

The Association of Increased Alcohol Outlet Density & Related Harms
Summary of Key Literature prepared October 25, 2011 by
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Alcohol Outlet Density & Consumption

Access to an increased number of alcohol outlets in a community is associated with a higher risk of harmful alcohol consumption among its residents. An increased risk of drinking at high levels, those associated with harm, at least monthly was observed when there were five or more outlets. Evidence suggests that when the number of outlets within a 1-km network distance is eight or more, the risk of drinking at levels associated with short-term harm (weekly and monthly) is increased.¹

The number of residents reporting riding with a drinking driver, making an alcohol purchase attempt, and making a successful alcohol purchase attempt clustered significantly within census tracts with the highest off-premise alcohol outlet density while those reporting frequent drinking clustered within census tracts with the greatest on-premise density. Driving after drinking and experiencing nonviolent alcohol-related consequences clustered marginally within census tracts with the greatest on-premise and off- premise alcohol outlet density, respectively.²

Alcohol Outlet Density & Violent Crime

Alcohol outlet density was significantly associated with peer violence after controlling for individual characteristics including alcohol consumption.³

Alcohol availability was significantly associated with the total crime rate, violent crime rate, property crime rate and homicide rate (alcohol elasticity of crime rates: 0.92, 0.82, 0.87, 0.12, respectively).⁴

A study in Newark, New Jersey found that alcohol outlet density was the single greatest predictor of violent crime, at both the census tract and census block group level.⁵

Another study in Cincinnati, Ohio suggests that assaultive violence frequently clusters near agglomerations of alcohol outlets. Areas displaying a higher spatial density of outlets appear to be more prone to clusters of assaultive violence when compared to agglomerations with a lower density of outlets. The two most significant clusters of violence are associated with the two most spatially dense agglomerations of outlets.⁶

¹ Kavanagh et al. Access to alcohol outlets and harmful alcohol consumption: a multi-level study in Melbourne, Australia. *Addiction*, 106, 1772–1779.

² Reboussin BA, Song E-Y, Wolfson M. The Impact of Alcohol Outlet Density on the Geographic Clustering of Underage Drinking Behaviors within Census Tracts. *Alcoholism: Clinical and Experimental Research*. August 2011. 35(8): 1541–1549.

³ Resko SM et al. Alcohol Availability and Violence among Inner-City Adolescents: A Multi-Level Analysis of the Role of Alcohol Outlet Density. *Am J Community Psychol* (2010) 46:253–262.

⁴ Gyimah-Brempong K. (2001) Alcohol availability and crime: evidence from census tract data. *South Econ J* 68:2–21.

⁵ Gorman et al. Spatial Dynamics of Alcohol Availability, Neighborhood Structure and Violent Crime. 2001 September. *Journal of Studies on Alcohol*: 628-636.

⁶ Grubestic TH, Pridemore WA. Alcohol outlets and clusters of violence. *Grubestic and Pridemore International Journal of Health Geographics* 2011, 10:30.

In Washington, DC, for every additional alcohol outlet, assaultive violence increases by a factor of 4.0% while holding all other variables constant. The number of alcohol outlets in a community is significantly associated with assaultive violence after controlling for other correlates of violent crime, including the prevalence of weapons and illicit drugs. The number of alcohol outlets in a census tract was significantly related to the frequency of robbery, assault, and sexual offenses.⁷

A 10% increase in the number of off-premise alcohol outlets and bars were related to 1.67% and 2.06% increases in violence rates across local and lagged spatial areas, respectively. Every six outlets accounted for one additional violent assault that resulted in at least one overnight stay in a hospital. These effects increased with larger male populations, doubling with every 3% increase. Controlling for changes in assault rates, greater numbers of licensed alcohol retail establishments, especially bars and off-premise outlets, were related to assault rates.⁸

For every 10,000 additional liters of pure alcohol sold by an off-site outlet, the risk of violence on residential premises increased by 26% (in 2000/2001 an average off-site outlet sold 12,000 liters of pure alcohol). The strongest association was evident for assaults which occurred at on-site outlets, estimated as a 5% increase in violent assault for one additional on-premise license.⁹

Alcohol Outlet Density & Homicide

Neighborhoods with high densities of off-site alcohol outlets also have high rates of homicide even after controlling for neighborhood-level confounders including race, unemployment, age structure and social disintegration. This analysis shows that a typical New Orleans census tract with two off-sale outlets has a homicide rate 24% higher than a census tract with one outlet.¹⁰

Alcohol Outlet Density & Suicide

Suicides, both attempted and completed, occur at greater rates in rural community areas with greater bar densities.¹¹

Intimate Partner Violence

A national (U.S.) population based study of couples indicates that as the density of alcohol outlets increases, so does the risk of male-to-female partner violence. These findings are consistent with most studies reporting that physical availability of alcohol increases interpersonal and family violence. After adjusting for potential confounding factors, an increase of 10 alcohol

⁷ Franklin FA et al. Alcohol Outlets and Violent Crime in Washington D.C. *Western Journal of Emergency Medicine*. August 2010 11(3) : 283-290.

⁸ Britt H, Carlin BP, Toomey TL, and Wagenaar AC. Neighborhood-level spatial analysis of the relationship between alcohol outlet density and criminal violence. *Environmental and Ecological Statistics* 2005; 12:411-26. Gruenewald PJ, Remer L. (2006) Changes in outlet densities affect violence rates. *Alcohol Clin Exp Res* 30:1184-93.

⁹ Liang W, Chikritzhs T. Revealing the link between licensed outlets and violence: Counting venues versus measuring alcohol availability. *Drug and Alcohol Review* (September 2011), 30, 524-535.

¹⁰ Scribner R. Alcohol Availability and Homicide in New Orleans: Conceptual Considerations for Small Area Analysis of the Effect of Alcohol Outlet Density. *J Stud Alcohol*. 1999 May;60(3):310-6

¹¹ Johnson FW, Gruenewald PJ, Remer LG. Suicide and Alcohol: Do Outlets Play a Role? *Alcohol Clin Exp Res*. 2009 December ; 33(12): 2124-2133.

outlets per 10,000 persons was associated with a 34% increased risk of male-to-female partner violence.¹²

A California city study showed that each additional off-premise alcohol outlet is associated with an approximate 4% increase in intimate partner violence-related police calls and an approximate 3% increase in intimate partner violence-related crime reports.¹³

Alcohol Outlet Density & Drunk Driving

Higher densities were associated with more frequent drinking and driving. This association was moderated by a number of individual-level characteristics, with younger respondents and females more likely to be affected by outlet densities. Our analysis of riding with drinking drivers found a similar main effect for density also moderated by age and gender.¹⁴

Alcohol Outlet Density & Motor Vehicle Crashes

In an average Los Angeles County city of 50,000 residents with 100 alcohol outlets, one additional outlet accounted for a 0.54% increase in the number of alcohol related injury crashes or approximately 2.7 additional injury crashes in 1990 based on a rate of 1 crash per 100 residents. A significant amount of the variance in the density of alcohol-related injury crashes and alcohol-related property damage crashes across L.A. County cities during 1990 can be accounted for by both on- and off-site alcohol outlet density.¹⁵

Suicides, alcohol-related crashes, and alcohol-related crash fatalities are significantly associated with alcohol outlet density in New Mexico. Data also show that, compared with communities in the lowest tertile, suicide and alcohol-related crash rates increase about 50% and the alcohol-related crash fatality rate increases two-fold in the communities in the highest tertile of alcohol outlet density. Greater availability of alcohol outlets is associated with higher rates of suicide, alcohol-related crashes, and alcohol-related crash fatalities. With one unit increase in the rate of liquor outlet density per every 1000 population, the rate of suicide increases by 0.23, the rate for alcohol-related crashes increases by 2.4 and the rate for alcohol-related crash fatality increases by 0.22.¹⁶

Alcohol Outlet Density & Adolescent Drinking

Alcohol availability, measured by mean and median number of licenses, was significantly higher around residences of minority and lower-income families in California. Binge drinking and driving after drinking among adolescents aged 12 to 17 years were significantly associated with

¹² McKinney et al. Alcohol Availability and Intimate Partner Violence Among US Couples. *Alcoholism: Clinical and Experimental Research*. Vol. 33 (1): January 2009.

¹³ Cunradi CB et al. Alcohol Outlets, Neighborhood Characteristics, and Intimate Partner Violence: Ecological Analysis of a California City. *Journal of Urban Health: Bulletin of the New York Academy of Medicine*, 88 (2):191-200.

¹⁴ Treno AJ, Grube JW, Martin SE. Alcohol Availability as a Predictor of Youth Drinking and Driving: A Hierarchical Analysis of Survey and Archival Data. *Alcoholism: Clinical and Experimental Research*. Vol. 27(5) May 2003.

¹⁵ Scribner RA, MacKinnon DP, Dwyer JH. Alcohol Outlet Density and Motor Vehicle Crashes in Los Angeles County Cities. *Journal of Studies on Alcohol*. July 1994. 447-453.

¹⁶ Escobedo LG, Oritz M. (2002) The relationship between liquor outlet density and injury and violence in New Mexico. *Accid Anal Prev*. 34:689-94.

the presence of alcohol retailers within 0.5 miles of home. Simulation of changes in the alcohol environment showed that if the mean number of alcohol outlets around the lowest-income quartile of households was reduced to the number around households in highest-income quartile, the prevalence of binge drinking would fall from 6.4% to 5.6% and driving after drinking from 7.9% to 5.9%.¹⁷

The density of bars interacts with reports of parental monitoring such that adolescents living in areas with more bars per roadway mile report lower levels of parental monitoring behaviors, which are associated with higher levels of deviant adolescent behaviors. These findings suggest that in those areas with greater densities of bars parents may spend more time away from home, making monitoring of their adolescents more difficult, or parents may drink more frequently, thus impairing their ability to adequately monitor their children.¹⁸

When all other factors were controlled, higher initial levels of drinking and excessive drinking (binge drinking) were observed among youths residing in zip codes with higher alcohol outlet densities. Increased consumption and excessive drinking was on average more rapid in zip codes with lower alcohol outlet densities. Youth who reside in areas with low alcohol outlet density may use social networks, friends with access to a car, to seek alcohol and drinking opportunities beyond the local community.¹⁹

Youth initial levels of alcohol access through direct purchase, shoulder tapping, home/family members, and underage acquaintances were all higher in zip codes with greater alcohol outlet densities, after controlling for individual-level factors, zip code, and household income. These findings support the argument that high alcohol outlet densities enable youth access to alcohol through commercial outlets and social networks (including family members). The deleterious effects of increasing alcohol outlet density found in the commercial access models are consistent with a previous study showing that off-premise establishments are more likely to sell alcohol to minors if they have similar outlets nearby.²⁰

Alcohol Outlet Density & Chronic Disease

A 10% increase in the rate of packaged (off-site) licenses would increase chronic alcohol caused hospitalizations by 1.9%, while a 10% increase in on-premise outlets would increase chronic alcohol caused disease by 0.5%. Higher density of outlets with on-premise drinking (on-premise licenses) are linked to increasing violence, while higher density of outlets where the cheapest alcohol is available are associated with elevated rates of diseases related to long-term heavy drinking.²¹

¹⁷ Truong KD, Sturm R. Alcohol Environments and Disparities in Exposure Associated With Adolescent Drinking in California. *American Journal of Public Health*. February 2009, Vol 99 (2): 264-270.

¹⁸ Freisthler B, Byrnes HF, Gruenewald PJ. Alcohol Outlet Density, Parental Monitoring, and Adolescent Deviance: A Multilevel Analysis. *Child Youth Serv Rev*. 2009 March ; 31(3): 325–330.

¹⁹ Chen M, Grube JW, Gruenewald PJ. Community Alcohol Outlet Density and Underage Drinking. *Addiction*. 2010 February ; 105(2): 270–278.

²⁰ M.-J. Chen et al. / *Journal of Adolescent Health* 44 (2009) 582–589.

²¹ Livingston M. Alcohol outlet density and harm: Comparing the impacts on violence and chronic harms. *Drug and Alcohol Review* (September 2011), 30, 515–523.

For a typical census tract in Los Angeles with 5 off-premise outlets the effect size of closing one of these outlets translates to 42 fewer gonorrhea cases per 100,000. Changes in the number of neighborhood alcohol outlets are significantly associated with changes in gonorrhea rates. The findings suggest that efforts to control sexually transmitted diseases, including gonorrhea and HIV, should address contextual factors that facilitate high-risk behaviors and disease transmission.²²

Alcohol outlet density was significantly associated with high rates of sexually transmitted infections (crude OR = 1.80, 95% CI = 1.10–3.00), liver problems (crude OR = 1.33, 95% CI = 1.02–1.75) and experienced violence (crude OR = 1.31, 95% CI = 1.13–1.51).²³

Alcohol Outlet Density & Social Disparities

There were important relationships between higher retail alcohol density and higher proportions of residents of Black race and Latino ethnicity, higher proportions of families living below the federal poverty level, and higher proportions of women with less than a high school education. For these variables, the slope of the association increased as the health disparity indicator became larger. Higher proportions of residents of Black race and Latino ethnicity, higher proportions of families living in poverty, and overall lower education attainment among neighborhood residents all predict higher density of alcohol retail outlets per 1000 population. Importantly, the relationships were nonlinear, with larger increases in alcohol retail density as the health disparity risk factor became more pronounced.²⁴

The most deprived neighborhoods had substantially higher levels of alcohol outlet density than the least deprived (46% versus 15%). Multi-level analysis showed that the least deprived neighborhoods were associated with the heaviest alcohol consumption even after adjusting for individual-level socio-demographic characteristics. Mismatch between supply and demand may cause people in the most deprived neighborhoods to disproportionately suffer the negative health consequences of living in area of high alcohol outlet density.²⁵

Alcohol Outlet Density & Social Capital

Neighborhood off-premise alcohol outlet density was strongly associated with reduced social capital, supporting the concept that off-premise alcohol outlets in the neighborhood environment may hinder the development of social capital. An off-premise alcohol outlet in a neighborhood represents a spatial focus for incivilities associated with physical (e.g., graffiti, liquor advertising, trash) and social (e.g., loitering, drug sales, prostitution, altercations) disorder. Consequently, the presence of off-premise alcohol outlets may hinder the expansion of a positive underlying neighborhood social network and lead to competing neighborhood social networks as the “eyes on the street” and “defensible space” are reduced.²⁶

²² Cohen DA et al. Alcohol outlets, gonorrhea, and the Los Angeles civil unrest: A longitudinal analysis. *Social Science & Medicine* 62 (2006) 3062–3071.

²³ Theall KP. The Neighborhood Alcohol Environment and Alcohol-Related Morbidity. *Alcohol & Alcoholism* Vol. 44, No. 5, pp. 491–499, 2009.

²⁴ Berke EM et al. Alcohol Retail Density and Demographic Predictors of Health Disparities: A Geographic Analysis. *Am J Public Health*. 2010 October; 100(10): 1967–1971.

²⁵ Pollack CE, Cubbin C, Ahn D et al. (2005) Neighbourhood deprivation and alcohol consumption: does the availability of alcohol play a role? *Int J Epidemiol* 34:772–80.

²⁶ Theall KP et al. Social capital and the neighborhood alcohol environment. *Health Place*. 2009 Mar;15(1):323-32.

Bars are part of the local neighborhood ecology, and those that fail to control patrons' behavior and are in a state of physical decay contribute to the overall level of social and physical disorder.²⁷

Alcohol Outlet Density & College Students

Off-campus, on-premise outlet density is strongly associated with college-drinking outcomes. Higher densities of on-premise alcohol outlets were strongly related to drinking outcomes even after controlling for individual predictors of college drinking. The association indicated that the campus means for the average number of drinks when partying and the number of drinking occasions in the past 30 days were, respectively, 1.13 drinks and 1.32 occasions greater when the outlet density was 2 standard deviations higher.²⁸

A campus-level measure of the physical availability of alcohol—namely, the number of on-premise or off-premise alcohol outlets within 3 miles of campus—also was associated with the overall violence rate. This finding suggests that campuses with higher alcohol-outlet density have higher drinking levels, which in turn explains their higher rates of violence.²⁹

Outlet density was correlated with frequent drinking (i.e., drank on 10+ occasions in past 30 days) for all drinkers, including non-Greek affiliated students, women, underage students, and students who picked up binge drinking in college.³⁰

²⁷ Gorman DM et al. Spatial dynamics of alcohol availability, neighborhood structure and violent crime. *J Stud Alcohol*. 2001 Sep;62(5):628-36.

²⁸ Scribner et al. The Contextual Role of Alcohol Outlet Density in College Drinking. *Journal of Studies on Alcohol and Drugs*. January 2008.

²⁹ Scribner et al. An Ecological Analysis of Alcohol-Outlet Density and Campus-Reported Violence at 32 U.S. Colleges. *Journal of Studies on Alcohol and Drugs*. March 2010. 184-191.

³⁰ Weitzman ER et al. The relationship of alcohol outlet density to heavy and frequent drinking and drinking-related problems among college students at eight universities. *Health & Place* 9 (2003) 1–6.