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Drinking patterns and drunk-driving behaviour in Catalonia, Spain: A comparative study

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ABSTRACT

This study explores three alcohol-related databases so as to provide a comprehensive understanding of drinking patterns and the prevalence of alcohol-impaired driving in Catalonia (Spain). The rate of alcohol-impaired drivers is compared with the percentage of drinkers in this population, with a particular focus on heavy episodic drinkers. Two strategies adopted by law enforcement agents when conducting alcohol breath tests are examined: (i) non-random and (ii) random approaches to roadblock location and driver selection. We find that heavy drinker profiles (in terms of age and gender) closely match those of alcohol-impaired drivers detected at strategically located, non-random sobriety checkpoints (especially in the case of female drivers), and that they also correlate with the age-gender distribution of drivers involved in road accidents with victims. Different drink driving patterns are detected when sobriety checkpoints are located randomly and drivers are tested at random. Older drivers are identified as a risk group as they abandon the safer driving habits in relation to alcohol shown when they were middle-aged. A combination of non-random and random controls would increase driver perception of their chances of being detected when drink driving. As such, the whole population, regardless of their drinking profile, would be alerted to the serious personal, social and legal implications of alcohol-impaired driving.

1. Introduction

1.1. Aims and scope

Abusive alcohol intake is a major public health risk for populations worldwide, particularly those in developed societies (Room, Babor, & Rehm, 2005; WHO, 2011). The consumption of alcohol can lead to impulsive actions by impairing the inhibitory mechanisms that normally promote socially appropriate behaviour (Marczinski & Fillmore, 2003). Such disinhibited actions are especially dangerous while driving, as they contribute to aggressive and risky behaviour, particularly among young drivers (Fillmore, Blackburn, & Harrison, 2008). In addition, alcohol impairs a driver's psychomotor performance, visual perception and coordination. As a result alcohol stands out as the most prevalent psychoactive substance among injured and killed drivers involved in road accidents (Isalberti et al., 2011).

In this paper we investigate the relation between drinking patterns and impaired driving behaviour in Catalonia (Spain). Our goal is to provide insights into alcohol drinking behaviour and the decision to drive drunk in relation to an individual's

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age and gender. To do so, we examine three official alcohol-related databases for the year 2012, and compare the percentage of drinkers in the population with the rate of illegal outcomes in random and non-random roadside alcohol tests. Random breath tests (RBT) differ from non-random breath tests (non-RBT) in their sample selection method, the former taking a probabilistic approach and the latter adhering to police officer criteria. We focus on the efficiency of sobriety checkpoints to detect alcohol-impaired drivers and to prevent road accidents, according to the randomness (or intentionality) in the selection of the tested driver. Specifically, we seek to determine whether there are alcohol risk profiles in the population not properly identified by traditional breath tests, in which traffic officers typically test drivers that arouse suspicions of drunk driving or those involved in an accident.

1.2. Background

Most studies in the literature to date analyse the drinking behaviour and drunk driving patterns of a population separately. Moreover, to the best of our knowledge, no previous attempts have been made to compare individuals' self-reported drinking behaviour and the drunk-driving patterns observed in RBT and non-RBT procedures to determine which breath-test strategy is more effective.

Spain's culture of alcohol consumption has traditionally adhered to the Mediterranean drinking pattern, with a relatively high proportion of daily alcohol intake with meals, and the avoidance of irregular heavy drinking (Rehm, Rehm, Shield, Gmel, & Gual, 2013). In recent years, however, this pattern seems to have undergone a change with an increase in heavy episodic (binge) drinking being detected in both genders (Valencia-Martín, Galán, & Rodríguez-Artalejo, 2007). This behaviour is typified, above all, by the consumption of spirits by Spanish youth and young adults as they socialise in public places (the so-called "botellón"). The harmful, long-term effects of binge drinking on health are well known, especially among adolescents and youth (Naassila et al., 2013) and, moreover, the literature has long warned of the strong association between binge drinking and impaired driving (Duncan, 1997) and fatal crashes (Voas, Romano, Tippetts, & Furr-Holden, 2006). For instance, Flowers et al. (2008) have shown that 88% of alcohol-related driving episodes in the United States involved this drinking pattern. Also in the US, Naimi, Nelson, and Brewer (2009) provide the following profile of the binge drunk driver: male, aged 35-plus and typically drinking in bars or clubs, although this profile of binge drunk drivers may be country-specific.

In order to reduce the prevalence of individuals driving under the influence of alcohol, national road safety policies in most countries make it a priority to deter drivers from drinking by making them aware of the risks involved (McCarthy & Tay, 2005). To determine whether drivers respect the maximum blood alcohol content (BAC) level, it is common practice to locate sobriety checkpoints at previously unannounced locations alongside roads and in urban areas (Dula, Dwyer, & LeVerne, 2007). At these selected locations, traffic officers then choose at their discretion which vehicles to pull over, and whether to perform the test or not on the driver. The effectiveness of this practice in reducing the number of alcohol-related crashes has been demonstrated in countries as diverse as the United States (Fell, Lacey, & Voas, 2004), Thailand (Ditsuwan, Veerman, Bertram, & Vos, 2013), Cuba (Garcell et al., 2008) and Australia (Peek-Asa, 1999). Erke, Goldenbeld, and Vaa (2009) conducted a meta-analysis of 40 studies and concluded that sobriety checkpoints reduce alcohol-related crashes by 17%, and all crashes by between 10% and 15%. They claim that testing all drivers that are stopped may improve the effectiveness of such controls, as this would eliminate the possibility of faking *normal* driving behaviour.

As the drivers tested at traditional sobriety checkpoints are not randomly selected, they cannot be considered to be representative of the drinking and driving patterns on the roads. The subjectivity incurred by an officer when selecting a driver to stop can result in the non-detection of certain profiles of drink driving offenders (Wells, Greene, Foss, Ferguson, & Williams, 1997). To counter this limitation and to alert the whole driving population to the risks of driving under the influence of alcohol, some countries have developed an alcohol detection strategy based on the random allocation of sobriety checkpoints across the territory, and the performance of a breath alcohol test on the first driver to approach an empty road block, whatever their gender, age, type of vehicle or observable driving performance (Gjerde et al., 2008; Lacey et al., 2011; Vanlaar, 2005). RBTs have the advantage of alerting the whole population to the possibility of being detected while driving under the influence, since the perceived risk increases (Löbmann, 2002). This serves as a major deterrent across the population strata (Homel, 1988), regardless of an individual's personal characteristics, or the time of the day when driving. Australia introduced RBT procedures in the early 80s and today is considered to have one of the most successful programs in the world in terms of reducing the number of crashes (Erke et al., 2009). Ferris et al. (2013) attribute Australia's success to high intensity enforcement, extensive publicity and a high visibility policy thanks to the use of custom-built "booze buses" that allow a high number of tests to be performed per hour and on-site processing. As a result, the number of drivers willing to risk detection for drink driving has fallen dramatically and, in turn, the number of alcohol-related crashes has been reduced.

2. Data and measures

2.1. Geographical area

The geographical area covered in this study is Catalonia, a Mediterranean region located in the northeast corner of Spain, whose capital and largest city is Barcelona. In 2012 the region had a population of more than 7.5 million inhabitants, while the total number of vehicles exceeded 5.0 million and the number of drivers at the end of that year was over 4.1 million