



Full length article

## Prevalence and socio-demographic correlates of alcohol consumption: Survey findings from five states in India

Kaushalendra Kumar<sup>a</sup>, Santosh Kumar<sup>b,\*</sup>, Anil Kumar Singh<sup>c</sup><sup>a</sup> International Institute for Population Sciences (IIPS), Mumbai, India<sup>b</sup> Department of Economics and International Business, Sam Houston State University, Huntsville, TX, USA<sup>c</sup> Department of Economics, Shyam Lal College (E), University of Delhi, Delhi, India

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## ABSTRACT

**Aim:** To investigate association between socio-demographic characteristics and alcohol consumption in India. **Methods:** Analytical data were derived from household surveys conducted by the study team that included 6088 adults in five states of India (male = 3803, female = 2285). The sample was a cross-sectional selected through stratified multistage sampling design. The survey collected data on socio-demographic characteristics of the respondents as well as pattern of alcohol consumption. Multivariate logistic regression models were fitted to investigate socio-demographic association with both alcohol consumption and types of alcoholic beverages consumed (distilled spirits, country liquor, home-brewed).

**Results:** More than one-third of the sample respondents (38.6%, 95%CI = 29.2–48.8%) reported to be current drinkers and approximately one-fifth (21.7%, 95%CI = 4.2–31.7%) were heavy drinkers and 7.4% (95%CI = 4.6–11.6%) were heavy episodic drinkers. In multivariate analyses, age greater than 50 years (OR = 0.70, 95%CI = 0.56–0.86), being female (OR = 0.08, 95%CI = 0.06–0.09), schooling greater than 12 years (OR = 0.61, 95% CI = 0.50–0.75), owning land (OR = 0.74, 95%CI = 0.65–0.86), and living in pucca house (OR = 0.85, 95% CI = 0.74–0.98) were negatively associated with current drinking status. Higher income (OR = 1.30, 95%CI = 1.08–0.57) and living in urban areas (OR = 1.54, 95%CI = 1.33–1.78) were positively associated with current drinking status.

**Conclusions:** Substantial differences in the socio-demographic correlates of alcohol consumption and types of alcoholic beverages exist in India. It is recommended that intervention and prevention strategies to curb alcohol consumption should include drinkers' characteristic.

## 1. Introduction

Approximately 38% of the global adult population consumed alcohol and almost half of the global adult population had never consumed alcohol in 2010 (WHO, 2014). The global per capita consumption of alcohol was estimated to be 6.2L annually, but the per capita consumption of alcohol among drinkers was 160% higher than the global average of 6.2 L, indicating greater prevalence of heavy drinking among alcohol consumers. The global prevalence of alcohol consumption has been steadily rising and has increased by 55% between 1992–2012 (Devaux and Sassi, 2015). Alcohol consumption is a major public health concern worldwide because it is one of the leading risk factors to mortality and disability-adjusted life years (DALYs) lost globally (IHME, 2015; Rehm et al., 2009). Globally, alcohol consumption accounted for 4.1% and 3.5% of deaths and DALYs, respectively in 2015 (IHME, 2015).

Over the last decade alcohol consumption has been rising steadily in India and has emerged as a leading public health challenge. According to the most recent estimates, alcohol consumption accounts for 3.5% of the deaths and 2.9% of the DALYs in India in 2015 (IHME, 2015). The World Health Organization (WHO) report estimated that 15% of people 15 years and older reported to be current drinkers in 2010 and per capita alcohol consumption increased by 37.5% from 1.6 L to 2.2 L of recorded pure alcohol between 2003–05 and 2010–12 in India (WHO, 2014).<sup>1</sup> This suggests that despite low prevalence of alcohol consumption in India (15%), per capita alcohol consumption is very high among drinkers, indicating a greater prevalence of high-frequency and high-volume drinking pattern among drinkers. India ranks first in the WHO South East Asia region for total per capita consumption of pure alcohol among drinkers. Drinkers consumed on average 28.7 L of pure alcohol per capita per year in India while drinkers in Australia, USA, and Germany consumed approximately 15 L of pure alcohol per year

\* Corresponding author at: Department of Economics and International Business, SHB 241A, Sam Houston State University, Huntsville, Texas, 77341-2118, USA.  
E-mail address: [skumar@shsu.edu](mailto:skumar@shsu.edu) (S. Kumar).

<sup>1</sup> Recorded alcohol is alcohol consumed as a beverage that is recorded in official statistics, such as data on alcohol taxation or sales.

(WHO, 2014). As expected, male alcohol consumers were more likely to be high-volume drinkers than female consumers (32.1 L vs 10.6 L) in India. Preference for hard liquors and distilled spirits is the main contributor to such high consumption levels of pure alcohol among Indian drinkers (Prasad, 2009). Distilled spirits, which have the highest alcohol by volume, accounted for more than 90% of the alcoholic beverages consumed in India. Furthermore, higher levels of alcohol consumption may increase the risk of non-communicable disease such as cancer, coronary heart disease, and intentional injuries (Room et al., 2005).

The health risk attributed to increasing prevalence of alcohol consumption in India is further exacerbated by consumption of unrecorded alcohol, illicit liquor, surrogate alcohol, and other hazardous drinking behaviour (Rathod et al., 2015; WHO, 2014). Unrecorded alcohol, defined as alcohol produced outside the formal channel of government system, accounts for 25% of all alcohol consumption worldwide in 2012 (WHO, 2014). However, the WHO 2014 report on alcohol and health, which is recognized as the best available estimate, found that share of unrecorded alcohol could be as high as 50% in India. Country liquor, industrially produced illicit alcohol, and home-brewed alcohol are the most common categories of unrecorded alcohol in India (Benegal et al., 2003). Compared to recorded alcohol consumption, data on unrecorded alcohol are not easily available and are harder to obtain because they are not part of formal tax or sales system. Furthermore, majority of the countries do not gather information on consumption of unrecorded alcohol and therefore estimates of unrecorded alcohol consumption are generated either through expert opinions or survey data that are further susceptible to measurement error and under-reporting. Given the illicit nature of unrecorded alcohol, it is very difficult to provide reliable estimates of consumption and survey-based estimates are generally lower bound due to under-reporting. Unrecorded alcohol consumption may pose greater health risks because consumers of unrecorded alcohol are more likely to be chronic and irregular heavy drinkers (Rehm et al., 2014). Due to the lower cost of unrecorded alcohol, people have greater propensity to consume larger volumes of unrecorded alcohol. Furthermore, unrecorded alcohol was found to be linked with heavy drinking by individuals in low socio-economic groups, especially in rural and tribal populations (Gupta et al., 2003; Chowdhury et al., 2006). The health risks of unrecorded alcohol is severe than risks from consumption of recorded alcohol. In a study conducted in Nepal, authors found significant increase in the risk of alcohol liver disease due to consumption of unrecorded or home-brewed alcohol, after adjusting for total quantity consumed (Pradhan et al., 2015).

The purpose of this study is twofold. Given that the most reliable and updated estimates on alcohol consumption in India are from 2010 and are based on aggregated data and expert opinions, there is a need to generate reliable estimate of recorded and unrecorded alcohol consumption because expert opinions are subjective and prone to bias and measurement error. The overarching goal of this study is to provide new and updated estimates of recorded and unrecorded alcohol consumption and patterns of alcohol consumption in India based on population surveys implemented in five states in 2014. The updated and reliable data is crucial for policy measures and to assess its effects. Additionally, this study further explores socio-demographic factors that are associated with patterns of alcohol consumption behaviors in India.

### 1.1. Alcohol consumption in India

Alcohol is the second most commonly used substance in India after tobacco. However, only a handful of studies were conducted to assess the prevalence and patterns of alcohol consumption in India. Based on small and community- or state-based studies, the prevalence of alcohol consumption was estimated to be 20.7% in Andaman and Nicobar in 2007–09, 9.4% in rural Tamil Nadu in 2012, and 13.3% in Madhya Pradesh in 2013–14 (Kumar et al., 2013; Manimunda et al., 2017; Rathod et al., 2015). The 2003 National Household Survey of Alcohol

and Drug Abuse found that 21.4% of the respondents were current users of alcohol (consumed in the last 30 days) and only 2% of women were current drinkers, but according to the WHO report it has risen to 25% for the men and 5% for women in 2010–2012 (Ray et al., 2004; WHO, 2014). Nonetheless, there is a paucity of reliable data on prevalence of alcohol consumption and factors associated with its consumption, which are likely to vary across states and by socio-demographic characteristics of alcohol consumers.

Alcohol consumers in India prefer hard liquors and distilled spirits (these beverages have higher alcohol by volume) over other alcoholic beverages (wine, beer etc.) and therefore, distilled spirits account for 93% of the recorded alcoholic beverages consumed in India (WHO, 2014). Additionally, estimates reported in these studies are based on recorded alcohol consumption, but there is a large share of unrecorded alcohol consumption among the socio-economically deprived populations living in rural areas and remote tribal areas.

In terms of drinking frequency and quantity, 30–50% of alcohol consumers are hazardous drinkers in India (Bonu et al., 2005; Rathod et al., 2015). Considering the widespread availability of unrecorded alcohol and lower price relative to recorded alcohol, we further explore the socio-demographic differential between recorded and unrecorded alcohol consumption in India. Specifically, the socio-demographic predictors of recorded alcohol, country liquor, and home-brewed alcohol were assessed.

### 1.2. Social determinants of alcohol consumption

The evidence on the association between the socio-demographic factors such as age, gender, income, socioeconomic status, and alcohol consumption in developing countries is limited, mixed, and lacks statistical inference due to small sample size.

Analyzing National Sample Survey of 500,000 million people, Neufeld et al. (2005) reported that men and members of Scheduled Castes (SC) and Scheduled Tribes (ST) (historically marginalized communities in India) were more likely to consume alcohol than women and other castes, respectively. Similarly, Subramanian et al. (2005) found that members of SC and ST groups and men with no education had higher probability of alcohol consumption. In contrast, Rathod et al. (2015) found no evidence of religion, caste, and occupation having an impact on alcohol consumption, while hazardous drinking was negatively associated with land ownership, out-of-pocket health-care expenditure and participation in the national employment program. Results from these aforementioned studies indicated that there is much to understand about factors that influence alcohol consumption and drinking patterns, and more extensive research based on large population surveys is needed to understand the dynamics of alcohol consumption in India. The foremost aim of our study is to fill this gap and provides reliable estimates on the prevalence and consumption of different types of alcoholic beverages and highlights factors that determine alcohol consumption in a multivariate regression framework.

## 2. Materials and methods

The present study is based on household data from the Survey of Unrecorded Alcohol (SURA) study in India, conducted between January and December 2014 in five states of India: Andhra Pradesh, Maharashtra, Madhya Pradesh, West Bengal, and Kerala, which represents the geographical, socio-demographic, political, and economic diversity of India. These five sampled states cover 28% of the Indian population. Study participants were asked about their socio-demographic characteristics and alcohol consumption in the past 12 months through pilot-tested structured interviews in the local language of each state. Verbal and written informed consent were obtained prior to interviews. The study interviewed respondents aged 15 years old and/or older.

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