# Alcohol License Overview for Wisconsin

Municipal governments in Wisconsin have the ability and authority to control the number and location of alcohol outlets in their community. This report provides a summary of current research on outlet density and a numerical overview of the number of alcohol outlets by municipality and county. The number and location of alcohol outlets has a significant impact on the social and economic welfare of the community.

*Produced by: the State of Wisconsin Department of Health Services, Division of Mental Health and Substance Abuse Services, Bureau of Prevention Treatment and Recovery and the University of Wisconsin Law School, Resource Center on Impaired Driving, Wisconsin Alcohol Policy Project.*
*Available at: http://www.dhs.wisconsin.gov/substabuse/alcdensity.htm*

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# Outlet Density: Limiting the Concentration of Retailers Selling & Serving Alcohol in Your Community

In Wisconsin, municipalities control many of the factors shaping the local alcohol environment. Because municipalities issue alcohol licenses, municipal government has control over the number and type of establishments selling and serving alcohol, as well as whether sales are concentrated in one area or spread throughout the community. Issues relating to the number and location of alcohol outlets are often referred to as "outlet density" issues or "density" issues.[i] In this report, alcohol outlet density refers to the number of licensed locations selling alcohol beverages within a municipality or other defined area. A glossary of terms found on page 8 defines several terms used in this document.

## Overview of alcohol outlet density:

The number, size and location of the retailers that sell alcohol for consumption elsewhere (known as off-premises or Class A licenses in Wisconsin) or consumption within the location the alcohol is purchased (known as on-premises or Class B licenses) have a significant impact on both the character and economic future of a community.

Independent research documents a relationship between a high concentration of licensed outlets selling alcohol and levels of alcohol-related crime and disorder.[ii] This research has evolved into detailed analyses of outlet concentration in different nations, states and communities and the range of predictable consequences (for a list of research that has been done in this area, see Appendix 2). In 2007, the Centers for Disease Control and Prevention (CDC) recommended communities limit alcohol outlet density in an effort to reduce alcohol related harm.[iii]

Increases in civic disorder, crime and violence resulting from over-concentrations can occur even when all licensees are responsible businesses. While poorly managed licensees can exacerbate alcohol related problems, an over concentration of alcohol licensees, even well operated establishments, can result in alcohol related problems. The municipal procedures and guidelines, or the lack of guidelines, used to award licenses will impact community character and municipal finances. Law enforcement, emergency responders and jail costs are major factors in most municipal budgets: alcohol-related disorder contributes to higher municipal costs.

Even recognizing the different measures and systems involved, it is clear Wisconsin has a significantly higher number of alcohol outlets than other states. There are approximately 330 residents for each alcohol outlet, based on reports from the Wisconsin Department of Revenue. National estimates show approximately one outlet for every 1,400 residents.[iv] Overall, Wisconsin has more outlets than the average by a factor of four.

Wisconsin also leads the nation, or ranks near the top, in several measures of alcohol consumption including; the number of adults who report binge drinking in the past month, the number of drinks consumed per binge drinking occasion[v] and the number of adults (18 and older) reporting that they consumed alcohol and drove at least once in the past year.[vi]

## Alcohol Licensing and Density

All alcohol use occurs within the larger context of the community. The number, location and operation of licensees have a dramatic impact on the community alcohol environment. It is more prudent and economical for a community to deny an application than address the consequences of over-concentration or poor operation. Reducing outlet density is difficult and time consuming. Community safety and economic development are well served by planning and the careful review of all license applicants.

The cities of Madison and Racine have partial density limits targeting their local alcohol related problems. Each community approach targeted a specific concern; in Madison, the proliferation of alcohol outlets near the UW Madison campus and in Racine, the large number of locations licensed for off-premises alcohol sales. In both communities, limitations on additional alcohol outlets were part of broader plans to prevent and reduce alcohol related problems. Both communities adopted ordinances to prevent or limit the number of additional outlets recognizing a municipal ordinance establishing a ceiling or a numerical limit on the number of licensees is more stable than political agreement.

### What problems do density limits address?

Researchers have documented the relationship between concentrations of alcohol retail outlets and social problems such as drunk driving, alcohol related injuries, violence, and property crime.[vii] Over-concentrations of alcohol outlets also create quality of life concerns, sometimes called amenity issues, such as late night noise, garbage, public urination, and minor vandalism. This is especially true where residential areas are adjacent to licensees. Some research indicates off-premises outlets (Class A outlets in Wisconsin) may be a factor in domestic violence.[viii]

### How does a density limit work?

Wisconsin Statutes do not limit the number of off-premises (Class A) retail licenses or Class B on-premises licenses limited to beer. The statutory license “quota” sets the number of on-premise licenses for beer, wine and distilled spirits, informally referred to as “Class B Combination” licenses to approximately 500 residents per license with numerous exceptions and special circumstances.

Limiting the number of outlets that sell and serve alcohol avoids two related situations. First, reducing the overall availability of alcohol reduces the overall amount of alcohol consumed, even among heavy drinkers.[ix] Second, limiting the number of retailers reduces the likelihood of drink specials or other price cutting promotional strategies that encourage dangerous drinking. Price cutting is a likely result of over-concentration which forces retailers to compete through aggressive pricing. Drink specials featuring discounted alcohol are known to contribute to dangerous drinking, sometimes called binge drinking.[x]

Even if a community froze the number, size, and location of outlets immediately, reductions in alcohol related problems would be gradual. Limitations on outlet density can achieve results over time. Like many alcohol related problems, no single policy or remedy can resolve all the problems associated with an over concentration of alcohol outlets.

Critical situations requiring an immediate response may respond to lower density but cannot replace immediate interventions. In 2006, Madison experienced several high profile incidents on and near State Street that were resolved by both the increased presence of law enforcement and the adoption of an ordinance placing strict limits on additional alcohol licenses in the area. Madison intervened to resolve the immediate issue at significant municipal expense and then took further steps to address the underlying over concentration of alcohol outlets.

**Define the density problem in your community.**

Communities will experience alcohol related problems when a large number of licensed establishments sell and serve within a confined geographic area. Density problems will occur in a community even in the absence of "problem" licensees. Local information can help you determine whether your community has reached a concerning concentration of alcohol outlets.

1. Before beginning, ask local police if crime and violence maps for the community are available. Many police departments have access to mapping software. Community coalitions can create a Google map of all the licensed establishments in your community. Designate Class A (retail outlets) licensees differently than Class B licensees (taverns and restaurants that serve alcohol) on the map (for example: red vs. blue dots). If you have access to arrest/crime and crash maps, combine or create overlays to consider the relationship between outlet density and law enforcement involvement.

2. Ask local law enforcement agencies about the amount and location calls for service or disturbances for issues such as underage drinking, impaired driving, property destruction, robbery, and assaults. For example: how many local police calls for service are alcohol-related?

3. Ask police to identify “hot spots” that have both a disproportionate number of alcohol outlets and a disproportionate number of alcohol related problems.

4. Review traffic reports or speak with law enforcement officers familiar with local traffic patterns to determine if motor vehicle incidents occur in that area, and if alcohol is a contributing factor.

As you conduct this research, be alert for trends in police, emergency room admissions, and other data indicating your community is at a saturation point for alcohol outlets. Be prepared to demonstrate how you determined a density problem exists in your community - or a portion of your community - and a compelling argument for swift action.

### Will reducing outlet density reduce alcohol related problems?

There is ample evidence that increasing outlet density increases alcohol related problems. Studies conducted in Norway (2000), California (2005), New Jersey (2001), Boston (2003), and Baton Rouge (2001) indicate a general relationship between the presence of a large number of establishments that sell and serve alcohol and increased levels of harmful alcohol related consequences.

Experts believe capping and then reducing the number of alcohol outlets in your community will reduce the number of alcohol related problems. It is important to pair practices that can address the results of over-concentration -- such as increased police presence, saturation patrols, or age compliance checks -- with community efforts to reduce outlet density. Limiting density alone will not resolve many immediate situations; it is a long term strategy.

### How should a community approach limiting outlet density?

There is no right to an alcohol license in Wisconsin. A municipality may deny a new application for any reason that is not discriminatory or arbitrary, as long as the rationale is provided in writing to the applicant.[xi] Municipalities may establish a numerical ceiling by ordinance, a moratorium, or simply refrain from issuing additional licenses. A moratorium on new licenses would lower density over time as licenses are surrendered, moved to a new location within the community, non-renewed or revoked.

For example, if an over-concentration of retail alcohol outlets triggers an increase (or perceived increase) in underage drinking, the community may wish to limit or cap the number of Class A licenses. If recent experience suggests problems result from an over-concentration of “Class B” licenses, a moratorium on additional licenses or similar limits on new licensees using license conditions may work best.

## Why limit alcohol outlet density through ordinance and not a political agreement or adopting an internal policy?

Adopting or modifying a municipal ordinance is more time consuming and difficult than political or organizational agreements but, it is far less vulnerable to repeal or amendment in the long run.

Political agreements will reflect changes in the political climate and composition of the governing body, changing over time. Once an ordinance is enacted, it becomes part of the status quo, and change requires a majority vote of the governing body (city council or village board).

## How does a community construct a density ordinance; what are the options?

A community may adopt broad or very narrow limitations on additional alcohol licenses. State statutes require municipalities to provide the reason for license denials in writing but do not establish any criteria for that determination.

For example, a municipality can:

- Create a numerical cap on the number of off-premise outlets in a specific geographic area. Convenience stores, gas stations, and drug stores often sell alcohol, as an additional source of revenue. Such outlets often employ young, low-wage workers who may be susceptible to requests from friends and other youth looking to purchase alcohol illegally.

- If your community believes the sale of gasoline and alcohol at a single location is incompatible, the municipality may adopt guidelines or an ordinance prohibiting the sale of gasoline by Class A licensees or adopt guidelines against issuing alcohol licenses to locations selling gasoline.

- Create a numerical cap on the total capacity (occupancy) for licensed establishments within a geographic area, that is, a ceiling on the maximum number of patrons the community wants to be in all licensed Class B establishments at one time. Clearly four licensees with a licensed occupancy of 500 each will generate more problems than four licensees limited to 100 customers each.

- Communities may establish a maximum occupancy for any Class B license when it is issued. Often, communities use the maximum number of patrons determined by the fire inspector to establish a maximum occupancy, but communities may set lower limits on capacity when issuing an alcohol license.

Ask local law enforcement about the total number of people allowed in licensed establishments. Is local law enforcement able to handle the level of calls for service in the area or are other jurisdictions regularly called upon for assistance? A barometer of total capacity might be the number and type of police calls at closing hour (bar time) when multiple outlets close simultaneously. Is there sufficient sidewalk capacity for the departing patrons or are individuals forced into the streets?

- Cease issuing or limit the number of Class B on-premise licenses, but allow additional licenses to be issued to restaurants. It is essential to define restaurants clearly, perhaps by the percentage of annual revenue generated from food sales as a condition of all licenses, then assign responsibility for making that determination to a specific agency or individual. There is a national trend in restaurants turning their establishments into a bar or club after food service ends. Remember, a club and a restaurant require the same alcohol licensing, "morphing" from restaurant to club is easy.

- Require a specific portal to portal distance between licensed outlets. For example, amend municipal ordinances to require a distance of 1,000 feet between the entrances of licensed establishments. (1000 feet = 0.189393 mi)

- Enforce existing statute 125.68(3)(b) which prohibits licensed outlets within 300 feet of a school, hospital or church building.

**How can a coalition initiate the public dialog on outlet density?**

Effective advocacy on alcohol licensing issues requires a thorough understanding of local licensing procedures. The first step is learning how your community issues, renews and disciplines alcohol licenses. While municipalities have the statutory authority to issue alcohol licenses, each community creates its own system for reviewing, approving, and disciplining licenses. The Wisconsin Alcohol Policy Project has a checklist to guide your research on local license procedure available at:

http://law.wisc.edu/wapp/index.html?iSec=dffb632116d8cf63798ed551e260926f&iNetID=jsherman2&iTime=1325865007 {Wisconsin Alcohol Policy web site}

It is important to determine the committees, governing bodies and individuals who review license applications, the role of local law enforcement and finally, the timing of each step. These discussions are open public meetings under the requirements of Wisconsin's open meetings and open records laws. The internet makes keeping abreast of meetings and agendas much easier, but regular review of pending applications is essential to learning and monitoring the process.

Often a committee of the Village Board or City Council conducts the initial review before making a recommendation to the full Council or Board. Some communities appoint citizen members to license review committees, and some governing bodies choose to conduct all aspects of review themselves. Regardless, these meetings are public and bound by open meeting and open record laws.

Once you understand the local licensing system and gather the data and the maps described earlier, you are prepared to work with local elected officials and other concerned residents to consider the over-concentration of alcohol outlets. A carefully considered outlet density policy and ordinance can support responsible local licensees while enhancing the community quality of life.

# Glossary of Terms

**Alcohol Outlet:** A business licensed by the municipality for either on-premise or off-premise consumption. Any entity providing alcohol *to the public* must be licensed in Wisconsin even if alcohol sales are not the primary business or alcohol provided without charge to customers.

**Alcohol Outlet Concentration/Clustering:** A significant number of alcohol outlets within a small defined area in comparison to other measures.

**Alcohol Outlet Density:** The number of physical locations in which alcoholic beverages are sold or served within a community, usually measured as outlets per population, land mile, or road mile.

**Outlet Capacity:** The number of patrons allowed in an establishment at one time. Local building codes will limit the number of individuals that can safely occupy a building. Alcohol licensees may have a lower occupancy number established at the time of issuance.

**Class A Licenses:** Class “A” beer fermented malt beverage licenses allow retail sale of fermented malt beverages (beer) for consumption off the premises (examples: grocery or convenience stores). “Class A” alcohol licenses allow retail sale of distilled spirits (including wine) for consumption off the premises (examples: liquor stores or grocery stores selling both beer and distilled spirits), and Class A beer/Class A liquor (includes wine) – off-premises sales.

**Class B Licenses:** Class "B" fermented malt beverage licenses allow retail sale of fermented malt beverages (beer) for consumption on premises and limited off premises sales by local ordinances. (Examples: restaurants, "beer bars."), "Class B" licenses allow retail sale of distilled spirits (including wine) for consumption on the premises.

**Class C Licenses:** "Class C" wine (on-premises sale), licenses allow the sale of wine for consumption only on the premises and allow the carryout of a single opened (resealed) bottle if sold with a meal.

# Alcohol License Overview for Wisconsin

Data in this section are taken from multiple data sources. The most recent data is presented for 2011-2012. Population estimates are from the Wisconsin Department of Administration (DOA) and are based on 2011 estimates.

Land area in square miles estimates are from the U.S. Census Bureau 2010 http://quickfacts.census.gov/qfd/states/55000.html. Land area does change from year to year, but usually not by significant amounts. Therefore, data is presented from the most reliable data taken in the Census year.

Municipal clerks annually report the number of alcohol licenses to the Wisconsin Department of Revenue (DOR). There is a difference between the number of licenses issued and the number of establishments issued licenses. Some establishments may be issued more than one type of license and some clerks do not provide information on the license type issued to an establishment. Analysis based on license number alone will inflate the number of establishments' serving or selling alcohol in the area. **For the purposes of this report, "Alcohol Licenses Issued" refers to the number of establishments holding a license.**

Alcohol licenses in Wisconsin are issued at the municipal level. Data is presented here on a county-wide basis, using the municipal information provided to the DOR for all 72 Wisconsin counties.

**Table 1: People per License by Wisconsin County**

| County | 2011 Population | Population rank w/i state | 2011 - 2012 Licenses issued | People per License | Ppl/Lic rank w/i state* |
|---|---|---|---|---|---|
| Adams | 20,935 | 50 | 100 | 209.4 | 27 |
| Ashland | 16,064 | 60 | 115 | 139.7 | 10 |
| Barron | 45,925 | 30 | 163 | 281.7 | 40 |
| Bayfield | 15,036 | 64 | 150 | 100.2 | 4 |
| Brown | 249,192 | 4 | 662 | 376.4 | 59 |
| Buffalo | 13,620 | 67 | 84 | 162.1 | 14 |
| Burnett | 15,448 | 62 | 97 | 159.3 | 13 |
| Calumet | 49,109 | 29 | 128 | 383.7 | 60 |
| Chippewa | 62,610 | 24 | 228 | 274.6 | 38 |
| Clark | 34,719 | 41 | 141 | 246.2 | 36 |
| Columbia | 56,850 | 26 | 179 | 317.6 | 48 |
| Crawford | 16,600 | 58 | 96 | 172.9 | 17 |
| Dane | 489,331 | 2 | 1,110 | 440.8 | 69 |
| Dodge | 88,789 | 17 | 277 | 320.5 | 49 |

| County | 2011 Population | Population rank w/i state | 2011 - 2012 Licenses issued | People per License | Ppl/Lic rank w/i state* |
|---|---|---|---|---|---|
| Door | 27,765 | 45 | 248 | 112.0 | 7 |
| Douglas | 44,176 | 33 | 210 | 210.4 | 28 |
| Dunn | 43,787 | 34 | 109 | 401.7 | 63 |
| Eau Claire | 99,012 | 16 | 241 | 410.8 | 66 |
| Florence | 4,337 | 71 | 43 | 100.9 | 5 |
| Fond du Lac | 101,740 | 15 | 307 | 331.4 | 52 |
| Forest | 9,180 | 68 | 83 | 110.6 | 6 |
| Grant | 51,280 | 28 | 202 | 253.9 | 37 |
| Green | 36,884 | 39 | 108 | 341.5 | 56 |
| Green Lake | 19,091 | 55 | 89 | 214.5 | 30 |
| Iowa | 23,720 | 48 | 101 | 234.9 | 33 |
| Iron | 5,828 | 70 | 89 | 65.5 | 1 |
| Jackson | 20,475 | 53 | 99 | 206.8 | 24 |
| Jefferson | 83,794 | 20 | 277 | 302.5 | 44 |
| Juneau | 26,725 | 46 | 136 | 196.5 | 22 |
| Kenosha | 166,632 | 8 | 400 | 416.6 | 67 |
| Kewaunee | 20,594 | 52 | 104 | 198.0 | 23 |
| La Crosse | 114,919 | 13 | 324 | 354.7 | 57 |
| Lafayette | 16,880 | 57 | 81 | 208.4 | 25 |
| Langlade | 19,901 | 54 | 116 | 171.6 | 16 |
| Lincoln | 28,668 | 44 | 154 | 186.2 | 20 |
| Manitowoc | 81,406 | 21 | 288 | 282.7 | 41 |
| Marathon | 134,414 | 10 | 410 | 327.8 | 51 |
| Marinette | 41,719 | 36 | 227 | 183.8 | 18 |
| Marquette | 15,392 | 63 | 71 | 216.8 | 31 |
| Menominee | 4,202 | 72 | 14 | 300.1 | 43 |
| Milwaukee | 948,369 | 1 | 1,960 | 483.9 | 70 |
| Monroe | 44,877 | 31 | 132 | 340.0 | 55 |
| Oconto | 37,723 | 38 | 196 | 192.5 | 21 |
| Oneida | 35,962 | 40 | 259 | 138.8 | 9 |
| Outagamie | 177,455 | 6 | 491 | 361.4 | 58 |
| Ozaukee | 86,530 | 18 | 215 | 402.5 | 64 |
| Pepin | 7,461 | 69 | 47 | 158.7 | 11 |
| Pierce | 41,085 | 37 | 121 | 339.5 | 54 |
| Polk | 44,244 | 32 | 159 | 278.3 | 39 |
| Portage | 70,370 | 23 | 227 | 310.0 | 46 |
| Price | 14,000 | 66 | 102 | 137.3 | 8 |
| Racine | 195,225 | 5 | 504 | 387.4 | 61 |

| County | 2011 Population | Population rank w/i state | 2011 - 2012 Licenses issued | People per License | Ppl/Lic rank w/i state* |
|---|---|---|---|---|---|
| Richland | 18,045 | 56 | 54 | 334.2 | 53 |
| Rock | 160,287 | 9 | 326 | 491.7 | 71 |
| Rusk | 14,703 | 65 | 90 | 163.4 | 15 |
| Sauk | 61,951 | 25 | 277 | 223.6 | 32 |
| Sawyer | 16,600 | 59 | 201 | 82.6 | 2 |
| Shawano | 41,954 | 35 | 228 | 184.0 | 19 |
| Sheboygan | 115,569 | 12 | 369 | 313.2 | 47 |
| St. Croix | 84,503 | 19 | 198 | 426.8 | 68 |
| Taylor | 20,681 | 51 | 99 | 208.9 | 26 |
| Trempealeau | 28,905 | 43 | 137 | 211.0 | 29 |
| Vernon | 29,849 | 42 | 102 | 292.6 | 42 |
| Vilas | 21,444 | 49 | 240 | 89.4 | 3 |
| Walworth | 102,485 | 14 | 334 | 306.8 | 45 |
| Washburn | 15,900 | 61 | 100 | 159.0 | 12 |
| Washington | 132,206 | 11 | 322 | 410.6 | 65 |
| Waukesha | 390,267 | 3 | 760 | 513.5 | 72 |
| Waupaca | 52,392 | 27 | 214 | 244.8 | 35 |
| Waushara | 24,531 | 47 | 102 | 240.5 | 34 |
| Winnebago | 167,245 | 7 | 426 | 392.6 | 62 |
| Wood | 74,669 | 22 | 232 | 321.8 | 50 |
| **Totals** | **5,694,236** | | **17,298** | **329.4** | |

*Ranked from 1-72, the county ranked #1 has the fewest people per license in the state (65.5). The county ranked #72 has the most people per license in the state (513.5).

**Table 2: Licenses Issued per 500 People by Wisconsin County**

| County | 2011 Population | 2011 - 2012 Licenses issued | Licenses/ 500 People | Lic/ 500 Ppl rank w/i state* |
|---|---|---|---|---|
| Adams | 20,935 | 100 | 2.4 | 24 |
| Ashland | 16,064 | 115 | 3.6 | 8 |
| Barron | 45,925 | 163 | 1.8 | 38 |
| Bayfield | 15,036 | 150 | 5.0 | 4 |
| Brown | 249,192 | 662 | 1.3 | 59 |
| Buffalo | 13,620 | 84 | 3.1 | 11 |
| Burnett | 15,448 | 97 | 3.1 | 11 |
| Calumet | 49,109 | 128 | 1.3 | 59 |
| Chippewa | 62,610 | 228 | 1.8 | 38 |
| Clark | 34,719 | 141 | 2.0 | 35 |

| County | 2011 Population | 2011 - 2012 Licenses issued | Licenses/ 500 People | Lic/ 500 Ppl rank w/i state* |
|---|---|---|---|---|
| Columbia | 56,850 | 179 | 1.6 | 45 |
| Crawford | 16,600 | 96 | 2.9 | 16 |
| Dane | 489,331 | 1,110 | 1.1 | 69 |
| Dodge | 88,789 | 277 | 1.6 | 45 |
| Door | 27,765 | 248 | 4.5 | 6 |
| Douglas | 44,176 | 210 | 2.4 | 24 |
| Dunn | 43,787 | 109 | 1.2 | 63 |
| Eau Claire | 99,012 | 241 | 1.2 | 63 |
| Florence | 4,337 | 43 | 5.0 | 4 |
| Fond du Lac | 101,740 | 307 | 1.5 | 51 |
| Forest | 9,180 | 83 | 4.5 | 6 |
| Grant | 51,280 | 202 | 2.0 | 35 |
| Green | 36,884 | 108 | 1.5 | 51 |
| Green Lake | 19,091 | 89 | 2.3 | 30 |
| Iowa | 23,720 | 101 | 2.1 | 33 |
| Iron | 5,828 | 89 | 7.6 | 1 |
| Jackson | 20,475 | 99 | 2.4 | 24 |
| Jefferson | 83,794 | 277 | 1.7 | 42 |
| Juneau | 26,725 | 136 | 2.5 | 22 |
| Kenosha | 166,632 | 400 | 1.2 | 63 |
| Kewaunee | 20,594 | 104 | 2.5 | 22 |
| La Crosse | 114,919 | 324 | 1.4 | 57 |
| Lafayette | 16,880 | 81 | 2.4 | 24 |
| Langlade | 19,901 | 116 | 2.9 | 16 |
| Lincoln | 28,668 | 154 | 2.7 | 18 |
| Manitowoc | 81,406 | 288 | 1.8 | 38 |
| Marathon | 134,414 | 410 | 1.5 | 51 |
| Marinette | 41,719 | 227 | 2.7 | 18 |
| Marquette | 15,392 | 71 | 2.3 | 30 |
| Menominee | 4,202 | 14 | 1.7 | 42 |
| Milwaukee | 948,369 | 1,960 | 1.0 | 70 |
| Monroe | 44,877 | 132 | 1.5 | 51 |
| Oconto | 37,723 | 196 | 2.6 | 21 |
| Oneida | 35,962 | 259 | 3.6 | 8 |
| Outagamie | 177,455 | 491 | 1.4 | 57 |
| Ozaukee | 86,530 | 215 | 1.2 | 63 |
| Pepin | 7,461 | 47 | 3.1 | 11 |

| County | 2011 Population | 2011 - 2012 Licenses issued | Licenses/ 500 People | Lic/ 500 Ppl rank w/i state* |
|---|---|---|---|---|
| Pierce | 41,085 | 121 | 1.5 | 51 |
| Polk | 44,244 | 159 | 1.8 | 38 |
| Portage | 70,370 | 227 | 1.6 | 45 |
| Price | 14,000 | 102 | 3.6 | 8 |
| Racine | 195,225 | 504 | 1.3 | 59 |
| Richland | 18,045 | 54 | 1.5 | 51 |
| Rock | 160,287 | 326 | 1.0 | 70 |
| Rusk | 14,703 | 90 | 3.1 | 11 |
| Sauk | 61,951 | 277 | 2.2 | 32 |
| Sawyer | 16,600 | 201 | 6.1 | 2 |
| Shawano | 41,954 | 228 | 2.7 | 18 |
| Sheboygan | 115,569 | 369 | 1.6 | 45 |
| St. Croix | 84,503 | 198 | 1.2 | 63 |
| Taylor | 20,681 | 99 | 2.4 | 24 |
| Trempealeau | 28,905 | 137 | 2.4 | 24 |
| Vernon | 29,849 | 102 | 1.7 | 42 |
| Vilas | 21,444 | 240 | 5.6 | 3 |
| Walworth | 102,485 | 334 | 1.6 | 45 |
| Washburn | 15,900 | 100 | 3.1 | 11 |
| Washington | 132,206 | 322 | 1.2 | 63 |
| Waukesha | 390,267 | 760 | 1.0 | 70 |
| Waupaca | 52,392 | 214 | 2.0 | 35 |
| Waushara | 24,531 | 102 | 2.1 | 33 |
| Winnebago | 167,245 | 426 | 1.3 | 59 |
| Wood | 74,669 | 232 | 1.6 | 45 |
| **Totals** | **5,694,236** | **17,298** | **1.5** | |

*Ranked from 1-70, the county ranked #1 has the most licenses per 500 people in the state (7.6). The counties ranked #70 has the fewest licenses per 500 people in the state (1.0).

**Table 3: Square Land Miles per Alcohol License by Wisconsin County**

| County | Sq. land miles | 2011 - 2012 Licenses issued | Sq. Mile/Lic. | Sq. Mi./Lic. rank in State* |
|---|---|---|---|---|
| Adams | 646 | 100 | 6.5 | 51 |
| Ashland | 1,045 | 115 | 9.1 | 63 |
| Barron | 863 | 163 | 5.3 | 38 |
| Bayfield | 1,478 | 150 | 9.9 | 65 |
| Brown | 523 | 662 | 0.8 | 5 |
| Buffalo | 672 | 84 | 8.0 | 59 |
| Burnett | 822 | 97 | 8.5 | 60 |
| Calumet | 318 | 128 | 2.5 | 19 |
| Chippewa | 1,008 | 228 | 4.4 | 34 |
| Clark | 1,210 | 141 | 8.6 | 62 |
| Columbia | 766 | 179 | 4.3 | 32 |
| Crawford | 571 | 96 | 5.9 | 45 |
| Dane | 1,197 | 1,110 | 1.1 | 7 |
| Dodge | 876 | 277 | 3.2 | 22 |
| Door | 482 | 248 | 1.9 | 14 |
| Douglas | 1,304 | 210 | 6.2 | 48 |
| Dunn | 850 | 109 | 7.8 | 56 |
| Eau Claire | 638 | 241 | 2.6 | 20 |
| Florence | 488 | 43 | 11.4 | 69 |
| Fond du Lac | 720 | 307 | 2.3 | 18 |
| Forest | 1,014 | 83 | 12.2 | 70 |
| Grant | 1,147 | 202 | 5.7 | 42 |
| Green | 584 | 108 | 5.4 | 40 |
| Green Lake | 349 | 89 | 3.9 | 31 |
| Iowa | 763 | 101 | 7.6 | 54 |
| Iron | 758 | 89 | 8.5 | 61 |
| Jackson | 988 | 99 | 10.0 | 66 |
| Jefferson | 557 | 277 | 2.0 | 15 |
| Juneau | 767 | 136 | 5.6 | 41 |
| Kenosha | 272 | 400 | 0.7 | 3 |
| Kewaunee | 343 | 104 | 3.3 | 23 |
| La Crosse | 452 | 324 | 1.4 | 12 |
| Lafayette | 634 | 81 | 7.8 | 57 |
| Langlade | 871 | 116 | 7.5 | 53 |
| Lincoln | 879 | 154 | 5.7 | 43 |

| County | Sq. land miles | 2011 - 2012 Licenses issued | Sq. Mile/Lic. | Sq. Mi./Lic. rank in State* |
|---|---|---|---|---|
| Manitowoc | 589 | 288 | 2.0 | 16 |
| Marathon | 1,545 | 410 | 3.8 | 29 |
| Marinette | 1,399 | 227 | 6.2 | 47 |
| Marquette | 456 | 71 | 6.4 | 50 |
| Menominee | 358 | 14 | 25.5 | 72 |
| Milwaukee | 241 | 1,960 | 0.1 | 1 |
| Monroe | 901 | 132 | 6.8 | 52 |
| Oconto | 998 | 196 | 5.1 | 37 |
| Oneida | 1,113 | 259 | 4.3 | 33 |
| Outagamie | 638 | 491 | 1.3 | 9 |
| Ozaukee | 233 | 215 | 1.1 | 8 |
| Pepin | 232 | 47 | 4.9 | 36 |
| Pierce | 574 | 121 | 4.7 | 35 |
| Polk | 914 | 159 | 5.7 | 44 |
| Portage | 801 | 227 | 3.5 | 26 |
| Price | 1,254 | 102 | 12.3 | 71 |
| Racine | 333 | 504 | 0.7 | 2 |
| Richland | 586 | 54 | 10.9 | 68 |
| Rock | 718 | 326 | 2.2 | 17 |
| Rusk | 914 | 90 | 10.2 | 67 |
| St. Croix | 722 | 198 | 3.6 | 28 |
| Sauk | 831 | 277 | 3.0 | 21 |
| Sawyer | 1,257 | 201 | 6.3 | 49 |
| Shawano | 893 | 228 | 3.9 | 30 |
| Sheboygan | 511 | 369 | 1.4 | 11 |
| Taylor | 975 | 99 | 9.8 | 64 |
| Trempealeau | 733 | 137 | 5.4 | 39 |
| Vernon | 792 | 102 | 7.8 | 55 |
| Vilas | 857 | 240 | 3.6 | 27 |
| Walworth | 555 | 334 | 1.7 | 13 |
| Washburn | 797 | 100 | 8.0 | 58 |
| Washington | 431 | 322 | 1.3 | 10 |
| Waukesha | 550 | 760 | 0.7 | 4 |
| Waupaca | 748 | 214 | 3.5 | 25 |
| Waushara | 626 | 102 | 6.1 | 46 |

| County | Sq. land miles | 2011 - 2012 Licenses issued | Sq. Mile/Lic. | Sq. Mi./Lic. rank in State* |
|---|---|---|---|---|
| Winnebago | 435 | 426 | 1.0 | 6 |
| Wood | 793 | 232 | 3.4 | 24 |
| **Totals** | **54,158** | **17,298** | **3.2** | |

*Ranked from 1-72, the county ranked #1 has the fewest square land miles per license in the state (0.1 miles/license). The county ranked #72 has the most square land miles per license in the state (25.5 miles/license).

# Appendix 1: Alcohol License Overview for the United States

Since 1933 (the repeal of prohibition), states have had the primary authority for determining whether alcohol could be sold legally and, if so, how. Since that time, numerous different alcohol control systems (in each state, the territories, and the District of Columbia) have evolved. While each alcohol distribution system is unique, each state and/or territory typically falls within one of two general classifications: *control states* and *license states*.

Both control states and license states regulate alcohol industry members through licensure. Alcohol beverage licenses are treated as a privilege rather than a right, and their issuance is conditioned on a set of restrictions and qualifications. Each state has developed its own licensing method.[xii]

Since every state licenses alcohol differently, comparisons across states can be problematic. The following data is provided as an overview of the most recent data available. Alcohol license counts are from the National Beverage Handbook 2009 Fact Book and population data is based on U.S. Census Bureau estimates for 2009.

**Table 1: People per Alcohol License by State**

| State | 2009 Population | 2009 Total Alcohol Licenses | 2009 Total Ppl/ License | 2009 Rank by Pop. ^ |
|---|---|---|---|---|
| Alabama* | 4,708,708 | 12,091 | 389.4 | 17 |
| Alaska | 698,473 | 1,605 | 435.2 | 22 |
| Arizona | 6,595,778 | 11,142 | 592.0 | 36 |
| Arkansas | 2,889,450 | 4,708 | 613.7 | 38 |
| California | 36,961,664 | 79,488 | 465.0 | 24 |
| Colorado | 5,024,748 | 12,784 | 393.0 | 18 |
| Connecticut | 3,518,288 | 7,212 | 487.8 | 29 |
| Delaware | 885,122 | 1,141 | 775.7 | 43 |
| District of Columbia | 599,657 | 1,216 | 493.1 | 30 |
| Florida | 18,537,969 | 39,302 | 471.7 | 27 |
| Georgia | 9,829,211 | 14,041 | 700.0 | 41 |
| Hawaii | 1,295,178 | 2,380 | 544.2 | 33 |
| Idaho* | 1,545,801 | 6,192 | 249.6 | 3 |
| Illinois | 12,910,409 | 21,732 | 594.1 | 37 |
| Indiana | 6,423,113 | 9,433 | 680.9 | 40 |
| Iowa* | 3,007,856 | 8,868 | 339.2 | 11 |
| Kansas | 2,818,747 | 2,995 | 941.2 | 47 |
| Kentucky | 4,314,113 | 5,466 | 789.3 | 44 |
| Louisiana | 4,492,076 | 12,654 | 355.0 | 13 |
| Maine* | 1,318,301 | 4,009 | 328.8 | 8 |
| Maryland | 5,699,478 | 7,922 | 719.4 | 42 |
| Massachusetts | 6,593,587 | 10,002 | 659.2 | 39 |

| State | 2009 Population | 2009 Total Alcohol Licenses | 2009 Total Ppl/ License | 2009 Rank by Pop. ^ |
|---|---|---|---|---|
| Michigan* | 9,969,727 | 17,168 | 580.7 | 35 |
| Minnesota | 5,266,214 | 9,889 | 532.5 | 32 |
| Mississippi* | 2,951,996 | 10,067 | 293.2 | 5 |
| Missouri | 5,987,580 | 12,569 | 476.4 | 28 |
| Montana* | 974,989 | 3,321 | 293.6 | 6 |
| Nebraska | 1,796,619 | 4,674 | 384.4 | 15 |
| Nevada**[a] | 2,643,085 | 1,420 | 1,861.3 | 51 |
| New Hampshire* | 1,324,575 | 4,445 | 298.0 | 7 |
| New Jersey | 8,707,739 | 7,929 | 1,098.2 | 48 |
| New Mexico | 2,009,671 | 2,522 | 796.9 | 45 |
| New York | 19,541,453 | 46,615 | 419.2 | 21 |
| North Carolina* | 9,380,884 | 22,871 | 410.2 | 19 |
| North Dakota | 646,844 | 1,384 | 467.4 | 25 |
| Ohio* | 11,542,645 | 26,084 | 442.5 | 23 |
| Oklahoma | 3,687,050 | 2,349 | 1,569.6 | 49 |
| Oregon* | 3,825,657 | 10,713 | 357.1 | 14 |
| Pennsylvania* | 12,604,767 | 30,218 | 417.1 | 20 |
| Rhode Island | 1,053,209 | 1,928 | 546.3 | 34 |
| South Carolina | 4,561,242 | 16,701 | 273.1 | 4 |
| South Dakota | 812,383 | 4,197 | 193.6 | 2 |
| Tennessee** | 6,296,254 | 3,528 | 1,784.7 | 50 |
| Texas | 24,782,302 | 46,730 | 530.3 | 31 |
| Utah*** | 2,784,572 | 3,432 | 811.4 | 46 |
| Vermont* | 621,760 | 3,455 | 180.0 | 1 |
| Virginia* | 7,882,590 | 16,841 | 468.1 | 26 |
| Washington* | 6,664,195 | 18,866 | 353.2 | 12 |
| West Virginia* | 1,819,777 | 5,380 | 338.2 | 10 |
| Wisconsin | 5,654,774 | 16,764 | 337.3 | 9 |
| Wyoming* | 544,270 | 1,410 | 386.0 | 16 |
| **Total** | **307,006,550** | **629,853** | **487.4** | |

^Ranked 1-51 (the District of Columbia is included). The state ranked #1 has the fewest people per alcohol license and the state ranked number 51 has the most people per license.

*Control States

**Licenses issued at the local level - data incomplete

*** Utah is a control state; some licenses issued locally, data incomplete.

**Table 2: Square Miles per Alcohol License by State**

| State | 2009 Area (sq. mile) | 2009 Alcohol Licenses | Sq. mi./ License | Rank^ |
|---|---|---|---|---|
| Alabama* | 51,718 | 12,091 | 4.3 | 25 |
| Alaska | 587,878 | 1,605 | 366.3 | 50 |
| Arizona | 114,007 | 11,142 | 10.2 | 36 |
| Arkansas | 53,183 | 4,708 | 11.3 | 37 |
| California | 158,648 | 79,488 | 2.0 | 12 |
| Colorado | 104,100 | 12,784 | 8.1 | 32 |
| Connecticut | 5,006 | 7,212 | 0.7 | 2 |
| Delaware | 2,026 | 1,141 | 1.8 | 10 |
| Florida | 58,513 | 39,302 | 1.5 | 7 |
| Georgia | 58,390 | 14,041 | 4.2 | 24 |
| Hawaii | 6,459 | 2,380 | 2.7 | 17 |
| Idaho* | 83,574 | 6,192 | 13.5 | 39 |
| Illinois | 56,343 | 21,732 | 2.6 | 16 |
| Indiana | 36,185 | 9,433 | 3.8 | 23 |
| Iowa* | 56,276 | 8,868 | 6.3 | 30 |
| Kansas | 82,282 | 2,995 | 27.5 | 43 |
| Kentucky | 40,411 | 5,466 | 7.4 | 31 |
| Louisiana | 47,720 | 12,654 | 3.8 | 22 |
| Maine* | 33,128 | 4,009 | 8.3 | 33 |
| Maryland | 10,455 | 7,922 | 1.3 | 6 |
| Massachusetts | 8,262 | 10,002 | 0.8 | 3 |
| Michigan* | 58,513 | 17,168 | 3.4 | 20 |
| Minnesota | 84,397 | 9,889 | 8.5 | 34 |
| Mississippi* | 47,695 | 10,067 | 4.7 | 27 |
| Missouri | 69,709 | 12,569 | 5.5 | 28 |
| Montana* | 147,047 | 3,321 | 44.3 | 45 |
| Nebraska | 77,359 | 4,674 | 16.6 | 40 |
| Nevada** | 110,567 | 1,420 | 77.9 | 49 |
| New Hampshire* | 9,283 | 4,445 | 2.1 | 13 |
| New Jersey | 7,790 | 7,929 | 1.0 | 4 |
| New Mexico | 121,599 | 2,522 | 48.2 | 46 |
| New York | 49,112 | 46,615 | 1.1 | 5 |
| North Carolina* | 52,672 | 22,871 | 2.3 | 14 |
| North Dakota | 70,704 | 1,384 | 51.1 | 47 |
| Ohio* | 41,328 | 26,084 | 1.6 | 9 |
| Oklahoma | 69,903 | 2,349 | 29.8 | 44 |
| Oregon* | 97,052 | 10,713 | 9.1 | 35 |
| Pennsylvania* | 45,310 | 30,218 | 1.5 | 8 |
| Rhode Island | 1,213 | 1,928 | 0.6 | 1 |
| South Carolina | 31,117 | 16,701 | 1.9 | 11 |
| South Dakota | 77,122 | 4,197 | 18.4 | 41 |
| Tennessee** | 42,146 | 3,528 | 11.9 | 38 |
| Texas | 266,874 | 46,730 | 5.7 | 29 |
| Utah*** | 84,905 | 3,432 | 24.7 | 42 |

| State | 2009 Area (sq. mile) | 2009 Alcohol Licenses | Sq. mi./ License | Rank^ |
|---|---|---|---|---|
| Vermont* | 9,615 | 3,455 | 2.8 | 18 |
| Virginia* | 40,598 | 16,841 | 2.4 | 15 |
| Washington* | 68,126 | 18,866 | 3.6 | 21 |
| West Virginia* | 24,231 | 5,380 | 4.5 | 26 |
| Wisconsin | 56,145 | 16,764 | 3.3 | 19 |
| Wyoming* | 97,818 | 1,410 | 69.4 | 48 |
| **Total** | **2,537,948** | **629,853** | **4.0** | |

^Ranked 1-50. The state ranked #1 has the fewest square miles per alcohol license and the state ranked number 50 has the most square miles per license.

*Control States

**Licenses issued at the local level - data incomplete

*** Utah is a control state; some licenses issued locally, data incomplete.

# Appendix 2: Regulation of Alcohol Outlet Density Summary Evidence Table

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| **LICENSING** | | | | | |
| Blose/Holder, 1987<br>Greatest<br>Good (1)<br>Panel Cross-Sectional Time Series | North Carolina<br>1973–1982<br>Counties implementing Liquor-by-the-Drink (LBD). Three counties (Early Change Counties) implemented LBD in Nov 1978 and eight counties (Late Change Counties) implemented LBD in Jan 1979. Groups of counties chosen as unit of analysis | Change to licensing regulation in 1978 allowing the sale of spirits for on-premises consumption. Number of establishments where spirits could be purchased increased from 344 to 900 between 1977 and 1980. Change impacts on-premises outlets | Spirit sales | + 8.3% (Early change counties)<br>+ 4.2% (Late change counties) | Interrupted Time-Series Analysis using ARIMA technique. The time of issuance of licenses used as the intervention point and not the time that legislation was passed. Each LBD county was matched on % change in per capita income (1970–1980), and % change in population (1970–1980) with an appropriate non-LBD county |
| | | | Alcohol-related crashes<br><u>LBD counties</u><br>- Had been drinking<br>- Male single vehicle nighttime crashes (SVNC) ≥21 years<br>- Male SVNC <21 years<br><u>Non-LBD Counties</u><br>- Had Been Drinking<br>- Male Single Vehicle Nighttime Crashes (SVNC) ≥21 years<br>- Male SVNC <21 years | <br><br>+23.6%<br>+15.7%<br><br>– 0.9%<br><br>+15.8%<br>– 0.1%<br><br>–5.6% | Interrupted Time Series using ARIMA modeling |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| Makela, 2002<br>Moderate<br>Fair (2)<br>Before-and-After | Finland<br>1968–1969<br>Cohort of 1720 men and women 15–69 years of age | 1969 legislation ending the monopoly of state owned retail stores on selling medium strength (<4.7% alcohol by volume) beer. Medium strength beer became available in grocery stores and cafes. Additionally, the ban on Alko stores (state-operated retail stores) in the rural countryside ended. The number of state-owned Alko stores increased 22% from **132** to **161** stores. The number of restaurants licensed to sell medium strength beer increased 46%, from **940** to **1372**. Additionally medium strength beer could be sold in **17,431 grocery stores** and **2716 cafes.** It also became easier to establish new licensed restaurants | Annual volume of alcohol consumed | Consumption category (cl of alcohol)<br>BL Change<br>0 26<br>1–49 67<br>50–199 184<br>200+ 103<br>All 85<br>Findings represent absolute change in consumption from baseline (BL) by baseline consumption category | Change in ethanol consumed by baseline consumption level |
| Wagennar, 1995<br>Greatest<br>Moderate (3)<br>Time Series, no control | New Zealand<br>1983–1993 (7 years pre-intervention) (3 years post-intervention)<br>National population | The New Zealand Sale of Liquor Act of 1989. This legal policy change allowed for the introduction of table wine to be sold in grocery stores. In first 27 months after intervention 608 newly licenses off-premises alcohol outlets opened | Percent change in:<br>- Total ethanol<br>- Wine ethanol<br>- Spirits ethanol<br>- Beer ethanol | –1.6 ($CI_{95\%}$ –7.3, 4.6)<br>15.6 ($CI_{95\%}$ 6.7, 25.2)<br>–7.9 ($CI_{95\%}$ –19.8, 5.7)<br>–4.1 ($CI_{95\%}$ –8.9, 1.0) | Box-Jenkins intervention-analysis with ARIMA model for each dependent time-series variable. Intervention model adjusted for the effects of economic conditions as measured by the unemployment rate |
| Olafsdottir, 2002<br>Moderate<br>Good (1)<br>Before-and-After | Iceland<br>Sales Data: 1950–1999 Self-report Consumption: 1988, 1989, 1992<br>Sample of 15–69-year-olds for three different years (N = 1195, N = 1118, N = 1163) | In 1989 Iceland allowed the sale of medium strength beer in grocery stores. Number of monopoly stores increased from 6 to 12 in Reykjavik, liquor license increased 49% in Reykjavik and 16% in rural areas | Alcohol sales<br>Percent of population by sex who changed self- reported level of consumption between 1988–1992 | +24% ($CI_{95\%}$ 9.4, 40.6)<br>Low-moderate consumers (0.1–351cl pure alcohol per 6 mo)<br>Men –4.8%<br>Women +0.8%<br><br>High consumers (>351cl pure alcohol per 6 mo)<br>Men +42.6%<br>Women –7.3% | Two analyses. One modeling changes in sale of alcohol and the other measuring changes in self-reported consumption. ARIMA Time Series analysis. The model adjusts for legalization of beer (dummy coded as 0 from 1950–88 then 1 thereafter) and disposable income. It assesses the impact on alcohol sales after beer was introduced into state monopoly stores Descriptive statistics (i.e. Averages) used for three self-report cross-sectional surveys stratifying by age, gender, education, region, and drinking habits |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| Gruenewald, 2006<br>Greatest<br>Good (1)<br>Panel Cross-Sectional Time Series | California<br>1995–2000<br>581 zip code areas<br>Descriptive Statistics zip code means<br>- Population n = 23,340<br>- Percentage male: 50.09<br>- Median Household Income: $41,280<br>- Median age: 34.71 yr<br>- African American: 6.83%<br>- Hispanic: 27.17%<br>- Asian: 10.31% | The study examines the temporal association between changes in alcohol outlet density and violence and theoretical formulations of the social processes that support violence in these community settings that include alcohol outlets. Overall during the six year period off-premise outlets decreased 0.43%, restaurants increased 5.3%, and bars decreased 4.0%. | Assaults requiring hospitalization per 1000 total population | A 1% increase in the outlet types below is associated with a given percent change in assault rates in a given local setting and in neighboring settings:<br>Local off-premises<br>0.167%<br>Local restaurants<br>–0.074%<br>Local bars<br>0.064%<br>Neighboring off-premises<br>ns<br>Neighboring restaurants<br>ns<br>Neighboring bars<br>0.142% | Two random-effects models (one taking into account spatial relations between adjacent zip codes, the other not) produced<br>- To address the possibility of cross-sectional differences between units biasing coefficient estimates of the longitudinal relationships, a comparison was made between a LSDV regression model and the REM model. Hausman test results were non-significant meaning that the REM model coefficients could be interpreted as an unbiased estimate.<br>-The Non-Spatial REM model controlled for spatial auto-correlated error.<br>- The Spatial REM model controlled for group heteroskedasticity |
| Hoadley, 1984<br>Greatest<br>Good (1)<br>Panel Cross-Sectional Longitudinal Design | 48 U.S. states<br>1955–1980<br>284 cases (48 states X 6 5-year study periods, minus 4 cases of totally dry states)<br>A study period consisted of a 5 year increment between 1955 and 1980<br>U.S. population | This study looked at a variety of state regulation and control measures and their impact on distilled spirits consumption. | Per capita spirits consumption | No. of alcohol outlet licenses per 1000 was significantly associated with spirits consumption b = .027 (p<.01) | A pooled regression model with dummy variables for regional and time differences allowing for a uniform shift (upward or downward) for any particular region or year. Four geographical regions were created (South, Midwest, Northeast, West). Change in time was assessed every five years between 1955–1980 |
| McCornac, 1984<br>Greatest<br>Good (1)<br>Panel Cross-Sectional Longitudinal Design | 50 US states and DC<br>1970–1975<br>Population not described, but study is population based | The study examines the association across time between alcohol outlet density, other societal variables, and spirits consumption | Per capita spirits consumption | A 1% increase in outlet density was associated with a 0.14% (p<.01) increase in spirits consumption | OLS regression |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| Markowitz, 2003<br>Greatest<br>Good (1)<br>Panel Cross-Sectional Longitudinal Design | 50 US states and DC<br>1976–1999<br>Study population consisted of youth 10–24 years of age. Multiple demographic, policy, and price variables | Study analyzes the impact of changes in alcohol policy and social factors over a 24 year period. Hypothesis tested is whether or not alcohol regulatory policies are associated with youth suicides | Suicide rates for population aged 10–24 years | A 1% increase in the outlet density was associated with a given percent change in suicide rates:<br>Male suicide<br>10–14 years<br>0.121 ns<br>15–19 years<br>0.098 (p<.05)<br>20–24 years<br>0.051 ns<br>Female suicide<br>10–14 years<br>0.104 ns<br>15–19 years<br>–0.014 ns<br>20–24 years<br>–0.029 ns | Negative Binomial Regression based on a simple demand model of the demand for health with an imbedded health production function with alcohol as a negative input in the production of health with suicide the outcome of interest. A linear specification of the reduced form demand function specifies that suicides for each gender-age group, in a state, at a point in time is a function of state alcohol regulatory variables, other state characteristics, state effects, year effects, and an error term. T-Statistics adjusted for effect of suicide clustering by year |
| Blake, 1997<br>Greatest<br>Good (1)<br>Panel Cross-Sectional Longitudinal Design | United Kingdom<br>1952–1992<br>Population not described, but study is population based | The study assesses the association between on- and off-premises density and its impact along with other economic and non-economic variables | Alcohol consumption | A 1% increase in the outlet types below is associated with a given percent change in alcohol consumption<br>On-premises<br>cider +3.1%<br>Off-premises<br>cider –4.1%<br>Beer 2.4% | The AIDS (Almost Ideal Demand System) model using OLS regression analysis that relates alcohol expenditure to economic and non-economic variables assuming separate budgeting procedures |
| Xie, 2000<br>Greatest<br>Good (1)<br>Panel Cross-Sectional Longitudinal Design | Canada<br>1968–1986<br>Population described on a variety of social and economic variables | The study assesses the association between changes in alcohol availability, rates of AA membership, economic and demographic measures with liver cirrhosis rate. | - Alcohol consumption<br>- Alcohol liver cirrhosis mortality | The number of retail outlets or agencies per 10,000 adult population was significantly associated with alcohol consumption. b = 0.19 (p<.01) but not significantly associated with liver cirrhosis mortality b = –0.85 (p>.05) when controlled for alcohol consumption | Least squares dummy variables regression model. Provincial dummy variables included to control for differences between provinces and year dummy variables used to control for differences over time |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| McCarthy, 2003<br>Greatest<br>Fair (2)<br>Panel Cross-Sectional Longitudinal Design | 111 small cities in California with populations not exceeding 50,000 during eight year study period<br>1981–1989<br>mean population 9014 | The study examines the association across time between changes in alcohol outlet density and other exposure variables and its association with alcohol related traffic crashes and fatalities | Alcohol-related traffic crashes | 1% increase in the outlet types below are associated with a given percent change in total alcohol related crashes:<br>General off-premise density –12.6%<br>General on-premise density +11.2%<br>Mean outlet density for both on and off-premise is 2.2 outlets per square mile | Negative binomial regression models. Each model includes a set of county-specific and month-specific dummy variables in order to reduce the effects of cross-section heterogeneity and serial correlation |
| McCarthy, 2005<br>Moderate<br>Good (0)<br>Time-Series, no control | California<br>1981–1989<br>Drivers ≥60 years of age | The study examines the association across time between changes in alcohol outlet density and other exposure variables and its association to crashes in drivers aged >60 years | Alcohol-related motor vehicle crashes | 1% increase in outlet density associated with changes in:<br>Fatality +1.70%<br>Injury –0.81 ns<br>Total 0.11 ns | Autoregressive models estimated to analyze monthly crashes involving older drivers. Assuming multiple degrees of autocorrelation the general model specification uses a vector of explanatory variables, a serially correlated error term, a normally distributed error term and explanatory variables to predict traffic accidents |
| Norstrom, 2000<br>Moderate<br>Fair (2)<br>Time-Series, no control | Norway<br>1960–1995<br>Population based study of individuals ≥15 years of age | The study examines the change in on-premises outlet density over time and its relation to violent crime. Outlet density increased slowly from 1960 to 1982, then rapidly from 1983 to 1995 | - Violent crime investigations (preferred measure)<br>- Violent crime convictions | One unit increase in outlet density associated with a 0.51% increase in violent crime convictions (p=.057) and a 0.45% increase in violent crimes investigated (p=.028) | ARIMA time series analysis. Analysis performed on the differenced series (yearly changes analyzed as opposed to raw series data). Model includes outlet density and adjusts for a noise term. Box-Ljung test for residual autocorrelation and Chow test to determine if the parameter estimates are stable during the study period |
| **BANS** | | | | | |
| Baughman, 2001<br>Greatest<br>Fair (2)<br>Panel Cross-Sectional Longitudinal Design | All 254 counties in Texas<br>1975–1996<br>Study is a comparison between dry and wet counties and counties that implemented change to alcohol policy during study period | At the start of 1975, 87 of Texas' 254 counties were dry; 33 of these legalized some type of alcohol sales by 1996. There were 32 other changes in which already non-dry counties liberalized alcohol control policies | Alcohol-related motor vehicle crashes | A 1% decrease in outlet density is associated with a 5.3% (p<.05) increase in alcohol-related MVCs | Linear mean regression model that accounts for observed and unobserved county-specific characteristics |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| Berman, 2000<br>Least<br>Fair (2)<br>Before-and-After | Alaska<br>1980–1993<br>97 small communities with predominantly Alaska Native population. All had 1990 population of less than 5000 and all but two had fewer than 1000 residents | Alaska communities that used the state local option law to restrict alcohol (went "dry" or "damp") at some point between 1980 and 1993" | - Injury<br>- Suicides<br>- Homicides | Percent change:<br>Injury –9.0%<br>Suicide –0.5%<br>Homicide –58.8% | Percent change |
| Bowerman, 1997<br>Least<br>Fair (NR)<br>Before-and-After | Barrow, Alaska<br>1992–1995<br>Jan 1992– Apr 1994 (pre-ban)<br>Nov 1994– Mar 1995 (post-ban)<br>Pregnant women in Barrow Alaska in both the pre and post ban era. Both groups received the same standard prenatal care with fetal alcohol syndrome education | A local option was passed banning the possession of alcohol in Barrow, Alaska making it the largest community in Alaska to prohibit the possession of alcohol. Prior to this legislative change, alcohol was banned in all regional villages surrounding Barrow | Self-report alcohol and substance use | % alcohol abuse during pregnancy<br>Pre-ban / Post-ban<br>Trimester 1 43% vs 11%<br>Trimester 2 17% vs 7%<br>Trimester 3 14% vs 5%<br>Only the trimester 1 change was significant: –75%, $CI_{95\%}$ –93, –6<br>Prenatal alcohol abuse in surrounding regional area<br>Pre-ban / Post-ban<br>42% vs 9% | Percent change and relative risk |
| Chui, 1997<br>Moderate<br>Fair (NR)<br>Before-and-After with Retrospective Time Series | Barrow, Alaska<br>1993–1996<br>61% Inupiat, 24% Anglo, 15% other ethnic groups mostly Asian or Asian- American | Ban on alcohol sale, importation, and possession was:<br>Enacted on November 1, 1994<br>Repealed on November 1, 1995<br>Re-imposed importation ban on March 1, 1996<br>Re-imposed possession ban Apr 1, 1996 | Average monthly number of alcohol-related outpatient visits | Nov 1993– Oct 1994<br>90<br>Nov 1994 – Oct 1995<br>16 (ban1)<br>Nov 1995 – Feb 1996<br>62<br>Mar 1996 – Jul 1996<br>17 (ban 2)<br>After implementation of ban 1, visits decreased 82% and after implementation of ban 2, visits decreased 72% | Autoregressive Integrated Moving Average (ARIMA) time-series analysis. Internal parameters at lags 1 and 12 months. The ban was 0 during baseline and 1 during first ban, reset to zero ban being repealed, and reset to one when re-enacted |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| May, 1975<br>Moderate<br>Fair (3)<br>Before-After-Before, no control | Great Plains, US<br>1969–1971<br>Border county: 7285 residents, 95% White. Only 4.3% of residents in border county are Native American, consequently it is assumed that the Native Americans in the border county were there primarily on transient business | Legalization of the sale of beer, wine, and liquor in June 1970 that lasted until the end of July 1970 | Native American arrests in border counties and by tribal police | Native American arrests in the border county were 47% higher during ban period and arrests by tribal police were 20% higher in ban period relative to period without ban | Z-test for proportion and chi-square |
| Smart, 1976<br>Greatest<br>Fair (2)<br>Natural Experiment with control community | Owen Sound, Ontario<br>1970–1974<br>Owen Sound population 18,469 (experimental population) Collingwood population 9775 (control population) | First lounge (on-premises establishment) opened in Owen Sound Jan 15, 1973, and three more lounges opened during that same year. This was the last "dry" city in Southern Ontario | Alcohol impaired motor vehicle crashes (BAC $\geq$.08) | 114% ($p<.05$) increase in alcohol-involved crashes after the removal of the ban of on-premises establishments | Methods not described<br>Chi Square test in results section |
| **PRIVATIZATION** | | | | | |
| Holder, 1990 & 1991<br>Greatest<br>Fair (2)<br>ARIMA Time Series with Control | Iowa & West Virginia<br>1968–1989 (Iowa)<br>1968–1987 (WV)<br>NR | Iowa privatized retail wine sales in 1985 and spirits sales in 1987<br>West Virginia privatized retail wine sales in 1981 | Alcohol consumption | Effect of wine privatization on consumption (Iowa):<br>Spirits –5.4% (±4.7)<br>Wine +93.1% (±24.8)<br>Beer –3.1% (±5.0)<br>Effect of spirits privatization on consumption (Iowa)<br>Spirits +9.5% (±6.0)<br>Wine –12.1% (±8.5)<br>Beer +1.3% (±16.3)<br>Effect of wine privatization (West Virginia)<br>Spirits –13.8 (±5.9)<br>Wine +48.2 (±12.3)<br>Beer +12.0 (±3.7) | Multiple Time Series Analysis<br>- To control for national patterns of change in consumption of beer, wine, and spirits over time, monthly nationwide sales figures (less Iowa sales) were included as a covariate in the time-series models for each beverage when estimating intervention effects<br>- Used Auto Regressive Integrated Moving Average (ARIMA) and intervention models to control for autocorrelation in alcohol sales and consumption data |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| MacDonald, 1986<br>Moderate<br>Fair (3)<br>Time-Series without control | Idaho, Maine, Washington<br>NR<br>NR | Retail wine sales privatization in each of the four states occurring between 1961–1971 | Wine consumption | Idaho (privatized in 1971)<br>190% increase (p<.05)<br>Maine (privatized in 1971)<br>305% increase (p<.05)<br>Washington (privatized in 1969)<br>26% increase | Regression Analysis Note that the type of regression analysis used would not account for seasonality or serial auto- correlation which can result in over-inflated confidence limit estimates |
| Mulford, 1992<br>Greatest<br>Fair (NR)<br>ARIMA time series with control | Iowa<br>1980–1990<br>Population not described, but study is population based | Retail wine privatization in 1985 and retail sprits privatization in 1987 | Wine and spirits consumption | Wine +0.5% (±15.9)<br>Spirits +0.7% (±5.3) | ARIMA time series, excluding alcohol content from wine coolers |
| Ramstedt, 2002<br>Moderate<br>Fair (2)<br>Time Series without control | Sweden<br>1973–1981<br>Population not described, but study is population based | Repeal of sales of medium strength beer in grocery stores in Sweden. Prior to intervention the product was available in 11,550 grocery stores to anyone aged ≥18 years. After intervention sales were restricted to slightly more than 300 retail monopoly stores and to individuals aged ≥20 years | Suicide, motor vehicle crashes, falls, and alcohol-related hospitalizations | Significant increases were reported for Alcohol-related hospitalization for those aged 10–19 years and motor vehicle crashes for all ages except 20–39 years | ARIMA model that includes variables adjusting for repeal of medium-strength beer, decriminalization of public drunkenness, and a noise term estimating other etiological factors. Box-Ljung Q-Stat used to test that no significant temporal structure remained after model estimation |
| Smart, 1986<br>Greatest<br>Fair (2)<br>Time Series with control | Quebec, Canada<br>1967–1983<br>NR | Introduction of wine to grocery stores increased the number of retail outlets from 353 to ~9000. At initial time of deregulation 30 locally produced wines were sold; this number increased to 55 | Wine sales | Relative percent change (compared to Ontario-control province) in wine consumption = 2.7%. The increase was not significant | Ordinary Least Squares (OLS) Regression model. Saturated model included three main effects and four related interaction terms<br>1. Phase of intervention<br>2. Time (a linear term measured in 0.5 increments and centered at the point of intervention<br>3. Province<br>4. Four interaction terms |
| Trolldal, 2005<br>Greatest<br>Fair (2)<br>Time Series with control population | Alberta, Canada<br>1950–2000<br>Population not described but study is population based. Rest of Canada used as control population | Privatization of wine and spirit retailing occurred in staged process between 1985 and 1994 | Alcohol consumption | Spirits +12.7% (±10.5)<br>Wine –1.0% (±17.6)<br>Beer –1.0% (±7.4) | Time Series analysis. Variables used in analysis were differenced to remove long-term trends and avoid spurious relationships. Privatization variable given value between 0 and the value of this variable was raised incrementally from 0 to 1 as larger parts of the market became privatized. Model also adjusts for price and disposable income |

| **Author, year**<br>**Design suitability**<br>**Quality of execution (limitations)**<br>**Study type** | **Location**<br>**Study period**<br>**Population** | **Intervention** | **Outcome** | **Findings** | **Analysis** |
|---|---|---|---|---|---|
| Wagenaar, 1995<br>Greatest<br>Fair (2)<br>Time Series with Control | Alabama, Idaho, Maine, Montana, New Hampshire<br>1968–1991<br>Population not described but study is population based | Retail wine privatization in Alabama in 1980, Idaho eliminated public monopoly on wine in 1971, Maine privatized sale of wine in 1971, Montana privatized wine sales in 1979, New Hampshire privatized retail wine sales in 1978. | Wine consumption | Alabama 42.0 ($CI_{95\%}$ 13.4, 77.7)<br>Idaho 150.1 ($CI_{95\%}$ 129.2, 172.9)<br>Maine 136.7 ($CI_{95\%}$ 112.6, 163.5)<br>Montana 75.3 ($CI_{95\%}$ 56.9, 96.0)<br>New Hampshire 13.0 ($CI_{95\%}$ 1.2, 26.2) | Box-Jenkins with identification or specification of a parsimonious ARIMA model |

AIDS Almost Ideal Demand System; ARIMA Autoregressive Integrated Moving Average; BAC blood alcohol concentration; cl centiliter(s); LBD liquor by the drink; LSDV Least Squares Dummy Variable; mo month(s); MVC motor vehicle crash; OSL Ordinary Least Squares; REM Random effects model; yr year(s)

# Endnotes

[i] The titles given to Wisconsin's licenses to sell and serve alcohol are very similar, but the type of the licensed activity varies significantly. In general, Class A licenses are awarded to alcohol retailers who sell alcohol for consumption at another location. In some states these are called off-premises licenses. In Wisconsin a Class "A" license permits beer (and malt based cooler) sales for consumption elsewhere, and a "Class A" license permits the sale of, beer, wine, and distilled spirits (hard liquor) for consumption elsewhere. The varying placement of the quotation marks shows the distinction in the beverages for sale.

Similarly, "Class B" licenses and Class "B" licenses are issued for establishments selling and serving alcohol at that location, such as taverns, bars, and restaurants. In some states these are called on-premises licenses. Following the pattern set for Class A licenses, a Class "B" license authorizes the sale of beer for immediate consumption, and a "Class B" license authorizes the sale of beer, wine, and distilled spirits for consumption within that site. "Class C" wine licenses permit the sale of just wine by the glass or bottle for consumption on-site. For simplicity, licenses are listed by Department of Revenue titles, and quotation marks are omitted when referring to all types of alcohol beverages.

[ii] Thomas Babor, et al., *Alcohol: No Ordinary Commodity* 131-134, (2d ed., Oxford University Press 2010) (2003).

[iii] Centers for Disease Control and Prevention, *Preventing Excessive Alcohol Consumption: Regulation of Alcohol Outlet Density.* Retrieved from: http://www.thecommunityguide.org/alcohol/outletdensity.html

[iv] Rick Romell, *Wasted in Wisconsin: Drinking Deeply Ingrained in Wisconsin's Culture*, Milwaukee Journal Sentinel, October 19, 2008.

[v] Centers for Disease Control and Prevention (CDC), *Vital Signs,* January, 2012. Retrieved from http://www.cdc.gov/vitalsigns/BingeDrinking/

[vi] Substance Abuse and Mental Health Services Administration, Office of Applied Studies. (April 10, 2008). *The NSDUH Report - State Estimates of Persons Aged 18 or Older Driving Under the Influence of Alcohol or Illicit Drugs*. Rockville, MD. Retrieved from http://oas.samhsa.gov/2k8/stateDUI/stateDUI.htm

[vii] Thomas Babor, et al., *Alcohol: No Ordinary Commodity* (1st ed., Oxford University Press 2003).

[viii] A Livingston, Michael. A longitudinal analysis of alcohol outlet density and domestic violence. Addiction, 106, 2011, p.919

[ix] Elissa R. Weitzman, Alison Folkman, M. P. H. Kerry Lemieux Folkman, Henry Wechsler, *The Relationship of Alcohol Outlet Density to Heavy and Frequent Drinking and Drinking-related Problems Among College Students at Eight Universities*, 9 Health & Place 1, 1-6 (2003).

[x] Thomas Babor, et al., *Alcohol: No Ordinary Commodity* 2d ed., Oxford University Press 2010).

[xi] Wis. Stat. § 125.12(3m).

[xii] U.S. Department of Transportation, National Highway Traffic Safety Administration, *the Role of Alcohol Beverage Control Agencies in the Enforcement and Adjudication of Alcohol Laws.* DOT HS 809 877 Revised July 2005. Retrieved from http://www.nhtsa.gov/people/injury/enforce/ABCRoleWeb/pages/index.htm