

Alcohol outlet density and alcohol-related hospital admissions in England: a geographical analysis

August 2018

Key findings

- A higher density of on-trade outlets is associated with higher hospital admission rates for conditions wholly attributable to alcohol.
- A higher density of licensed convenience stores is also associated with higher hospital admission rates for conditions wholly attributable to alcohol.
- The relationship between outlet density and hospital admission rates is largely the same for men and women, though appears more pronounced for older people.
- The overall relationship between outlet density and hospital admission rates appears to be the same in de-prived areas and affluent areas.

Researchers

Professor Ravi Maheswaran, Dr Mark Strong, Dr Paul Brindley (Public Health GIS Unit, School of Health and Related Research, University of Sheffield)

Dr Mark Green (Department of Geography & Planning, University of Liverpool)

Mr Colin Angus, Dr John Holmes (Sheffield Alcohol Research Group, School of Health and Related Research, University of Sheffield)

Background

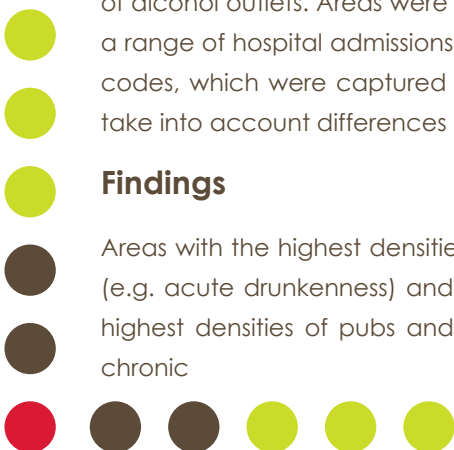
The availability of alcohol is a major policy issue. A key measure of availability is the number, or density, of alcohol outlets in a given area. Numerous international studies have looked at links between outlet density, overall consumption, and crime and disorder (Popova et al., 2009; Campbell et al., 2009; Bryden et al., 2012; Holmes et al., 2014). However, few have examined associations between outlet density and alcohol-related hospital admissions (Tatlow et al., 2000; Livingston, 2011; Stockwell et al., 2013; Richardson et al., 2015; Fone et al., 2016;).

The purpose of this study was to investigate if alcohol outlet density was associated with hospital admissions for alcohol-related conditions in England. We used hospital admissions data from 2002/03 to 2013/14 and data on alcohol outlets from a market research company.

The study examines associations at the Lower Layer Super Output Area (LSOA) census area level using six categories of alcohol outlets. Areas were split into four levels of outlet density, and the relationship between these densities and a range of hospital admissions measures were compared. Outlet density was measured within a 1-km radius of post-codes, which were captured for all 32,482 LSOAs in England. Data on admissions were examined as rate ratios to take into account differences in the numbers and ages of people in LSOAs.

Findings

Areas with the highest densities of pubs, bars and nightclubs were associated with higher admissions of both acute (e.g. acute drunkenness) and chronic (e.g. liver disease) conditions wholly attributable to alcohol. Areas with the highest densities of pubs and bars had 13% more admissions for acute conditions, and 22% more admissions for chronic



conditions, than areas with the lowest densities. Areas with the highest density of licensed restaurants had 9% higher rates of admissions for both acute and chronic conditions. High densities of other on-trade outlets, such as social clubs, hotels or casinos, were associated with 12% higher levels of acute conditions and 19% higher levels of chronic conditions.

Recent years have seen a significant change in where alcohol is sold in the UK, with far more alcohol now being bought in shops and supermarkets than pubs and bars. Therefore, the impact of off-trade density is also critically important. In this study, a high density of licensed convenience stores was associated with higher admissions of both acute and chronic conditions wholly attributable to alcohol. Areas with the most licensed convenience stores had, on average, 10% more acute admissions and 7% more admissions for chronic conditions.

However, supermarkets were only associated with a modest increase in admissions (3% more acute and 4% more chronic conditions in the highest density areas compared to the lowest). Other off-trade outlets (including specialist off-licences and garage forecourts) were associated with 11% higher admissions for chronic conditions in the highest density areas, but there was no evidence of higher admission with acute conditions.

The effect of outlet density only applied to wholly-attributable conditions; that is, conditions for which alcohol is the only cause. Partially attributable conditions (where alcohol may be a contributory factor – such as breast cancer) were also measured. However, no strong pattern of association was found between these and outlet density.

The association between on-trade density and hospital admissions increased with increasing age, meaning that older people appeared to be more affected by an increase in density than younger drinkers. This was to be expected for chronic conditions, which more commonly affect older people; surprisingly, however, this was also the case for acute conditions such as extreme intoxication. It appeared that the impact of higher outlet density was largely the same for men and women.

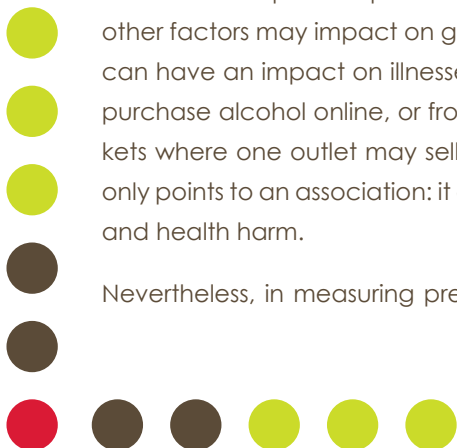
It is widely recognised that alcohol-related harms are many times higher in deprived areas than more affluent ones. It has been suggested that this may be partly related to outlet density patterns. However, while deprived areas generally showed a higher overall density for most types of outlet, the relative effect of increasing density was the same irrespective of socio-economic gradient.

Implications

A number of clear associations were identified between the density of several alcohol outlet categories and hospital admissions; in particular, on-trade outlet density and a high density of licensed convenience stores. This has potentially important implications for alcohol policy, especially decisions made by local licensing authorities in assessing the overall impact of the retail market in their areas.

While these findings point to an association between some types of density and health harms, the precise nature of that relationship is complex. Higher densities of outlets, for instance, tend to occur near town and city centres where other factors may impact on general health. We know that other factors, such as diet, smoking, exercise and so forth can have an impact on illnesses usually associated with alcohol (Bellis et al., 2016). We also know that people often purchase alcohol online, or from outlets some distance from their homes, and that this is especially true of supermarkets where one outlet may sell many times more alcohol than a larger number of small stores. This study, therefore, only points to an association: it cannot demonstrate precisely the causal relationship, or mechanisms, between density and health harm.

Nevertheless, in measuring precisely the observed relationship between outlet density and hospital admissions, this



research provides an important contribution to the existing evidence base on a key issue. Better understanding of how retail patterns are linked to patterns of harm is critical for policy-makers, particularly those responsible for local licensing. In showing clearly that hospital admissions for alcohol-specific conditions are higher in areas with greater levels of density, this study adds to the already significant evidence that there is a relationship between the two, even if the precise nature of that relationship requires further analysis.

Conclusion

This study provides a detailed, large-scale picture of the relationship between the shape of the alcohol market in local areas and the levels of alcohol-related hospital admissions in those areas. It suggests that there is a relationship, and that it is marked especially where there is a high density of any on-trade outlets or licensed convenience stores. It suggests that this relationship is largely the same for men and women, and applies in a similar fashion irrespective of the relative affluence of a given area.

It also suggests that while alcohol outlet density is already high across England, increasing that density may lead to increased hospital admissions. In other words, there isn't a point beyond which further increases in density cease to matter. Local licensing decisions may have an impact not only on the local economy, or on rates of crime and disorder, but on the health of the local population and the burden on local hospitals. It is increasingly clear that this is an impact local authorities should consider, and factor into their decisions using the best available evidence.

Further Information

Corresponding author:

Professor Ravi Maheswaran

Public Health GIS Unit, School of Health and Related Research, University of Sheffield, Regent Court, 30 Regent Street, Sheffield S1 4DA, United Kingdom

Tel: +44 1142220681

Fax: +44 1142220749

References

Bellis, M., Hughes, K., Nicholls, J., Sheron, N., Gilmore, I., Jones, L. (2016). The alcohol harm paradox: using a national survey to explore how alcohol may disproportionately impact health in deprived individuals. *BMC Public Health* 16.111.

Bryden A, Roberts B, McKee M, Petticrew M. (2012). A systematic review of the influence on alcohol use of community level availability and marketing of alcohol. *Health and Place*, 18:349-57.

Campbell CA, Hahn RA, Elder R, Brewer R, Chattopadhyay S, Fielding J, Naimi TS, Toomey T, Lawrence B, Middleton JC (2009). Task Force on Community Preventive Services. The effectiveness of limiting alcohol outlet density as a means of reducing excessive alcohol consumption and alcohol-related harms. *American Journal of Preventative Medicine*, 37:556-69.

Department of Health and North West Public Health Observatory (2008). Hospital admissions for alcohol-related harm: understanding the dataset. London: Department of Health, 2008.

Department of Health (2008). The cost of alcohol harm to the NHS in England. An update to the Cabinet Office (2003)

study: Health Improvement Analytical Team. London: Department of Health.

Fone D, Morgan J, Fry R, Rodgers S, Orford S, Farewell D, Dunstan F, White J, Sivarajasingam V, Trefan L, Brennan I, Lee S, Shiode N, Weightman A, Webster C, Lyons R. (2016). Change in alcohol outlet density and alcohol-related harm to population health (CHALICE): a comprehensive record-linked database study in Wales. Southampton (UK): NIHR Journals Library.

Holmes J, Guo Y, Maheswaran R, Nicholls J, Meier PS, Brennan A. (2014). The impact of spatial and temporal availability of alcohol on its consumption and related harms: A critical review in the context of UK licensing policies. *Drug and Alcohol Review*, 33:515-25.

Livingston M. (2011). Alcohol outlet density and harm: comparing the impacts on violence and chronic harms. *Drug and Alcohol Review*, 30:515-23.

Popova S, Giesbrecht N, Bekmuradov D, Patra J. (2009). Hours and days of sale and density of alcohol outlets: impacts on alcohol consumption and damage: a systematic review. *Alcohol and Alcoholism*, 44:500-16.

Richardson EA, Hill SE, Mitchell R, Pearce J, Shortt NK. (2015). Is local alcohol outlet density related to alcohol-related morbidity and mortality in Scottish cities? *Health and Place*, 33:172-80.

Stockwell T, Zhao J, Martin G, Macdonald S, Vallance K, Treno A, Ponicki W, Tu A, Buxton J. (2013). Minimum alcohol prices and outlet densities in British Columbia, Canada: estimated impacts on alcohol-attributable hospital admissions. *American Journal of Public Health*, 103:2014-20.

Tatlow JR, Clapp JD, Hohman MM. (2000). The relationship between the geographic density of alcohol outlets and alcohol-related hospital admissions in San Diego County. *Journal of Community Health*, 25:79-88.

[Download the Final Report](#)



This research was funded by **Alcohol Research UK**. Alcohol Research UK and Alcohol Concern merged in April 2017 to form a major independent national charity, working to reduce the harms caused by alcohol.

Read more reports at www.alcoholresearchuk.org

Alcohol Research UK, 27 Swinton Street, London WC1X 9NW

Registered charity 1140287

Registered as a Company Limited by Guarantee Number 7462605

