Hazardous Alcohol Use in 2 Countries: A Comparison Between Alberta, Canada and Queensland, Australia

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Objectives: This article aimed to compare alcohol consumption between the populations of Queensland in Australia and Alberta in Canada. Furthermore, the associations between greater alcohol consumption and socio-demographic characteristics were explored in each population.

Methods: Data from 2500 participants of the 2013 Alberta Survey and the 2013 Queensland Social Survey were analyzed. Regression analyses were used to explore the associations between alcohol risk and socio-demographic characteristics.

Results: A higher rate of hazardous alcohol use was found in Queenslanders than in Albertans. In both Albertans and Queenslanders, hazardous alcohol use was associated with being between 18 and 24 years of age. Higher income, having no religion, living alone, and being born in Canada were also associated with alcohol risk in Albertans; while in Queenslanders, hazardous alcohol use was also associated with common-law marital status. In addition, hazardous alcohol use was lower among respondents with a non-Catholic or Protestant religious affiliation.

Conclusions: Younger age was associated with greater hazardous alcohol use in both populations. In addition, different socio-demographic factors were associated with hazardous alcohol use in each of the populations studied. Our results allowed us to identify the socio-demographic profiles associated with hazardous alcohol use in Alberta and Queensland. These profiles constitute valuable sources of information for local health authorities and policymakers when designing suitable preventive strategies targeting hazardous alcohol use. Overall, the present study highlights the importance of analyzing the socio-demographic factors associated with alcohol consumption in population-specific contexts.

Key words: Alcohol drinking, Risk factors, Alberta, Queensland

INTRODUCTION

Alcohol imposes a significant economic and social burden worldwide. It is a causal factor of many diseases, as well as a precursor to injury and violence [1]. As the harmful effects of alcohol are not constrained to a given country, studies comparing the use of alcohol between countries have been undertaken [2,3]. However, such studies have mostly described the size of the problem, but have not further explored the socio-demographic factors associated with it. Furthermore, the comparison of alcohol consumption across countries can be a useful mechanism to identify context-specific characteristics that may help tailor alcohol policies in specific cultural, political, and economic settings.

Canada and Australia have many similarities that make comparisons between them relevant. They are both democracies

based on the Westminster system of government and have 3 tiers of government (local, state, and national). In addition, both countries have implemented approaches controlling the physical availability and the affordability of alcohol [4,5]. At the regional level, the province of Alberta in Canada and the state of Queensland in Australia have similar socioeconomic characteristics (i.e., a population of around 4 million [6,7], an annual gross domestic product close to 290 million (local currency), as well as both agriculture-based and resource-based economies), which make the comparative study of alcohol consumption between them pertinent.

Size of the Problem and Context

According to the Organization of Economic Cooperation and Development (OECD), an estimated 8 liters of alcohol per capita were consumed in Canada in 2012 [8]. In Alberta, the amount of pure alcohol consumed per person 15 years and older has increased from 8.7 liters in 1993 to 9.4 liters in 2013. The Alberta Gaming and Liquor Commission's performance measures survey carried out in 2015 reported that 73% of Albertans consumed alcohol, of whom 10% would be considered problem drinkers [9]. Thus, approximately one out of 10 Albertans of any age is a problem drinker, as defined by the government of Alberta.

In 1993, the government of Alberta switched from publicly controlled liquor stores to private retail outlets. Since that time, the total number of liquor retailers has increased from 803 (1993) to 2136 (2017) [9]. Currently, there are also 9125 liquor licenses for food and beverage providers through restaurants, bars, private clubs, and public event facilities. There is one retail liquor outlet for every 2050 Albertans and a liquor license in effect for each 458 Albertans. In addition, with the privatization of services came changes in the hours of operation, from business hours (10 am to 6 pm) Monday through Saturday to extended evening hours (2 am) and Sunday sales. Liquor is distributed through privately owned and government-approved warehouses where retail outlets purchase at a wholesale price that includes the manufacturers' cost; federal customs, excise, and tax charges; recycling costs; and the Alberta government's flat mark-up tax. For example, a beer less than or equal to 11.9% alcohol by volume had a $1.25 mark-up rate as of August 5, 2016 [10].

Australians consumed an estimated 10 liters of pure alcohol per capita per year in 2011, which is more than Canadians and close to the OECD average [8]. In 2010, 93% of Queenslanders 14 years or older reported having consumed alcohol at some time in the past 12 months, with 47% drinking weekly and 11% drinking daily [11].

Over the last decade, the total number of liquor retailers in Queensland has increased from 5550 (2003) to 7432 (2014) [12], which translates to a liquor license in effect for each 657 Queenslanders. All liquor licenses are issued with approved trading hours, which are usually from 10 am to midnight. However, it is possible to apply for extended trading hours, either on a one-off basis or permanently. On regular days, all late-trading licensees must also participate in the 3 am lockout. Mark-up prices of alcohol sales are established by policy based on product type and alcohol percentage. For example, an individual container of up to 48 liters of beer exceeding 3.5% alcohol by volume had a mark-up of $47.96 ($0.99/L) as of August 1, 2016 [13].

To the best of our knowledge, previous studies have focused mainly in the comparison of alcohol consumption between countries, and further research exploring the associations between greater alcohol consumption and socio-demographic factors in populations from different countries is lacking. The identification of context-specific characteristics of population groups with hazardous alcohol use will provide valuable information to health planners and policy makers in designing strategies to reduce alcohol-related problems. Therefore, this article aimed to tackle the knowledge gap in this field by comparing alcohol consumption between the populations of Queensland in Australia and Alberta in Canada. Furthermore, associations between hazardous alcohol use and socio-demographic characteristics were explored in each population.

METHODS

This study used data from the 2013 Alberta Survey, collected by the Population Research Laboratory (PRL) of the Department of Sociology at the University of Alberta (UA) (Canada); and from the 2013 Queensland Social Survey (QSS13), administered by the PRL within the Institute for Health and Social Science Research at Central Queensland University (CQU) (Australia). Through a cost-sharing agreement, both surveys enabled academic researchers, government departments, and non-profit organizations to explore a wide range of topics in a structured research framework and environment. The Research Ethics Board at the UA and the Human Ethics Research Review Panel at CQU (H13/06-120, QSS13) reviewed and ap-

proved the survey questions and data collection protocols. Informed consent for participation in the study was obtained verbally from responders at the time of enrollment.

The Alberta survey aimed for a total sample size of 1200 households across Alberta, with a minimum of 400 respondents in metropolitan Edmonton, 400 in metropolitan Calgary, and 400 from the remainder of the province (other areas in Alberta). The QSS13 aimed for a minimum sample size of 1200, with 800 or more from southeast Queensland and 400 from the remainder of Queensland. The a priori estimated sample errors at the 95% confidence interval (CI) were ±2.8 and ±2.7 for the entire samples of Alberta and Queensland, respectively.

The surveys were administered by trained interviewers in Alberta (from June 18 to July 28, 2013) and in Queensland (from July 2 to August 4, 2013) through the PC-based Ci3 Computer-Assisted Telephone Interviewing (CATI) system (Sawtooth Technologies, Northbrook, IL, USA) installed on a local network at the PRL at each institution. A random selection approach was used to ensure that all respondents from the households across the province of Alberta and the state of Queensland had an equal chance of being contacted. For both surveys, samples were drawn from the telephone database by using a computer program to select, with replacement, a simple random sample of telephone numbers. Duplicate telephone numbers were purged from the computer list. Within the household, 1 eligible person 18 years of age or older who, at the time of the survey, was living in a dwelling unit was selected as a responder. Additional algorithms were used in each survey to ensure an equal yet random selection of male and female participants.

The survey instrument consisted of 3 components: 1) a standard introduction; 2) questions that reflected the specific interests of the university and the community researchers participating in the study, such as patterns of alcohol consumption; and 3) demographic questions. The Research Ethics Board at the UA and the Human Ethics Research Review Panel at CQU (H13/06-120, QSS13) reviewed and approved the survey questions and data collection protocols.

Socio-demographic Characteristics

Characteristics including sex, age, marital status, education, religion, housing situation, employment status, income, number of children and adults living at home, and being a native of the country studied (Canada/Australia) were analyzed (Table 1).

Alcohol Consumption and Hazardous Alcohol Use

Patterns of alcohol consumption were assessed using the Alcohol Use Disorder Identification Test (AUDIT) [14] in which the participants were asked about their alcohol consumption (i.e., frequency, quantity) during the previous 30 days. Among people who reported consuming at least 1 drink of any alcoholic beverage during the past 30 days, further questions about alcohol consumption were formulated and recoded based on the AUDIT score as following:

a) Number of DAYS on which you had a least one drink of any alcohol beverage during the past 30 days. It was codified as 0, none; 1, 1 day; 2, 2-4 days; 3, 5-15 days; and 4, 16-30 days; b) On the days when you drank, number of DRINKS on average during the past 30 days? It was codified as 0, 0-2 drinks; 1, 3-4 drinks; 2, 5-6 drinks; 3, 7-9 drinks; and 4, if ≥10 drinks; and c) Considering all types of alcoholic beverages, number of TIMES during the past 30 days you had 6 or more drinks on an occasion? It was codified as 0, none; 2, 1-7 times; 3, 8-12 times; and 4, if ≥13 times.

Hazardous alcohol use was calculated adding the scores given above (a+b+c). It was considered positive if the resulting score was ≥3 in females and ≥4 in males.

Statistical Analysis

Descriptive statistics were used to present the demographic findings and patterns of alcohol consumption and alcohol risk among the study populations (Alberta and Queensland) and among the population groups with alcohol risk. Percentages were used for categorical variables and means (standard deviations [SD]) for continuous variables. The chi-square test or Student t-test was used to analyze the differences in the distribution of the variables between the 2 populations. Associations between hazardous alcohol use and demographic characteristics among Albertans and Queenslanders were analyzed through multivariate logistic regression analyses.

Statistical significance was accepted for p-values <0.05. All analyses were performed using SPSS version 23.0 (IBM Corp., Armonk, NY, USA).

RESULTS

Descriptive Findings

The final sample included 2500 participants (1207 Albertans and 1293 Queenslanders). The response rate for the 2013 Alberta survey was 20.9% and the response rate for the QSS13

Table 1. Description of the populations included in the study

		All (n=2500)	Alberta (n=1207)	Queensland (n=1293)	*p*-value
Sex	Male	50.6	49.3	51.9	0.19
Age (y)	Mean±standard deviation	54.5±16.1	52.4±16.4	56.4±15.7	<0.001
	Range	18-101	18-94	18-101	
Marital status	Never married (single)	13.1	14.6	11.7	0.001
	Married	63.7	59.4	67.7	
	Common-law relationship / live-in partner	5.9	6.4	5.4	
	Divorced	7.3	8.8	6.0	
	Separated	2.0	2.2	1.9	
	Widowed	8.0	8.6	7.4	
Educational level (y)	Primary (0-7)	1.0	0.4	1.5	<0.001
	High school (8-13)	39.4	28.2	50.0	
	Post-secondary school (14-16)	32.1	37.9	26.7	
	Post-graduate (≥17)	27.4	33.5	21.8	
Religion	Protestant	38.4	29.1	47.0	<0.001
	Catholic	19.6	20.3	18.9	
	Other	9.4	18.3	1.2	
	No religion	32.6	32.2	32.9	
Presently own or rent your residence?	Own	84.5	83.5	85.4	0.19
Employment status	Employed	52.6	56.7	48.8	<0.001
	Not employed	12.2	9.0	15.1	
	Student	2.1	3.3	1.0	
	Retired	25.3	26.1	24.6	
	Disabled	7.1	3.7	10.3	
	Not specified	0.7	1.2	0.2	
Income (US dollar)	<25 000	13.1	8.4	18.5	<0.001
	25 000-49 999	15.5	12.5	18.9	
	50 000-74 999	14.7	16.2	13.1	
	75 000-99 000	12.3	13.3	11.1	
	100 000-124 999	14.6	15.7	13.5	
	≥125 000	29.8	33.9	24.9	
Children living in household	Yes	31.1	29.1	33.0	0.04
No. of adults living in household (including the participant)	1	2.2	22.0	16.1	<0.001
	2	1.0	56.0	62.7	
	≥3	1.1	22.0	21.2	
Born in Canada / Australia	Yes	79.0	80.1	78.0	0.21

Values are presented as %.

was 41.2%. In both groups studied, there was oversampling in the 55 and above age categories, and undersampling in the under-35 age categories. Otherwise, the demographics of the participants reasonably approximated the general population.

Approximately half of the population included in the study were males (50.6%), and the mean age of the whole study group was 54.5 years (SD, 16.1 years). Albertans were signifi-

cantly younger (*p*<0.001) and had a higher educational level than Queenslanders (*p*<0.001). In addition, a higher percentage of the participants from Alberta had no children living in the house (*p*=0.04) and were living alone (*p*<0.001) compared with participants from Queensland. The distribution of marital status, employment status, and income were also significantly different between both populations studied (Table 1).

Table 2. Alcohol consumption and hazardous alcohol use

		All (n=2500)	Alberta (n=1207)	Queensland (n=1293)	*p*-value
Had at least 1 drink of any alcoholic beverage during the past 30 days?					
Yes (%)		66.5	64.7	68.3	0.05
If yes for "had at least 1 drink of any alcoholic beverage during the past 30 days"					
1. No. of DAYS on which you had at least 1 drink of any alcoholic beverage during the past 30 days	Mean±SD	10.3±9.8	7.7±8.0	12.6±10.7	<0.001
	Range	1-30	1-30	1-30	
2. On the days when you drank, how many DRINKS did you consume on average during the past 30 days?	Mean±SD	2.4±2.3	2.1±2.1	2.6±2.5	<0.001
	Range	1-32	1-24	1-32	
3. Considering all types of alcoholic beverages, how many TIMES during the past 30 days did you have 6 or more drinks on an occasion? (%)	Never	78.7	81.9	75.9	<0.001
	Once	8.1	8.4	7.8	
	2-4 times	8.2	6.9	9.4	
	≥5 times	5.0	2.8	6.9	
Hazardous alcohol use[1]					
Yes (%)		36.5	28.9	42.8	<0.001

SD, standard deviation.
[1]Calculated based on 1, 2, and 3. Please see Methods for further explanation.

Alcohol Consumption

Sixty-five percent of Albertans and 68% of Queenslanders reported having had at least 1 drink of any alcoholic beverage during the past 30 days (*p*=0.052). Queenslanders reported having alcohol on more days during the past 30 days (*p*<0.001), when drinking, drank more alcoholic beverages on average (*p*<0.001), and were more likely to have had 6 or more drinks on a given occasion (*p*<0.001) than Albertans. Consequently, Queenslanders showed a higher level of hazardous alcohol use than Albertans (*p*<0.001) (Table 2).

Factors Associated With Alcohol Risk in Both Populations Studied

Hazardous alcohol use was associated with being between 18 and 24 years of age (Table 3), having common-law marital status (odds ratio [OR], 2.07; 95% CI, 1.16 to 3.67; *p*=0.01), having no religion (OR, 1.46; 95% CI, 1.14 to 1.87; *p*=0.003), and having an income of ≥$125 000 (OR, 1.92; 95% CI, 1.24 to 2.96; *p*=0.003). Conversely, lower rates of hazardous alcohol use were associated with reporting a non-Catholic or Protestant religious affiliation (OR, 0.60; 95% CI, 0.39 to 0.92; *p*=0.02) and with living with 1 (OR, 0.62; 95% CI, 0.40 to 0.96; *p*=0.03) or more (OR, 0.52; 95% CI, 0.33 to 0.83; *p*=0.006) adults in the house.

Factors Associated With Alcohol Risk in Albertans

In the population of Alberta, hazardous alcohol use was associated with being between 18 and 24 years of age (Table 3),

having no religion (OR, 1.94; 95% CI, 1.32 to 2.86; *p*=0.001), having an income of ≥$125 000 (OR, 2.88; 95% CI, 1.36 to 6.09; *p*=0.006) and being born in Canada (OR, 1.63; 95% CI, 1.06 to 2.50; *p*=0.03). Living with 2 or more adults in the house was associated with lower rates of hazardous alcohol use (OR, 0.33; 95% CI, 0.17 to 0.66; *p*=0.002).

Factors Associated With Alcohol Risk in Queenslanders

In a crude regression model, male Queenslanders were more likely to exhibit hazardous alcohol use than females (OR, 1.47; 95% CI, 1.18 to 1.84; *p*=0.001). However, the significance of the association between sex and hazardous alcohol use disappeared once additional relevant demographic variables were incorporated into the multivariate analysis (*p*=0.21) (Table 3). Among the population of Queensland, hazardous alcohol use was associated with being between 18 and 24 years of age (Table 3) and having common-law marital status (OR, 2.51; 95% CI, 1.03 to 6.14; *p*=0.04).

DISCUSSION

A higher rate of hazardous alcohol use was found in Queenslanders than in Albertans, and a different combination of socio-demographic factors was associated with hazardous alcohol use in each of those populations. To the best of our knowledge, this is one of the first studies to use a common ap-

Table 3. Associations between hazardous alcohol use and socio-demographic characteristics

	All populations studied		Alberta's population		Queensland's population	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Male	1.03 (0.83, 1.27)	0.81	0.89 (0.65, 1.21)	0.44	1.22 (0.89, 1.66)	0.21
Age (y)						
18-24	1.00 (reference)		1.00 (reference)		1.00 (reference)	
25-34	0.33 (0.16, 0.71)	0.04	0.44 (0.17, 1.12)	0.10	0.10 (0.03, 0.46)	<0.01
35-44	0.25 (0.12, 0.53)	<0.01	0.30 (0.11, 0.80)	0.02	0.16 (0.04, 0.62)	0.01
45-54	0.41 (0.20, 0.85)	0.02	0.40 (0.15, 1.06)	0.06	0.29 (0.08, 1.09)	0.07
55-64	0.30 (0.14, 0.64)	<0.01	0.28 (0.10, 0.77)	0.01	0.21 (0.05, 0.83)	0.03
64-74	0.38 (0.17, 0.85)	0.02	0.29 (0.09, 0.88)	0.03	0.26 (0.06, 1.06)	0.06
75+	0.24 (0.10, 0.59)	<0.01	0.22 (0.06, 0.78)	0.02	0.14 (0.03, 0.62)	0.01
Marital status						
Single (never married)	1.00 (reference)		1.00 (reference)		1.00 (reference)	
Married	1.34 (0.85, 2.12)	0.21	1.44 (0.75, 2.75)	0.28	1.30 (0.64, 2.62)	0.47
Common-law	2.07 (1.16, 3.67)	0.01	1.89 (0.84, 4.25)	0.13	2.51 (1.03, 6.14)	0.04
Divorced	1.03 (0.62, 1.72)	0.92	1.82 (0.90, 3.68)	0.09	0.62 (0.28, 1.37)	0.24
Separate	1.39 (0.63, 3.07)	0.42	2.38 (0.83, 6.84)	0.11	0.88 (0.26, 30.2)	0.85
Widow	0.81 (0.45, 1.44)	0.47	1.26 (0.55, 2.89)	0.59	0.62 (0.27, 1.44)	0.27
Religion						
Protestant	1.00 (reference)		1.00 (reference)		1.00 (reference)	
Catholic	1.17 (0.88, 1.54)	0.28	1.09 (0.70, 1.70)	0.71	1.29 (0.88, 1.90)	0.19
Other religion	0.60 (0.39, 0.92)	0.02	0.68 (0.41, 1.12)	0.13	0.34 (0.07, 1.67)	0.19
No religion	1.46 (1.14, 1.87)	<0.01	1.94 (1.32, 2.86)	<0.01	1.12 (0.80, 1.57)	0.51
Income (US dollar)						
<25 000	1.00 (reference)		1.00 (reference)		1.00 (reference)	
25 001-49 999	0.93 (0.63, 1.38)	0.72	0.68 (0.32, 1.45)	0.32	1.04 (0.63, 1.70)	0.88
50 000-74 999	1.07 (0.70, 1.62)	0.77	1.41 (0.70, 2.84)	0.34	0.92 (0.52, 1.62)	0.77
75 000-99 999	1.39 (0.88, 2.17)	0.16	1.48 (0.70, 3.13)	0.31	1.52 (0.81, 2.86)	0.20
100 000-124 999	1.37 (0.87, 2.16)	0.17	2.10 (0.97, 4.52)	0.06	1.22 (0.65, 2.29)	0.54
≥125 000	1.92 (1.24, 2.96)	<0.01	2.88 (1.36, 6.09)	<0.01	1.71 (0.95, 3.06)	0.07
Employment status						
Employed	1.00 (reference)		1.00 (reference)		1.00 (reference)	
Not employed	1.04 (0.74, 1.47)	0.82	1.12 (0.65, 1.92)	0.69	1.09 (0.69, 1.74)	0.71
Student	0.45 (0.18, 1.10)	0.08	0.54 (0.18, 1.62)	0.27	0.43 (0.07, 2.56)	0.43
Retired	1.14 (0.79, 1.63)	0.49	1.14 (0.67, 1.94)	0.63	1.39 (0.81, 2.39)	0.23
Disable	1.00 (0.62, 1.63)	0.99	0.64 (0.26, 1.56)	0.33	1.18 (0.60, 2.30)	0.64
Not Specified	0.86 (0.21, 3.51)	0.85	0.81 (0.15, 4.69)	0.85	2.45 (0.13, 44.63)	0.55
Education						
Post-graduate	1.00 (reference)		1.00 (reference)		1.00 (reference)	
Primary	0.95 (0.30, 3.02)	0.93	N/A[1]		1.36 (0.37, 5.00)	0.65
High school	0.90 (0.69, 1.19)	0.47	0.73 (0.48, 1.11)	0.15	1.03 (0.70, 1.52)	0.89
Post-secondary	0.91 (0.70, 1.17)	0.45	0.83 (0.59, 1.18)	0.30	0.99 (0.67, 1.48)	0.97
Own house	1.19 (0.88, 1.62)	0.27	1.22 (0.78, 1.81)	0.42	0.95 (0.60, 1.50)	0.83
Children living at home	0.88 (0.66,1.16)	0.37	0.85 (0.57, 1.28)	0.43	0.83 (0.55, 1.25)	0.36
Adults living in the house						
1 (lives alone)	1.00 (reference)		1.00 (reference)		1.00 (reference)	
2	0.62 (0.40, 0.96)	0.03	0.56 (0.30, 1.05)	0.07	0.65 (0.35, 1.23)	0.19
≥3	0.52 (0.33, 0.83)	<0.01	0.33 (0.17, 0.66)	<0.01	0.69 (0.35, 1.35)	0.27
Born in Canada/Australia	1.24 (0.96, 1.61)	0.11	1.63 (1.06, 2.50)	0.03	1.05 (0.74, 1.49)	0.80

Multivariate logistic regression analyses used alcohol risk as the dependent variable.
OR, odds ratio; CI, confidence interval; N/A, not applicable.
[1]The OR could not be calculated due to the very small group of people with only a primary education.

proach to compare alcohol consumption and factors associated with it between 2 populations from different countries.

A similar percentage of Albertans and Queenslanders reported having consumed alcohol during the past month. However, based on an analysis of patterns of alcohol consumption, we found that Queenslanders showed a higher rate of hazardous alcohol use than Albertans. This finding is not particularly surprising, due to the fact that higher alcohol consumption per capita has been described in Australia than in Canada [8]. Availability-limitations policies, implemented by increasing the price of alcohol and regulating the context (places or times) where consumers can obtain alcohol, have proven to be cost-effective ways to control alcohol consumption [15]. From the perspective of context, based on the information presented in the introduction about alcohol taxes and the number of alcohol licenses per population in Alberta and Queensland, we can infer that affordability (lower costs) may have a greater influence on hazardous alcohol consumption than availability (more licenses). However, further studies comparing the effects of alcohol policy on hazardous alcohol consumption between countries are needed.

In the overall population studied, hazardous alcohol use was associated with being between 18 and 24 years of age. This finding is in line with a previous study that established that mean alcohol consumption rose sharply during adolescence, peaked at around 25 years, and then declined and plateaued during mid-life [16]. In addition, our study found no difference in hazardous alcohol use by educational level; however, higher income was associated with hazardous alcohol use, in accordance with previous evidence [17]. These results are likely related to the high incomes earned by those working in the resource sectors in both countries, which have agriculture-based and resource-based economies. Workers in the oil and gas industries in Alberta [18] and in the mining industry in Queensland [19] have higher average earnings than those in other industries. In addition, the cyclic nature of those jobs, with long periods of rest vs. periods of intense work, combined with the isolated location of the workplaces, might be possible work stress factors influencing higher alcohol consumption [20]. Further studies are needed to confirm this hypothesis and its implications.

Other socio-demographic characteristics such as having no religion, living alone, and being born in Canada were also associated with hazardous alcohol use among Albertans. Previous research has suggested religiosity as protective factor against the early onset of alcohol use and later development of alcohol problems [21]. Loneliness, probably due to the modern way of living in industrialized societies, has also been recognized as a cause and consequence of alcohol abuse [22]. Greater alcohol-related problems have been reported among Canadian-born individuals than among immigrants [23], perhaps as a consequence of other factors, such as better socio-economic status.

In Queenslanders, hazardous alcohol use was also associated with common-law marital status. Previous studies have found lower alcohol consumption in married and common-law people, when grouped into a single category, than among single or divorced individuals [24,25]. However, we found that the patterns of alcohol consumption seemed to be different in common-law couples than in married people, and therefore these groups should be explored separately.

Lower rates of hazardous alcohol use was found among those having a religious affiliation other than Catholic or Protestant when the overall population was analyzed. Evidence has shown that Mormons, Jews, and Muslims are less likely to use alcohol than Catholics and liberal Protestants [26,27]. This association was not significant in Alberta or Queensland when analyzed separately, probably due to the small numbers of people with non-Catholic or Protestant religious affiliation in each population.

The homogenous design and implementation of data collection constitute a key strength of the present research. To the best of our knowledge, this is the first study to compare alcohol consumption between regions of 2 different, yet comparable, countries. An additional strength of the present study was the analysis of the specific socio-demographic characteristics associated with hazardous alcohol use in each of the populations studied.

The low response rate of the survey might be considered a limitation of the present study. Nevertheless, consistent efforts were used to reach the sample size calculated following the criteria established. Unfortunately, response rates for general household surveys have been on the decline in recent decades [28], probably due an increase of telephone solicitation for fundraising, market research, and sales. In addition, in both populations, there was oversampling in the 55 and above age categories and undersampling in the under-35 age categories compared with the total population of Alberta and Queensland. Gaining adequate participation from younger responders when conducting CATI surveys using randomly generated landline telephone samples has become more difficult due to

the fact that this demographic group has been particularly affected by the shift towards exclusive use of mobile phones.

This study presents the key socio-demographic factors associated with hazardous alcohol use in the populations of Alberta and Queensland. These results can be used by health planners and policymakers to design and implement strategies designed to reduce hazardous alcohol use in those populations. From a policy perspective, it is important to consider that policies with the goal of controlling alcohol consumption by affecting its cost (i.e., taxes and volumetric pricing) are more likely to impact populations with lower incomes, which have already a lower rate of hazardous alcohol use, whereas populations with higher incomes are less likely to be affected. Consequently, efforts should be directed to the identification of more effective ways to tackle alcohol use in the higher-income group, which could be harder to reach through some of the traditional methods used to control alcohol consumption. Particular care should be taken when considering the potential effect of raising alcohol prices on alcohol consumption among younger adults. Although it is possible that a substantial increase in the price of alcohol could help to restrict the consumption of alcohol in this population group, higher alcohol prices can also lead to the consumption of other recreational drugs prior to (or in combination with) alcohol intake, increasing the potential risk of injuries or other health problems.

The comparison of alcohol-related policies between both locations is outside the scope of this study. Nevertheless, based on the fact that the mark-up rate of alcohol in Queensland seems to be lower than in Alberta and the oppose pattern was found in hazardous alcohol use, we speculate that alcohol-related policies that impact affordability by increasing alcohol prices could have a positive effect in those regions despite their overall high socioeconomic status. Overall, current and novel strategies should be planned according to the characteristics of the population exhibiting hazardous alcohol use in each context.

In conclusion, younger age was associated with hazardous alcohol use in both populations. In addition, different socio-demographic factors were associated with hazardous alcohol use in each of the populations studied. Our results allowed us to identify the socio-demographic profiles associated with hazardous alcohol use in Alberta and Queensland. These profiles constitute valuable sources of information for local health authorities and policymakers when designing suitable preventive strategies targeting alcohol use. Overall, the present study highlights the importance of analyzing the socio-demographic factors associated with alcohol consumption in population-specific contexts.

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CONFLICT OF INTEREST

The authors have no conflicts of interest associated with the material in this paper.

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