



Full length article

## Socioeconomic inequalities in alcohol consumption in Chile and Finland



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### ABSTRACT

**Background:** Reasons for socioeconomic inequalities in alcohol harm are not sufficiently understood. One explanation relates to differential exposure to alcohol by socioeconomic status (SES). The present study investigated socioeconomic inequalities in alcohol use in two countries with high alcohol consumption and alcohol harm.

**Methods:** Data from nationally representative surveys in 2009–2010 in Chile and in 2008–2011 in Finland were used. Surveys comprised 3477 participants in Chile and 9994 in Finland aged 30–64 years. Outcome measures included abstinence, weekly consumption of pure alcohol, heavy volume drinking and heavy episodic drinking (HED). We employed a novel method in alcohol research, the concentration index, to measure socioeconomic inequalities.

**Results:** Alcohol abstinence showed a strong association with lower SES in Chile and Finland. These were largely driven by inequalities among women in Chile and older subgroups in Finland. In both countries, women aged 45–64 of higher SES showed higher weekly consumption of pure alcohol and heavy volume drinking. Heavy volume drinking among Chilean women aged 45–64 showed the highest inequality, favouring higher SES. HED was equally distributed among SES groups in Chile; in Finland HED disproportionately affected lower SES groups.

**Conclusions:** Lower SES was associated with higher abstinence rates in both countries and heavy episodic drinking in Finland. Heavy volume drinking was more prevalent in middle-aged women of high SES. The results identified groups for targeted interventions, including middle-aged higher SES women, who traditionally have not been specifically targeted. The concentration index could be a useful measure of inequalities in alcohol use.

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## 1. Introduction

Harmful use of alcohol accounts for 3.3 million net deaths every year and is the fifth largest risk factor of death and disability worldwide (Lim et al., 2012; World Health Organization, 2014b). Harmful drinking is also associated with vast social harm, including domestic violence, low productivity, work absenteeism, social isolation and stigma (Babor et al., 2010; Rehm et al., 2010).

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Within societies, populations at the lower socioeconomic spectrum experience greater alcohol-related harm. A steep social gradient has been consistently described in high-income countries, but similar patterns of socioeconomic inequalities have also been found in low and middle-income countries such as Brazil (Mackenbach et al., 2015; Probst et al., 2014; Silveira et al., 2014).

Reasons for socioeconomic inequalities in alcohol-related harm are not sufficiently understood. Possible explanations include differential exposure due to differential alcohol use among socioeconomic groups; differential vulnerability, where the same amount of alcohol results in different consequences; selection or reversed causality or methodological shortcomings in survey measurements (Bellis et al., 2016; Grittner et al., 2013; Grittner et al., 2012; Jones et al., 2015; Makela and Paljarvi, 2008).

Evidence of differential exposure to alcohol by socioeconomic groups is inconsistent. The most recurrent pattern is that lower socioeconomic groups tend to have higher levels of abstinence (Bloomfield et al., 2006; van Oers et al., 1999). Men in disadvantaged groups tend to drink less frequently but report higher rates of heavy episodic drinking (Dzúrová et al., 2011; Harper and Lynch, 2007; Midanik and Clark, 1994), although some studies have described opposite patterns (Giskes et al., 2011). Women show inconsistent patterns: some studies report higher rates of mean consumption and heavy episodic drinking among higher socioeconomic groups (Bloomfield et al., 2000; Bloomfield et al., 2008; McKee et al., 2000), while others show the opposite (Bloomfield et al., 2008; Casswell et al., 2003; Helasoja et al., 2007), or no differences at all (Bloomfield et al., 2006).

Studies in low- and middle-income countries suggest alcohol consumption might have different patterns than in high-income countries. A regional study from Brazil showed that higher socioeconomic status was associated with 3-fold odds of high-risk drinking (Almeida-Filho et al., 2005). A national study from India found lower abstinence rates in lower educational groups (Subramanian et al., 2005). Material affluence was positively associated with alcohol use in Ghanaian adolescents, but self-reported drunkenness was higher among those with lower material affluence (Doku et al., 2012). A recent study in 50 countries found mixed results in heavy episodic drinking (Hosseinpoor et al., 2012).

Much of the research literature available has measured inequalities in alcohol use in ways that fail to incorporate the whole socioeconomic spectrum (comparing, for example, only top and bottom levels of SES), are not able to compare all social categories at once or do not provide quantitative estimates of the severity of the inequality. The use of odds ratios is particularly problematic when the outcome has a high prevalence and varies with time, as it is often the case of alcohol use indicators (Khang et al., 2008). Several studies, particularly those in low- and middle-income countries, have not examined both levels and patterns of alcohol use and instead relied on a single indicator.

These methodological shortcomings could partly explain the observed heterogeneity in the research literature. To overcome these limitations, we used the concentration index, a summative measure of inequality that has several advantages: (1) use information from the whole socioeconomic spectrum; (2) account for changes in the population distribution in social groups over time; (3) provides quantitative estimates of the severity of the inequality and (4) is adequate for international comparisons (Harper and Lynch, 2007; O'Donnell et al., 2008). We also examined socioeconomic inequalities using four comparable indicators of levels and patterns of alcohol use.

The present study investigates the existence and patterns of socioeconomic inequalities in alcohol use in Chile and Finland using nationally representative data. The rationale for this comparison rests in the fact that Chile and Finland have the highest alcohol consumption in the Americas and Northern Europe and suffer high alcohol-related harm. The comparison of two economically, geographically and culturally different countries increases the potential for the results to be applicable to other study settings and samples (i.e., external validity).

Given the social patterning of alcohol related-harm, we hypothesized that alcohol consumption would tend to be higher in lower socioeconomic groups, in particular those measures more closely linked to alcohol-related harm: heavy volume drinking and heavy episodic drinking.

## 1.1. Country settings

### 1.1.1. Chile.

Chile, which during our observation period was an upper middle-income country, has the highest alcohol consump-

tion of the Americas, with a total alcohol consumption of 9.61 of pure alcohol per capita (15+) in 2008–2010, 7.6 of which is recorded consumption. As the world's tenth largest wine producer, its 16 million inhabitants drink predominantly wine (38%), followed by spirits (32%) and beer (30%) (World Health Organization, 2015). Chileans have a drinking culture of consuming alcohol a few days per week (1.6 days on average) and, on average, 55 g per occasion (Margozzini and Sapag, 2015). Harmful alcohol use is the leading risk factor of death and disability and accounts for 12.4% of DALYs lost (Ministerio de Salud, 2008). Prevalence of AUDIT score over 8 points is 10.9%, with a 8:1 ratio between men and women (Ministerio de Salud, 2014).

### 1.1.2. Finland.

Finland has a total alcohol consumption of 12.31 of pure alcohol per capita (15+) in 2008–2010, 10.01 of which is recorded consumption. Finns drink predominantly beer (46%), followed by spirits (24%), and wine (17%) (World Health Organization, 2014a). Alcohol consumption has steadily increased since mid-1990s and it is nowadays the highest of Nordic countries (World Health Organization, 2015). Finns have a similar drinking culture, concentrating consumption on few days accompanied by high rates of heavy episodic drinking (Makela et al., 2012). Trends in consumption have been mirrored by alcohol-related mortality, which has increased from 25.6 per 100,000 inhabitants in 1990–32.6 in 2014 (Statistics Finland, 2015).

## 2. Methods and materials

### 2.1. Data sources

In Chile, we used data from the National Health Survey 2009–2010 (ENS09-10). ENS09-10 is a household, face-to-face health examination survey representative of the Chilean population aged 15 or over ( $n=5293$ ). The survey has a multi-stage clustered sampling stratified by region and by urban and rural areas, resulting in 29 sampling clusters. Participation rate was 70% (Ministerio de Salud, 2014). To ensure comparability with the Finnish data, we restricted our analysis to population below 65 years old. Similarly, respondents aged less than 25 years were not included in the analysis considering their education is still undergoing. The analytical sample of respondents aged 25–64 consisted of 3477 adults.

In Finland, we used pooled data from the annual Surveys on Health Behaviour and Health among the Finnish Adult Population (AVTK) in 2008–2011. AVTK is a postal survey representative of the Finnish population aged 15–64 (total sample 2008–2011 = 11772). The study uses a random sampling of 5000 permanent residents in Finland; the response rate ranged from 64 to 57% (Helakorpi et al., 2012). The analytical sample after excluding respondents aged less than 25 years comprised 9994 adults.

ENS09-10 was approved by the Ethics Committee of the Catholic University of Chile in 2009. The protocol of the AVTK-study had been accepted by the Ethical Review Board of the National Institute for Health and Welfare, Finland. Informed consents were obtained by participants in both studies.

### 2.2. Measures

#### 2.2.1. Alcohol use.

We used four measures of alcohol consumption: abstinence, weekly consumption of pure alcohol, heavy volume drinking, and heavy episodic drinking.

*Abstinence* was assessed in both surveys by a question on whether respondents had consumed any alcoholic beverages in the last 12 months. A dichotomous variable was constructed.

*Weekly consumption of pure alcohol* was measured in Finland with a question on the number of portions of beer or ready-mixed

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