accidental injury (for a review, see Paglia & Room, 1999). For instance, in addition to the carcinogenic properties of cannabis (e.g., tar, benzanthracenes, benzopyrenes), research suggests that modest use of cannabis impairs cognitive and psychomotor performance in ways similar to alcohol (Ashton, 2001). In addition to health risks, previous research drawing on high school student survey data from the U.S. and Canada has noted that illicit drug (including cannabis) use and binge drinking are independently and significantly associated with violent behaviour in both countries, even after statistically controlling for gender and academic grades (Harrison, Erickson, Adlaf, & Freeman, 2001).

The data do not speak to whether tobacco is a gateway for use of other substances. That is, we are unable to determine whether tobacco use leads to cannabis use, and cannabis use to illicit drug use. However, the data do suggest that tobacco use in youth is a powerful and effective marker of other substance use: almost all youth who reported smoking also reported consuming alcohol

and using cannabis in the past year, but not all who reported using cannabis or consuming alcohol were smokers (for a similar finding in the U.S., see Weitzman & Chen, 2005). Thus, tobacco smoking in youth is a good indication that youth may be engaging in other risky behaviour.

Clearly not all youth who use tobacco also abuse or are dependent on alcohol, cannabis or other illicit drugs. Recent research suggests, however, that use of these substances is more likely to lead to abuse, dependence, and mental health problems in young people than is the case for adults (Ashton, 2001; Chen et al., 2005, DeWit et al., 2000, 2001; Raphael et al., 2005). Although we do not have clear data in the CAS on drug abuse and dependency, it is evident from the data reported here that youth who smoke are much more likely to engage in problematic drinking behaviour and to use cannabis regularly.

It is cause for concern that the high rates of problematic drinking are as common among those teen smokers under the legal drinking age as they are among those at the legal drinking age. Teenage smokers appear to have ready access to significant quantities of alcohol, despite being under the legal age for obtaining both tobacco and alcohol.

It is important to keep in mind that estimated use of substances was based on self-report. Although self-report on an anonymous survey may be the best means available of obtaining prevalence data, it must be acknowledged that individuals may be motivated to misrepresent their actual use of these substances.

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