

Preventing Excessive Alcohol Consumption: Privatization of Retail Alcohol Sales (Effects on Privatized and Non-privatized Alcoholic Beverages)

Summary Evidence Tables

Studies from the United States

Author/ Design	Population/ Study Time Period	Intervention/ Comparison	Analysis/Outcome	Reported Findings	Review Effect Estimate
Holder & Wagenaar (1990) Wagenaar & Holder (1991) Greatest Suitability Design: Interrupted time-series with concurrent comparison Fair (2 Limitations)	Iowa 1968-1989	Intervention: Termination of wine retail monopoly in Iowa. Wine wholesaling by the state ended on July 1, 1985. By March 1987, all state wine shops were closed. Comparison: The other 47 contiguous states in the U.S. were used as a comparison group.	Interrupted time-series Liters of absolute alcohol in wine entering retail markets each month Monthly beer and distilled spirits sales Wine sold in all other contiguous US states	Significant overall increase in ethanol consumption associated with the end of the Iowa off-premises wine sales monopoly in July 1, 1985. Using longer term data, wine privatization resulted in a longer term increase of wine consumption.	Relative % Change Wine Sales 93.0 (CI _{95%} 80.2, 106.5) Distilled Spirit Sales 9.5 (CI _{90%} 4.4, 14.9) Beer Sales 1.3 (CI _{90%} -2.6, 5.4)
See previous	See previous	Intervention: Termination of distilled spirits monopoly in Iowa in Mar. 1, 1987. Comparison: The other 47 contiguous states in the U.S. were used as a comparison group.	Interrupted time-series Liters of absolute alcohol in distilled spirits entering retail markets each month Monthly beer and wine sales Distilled spirits sold in all other contiguous US states	Significant overall increase in ethanol consumption associated with the end of the Iowa off-premises distilled spirits sales monopoly in March 1987. Using longer term data, spirits privatization resulted in a substitution effect on wine (i.e. Reduced wine consumption).	Relative % Change Spirits Sales 9.5 (CI _{95%} 6.4, 12.7) Wine -12.1% (95%CI -20.6, -2.7) Beer 1.3% (95%CI -3.3, 6.2)

See previous	West Virginia 1968-1987	<p>Intervention: On July 1, 1981 private retail outlets such as grocery stores, drug stores or general stores were licensed to sell wine. The state retained a monopoly on all sales of beverages with an alcohol concentration of $\geq 14\%$. Additionally, state stores continued to sell wine $< 14\%$ in competition with private retailers.</p> <p>Comparison: The other 47 contiguous states in the U.S.</p>	<p>Interrupted time-series</p> <p>Liters of absolute ethanol consumed per month</p> <p>Monthly beer and distilled spirits sales</p>	<p>No significant increase in wine consumption in states bordering West Virginia. Results for cross-beverage effects of wine privatization are inconsistent.</p>	<p>Relative % Change</p> <p>Wine Sales 48.2 (CI_{95%} 40.6, 56.0)</p> <p>Distilled Spirits Sales -13.8 (CI_{90%} -19.7, -7.5)</p> <p>Beer Sales 12.0 (CI_{90%} 8.3, 15.8)</p>
<p>Wagenaar & Holder (1995)</p> <p>Interrupted time-series with concurrent comparison</p> <p>Fair (4 Limitations)</p>	Alabama 1968-1991	<p>Intervention: Wine sales privatization occurred in two phases.</p> <p><i>Phase 1:</i> October, 1973 Jefferson, Tuscaloosa, and Mobile counties (31% of state population) allowed off-premises private outlets to sell table wine. On-premises sale of wine permitted in Montgomery county.</p> <p><i>Phase 2:</i> October, 1980- Privatized table wine sales permitted in all counties</p> <p>Comparison: Control 1: 47 contiguous states that did not implement any policy changes regarding wine sales at the time the focal state did.</p> <p>Control 2: Bordering states that did not implement privatization.</p> <p>Control 3: Changes in consumption of other alcoholic beverages</p>	<p>Interrupted time-series</p> <p>Absolute ethanol sold in the form of wine, beer or spirits measured as shipments from wholesalers to retail sellers. Monthly shipments of alcohol beverage volume were converted to absolute alcohol using various ethanol proportions adjusted over time.</p>	<p>Elimination of state monopolies on retail wine sales is followed by significantly increased wine sales. Results reflect increased consumption of wine, since there is no evidence of shifts of sales from border states or shifts from beer or spirits to wine within each state</p> <p>Negative point estimates for beer and spirits in several states indicate that wine privatization may result in increased wine sales at the expense of other alcoholic beverages but the increase in wine consumption still greatly outweighs the decline in the consumption of other beverages.</p>	<p>Relative % Change</p> <p>Wine Sales 42.0 (CI_{95%} 13.4, 77.7)</p> <p>Beer -7.4 (CI_{95%} -14.7, 0.6)</p> <p>Spirits -9.7 (CI_{95%} -9.7, 0.1)</p>

See previous	Idaho 1968-1991	Intervention: Eliminated public monopoly of table wines in July, 1971 Comparison: See previous	See previous	See previous	Relative % Change Wine Sales 150.1 (CI _{95%} 129.2, 172.9) Beer 9.5 (CI _{95%} -7.0, 28.8) Spirits 6.8 (CI _{95%} -0.3, 14.4)
See previous	Maine 1968-1991	Intervention: Privatized retail sales of table wines on Jan 1, 1971. State retained control of fortified wine sales ($\geq 14\%$ alcohol by volume) Comparison: See previous	See previous	See previous	Relative % Change Wine Sales 136.7 (CI _{95%} 112.6, 163.5) Beer 3.2 (CI _{95%} -5.5, 12.7) Spirits -1.9 (CI _{95%} -7.3, 4.0)
See previous	Montana 1968-1991	Intervention: Privatized retail sales of table wine ($\leq 14\%$ alcohol by vol) in Oct, 1979. State increased this level to 16% in 1985 Comparison: See previous	See previous	See previous	Relative % Change Wine Sales 75.3 (CI _{95%} 56.9, 96.0) Beer -4.9 (CI _{95%} -13.0, 4.0) Spirits -4.4 (CI _{95%} -14.0, 6.4)
See previous	New Hampshire 1968-1991	Intervention: Privatized retail sales of table wine in August, 1978. Fortified wines continued to be sold in state retail monopoly stores Comparison: See previous	See previous	See previous	Relative % Change Wine Sales 13.0 (CI _{95%} 1.2, 26.2) Beer -2.2 (CI _{95%} -10.5, 6.8) Spirits -1.2 (CI _{95%} -7.6, 5.7)

<p>Macdonald (1986)</p> <p>Moderate design suitability: Time-series multiple pre-post measurements without control population</p> <p>Fair (3 Limitations)</p>	<p>Idaho</p>	<p>Intervention: On July, 1, 1987, grocery stores were permitted to sell wine. Number of outlets increases from 70 to 1,000.</p> <p>Comparison: No control populations for the states examined. Changes in consumption of other beverages observed.</p>	<p>Regression Analysis</p> <p>Per Capita (≥ 21 years of age) consumption of wine, spirits and beer in liters of absolute alcohol</p>	<p>Wine consumption increased significantly after intervention. Based on the regression model, expected wine consumption in 1971 was 0.39 liters/person; actual consumption was 1.13. Wine consumption remained significantly elevated over the course of analysis. No significant change observed for beer or spirits consumption. (Relative increase above expectation = 190%)</p>	<p>Relative % Increase</p> <p>190% (<0.001)</p>
<p>See previous</p>	<p>Maine</p>	<p>Intervention: On January 1, 1971, both domestic and imported wines were permitted wider distribution in grocery stores, but fortified wines were still sold in the state-controlled stores. Number of outlets increases from 65 to 1,400.</p> <p>Comparison: See previous</p>	<p>See previous</p>	<p>Between 1961 and 1971 wine sales increased linearly. In 1971 wine consumption increased 305% ($p < .001$). Observed vs. predicted rates of consumption not provided (as they are for Iowa.) The year after, wine sales decreased and returned to their pre-1971 trend, but at a substantially higher level. Beer and Spirits were not significantly higher than expected 6.06 (expected) vs 6.00 (actual) for beer and 4.31 (expected) vs 4.46 (actual) for spirits.</p>	<p>Relative % Change</p> <p>305% (<0.001)</p> <p>Beer -1.0%</p> <p>Spirits 3.5%</p>

<p>Mulford & Fitzgerald, (1988)</p> <p>Fitzgerald & Mulford (1992)</p> <p>Fitzgerald & Mulford (1993a)</p> <p>Mulford, Ledolter, & Fitzgerald (1992)</p> <p>Moderate design suitability: Before/After Survey used in conjunction with beverage and alcohol sales data. Several follow-up surveys.</p> <p>Fair (2 Limitations)</p>	<p>Iowa</p> <p>Baseline Survey-: Feb-April 1985</p> <p>Second Survey: April 1986</p> <p>Third Survey: April 1989</p>	<p>Intervention: Privatization of wholesale and retail distribution of bottled wine on July 1, 1985 in Iowa.</p> <p>Comparison: Other states. (Earlier paper had no control population)</p>	<p>Interrupted time series. (Earlier paper used Ordinary Least Squares Regression models)</p> <p>Official Alcohol Sales, Self-Reported, Alcohol Purchases, Heavy Drinking, Problem Drinking</p>	<p>Increased wine availability produces no significant or lasting consumption increases. Heavy drinker and problem drinker prevalence rates did not increase</p>	<p>Relative % Change</p> <p>Wine Sales 0.5</p> <p>Beer -.10</p> <p>Spirits 0.09</p>
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See previous Fitzgerald & Mulford (1993b)	See previous	Intervention: Privatized retail but not the wholesale distribution of bottled spirits on March 1, 1987. Comparison: Other states.	Spirits Sales— Interrupted time series Traffic fatalities and cirrhosis mortality— Pre- post privatization comparison; "pre- "period was 1985, only half of which was truly prior to privatization, the other half after privatization. Official Alcohol Sales Single Vehicle Nighttime Crash Fatalities (SVNF) Cirrhosis mortality	Increased spirits availability produces no significant or lasting consumption increases.	Relative % Change Spirits Sales 0.7 SVNF 1985-86: 1.6% 1986-89: -3.1% Cirrhosis 1985-86: -12.8% 1986-89: 8.4%
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Studies from Canada

Author/ Design	Population/ Study Time Period	Intervention/ Comparison	Analysis/Outcome	Reported Findings	Review Effect Estimate
<p>Trollidal, (2005a)</p> <p>Greatest Suitability Design: Quasi-experimental control Interrupted time-series</p> <p>Fair (4 Limitations)</p>	<p>Alberta</p> <p>1950-2000 (alcohol sales)</p> <p>1950-1998 (fatal traffic crashes)</p>	<p>Intervention: Privatization occurred gradually from the mid 1970s to early 1990s.</p> <p>1974: some privately owned stores authorized to sell beer on a small scale</p> <p>1985: Privately owned wine stores permitted</p> <p>1989: Privately owned so-called cold beer stores authorized</p> <p>1990: Hundreds of hotels in rural areas allowed to sell spirits and wine for off-premises consumption</p> <p>1992: Hotels in non-rural areas allowed to sell spirits and wine for off-premises consumption. Rural stores were allowed extended hours of operation</p> <p>1993: Announcement that retail sales market would be completely privatized.</p> <p>1994: Retail sales privatization completed</p> <p>Comparison: The rest of Canada was used as control.</p>	<p>Interrupted time-series analyses. Privatization effects were estimated based on assumptions about the incremental amount of privatization associated with each "privatization event" between 1974 and 1994</p> <p>Total alcohol sales and on the sale of each beverage</p> <p>Effect of privatization on total fatal traffic crashes (alcohol-related and non-alcohol-related combined)</p>	<p>Based on the modeled effects of gradual privatization in Alberta, spirits sales were estimated to increase significantly. Model estimates suggested no significant effects of the gradual privatization on the number of fatal traffic crashes.</p>	<p>Relative % Change (95% CI)</p> <p>Spirits Sales 12 % (CI 11.9,12.1)</p> <p>Wine Sales -1% (CI -1.2, -.8)</p> <p>Beer Sales 1% (CI .9,1.1)</p> <p>Total Sales 5% (CI 1.0, 9.4)</p> <p>Total traffic crashes -12% (95%CI -27%, 3%)</p>

<p>Trollidal, B. (2005b)</p> <p>Greatest design suitability: Interrupted ARIMA time-series analyses, with control population.</p> <p>Fair (2 Limitations)</p>	<p>Quebec</p> <p>1950-2000</p>	<p>Intervention: Privatization of wine in Quebec occurred in several stages. In June 1978 grocery stores in Quebec were allowed to sell domestically produced wine along with wine that was imported and bottled by the Liquor Board in Quebec. In 1983 imported wine that was bottled by privately owned manufacturers in Quebec was included. Larger grocery store chains were allowed to sell wine in 1984. The analysis treated the change in 1978 as one event, the changes of 1983 and 1984 as a second event.</p> <p>Comparison: The rest of Canada.</p>	<p>Interrupted time-series analyses</p> <p>Alcohol sales</p>	<p>Results showed a significant effect of the policy change in 1978. The immediate permanent effect on the sale of wine was a 10.5% increase in wine sales. However, the segment of the market affected by the policy change in 1978 was very small, amounting to no more than 4% of the total alcohol sales market, which limited the possible effects on total sales. The policy changes in 1983 to 1984 had no immediate effect on wine sales.</p>	<p>Relative % Change (95% CI)</p> <p>Wine Sales</p> <p>1978 Policy Change 10.5 (95%CI 7.3, 13.9)</p> <p>Beer 0.0% (95%CI -3.8, 4.0) Spirits -1.0% (95%CI -6.6, 5.0)</p> <p>1983-1984 Policy change -1.0 (95%CI -6.8, 5.1)</p> <p>Beer 0.0% (95%CI -5.7, 6.1) Spirits 8.3% (95%CI -1.8, 19.5)</p>
<p>Smart (1986)</p> <p>Greatest design suitability: Quasi-Experimental with control group design (not explicitly stated in article)</p> <p>Fair (4 Limitations)</p>	<p>Quebec</p> <p>Fiscal year 1967 to 1983</p> <p>Pre-intervention phase = 1967-78</p> <p>Post-Intervention phase = 1979-83</p>	<p>Intervention: June 1978 privatization of domestic wine sales in Quebec grocery stores.</p> <p>Control: The province of Ontario was used as the control population.</p>	<p>Ordinary Least Squares (OLS)</p> <p>Wine sales (expressed as liters of absolute alcohol consumption per capita for those 15 years and older)</p> <p>Total per capita sales (expressed as liters of absolute alcohol consumption per capita for those 15 years and older)</p>	<p>Introduction of wine into Quebec grocery stores created no short- or medium-term increase in wine sales or total per capita alcohol consumption. Alcohol consumption decreased more in Quebec where sales were de-regulated.</p>	<p>Relative % Change</p> <p>Wine Sales -8%</p>

Studies from Other Countries

Author/ Design	Population/ Study Time Period	Intervention/ Comparison	Analysis/Outcome	Reported Findings	Review Effect Estimate
Mäkelä (2002) Moderate Suitability Design: Before and After Cohort Study without control population Fair (4 Limitations)	Finland 1968-1969	Intervention: In 1969 medium strength beer could be sold in 17,431 licensed grocery stores and 2,716 licensed cafes. Concurrently, state- controlled stores were introduced in rural areas. Comparison: No control population.	Ratio Average centiliters of pure alcohol consumed per year.	All consumption groups increased their per capita alcohol consumption. The heavier drinkers were more affected by the intervention than the lighter drinkers. Alcohol <i>sales</i> in Finland rose by 46% from 3.9 to 5.7 liters of pure alcohol per inhabitant 15 years or older. Alcohol <i>consumption</i> increased at all levels of baseline drinking.	% Change Medium Strength Beer sales 242% <u>Baseline consumption</u> <u>Change</u> (drinks/year) (drinks/year) 0 14.7 1-27 37.8 28-112 103.8 ≥113 58.1

<p>Ramstedt (2002)</p> <p>Moderate Design Suitability: Natural Experiment Time-series design without control population</p> <p>Fair (2 Limitations)</p>	<p>Sweden</p> <p>Study period: 1973-1981</p> <p>Pre- <i>Intervention period:</i> Jan 1, 1973 to Jun 30, 1977 (52 months)</p> <p>Post- <i>Intervention period:</i> Aug 1977 to Dec 1981 (51 months)</p>	<p>Intervention: 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 18 years and over. After intervention sales were restricted to slightly more than 300 retail monopoly stores to individuals 20 years and older.</p> <p>Comparison: Sales during the pre-intervention time period.</p>	<p>Interrupted time-series analyses.</p> <p>Outcome data were stratified by age, and insufficient information was provided to allow aggregation across age groups.</p> <p>1. Alcoholism, alcohol intoxication or alcohol psychosis (AAA) hospitalizations</p> <p>2. Patient records with the following E-codes: Motor vehicle accidents, Accidental Falls, Attempted Suicides</p>	<p>Alcohol related problems in young people in Sweden declined after repeal of medium strength beer sales in grocery stores. Some benefit was observed in older populations but it did not reach statistical significance</p>	<p>Relative % change (p<0.05)</p> <p><u>AAA diagnoses</u></p> <p>10-19yrs -20.1 (p<0.05)</p> <p>20-39yrs .2</p> <p>40-59yrs -6.0 (p<0.05)</p> <p>60+ yrs -5.3 (p<0.05)</p> <p><u>Alcohol intoxication</u></p> <p>10-19yrs -14.7 (p<0.05)</p> <p>20-39yrs -9.9 (p<0.05)</p> <p>40-59yrs -5.0</p> <p>60+ yrs -3.5</p> <p><u>Assaults</u></p> <p>10-19yrs 14.8</p> <p>20-39yrs -1.4</p> <p>40-59yrs 6.9</p> <p>60+ yrs 8.3</p> <p><u>Suicides</u></p> <p>10-19yrs -11.8</p> <p>20-39yrs -1.7</p> <p>40-59yrs -10.7 (p<0.05)</p> <p>60+ yrs -8.6 (p<0.05)</p> <p><u>Falls</u></p> <p>10-19yrs -4.9</p> <p>20-39yrs -3.6</p> <p>40-59yrs -5.4</p> <p>60+ yrs -4.0</p> <p><u>Motor vehicle accidents</u></p> <p>10-19yrs -14.0 (p<0.05)</p> <p>20-39yrs -4.4</p> <p>40-59yrs -14.2</p> <p>60+ yrs -14.7 (p<0.05)</p>
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