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Social Disadvantage and Exposure to Lower Priced Alcohol in Off-Premise Outlets

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Abstract

Introduction and Aims—Greater concentrations of off-premise alcohol outlets are found in areas of social disadvantage, exposing disadvantaged populations to excess risk for problems such as assault, child abuse and intimate partner violence. This study examines whether the outlets to which they are exposed also sell cheaper alcohol, potentially further contributing to income-related health disparities.

Design and Methods—We conducted unobtrusive observations in 295 off-premise outlets in Melbourne, Australia, randomly selected using a spatial sample frame. In semi-logged linear regression models we related the minimum purchase price for a 750ml bottle of wine to a national index of socio-economic advantage for the Census areas in which the outlets were located. Other independent variables characterised outlet features (e.g., volume, chain management) and conditions of the local alcohol market (adjacent outlet characteristics, neighbourhood characteristics).

Results—A one decile increase in socio-economic advantage was related to a 1.3% increase in logged price. Larger outlets, chains, outlets adjacent to chains, outlets in greater proximity to the nearest neighbouring outlet, those located in areas with more students also had cheaper alcohol.

Discussion and Conclusions—Not only are disadvantaged populations exposed to more outlets, the outlets to which they are exposed sell cheaper alcohol. This finding appears to be consistent with the spatial dynamics of typical retail markets.

Keywords

Alcohol; off-premise; prevention and control; minimum purchase price; density

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Introduction

Disadvantaged populations are exposed to greater concentrations of outlets licenced to sell alcohol for off-premise consumption (1–4). As off-premise outlet density is related to problems such as assault, child abuse and intimate partner violence (5–8), it appears greater exposure to outlets contributes to poorer health outcomes among disadvantaged populations. However, theory regarding the economic geography of alcohol markets suggests outlets will differ systematically and will not contribute equally to risk (9). Those selling cheaper alcohol are of particular interest because having lower priced alcohol available in a geographic region is associated with greater alcohol consumption and more problems for local residents (e.g., hospital admissions)(10, 11). In this study we examine whether outlets in disadvantaged areas sell cheaper alcohol, potentially further contributing to health disparities.

Theories describing the spatial dynamics of retail markets suggest several reasons why stores selling equivalent commodities (such as packaged alcohol) will have different prices (9). Economies of scale may allow large stores and chains to charge lower prices while maintaining profits through low margins and high volume (12). Unable to compete on price, smaller stores are forced to appeal to potential customers by alternate means (e.g. product range, customer service, amenities). Competition for market share will force prices down where nearby outlets have lower prices and where proximity to other outlets is greater (13). Lower priced alcohol may also be found in areas with lower income, due in part to demand for cheaper brands among poorer customers. Moreover, while high income areas have been theorised to exclude undesirable land uses (such as alcohol retailers) (14), these communities might also oppose the opening of cheaper outlets to a greater degree than more expensive outlets (such as high end wine merchants).

Some studies relating off-premise alcohol price to neighbourhood characteristics have found cheaper alcohol in socially disadvantaged (including lower income) areas in the US (15–17), though one study found no such evidence (4). We conducted premise assessments in a random geographic sample of off-premise outlets in Melbourne, Australia. Our sample frame enabled us to account for individual outlet characteristics as well as the theoretically relevant indicators of the local alcohol market: characteristics of adjacent (lagged) outlets and of the Census areas in which the outlets were located.

Method

Sample Frame

This study used data collected for a spatial analysis of off-premise alcohol sales and alcohol-related harms within Census 2011 areas of metropolitan Melbourne, Australia. We stratified 256 Statistical Area Level 2 (SA2) regions by high versus low median household income and high versus low off-premise outlet density (i.e., counts of Packaged licences denominated by land area)(18, 19), as these are important predictors of alcohol-related harms (5–8). We then selected a random sample of 62 SA2 units (mean population = 14,020.2) from among the four strata. We were concerned that inner city areas with higher outlet density would predominate, so we over-sampled areas with lower outlet density.

Two major classes of liquor licence permit alcohol sales for off-premise consumption in Melbourne. Dedicated liquor stores have Packaged licences, and bars and restaurants that also sell take-away alcohol have General licences. Using an online resource listing all licenced premises in the state (updated daily, including georeferences) (18), potentially eligible outlets were located in the selected SA2 regions and had either a Packaged licence (n = 273) or had a General licence (n = 195) and a separate room dedicated to off-premise sales. Virtual assessments using Google street view excluded 112 General-licenced outlets that clearly did not have dedicated space for off-premise sales (e.g., restaurants in shopping strips)(20, 21). Research assistants made site visits to all other outlets to confirm they were currently in business and were eligible for inclusion, excluding a further 61. The final sample was 295 outlets, including 260 with Packaged licences and 35 with General licences.

Data Collection

Two research assistants independently conducted 5-minute premise assessments in all eligible outlets. After exiting the outlet they completed an electronic form with items describing price, alcohol volume, and operating characteristics. After Bluthenthal et al. (4), *price* was measured using the minimum purchase price for a 750ml bottle of wine (in Australian dollars), and *volume* was the number of paces of shelf space dedicated to alcohol sales (measured by counting paces along every shelf in the outlet). Easily assessable *operating characteristics* were the presence of a walk-in fridge and facilities for drive-through sales. The Monash University Human Research Ethics Committee approved this protocol.

Variables

Using Pearson correlations for continuous measures and Cohen's kappa for dichotomous measures (22–24), inter-observer reliability for the price and shelf-pace measures ($r \geq 0.93$) and the walk-in fridge and drive-through measures was very high ($\kappa \geq 0.73$). The unit of interest for the current analysis was outlets rather than Census areas, so we measured outlet concentration using the Euclidean distance to the nearest Packaged liquor licence rather than an areal density measure. We also differentiated between independent (n = 80) and chain outlets (n = 215), identifying chains based on licencee name, operating name, and store-front signage.

To identify adjacent outlets, we created Thiessen polygons around the selected outlets, clipped at the boundaries of the included SA2 units. For adjacent outlets we calculated the average alcohol volume, average price for the cheapest bottle of wine, and a dummy variable indicating whether any were chains.

Census data characterised the neighbourhoods in which the outlets were located. To minimize aggregation bias, we used the smallest available Census areas, Statistical Area level 1 (SA1) units (mean population = 410.2). SA1 units are wholly nested within SA2 units. National decile scores for the Index of Relative Socio-economic Advantage and Disadvantage (IRSAD) described relative advantage (25). Given that lower priced alcohol may be sold in areas where residents have fewer material and social resources, we preferred this variable to a simple income measure for this analysis. Other extracted variables were

demographic indicators which may be related to demand for cheaper alcohol: population density, median age, the proportion of residents who were Australian born, and the proportion of residents who were current students.

Statistical Analysis

A semi-logged univariable linear regression model predicted the price of the cheapest bottle of wine in each outlet according to the relative advantage decile for the SA1 unit in which the outlet was located. We then constructed a multivariable model adjusting for the outlets' own characteristics, the characteristics of adjacent outlets, and other SA1 unit characteristics. The dependent measure was normally distributed after natural log transformation, and sample weights accounted for oversampling in low outlet density areas. Spatial autocorrelation of model residuals within the clipped Thiessen polygons was very low (Moran's I = 0.072), indicating adjustment for this potential source of type I error was not required (26). Likelihood ratio tests suggested hierarchical structures nesting outlets in SA2 units did not improve model fit ($p > 0.999$).

Results

Outlet characteristics are presented in Table S1 (in the online supplementary material). In the univariable model, a one decile increase in relative advantage was associated with greater logged price for the cheapest bottle of wine ($b = 0.038$, 95% confidence interval: 0.020, 0.055; $p < 0.001$; data not shown). In the multivariable model (Table 1), a one decile increase in relative advantage was associated with a 0.02 unit increase in logged price ($b = 0.021$, 95% CI: 0.002, 0.040; $p = 0.030$). Extrapolating the point estimate from the multivariable model, this equates to a 1.3% increase in logged price compared to the average for all outlets. Chains and larger outlets were cheaper than independent and smaller outlets, and those adjacent to chains were cheaper than those not adjacent to chains. Greater distance to the nearest Packaged outlet predicted more expensive wine, whereas greater proportions of students predicted cheaper wine.

Discussion

This study suggests residents of socially disadvantaged areas are exposed to lower priced alcohol in off-premise outlets. This finding is consistent with other similar analyses (15, 16). As exposure to cheap alcohol is related to increased risk for alcohol-related problems (10, 11), differential exposure potentially contributes to poorer health outcomes for disadvantaged populations.

Notwithstanding the inherent limitations of our cross-sectional design (precluding assessment of the endogeneity of lower purchase price and demand for cheaper alcohol), our results suggest the distribution of outlets selling cheaper alcohol is consistent with the spatial dynamics of typical retail markets. The greater purchasing power of chains appears to force nearby outlets to lower their prices in order to compete, and areas where local populations may prefer lower priced alcohol (e.g., greater social disadvantage, more students) have cheaper outlets. Results also suggest that greater proximity to other outlets increases

competition and depresses purchase price, further reducing the total cost of alcohol (beyond convenience costs) (27).

Disadvantaged populations are exposed to more off-premise outlets (1–4). Here we add that the outlets to which they are exposed sell cheaper alcohol. Strategies that disrupt the market processes by which these exposures likely arise (e.g., limits to outlet density, minimum purchase prices) may reduce economic health disparities.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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References

1. Gorman DM, Speer PW. The concentration of liquor outlets in an economically disadvantaged city in the north-eastern United States. Subst Use Misuse. 1997; 32(14):2033–46. [PubMed: 9440151]
2. Morrison C. Exposure to alcohol outlets in rural towns. Alcohol Clin Exp Res. 2015; 39:73–78. [PubMed: 25515926]
3. Berke EM, Tanski SE, Demidenko E, et al. Alcohol retail density and demographic predictors of health disparities: A geographic analysis. Am J Public Health. 2010; 100(10):1967–71. [PubMed: 20724696]
4. Bluthenthal RN, Cohen DA, Farley TA, et al. Alcohol availability and neighborhood characteristics in Los Angeles, California and southern Louisiana. J Urban Health. 2008; 85(2):191–205. [PubMed: 18228148]
5. Livingston M. A longitudinal analysis of alcohol outlet density and assault. Alcohol Clin Exp Res. 2008; 32(6):1074–9. [PubMed: 18445114]
6. Gruenewald PJ, Remer L. Changes in outlet densities affect violence rates. Alcohol Clin Exp Res. 2006; 30(7):1184–93. [PubMed: 16792566]
7. Livingston M. A longitudinal analysis of alcohol outlet density and domestic violence. Addiction. 2011; 106:919–25. [PubMed: 21205052]
8. Freisthler B, Midanik LT, Gruenewald PJ. Alcohol outlets and child physical abuse and neglect: applying routine activities theory to the study of child maltreatment. J Stud Alcohol. 2004; 65(5): 586–92. [PubMed: 15536767]
9. Aoyama, Y.; Murphy, JT.; Hanson, S. Key Concepts in Economic Geography. Thousand Oaks, California: Sage Publications; 2011.
10. Stockwell T, Jinhui Z, Martin G, et al. Minimum alcohol prices and outlet densities in British Columbia, Canada: Estimated impacts on alcohol-attributable hospital admissions. Am J Public Health. 2013; 103(11):2014–20. [PubMed: 23597383]
11. Stockwell T, Auld MC, Zhao J, et al. Does minimum pricing reduce alcohol consumption? The experience of a Canadian province. Addiction. 2012; 107(5):912–20. [PubMed: 22168350]
12. Mankiw, NG. Principles of Microeconomics. 6. Mason, OH: Cengage SouthWestern; 2012.
13. Treno AJ, Ponicki WR, Stockwell T, et al. Alcohol outlet densities and alcohol price: The British Columbia experiment in the partial privatization of alcohol sales off-premise. Alcohol Clin Exp Res. 2013; 37(5):854–9. [PubMed: 23316802]
14. DiPasquale D, Wheaton WC. The markets for real estate assets and space: A conceptual framework. Real Estate Econ. 1992; 20:181–197.

15. Harwood EM, Erickson DJ, Fabian LEA, et al. Effects of communities, neighborhoods and stores on retail pricing and promotion of beer. J Stud Alcohol. 2003; 64:720–6. [PubMed: 14572195]
16. Treno AJ, Gruenewald PJ, Wood DS, et al. The price of alcohol: A consideration of contextual factors. Alcohol Clin Exp Res. 2006; 30(10):1734–42. [PubMed: 17010140]
17. Jones-Webb R, McKee P, Hannan P, Wall M, Pham L, Erickson D, et al. Alcohol and malt liquor availability and promotion and homicide in inner cities. Subst Use Misuse. 2008; 43(2):159–77. [PubMed: 18205086]
18. Victorian Commission for Gambling and Liquor Regulation. [accessed November 2014] Interactive Map of Victoria's Liquor Licences. Nov. 2014 Available at: http://geomaps.vcglr.vic.gov.au
19. Australian Bureau of Statistics. Glossary of Statistical Geography Terminology. Canberra, Australia: Author; 2013. (1217.0.55.001)
20. Chudyk AM, Winters M, Gorman E, et al. Agreement between virtual and in-the-field environment audits of assisted living sites. J Aging Phys Activ. 2014; 22(3):414–20.
21. Mooney SJ, Bader MDM, Lovasi GS, et al. Validity of an ecometric neighborhood physical disorder measure constructed by virtual street audit. Am J Epidemiolog. 2014; 180(6):626–35.
22. Landis JR, Koch GG. The measurement of observer agreement for categorical data. Biometrics. 1977; 33:159–74. [PubMed: 843571]
23. Litwin, MW. How to assess and interpret survey psychometrics. Thousand Oaks: CA: Sage Publications; 2002.
24. Bakeman R, Quera V, McArthur D, Robinson BF. Detecting sequential patterns and determining their reliability with fallible observers. Psychological Methods. 1997; 2(4):357–70.
25. Australian Bureau of Statistics. Socio-Economic Indexes for Areas (SEIFA) 2011. Canberra, Australia: Author; 2013.
26. Waller, LA.; Gotway, CA. Applied Spatial Statistics for Public Health Data. New Jersey: Wiley; 2004.
27. Stockwell, T.; Gruenewald, PJ. Controls on the physical availability of alcohol. In: Heather, N.; Stockwell, T., editors. The Essential Handbook of Treatment and Prevention of Alcohol Problems. New York: John Wiley; 2004. p. 213-34.

Table 1

Multivariable linear regression model for the price of the cheapest 750ml bottle of wine (natural log, ln), with adjustment for sample weights (n = 295).*

	b	(95% CI)	p-value
Outlet Characteristics			
Paces of Alcohol Shelves (ln)	**−0.095**	**(−0.185, −0.006)**	**0.037**
Chain	**−0.392**	**(−0.513, −0.271)**	**< 0.001**
General Licence	0.050	(−0.130, 0.230)	0.584
Drive-Through	0.101	(−0.040, 0.242)	0.158
Walk-in Fridge	0.092	(−0.025, 0.210)	0.122
Characteristics of Adjacent Outlets			
Mean Paces of Alcohol Shelves (ln)	−0.021	(−0.105, 0.063)	0.628
Mean Cheapest Bottle of Wine (ln)	0.005	(−0.179, 0.190)	0.954
Distance to Nearest Off-Premise Outlet (1 km)	**0.047**	**(0.008, 0.085)**	**0.018**
Any Chain	**−0.233**	**(−0.450, −0.016)**	**0.035**
Neighbourhood Characteristics			
Socio-Economic Advantage** (decile)	**0.021**	**(0.002, 0.040)**	**0.030**
Population Density (1000/km^2)	0.008	(−0.017, 0.033)	0.526
Median Age (10 years)	−0.017	(−0.060, 0.027)	0.449
Australian Born (10%)	−0.015	(−0.044, 0.013)	0.281
Current Students (10%)	**−0.079**	**(−0.148, −0.011)**	**0.023**
Constant	**2.655**	**(1.919, 3.392)**	**< 0.001**
Model R^2	*0.361*		
Spatial autocorrelation of model residuals (Moran's I)	*0.072*		

* Bolded estimates have $p < 0.05$

** Index of Relative Socio-economic Advantage and Disadvantage