

## Binge Drinking Among Youth in Québec: Portrait and Evolution from 2000 to 2012

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### Introduction

Alcohol use and the many social and health issues associated with it are public health concerns. The impact of alcohol depends primarily on the total volume of alcohol consumed and the pattern of drinking, particularly drinking a large quantity on a single occasion (WHO, 2009). Since the late 90s, both the average volume of alcohol consumed per inhabitant and the frequency of binge drinking have increased in Québec (Statistics Canada, 2010; 2013). In order to implement measures of prevention for alcohol-related issues that are better targeted and contextualized, we must understand behaviours in population sub-groups and their change over time.

Binge drinking among youth warrants special attention. This pattern of consumption is more frequent among young adults than among other population groups (Statistics Canada, 2010). Binge drinking is associated with intentional injuries, i.e., interpersonal violence and suicide (WHO, 2011). The decrease in psychomotor skills that accompanies a high blood alcohol level may result in traffic accidents, falls, drowning and intoxication (WHO, 2011). A high blood alcohol level is also a risk factor for the intent to engage in unprotected sexual activity (Rehm et al., 2011).

This study aims to develop an overall profile of binge drinking among youth in Québec who drink alcohol. Its specific objectives are to: 1) describe binge drinking among youth in 2011-2012; 2) identify the ages at which young men and women are more likely to binge drink; 3) describe the development of binge drinking among youth in the period between 2000 and 2012; 4) see whether binge drinking is a cohort phenomenon, i.e., whether it varies depending on year of birth, regardless of age or period.

## Methods

The study focuses on young people from 12 to 35 years of age in order to document changes in binge drinking from initiation into this behaviour. Analysis concern two-year age groupings and percentages are relative to drinkers during the previous year. Binge drinking is defined as consuming five or more drinks on a single occasion at least twelve times in the course of the year prior to the survey (Statistics Canada, 2011). Data were taken from the Québec part of the general health surveys conducted by Statistics Canada, the Canadian Community Health Survey (CCHS): cycles 1.1 (2000-2001); 2.1 (2003); 3.1 (2005); 2007-2008; 2009-2010; 2011-2012.

First, descriptive data from 2011-2012 were presented. Then, changes in binge drinking among young drinkers was described according to the multi-phase approach proposed by Keyes (Keyes and Li, 2010; Légaré and Hamel, 2013). The first stage of this approach consisted of analyzing different graphs to identify peaks in binge drinking by age and study the trends and changes over time from 2000-2001 to 2011-2012. Then, analyses employing the median polish method were used to isolate the effects of age and period in order to verify the presence of a birth cohort effect (Keyes and Li, 2010).

## Results

### Binge drinking among young drinkers in 2011-2012

In 2011-2012, slightly more than one Quebecer in 3 (34.9%) aged 12 to 35 stated that they had engaged in binge drinking at least once a month in the year preceding the survey. This percentage varies greatly according to sex and age. Indeed, this behaviour is far more frequent in males than in females (43% vs. 26%). Young adults (ages 18 to 24) represent the group in which we find the highest percentage of people who binge drink, amounting to nearly 50% of drinkers in that age group (Table 1).

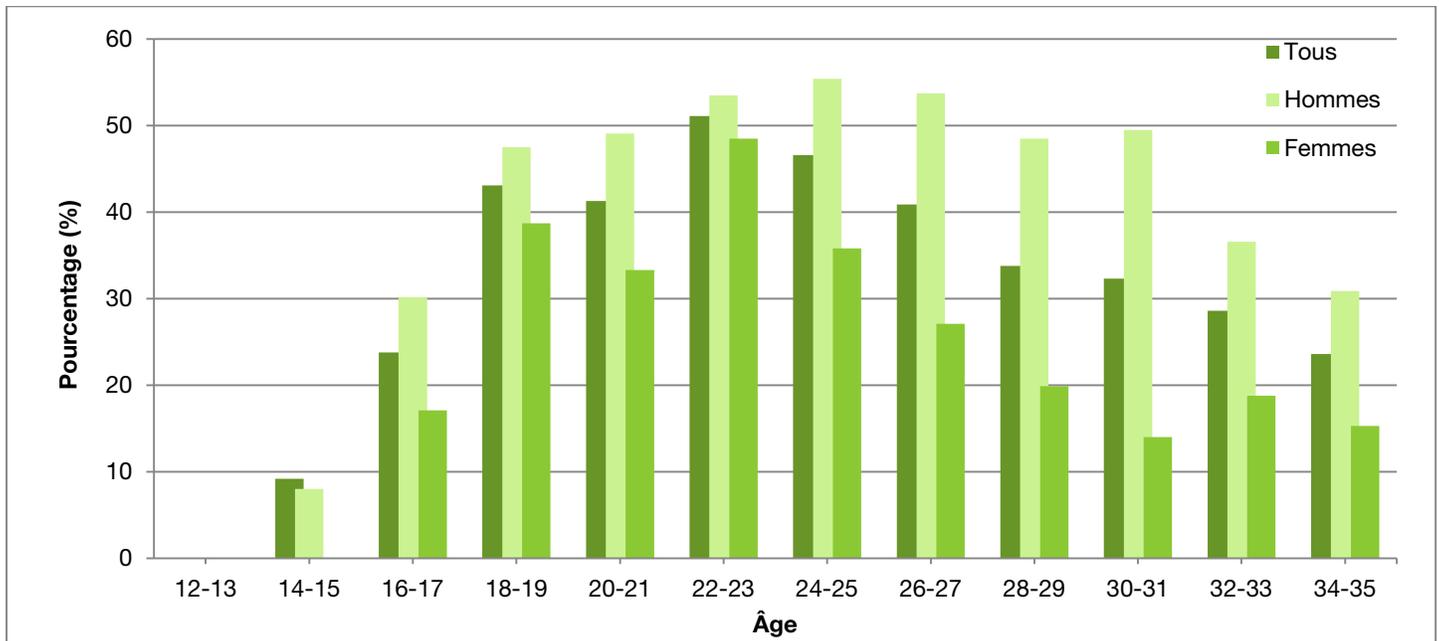
**Table 1** Binge drinking at least once a month in the last 12 months according to sex and age, population from 12 to 35 years of age, Québec, 2011-2012

	<i>All</i> %	<i>Males</i> %	<i>Females</i> %
<b>Total</b>	34.9	43.3	25.7
<b>Age group</b>			
<b>12-17 years</b>	16.1	18.8	13.2
<b>18-24 years</b>	46.4	51.8	40.8
<b>25-35 years</b>	32.7	44.6	19.7

Data source: Statistics Canada, CCHS 2011-2012 - Master file.

Figure one below shows first that binge drinking starts from age 14 in males and age 16 in females, and 43% of young people are initiated into this pattern of consumption by around the age of 18. When data are presented by age group (grouped by two years), we can observe that it is young adults in their mid-twenties who are the most likely to binge drink. When data from both sexes are combined, the rate is the highest around ages 22-23 (51%) and then gradually decreases with age. However, males and females behave differently in terms of this pattern of consumption. In males, binge drinking reaches a maximum at ages 24-25 then remains the same over time until the age of 32, when a significant drop is observed. In females, this behaviour reaches its peak around ages 22-23 and then decreases rapidly until the age of 30. The most significant difference noted between the two sexes is around ages 30-31, when the percentage of males who engage in this behaviour is around four times higher than that of females (M: 49.5%; F: 14%).

**Figure 1 Binge drinking at least once a month in the last 12 months according to sex and age, population from 12 to 35 years of age, Québec, 2011-2012**



Data source: Statistics Canada, CCHS 2011-2012 - Master file.

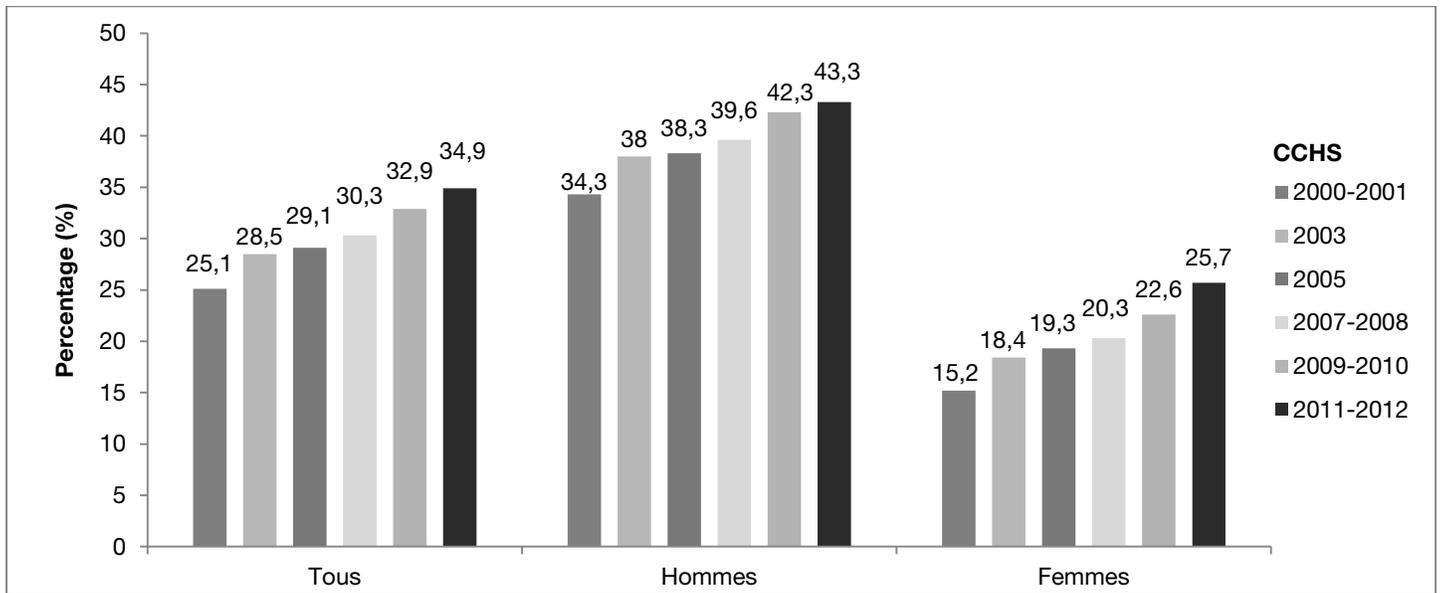
### Change in binge drinking by young drinkers from 2000 to 2012

Analysis of data from the CCHS since 2000-2001 reveals that binge drinking has increased markedly over the last decade. In fact, 25.1% of Quebecers from 12 to 35 years of age reported having engaged in binge drinking at least once a month in 2000-2001, a percentage which increased to 34.9% in 2011-2012 (Figure 2). This increase affects both males and females.

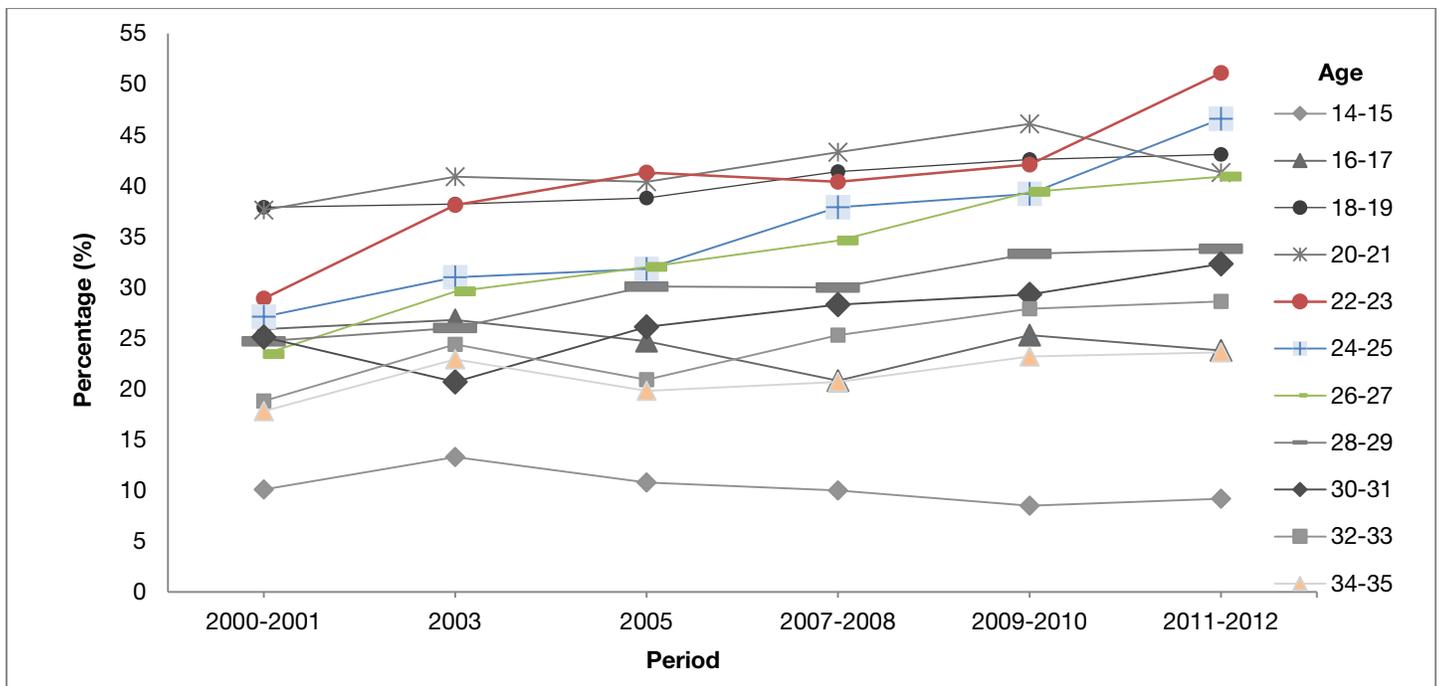
If we look at the same data, but based on age, we can see that binge drinking, despite a general upward trend, has not changed similarly for all individuals aged 12 to 35.

Figure 3 shows that among adolescents (14 to 17) and in young adults (18 to 21) binge drinking has remained relatively stable since 2000. For their part, it is among individuals of ages 22 to 27 that the greatest increase has been observed in this period. For example, an increase of slightly more than 22% was noted in the 22-23 age group between 2000 and 2012. Finally, binge drinking among adults of ages 28 to 33 has also increased, but not as heavily (average of 9%).

**Figure 2** Changes in binge drinking at least once a month during the last 12 months according to sex, population from 12 to 35 years of age, Québec, 2000-2001 to 2011-2012



**Figure 3** Changes in binge drinking according to period, Québec, 2000-2001 to 2011-2012



Data source: Statistics Canada, CCHS 2000-2001 to 2011-2012 - Master file.

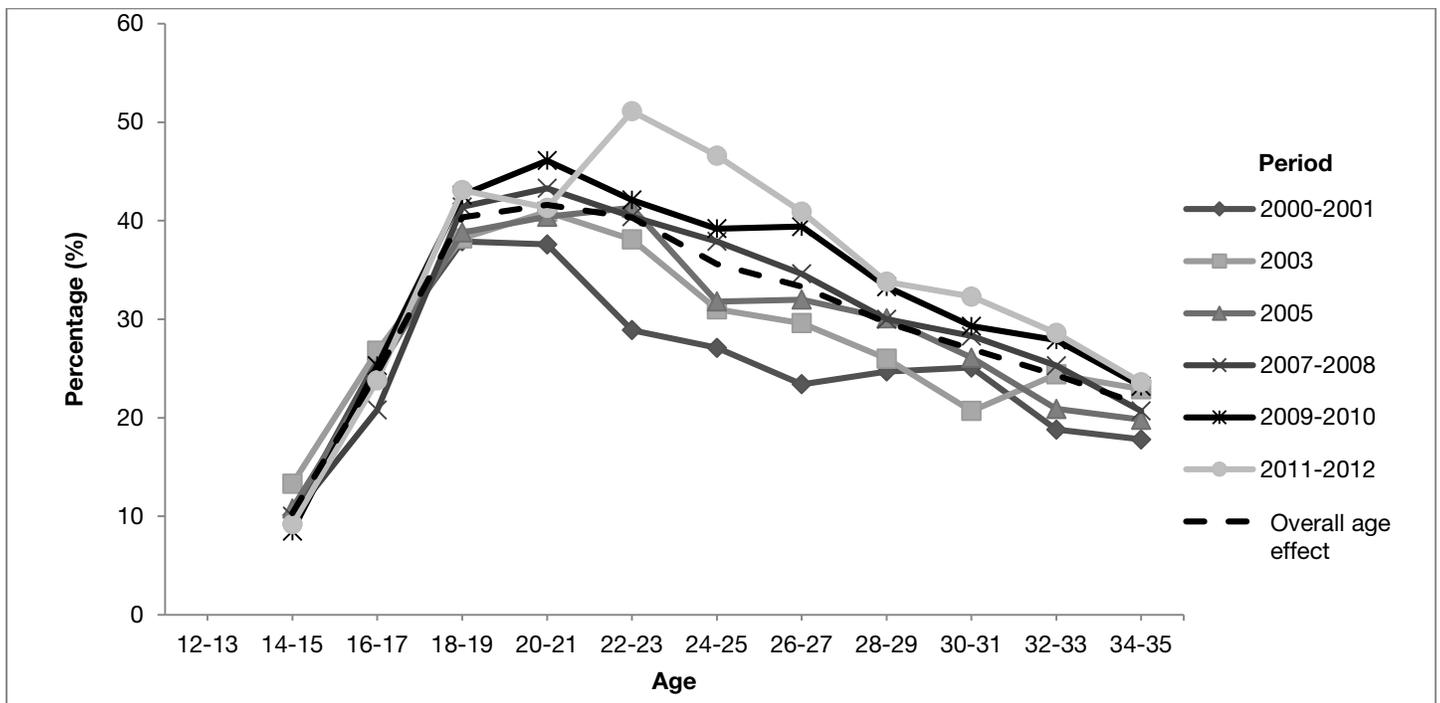
### Graphical approach

The distribution of binge drinking rates shown in Figure 4 demonstrates the effect of age on this pattern of consumption. The curve of the overall age effect (dotted line) increases consistently up to ages 20-21 and then gradually decreases until ages 34-35. This figure also shows us the age at which this pattern of consumption reaches its peak. According to the consumption peaks observed, the age at which this behaviour reaches its high point has not really changed over the years and is situated between ages 20 to 23, with the exception of years 2000-2001, where it is 18-19 years of age. Just as in the previous figure, Figure 4 shows clearly that the greatest increase in binge drinking has occurred among young adults of 22 to 27 years old (greater distance between curves) and that among 14 to 21 year olds, binge drinking has remained relatively stable over time (curves almost on top of each other).

**Table 2** Change in excessive alcohol consumption according to age

Age	Change (%)
14-15	-0.9
16-17	-2.1
18-19	5.2
20-21	3.7
<b>22-23</b>	<b>22.2</b>
<b>24-25</b>	<b>19.5</b>
<b>26-27</b>	<b>17.5</b>
28-29	9.1
30-31	7.2
32-33	9.8
34-35	5.8

**Figure 4** Binge drinking according to age and period, Québec, 2000-2001 to 2011-2012



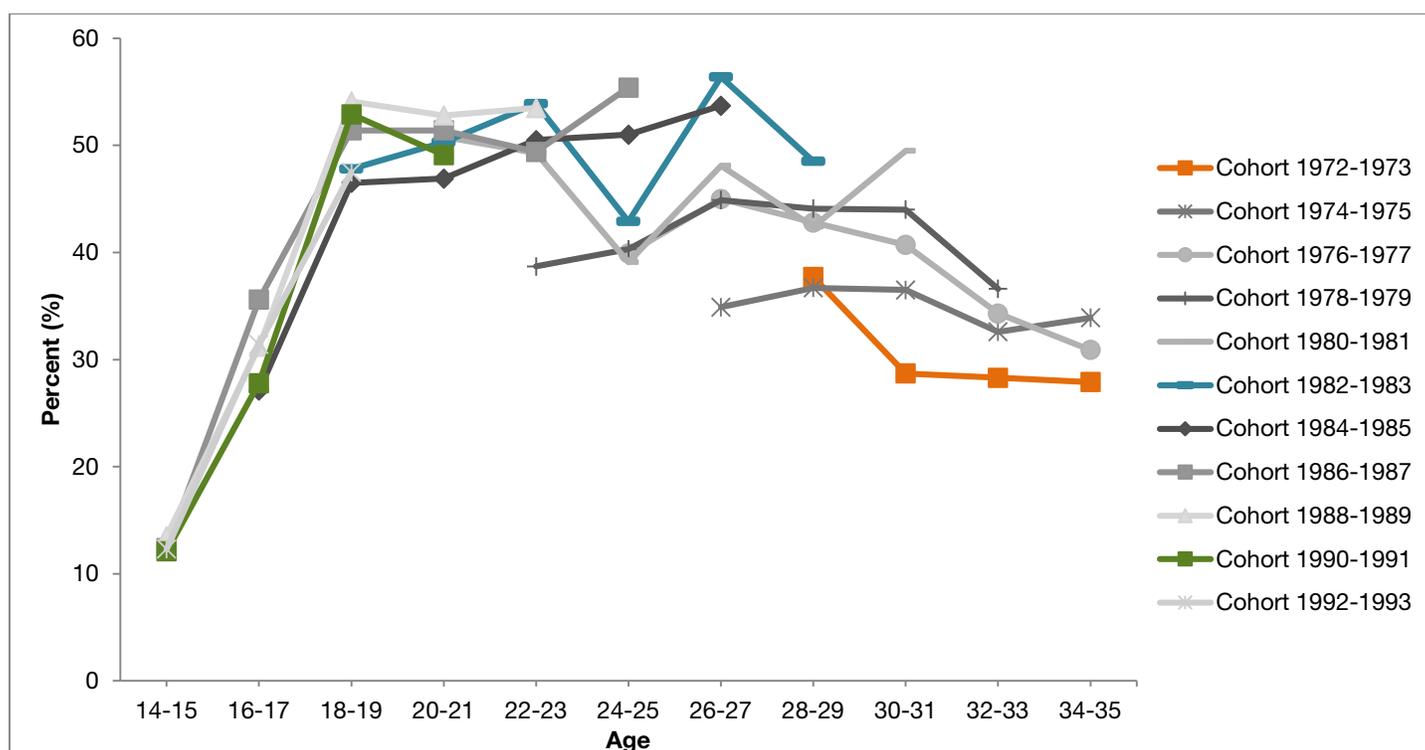
Data source: Statistics Canada, CCHS 2000-2001 to 2011-2012 - Master file.

Figures 5 and 6 show the changes in binge drinking rates according to year of birth. In these figures, rates are shown based on the age of the cohort at the time of the survey. Take, for example, males in the cohort of reference born in 1972-1973 (Figure 5). When males from this cohort were 28-29 years of age (i.e., in 2000-2001) the rate was 38%. Two years later, it went to 29% and so on.

Despite the short period studied (2000 to 2012), these figures demonstrate a certain cohort effect that manifests itself in a change in the rate of binge drinking according to year of birth regardless of age or period.

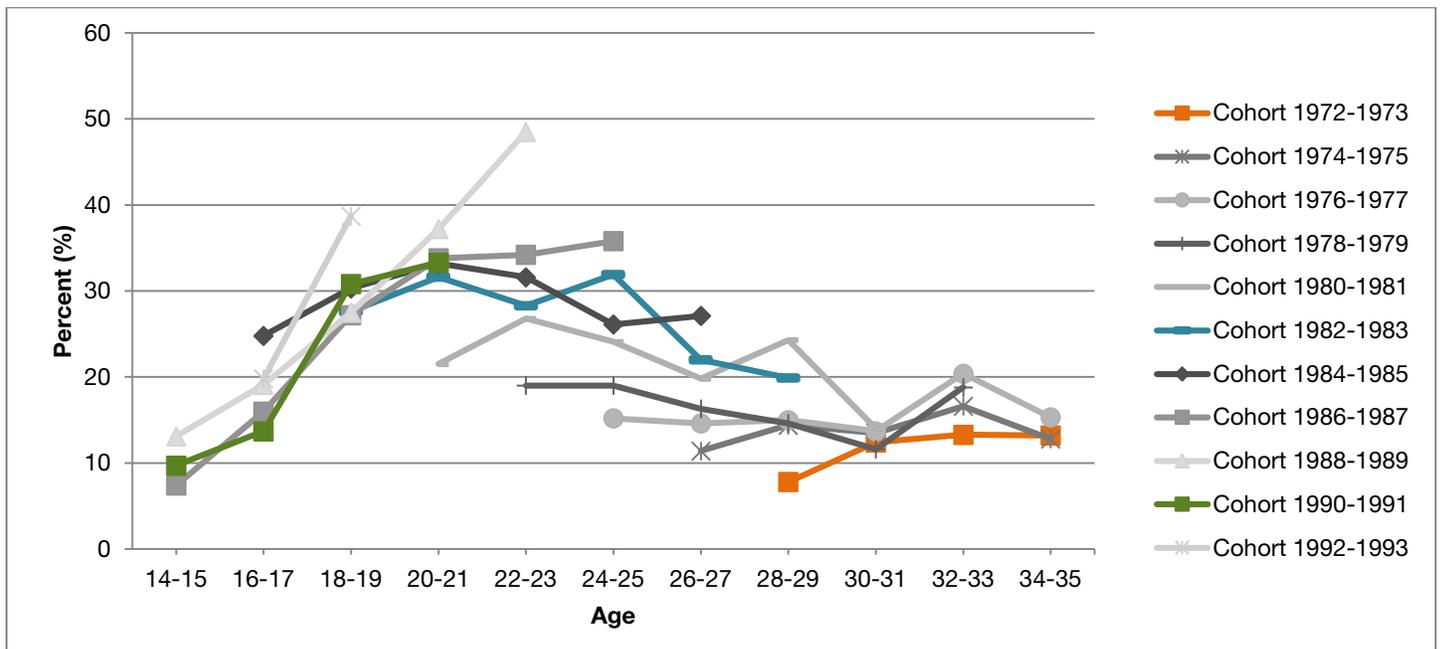
The effect is observed by the fact that the curves become increasingly higher in relation to the reference cohort of 1972-1973, up to the cohort born in 1988-1989. For younger cohorts born in 1990-1991 or later, the curves do not seem to increase beyond the maximum limits reached by the 1982-1983 to 1988-1989 cohorts, and overlap more, suggesting that the behaviour had reached a certain plateau. Despite a noticeable cohort effect as per the graphical approach, in both males and females, the levelling off of behaviour is more evident in males. As there is little data available for younger cohorts, these trends must be addressed in future cycles of the CCHS.

**Figure 5 Binge drinking according to age and cohort, males, Québec, 2000-2001 to 2011-2012**



Data source: Statistics Canada, CCHS 2000-2001 to 2011-2012 - Master file.

**Figure 6 Binge drinking according to age and cohort, females, Québec, 2000-2001 to 2011-2012**



Data source: Statistics Canada, CCHS 2000-2001 to 2011-2012 - Master file.

**Analysis of cohort effect: associated risk**

In order to pinpoint the presence of the cohort effect (change in rate according to year of birth, independent of age or period) observed using the graphical approach, regression analyses were performed on the residuals obtained from the median polish method on the effects of age and period. These analyses allowed us to determine the relative risk of binge drinking by each of the birth cohorts compared to a reference cohort (1972-1973). The results show that, in males, the risk of binge drinking is highest among those born between 1980 and 1989 (changes in risk compared to reference cohort of 14% to 21%). Thus, regardless of age, young men from

these generations seem to have been more likely to binge drink. The same trends are observed among females, but given that there were proportionately fewer females reporting this behaviour, the results do not prove significant, except for those born in 1984-1985 where the increase in risk of engaging in this behaviour is around 26% compared to that of the reference cohort (Table 3).

Interestingly, as in the preceding figures, these analyses suggest that this behaviour reached its highest level and the risk of binge drinking seems to be lower among the new generation of young adults, those born after 1989 (Table 3 and Figure 7).

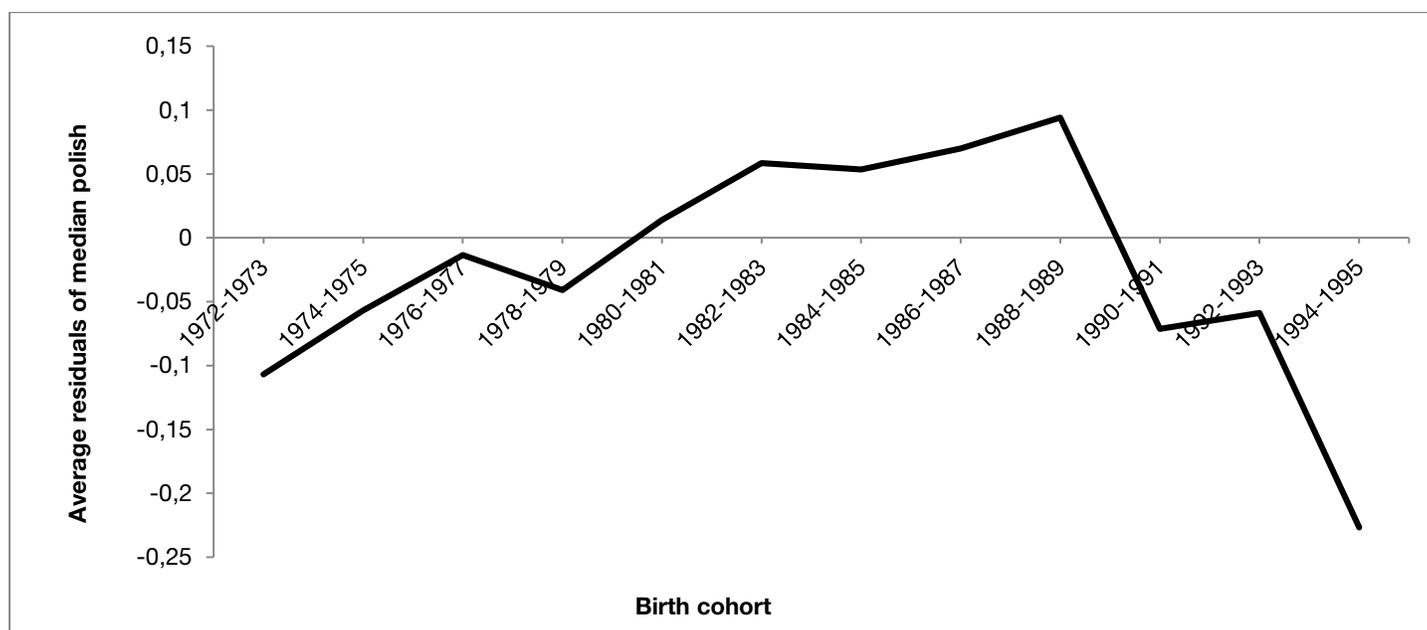
**Table 3** Relative risk (RR) of binge drinking by drinkers among various two-year birth cohorts by sex, Québec, 2000-2001 and 2011-2012

Cohort	Males		Females	
	RR	p	RR	p
1972-1973*	1	-	1	-
1974-1975	1.07	0.220	1.07	0.532
1976-1977	<b>1.13</b>	<b>0.021</b>	1.06	0.580
1978-1979	1.11	1.11	0.95	0.645
1980-1981	<b>1.16</b>	<b>0.008</b>	1.09	0.441
1982-1983	<b>1.20</b>	<b>0.001</b>	1.19	0.123
1984-1985	<b>1.14</b>	<b>0.013</b>	<b>1.26</b>	<b>0.040</b>
1986-1987	<b>1.21</b>	<b>0.001</b>	1.07	0.531
1988-1989	<b>1.16</b>	<b>0.013</b>	1.12	0.333
1990-1991	1.05	0.447	0.86	0.255
1992-1993	1.03	0.636	1.07	0.636
1994-1995	1.03	0.754	0.79	0.225

\* The 1972-1973 cohort represents the cohort of reference.

R Rs shown in bold are significant ( $p < 0.05$ ).

**Figure 7** Average cohort effect of binge drinking according to birth cohort, males and females, Québec



Data source: Statistics Canada, CCHS 2000-2001 to 2011-2012 - Master file.

## Discussion and conclusion

This work has allowed us to develop a current profile of binge drinking among youth in Québec who drink alcohol and to examine the trends and changes over time in this consumption pattern from 2000 to 2012.

These initial results indicate that just under a third of young drinkers in Québec engaged in binge drinking in 2011-2012. This phenomenon affects males much more than females, regardless of age.

Although many young drinkers started to drink excessively at around the age of 18, this behaviour was already present in young males of 14-15 years and in young females of 16-17 years of age. However, it is young adults of 22-23 years of age who are most likely to binge drink. This behaviour drops off quickly in females after this age, but remains at a high level (between 49% and 55%) throughout the twenties among males.

The results also show that binge drinking has changed over the last decade. During the period studied, from 2000-2001 to 2011-2012, an overall increase of about 10% is observed, in both males and females. Young adults in their mid-twenties, ages 22-27, are those with the sharpest increase, while this behaviour has remained rather stable over time in youth aged 21 and under. Moreover, the age at which binge drinking reaches its highest level does not appear to have changed in the past 10 years, and is still situated in the early twenties.

In addition to the effect of age on binge drinking, the analyses also enabled us to observe a cohort effect resulting in a noticeable difference in the rate of binge drinking according to year of birth. Cohorts born in the 1980s demonstrated an increased risk of binge drinking and the risk seems to be lowest among the youngest cohorts, for those born between 1990 and 1995. Despite these observations, we must mention, however, that a short monitoring time of 12 years greatly limits the application of an age-period-cohort model.

Another limit of this study is that the time analyses of survey data assume that estimates are comparable over time. However, the data collection methods of the various cycles of the CCHS have changed in the past

few years, which could constitute a potential bias (Institut de la statistique du Québec, 2010).

Additional analyses will help us to draw up hypotheses to interpret these findings. Thus, this first stage paves the way for a second stage that will allow us to deepen our understanding of binge drinking among youth and attempt to identify certain determinant factors of this pattern of drinking.

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