

## Associations between social vulnerability, employment conditions and hazardous alcohol consumption in Chile

ELISA ANSOLEAGA<sup>1,2</sup> & ALVARO CASTILLO-CARNIGLIA<sup>2,3</sup>

<sup>1</sup>Program on Work Psychosocial Studies, Diego Portales University, Santiago, Chile, <sup>2</sup>Doctoral Program in Public Health, University of Chile, Santiago, Chile, and <sup>3</sup>National Service for Prevention and Rehabilitation on Alcohol and Drugs of Chile, Santiago, Chile

### Abstract

**Introduction and Aims.** Studies from many different countries have found associations between alcohol use, employment and social context. The aim of this study was to investigate associations between hazardous alcohol consumption (HAC), social vulnerability and employment conditions among Chilean adults. **Design and Methods.** A cross-sectional study, involving analysis of the 2008 National Survey on Drugs in Chile, was conducted on 8316 economically active men and women aged between 18 and 65 years, who completed the alcohol section of the survey. The participants were selected randomly and data collected through face-to-face interviews. Multilevel analysis was used to achieve the study's objectives. The Alcohol Use Disorders Identification Test was used to define HAC. **Results.** There were no significant associations between HAC and employment status or occupational category when controlling for potential confounders. Using the social services sector as a reference, the adjusted odds ratio (95% confidence interval) of HAC was 2.60 (1.96–3.46) for those who worked in construction, 2.03 (1.43–2.89) in mining, 1.74 in agriculture (1.16–2.63) and in industry (1.26–2.39), 1.73 (1.31–2.28) in trade, 1.67 (1.29–2.16) in other services and 1.42 (1.01–2.00) in transport. There was no association between the socioeconomic status of the participant's neighbourhood and HAC in the fully adjusted model. The perception of neighbourhood security (third quartile of insecurity) was associated with HAC (odds ratio 1.22; 95% confidence interval 1.02–1.46). **Discussion and Conclusions.** HAC was independently associated with the participant's economic sector and perception of neighbourhood security in Chilean adults. It is important to perform in-depth analyses of contextual effects on individual alcohol consumption. [Ansoleaga E, Castillo-Carniglia A. Associations between social vulnerability, employment conditions and hazardous alcohol consumption in Chile. *Drug Alcohol Rev* 2013;32:254–261]

**Key words:** hazardous alcohol consumption, employment condition, social vulnerability, neighbourhood security.

### Introduction

It is estimated that there are approximately 70 million people worldwide who experience alcohol use disorders [1] and the harmful use results in nearly 2.5 million deaths per year [2]. In the Americas and middle-income countries, it is the greatest risk factor for disease and disability [2].

In Chile, alcohol dependence is among the top five conditions that cause premature death and avoidable disability (23% of Disability Adjusted Life-Years) in both sexes [3]. Reducing alcohol consumption by 20% would prevent 1380 deaths and 105 063 Disability

Adjusted Life-Years per year (corresponding to 2.8% of the total Disability Adjusted Life-Years) [3]. There are also strong associations between alcohol consumption and issues such as domestic violence, traffic accidents, child neglect and absenteeism in the workplace, as well as various health problems [3,4].

One of the difficulties in studying alcohol consumption is that it is a multicausal phenomenon with various consequences. It is associated with individual elements of vulnerability, including biology, genetics, characteristics and coping styles [4], as well as other elements of vulnerability that can be called contextual, that is, a set of factors at the macrosocial (e.g. structural economic

Elisa Ansoleaga MSc, PhD Candidate in Public Health, Professor and Researcher, Department of Psychology, Diego Portales University, Santiago de Chile. Alvaro Castillo-Carniglia MSc, PhD Candidate in Public Health, Head of Research Unit, National Service for Prevention and Rehabilitation on Alcohol and Drugs of Chile. Correspondence to Professor Elisa Ansoleaga, Program on Work Psychosocial Studies, Diego Portales University, Grajales #1898, Santiago Centro, Santiago, Chile. Tel: +56 2 6762556; Fax: +56 2 6762501; E-mail: maria.ansoleaga@udp.cl

Received 13 December 2011; accepted for publication 9 September 2012.

and political factors, economy sector) and microsocial levels (e.g. neighbourhood quality and social vulnerability) [5].

Several reports have shown an association between working conditions and alcohol consumption [6–8], where people in certain occupations present an increased risk of this behaviour [9] and those with a lower employment status possess an increased risk of alcohol consumption regardless of sex, age and other confounding variables [10]. In Chile and Latin America, few studies have analysed these variables. Balsa and French observed, in Uruguayan workers, strong positive associations between high consumption/intoxication and participation in the labour market, unlike the results of related literature from developed countries where high alcohol intake was associated with unemployment [11]. In Chile, Trucco *et al.* [12] showed that there was a high occurrence of work accidents associated with alcohol use, which suggests a need for incorporating employment status as a dimension in studies of problematic alcohol consumption.

On the other hand, social and environmental conditions, such as neighbourhood security and socioeconomic status, have also been associated with alcohol consumption. Numerous studies have reported associations between alcohol consumption and certain conditions of social vulnerability, such as income or educational level [13–20]. Some studies have shown that the quality of a neighbourhood has a significant impact on drug and alcohol consumption [15,21–23]; for instance, people who live in a disadvantaged neighbourhood drink more heavily than those who live in a more favourable area [24]. Some hypothesised underlying mechanisms for these associations have focused on neighbourhood conditions, such as high alcohol outlet density, access to off-premises alcohol outlets and neighbourhood deprivation [25–27]. Other conditions are neighbourhood disorders and perceived security. According to Kuipers *et al.*, higher rates of hazardous alcohol use could increase the occurrence of problematic behaviour among residents, which in turn would increase neighbourhood disorders [28]. Also, an environment that generates daily stress (i.e. drug use in the streets, drug trafficking, assaults or damage to public property) may be associated with mental health problems and drug and alcohol consumption [29]. This last hypothesis has received increasing attention in related literature [30,31].

However, few studies have examined the relationship between social vulnerability and alcohol consumption in Latin America [32]. Our hypotheses are: (i) that there is an association between hazardous alcohol consumption and employment status in Chilean adults; and (ii) that an increased social vulnerability and a poor perception of neighbourhood security in this part of the

population increase the odds of hazardous drinking, regardless of an individual's socioeconomic position.

Therefore, the objective of this study was to explore relationships between hazardous alcohol consumption and employment status, and between hazardous alcohol consumption and social vulnerability in Chilean adults.

## Methods

### Study design

We analysed data from the 2008 Eighth Chilean General Population Survey by the National Council for Narcotics Control [33]. The study sampling was performed in three stages: (i) randomly selecting sections nested in communes; (ii) randomly selecting households nested in sections; and (iii) randomly selecting individuals within households. The sections are made up of geographic clusters of an approximated five blocks, and in this study each section is considered a neighbourhood. The survey had a response rate of 77% and all the interviews were conducted by a trained interviewer in the participant's house.

The sample analysed in this study included men and women aged between 18 and 65 years. The total number of individuals in the sample was 15 586, and 12 781 of the individuals (82%) completed the alcohol questionnaire (people who declared consuming alcohol at least once in their lifetime). As our first objective concerned the economically active population who are paid wages for their labour, we eliminated 5907 economically inactive individuals (students, housewives, retirees and people who reported 'doing no work') and an additional 21 subjects who reported performing unpaid work for their families from the analysis. For the second objective we included all subjects who completed the alcohol test.

### Variables

Hazardous alcohol consumption was measured by the Alcohol Use Disorders Identification Test, developed by the World Health Organization and validated in Chile by Alvarado *et al.* [34]. The instrument includes 10 items and three dimensions: hazardous drinking, dependence symptoms and harmful drinking. Hazardous drinking was defined by a score equal or above 6 points for the 10 items, which is the cut-off point validated for Chile with a sensitivity and specificity of 83.3% and 87.9%, respectively [34]. For the purposes of this study, the variable was dichotomised at the cut-off point mentioned above.

The employment status variable included people working full- or part-time jobs, employed people with a

medical ailment or prolonged illness, and also unemployed individuals who were seeking work. This variable was regrouped into two categories: employed and unemployed. Ten sectors of the economy evaluated in the survey include the following eight categories: agriculture, mining, industry, construction, services (including education, health and personal), other services, and trade and transportation. The following established occupational categories were used to identify each worker's position in the occupational hierarchy: employer, self-employed, employee, labourer and domestic service.

The individual-level socioeconomic index included the following factors: years of education, average household income and the negative or positive perception of neighbourhood security, as measured by seven items relating to the identification of environmental problems (detailed below). The social vulnerability index was constructed by measuring the proportion of households in a neighbourhood with an average monthly income below US\$600 (approximately CLP\$300 000), as well as measuring the proportion of people with less than 12 years of education and the proportion of unemployed people. Levels of vulnerability were defined by the score quartiles, with the fourth quartile being the most vulnerable one.

Finally, the perception of neighbourhood security was calculated from self-reported perceptions of drug traffic, house burglaries, graffiti or damage to public lighting, use of drugs in public places, assaults and robberies in the streets, loitering, shootings and violent acts with guns. This is a one-factor scale and the reliability (Cronbach alpha) for this sample was 0.88. The index was calculated as the standardised sum of the proportion of people in the neighbourhood who reported 'a lot' or 'plenty' for the seven items. The perception of neighbourhood security was categorised into quartiles, and the fourth quartile represented the neighbourhoods with the most perceived problems.

### *Statistical analysis*

To construct the individual socioeconomic levels and to prevent the loss of a large number of observations in the regression models, missing data were inputted for the income and neighbourhood security variables. We ran a sensitivity analysis testing the inputted and non-inputted data and the imputation procedure did not change the direction or strength of the effect. In both cases, we used a multiple imputation procedure in the STATA statistical package (Stata Corporation, College Station, TX, USA) with the ordinal logistic regression model. The percentage of inputted values for the income variable was 9.29%, while the percentages of

inputted values for the neighbourhood security variables were between 2.2% and 14.8%.

To consider the non-independence of subjects within a neighbourhood (clustering) and to perform simultaneous modelling of contextual- and individual-level variables, we used logistic mixed-effect models with two levels.

Various tests were performed in accordance with the study's hypotheses and controlling for potential confounders, such as sex, age, socioeconomic status and relationship status. All analyses were performed using the unexpanded data and with STATA 11.1 statistical software [35].

The protocol of this study was reviewed and approved by the Ethics in Investigation Committee of Diego Portales University.

### **Results**

Table 1 displays demographic characteristics of the sample who completed the Alcohol Use Disorders Identification Test items, including sex, age, education, relationship status and average monthly household income (US\$1 = CLP\$500, approximately) of the participants.

Table 2 shows variables related to the employment conditions of the respondents who completed the alcohol test, including the employment status, occupational category and economic sector.

The Alcohol Use Disorders Identification Test had an internal reliability of 0.83 in the total sample. The total prevalence of hazardous alcohol consumption was 14.2%, 26.2% in men and 4.7% in women. When we disaggregated the data by employment status, employed respondents presented a prevalence of hazardous alcohol consumption of 16.8%, while unemployed respondents reported a prevalence of 22.6% (Table 3). The intra-class correlation indicated that 2.9% of the total variability of hazardous drinking is on the neighbourhood level.

When we analysed hazardous alcohol consumption by economic sector (Table 3), we observed areas with high prevalence, particularly in construction (32.5%), mining (28.1%) and industry (21.6%). There were differences in the prevalence of hazardous alcohol consumption when the sample was divided by relationship status, educational level, sex and age (data not reported).

As shown in Table 3, the odds of hazardous alcohol consumption was 45% higher among those who were unemployed. This association decreased to 23% and included the null value after adjusting for sex, age, relationship status and socioeconomic status.

To make comparisons regarding economic sector, we considered the educational, health and personal

**Table 1.** Demographic characteristics of the sample which completed the alcohol test (unexpanded data)

	n (%)
Sex	
Male	5653 (44.4)
Female	7128 (55.6)
Age, years	
18–25	2035 (15.9)
26–34	2621 (20.5)
35–44	3204 (25.1)
45–54	2719 (21.3)
55–65	2202 (17.2)
Relationship status	
In a relationship	7731 (60.8)
Not in a relationship	4976 (39.2)
Education	
Did not complete primary school	1278 (10.2)
Completed primary school	1340 (10.7)
Did not complete high school	2198 (17.6)
Completed high school	3994 (31.9)
Did not complete technical education	296 (2.4)
Completed technical education	1259 (10.1)
Did not complete graduate education	915 (7.3)
Graduate education or higher	1235 (9.8)
Household monthly income <sup>a</sup>	
Less than US\$200	1301 (10.2)
US\$201–US\$400	4116 (32.3)
US\$401–US\$600	3011 (23.6)
US\$601–US\$1000	2439 (19.1)
US\$1001–US\$2000	1222 (9.6)
US\$2001–US\$3000	308 (2.4)
US\$3001–US\$4000	187 (1.5)
More than US\$4000	162 (1.3)

<sup>a</sup>US\$1 = CLP\$500 approximately; the frequencies and percentages reported include imputed missing values that correspond to 9.29% of the total.

services sector as a reference. When compared with the referenced sector, the odds of hazardous alcohol consumption was 6.8 times higher among participants in construction, more than five times higher in mining and agriculture and nearly four times higher in industry (Table 3). When we adjusted the models for sex, age, marital status and socioeconomic status, the effect size decreased (see Figure 1); however, the association remained significant.

In regard to the occupational categories, and compared with the group of employers, labourers were 1.5 [95% confidence interval (CI) 1.13–2.01] times more likely to engage in hazardous alcohol consumption, while domestic workers were 3.5 (95% CI 0.16–0.47) times less likely to. However, after adjusting for potential confounding variables, both associations decreased.

We tested our hypothesis that the aggregated data at the neighbourhood level were associated with hazardous alcohol consumption at the individual level. As

**Table 2.** Description of the sample who completed alcohol test by employment conditions (unexpanded data)

	n (%)
Employment status	
Employed	7707 (93.6)
Unemployed	526 (6.4)
Occupational category	
Employer (owner or partner)	437 (5.8)
Self-employed	1281 (17.1)
Employee	4057 (54.1)
Labourer	1400 (18.7)
Domestic service	331 (4.4)
Economy sector	
Services	1428 (18.7)
Agriculture	263 (3.5)
Mining	349 (4.6)
Industry	538 (7.1)
Construction	810 (10.6)
Other services	2381 (31.2)
Trade	1405 (18.4)
Transport	459 (6.0)

shown in Table 4, there is an association between the lowest quartile of the social vulnerability index and hazardous drinking. After adjusting for sex and age, this association was maintained in the fourth quartile, and it excluded the null value in the third quartile. However, by incorporating individual socioeconomic covariates (income, education and unemployment) into the model, the odds ratio decreased and all of the confidence intervals included the null value.

When analysing the perception of neighbourhood security, there was a significant effect of hazardous alcohol consumption in quartiles two, three and four in relation to those who held a poorer perception of their neighbourhood. This association did not remain after adjusting for the individual-level socioeconomic status (income and education) and individual perception of the neighbourhood's security, except in the third quartile, where the odds ratio decreased from 1.29 (95% CI 1.08–1.53) to 1.22 (95% CI 1.02–1.46).

## Discussion

In this study we examined the associations between working conditions in economically active adults, neighbourhood social vulnerability, perceived neighbourhood security and hazardous alcohol consumption using a multilevel analysis.

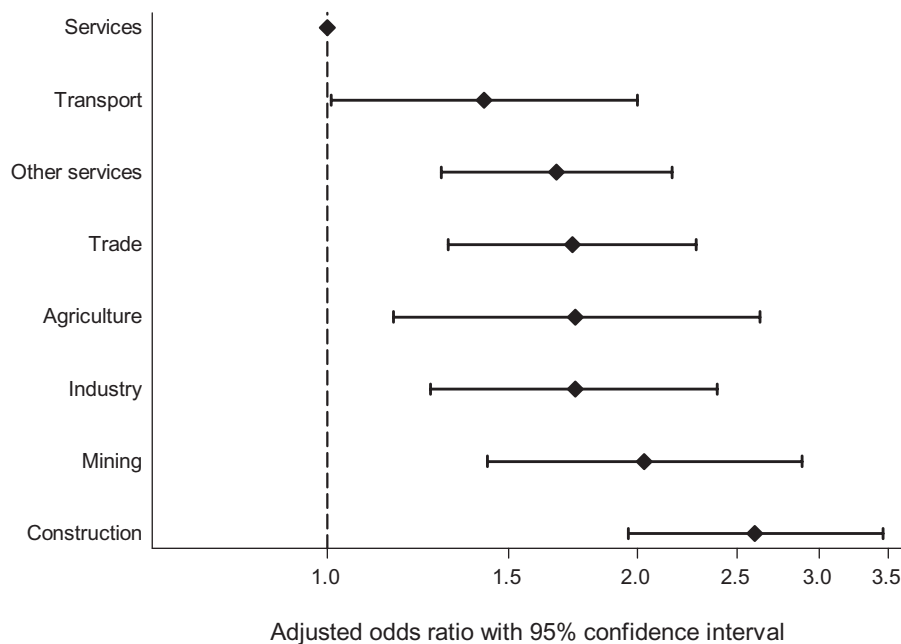
We ran several models to test the hypothesis of an association between hazardous alcohol consumption and employment status. In the bivariate models, we observed associations between hazardous alcohol consumption, employment status, economic sector and



**Table 3.** Relationships among hazardous alcohol consumption and employment status, economic sector and occupational categories

	Prev., %	OR (CI 95%)	OR <sup>a</sup> (CI 95%)
Employment status			
Employed	16.8	1	1
Unemployed	22.6	1.45 (1.17–1.80)	1.23 (0.97–1.56)
Economic sector			
Services	6.7	1	1
Agriculture	18.3	5.21 (2.19–4.70)	1.74 (1.16–2.63)
Mining	28.1	5.48 (3.98–7.54)	2.03 (1.43–2.89)
Industry	21.6	3.90 (2.90–5.44)	1.74 (1.26–2.39)
Construction	32.5	6.82 (5.27–8.90)	2.60 (1.96–3.46)
Other services	15.5	2.60 (2.04–3.29)	1.67 (1.29–2.16)
Trade	14.7	2.43 (1.88–3.14)	1.73 (1.31–2.28)
Transport	18.5	3.22 (2.34–4.43)	1.42 (1.01–2.00)
Occupational category			
Employer (owner or partner)	16.9	1	1
Self-employed	18.8	1.14 (0.85–1.52)	1.04 (0.76–1.43)
Employee	14.7	0.85 (0.65–1.11)	0.72 (0.54–0.97)
Labourer	23.3	1.51 (1.13–2.01)	0.97 (0.71–1.32)
Domestic services	5.4	0.28 (0.16–0.47)	0.83 (0.46–1.49)

<sup>a</sup>Adjusted for sex, age (18–25, 26–34, 35–44, 45–54, 55–65 years), relationship status and individual socioeconomic index. CI, confidence interval; OR, odds ratio; Prev., prevalence of hazardous alcohol consumption.

**Figure 1.** Hazardous alcohol consumption in different economic sectors.

occupational category. However, after adjusting for socioeconomic factors, sex, age and relationship status, the strength of these associations decreased in all cases. This can be explained, in part, by the associations between employment and alcohol consumption, and variables such as socioeconomic status, sex and age, which act as confounders in the relationship.

On the one hand, our results are consistent with those reported for Uruguay by Balsa and French [11], who observed an association between employment status and alcohol consumption. By contrast, such a result has not always been observed in studies from developed countries [36,37]. The inverse associations between unemployment and alcohol consumption can

**Table 4.** Hazardous alcohol consumption subdivided into quartiles for the social vulnerability index and perception of neighbourhood security

	<i>n</i>	Prev., %	OR (CI 95%)	OR <sup>a</sup> (CI 95%)	OR <sup>b</sup> (CI 95%)	OR <sup>c</sup> (CI 95%)
Social vulnerability index						
Quartile 1	3257	12.9	1	1	1	—
Quartile 2	3196	14.2	1.12 (0.95–1.32)	1.13 (0.95–1.34)	0.99 (0.80–1.23)	—
Quartile 3	3192	14.4	1.14 (0.97–1.34)	1.20 (1.01–1.42)	1.05 (0.85–1.30)	—
Quartile 4	3132	15.3	1.22 (1.04–1.44)	1.28 (1.08–1.51)	1.00 (0.81–1.24)	—
Perception of neighbourhood security						
Quartile 1	3241	12.0	1	1		1
Quartile 2	3125	14.1	1.21 (1.02–1.43)	1.19 (1.00–1.41)		1.12 (0.93–1.34)
Quartile 3	3178	14.7	1.29 (1.09–1.52)	1.29 (1.08–1.53)		1.22 (1.02–1.46)
Quartile 4	3237	16.0	1.39 (1.19–1.63)	1.37 (1.16–1.62)		1.16 (0.96–1.39)

<sup>a</sup>Adjusted for sex, age (18–25, 26–34, 35–44, 45–54, 55–65). <sup>b</sup>Adjusted for sex, age (18–25, 26–34, 35–44, 45–54, 55–65), individual income (eight categories), individual education (eight categories) and unemployment. <sup>c</sup>Adjusted for sex, age (18–25, 26–34, 35–44, 45–54, 55–65), individual income (eight categories), individual education (eight categories) and individual perceptions of neighbourhood security (scale of seven items). CI, confidence interval; OR, odds ratio; Prev., prevalence of hazardous alcohol consumption.

be interpreted through hypotheses such as the non-criminalisation of alcohol related to work, alcohol consumption for socialisation at work and the possibility that income increases the access to alcohol [11,38,39].

On the other hand, there was a strong association between the economic sector an individual was employed in and whether they engaged in hazardous alcohol consumption, even after controlling for the potential confounders mentioned above. Several hypotheses may help understand these results. One would be the selection of individuals (unskilled workers) with an increased risk of alcohol consumption in some occupations (e.g. manual labour) [40]. Also, people working in blue collar occupations, such as construction, mining, industry and agriculture, may increase their consumption for reasons such as availability of alcohol at work, social pressure to drink, low income levels, collusion by colleagues, strain and stress, and job insecurity [41,42].

According to our second hypothesis that a higher social vulnerability and a poor perception of neighbourhood security are associated with hazardous drinking, we observed an association between hazardous alcohol consumption and both variables at the ecological level. This association remained for the perception of neighbourhood security, even after controlling for individual variables, such as sex, age and/or socioeconomic status. These results support the hypothesis that social context has an influence on behaviour and an individual's health conditions. Also, our results are similar to findings reported for developed countries, such as the USA and some European countries [15,27,43]. Cerdá *et al.*, in a prospective study of adults (18–30 years old), showed that neigh-

bourhood poverty was associated with an 86% odds increase for binge drinking [15]; in the same way, Halonen *et al.*, in a Finnish sample of more than 60 000 cases, found that the cumulative odds ratio for the sum of health risks (tobacco, alcohol use and physical inactivity) was highest, from 13% to 75%, in more disadvantaged neighbourhoods [44].

Broadly speaking, we suggest that our findings support the idea of a social gradient [45] along which different communities can be located, the social characteristics of which influence patterns of alcohol consumption and related consequences. Our measures of employment status and neighbourhood security are two indicators illustrating such a social gradient in health outcomes and risk factors such as those related to alcohol use.

For instance, Harford *et al.* [9] have shown that socioeconomic status has implications on alcohol consumption. Workers in higher occupational categories showed a higher prevalence of current alcohol consumption and in greater volumes, but the workers in lower categories consumed alcohol in a more risky pattern than white collar employees. This suggests that in some populations there may be an inverse relationship between socioeconomic status and the presence of some criteria for alcohol abuse or dependence. For example, reports by the National Service for Prevention and Rehabilitation on Alcohol and Drugs of Chile (previously the National Council for Narcotics Control) show that the monthly prevalence of alcohol consumption reported in the 2008 study was 46.3% for those in the lower socioeconomic sector and 55.9% in the more affluent sector. However, the prevalence of Diagnostic and Statistical Manual of Mental Disorders-IV alcohol

abuse was 14.5% in the highest socioeconomic level and 28.4% in the lowest level [33].

Likewise, the results of the 2010 Chilean National Survey of Health, Work and Quality of Life indicate that some economic sectors like construction have consistently more precarious employment conditions related to negative health outcomes [46].

The relevance of our results is that they can help identify factors associated with risky alcohol consumption and highlight the hypothesis of contextual effects on individual alcohol consumption which is a new approach towards developing countries. Finally, it is important to perform further analyses of specific sectors and occupations with an increased risk and prevalence of hazardous alcohol consumption.

## References

- [1] World Health Organization. Mental health: new understanding, new hope. Geneva: WHO, 2001.
- [2] World Health Organization. Global status report on alcohol and health. Geneva: WHO, 2011.
- [3] Ministerio de Salud. Estudio de Carga de Enfermedad y Carga Atribuible 2007. Santiago: Departamento de Epidemiología, 2008.
- [4] World Health Organization. Reducing risks, promoting healthy life. Geneva: WHO, 2002.
- [5] Rehm J, Monteiro M. Alcohol consumption and burden of disease in the Americas: implications for alcohol policy. *Rev Panam Salud Publica* 2005;18:241–8.
- [6] Kawakami N, Araki S, Haratani T, Hemmi T. Relations of work stress to alcohol use and drinking problems in male and female employees of a computer factory in Japan. *Environ Res* 1993;62:314–24.
- [7] Vasse RM, Nijhuis FJ, Kok G. Associations between work stress, alcohol consumption and sickness absence. *Addiction* 1998;93:231–41.
- [8] Greenberg ES, Grunberg L. Work alienation and problem alcohol behavior. *J Health Soc Behav* 1995;36:83–102.
- [9] Harford TC, Parker DA, Grant BF, Dawson DA. Alcohol use and dependence among employed men and women in the United States in 1988. *Alcohol Clin Exp Res* 1992;16:146–8.
- [10] Temple MT, Fillmore KM, Hartka E, Johnstone B, Leino EV, Motoyoshi M. A meta-analysis of change in marital and employment status as predictors of alcohol consumption on a typical occasion. *Br J Addict* 1991;86:1269–81.
- [11] Balsa AI, French MT. Alcohol use and the labor market in Uruguay. *Health Econ* 2010;19:833–54.
- [12] Trucco M, Rebolledo P, González X, Correa A, Bustamante M. Consumo reciente de alcohol y drogas en accidentes del trabajo. *Rev Med Chil* 1998;126:1262–7.
- [13] van Oers JA, Bongers IM, van de Goor LA, Garretsen HF. Alcohol consumption, alcohol-related problems, problem drinking, and socioeconomic status. *Alcohol Alcohol* 1999;34:78–88.
- [14] Kuendig H, Plant ML, Plant MA, *et al.* Beyond drinking: differential effects of demographic and socioeconomic factors on alcohol-related adverse consequences across European countries. *Eur Addict Res* 2008;14:150–60.
- [15] Cerdá M, Diez-Roux AV, Tchetgen ET, Gordon-Larsen P, Kiefe C. The relationship between neighborhood poverty and alcohol use: estimation by marginal structural models. *Epidemiology* 2010;21:482–9.
- [16] Wu B, Mao ZF, Rockett IR, Yue Y. Socioeconomic status and alcohol use among urban and rural residents in China. *Subst Use Misuse* 2008;43:952–66.
- [17] Trim RS, Chassin L. Neighborhood socioeconomic status effects on adolescent alcohol outcomes using growth models: exploring the role of parental alcoholism. *J Stud Alcohol Drugs* 2008;69:639–48.
- [18] Subramanian SV, Nandy S, Irving M, Gordon D, Davey Smith G. Role of socioeconomic markers and state prohibition policy in predicting alcohol consumption among men and women in India: a multilevel statistical analysis. *Bull World Health Organ* 2005;83:829–36.
- [19] Melchior M, Choquet M, Le Strat Y, Hassler C, Gorwood P. Parental alcohol dependence, socioeconomic disadvantage and alcohol and cannabis dependence among young adults in the community. *Eur Psychiatry* 2011;26:13–17.
- [20] Batty GD, Lewars H, Emslie C, Benzeval M, Hunt K. Problem drinking and exceeding guidelines for 'sensible' alcohol consumption in Scottish men: associations with life course socioeconomic disadvantage in a population-based cohort study. *BMC Public Health* 2008;8:302.
- [21] Hill TD, Khamis HJ, Tyczynski JE, Berkel HJ. Comparison of male and female breast cancer incidence trends, tumor characteristics, and survival. *Ann Epidemiol* 2005;15:773–80.
- [22] Jones-Webb R, Snowden L, Herd D, Short B, Hannan P. Alcohol-related problems among black, Hispanic and white men: the contribution of neighborhood poverty. *J Stud Alcohol* 1997;58:539–45.
- [23] Pickett KE, Pearl M. Multilevel analyses of neighbourhood socioeconomic context and health outcomes: a critical review. *J Epidemiol Community Health* 2001;55:111–22.
- [24] Hill TD, Angel RJ. Neighborhood disorder, psychological distress, and heavy drinking. *Soc Sci Med* 2005;61:965–75.
- [25] Scribner RA, Cohen DA, Fisher W. Evidence of a structural effect for alcohol outlet density: a multilevel analysis. *Alcohol Clin Exp Res* 2000;24:188–95.
- [26] Kavanagh AM, Kelly MT, Krnjacki L, *et al.* Access to alcohol outlets and harmful alcohol consumption: a multilevel study in Melbourne, Australia. *Addiction* 2011;106:1772–9.
- [27] Stimpson JP, Ju H, Raji MA, Eschbach K. Neighborhood deprivation and health risk behaviors in NHANES III. *Am J Health Behav* 2007;31:215–22.
- [28] Kuipers MA, van Poppel MN, van den Brink W, Wingen M, Kunst AE. The association between neighborhood disorder, social cohesion and hazardous alcohol use: a national multilevel study. *Drug Alcohol Depend* 2012; <http://dx.doi.org/10.1016/j.bbr.2011.03.031>.
- [29] Mirowsky J, Ross C. Social causes of psychological distress, 2nd edn. Hawthorne: Walter de Gruyter, 2003.
- [30] Latkin CA, Curry AD. Stressful neighborhoods and depression: a prospective study of the impact of neighborhood disorder. *J Health Soc Behav* 2003;44:34–44.
- [31] Ross CE, Mirowsky J. Neighborhood disadvantage, disorder, and health. *J Health Soc Behav* 2001;42:258–76.
- [32] Godoy RA, Reyes-García V, McDade T, *et al.* Does village inequality in modern income harm the psyche? Anger, fear, sadness, and alcohol consumption in a pre-industrial society. *Soc Sci Med* 2006;63:359–72.

- [33] National Council for Narcotics Control (CONACE). Eighth general population survey. Santiago: CONACE, 2008.
- [34] Alvarado ME, Garmendia ML, Acuna G, Santis R, Arteaga O. [Assessment of the alcohol use disorders identification test (AUDIT) to detect problem drinkers]. *Rev Med Chil* 2009;137:1463–8.
- [35] Stata Corp LP. Stata statistical software: release 11.1. College Station: Stata Corporation, 2010.
- [36] Janlert U, Hammarstrom A. Alcohol consumption among unemployed youths: results from a prospective study. *Br J Addict* 1992;87:703–14.
- [37] Lundin A, Backhans M, Hemmingsson T. Unemployment and hospitalization owing to an alcohol-related diagnosis among middle-aged men in Sweden. *Alcohol Clin Exp Res* 2012;36:663–9.
- [38] D'Arcy C. Unemployment and health: data and implications. *Can J Public Health* 1986;77 (Suppl. 1):124–31.
- [39] Morris JK, Cook DG, Shaper AG. Non-employment and changes in smoking, drinking, and body weight. *BMJ* 1992;304:536–41.
- [40] Hemmingsson T, Lundberg I, Romelsjo A, Alfredsson L. Alcoholism in social classes and occupations in Sweden. *Int J Epidemiol* 1997;26:584–91.
- [41] Olkinuora M. Alcoholism and occupation. *Scand J Work Environ Health* 1984;10:511–15.
- [42] Roxburgh S. Gender differences in the effect of job stressors on alcohol consumption. *Addict Behav* 1998;23:101–7.
- [43] Le F, Ahern J, Galea S. Neighborhood education inequality and drinking behavior. *Drug Alcohol Depend* 2010;112:18–26.
- [44] Halonen JI, Kivimaki M, Pentti J, Kawachi I, Virtanen M, Martikainen P, *et al.* Quantifying neighbourhood socioeconomic effects in clustering of behaviour-related risk factors: a multilevel analysis. *PLoS One* 2012;7:e32937.
- [45] Marmot M, Atkinson T, Bell J, Black C, Broadford P, Cumberlege J, *et al.* Fair Society, Healthy Lives. The Marmot Review, Executive Summary: Strategic Review of Health Inequalities in England post-2010. Available at: <http://www.instituteofhealthequity.org/projects/fair-society-healthy-lives-the-marmot-review> (accessed May 2011).
- [46] Gobierno de Chile. Primera encuesta nacional de empleo, trabajo, salud y calidad de vida de los trabajadores y trabajadoras en Chile (ENETS 2009–2010). Santiago: Ministerio de Salud y Ministerio de Trabajo, 2011.