



The spatial and temporal development of binge drinking in England 2001–2009: An observational study



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ABSTRACT

Binge drinking has been linked to escalating costs of hospitalisation and to premature mortality, and implicated in a range of acute and chronic health problems as well as crime, violence and other negative aspects of the wider well-being agenda. Various definitions, it can be characterised as brief periods of heavy drinking (across one day or evening) within a longer time-frame of lower consumption or even abstinence (across a week or several weeks). In England the current binge drinking epidemic has become particularly salient in the past decade and has been seen largely in terms of excessive consumption by younger people, particularly women in urban centres. It has also been linked to the liberalisation of licensing laws and the promotion of 24 h club cultures. This paper presents an observational study of the regional development of binge drinking between 2001 and 2009 as evidenced in the Health Survey for England. We innovate by using two different definitions of binge drinking within a multivariate multilevel modelling framework, with a focus on the random effects attributable to the year of study and region. We control for age, sex, ethnicity, marital status and individual socio-economic status, and confounding by neighbourhood deprivation and urbanisation. The paper identifies pronounced regional geographies that persist in the face of controls and vary little over time, and strong spatio-temporal gender differences which reflect the definition of binge drinking.

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Introduction

Problem drinking is a global challenge to health. Levels of problem drinking in the UK are among the highest in Europe and the implications for society and for policy are considerable (see [RGS/IBG, 2010](#) for a summary of current debates). In 2008, it was estimated that the financial burden of alcohol misuse for the UK was around £25.1 billion, with £2.7 billion of those costs relating to NHS services in England ([National Audit Office, 2008](#)). Research on drinking behaviour has given particular attention to binge drinking: concentrated bouts of heavy drinking within defined periods of time.

Evidence suggests that this binge drinking is highest among younger people and declines with age ([Smith & Foxcroft, 2009](#)). An association between binge drinking and particular places is also long established, drawing generally on cross-sectional surveys or case studies conducted at a single point in time. Whether at a local neighbourhood or at a larger regional or even national scale, particular places have reputations for excess alcohol consumption.

These reputations are an outcome of a diverse range of factors including licensing laws, alcohol pricing, drinking cultures, hedonism, holidays or other forms of social release as well as the compositional socio-demographic make-up of local populations (see for example [Jane, Valentine and Holloway, 2008a](#); [Jayne, Holloway, & Valentine, 2006](#); [Twigg, Moon, Duncan, & Jones, 2000](#)).

Our aim in this paper is to assess whether the relationship between binge drinking and socio-demographic factors in England changed over the first decade of the current century. To this end, we extend existing knowledge of binge drinking in England by moving beyond a single temporal snapshot to a consideration of the interplay between time, space and binge drinking behaviour. Drawing on a statistical analysis of data on binge drinking behaviour in England between 2001 and 2009, we also consider how different definitions of binge drinking influence conclusions about the changing geography of the topic and affect associations between place and drinking behaviour.

Background

Social science research on binge drinking has focused on the geographies of excessive alcohol consumption associated with 'spring

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break' in the US, youth cultures, 'stag' and 'hen' destinations in Europe and the development of night-time economies (Bell, 2008; Courtney & Polich, 2009; Grucza, Norberg, & Bierut, 2009; Jayne, Valentine, & Holloway, 2008b; Measham & Brain, 2005; Naimi et al., 2003).

Quantitative studies in health geography have considered variations in levels of drinking and emergent stereotypes about regional drinking cultures (Twigg et al., 2000). A recent study examined a cross-section of the Health Survey for England (HSfE) from 2007 (Shelton & Savell, 2011) finding lowest levels of adult binge drinking in London, the East of England and the West Midlands. In contrast, significantly high prevalences were in the Yorkshire and Humber region and the North-East. Binge drinking was associated with concentrated weekend consumption, beer for men and alcopops (highly flavoured alcoholic drinks typically mixing spirits or wine with sweetened fruit juices) for women.

Though time trends towards higher levels of binge drinking have been identified, there has been little in-depth analytical study of such trends beyond noting linkages to changing policies regarding alcohol pricing or licencing laws. Smith and Foxcroft (2009) suggest that binge drinking among men has risen by c.5% in the past ten years. The figure for women is significantly higher. These aggregate changes mask reductions in binge drinking among young men in contrast to increases in other age groups and for women at all ages. They also mask differences between men and women in the regional geography of binge drinking that suggest a need to unpack socio-economic status, sex and region over time.

Qualitative evidence from health and social geography offers further useful insights into the complex underpinnings and implications of binge drinking for different places and different population groups. Major UK contributions include Jayne et al. (2006); Jayne et al., (2008a, c, 2011a); Valentine, Holloway, and Jayne (2010). This research has given particular attention to the gendered nature of binge drinking, public and private drinking and the role of binge drinking in youth cultures. Another theme has been rural binge drinking (Holloway, Valentine, & Jayne, 2009; Leyshon, 2008; Valentine, Holloway, Knell, & Jayne, 2008). Throughout this qualitative work there has been a concern to dig beneath the moral panic about binge drinking and recognise the differentiated cultures and meanings attached to its performance and practice. There is also a recognition that binge drinking cannot simply be read as an outcome of social and legislative processes associated with regulatory change and (urban) restructuring. Indeed one qualitative geographical study provides a useful reminder that concerns with binge drinking can be traced back at least to the nineteenth century (Kneale & French, 2008).

Both quantitative and qualitative studies of binge drinking show definitional variability. At issue has been the amount of alcohol consumed, the period of consumption, the extent of variation in consumption between sexes, and the measurement of the consumption 'unit' (Courtney & Polich, 2009; Herring, Berridge, & Thom, 2008; Jayne, Valentine, & Holloway, 2011b). In the UK, the accepted definition focuses on a level of daily consumption that is twice the recommended 'safe' limit. This is measured by reference to the heaviest day of consumption in a week. Given that binge drinking also carries an implication of episodic excess consumption, a criticism of the UK definition is that it may not capture concentrated consumption on a single day. We explore this distinction in our results section alongside a consideration of how the issues raised in the literature cited above have played out over time and space in the context of binge drinking in England.

Methods

We measured binge drinking using the standard UK Government definition: drinking eight units or more for men and six or

more for women on the heaviest drinking day of the past week (Herring et al., 2008; Parliamentary Office of Science and Technology, 2005). We term this 'standard binge drinking'. Standard binge drinkers may also drink heavily on other days of the week; the measure does not consider the variability of behaviour over the week. Consequently we also developed a measure capturing the concentration of binge drinking on one single day in each week with all other days within the week recorded as alcohol free. We term this 'episodic binge drinking'. The individuals who fall into this category are therefore a subset of the 'standard binge drinkers'. On the one day during the week when alcohol is consumed, it is at binge levels according to the standard definition (i.e. drinking eight units or more for men and six or more for women). Traditionally, advice has focused on following levels of consumption which are averaged over a weekly period, a message that is easily misunderstood and counter-productive when alcohol is consumed on just one day. Recent epidemiological evidence, for example, suggests that heart attack risk is greater for those who binge in isolated sessions compared to those who spread their drinking across the week (Ruidavets, Ducimetière, Evans, et al., 2010). We contend that differentiating the socio-demographic patterns underpinning the standard definition of binge drinking and the episodic definition may provide useful intelligence for alcohol reduction strategies.

Data were derived from the 2001 to 2009 HSfE. For a full description of this annual, continuous survey including content and sampling frame see Craig & Shelton (2008). The number of respondents in the selected years of the survey range from c. 8000 to c. 22,000. Analysis was restricted to those respondents aged over 18 years who drank alcohol ($n = 64,085$). Each individual respondent was characterised as either a binge drinker ($n = 18,845$) or not ($n = 42,250$) based on the standard definition and a subset of the binge drinkers were flagged as also a binge drinker according to the episodic definition ($n = 3164$). Information on the respondents' age, sex, socio-economic status, marital status and ethnicity was extracted from the surveys. Social class was based on the National Statistics Socio-economic classification (NS-SEC) of the household reference person (the head of the household). Marital status was dichotomized into two groups, one group made up of single, widowed, divorced or separated individuals and the other group comprised married or cohabiting individuals among whom binge drinking levels are known to be lower (Duncan, 2006). The ethnicity variable was split into White, Mixed, Black, Asian and 'other'. We also included quintiles of the index of multiple deprivation (IMD) for the lower super output area within which the respondent lived (Noble, Wright, Smith, Dibben, 2006) and a threefold classification reflecting the survey design and summarizing the degree of urbanisation (urban, suburban or rural). Both these area-level variables are routinely attached to the respondent address in the public use versions of HSfE data. Our use of quintiles allowed us to accommodate changes in the IMD over our study period.

Our analytical strategy used multilevel logistic modelling to reflect the hierarchical nature of the HSfE dataset and to simultaneously explore individual and place covariates of the spatial and temporal patterns in binge drinking (Goldstein, 2011). Multivariate multilevel models (i.e. models with more than one dependent variable) were developed with the two definitions of binge drinking as separate binary response outcomes. The two responses were nested within each respondent who were nested within the primary sampling unit (PSU) used in each wave of the survey, which in turn were nested within one of the nine English Government Office Regions (GORs). The multivariate approach allows for a direct comparison of statistical significance for any one independent variable across both outcomes (Snijders & Bosker, 2012). The IMD

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