

Alcohol and Other Drug Use Among Adolescent Students in the Atlantic Provinces

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The objective of this study was to estimate the prevalence of alcohol and other drug use among students in junior and high school in the Atlantic region as a whole, and to determine if the prevalence of use differed among the provinces of Nova Scotia (NS), New Brunswick (NB), Newfoundland and Labrador (NF) and Prince Edward Island (PEI).

The 1996 Student Drug Use survey was part of a coordinated initiative accomplished in NS, NB, NF and PEI.¹⁻⁴ The surveys were province-wide self-reported drug use surveys of students in the public school system in grades 7, 9, 10, and 12. Participation was anonymous and confidential. The sample design was a single-stage cluster sample of randomly selected classes stratified by grade and health region. Each province performed its own survey in the spring of 1996, adhering to a standard protocol developed and pilot tested in 1994-1995.⁵

In the present article, for alcohol, "any use" refers to use in the 12 months prior to the survey, ranging from more than a sip to daily use of alcohol. Tobacco refers only to cigarettes and "any use" refers to smok-

	NS	NB	NF	PEI
Total number of students enrolled in grades 7, 9, 10 & 12	50,226	43,396	35,447	7,942
Percentage of students absent at the time of the survey	13%	not available	20%	11%
Participation rate among those present on the day of the survey (%)	98%	not available	98%	98%
Number of respondents	3,790	3,339	3,332	3,066
Mean age of respondents	15.2 years	15.1 years	14.9 years	15.2 years
Percentage of respondents by gender	50% female	47% female	50% female	53% female

ing more than one cigarette in the 12 months prior to the survey. For all other drugs, "any use" refers to use on one or more occasions during the 12 months prior to the survey.

To correct for over and under sampling, the data were weighted to represent the number of students in each stratum, based on a census of the total number of students in each stratum.⁶ The overall estimates pertaining to the Atlantic region as a whole were weighted to take into account the disproportional sample design. The standard errors used to compute 95% confidence intervals were adjusted for the intra-cluster correlation arising from the cluster sampling design, by means of the Kish design effect,⁷ and were verified using the bootstrap procedure.⁸ In NB, the surveys were collected without a record of in which class the individuals belonged so that cluster effects cannot be estimated for NB. Previous studies suggest that NS and NB are similar in drug use prevalence,^{9,10} therefore, the design

effect estimate for NS was used as a proxy for that of NB. Similarly, the design effect estimate for NS, PEI and NF together was used as a proxy for that of all four provinces. Multivariate logistic regressions were performed to assess the independent influence of province, gender and age on any use of specific drugs. To account for the multiplicity of multivariate analyses, a stringent p-value ($p < 0.01$) was taken as significant. The *Stata* computer program was employed for all statistical analyses.¹¹

Table I shows a total sample size of 13,527, with each province obtaining an adequate sample size, and response rate (where available). The distribution according to gender was significantly different in the four provinces ($p < 0.001$). Rather than making assumptions about gender and performing post-hoc corrections for the differential gender distribution, the possible role of gender in causing differential prevalence rates was taken into account through multivariate analyses.

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TABLE II
Prevalence of Any Use in the 12 Months Prior to the Survey and Interprovincial Differences Based on Univariate Analyses

	NS		NB		NF		PEI		Atlantic Region		Interprovincial Differences
	%	95% CI	%	95% CI	%	95% CI	%	95% CI	%	95% CI	
Alcohol	54.1	±2.0	51.9	±2.1	55.4	±2.5	51.4	±2.8	53.6	±1.4	ns
Cigarette smoking	34.8	±2.1	32.8	±2.2	35.7	±3.0	33.1	±2.4	34.3	±1.5	ns
Cannabis	32.1	±2.0	28.8	±2.0	22.8	±2.2	22.2	±2.2	28.1	±1.3	■
LSD	12.4	±1.3	15.1	±1.4	6.6	±1.2	8.2	±1.4	11.5	±0.9	■
Stimulants – non-medical	8.9	±1.1	9.2	±1.2	4.5	±1.1	6.2	±1.0	7.7	±0.7	■
Stimulants – medical	4.9	±0.7	3.7	±0.7	4.0	±0.7	4.5	±0.7	4.3	±0.4	ns
Psilocybin/mescaline	8.3	±1.0	8.3	±1.1	10.3	±1.6	8.7	±1.3	8.9	±0.8	ns
Inhalants	7.2	±0.9	5.9	±0.9	8.0	±1.1	7.2	±1.1	7.0	±0.6	•
Tranquilizers – non-medical	4.8	±0.9	4.5	±0.9	4.0	±1.2	3.9	±0.8	4.4	±0.6	ns
Tranquilizers – medical	5.7	±0.8	5.2	±0.8	5.3	±0.8	4.7	±0.7	5.4	±0.5	ns
Cocaine	3.5	±0.7	4.7	±0.8	3.0	±0.6	3.5	±0.7	3.8	±0.5	•
Steroids	2.8	±0.6	2.7	±0.6	2.2	±0.9	2.1	±0.5	2.6	±0.4	ns
PCP	2.6	±0.6	3.8	±0.8	1.1	±0.3	1.8	±0.5	2.6	±0.4	■
Heroin	2.1	±0.5	2.4	±0.6	1.3	±0.4	2.0	±0.6	2.0	±0.3	•
Barbiturates – non-medical	1.8	±0.5	2.5	±0.6	1.6	±0.5	1.9	±0.5	1.9	±0.3	ns
Barbiturates – medical	1.2	±0.4	1.3	±0.4	1.3	±0.4	1.4	±0.4	1.3	±0.2	ns

ns No significant difference among the four provinces
 ■ NS & NB not significantly different, NF & PEI not significantly different, but the percentages are significantly higher in the former pair than in the latter.
 • The highest and lowest provincial estimates are significantly different but other pair-wise comparisons are not significantly different.

Table II shows that on univariate analysis, the prevalence of any use of alcohol, cigarettes, medical stimulants, psilocybin/mescaline, non-medical and medical tranquilizers, steroids, and non-medical and medical barbiturates was not significantly different in the four provinces.

Table II also reveals two patterns of inter-provincial differences. The first is the situation where NS and NB are not significantly different, and NF and PEI are not significantly different, but the proportions of use among students in the former two provinces are significantly higher than those in the latter two provinces. Such is the case with cannabis, LSD, non-medical stimulants and PCP.

The second pattern of inter-provincial differences is the situation where the highest and lowest of the four provincial estimates are significantly different but other pair-wise comparisons show no significant difference. For example, the proportion of students reporting inhalant use is significantly higher in NF than in NB; however, neither province differs significantly from the remaining two provinces. A similar pattern emerges in the case of cocaine and heroin.

Table III shows that province is an independent risk factor for any use of several drugs, taking into account gender and age. Thus, it can be seen that even after controlling for gender, students in NB are at higher risk of LSD, cocaine and PCP use,

TABLE III
Multivariate Logistic Regression Models of the Prevalence of any Use of Specific Drugs, Taking into Account Province, Gender and Age

Any use of ...	NS	NB	Adjusted odds ratios		Gender	Age
			NF	PEI		
Alcohol	1	1.00	1.20 *	0.97	0.90 †	1.68 *
Cigarette smoking	1	0.97	1.11	0.98	1.12 †	1.30 *
Cannabis	1	0.90	0.66 *	0.63 *	0.78 *	1.44 *
LSD	1	1.33 *	0.53 *	0.67 †	0.65 *	1.34 *
Stimulants – non-medical	1	1.10	0.52 *	0.70	0.99	1.26 *
Stimulants – medical	1	0.78	0.84	0.91	1.28 †	1.09 *
Psilocybin/mescaline	1	1.05	1.41 *	1.16	0.53 *	1.32 *
Inhalants	1	0.77 †	1.09	0.99	0.78 *	0.86 *
Tranquilizers – non-medical	1	0.97	0.85	0.83	0.97	1.16 *
Tranquilizers – medical	1	0.95	0.96	0.83	1.11	1.11 *
Cocaine	1	1.37 †	0.87	1.04	0.63 *	1.12 *
Steroids	1	0.97	0.81	0.80	0.37 *	1.11 *
PCP	1	1.52 †	0.43 *	0.70	0.63 *	1.21 *
Heroin	1	1.11	0.60 †	0.94	0.74	0.95
Barbiturates – non-medical	1	1.46	0.93	1.11	1.00	1.18 †
Barbiturates – medical	1	1.06	1.03	1.12	0.99	0.96

* $p < 0.001$ † $0.001 \leq p < 0.01$

and lower risk of inhalant use, compared with students in NS. Students in NF are at higher risk of alcohol and psilocybin/mescaline use, and at lower risk of cannabis, LSD, non-medical stimulants, PCP and heroin use, than are students in NS.

The underlying causes of similarities and differences in the prevalences found in the four Atlantic provinces are not known. However, knowledge of the existence of the situation may be useful, for example, as a stimulus for a given province to address a higher prevalence, or as a baseline against which comparisons can be made after the

implementation of an intervention. The emergence of a higher prevalence of use of several drugs in the two mainland provinces in contrast with the two island provinces certainly leads to the speculation of differential availability related to geography.

Our study reveals marked increases in the prevalence of cigarette smoking and the use of hallucinogens among adolescents since 1991/92. At that time in NS and NB, the rates of cigarette smoking, cannabis use and LSD use were about 26%, 17% and 8% respectively.^{1,4,12} Although information about drug use in

1991/92 is not available for PEI or NF, clearly the proportions of adolescents who reported cigarette smoking and cannabis use in 1996 were significantly higher than observed in NS and NB five years earlier. An upward trend in substance use among adolescents has also been noted elsewhere in Canada, and in the United States and the United Kingdom.¹³⁻¹⁶ For example, from 1991 to 1997, Ontario experienced significant increases in the prevalence of cigarette smoking (from 21.7% to 27.6%) and cannabis use (from 11.7% to 24.9%).^{13,14} Clearly, the high rates and increases reported in the present study leave no room for complacency concerning adolescent drug use, in any of the Atlantic provinces.

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