

Personal health practices: Smoking, drinking, physical activity and weight

Highlights

- The proportion of young adults aged 20 to 24 who are at least moderately physically active in their leisure time increased between 1994/95 and 1998/99.
- The prevalence of smoking among teen girls aged 15 to 19 is higher than among teenage boys.
- Heavier drinking (at least five alcoholic drinks per occasion) increased among both males and females between 1994/95 and 1998/99. Fully 45% of males aged 20 to 24 did so at least monthly in 1998/99.

Personal health practices have an important influence on health at any age. However, decisions made in the teen and young adult years may be particularly important to future health. For example, the vast majority of daily adult smokers begin smoking daily in their teens.¹ Further, it has been shown that the younger the age of daily smoking initiation, the lower the chances of quitting as an adult, and the stronger the addiction to nicotine.¹ The proportion of youths practising risky lifestyle behaviours may also differ from the rest of the population. For example, while smoking has been declining in the Canadian population as a whole, the prevalence of youth smoking increased between 1991 and 1994/95.²

This article looks at some of the most recent findings from the 1998/99 National Population Health Survey (NPHS) related to smoking, binge drinking and physical activity patterns, as well as the prevalence of overweight (see *Methods and Definitions*). Coefficients of variation (CVs) and changes in proportions across data years were examined only for NPHS data, and these tests accounted for multiple

comparisons: 1994/95 versus 1996/97; 1994/95 versus 1998/99; and 1996/97 versus 1998/99. In addition, data from the 1978/79 Canada Health Survey (CHS) and the 1985 and 1991 General Social Survey (GSS) were used to produce time series data for rates of smoking and overweight. The tables show rates for respondents aged 15 or older, by age group. However, the analysis focuses on young Canadians aged 15 to 19 and 20 to 24.

Data analyzed for this article pertain only to the provinces. In addition, body mass index figures in the teen years may change substantially in adulthood. However, tracking overweight trends in teens and young adults is still useful in determining overall trends.

Fluctuations in youth smoking not significant

For the 15-to-19 and 20-to-24 age groups, both daily and current smoking remained fairly stable across the three NPHS cycles (1994/95, 1996/97 and 1998/99) when the sexes are combined (Table 1). And although it appears that rates observed separately by sex for these age groups see greater changes, none of these was statistically significant. For example, the “current” smoking rate for boys aged 15 to 19 dropped by 5 percentage points between cycles 1 and 3 (28% compared with 23%), but this failed to reach statistical significance. Similarly, the current smoking rate for girls aged 15

Methods

Data sources

The time series on at least monthly or at least weekly binge drinking and on at least moderate exercise are from the first three cross-sectional National Population Health Survey (NPHS) Health files (1994/95, 1996/97 and 1998/99) (see *Annex*). In addition to these files, data from the Canada Health Survey (1978/79) and from the General Social Survey (GSS) (1985 and 1991) were used to produce time series data for current and daily smoking rates, as well as some excess weight and overweight rates. Surveys were selected based on the comparability of occasional smoking data.³ (A brief description of these surveys can be found in reference 2.) In addition, to perform the longitudinal analysis on new smokers and new binge drinkers, the 1994/95-to-1998/99 longitudinal NPHS file was used.

Analytical techniques

All analyses performed utilized respondent data weighted to represent the Canadian population. Coefficients of variation (CVs) for prevalence estimates, comparisons between prevalences (1994/95 versus 1996/97; 1994/95 versus 1998/99; 1996/97 versus 1998/99) and p-values for odds ratios were performed only for NPHS data, using the bootstrap variance estimation technique, which accounts for sample design complexity, such as clustering.^{4,6} Tests for statistically significant differences were adjusted for multiple (three) comparisons using the Bonferroni approach.

Multiple logistic regression was performed to investigate which 1994/95 respondent characteristics were associated with becoming a new smoker or new binge drinker by 1998/99. Respondents kept

for the multivariate analysis on new daily/occasional smokers were aged 12 to 15 or 16 to 19 in 1994/95 and had reported being a “never smoker” at that time. They had then either become a daily/occasional smoker or had remained a never smoker by 1998/99. All other respondents were removed from the analysis. Similar criteria were used in selecting respondents for analysis on new daily smoking. For the models used to investigate new monthly or more frequent binge drinking by 1998/99, respondents had to report no binge drinking or binge drinking on less than a monthly basis in cycle 1. A similar definition was used for new weekly or more frequent binge drinkers.

Limitations

Analysis was performed for provincial data only. Body mass index figures calculated to obtain some excess weight and overweight rates are not usually used for people under the age of 21 or over the age of 65, because they are not considered reliable. However, time series data can still provide useful trend information for these sub-populations. Pregnant women are out-of-scope for BMI measurements, but they could not be identified, and, therefore, they were not removed from the GSS files. Information on binge drinking was collected differently in 1994/95. Respondents were asked how many times in the last year they had had five or more alcoholic drinks per occasion, whereas in 1996/97 and 1998/99, they were asked how often in the last year they had had five or more alcoholic drinks per occasion (that is, more than weekly, weekly, monthly, etc).

to 19 seems to have increased slightly between NPHS cycles, but the changes were not statistically significant. However, the difference between the sexes in that age group was significant in the last NPHS cycle, with girl smokers at 32%, compared with 23% of boys. What makes these smoking rates all the more troubling, particularly in teenage girls, is that young smokers are almost as well aware as young non-smokers of the health risks associated with lighting up.⁷

Young adults aged 20 to 24 are more likely than any other age group to smoke. And although it appears that men and women in this age category have been fluctuating back and forth in terms of having the higher smoking prevalence, the only time point in the NPHS collection periods where this difference was significant was in 1996/97, when it was a greater proportion of men smoking (38% compared with 31% of women).

Some of the changes observed in the older age groups did achieve statistical significance. For women aged 25 to 44, the rate of 31% observed in cycles 2 and 3 of the NPHS were both lower than the 34% observed in cycle 1. Similarly, men in that age group saw lower rates in both 1996/97 and 1998/99 as compared with 1994/95. A significant drop was also observed for men in the next age category (45- to 64-years-old) between cycles 1 and 3 of the NPHS.

A multivariate analysis was conducted using the 1994/95-to-1998/99 NPHS longitudinal file to observe which factors, if any, were associated with youths taking up current or daily smoking four years later (Table 2). Variables examined include sex, low self-esteem, being overweight, having two or more chronic conditions, and differences in household income. None of these factors had any association with future smoking, either before or after adjusting for multiple factors (unadjusted results not shown).

Table 1
Smoking, by age and sex, household population aged 15 or older, Canada excluding territories, 1978/79 to 1998/99

	Current smoking [†]						Daily smoking [‡]					
	1978/79	1985	1991	1994/95	1996/97	1998/99	1978/79	1985	1991	1994/95	1996/97	1998/99
	%						%					
Both sexes												
Total	41	35	31	31	29 [§]	28 [§]	37	30	26	25	25	24 [§]
15-19	38	27	23	28	29	28	33	20	16	20	22	22
20-24	51	42	40	36	35	37	47	35	28	29	28	29
25-44	45	39	36	37	33 [§]	33 [§]	41	34	31	31	29 [§]	28 [§]
45-64	39	35	30	29	26	26 [§]	37	32	26	25	24	23
65+	22	21	16	15	15	13	21	18	13	12	12	11
Men												
Total	44	37	32	33	31	29 ^{§††}	41	33	26	27	27	25 [§]
15-19	36	26	20	28	28	23	32	20	12	19	21	19
20-24	52	39	44	33	38	38	49	32	28	27	31	30
25-44	48	43	37	39	36 [§]	34 [§]	45	38	33	33	32	30
45-64	44	38	29	32	29	27 [§]	42	36	25	27	26	25
65+	32	26	18	17	17	15	30	23	15	14	15	13
Women												
Total	37	32	30	28	26 [§]	26 [§]	33	28	26	24	22 [§]	22
15-19	40	28	26	30	31	32	34	21	20	21	23	25
20-24	50	45	35	38	31	36	45	38	27	30	25	27
25-44	41	35	34	34	31 [§]	31 [§]	37	31	30	29	27	26
45-64	34	33	31	25	24	24	32	29	28	22	22	22
65+	15	17	15	13	13	12	14	15	12	10	10	10

Data sources: 1978/79 Canada Health Survey; 1985 and 1991 General Social Survey; 1994/95, 1996/97 and 1998/99 National Population Health Survey, cross-sectional sample, Household files

Notes: All National Population Health Survey (NPHS) estimates have coefficients of variation less than 16.6%. Pairwise comparisons were done for NPHS estimates; tests of differences were adjusted for multiple (3) comparisons (1994/95 vs 1996/97, 1994/95 vs 1998/99 and 1996/97 vs 1998/99).

[†] Daily or occasional smokers as a percentage of all respondents

[‡] Daily smokers as a percentage of all respondents

[§] Significantly different from 1994/95, $p \leq 0.05$

^{††} Significantly different from 1996/97, $p \leq 0.05$

Some of these factors, such as income, may play a role in adult smoking rates, but perhaps other factors not examined here, such as peer pressure, may play a more important role in youth smoking initiation.

It should be noted that, although binge drinking (having at least five alcoholic drinks in one occasion) in 1994/95 was not associated with future “current” or “daily” smoking for these age groups, monthly or more binge drinking in 1998/99 was highly associated with concurrent smoking (data not shown). It is not possible, however, to determine if

Table 2
Adjusted odds ratios relating new current or daily smoking and new monthly or weekly binge drinking in 1998/99 to selected 1994/95 characteristics, household population aged 12 to 15 and 16 to 19 in 1994/95, Canada excluding territories

1994/95 characteristics	New current smoking [†]	New daily smoking [†]	New monthly alcohol bingeing [‡]	New weekly alcohol bingeing [§]
Male	0.8	1.0	2.2*	4.4*
Age 12-15 ^{††}	1.0	1.1	1.0	1.0
2+ chronic conditions	1.5	1.8	0.9	2.0*
At least monthly binge drinker	1.0	1.0	...	3.9*
At least some excess weight	0.6	0.6	0.8	0.8
Regular, moderate leisure-time physical activity	1.1	1.0	1.4	1.3
Rural	0.9	1.4	1.3	1.3
Lowest/Lower-middle income ^{‡‡}	0.7	1.1	0.9	0.8
Someone else in household smoked	1.3	1.8	1.5	1.8*
Low self-esteem ^{‡‡}	0.9	1.1	0.9	1.4
Current smoker (1994/95)	1.6	1.8

Data sources: National Population Health Survey, Longitudinal File, 1994/95 to 1998/99

Notes: Bingeing means having 5 or more drinks per occasion; a drink is one bottle or can of beer or glass of draft, one glass of wine or a wine cooler, or one drink or cocktail with 1.5 ounces of liquor.

[†] Reported never smoking in 1994/95.

[‡] Reported bingeing fewer than 12 times (including no bingeing) in year before 1994/95.

[§] Reported bingeing fewer than 52 times (including no bingeing) in year before 1994/95.

^{††} Reference category is 16-19.

^{‡‡} A missing category was included in the models, but is not shown.

... Not applicable

* $p \leq 0.05$

the smoking habit really developed concurrently with the drinking, or if one behaviour preceded the other.

Further analysis of smoking rates can be obtained from other published reports.^{3,8}

Binge drinking rises sharply among young males

Binge drinking by young Canadians, at least on a yearly basis, is relatively prevalent among teens and young adults.⁹ But even when examining binge drinking on at least a monthly basis, figures are

Table 3
Binge drinking, by age and sex, household population aged 15 or older, Canada excluding territories, 1994/95 to 1998/99

	Binge at least monthly [†]			Binge at least weekly [‡]		
	1994/95	1996/97	1998/99	1994/95	1996/97	1998/99
	%			%		
Both sexes						
Total	11	14 [§]	15 ^{§††}	4	5 [§]	5 [§]
15-19	13	19 [§]	24 ^{§††}	4 ^{‡‡}	5	7 [§]
20-24	20	30 [§]	32 [§]	6	11 [§]	10 [§]
25-44	13	16 [§]	17 [§]	4	5 [§]	6 [§]
45-64	9	10	12 ^{§††}	3	3	4
65+	3	3	3	1 ^{‡‡}	1 ^{‡‡}	1 ^{‡‡}
Men						
Total	18	20 [§]	24 ^{§††}	6	7 [§]	9 [§]
15-19	17	21	29 ^{§††}	6 [‡]	7	10 ^{‡‡}
20-24	31	40 [§]	45 [§]	11	16 [§]	17 [§]
25-44	21	24 [§]	27 ^{§††}	7	9 [§]	10
45-64	16	16	19 ^{§††}	6	6	7
65+	5	5	6	2 ^{‡‡}	2 ^{‡‡}	2 ^{‡‡}
Women						
Total	4	7 [§]	7 [§]	1	2 [§]	2 [§]
15-19	8 ^{‡‡}	16 [§]	19 [§]	†††	4 ^{‡‡}	3 ^{§§}
20-24	11	21 [§]	19 [§]	†††	6 ^{‡‡}	4 ^{‡‡}
25-44	5	7 [§]	7 [§]	1 ^{‡‡}	2 [§]	2
45-64	3	4 [§]	5 [§]	1 ^{§§}	1 [‡]	2 ^{‡‡}
65+	†††	†††	†††	†††	†††	†††

Data source: 1994/95, 1996/97 and 1998/99 National Population Health Survey, cross-sectional sample, Household files

Notes: Bingeing means having 5 or more drinks per occasion; a drink is one bottle or can of beer or glass of draft, one glass of wine or a wine cooler, or one drink or cocktail with 1.5 ounces of liquor. For 1994/95, binge drinking was determined to be at least monthly or weekly if 12 or 52 or more binges, respectively, were reported for the past year. For 1996/97 and 1998/99, binge drinking was determined to be at least monthly (weekly) if binges were reported as taking place “monthly” (“weekly”). Pairwise comparisons of percentages were done; tests of differences were adjusted for multiple (3) comparisons (1994/95 vs 1996/97, 1994/95 vs 1998/99 and 1996/97 vs 1998/99).

[†] Respondents who binged at least monthly as a percentage of all respondents

[‡] Respondents who binged at least weekly as a percentage of all respondents

[§] Significantly different from 1994/95, $p \leq 0.05$

^{††} Significantly different from 1996/97, $p \leq 0.05$

^{‡‡} Coefficient of variation between 16.6% and 25.0%

^{§§} Coefficient of variation between 25.1% and 33.3%

^{†††} Coefficient of variation greater than 33.3%

relatively high for teens and young adults (Table 3). Over the last three NPHS cycles, the prevalence of binge drinking at least monthly among all teens aged 15 to 19, increased sharply and significantly from 13% to 19% to 24% by 1998/99. Unlike smoking, the prevalence is lower for girls than for boys, but sharp increases over the three surveys are also evident for girls (8% to 16% to 19% by 1998/99),

although the last increase was not statistically significant.

Binge drinking on a much more frequent basis (that is, at least weekly) is much less prevalent; nonetheless, it reached 10% for boys aged 15 to 19 by 1998/99.

Young adult males in the 20-to-24 age group are by far the most likely to engage in at least monthly

Definitions

A *current smoker* is someone who smokes either daily or on an occasional basis.

At least monthly binge drinking in 1994/95 refers to having had five or more alcoholic drinks per occasion at least 12 times in the year preceding the National Population Health Survey (NPHS) interview. In 1996/97 and 1998/99, it refers to reporting bingeing on at least a “monthly” basis in the year prior to the NPHS interview.

At least weekly binge drinking in 1994/95 refers to having had five or more alcoholic drinks per occasion at least 52 times in the year preceding the NPHS interview. In 1996/97 and 1998/99, it refers to reporting bingeing on at least a “weekly” basis in the year prior to the NPHS interview.

Some excess weight refers to having a body mass index (weight/height², with weight in kilograms and height in metres) of 25.0 or greater. This coincides with the Canadian standard for “some excess weight and overweight” and the World Health Organization standard for “overweight and obese.” Respondents who were under 3 feet (0.914 m) tall, over 6 feet, 11 inches (2.108 m), or pregnant were out of scope for a BMI measurement and were excluded in the estimation of these proportions (see *Limitations*).

Overweight refers to having a body mass index of 27.0 or greater. This coincides with the Canadian standard for “overweight” (see note for *some excess weight*).

At least moderate leisure-time physical activity refers to reporting physical activities requiring at least medium energy expenditure (at least 1.5 kilocalories per day, based on the duration and independently established energy demand of the activity) and reporting activities at least 12 times per month, where the duration of each session is at least 15 minutes. Only recreational activities are considered for this measure (for example, physical activities at work or while commuting to and from work are not included).

Respondents were asked if they had any conditions that had lasted or were expected to last at least six months and that had been diagnosed by a health professional. Respondents were read a list of 20 chronic conditions (for example, arthritis or rheumatism, back

problems, high blood pressure, cancer) to which a “yes” or “no” answer was required. Respondents were also asked to specify if they had any other chronic conditions not mentioned in the list. Respondents having *two or more chronic conditions* were flagged as such.

Income was defined based on the number of people in the household and total household income from all sources in the 12 months before the survey. The following income groups were defined:

Household income group	People in household	Total household income
Lowest	1 or 2	Less than \$15,000
	3 or 4	Less than \$20,000
	5 or more	Less than \$30,000
Lower-middle	1 or 2	\$15,000 to \$29,999
	3 or 4	\$20,000 to \$39,999
	5 or more	\$30,000 to \$59,999
Upper-middle	1 or 2	\$30,000 to \$59,999
	3 or 4	\$40,000 to \$79,999
	5 or more	\$60,000 to \$79,999
Highest	1 or 2	\$60,000 or more
	3 or more	\$80,000 or more

Self-esteem was defined from the following items. Respondents had to strongly disagree (score 0), disagree (score 1), neither agree nor disagree (score 2), agree (score 3) or strongly agree (score 4) with each of the following:

- You feel that you have a number of good qualities.
- You feel that you're a person of worth at least equal to others.
- You are able to do things as well as most other people.
- You take a positive attitude toward yourself.
- On the whole, you are satisfied with yourself.
- All in all, you're inclined to feel you're a failure (reverse scale on this item.)

If respondents scored less than 18, then they were deemed to have *low self-esteem*.

or at least weekly binge drinking. The prevalence of at least monthly bingeing observed for males in this age group increased by 14 percentage points (95%, confidence interval; 7 to 22 percentage points) in four years to 45% in 1998/99. The prevalence of binge drinking on a weekly basis also increased in four years for males this age, from 11% in 1994/95 to 17% in 1998/99.

As was the case with smoking, youths aged 12 to 15 and 16 to 19 in 1994/95 were used in multiple logistic regression models to examine the associations between selected factors and future binge drinking (Table 2). This time, sex was a significant factor, even when all other factors were accounted for in the model. Males had more than twice the adjusted odds of at least monthly binge drinking than females. The corresponding odds for

at least weekly binge drinking were 4.5 times higher for males than females. Having multiple chronic conditions and the presence of a smoker other than the respondent in the household also increased the adjusted odds of bingeing frequently. As mentioned earlier, both "current" and "daily" smoking in 1998/99 were highly associated with either monthly or weekly binge drinking in the same cycle, but only 1994/95 "current" smoking was examined in the binge drinking models.

The increase in monthly bingeing may signal a continued increase in weekly bingeing in future NPHS cycles, given that young drinkers who binged monthly or more, but not as much as weekly in 1994/95, had significantly higher adjusted odds of becoming new weekly binge drinkers by 1998/99.

Table 4
Overweight, by age and sex, household population aged 15 or older, Canada excluding territories, 1978/79 to 1998/99

	At least some excess weight (BMI ≥ 25)						Overweight (BMI ≥ 27)					
	1978/79	1985	1991	1994/95	1996/97	1998/99	1978/79	1985	1991	1994/95	1996/97	1998/99
	%						%					
Both sexes												
Total	40	32	40	45	44	47 ^{††}	27	17	22	28	27 [†]	30 ^{††}
15-19	10	11	13	16	17	17	7	5	5	8	9	9
20-24	28	17	25	30	27	27	17	8	10	17	15	14
25-44	39	31	37	43	42	47 ^{††}	24	16	21	27	26	30 ^{††}
45-64	63	46	53	58	55	58 [‡]	42	26	32	39	36 [†]	39 [†]
65+	58	43	48	49	50	52	39	24	27	32	31	34 [†]
Men												
Total	44	40	49	53	53	56 [‡]	29	20	26	32	32	35 ^{††}
15-19	11	12	29	21	20	20	8	6	8	10	12	10
20-24	34	23	32	37	37	36	22	10	13	19	20	19
25-44	49	42	50	55	54	59 ^{††}	31	21	27	32	33	37 ^{††}
45-64	67	55	63	67	65	67	41	29	36	44	41	44
65+	55	46	55	54	56	56	32	23	28	33	32	35
Women												
Total	35	25	30	36	34 [†]	38 [‡]	25	15	18	25	22 [†]	25 [‡]
15-19	9	8	7	11	13	13 [§]	5	4	3	6 [§]	7	8 [§]
20-24	23	11	17	23	17	17	12	7	7	16	10 [†]	10 ^{†§}
25-44	29	20	25	31	30	34 [‡]	17	11	15	22	19	23 [‡]
45-64	59	37	43	50	46	50	43	22	27	34	31	34
65+	60	40	43	46	45	49	44	25	26	32	30	33

Data sources: 1978/79 Canada Health Survey; 1985 and 1991 General Social Survey; 1994/95, 1996/97 and 1998/99 National Population Health Survey, cross-sectional sample, Household files

Notes: Based on Body Mass Index (BMI), where $BMI = \text{weight}/\text{height}^2$, with weight in kilograms and height in metres. Some excess weight is BMI 25 to 26.9; overweight is $BMI \geq 27$. Respondents under 3' (0.914m), over 6'11" (2.108m) or pregnant were out of scope for a BMI measurement and were excluded. In the 1985 and 1991 General Social Survey, pregnant women could not be identified and were, therefore, not excluded. Pairwise comparisons were done for National Population Health Survey estimates; tests of difference were adjusted for multiple (3) comparisons (1994/95 vs 1996/97, 1994/95 vs 1998/99 and 1996/97 vs 1998/99).

[†] Significantly different from 1994/95, $p \leq 0.05$

[‡] Significantly different from 1996/97, $p \leq 0.05$

[§] Coefficient of variation between 16.6% and 25.0%

Overweight among young people

Proportions of males aged 15 to 19 and 20 to 24 with at least some excess weight (a body mass index of 25 or more) have held stable since 1994/95, at approximately 20% and 36%, respectively (Table 4).

For 15- to 19-year-old girls, there was a 2-percentage-point climb between cycles 1 and 2 of the NPHS (from 11% to 13%), but this change was not statistically significant, and the rate held stable in cycle 3. For young women (aged 20 to 24), the reverse pattern can be seen, with a 6-point drop to 17% by cycle 2, which then held steady for another cycle. Again, the drop did not reach statistical significance.

Being “definitely overweight” (a body mass index of 27 or more) may carry with it more substantial health risks than having some excess weight.¹⁰ These rates are lower, of course, and while there is a statistically significant increase from 1994/95 to 1995/96 and then again in 1998/99 for the entire population aged 15 or older, no differences can be observed among youths aged 15 to 19 and 20 to 24.

Leisure-time physical activity

Maintaining physical activity is known to be associated with a variety of health benefits.¹¹ Using data collected in the NPHS, it is possible to determine if respondents participated in leisure-time activities that required “moderate” or higher levels of energy expenditure and if these occurred on a “regular” basis. It must be noted, however, that this indicator takes into account recreational activities only and does not include physical activity at work or while commuting to and from work, for example.

The proportion of teens aged 15 to 19 engaging in moderate leisure-time physical activity appears to have increased 5 percentage points, from 54% to 59% between 1994/95 and 1996/97 (Table 5). The apparent increase was similar for boys (up to 66%) and for girls (up to 51%). However, a statistical difference could not be detected.

The story is different for young adults. Although this group has a smaller proportion of moderately active individuals than do teenagers, their percentages increased from 44% (95% confidence

Table 5

Moderate leisure-time physical activity, by age and sex, household population aged 15 or older, Canada excluding territories, 1994/95 to 1998/99

	1994/95	1996/97	1998/99
	%		
Both sexes			
Total	37	40[†]	44^{††}
15-19	54	59	57
20-24	44	49 [†]	54 [†]
25-44	36	39 [†]	43 ^{††}
45-64	35	37	43 ^{††}
65+	32	32	35 [†]
Male			
Total	40	42	47^{††}
15-19	62	66	65
20-24	47	51 [†]	57
25-44	38	40 [†]	46 [†]
45-64	34	38 [†]	44 [†]
65+	37	37	41
Female			
Total	35	38[†]	41^{††}
15-19	45	51	49
20-24	40	47	52 [†]
25-44	34	39 [†]	41 [†]
45-64	36	37	42 ^{††}
65+	28	28	31

Data sources: 1994/95, 1996/97 and 1998/99 National Population Health Survey, cross-sectional sample, Household files

Notes: Percentages refer to respondents who reported at least moderate physical activity, that is, at least medium energy expenditure (EE) on leisure-time activity on a regular basis, as a proportion of the total population aged 15 or older. At least medium EE refers to a sum of 1.5 or more kcal/kg/day, based on frequency, duration and independently established metabolic energy demand of all leisure-time physical activities reported for the last three months. Regular frequency refers to engaging in a leisure-time physical activity at least 12 times per month, with each session lasting at least 15 minutes. All estimates have coefficients of variation less than 16.6%. Pairwise comparisons of percentages were done; tests of difference were adjusted for multiple (3) comparisons (1994/95 vs 1996/97, 1994/95 vs 1998/99 and 1996/97 vs 1998/99).

[†] Significantly different from 1994/95

^{††} Significantly different from 1996/97

interval, 40% to 47%) in 1994/95 to 54% (95% confidence interval, 50% to 58%) by 1998/99. Both sexes saw an increase in cycle 3 of the NPHS.

Concluding remarks

The health behaviours reported here provide a mixed report for young people. More people aged 20 to 24 are moderately active, and rates of overweight have remained relatively stable. Smoking rates appear to have fluctuated somewhat, but the changes did not prove to be significant for individuals aged 15 to 19 and 20 to 24. Binge drinking, particularly among boys and young men,

raises some concerns for the health and well-being of young people, both now and in the future.

Gender differences in these behaviours are worthy of future study and need to be carefully taken into account when programs and policies are developed to prevent and reduce smoking and binge drinking among young people.

The association between binge drinking and smoking is not surprising, given that both behaviours are relatively prevalent among teens, and especially, young adults. An interrelationship of alcohol and smoking dependence has been discussed in other research.¹²⁻¹⁵ It may be necessary to address both issues simultaneously in order to reduce their prevalence. ●

For more information, contact Claudio Pérez (613-951-1733; perecla@statcan.ca), Health Statistics Division, Statistics Canada

References

- 1 Chen J, Millar WJ. Age of smoking initiation: Implications for quitting. *Health Reports* (Statistics Canada, Catalogue 82-003) 1998; 9(4): 39-46.
- 2 Stephens M, Siroonian J. Smoking prevalence, quit attempts and successes. *Health Reports* (Statistics Canada, Catalogue 82-003) 1998; 9(4): 31-7.
- 3 Gilmore J. *Report on smoking prevalence in Canada, 1985 to 1999* (Statistics Canada, Catalogue 82F0077XIE) Ottawa: Minister of Industry, 2000.
- 4 Rao JNK, Wu CFJ, Yue K. Some recent work on resampling methods for complex surveys. *Survey Methodology* (Statistics Canada, Catalogue 12-001) 1992; 18(2): 209-17.
- 5 Rust KF, Rao JNK. Variance estimation for complex surveys in using replication techniques. *Statistical Methods in Medical Research* 1996; 5: 283-310.
- 6 Yeo D, Mantel H, Liu TP. Bootstrap variance estimation for the National Population Health Survey. *American Statistical Association: Proceedings of the Survey Research Methods Section*. Baltimore: August 1999.
- 7 Ross N, Pérez C. Attitudes towards smoking. *Health Reports* (Statistics Canada, Catalogue 82-003) 1998; 10(3): 23-33.
- 8 Health Canada. *1. Summary of Results*. CTUMS (Canadian Tobacco Use Monitoring Survey), Wave 1: February-June 1999.
- 9 Galambos N, Tilton-Weaver L. Multiple-risk behaviour in adolescents and young adults. *Health Reports* (Statistics Canada, Catalogue 82-003) 1998; 10(2): 9-20.
- 10 Gilmore J. Body mass index and health. *Health Reports* (Statistics Canada, Catalogue 82-003) 1999; 11(1): 31-43.
- 11 Chen J, Millar W. Health effects of physical activity. *Health Reports* (Statistics Canada, Catalogue 82-003) 1999; 11(1): 21-30.
- 12 Gulliver SB, Kalman D, Rohsenow DJ, et al. Smoking and drinking among alcoholics in treatment: cross-sectional and longitudinal relationships. *Journal of Studies on Alcohol* 2000; 61(1): 157-63.
- 13 Gulliver SB, Rohsenow DJ, Colby SM, et al. Interrelationship of smoking and alcohol dependence, use and urges to use. *Journal of Studies on Alcohol* 1995; 56(2): 202-6.
- 14 Zacny JP. Behavioral aspects of alcohol-tobacco interactions. *Recent Developments in Alcoholism* 1990; 8: 205-19.
- 15 Batel P, Pessione F, Maitre C, et al. Relationships between alcohol and tobacco dependencies among alcoholics who smoke. *Addiction* 1995; 90(7): 977-80.