Alcohol Policy Research and Alcoholic Beverage Control Systems

AN ANNOTATED BIBLIOGRAPHY 3 & REVIEW

NATIONAL ALCOHOL BEVERAGE CONTROL ASSOCIATION (NABCA)

NABCA RESEARCH

Alcohol Policy Research and Alcoholic Beverage Control Systems:

AN ANNOTATED BIBLIOGRAPHY

3RD EDITION

National Alcohol Beverage Control Association (NABCA)

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Alcohol Policy Research and Alcoholic Beverage Control Systems:

Annotated Bibliography and Review

3rd Version | Updated 2013

Prepared for the

National Alcohol Beverage Control Association (NABCA)

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INTRODUCTION

NABCA

Founded in 1938, the National Alcohol Beverage Control Association (NABCA) is the national association representing the political jurisdictions that directly control the distribution and sale of beverages alcohol within their borders. NABCA's mission is to support member jurisdictions in their efforts to protect public health and safety and assure responsible and efficient systems for beverage alcohol distribution and sales.

MISSION STATEMENT

The mission of the National Alcohol Beverage Control Association (NABCA) is to support member jurisdictions in their efforts to protect public health and safety and ensure responsible and efficient systems for beverage alcohol distribution and sales.

In order to carry out the mission, NABCA has the following objectives:

Resources

Provide resources and research on regulatory, operational, policy and public health issues to member jurisdictions and other organizations.

Systems and Data

Create and distribute member jurisdiction sales, inventory and pricing data for governmental entities, industry, public health, and other organizations.

Relationships

Cultivate relationships between member jurisdictions, governmental entities, public health, industry, media and other organizations to encourage and facilitate communication and collaboration.

ARG

The Alcohol Research Group (ARG) of the Public Health Institute was established in 1959 to conduct and disseminate high-quality research in the epidemiology of alcohol consumption and problems including alcohol use disorders, alcohol-related health services research, and analyses of alcohol policy and its impacts. ARG is home to the National Alcohol Research Center, one of 18 such centers funded by the U.S. National Institute on Alcohol Abuse and Alcoholism (NIAAA), and is the only one of its kind specializing in the epidemiology of alcohol use and problems. ARG's mission focuses on better understanding the public health implications of alcohol use patterns and associated problems of all kinds. Additionally, it disseminates these findings, as well as training future generations of public health researchers to become independent scientists in the field of alcohol studies. We are interested in regional, national and international dimensions of alcohol consumption and problems. A major component of ARG's activities is centered on epidemiology of drinking patterns and alcohol-related problems including alcohol use disorders and social and health harms such as injuries and drinking driving, various co-morbidities of alcohol dependence, and alcohol-related mortality. We also study community responses to these problems including informal criticism and confrontations of problem drinkers, mutual aid groups such as Alcoholics Anonymous, medical and specialty services that treat alcohol-related conditions, as well as community-based organizations and legislative remedies.

The Alcohol Policy Research Annotated Bibliography and Review Project

The first issue of the report, **Alcohol Policy Research and Alcoholic Beverage Control Systems: Annotated Bibliography and Review**, was compiled by the Alcohol Research Group (ARG) during the spring of

2008. The Alcohol Research Group performed a bibliographic search and document annotation, resulting in a selective annotated bibliography and summary report presented to NABCA for use in:

(a) identifying effective policies to reduce the harm associated with alcohol

(b) assisting states to evaluate and improve existing alcohol regulatory systems and

(c) determining where more research is needed.

This bibliography is an update to the one created in 2008, with searches conducted using the same methodology. An earlier update is focused on literature from 2008 through July of 2009 and the current update includes literature published up to May of 2013, but is by no means to be considered an exhaustive listing.

Categories and key topic areas were identified by Dr. Kerr and Dr. Greenfield based on their knowledge of the alcohol policy research literature and the perceived interests of NABCA members. A broad view was taken in the topic selection to include issues basic to the regulation of alcohol, to the differential regulation of spirits, wine and beer as is the practice in all U.S. states, and to the practice of differential regulation across states. Reviews were initiated by conducting key word searches in the relevant databases and follow-up searches of references, "grey literature" in the ARG library and in collections in countries with similar regulatory systems.

The selected references include mainly research published in peer reviewed journals, although books, reports, working papers and other types of documents are also included. The peer review process is an essential element of academic research, in which a journal's editors solicit ratings and commentaries from experts in the topic area who are independent of the studies' authors. These commentaries often result in revisions to the original study such that the final article reflects the author's response to these and agreement by the editors that the article represents an important and valid contribution to the literature. While this is not a guarantee of accuracy and completeness, it is the generally agreed on scientific standard.

The main criteria in selecting references are as follows: (1) the reference is relevant to NABCA's uses stated above (2) the reference falls into the selected categories (3) the reference was published during or after 1995 (with a few exceptions). The selection of references for annotation from among those deemed relevant under each topic was based on recency, perceived importance and diversity of views. This selection should not be viewed as an endorsement of any article by ARG or NABCA. The reviews attempt to summarize the recent literature in each topic area with particular attention to the articles chosen for annotation. We understand that differences of opinion exist in most of these areas and that relevant articles may have been missed. An ongoing revision process is anticipated in which any additional materials brought to our attention, along with newly published articles, books or other documents, will be considered for incorporation into the next version.

SEARCH METHODOLOGY & ORGANIZATION

To meet the goals of the bibliographic search and annotated bibliography, a comprehensive search and review of the literature was conducted for the original version. This includes:

1. A systematic keyword search on ETOH Alcohol Science Database of NIAAA, ECONLIT, Expanded Academic ASAP, PsychArticle, and PubMed.

2. A systematic search of the University of California Berkeley databases for relevant journals and journal indexes.

3. An examination of articles, reports, and books housed at the Alcohol Research Group Library and provided by the Principal Investigator William C. Kerr.

4. Searching the internet (using Google and Google Scholar) for sites and articles relevant to alcohol and policy issues.

5. References cited by articles reviewed were checked to identify additional sources.

6. Review and inquiries to "grey" literature sources were made.

7. A tree-like internet search of known organizations, academic institutions for content on alcohol and price, alcohol and health issues, and all other relevant alcohol topics; each site lead to suggestions and links for further sites which were then explored.

The following keywords were used in these searches: alcohol, alcoholic beverages, liquor, spirits, malt beverages, sake, wine, access control, advertising, sales and earnings, consumption, control, distribution, e-commerce, economic aspects, industry sales and revenue, labeling, licensing, market share, marketing, minimum drinking age, monopolies, policies, price, price posting, public opinion, taxes, taxation, youth market. These keywords were used separately and in various combinations.

Restrictions used in the selection process include:

1. This report focused on peer-reviewed and scholarly writing; however, at the discretion of the principle investigator, some non-peer-reviewed publications (e.g. Letters to the editor, NBER and other working papers) were included.

2. References were published during or after 1995 (with exceptions where appropriate).

3. Articles chosen were relevant to alcohol policy in the United States or can be used to provide useful information regarding the stated policies.

4. Only English language articles were included.

Organization of report:

Annotations and references are arranged according to the subject area they cover. Citations are often relevant to more than one topic area, and in these

instances, they have been included in all relevant sections. The subject areas include:

Section 1: What makes alcohol different from other commercial products?

Section 2: In order to reduce alcohol abuse and harm, what policies are needed and which policies are most effective?

Section 3: Are all types of beverage alcohol the same?

Section 4: Why should states be allowed to regulate alcohol differently from the federal government and from each other?

The bibliography is arranged firstly by reverse date order, and secondly by author surname. Documents are cited in APA 5th style.

Review, Annotations & Bibliography

Section 1:
What Makes Alcohol Different from Other Commercial Products?

1. What makes alcohol different from other commercial products?

Alcohol consumption has been found to contribute to significant harms from a variety of causes. Acute intoxication or impairment can result in death from poisoning and increases the risk of death or injury from accidents of various types including driving-related crashes, drowning, falls, violent death or injury from assault, and deaths from homicide and suicide. Acute impairment may also increase risky sexual practices, which can lead to HIV infection, AIDS or other STDs. Drinking by pregnant women can result in Fetal Alcohol Syndrome (FAS) or Fetal Alcohol Spectrum Disorder (FASD). Chronic alcohol consumption at high or in some cases even moderate, levels has been associated with many causes of death and illness including cancers of various sites, particularly head and neck cancers, liver cancer and breast cancer as well as heart disease and stroke. Additionally, chronic drinking can result in alcohol dependence, a chronic relapsing condition sometimes associated with co-occurring mental health disorders such as depression.

Article Cited In Section 1

Rehm, J., & Greenfield, T. K. (2008). Public alcohol policy: current directions and new opportunities. *Clinical Pharmacology and Therapeutics*, 83(4), 640-643.

This is a brief current summary article identifying the health and social basis of alcohol control and treatment policies. It reviews the findings of expert groups (e.g., Babor et al, 2003, below) and recent reviews on best practices as regards various policy measures (legislative policy interventions, law enforcement based measures, treatment system and brief interventions, and mass media/awareness campaigns). It summarizes evidence-based support for alcohol taxes, minimum legal purchase age, government retail monopolies, availability restrictions, and lowered BAC limits for drink driving definitions.

Babor, T. F., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N., Graham, K., Grube, J., Hill, L., Holder, H., Homel, R., Livingston, M., Österberg, E., Rehm, J., Room, R., & Rossow, I. (2010). *Alcohol: No Ordinary Commodity: Research and public policy (2nd ed.)*. New York: Oxford University Press.

Babor, T. F., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N. A., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H. D., Homel, R. Österberg, E., Rehm, J., Room, R., & Rossow, I. (2003). *Alcohol: No Ordinary Commodity. Research and public policy*. New York, NY: Oxford University Press.

This comprehensive book by a panel of recognized alcohol policy experts makes the case that alcohol is no ordinary commodity, in part based on epidemiological data on the resulting global burden of alcohol-related problems. Sections extensively review the evidence base for strategies and interventions to minimize alcohol-related social and health harms. A final section considers the policy development process. The book builds on its well-known predecessors Alcohol and the Public Good (Edwards et al., 1994) and the so-called purple book (Bruun et al., 1975).

Additional References Not Annotated for Section 1

Cook, P. J. (2007). ***Paying the Tab: The costs and benefits of alcohol control***. Princeton, NJ: Princeton University Press.

Giesbrecht, N. A., Room, R., Demers, A., Lindquist, E., Ogborne, A., Bondy, S., et al. (2006). Alcohol policies: is there a future for public health considerations in a commerce-oriented environment? In N. Giesbrecht, A. Demers, A. Ogborne, R. Room, G. Stoduto & E. Lindquist (Eds.), ***Sober Reflections: Commerce, public health, and the evolution of alcohol policy in Canada, 1980–2000 (pp. 289-329)***. Montreal, Quebec, Canada: McGill–Queen's University Press.

1.1 Ingestion may result in intoxication or impairment from which accidents, violence and serious health effects may result. Accidents and some chronic heath effects can result from smaller amounts as well.

Breslow, R.A. & Graubard, B. I. (2008) Prospective Study of Alcohol Consumption in the United States: Quantity, Frequency, and Cause-Specific Mortality. *Alcoholism: Clinical and Experimental Research*, 32 (3), 513–521.

This study, based on prospective follow-up of a large U.S. survey, found that increased risk of death from heart disease and cancer is linked to the quantity of alcohol consumed in a day rather than the frequency of consumption.

Rehm, J., Greenfield, T. K. & Kerr, W. C. (2006). Patterns of drinking and mortality from different diseases – an overview. *Contemporary Drug Problems*, 33(2), 205-235.

This review of the literature found that mortality risks from alcohol differ by drinking pattern. For heart disease heavy drinking occasions are associated with increased risk. Spirits consumption results in higher risk of certain cancers and possibly cirrhosis of the liver. Injuries are especially linked to heavy drinking occasions.

Hingson, R. W., Heeren, T., Winter, M. R. & Wechsler, H. (2005). Magnitude of alcohol-related mortality and morbidity among U.S. college students ages 18-24 changes from 1998 to 2001. *Annual Review of Public Health*, 26, 259-279.

This study used multiple data sources to estimate alcohol-related injury deaths and health problems among U.S. college students. For 2001, they found 1700 deaths, an increase of 6% over 1998. Alcohol-related injuries and victimization were common: they estimated that in drinking-related incidents more than 500,000 students per year were injured and more than 600,000 were hit or assaulted.

Corrao, G., Bagnardi, V., Zambon, A. & La Vecchia, C. (2004). A meta-analysis of alcohol consumption and the risk of 15 diseases. *Preventive Medicine*, 38, 613-619.

This literature review found strong evidence linking alcohol with mortality from oral, esophageal and laryngeal cancers, hypertension, liver cirrhosis, pancreatitis, injuries and violence, and some evidence for risks of other cancers.

1.11 Reviews and all-cause mortality and morbidity.

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Section 2:
In Order To Reduce Alcohol Abuse And Harm, What Policies Are Needed And Which Policies Are Most Effective?

2.1 *What are the effects of price targets like taxes, tax indexing, minimum markups, price posting, price floor, tax earmarking or user fees, the three-tier system, monopolies, and other restrictions on market competition?*

2.11 Justifications and other taxation issues including optimal tax rates, incidence, earmarking, methodology, public opinion and the policy process.

Alcohol taxes have historically been justified as a good way for governments to raise money because the demand for alcohol is generally inelastic, meaning that higher prices will have a less than proportional impact on demand, which is unusual for a product considered by many to be a luxury. In eras where few options were available for broad-based taxes like those on income and sales, alcohol taxes were a key source of revenue for many governments. Although most modern justifications are based on the social, health and personal problems attributed to alcohol use and abuse, revenue considerations continue to dominate motivations for tax changes in the U.S. The two most common non-revenue justifications are the economic approach, based on external social costs and market efficiency, and the public health approach, based on reducing alcohol-related harm. The public health approach is the most straightforward in that the only issue is whether the tax is effective in reducing deaths, hospitalizations, rates of alcohol dependence and other indicators of harm. The main argument against this approach is that benefits to the consumer are not considered. The economic approach views the cost to society surrounding alcohol-related problems as externalities (costs that accrue to those other than the consumer). The existence of externalities means that the consumer is not taking the full costs of their behavior into account in the decision regarding how much alcohol to drink, leading to more drinking than would be optimal from a societal perspective. In this view, the tax is a mechanism for applying the average social cost to each drink and therefore incorporating these costs into the individual consumers drinking decisions. This view is complicated by the fact that consumption and problems are not equally distributed. Many consumers have no associated social costs, so the tax is too high, and many others have considerable costs, so the tax is too low. Issues surrounding which costs

should be included, particularly costs to individuals who are dependent, and how to measure the value of these costs, especially mortality and disability, further complicates implementing this approach. Another issue here is the degree of competitiveness in alcohol markets. If they are less than perfectly competitive, the resulting increased price will already cover some of the external costs. A fourth justification that has been gaining some prominence in recent years is the idea that the alcohol tax is a user fee needed to cover the considerable costs to society related to alcohol. The idea here is that consumers of alcohol should pay for the varied costs to society of regulating alcohol sales to prevent harm, understanding alcohol abuse, dependence and health risks through research, helping drinkers control their alcohol use, treating alcohol dependent individuals, and caring for those who became sick, injured or disabled due to alcohol. These costs can be estimated and distributed across predicted consumption to calculate a user fee tax. Both problematic and more moderate drinkers would then pay their share of costs in proportion to the amount of alcohol they drink such that heavy drinkers pay most of the tax.

A second key issue in alcohol taxation is fairness from the economic perspective. This refers to the impact of the tax on different income groups with the implication that those with higher income should pay more. Alcohol excise taxes have been described as being regressive, i.e. affecting those with a lower income disproportionately. While this is generally true, there are several factors that mitigate the importance of this. In the U.S., lower income groups have been found to include higher proportions of both abstainers and heavy drinkers as compared to higher income groups. This means that many low-income households pay no alcohol tax and that the tax burden falls more on the heavy drinkers, while among higher income groups the tax burden is more distributed. Also, heavy drinking is much more common among younger individuals whose lifetime income is much higher than their current income. It has been suggested that ad valorem taxes (taxes as a percentage of price rather than per unit of beverage) on alcohol might be a more equitable policy since that would tax based on the amount spent rather than by volume. These taxes (or mark-ups in control states) may also be viewed as luxury taxes, as champagne and other expensive alcohol products are sometimes seen as symbols of wealth. However, these taxes do not directly tax the source of problems and costs to society, the alcohol itself, and change relative prices in a way that encourages quality downgrading. On the other hand, ad valorem tax revenues will rise with inflation over time while excise tax revenues only rise with increasing consumption. It should be noted here

that most of the current alcohol taxes in the U.S. are on beverage, rather than alcohol volume. These taxes may create incentives to drink brands with higher percentages of alcohol within a beverage type because the tax per ounce of pure alcohol is lower on these brands. The most appropriate unit of taxation from the economic, public health and user fee approaches is the alcohol (i.e., ethanol) itself. For example, the federal spirits tax is levied on this basis. A tax system that depends directly on the volume and percentage alcohol by volume (%ABV) either in general or by beverage type would fit this criteria and the rate could be increased for beverages sold at higher concentrations. As an example, tax incentives for lower, relative to higher, alcohol content beer were implemented in Australia to encourage consumption of the lower strength product, for which market shares then increased.

Earmarking refers to the concept of applying tax revenue to a specific purpose rather than putting it into a general fund. The user fee approach in particular suggests, although it does not require, earmarking alcohol taxes. The general argument against earmarking is that it reduces the government's flexibility and creates its own bureaucracy that is dependent on these revenues. An argument for doing this is that it may be the only way to ensure continued funding for needed programs in the area and that it fits the justification for the tax in the first place. Also, public opinion in favor of alcohol taxation appears to be stronger when the revenues are tied to particular programs, like treatment for alcohol dependence. In general, public opinion polls have shown that there is support for alcohol taxes and better communication between legislators, scientists and the public on this topic might place taxation higher on the list of alcohol interventions.

Key Articles Cited In Section 2.11

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A hypothetical 25-cent per drink tax, given the assumption made in this paper, would reduce alcohol consumption by 9.2% and heavy drinking by 11.4%. The tax would generate nearly 8 billion dollars in revenues per year, most of which would be paid by higher-risk drinkers.

Sornpaisarn, B., Shield, K. D., & Rehm, J. (2012). Alcohol taxation policy in Thailand: implications for other low- to middle-income countries. *Addiction*, 107(8), 1372-1384.

This study describes the "Two-Chosen-One" (2C1) tax system used in Thailand where an alcohol unit based tax or an ad valorem tax are applied to each alcoholic beverage depending on which of the two is the highest. The unit-based tax will apply to cheaper beverage types and the ad valorem tax will apply to more expensive types. It is argued that this system will keep the costs of the cheapest types higher to reduce consumption among problematic drinkers and will raise the prices of more expensive international brands higher, potentially preventing younger drinkers from starting to drink. This type of system can address these two goals, which are important for low and middle income countries with high rates of abstention.

Meier, P. S., Purshouse, R., & Brennan, A. (2010). Policy options for alcohol price regulation: the importance of modelling population heterogeneity. *Addiction*, 105(3), 383-393.

This study uses simulation exercises to evaluate the impacts of different types of pricing policies on alcohol consumption and related harms with the intent of identifying policies having greater effects on the consumption of harmful drinkers in the UK. They find that minimum pricing policies tend to effect this type of drinker the most as compared to various types of taxation and restriction on promotions or below-cost selling.

Chetty, R., Looney, A., & Kroft, K. (2008). Salience and taxation: theory and evidence [Accessed: 2012-07-19. Archived by WebCite® at http://www.webcitation.org/69HRnDDly]. Washington, DC: *Finance and Economics Discussion Series*, Division of Research and Statistics.

This study considered the potential for differential effects on consumer choice depending on whether taxes were included in posted prices or added at the register, like most sales taxes in the U.S. They find that including sales taxes in posted prices reduced purchases by 8% compared

to adding the same taxes at the register, and that changes in alcohol excise taxes reduced alcohol consumption significantly more than increases in sales taxes.

Cook, P. J. (2007). *Paying the Tab: The costs and benefits of alcohol control.* Princeton, NJ: Princeton University Press.

Includes general discussion of issues related to alcohol tax justifications, fairness, efficiency and other relevant topics. Cook presents a case for significantly increased alcohol taxes and uniform taxes across beverage types.

Stockwell, T., Pakula, B., Macdonald, S., Buxton, J., Zhao, J., Tu, A., Reist, D., Thomas, G., Puri, A., & Duff, C. (2007). Alcohol consumption in British Columbia and Canada: A case for liquor taxes that reduce harm. (*CARBC statistical bulletin*). University of Victoria, British Columbia.

This report argues for taxation based on the alcohol content rather than beverage volume or beverage cost. Most justifications for alcohol taxes are based on the alcohol, not the beverage or the price. British Columbia and many Canadian Provinces use all three of these as a basis for taxation. When beverage volume is used as the basis, relative prices are distorted in favor of brands with higher alcohol concentration within the beverage class. When price is used as the basis for a proportional markup, then relative prices are distorted in favor of lower quality (as measured by price) beverages. Conversely, when beverages are taxed directly on their alcohol content, then relative price changes favor lower alcohol concentration and higher quality beverages, which is preferred from a public health perspective.

Giesbrecht, N., Greenfield, T., Anglin, L., & Johnson, S. (2004). Changing the price of alcohol in the United States: Perspectives from the alcohol industry, public health and research. *Contemporary Drug Problems*, 31, 711-736.

This study utilized 64 in-depth interviews with experts on U.S. Federal alcohol policy to analyze the arguments for and against the unique taxation of alcohol. The authors present several conclusions concerning disagreements over the most effective use of alcohol taxes. First, there is a belief that these kinds of policies are more appropriate for state-level intervention. Secondly, the belief that youth and heavy drinkers are affected by advertising leads to advertising control being a much more advocate-friendly method of curtailing consumption and other alcohol related problems. The belief that voters oppose taxes indiscriminately, along with the anti-regulatory Congress in place at the time of this study (1996-1999), has influenced the decision to support advertising controls in place of higher taxes on alcohol. However, the authors note that there is some public survey support for alcohol taxes. This leads to the third point, that activists like to push for interventions that have been successfully adopted in the past, and many assume that higher taxes is a difficult pill to swallow for many Americans. Next, the authors present the issue of intra-industry conflict affecting the support for alcohol taxes, with disagreements among the beer, wine and spirits industries as to whose product should be taxed most heavily. Finally, the authors state that there has been a breakdown in communication among legislators, scientists and the public as to how alcohol taxes effect consumption and alcohol related problems. The authors make several suggestions for improving the knowledge base concerning alcohol taxes as a viable intervention, such as more research on the basis for support of alcohol taxes, striking a balance between taxation and other forms of control, such as advertising restrictions, and using past, state level taxation initiatives as a guide to developing effective, federal policies.

Kenkel, D., & Manning, W. (1996). Perspectives on alcohol taxation. *Alcohol Health & Research World*, 20(4), 230-238.

This article is a literature review looking at the effects of alcohol taxation on: public health, revenue generation, economic efficiency, equity and employment of those in the alcohol beverage industry. From a public

health perspective, the important information for determining alcohol taxes is not the price elasticity of alcohol itself, but the price elasticity for alcohol-related outcomes such as drinking and driving. This is because the goal of public health-related alcohol policies is not necessarily to curtail consumption, but to reduce the negative outcomes of consumption. It is argued that increased taxes on alcohol do not necessarily result in higher revenue generation, with a 10% increase in alcohol tax estimated to increase the amount of tax revenue collected by less than 10%. However, evidence also supports the notion that an increase in alcohol tax would not cause tax revenues to fall. However, the possibility of price unresponsiveness by heavy drinkers might not have an effect on the ability of higher taxes to generate revenue, but the inability to affect consumption through taxes for this population is not favorable from a public health perspective. Considering the effects of taxation on economic efficiency, the authors suggest that the condition of consumers paying prices that reflect the costs of their actions on others might not be fully realized as alcohol taxes are most likely too low relative to the social costs of drinking. It is suggested that the ideal situation would be to only impose higher alcohol taxes on problem drinkers. However, current policies tax all alcohol consumption, which leads to an efficiency loss among moderate drinkers who reduce their consumption due to price. When considering the equity of alcohol taxes, the authors discuss the pros and cons of excise versus sales taxes for alcohol. The argument is made that excise taxes might be unfair because, although the amount of alcohol consumed increases as income increases, it does so at a lower rate. Because sales tax is based on the cost of the purchase rather than the quantity purchased, this type of tax might be more equitable, however, it is more difficult and costly to implement. Concerning employment, an increase in alcohol taxes has been shown to result in some worker displacement. Although research suggests that the displaced workers would be able to find employment, over time this displacement could still prove costly, as wages in a new job tend to be reduced. The authors conclude by suggesting that more research be done in the areas of the effects of taxes on consumption and alcohol related-problems, and the differences between the social and private costs of alcohol consumption.

Heien, D. M. (1995). Are higher alcohol taxes justified? *The Cato Journal*, 15(2-3), 243-254.

This article examines the viability of alcohol taxes through a series of analyses looking at previous estimates of alcohol abuse and their methodology, costs of alcohol related consequences such as DUI deaths and injuries, welfare losses to moderate consumers, and the impact of drinking on medical insurance costs. Three rationales for higher alcohol taxes are presented. First, the historical standard, which reasons that alcohol taxes should not be eroded by inflation. The next rationale is the fairness standard, which operates along three dimensions: that those who are equal are treated equally, those who are not equal are not treated equally so that those with greater means pay more, and households who receive more government benefits are taxed at a higher rate. The final rationale discussed is the public health approach, which considers both the costs to the abuser and his or her family and the external costs to society. The author warns against labels such as "sin taxes" as having too much of a moralistic undertone.

Pogue, T. F., & Sgontz, L. G. (1989). Taxing to control social costs: The case of alcohol. *The American Economic Review*, 79(1), 235-243.

This article lays out the case for alcohol taxes based on the external costs (cost to others, not the consumer) of alcohol use and abuse and explores ideas related to whether alcohol taxes are effective at controlling consumption across the drinking population and whether those with alcoholism may not be affected by the price increases. The authors question whether alcohol taxes are only really controlling the consumption of those without alcohol related issues. The authors conclude that from the economic perspective the optimal tax rate for alcohol depends greatly on whether alcoholism is viewed as a disease or as a choice, since internal costs to the drinker would be included in the optimal tax rate under the disease view. Furthermore, the authors state that the optimal alcohol tax rate could be reduced if institutional changes were made that reduced the costs of alcohol abuse on society, such as insurance premiums that are dependent on alcohol.

Crain, M., Deaton, T., Holocombe, R., & Tollison, R. (1977). Rational choice and the taxation of sin. *Journal of Public Economics*, 8, 239-245.

This article uses economic modeling to illustrate two explanations for the acceptance by the individual of taxes on goods such as alcohol. First, an individual might accept taxes on alcohol to control their own behavior by making the safer rational choice easier. For example, raising the cost of alcohol reduces the cost of safe driving, affecting the drinker's rational choice process in favor of this. The second explanation focuses on the effect of these taxes on those around the individual engaging in behaviors such as drinking and driving. The model illustrates that a drinker is willing to pay increased alcohol taxes if they believe this will reduce the instances of drinking and driving for those around them. The authors conclude that individuals might not object to being taxed for this kind of behavior if they believe that they are safer and able to make better decisions as a result.

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Ayyagari, P., Deb, P., Fletcher, J., Gallo, W. T., & Sindelar, J. L. (2009). Sin taxes: do heterogeneous responses undercut their value? ***National Bureau of Economic Research (NBER) Working Paper Series***, No. 15124.

Parry, I. W. H., West, S. E., & Laxminarayan, R. (2009). Fiscal and Externality Rationales for Alcohol Taxes (Article 29). ***The B.E. Journal of Economic Analysis and Policy***, 9(1), 1-46.

Smith, D. E., & Mitry, D. J. (2006). Consumer sensitivity to changes in tax policy on consumption of alcohol. ***International Journal of Consumer Studies***, 30(3), 247-255.

Bishai, D. M., Mercer, D., & Tapales, A. (2005). Can government policies help adolescents avoid risky behavior? ***Preventive Medicine: An International Journal Devoted to Practice and Theory***, 40(2), 197-202.

Trolldal, B. r., & Ponicki, W. (2005). Alcohol price elasticities in control and license states in the United States, 1982-99. ***Addiction***, 100(8), 1158-1165.

Young, D. J., & Bielinska-Kwapisz, A. (2003). Alcohol consumption, beverage prices and measurement error. ***Journal of Studies on Alcohol***, 64(2), 235-238.

Freeman, D. G. (2000). Alternative panel estimates of alcohol demand, taxation, and the business cycle. ***Southern Economic Journal***, 67(2), 325-344.

Giesbrecht, N. (2000). Roles of commercial interests in alcohol policies: recent developments in North America. ***Addiction***, 95 Suppl 4, S581-595.

Gruenewald, P. J., & Treno, A. J. (2000). Local and global alcohol supply: Economic and geographic models of community systems. ***Addiction***, 95(Suppl4), S537-S549.

Brinkley, G. L. (1999). The causal relationship between socioeconomic factors and alcohol consumption: A granger-causality time series analysis, 1950-1993. ***Journal of Studies on Alcohol***, 60(6), 759-768.

Kenkel, D. S. (1996). New estimates of the optimal tax on alcohol. ***Economic Inquiry***, 34, 296-319.

Baltagi, B. H., & Griffin, J. M. (1995). A dynamic demand model for liquor: the case for pooling. ***Review of Economics and Statistics***, 77(3), 545-554.

Lyon, A. B., & Schwab, R. M. (1995). Consumption taxes in a life-cycle framework: Are sin taxes regressive? ***Review of Economics and Statistics***, 77(3), 389-406.

Richardson, J., & Crowley, S. (1994). Optimum alcohol taxation: balancing consumption and external costs. ***Health Economics***, 3(2), 73-87.

Clements, K. W., & Johnson, L. W. (1983). The demand for beer, wine, and spirits: A system wide analysis. ***Journal of Business***, 56(3), 273-304.

Levy, D., & Sheflin, N. (1983). New evidence on controlling alcohol use through price. ***Journal of Studies on Alcohol***, 44(6), 929-937.

2.12 Effects of alcoholic beverage taxes and/or prices on consumption (including patterns, quality choice and beverage type choice)

Beer, wine and spirits and all alcohol have been consistently found to have negative price elasticity of demand, meaning that higher prices lead consumers to reduce their consumption. However, price responsiveness has been found to be variable across beverage type, age group, gender and volume-based drinker categories. Research has shown that 1) price increases do not always lead to decreased consumption across all demographic groups and for all alcoholic beverages, 2) price responsiveness can vary across drinking levels, 3) price responsiveness can vary by beverage type with beer generally having the least elastic response while spirits has the most elastic, and 4) social and societal factors might play a larger role in changes in consumption over time than economic factors. There is also some disagreement as to the relative price responsiveness of heavy drinkers, with some studies finding heavy drinkers' demand to be more price responsive than that of moderate or light drinkers, while others have found less price response by heavy drinkers. However, findings that even alcohol dependent drinkers are responsive to price changes and findings that cirrhosis mortality and alcohol-related mortality rates are responsive to price and tax changes (see section 2.13) make a strong case that even the most extreme drinkers can be affected by tax and price changes. An important and understudied area of direct relevance is the degree to which drinkers of different types respond to price increases by substituting beverages of lower quality (also lower price) rather than reducing the quantity they consume. Considerable variability in the price of a unit of alcohol has been found in the U.S., particularly between on-premise and off-premise consumption. A study using relatively complete and accurate data from the Swedish alcohol monopoly found that quality substitution was a major aspect of price

response and that quantity response was greatest for price increases in the lowest quality brands. This suggests that the lack of opportunities to quality downgrade for drinkers who already choose the lowest quality leads to more effective tax policy in this group and policies mandating a minimum price of alcohol, usually by beverage type, may increase the effectiveness of tax policy. Other evidence that the heaviest drinkers spend far less per drink than light or moderate drinkers suggests that heavy drinkers are disproportionately present among these low quality consumers, supporting findings of price responsiveness in this group, but possibly indicating ways that volume reduction from increased taxation may be lower than might otherwise be expected among some heavy drinkers, again suggestive of the potential preventive value of minimum price measures. New research from Canada has now demonstrated the effectiveness of minimum prices on alcohol demand.

Key Articles Cited In Section 2.12

Ruhm C, Jones AS, McGeary KA, Kerr WC, Terza JV, Greenfield TK, et al (2012) What U.S. data should be used to measure the price elasticity of demand for alcohol? *Journal of Health Economics* 31(6):851-862.

This study considers the quality of data typically used in U.S. studies of alcoholic beverage demand and finds that the most commonly used ACCRA price series and beer tax rates may not accurately represent prices across the U.S. An alternative measure based on the average prices of many popular brands is found to result in more stable estimates across specifications. A relatively low price elasticity for beer of 0.3 is found.

Stockwell, T., Zhao, J., Giesbrecht, N., Macdonald, S., Thomas, G., & Wettlaufer, A. (2012). The raising of minimum alcohol prices in Saskatchewan, Canada: impacts on consumption and implications for public health. *American Journal of Public Health*, 102(12), e103-e110.

Increases in the minimum price allowed for specific beverage types in the Canadian province of Saskatchewan were found to reduce sales of specific

types with an overall impact of 8.43% for a 10% increase in the minimum price. The largest impact was found for higher strength beer.

An, R., & Sturm, R. (2011). Does the response to alcohol taxes differ across racial/ethnic groups? Some evidence from 1984-2009 Behavior Risk Factor Surveillance System. *Journal of Mental Health Policy and Economics*, 14(1), 13-23.

This panel analysis of BRFSS data covering 1984-2009 considered the potential for differential response to beer taxes across groups defined by race and ethnicity. The strongest response was found among White Americans and the weakest among Hispanics.

Xu, X., & Chaloupka, F. J. (2011). The effects of prices on alcohol use and its consequences. *Alcohol Research and Health*, 34(2), 236-245.

This review notes declines in the real value of alcoholic beverage taxes in the U.S. and reviews evidence for the effectiveness of alcohol taxes and the relationship between alcohol prices, alcohol demand and alcohol-related consequences. A large number of studies have demonstrated that increases in alcohol prices reduce consumption in the population and among sub-populations including youth and heavier drinkers. Studies have also shown reductions in many types of alcohol-related consequences including cirrhosis mortality, drinking and driving and school performance.

Black, H., Gill, J., & Chick, J. (2010). The price of a drink: levels of consumption and price paid per unit of alcohol by Edinburgh's ill drinkers with a comparison to wider alcohol sales in Scotland. *Addiction*, 106(4), 729-736.

Heavy and problem drinkers in Scotland are found to choose low-priced alcoholic beverage types and brands with price paid being negatively correlated with alcohol consumption volume.

Elder, R. W., Lawrence, B., Ferguson, A., Naimi, T. S., Brewer, R. D., Chattopadhyay, S. K., et al. (2010). The effectiveness of tax policy interventions for reducing excessive alcohol consumptions and related harms. *American Journal of Preventive Medicine*, 38(2), 217-229.

This review from the CDC indicates strong evidence in favor of increasing alcohol taxes as an effective measure for reducing excessive alcohol consumption and related harms. Nearly all of the 72 studies reviewed found evidence that increases in taxes or prices reduce consumption and/or harms in both adult and under-age populations.

Helakorpi, S., Mäkelä, P., & Uutela, A. (2010). Alcohol consumption before and after a significant reduction of alcohol prices in 2004 in Finland: were the effects different across population subgroups? *Alcohol and Alcoholism*, 45(3), 286-292.

Results from surveys of the Finnish population indicate that substantial price reductions in 2004 resulted in increased consumption among those aged 45-64 and among individuals with lower levels of education, but not for other population groups.

Müller, S., Piontek, D., Pabst, A., Baumeister, S. E., & Kraus, L. (2010). Changes in alcohol consumption and beverage preference among adolescents after the introduction of the alcopops tax in Germany. *Addiction*, 105(7), 1205-1213.

This study of high school student drinking in Germany found that a tax increase on alcopop beverages only resulted in a non-significant reduction in alcohol intake and a shift from alcopops to spirits and beer.

Wagenaar, A. C., Salois, M. J., & Komro, K. A. (2009). Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction*, 104(2), 179-190.

This study summarized the results of previous analyses of the effects of prices and taxes on total alcohol and beer, wine and spirits consumption separately. It also analyzed heavy drinking specifically. Results confirm

the significant negative relationship between prices or taxes and alcohol consumption. Spirits consumption is found to be the most responsive with an average elasticity of -0.80 and beer the least responsive with an average elasticity of -0.46. Heavy drinking results come only from individual studies, unlike the overall and beverage-specific results where more of the studies were at the aggregate level. Heavy drinking is found to be responsive to prices and taxes but with a smaller elasticity -0.28 than for overall drinking.

Dave, D., & Saffer, H. (2008). Alcohol demand and risk preference. *Journal of Economic Psychology*, 29(6), 810-831.

This study of longitudinal data finds that risk-tolerant individuals drink more than risk-averse individuals and that alcohol taxes are equally effective in reducing consumption for both types.

Makela, P., Bloomfield, K., Gustafsson, N. K., Huhtanen, P., & Room, R. (2008). Changes in volume of drinking after changes in alcohol taxes and travellers' allowances: results from a panel study. *Addiction*, 103(2), 181-191.

Following a large-scale decrease in alcohol taxation in Denmark and Finland, this study looked at changes in drinking volume aggregated by age, gender and income. Drinking volume was assessed before and after the policy changed and used northern Sweden as a control site. Alcohol consumption decreased or remained the same for both men and women at all study sites. Older individuals' drinking volumes converged with younger drinking volumes across study sites.

Gruenewald, P. J., Ponicki, W. R., Holder, H. D., & Romelsjö, A. (2006). Alcohol prices, beverage quality, and the demand for alcohol: Quality substitutions and price elasticity. *Alcoholism: Clinical and Experimental Research*, 30(1), 96-105.

This paper presents the results of analyses of Swedish data on the price and sales of specific alcohol brands over a 10 year period. Results suggest that

the impact of tax or price changes will depend on the relative changes of the prices of brands with different quality levels because consumers will substitute between quality levels as part of their overall response to the change. The potential for the largest effect of a tax or price increase will occur when the prices of lower quality products are increased by a higher proportion, as would be the case with an excise tax on alcohol content. The authors also suggest that establishing a minimum price for alcoholic beverages by type or per unit of alcohol could be an effective strategy in conjunction with a tax increase because this would put a lower bound on the range of possible prices.

Farrell, S., Manning, W. G., & Finch, M. D. (2003). Alcohol dependence and the price of alcoholic beverages. *Journal of Health Economics*, 22(1), 117-147.

In this article, the authors developed econometric models for the price elasticity of heavy drinking and of overall dependence and abuse of alcohol. The overall price elasticity of current alcohol dependence was found to be -1.264. The authors, however, found from their model that the price elasticity for heavy drinking was -1.325 and the overall elasticity for abuse or dependence was -1.487. These findings of highly elastic response by heavy and dependent drinkers call into question the previous conjectures of a lack of price responsiveness for heavy drinkers.

Heeb, J., Gmel, G., Zurbrügg, C., Kuo, M., & Rehm, J. (2003). Changes in alcohol consumption following a reduction in the price of spirits: A natural experiment in Switzerland. *Addiction*, 98(10), 1433-1446.

This article explores changes in alcohol consumption across age and gender following a reduction in the price of spirits in Switzerland in 1999. Data on volume of drinking and drinking occasions were collected three months before the policy change and again three months after the change. Results showed that spirits consumption increased by 28.6%. The effect was greatest among young males and low-volume drinkers at baseline. However, overall consumption and wine and beer consumption did show statistically significant changes, suggesting that the increase in spirits did not come from substitution between beverage types. Spirits comprises

only about 10% of alcohol consumption and the relatively large percentage increase was offset by proportionately small declines in beer and wine sales. The authors also noted that the price decrease also resulted in greater alcohol availability.

Manning, W. G., Blumberg, L., & Moulton, L. H. (1995). The demand for alcohol: the differential response to price. *Journal of Health Economics*, 14(2), 123-148.

This article looked at the price responsiveness of light, moderate and heavy drinkers. Using data from the 1983 National Health Interview Survey, results indicated that light and heavy drinkers are much less responsive to price than moderate drinkers. Furthermore, the authors concluded that heavy drinkers are in fact responsive to price.

Treno, A. J., Parker, R. N., & Holder, H. D. (1993). Understanding U.S. alcohol consumption with social and economic factors: a multivariate time series analysis, 1950-1986. *Journal of Studies on Alcohol*, 54(2), 146-156.

This article examines economic factors, such as the price of alcohol and family income along with social factors, such as population age structure, marital instability, female labor force participation and daily life routines, to develop a model of per capita alcohol consumption. The authors found that the economic variables of family income and alcohol price played only minor roles in explaining changes in alcohol consumption, taking a back seat to social factors.

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Ogwang, T., & Cho, D. I. (2009). Economic determinants of the consumption of alcoholic beverages in Canada: a panel data analysis. ***Empirical Economics***, 37(3), 599-613.

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Cook, P. J. (2007). ***Paying the tab: The costs and benefits of alcohol control***. Princeton, NJ: Princeton University Press.

French, M. T., Brown Taylor, D., & Bluthenthal, R. N. (2006). Price elasticity of demand for malt liquor beer: findings from a U.S. pilot study. ***Social Science & Medicine***, 62(9), 2101-2111.

Mohler-Kuo, M., Rehm, J., Heeb, J. L., & Gmel, G. (2004). Decreased taxation, spirits consumption and alcohol-related problems in Switzerland. ***Journal of Studies on Alcohol***, 65(2), 266-273.

Trolldal, B. R., & Ponicki, W. (2005). Alcohol price elasticity in control and license states in the United States, 1982-99. ***Addiction***, 100(8), 1158-1165.

Young, D. J., & Bielinska-Kwapisz, A. (2003). Alcohol consumption, beverage prices and measurement error. ***Journal of Studies on Alcohol***, 64(2), 235-238.

Cook, P. J., & Moore, M. J. (2002). The economics of alcohol abuse and alcohol-control policies. ***Health Affairs***, 21(2), 120-133.

Young, D. J., & Bielinska-Kwapisz, A. (2002). Alcohol taxes and beverage prices. ***National Tax Journal***, 55(1), 57-73.

Stout, E. M., Sloan, F. A., Liang, L., & Davies, H. H. (2000). Reducing harmful alcohol-related behaviors: Effective regulatory methods. ***Journal of Studies on Alcohol***, 61(3), 402-412.

Nelson, J. P. (1997). Economic and demographic factors in U.S. alcohol demand: A growth-accounting analysis. ***Empirical Economics***, 22(1), 83-102.

Ponicki, W., Holder, H. D., Gruenewald, P. J., & Romelsjö, A. (1997). Altering alcohol price by ethanol content: results from a Swedish tax policy in 1992. ***Addiction***, 92(7), 859-870.

Kenkel, D. S. (1996). New estimates of the optimal tax on alcohol. ***Economic Inquiry***, 34, 296-319.

Baltagi, B. H., & Griffin, J. M. (1995). A dynamic demand model for liquor: the case for pooling. ***Review of Economics and Statistics***, 77(3), 545-554.

Leung, S. F., & Phelps, C. E. (1993). My kingdom for a drink … ? A review of estimates of the price sensitivity of demand for alcoholic beverages. In M. E. Hilton & G. Bolss (Eds.), ***Economics and the prevention of alcohol-related problems***. (National Institute on Alcohol Abuse and Alcoholism, Research Monograph No. 25 ed., pp. 1-31). Rockville, MD: U.S. Department of Health and Human Services.

Treno, A. J., Nephew, T. M., Ponicki, W. R., & Gruenewald, P. J. (1993). Alcohol beverage price spectra: Opportunities for substitution. ***Alcoholism: Clinical and Experimental Research***, 17(3), 675-680.

Selvanathan, E. A. (1991). Cross-country alcohol consumption comparison: An application of the Rotterdam demand system. ***Applied Economics***, 23(10), 1613-1622.

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Walsh, B. M. (1987). Do excise taxes save lives? The Irish experience with alcohol taxation. ***Accident Analysis & Prevention***, 19(6), 433-448.

Clements, K. W., & Johnson, L. W. (1983). The demand for beer, wine, and spirits: A systemwide analysis. ***Journal of Business***, 56(3), 273-304.

Levy, D., & Sheflin, N. (1983). New evidence on controlling alcohol use through price. ***Journal of Studies on Alcohol***, 44(6), 929-937.

2.13 Effects of alcoholic beverage taxes and/or prices on other outcomes

Taxes on alcoholic beverages have been found to be related to decreases in alcohol-related outcomes including drinking and driving, violence and deaths from health problems such as cirrhosis of the liver. However, these relationships are nuanced by individual characteristics, consumption patterns and beverage type. Taxes on distilled spirits have shown the greatest effect in lowering mortality from liver cirrhosis, while beer taxes have been found to reduce drinking and driving and instances of violence on college campuses. Reductions in violent behavior have been found to be gender and crime-specific, with larger effects for women and for the crimes of rape and robbery as compared to homicides and assaults. However, an evaluation of the 1991 federal tax increase found a significant and substantial effect on crime rates. Use of policies such as the minimum legal drinking age in conjunction with higher beer taxes have proven effective for lowering the instance of traffic fatalities among youth, although these policies are somewhat interdependent of each other, such that higher beer taxes may reduce the scope of effectiveness for the minimum drinking age. While an increase in alcohol excise taxes can clearly result in a short term decrease in mortality, the fact that such policies may affect moderate drinkers the most raises the question as to whether these individuals are losing the potential protective effects of

alcohol on heart disease. However, a recent study from Hong Kong has shown that a tax reduction resulting in a substantial increase in heart disease deaths. Further, recent analysis of alcohol-related mortality in Alaska and Florida clearly indicates that tax increases were effective in reducing deaths and that these effects were sustained over time. An analysis of the 1991 U.S. federal tax increase has also found significant reductions in injury-related mortality.

Key Articles Cited In Section 2.13

Cook, P. J., & Durrance, C. P. (2013). The virtuous tax: lifesaving and crime-prevention effects of the 1991 federal alcohol-tax increase. ***Journal of Health Economics*****, 32(1), 261-267.**

The most recent increase in U.S. federal alcohol tax rates occurred in 1991 and initially increased alcohol prices by about 6%. This price increase is found to have significantly reduced both injury mortality and violent crime rates.

Pun VC, Lin H, Kim JH, Yip BHK, Chung VCH, Wong MCS, et al (2013) Impacts of alcohol duty reductions on cardiovascular mortality among elderly Chinese: a 10-year time series analysis. ***J Epidemiol Community Health*** **67(6):514-518.**

Time-series analyses of cardiovascular disease mortality rates in Hong Kong around two reductions in beer and wine taxes in 2007 and 2008 found that the 2007, 50% reduction in tax rates resulted in an 18% increase in ischemic heart disease mortality for men and a 15% increase for women.

Maldonado-Molina, M. M., & Wagenaar, A. C. (2010). Effects of alcohol taxes on alcohol-related mortality in Florida: time-series analyses from 1969 to 2004. ***Alcoholism: Clinical and Experimental Research*****, 34(11), 1915-1921.**

This interrupted time-series analysis of alcohol-related mortality rates in the state of Florida found that a 10% increase in tax rates resulted in a 2.2% decrease in deaths.

Wagenaar, A. C., Maldonado-Molina, M. M., & Wagenaar, B. H. (2009). Effects of alcohol tax increases on alcohol-related disease mortality in Alaska: time-series analyses from 1976 to 2004. *American Journal of Public Health*, 99(9), 1464-1470.

This study utilized interrupted time-series analysis on the monthly alcohol-related mortality in Alaska over the years from 1976 to 2004 to evaluate the effects of tax increases on alcoholic beverages occurring in both 1983 and 2002. Models controlled for changes in alcohol-related mortality rates in all other U.S. states. Results showed statistically significant reductions in deaths following each tax increase and that these reductions were maintained over time rather than dissipating as inflation eroded the real value of the tax.

Ponicki, W. R., Gruenewald, P. J., & LaScala, E. A. (2007). Joint impacts of minimum legal drinking age and beer taxes on U.S. youth traffic fatalities, 1975 to 2001. *Alcoholism: Clinical and Experimental Research*, 31(5), 804-813.

This article examines the interdependent effects of minimum legal drinking age (MLDA) and beer taxes on youth traffic fatalities in the U.S. from 1975-2001. The authors found that, independently, MLDA's and higher beer taxes resulted in a reduction in youth traffic fatalities. However, the authors also found that, when beer taxes are already high, raising the MLDA has a smaller effect on reducing traffic fatalities than when beer taxes are low. The authors concluded that the magnitude of the effect of MLDA's on traffic fatalities might be dependent on the current tax structure for beer.

Ponicki, W. R., & Gruenewald, P. J. (2006). The impact of alcohol taxation on liver cirrhosis mortality. *Journal of Studies on Alcohol*, 67(6), 934-938.

This article looked at the relative effect of alcohol taxation on liver cirrhosis resulting from beer, wine and distilled spirits. The authors found that cirrhosis rates were significantly related to taxes on distilled spirits, but not wine and beer.

Cook, P. J., Ostermann, J., & Sloan, F. A. (2005). Are alcohol excise taxes good for us? short and long-term effects on mortality rates (*National Bureau of Economic Research Working Paper Series No. 11138*).

In an attempt to examine whether an increase in alcohol excise taxes and therefore a reduction in consumption has an effect on long term mortality rates, this article explores the effects of a one percent reduction in drinking on all-cause mortality among middle aged individuals, 35-69. The authors posit that the short term reduction in mortality rates due to alcohol might disappear in the long run among this age group due to a reduction in consumption that negates the protective effect of alcohol on the heart as a result of moderate drinking. The authors found that indeed, the long term effect of mortality reduction disappears among this age group after accounting for a one percent reduction in consumption.

Chaloupka, F. J., Grossman, M., & Saffer, H. (2002). The effects of price on alcohol consumption and alcohol-related problems. *Alcohol Research & Health*, 26(1), 22-34.

This article is a literature review looking at the effect of alcohol excise taxes on drinking and driving, the health effects of alcohol and violence, and other crimes. Literature reviewed supports the notion that higher beer taxes can reduce both fatal and non-fatal alcohol-related automobile accidents. Considering health effects from alcohol, such as liver cirrhosis, the research supports that higher excise taxes on distilled spirits could significantly reduce such effects. However, research also supports a greater effect of excise taxes on deaths in which alcohol played a role, but was not the primary cause, such as motor vehicle crashes, suicide and workplace injury. The authors suggest that 1) it might be the full price of the alcoholic beverage that accounts for a reduction in health effects rather than the excise tax alone, and that these reductions in negative outcomes occur across drinking levels, affecting light, moderate and heavy drinkers, although not at the same rate. The heaviest drinkers (top 5%), might not be as responsive to price. Considering violent crime, the authors explain that research supports higher excise taxes resulting in fewer rapes and robberies, but not necessarily fewer homicides and assaults. Higher excise taxes have also been shown to reduce the rates of domestic violence and

child abuse, particularly abuse of children by their mothers, as well as the incidents of violence on college campuses.

Markowitz, S., & Grossman, M. (2000). The effects of beer taxes on physical child abuse. *Journal of Health Economics*, 19(2), 271-282.

The authors examined the effects of an increase in beer tax on the incidence of child abuse. Results show that an increase in beer taxes may decrease the incidence of violence perpetrated by females, but not by males.

Additional References Not Annotated for Section 2.13

Macdonald, S., Stockwell, T., & Luo, J. (2011). The relationship between alcohol problems, perceived risks and attitudes toward alcohol policy in Canada. ***Drug and Alcohol Review***, 30(6), 652-658.

Son, C. H., & Topyan, K. (2011). The effect of alcoholic beverage excise tax on alcohol-attributable injury mortalities. ***The European Journal of Health Economics***, 12(2), 103-113.

Bloomfield, K., Wicki, M., Gustafsson, N.-K., Mäkelä, P., & Room, R. (2010). Changes in alcohol-related problems after alcohol policy changes in Denmark, Finland, and Sweden. ***Journal of Studies on Alcohol and Drugs***, 71(1), 32-40.

Herttua, K. (2010). ***The effects of the 2004 reduction in the price of alcohol on alcohol-related harm in Finland*** [Accessed: 2012-07-19. Archived by WebCite® at http://www.webcitation.org/69HSxD1rV]. Helsinki, Finland: The Population Research Institute.

Herttua, K., Makela, P., & Martikainen, P. (2008). Changes in alcohol-related mortality and its socioeconomic differences after a large reduction in alcohol prices: a natural experiment based on register data. ***American Journal of Epidemiology***, 168(10), 1110-1118; discussion 1126-1131.

Koski, A., Sirén, R., Vuori, E., & Poikolainen, K. (2007). Alcohol tax cuts and increase in alcohol-positive sudden deaths—A time-series intervention analysis. ***Addiction***, 102(3), 362-368.

Hollingworth, W., Ebel, B. E., McCarty, C. A., Garrison, M. M., Christakis, D. A., & Rivara, F. P. (2006). Prevention of deaths from harmful drinking in the united states: The potential effects of tax increases and advertising bans on young drinkers. ***Journal of Studies on Alcohol***, 67(2), 300-308.

Markowitz, S., Chatterji, P., & Kaestner, R. (2003). Estimating the impact of alcohol policies on youth suicides. ***Journal of Mental Health Policy and Economics***, 6(1), 37-46.

Grossman, M., & Markowitz, S. (2001). Alcohol regulation and violence on college campuses. In ***Economic analysis of substance use and abuse: The experience of developed countries and lessons for developing countries*** (pp. 257-289). Cheltenham, UK.

Markowitz, S. (2000). The price of alcohol, wife abuse, and husband abuse. ***Southern Economic Journal***, 67(2), 279-303.

Young, D. J., & Likens, T. W. (2000). Alcohol regulation and auto fatalities. ***International Review of Law and Economics***, 20(1), 107-126.

Markowitz, S., & Grossman, M. (1998). Alcohol regulation and domestic violence towards children. ***Contemporary Economic Policy***, 16, 309-320.

Ohsfeldt, R. L., & Morrisey, M. A. (1997). Beer taxes, workers' compensation, and industrial injury. ***The Review of Economics and Statistics***, 79(1), 155-160.

Ruhm, C. J. (1996). Alcohol policies and highway vehicle fatalities. ***Journal of Health Economics***, 15, 435-454.

Österberg, E. (1995). Do alcohol prices affect consumption and related problems?. In H. Holder & G. Edwards (Eds.), ***Alcohol and public policy: evidence and issues*** (pp. 145–163.). Oxford: Oxford University Press.

Sloan, F. A., Reilly, B. A., & Schenzler, C. (1994). Effects of prices, civil and criminal sanctions, and law enforcement on alcohol-related mortality. ***Journal of Studies on Alcohol***, 55(4), 454-465.

Cook, P. J., & Moore, M. J. (1993). Violence reduction through restrictions on alcohol availability. ***Alcohol Health & Research World***, 17(2), 151-156.

Chaloupka, F. J., Saffer, H., & Grossman, M. (1993). Alcohol control policies and motor vehicle fatalities (NBER Working Papers No. 3831): ***National Bureau of Economic Research, Inc.***

Cook, P. J., & Moore , M. J. (1993b). Economic perspectives on reducing alcohol-related violence. (Monograph No. 24 No. NIH Publication No. 93-3496). Bethesda, MD: ***National Institute on Alcohol Abuse and Alcoholism Research.***

Pogue, T. F., & Sgontz, L. G. (1989). Taxing to control social costs: The case of alcohol. ***The American Economic Review***, 79(1), 235-243.

Cook, P. (1987). The impact of distilled spirits taxes on consumption, auto fatalities and cirrhosis mortality. ***Advances in Substance Use***, Suppl, 1, 159-167.

Saffer, H., & Grossman, M. (1987). Beer taxes, the legal drinking age, and youth motor vehicle fatalities. ***The Journal of Legal Studies***, 16(2), 351-374.

Walsh, B. M. (1987). Do excise taxes save lives? The Irish experience with alcohol taxation. ***Accident Analysis & Prevention***, 19(6), 433-448.

2.14 The effects of economic alcohol policies on tobacco, marijuana and other drug use.

Research supports the notion that alcohol, tobacco and illegal drugs are all responsive to price. Considering increases in the price of cigarettes and smoking bans in drinking establishments such as bars, research has found that tobacco and alcohol can act as both complements and substitutes, depending on the motivation for drinking and whether the patterns of drinking and smoking are well established in the population. Research has suggested a complementary relationship between alcohol and marijuana, where reductions in one substance are associated with reductions in the other, but a substitution relationship has also been found in other studies. These conflicting results indicate that the relationship may differ depending on the population and analytic method. Concerning youth and college students, research supports the idea that taxes and availability policies around alcohol can reduce both drinking and marijuana use. However, among college students, an increase in alcohol price and a decrease in availability were found to have greater effect on reducing the use of both alcohol and marijuana among females. In one study an observed increase in marijuana use on college campuses over time was posited to be more closely related to a gradual decrease in the price of marijuana, rather than the price of alcohol, which also decreased over the period.

Key Articles Cited In Section 2.14

Crost, B., & Guerrero, S. (2012). The effect of alcohol availability on marijuana use: evidence from the minimum legal drinking age. *Journal of Health Economics*, 31(1), 112-121.

This study evaluates change sin alcohol and marijuana use across the age 21 minimum legal drinking age in the U.S. They find a significant reduction in marijuana use after age 21, suggesting that alcohol and marijuana are substitutes and that the substitution effect is substantially stronger among women.

Goodman, A. C. (2009). Economic analysis of multiple addictions for men and women. *The Journal of Mental Health Policy and Economics*, 12(3), 139-156.

This analysis of the 2001-2002 NESARC survey finds that beer and cigarette taxes are effective in reducing consumption of alcohol and tobacco but result in some substitution into illegal drug use, especially among women.

Grossman, M. (2005). Individual behaviours and substance use: the role of price. *Advances in Health Economics and Health Services Research*, 16, 15-39.

This article estimates the effects of price change on the consumption of alcohol, cigarettes and marijuana by high school seniors from 1975-2003. Economic models developed by the author suggest that much of the fluctuation in use during this time can be explained by price. These fluctuations held true for both legal and illegal substances, making the argument that illegal drugs, such as marijuana and cocaine, are also sensitive to price. The author also explores the possibility of legalizing such drugs and imposing excise taxes on them, similar to the ways in which cigarettes and alcohol are taxed.

Picone, G. A., Sloan, F., & Trogdon, J. G. (2004). The effect of the tobacco settlement and smoking bans on alcohol consumption. *Health Economics*, 13(10), 1063-1080.

This study utilized data from the Health and Retirement survey to examine the effect of higher cigarette prices and smoking bans on alcohol consumption. The authors found that smoking bans reduced alcohol consumption, but only for females, suggesting complementarity. However, the authors also found that higher cigarette prices increased alcohol consumption, suggesting that alcohol and cigarettes are economic substitutes. The authors explain these differential results by drinking motivation and whether that motivation places the drinker inside the home or out at a drinking establishment. For those smokers who drink socially at bars, smoking bans might lower their alcohol consumption, suggesting complementarity. For those smokers who drink at home, the higher price of cigarettes might lead them to drink rather than smoke, making the two substances substitutes. The authors also note that these effects might be stronger among older adults, for whom the patterns of drinking and smoking have been well established.

Williams, J., Liccardo Pacula, R., Chaloupka, F. J., & Wechsler, H. (2004). Alcohol and marijuana use among college students: Economic complements or substitutes? *Health Economics*, 13(9), 825-843.

This article examined the 1993, 1997 and 1999 waves of the Harvard School of Public Health's College Alcohol Study to determine whether alcohol and marijuana were substitutes or complements among college students. The authors found the two substances to be complements, as policies that increased the full price of alcohol decreased marijuana use. For example, colleges that banned alcohol from campus saw a reduction in both alcohol and marijuana use among females. The lack of significance among males might be driven by the fact that male alcohol use was not responsive to the campus-wide ban. The authors also found that an increase in the price of marijuana resulted in a decrease in both marijuana and alcohol use. However, the authors explain that the price of marijuana has steadily decreased over the years, which might explain other research noting the increase on marijuana use on college campuses over time.

Zhao, X., & Harris, M. N. (2004). Demand for marijuana, alcohol and tobacco: Participation, levels of consumption and cross-equation correlations. *The Economic Record*, 80(251), 394-410.

Analyzing data from the Australian National Drug Strategy Household Surveys, the authors examined the relationship between marijuana, alcohol and tobacco use. Although significant correlations exist between all three variables, marijuana and tobacco resulted in the strongest correlations. The authors also concluded that the three substances act as economic complements as opposed to substitutes.

Pacula, R. L. (1998). Does increasing the beer tax reduce marijuana consumption? *Journal of Health Economics*, 17, 557-585.

By analyzing data from the National Longitudinal Survey of Youth, the author concludes that, among teens, alcohol and marijuana are economic complements, not substitutes as has been suggested previously. This conclusion is based on finding that an increase in beer tax reduces both beer and marijuana use. The author also finds that an increase in beer tax will have a greater effect on the reduction of marijuana use among youth than of alcohol. This effect is held across states with differing marijuana policies.

Additional References Not Annotated for Section 2.14

Cook, P. J., & Reuter, P. (2007). When is alcohol just another drug? Some thoughts on research and policy. ***Addiction***, 102(8), 1183-1188.

Midanik, L. T., Tam, T. W., & Weisner, C. (2007). Concurrent and simultaneous drug and alcohol use: Results of the 2000 National Alcohol Survey. ***Drug and Alcohol Dependence***, 90(1), 72-80.

Carpenter, C., & Cook, P. (2006). ***Effects of Tobacco Price Increases on Drinking*** (Working Paper). Durham, N.C.: Duke University, Sanford Institute of Public Policy.

Sumnall, H. R., Tyler, E., Wagstaff, G. F., & Cole, J. C. (2004). A behavioural economic analysis of alcohol, amphetamine, cocaine and ecstasy purchases by polysubstance misusers. ***Drug and Alcohol Dependence***, 76(1), 93-99.

Petry, N. M. (2001). A behavioral economic analysis of polydrug abuse in alcoholics: Asymmetrical substitution of alcohol and cocaine. ***Drug and Alcohol Dependence***, 62(1), 31-39.

Gruenewald, P. J., & Treno, A. J. (2000). Local and global alcohol supply: Economic and geographic models of community systems. ***Addiction***, 95(Suppl4), S537-S549.

Farrelly, M. C., Bray, J. W., Zarkin, G. A., Wendling, B. W., & Pacula, R. L. (1999). ***The effects of prices and policies on the demand for marijuana: Evidence from the National Household Surveys on Drug Abuse*** (No. 6940): National Bureau of Economic Research, Inc.

Saffer, H., & Chaloupka, F. (1999). ***State drug control and illicit drug participation*** (National Bureau of Economic Research Working Paper Series No. 7114).

Goel, R. K., & Morey, M. J. (1995). The interdependence of cigarette and liquor demand. ***Southern Economic Journal***, 62(2), 451-459.

Lyon, A. B., & Schwab, R. M. (1995). Consumption taxes in a life-cycle framework: Are sin taxes regressive? ***Review of Economics and Statistics***, 77(3), 389-406.

2.15 Other pricing issues

Other pricing issues related to alcohol availability, consumption and related problems include the presence or absence of direct state control over alcohol sales, whether increases in alcohol taxes actually raise the price of alcohol, the effects of mandated exclusive territories and the affordability of alcohol. Research suggests that direct state control over alcohol sales both in the United States and in countries such as Sweden, Finland and Norway, increases the price of alcohol and reduces alcohol consumption. Research projects that the modification and/or elimination of monopoly status would increase consumption and alcohol-related problems such as assault and mortality. However, a privatization in Canada was found to have no effect on alcohol sales, possibly due to a retained monopoly on the wholesale alcohol trade, the restrictions of alcohol being sold in grocery stores, and an already present downward trend in alcohol demand at the time of privatization. A study in the U.S. has found that spirits prices were slightly higher in control states as compared to online retailers in some license states. Another pricing issue is whether an increase in alcohol taxes actually results in higher prices and whether these price increases hold across beverage type, brand and location of sale. Research from Alaska suggests that an increase in alcohol tax does result in higher prices across beverage type, brand and location of sale, although higher base prices might reflect a smaller price increase due to the elasticity of the consumer demand curve. Another pricing issue concerns the efficiency of mandated exclusive territories and their effect on beverage price and demand. Research suggests that exclusive territories do result in higher beer prices and but also greater demand, partly due to increased promotion on the part of beverage dealers. Research in this area also supports the notion that these effects are larger in areas with mandated exclusive territories due in part to greater protection from anti-trust litigation. A recent study of alcohol affordability in the U.S. has shown that even heavy drinking is highly affordable if low-priced brands are purchased for off-premise consumption and that this was not the case in the 1950's and 60's. In the 1950's, 10 drinks a day of even the cheapest vodka would require about 45% of the average disposable income while in 2011, it would require only 2.9%.

Key Articles Cited In Section 2.15

Kerr WC, Patterson D, Greenfield TK, Jones AS, McGeary KA, Terza JV, et al (2013) U.S. Alcohol Affordability and Real Tax Rates, 1950–2011. ***American Journal of Preventive Medicine*****, 44(5):459-64.**

This study finds that the affordability of alcoholic beverage in the U.S. has increased substantially since the 1950's. One drink per day of the cheapest spirits required 15 times the percentage of average disposable in 1950 as in 2011. In 2010 a heavy drinker consuming 10 drinks per day with an income in the lowest quintile would have to spend only about 5% of that income to drink the cheapest spirits and about 17% to drink Budweiser beer.

Siegel, M., DeJong, W., Albers, A. B., Naimi, T. S., & Jernigan, D. H. (2013). Differences in liquor prices between control state-operated and license-state retail outlets in the United States. ***Addiction*****, 108(2), 339-347.**

This comparison of prices on 74 liquor brands between control states and license states where large retailers sell alcohol over the internet found that prices were on average 7% higher in the control states, although there was also substantial variation between the control states.

Bloomfield, K., Wicki, M., Gustafsson, N.-K., Makela, Pia., & Room, R. (2010). Changes in Alcohol-Related Problems After Alcohol Policy Changes in Denmark, Finland, and Sweden. ***Journal of Studies on Alcohol and Drugs*****, 32-40.**

This study examines whether or not alcohol problems have changed in Denmark, Finland, and southern Sweden as a result of policy changes, which included the abolishment of alcohol import, and the lowering of excise taxes. On the whole, the prevalence of alcohol problems decreased.

Kenkel, D. S. (2005). Are alcohol tax hikes fully passed through to prices? Evidence from Alaska. *American Economic Review*, 95(2), 273-277.

Following an increase in taxes on malt beverages, wine and spirits in 2002, the author examines whether this tax increase affected the actual price of these beverages. Data were examined across beverage type, brand and whether the beverage was sold in a drinking establishment or store before and after the tax hike. Results showed that the tax increase did result in an increase in the price of beer, wine and liquor, and that the price increase was found across brands and both on and off premise. Results also suggest that the higher the base price of the beverage, the less of the higher tax was passed through, indicating the limitations of reaching the consumer demand curve before the tax increase.

Holder, H. D., Giesbrecht, N., Horverak, O., Nordlund, S., Norström, T., Olsson, O., et al. (1995). Potential consequences from possible changes to Nordic retail alcohol monopolies resulting from European Union membership. *Addiction*, 90(12), 1603-1618.

This article predicts changes in alcohol consumption and related problems as result of several Nordic countries modifying or eliminating national retail alcohol monopolies as a result of joining the European Union (EU). The authors suggest that modifying the monopolies, leading to a slight decrease in the price of alcohol, would increase consumption and alcohol related problems in Sweden, Finland and Norway. They further conclude that a complete elimination of monopolies in these countries, so that beer, wine and liquor were sold in grocery stores and gas stations, coupled with a significant drop in price resulting from private competition, would lead to a greater increase in consumption and alcohol related problems, such as alcohol induced assaults and alcohol related mortality.

Sass, T. R., & Saurman, D. S. (1993). Mandated exclusive territories and economic efficiency: an empirical analysis of the malt-beverage industry. *Journal of Law and Economics*, 36(1-2), 153-177.

This article examines the economic consequences of exclusive territories in the malt-beverage industry, including an incorporation of the costs of enforcing these territory agreements when determining the efficiency of such policies. The authors suggest that these policies assist in protecting dealers of malt-beverage from anti-trust challenges and are therefore more appealing than private contracting. The authors found that exclusive territories result in higher beer prices, a finding that has been supported by previous research. However, contrary to previous research, the authors find that these exclusive territories significantly increase demand by encouraging product promotion efforts on the part of the dealers. The authors conclude that exclusive territories result in higher prices without a significant change in total output. Furthermore, the authors found that these effects of exclusive territories are greater in states that mandate these territories due to the anti-trust protection previously mentioned.

Additional References Not Annotated for Section 2.15

Kan, M.-Y., & Lau, M. (2013). Comparing alcohol affordability in 65 cities worldwide, ***Drug and Alcohol Review***, 32(1), 19-26.

Wall, M., & Casswell, S. (2013). Affordability of alcohol as a key driver of alcohol demand in New Zealand: a co-integration analysis, ***Addiction***, 108(1), 72-79.

Stockwell, T., Zhao, J., Giesbrecht, N., Macdonald, S., Thomas, G., & Wettlaufer, A. (2012). The raising of minimum alcohol prices in Saskatchewan, Canada: impacts on consumption and implications for public health. ***American Journal of Public Health***, 102(12), e103-e110.

Spiering, C. (2011). ***The Pricing Policy of Alcohol Monopolies: the Case of Sweden and Quebec***. Unpublished Masters, Erasmus University Rotterdam, Rotterdam.

Bray, J. W., Loomis, B. R., & Engelen, M. (2009). You save money when you buy in bulk: does volume-based pricing cause people to buy more beer? ***Health Economics***, 18(5), 607-618.

Bray, J. W., Loomis, B., & Engelen, M. (2007). Correlates of in-store promotions for beer: differential effects of market and product characteristics. ***Journal of Studies on Alcohol and Drugs***, 68(2), 220-228.

Lecocq, S., & Visser, M. (2006). What Determines Wine Prices: Objective vs. Sensory Characteristics. ***Journal of Wine Economics***, 1(1), 42-56.

Trolldal, B. (2005). An investigation of the effect of privatization of retail sales of alcohol on consumption and traffic accidents in Alberta, Canada. ***Addiction***, 100(5), 662-671.

Henderson, C., Liu, X., Diez Roux, A. V., Link, B. G., & Hasin, D. (2004). The effects of U.S. state income inequality and alcohol policies on symptoms of depression and alcohol dependence. ***Social Science & Medicine***, 58(3), 565-575.

Benson, B.-L., Rasmussen, D.-W., & Zimmerman, P.-R. (2003). Implicit taxes collected by state liquor monopolies. ***Public Choice***, 115(3-4), 313-331.

Gisser, M. (1999). Dynamic gains and static losses in oligopoly: evidence from the beer industry. ***Economic Inquiry***, 37(3), 554-573.

Ordonez, L. D. (1998). The effect of correlation between price and quality on consumer choice. ***Organizational Behavior and Human Decision Processes***, 75(3), 258-273.

Slade, M. E. (1998). Beer and the tie: did divestiture of brewer-owned public houses lead to higher beer prices? ***Economic Journal***, 108, 565-602.

Beard, T. R., Gant, P. A., & Saba, R. P. (1997). Border-crossing sales, tax avoidance, and state tax policies: An application to alcohol. ***Southern Economic Journal***, 64(1), 293-306.

Heien, D. M., & Pittman, D. J. (1993). The external costs of alcohol abuse. ***Journal of Studies on Alcohol***, 54(3), 302-307.

Horverak, O., & Osterberg, E. (1992). The prices of alcoholic beverages in the Nordic countries. ***British Journal of Addiction***, 87(10), 1393-1408.

Rosen, M. (1989). Price and health policy in Sweden--a critical review. ***Health Policy***, 12(3), 263-274.

2.2 *What are the effects of availability targets including licensing, restrictions on the number, types and location of outlets, monopolies, direct shipping laws, hours or day of sale restrictions, and minimum drinking age laws?*

2.21 Government Control of Alcohol Sales

Reviews of the research on the effect of privatization of alcohol sales show that such policies are related to higher outlet density, increased price and consumption. However, at least in the United States, studies have not gone into detail concerning the types of outlets, how privatization effects economic and public health interests and what the underlying causes of increased consumption are. Studies of individual U.S. states have shown a significant increase in the sales of the beverage that has been privatized, although the effect does not seem to change the sales and/or consumption in surrounding states. Studies outside of the U.S., in Canada and the Netherlands, also show an increase in consumption related to the privatization of alcohol sales across various privatization and availability scenarios. A recent study in the U.S. compared rates of drinking, binge drinking and driving-related fatalities for those under 21 between states with retail monopolies on spirits sales and those that do not have this. Retail monopoly states were found to have significantly lower rate of drinking, binge drinking and driving fatalities suggesting reduced access to alcohol for under-age persons in retail control states.

Key Articles Cited In Section 2.21

Hahn, R. A., Middleton, J. C., Elder, R., Brewer, R., Fielding, J., Naimi, T. S., et al. (2012). Effects of alcohol retail privatization on excessive alcohol consumption and related harms: a community guide systematic review. ***American Journal of Preventive Medicine*****, 42(4), 418-427.**

This systematic review by the CDC covers 17 studies of the impact of privatization on alcohol sales or consumption. Results indicate that privatizations have led to substantial increases in the sales of privatized

beverage types and to small reductions in the sales of non-privatized beverages. It is concluded that there is strong evidence that privatization of retail alcohol sales leads to increases in excessive consumption.

Wang, J., Price, M., & Herzenberg, S. (2012). The Road Less Traveled: States that more tightly control the sale and distribution of alcohol have lower alcohol-related fatalities [Accessed: 2012-07-31. Archived by *WebCite*® at *http://www.webcitation.org/69Zu4YtLL*]. Harrisburg, PA: Keystone Research Center.

This report evaluates a previous non-peer reviewed study by Pulito and Davies that claimed to have found that control states had similar rates of alcohol-related traffic fatalities as license states. This new analysis adds the crucial control variables for vehicle miles traveled and per capita income and finds that control states have lower rates of alcohol-related traffic deaths.

Popova, S., Patra, J., Sarnocinska-Hart, A., Gnam, W.H., Giesbrecht, N., & Rehm, J. (2011). Cost of privatization versus government alcohol retailing systems: Canadian example. *Drug and Alcohol Review*, 1-9.

This study aims to determine how detrimental to public health and safety the privatization of alcohol sale has been in Canada. The researchers found that if all the Canadian provinces were to privatize alcohol sales, more money would be lost through harm than gained through increased sales. Thus for both economic and public health reasons, government should continue to hold a monopoly on alcohol sales.

Stockwell, T., Zhao, J., Macdonald, S., Vallance, K., Gruenwald, P., Ponicki, W., et al. (2011). Impact on alcohol-related mortality of a rapid rise in the density of private liquor outlets in British Columbia: a local area multi-level analysis. *Addiction*, 106(4), 768-776.

This study evaluates the impact of increased liquor store density and density of private stores during a partial privatization of retail sales of all beverage types in British Columbia, Canada from 2003 to 2008. Both the

total number of stores and the percentage of private stores were found to increase rates of alcohol-related deaths in an analysis of local areas over time.

Seim, K., & Waldfogel, J. (2010). Public Monopoly and Economic Efficiency: Evidence from the Pennsylvania Liquor Control Board's Entry Decisions (NBER Working Paper No. 16258) [Accessed: 2012-07-25. Archived by *WebCite*® at *http://www.webcitation.org/69QclqGXI*]. Cambridge, MA: National Bureau of Economic Research.

This study considers the number and locations of liquor stores in Pennsylvania in relation to profit maximizing, consumer welfare maximizing and unregulated, free entry. They conclude that the current system appears to focus on consumer welfare rather than profit maximization, which would lead to fewer outlets, or an unregulated market, which would lead to an inefficiently high number of outlets in high demand areas and fewer outlets in less populated areas.

Stockwell, T., Zhao, J., Macdonald, S., Pakula, B., Gruenewald, P. J., & Holder, H. D. (2009). Changes in per capita alcohol sales during the partial privatisation of British Columbia's retail alcohol monopoly 2003-2008: a multilevel local area analysis. *Addiction*, 104(11), 1827-1836.

British Columbia, Canada has a partially privatized retail system for alcoholic beverages with both state-run and private stores while the wholesale tier remains state-run. In 2002 a moratorium on private retail licenses was lifted resulting in a 33% increase in private stores between 2002 and 2008. This study evaluates the impact of this change on alcohol sales at the local level in multi-level regression models controlling for economic and demographic characteristics of areas. Results showed that the number of private stores per 10,000 residents and the proportion of stores that were private were both positively related to alcohol sales.

Nelson, J. (2008). How Similar are Youth and Adult Alcohol Behaviors? Panel Results for Excise Taxes and Outlet Density. *Atlantic Economic Journal*, 36(1), 89-104.

This study estimates the effects of a variety of regulatory, economic and demographic variables on the prevalence of drinking and binge drinking in the 1999 to 2003 National Survey of Drug Use and Health. Results show that states with a spirits retail monopoly had a lower prevalence of drinking and binge drinking among adolescents and young adults aged 12 to 25.

Miller, T., Snowden, C., Birckmayer, J., & Hendrie, D. (2006). Retail alcohol monopolies, underage drinking, and youth impaired driving deaths. *Accident Analysis & Prevention*, 38(6), 1162-1167.

This study used data from the Health Behavior in School-Aged Children (HBSC) and Youth Risk Behavior Survey (YRBS) along with accident fatality data from the Fatality Analysis Reporting System (FARS) to compare rates of drinking, risky drinking and driving fatalities for those under 21 years of age between states with retail monopoly systems and those without. Results showed that states with retail monopolies had significantly fewer youth reporting past 30 day drinking and binge drinking, and had rates of alcohol-impaired drinking deaths that were 9.3% lower than those in non-monopoly states.

Trolldal, B. (2005). An investigation of the effect of privatization of retail sales of alcohol on consumption and traffic accidents in Alberta, Canada. *Addiction*, 100(5), 662-671.

The article examines the effect of the privatization of alcohol sales in Alberta, Canada in the 1980's and 1990's on the occurrence of fatal car accidents. While the move to privatization resulted in an increase in the sale of spirits, the sale of beer and wine was not affected. The increase in spirits sales was not large enough to significantly affect total sales, nor was privatization shown to have an effect on fatal car crashes in the region. The author posits several explanations for these results. First, the wholesale alcohol trade in Alberta continued to be under state control, which put

restraints on the development of liquor store chains through uniform wholesale prices and transportation charges. Also, alcohol was not sold in grocery stores, maintaining a barrier between food and alcohol sales and restricting in store promotions. Secondly, the author notes that the move to privatization occurred during a downward trend in alcohol demand. Finally, the author suggests that the findings could be related to the way that availability was calculated. Counting the number of outlets within a jurisdiction does not account for the size or number of customers, both of which vary by outlet.

Trolldal, B. (2005). The privatization of wine sales in Quebec in 1978 and 1983 to 1984. *Alcoholism: Clinical and Experimental Research*, 29: 410-416.

This study evaluates the effects of three incremental privatizations allowing the sale of domestically (Quebec) produced or bottled wine in grocery stores occurring in 1979, 1983 and 1984. Interrupted time-series analyses and comparison with a quasi-experimental control area were used to evaluate the effects of the privatizations on spirits, wine and beer sales. Results show that the initial privatization increased wine sales per capita by 10% and this effect persisted over time. Sales of beer and spirits did not appear to be affected and no significant effect was found on total sales. Wine comprised only about 10% of the alcohol consumed in Quebec at the time. The effect was small relative to other studies, possibly due to the privatization occurring only for certain wines and not all.

Her, M., Giesbrecht, N., Room, R., & Rehm, J. (1999). Privatizing alcohol sales and alcohol consumption: evidence and implications. *Addiction*, 94(8), 1125-1139.

This paper reviews the literature and related research on privatization of alcohol sales in the United States and its effect on consumption and alcohol related problems. In general, the authors report that privatization results in higher outlet density, increased price, greater physical availability and new elements in the marketing and sales processes, such as a greater commercial orientation towards alcohol sales and additional economic vested interests. There is also increased consumption with privatization,

at least in the short term, and long term estimates show a decline in the real price of alcohol. The authors point out a lack of research into the underlying causes of changes in alcohol consumption and alcohol related harm and make several suggestions for future research in this area. Suggested research includes the impact of privatization by beverage type, more detail on the types of outlets created/affected by privatization, how days and times of sale are affected by privatization, what role tax structures play in privatization, what public health interests are affected by privatization, and the role of these new vested economic interests in shaping the alcohol market post-privatization.

Her, M., Giesbrecht, N., Room, R., & Rehm, J. (1998). Implications of privatizing/deregulating alcohol retail sales: projections of alcohol consumption in Ontario. *Journal of Substance Abuse*, 10(4), 355-373.

This paper examined four hypothetical situations that could occur due to partial/full privatization of retail alcohol sales in Ontario, Canada including: 1) no change to the current system, 2) wine and beer sales extending to all corner stores, convenience stores and small and large grocery stores, 3) wine and beer sales extending to all corner stores, convenience stores and small grocery stores, but not large grocery stores, and 4) all alcoholic beverages sold in independent, privately owned retail stores, with the current government run liquor, wine and beer stores closed. The authors hypothesized how each of these scenarios would affect the physical and economic availability of alcohol and concluded, that for all scenarios, alcohol consumption in the short/medium term is likely to increase. They conclude that any liberalization of alcohol access will increase consumption, although these effects might also be counterbalanced by increased price. Finally, the authors provide comparisons with similar research in other countries, showing the estimated increase in consumption in Ontario might be greater than in Nordic countries such as Sweden and Norway.

Wagenaar, A. C., & Holder, H. D. (1995). Changes in alcohol consumption resulting from the elimination of retail wine monopolies: results from five U.S. states, *Journal of Studies on Alcohol* (Vol. 56, pp. 566-572).

This article described the effects of privatizing wine sales in five U.S. states (AL, ID, ME, MT and NH). Significant increases in both wine sales and liters of pure ethanol consumed per year in the form of wine were found for all five states. There was a 42% increase in wine sales in AL, 150% increase in ID, 137% in ME, 75% in MT and 15% in NH. The authors suggest, that given the apparent effects of increased sales and consumption following such a policy change, careful consideration should be given to the possible social consequences of privatization.

Gruenewald, P. J., Madden, P., & Janes, K. (1992). Alcohol availability and the formal power and resources of state alcohol beverage control agencies. *Alcoholism: Clinical and Experimental Research*, 16(3), 591-597.

This article describes the effects of state level alcohol restrictions, both in retail and marketplace restrictions, on resources available for conduct and enforcement on the part of alcohol beverage control (ABC), alcohol outlet densities and consumption in 44 U.S. states. The authors found that higher outlet densities were related to higher consumption levels. Conclusions were complicated by findings suggesting that states with greater restrictions on the retail sales of alcohol had more resources to conduct ABC activities, such as higher budgets, lower densities of spirit's outlets, but greater densities of wine and beer outlets. Furthermore, the authors found that states with greater restrictions in the marketplace, such as price posting and fixing provisions, had greater resources for the enforcement of ABC activities, such as issuing citations and holding disciplinary hearings, and lower outlet densities across all beverage types.

Holder, H. D., & Wagenaar, A. C. (1990). Effects of the elimination of a state monopoly on distilled spirits' retail sales: a time-series analysis of Iowa. *British Journal of Addiction*, 85(12), 1615-1625.

In 1987 all of the state retail stores were closed and licenses to sell spirits were awarded to private establishments. This article looks at the effect of that policy change on the sales of spirits, beer and wine in Iowa and the sales of spirits in states surrounding Iowa. The authors found that spirits' sales increased by a significant 9.5% in Iowa following the policy change, which corresponded to a 13.7% decrease in wine sales and no change in beer sales. This change resulted in a net increase of total alcohol consumption in Iowa; however no change was detected in spirits' sales in states bordering Iowa.

Additional References Not Annotated for Section 2.21

Hahn, R. A., Middleton, J. C., Elder, R., Brewer, R., Fielding, J., Naimi, T. S., et al. (2012). Recommendations on privatization of alcohol retail sales and prevention of excessive alcohol consumption and related harms. ***American Journal of Preventive Medicine***, 42(4), 428-429.

Norström, T., Miller, T., Holder, H., Österberg, E., Ramstedt, M., Rossow, I., et al. (2010). Potential consequences of replacing a retail alcohol monopoly with a private license system: results from Sweden. ***Addiction*** 105(12), 2113-2119.

BMA Board of Science. (2008). ***Alcohol misuse: Tackling the UK epidemic***. London: British Medical Association.

Rossow, I., Karlsson, T., & Raitasalo, K. (2008). Old enough for a beer? Compliance with minimum legal age for alcohol purchases in monopoly and other off-premise outlets in Finland and Norway. ***Addiction***, 103(9), 1468-1473.

Brand, D. A., Saisana, M., Rynn, L. A., Pennoni, F., & Lowenfels, A. B. (2007). Comparative analysis of alcohol control policies in 30 countries. ***PLoS Medicine***, 4(4), 0752-0759.

Holder, H. (ed.) (2007) ***If retail alcohol sales in Sweden were privatized, what would be the potential consequences?*** Swedish National Institute of Public Health, Stockholm, Sweden.

Nordlund, S. (2007). The influence of EU on alcohol policy in a non-EU country. ***Journal of Substance Use***, 12(6), 405-418.

Zalcman, R. F., & Mann, R. E. (2007). The effects of privatization of alcohol sales in Alberta on suicide mortality rates. ***Contemporary Drug Problems***, 34(4), 589-609.

Andreasson, S., Holder, H., Norstrom, T., Osterberg, E. and Rossow, I. (2006). Estimates of harm associated with changes in Swedish alcohol policy: Results from past and present estimates. ***Addiction***, 101: 1096-1105.

Ziegler, D. (2006). International Trade Agreements challenge tobacco and alcohol control policies. ***Drug and Alcohol Review***, 25: 567-579.

Nelson, T. F., Naimi, T. S., Brewer, R. D., & Wechsler, H. (2005). The state sets the rate: the relationship among state-specific college binge drinking, state binge drinking rates, and selected state alcohol control policies. ***The American Journal of Public Health***, 95(3), 441-446.

Shaffer, E.R. and Brenner, J. (2004). International Trade Agreements: Hazards to health? ***International Journal of Health Services***, 34: 467-481.

Nelson, J. P. (2003). Advertising bans, monopoly, and alcohol demand: testing for substitution effects using state panel data. ***Review of Industrial Organization***, 22(1), 1-25.

Flanagan, G. (2003) ***Sobering Result: The Alberta liquor retailing industry ten years after privatization***. Canadian Centre for Policy Alternatives and Parkland Institute, Ottawa, Canada.

West, D. S. (2000). Double marginalization and privatization in liquor retailing. ***Review of Industrial Organization***, 16(4), 399-415.

Gisser, M. (1999). Dynamic gains and static losses in oligopoly: evidence from the beer industry. ***Economic Inquiry***, 37(3), 554-573.

Ponicki, W., Holder, H. D., Gruenewald, P. J., & Romelsjo, A. (1997). Altering alcohol price by ethanol content: results from a Swedish tax policy in 1992. ***Addiction***, 92(7), 859-870.

Holder, H. D., Giesbrecht, N., Horverak, O., Nordlund, S., Norstrom, T., Olsson, O., et al. (1995). Potential consequences from possible changes to Nordic retail alcohol monopolies resulting from European Union membership. ***Addiction***, 90(12), 1603-1618.

Fitzgerald, J. L. & Mulford, H. A. (1993). Privatization, price and cross-border liquor purchases. ***Journal of Studies on Alcohol***, 54, 462-464.

Mulford, H. A., Ledolter, J., & Fitzgerald, J. L. (1992). Alcohol availability and consumption: Iowa sales data revisited. ***Journal of Studies on Alcohol***, 53(5), 487-494.

Wagenaar, A. C., & Holder, H. D. (1991). A change from public to private sale of wine: Results from natural experiments in Iowa and West Virginia. ***Journal of Studies on Alcohol***, 52(2), 162-173.

Nelson, J. P. (1990). State monopolies and alcoholic beverage consumption. ***Journal of Regulatory Economics*** 2(1): 83-98.

2.22 Licensing of Alcohol Sales

Very little literature exists on the general topic of licensing despite the importance of licensing regulations for determining alcohol availability in terms of outlet density, location and opening hours and for ensuring that licensees follow responsible alcohol retailing practices. The issues involved include the type of stores alcohol will be sold in, how many of these stores there will be, who is eligible to get a license and who specifically will get each particular license. License related policies, such as the Liquor License Act in Ontario, engage the public in the process of determining whether establishments should be granted licenses, as well whether they should keep them given their business practices. However, even if establishments hold licenses to sell alcohol, their patrons may still be at risk for alcohol-related problems and injuries. This risk might vary by type of establishment and other establishment characteristics, such as who the customer is, why they patronize the establishment, the hours that the establishment operates and whether food is also served. Ongoing monitoring of licensees is generally required. Also included here are studies of prohibiting alcohol sales. While prohibition is often viewed as a failed experiment some authors argue that it can be an appropriate and useful response to some situations where alcohol is commonly used in particularly harmful ways.

Key Articles Cited In Section 2.22

Wood, D.S. (2011). Alcohol controls and violence in Nunavut: a comparison of wet and dry communities. *International Journal of Circumpolar Health*, 70 (1), 19-28.

This study seeks to understand if communities in Nunavut that forbid the importation of alcohol are less violent than communities that allow it. The researcher found that prohibiting alcohol imports led to less violence.

Hall, W. (2010). What are the policy lessons of National Alcohol Prohibition in the United States, 1920-1933? ***Addiction*****, 1-10.**

Prohibition in the United States is widely regarded as a failed experiment that actually made alcohol problems worse because it created a large black market and caused a shift to greater spirits consumption. This article seeks to correct this view by arguing that Prohibition, as a way to regulate alcohol, is not in every case doomed to failure.

Kulis, R. E. (1998). The public interest and liquor licenses in Ontario. ***Contemporary Drug Problems*****, 25, 85-97.**

The Liquor License Act in Ontario lays out the guidelines for how, where and when alcohol can be consumed. These guidelines are created and enforced by the Liquor License Board, which is an independent, administrative tribunal. In addition to deciding which establishments can receive liquor licenses, the board has the authority to revoke and deny licenses to applicants. One aspect of the board's role is to hear from the public concerning licensing issues. Sometimes the public has the ability to invoke license revocation by testifying to the board concerning poor business practices. Some of the pathways by which the public has affected the licensing of alcohol establishments are by consultations with establishment owners before a complaint is filed to the board, lobbying politicians, license hearings and legislative amendments. This article describes some of the mechanisms by which the public has influenced the board and some of the problems that residents face in attempting to influence licensure.

Additional References Not Annotated for Section 2.22

Hill, L., & Stewart, L. (1998). "Responsive regulation" theory and the sale of Liquor Act, ***Social Policy Journal of New Zealand*** (pp. 49-65).

2.23 Outlet Density, Types of Stores and Locations

Research from a large number of studies indicates that alcohol outlet density is positively correlated with alcohol-related problems including violence, such as assaults and child abuse. Further, research has established that these relationships vary by license type and may in some cases be non-linear, such that beyond a threshold number in a particular area each additional license resulted in more assaults than an additional license in areas with fewer outlets. However, research is mixed on the relationship between outlet density and behaviors such as drinking and driving. Some research suggests that lower density increases drinking and driving due to the distance that a drinker must travel to get to and from an alcohol outlet, and the necessity of driving rather than walking. These mixed results are also found when considering type of establishment, with restaurant density showing a positive correlation with drinking and driving, and bar density showing a negative correlation. However, these differences are nested in the context of individual drinking behaviors and patterns as well as characteristics of patrons such as aggression and hostility. Also in question is whether effects related to hostility and aggression are the result of the norms held at a particular establishment, or if patrons with similar norms are able to choose a particular establishment as a result of high outlet density. Overall, a lack of research using well established and tested measures of outlet density and alcohol-related harms is cited as a barrier to understanding the nuances of how outlet density affects alcohol consumption and related harms. It is suggested that states and territories collect systematic data on outlet densities, consumption and alcohol-related harms in an effort to predict how changes in density might affect these outcomes. The few studies of changes in store types allowed to sell particular types of alcoholic beverage suggest that this will increase consumption of that beverage type but may not affect other types.

Key Articles Cited In Section 2.23

Mair, C., Gruenewald, P. J., Ponicki, W. R., & Remer, L. (2013). Varying impacts of alcohol outlet densities on violent assaults: explaining differences across neighborhoods. ***Journal of Studies on Alcohol and Drugs*****, 74(1), 50-58.**

This study modeled relationships between outlet density and assaults in California zip codes over the 1995 to 2008 period. Results indicate that alcohol outlet densities in both local and surrounding areas were related to increased rates of assault. The impact of bar density was found to be much larger in areas with low income and high population density.

Paschall, M. J., Grube, J. W., Thomas, S., & Cannon, C. (2012). Relationships between local enforcement, alcohol availability, drinking norms, and adolescent alcohol use in 50 California cities. ***Journal of Studies on Alcohol and Drugs*****, 73(4), 657-665.**

Among other policies, this study evaluated the relationship between local outlet density and underage drinking in 50 California cities. They found that greater density was associated with increased rates of underage drinking and heavy drinking.

Livingston, M. (2011). A longitudinal analysis of alcohol outlet density and domestic violence. ***Addiction*****, 106(5), 919-925.**

This study of Melbourne Australia found that the density of off-premise outlets and pubs was associated with increased rates of domestic violence while the density of other on-premise licenses, which include restaurants and cafes, was associated with decreased rates.

Stockwell, T., Zhao, J., Macdonald, S., Vallance, K., Gruenwald, P., Ponicki, W., et al. (2011). Impact on alcohol-related mortality of a rapid rise in the density of private liquor outlets in British Columbia: a local area multi-level analysis. *Addiction*, 106(4), 768-776.

This study evaluates the impact of increased liquor store density and density of private stores during a partial privatization of retail sales of all beverage types in British Columbia, Canada from 2003 to 2008. Both the total number of stores and the percentage of private stores were found to increase rates of alcohol-related deaths in an analysis of local areas over time.

Scribner, R. A., Mason, K. E., Simonsen, N. R., Theall, K., Chotalia, J., Johnson, S., et al. (2010). An ecological analysis of alcohol-outlet density and campus-reported violence at 32 U.S. colleges. *Journal of Studies on Alcohol and Drugs*, 71(2), 184-191.

This study of 32 U.S. colleges from 2000 to 2004 found that the density of on and off-premise alcohol outlets was positively associated with rates of sexual violence.

Branas, C. C., Elliott, M. R., Richmond, T. S., Culhane, D. P., & Wiebe, D. J. (2009). Alcohol consumption, alcohol outlets, and the risk of being assaulted with a gun. *Alcoholism: Clinical and Experimental Research*, 33(5), 906-915.

This case control study of 677 gunshot assault cases in Philadelphia and 684 matched population controls found that the risk of assault with a gun was positively related to being a heavy drinker and living in a high off-premise outlet density area. The risk for those living in a high off-premise outlet density area was double that for lower density areas, while risk was not elevated for those living in high on-premise outlet areas.

Campbell, C. A., Hahn, R. A., Elder, R., Brewer, R., Chattopadhyay, S., Fielding, J., et al. (2009). The effectiveness of limiting alcohol outlet density as a means of reducing excessive alcohol consumption and alcohol-related harms. ***American Journal of Preventive Medicine*****, 37(6), 556-569.**

This review from the CDC found that increased density of alcohol outlets has been associated with increased alcohol consumption and related harms including medical, injury, crime and violence outcomes and concludes that restricting alcohol density may be a useful public health tool.

Popova, S., Giesbrecht, N., Bekmuradov, D., & Patra, J. (2009). Hours and days of sale and density of alcohol outlets: impacts on alcohol consumption and damage: a systematic review. ***Alcohol and Alcoholism*****, 44(5), 500-516.**

This review covers studies published after 2000, which showed that the majority of the 44 studies found alcohol outlet density has an impact on alcohol consumption and harms. It also concluded that restricting density is an effective measure for preventing alcohol-related harm.

Truong, K. D., & Sturm, R. (2009). Alcohol environments and disparities in exposure associated with adolescent drinking in California. ***American Journal of Public Health*****, 99(2), 264-270.**

Analyses of geo-coded outlet density for adolescents whose alcohol use was measured in the California Health Interview Survey found that binge drinking, and driving after drinking, were positively associated with the density of outlets within a half mile radius of their home. Higher outlet densities were also found in areas with more minority and lower income families.

Freisthler, B., Gruenewald, P. J., Ring, L., & LaScala, E. A. (2008). An ecological assessment of the population and environmental correlates of childhood accident, assault, and child abuse. *Alcoholism: Clinical and Experimental Research*, 32(11), 1969-1968.

This study analyzed zip code level data in California on childhood accidents, assaults and child abuse injuries using hospital discharge data. Results indicate that the density of off-premise alcohol outlets is associated with higher rates of accidents assaults and abuse for children aged 0 to 17.

Livingston, M. (2008). Alcohol outlet density and assault: A spatial analysis. *Addiction*, 103(4), 619-628.

Using a spatial analysis of 223 postcodes in Melbourne, Australia, this study modeled the relationship between the number of outlets and assaults while controlling for other factors. Results indicated a non-linear relationship between the number of outlets and the number of assaults. An accelerating relationship between on-premise licenses and assaults was found suggesting the potential for an empirically determined maximum density limit.

Treno, A. J., Gruenewald, P. J., Remer, L. G., Johnson, F., & Lascala, E. A. (2008). Examining multi-level relationships between bars, hostility and aggression: Social selection and social influence. *Addiction*, 103(1), 66-77.

This study sought to explore the relationship between outlet density and aggression through the mechanisms of social influence and social selection. Social influence contends that drinkers are influenced by the norms presented at the drinking establishments they patronize. Therefore, if other patrons of the establishment have lowered norms for aggression, these attitudes will have influence on those who drink at the establishment, leading to higher instances of hostility and violence. The social selection theory posits that those with similar aggression norms will patronize the same establishment and therefore reinforce those norms. To explore these issues, the authors used a sample of 36 zip code areas in California to establish which areas had high, medium and low outlet densities, then conducted a survey of residents in those areas to assess

drinking habits, establishment patronage, and reported norms and levels of hostility and aggression. Results showed that outlet density was related to aggression and hostility norms. However, greater outlet density was related to lower aggression norms and higher alcohol-related aggression norms, supporting the social selection theory. Greater peak drinking levels were also related to all types of hostility and aggression norms.

Chikritzhs T, C. P., Pascal R & Henrickson N. (2007). *Predicting alcohol-related harms from licensed outlet density: A feasibility study' (Monograph No. 28)*. Perth, Western Australia: National Drug Law Enforcement Research Fund (NDLERF).

This paper seeks to determine whether controlling alcohol outlet density can be a successful policy for reducing alcohol consumption and related harm in Australia. The authors conducted a literature review and developed a framework for using this information to maximize the effects of restricting density on alcohol-related harms. Results from the literature review show that assaults are highly correlated with outlet density, even in light of methodological and measurement limitations. Studies related to road crashes and drinking and driving were more obscure. While some recent studies have shown a positive relationship between alcohol-related accidents and outlet density, some earlier studies have found the opposite; that crashes increased as density decreased, perhaps due to drinkers driving longer distances to procure alcohol. The association between outlet density and harms such as homicide and child abuse is in the positive direction, although there are few studies that focus on this issue specifically. The authors found that overall there is a gap in the literature around the effects of outlet density on consumption and alcohol-related harms. The suggestions made by the authors concerning this area of study included forming a working group to develop new models to test the relationship between outlet density and alcohol-related harms, establishing ongoing data collection across all states and territories in Australia to assist in predicting the impact in outlet density changes, and developing responsive and accurate measures of outlet density and alcohol-related harms.

Zhu, L., Gorman, D. M., & Horel, S. (2004). Alcohol outlet density and violence: A geospatial analysis. *Alcohol and Alcoholism*, 39(4), 369-375.

This study looked at the relationship between outlet density and violent crime, after controlling for neighborhood socio-structural characteristics in two geographic regions of Texas. Results showed a direct relationship between the density of alcohol outlets and violent crime in both regions.

Gruenewald, P. J., Johnson, F. W., & Treno, A. J. (2002). Outlets, drinking and driving: A multilevel analysis of availability. *Journal of Studies on Alcohol*, 63(4), 460-468.

This study examined the relationship between alcohol outlet density and self-reported drinking patterns, such as preferred drinking location, driving after drinking, and driving while intoxicated. Data were collected from 7,826 adults in the state of California. Results varied based on type of establishment. Restaurant densities were positively correlated with drinking frequency and drinking after driving, while bar densities were negatively correlated with drinking after driving. The authors also found that the strongest influence on drinking after driving and driving while intoxicated was preferred location of drinking in the context of reported drinking patterns. Outlet density was most strongly related to alcohol-related accidents when considered in the context of preferred drinking location and reported drinking pattern.

Wagenaar, A. C., & Langley, J. D. (1995). Alcohol licensing system changes and alcohol consumption: Introduction of wine into New Zealand grocery stores. *Addiction*, 90(6), 773-783.

In 1990, a New Zealand policy change allowed table wine to be sold in grocery stores. In this article, the authors examined whether that policy change resulted in greater wine sales and consumption. They concluded that, after the policy change, wine sales increased by 17%. There was no increase in fortified wine (still unavailable in grocery stores) or for beer or distilled spirits.

Gruenewald, P. J., Ponicki, W. R., & Holder, H. D. (1993). The relationship of outlet densities to alcohol consumption: A time series cross-sectional analysis. *Alcoholism: Clinical and Experimental Research*, 17(1), 38-47.

Citing a lack of research on the role of availability in reducing alcohol consumption and related problems, the authors used data from states in the U.S. to examine the relationship between alcohol beverage prices, availability and alcohol sales. Results show that availability, in the form of outlet density, was directly related to the sales of wine and spirits. This was found to be independent from alcohol price and included consideration of market and consumer characteristics. However, the authors also bring up the issue that lowering outlet density might increase travel related alcohol problems due to driving further distances to obtain alcohol and having to drive rather than walk to liquor stores.

Stockwell, T., Somerford, P., & Lang, E. (1992). The relationship between license type and alcohol-related problems attributed to licensed premises in Perth, Western Australia. *Journal of Studies on Alcohol*, 53(5), 495-498.

This article examined the number of alcohol-related problems such as drinking and driving, traffic accidents and alcohol-related assaults in reference to the type of alcohol license of a given establishment in Perth, Western Australia. The goal of the study was to determine whether patrons of a particular type of establishment were more likely to experience alcohol-related problems. The authors found that nightclubs, taverns and hotels were "high risk" establishments when compared to clubs and restaurants. The authors suggest that the findings could be related to customer characteristics, opening hours, types of entertainment, restrictions on clientele and whether food is also served at the establishment.

Additional References Not Annotated for Section 2.23

Stockwell, T., Zhao, J., Martin, G., Macdonald, S., Vallance, K., Treno, A., Ponicki, W., Tu, A., & Buxton, J. (in press). Minimum alcohol prices and outlet desnities in British Columbia, Canada: estimated impacts on alcohol-attributable hospitable admissions [doi:10.2105/AJPH.2013.301289]. ***American Journal of Public Health***.

Alcohol Concern Youth Policy Project. (2011). One on Every Corner: The relationship between off-licence density and alcohol harms in young people [Accessed: 2012-07-25. Archived by ***WebCite***® at ***http://www.webcitation.org/69QlprkPV***]. London: Alcohol Concern.

Chinman, M., Burkhart, Q., Ebener, P., Fan, C.-C., Imm, P., Osilla, K. C., et al. (2011). The premises is the premise: understanding off- and on-premises alcohol sales outlets to improve environmental alcohol prevention strategies. ***Prevention Science***, 12(2), 181-191.

Cunradi, C. B., Mair, C., & Ponicki, W. (2011). Alcohol outlets, neighborhood characteristics, and intimate partner violence: ecological analysis of a California city. ***Journal of Urban Health***, 88(2), 191-200.

Kavanagh, A. M., Kelly, M. T., Krnjacki, L., Thornton, L., Jolley, D., Subramanian, S. V., et al. (2011). Access to alcohol outlets and harmful alcohol consumption: a multi-level study in Melbourne, Australia. ***Addiction***, 106(10), 1772-1779.

Parker, R. N., Williams, K. R., McCaffree, K. J., Acensio, E. K., Browne, A., Strom, K. J., et al. (2011). Alcohol availability and youth homicide in the 91 largest U.S. cities, 1984-2006. ***Drug and Alcohol Review***, 30(5), 505-514.

Shamblen, S. R., Harris, M. S., Ringwalt, C. L., Flewelling, R. L., Clark, H. K., & Hanley, S. M. (2011). Outlet density as a predictor of alcohol of alcohol use in early adolescence. ***Substance Use and Misuse***, 46(8), 1049-1059.

Theall, K. P., Lancaster, B. P., Lynch, S., Haines, R. T., Scribner, S., Scribner, R., et al. (2011). The neighborhood alcohol environment and at-risk drinking among African-Americans. ***Alcoholism: Clinical and Experimental Research***, 35(5), 996-1003.

Carpenter, C., & Dobkin, C. (2010). Alcohol regulation and crime [NBER Working Paper No. 15828] [Accessed: 2012-07-26. Archived by ***WebCite***® at ***http://www.webcitation.org/69RvqKVXu***]. New York: The National Bureau of Economics Research.

Chen, M.-J., Grube, J. W., & Gruenewald, P. J. (2010). Community alcohol outlet density and underage drinking. ***Addiction***, 105(2), 270-278.

Cotti, C. D., & Walker, D. M. (2010). The impact of casinos on fatal alcohol-related traffic accidents in the United States. ***Journal of Health Economics***, 29(6), 788-796.

Cunradi, C. B. (2010). Neighborhoods, alcohol outlets and intimate partner violence: addressing research gaps in explanatory mechanisms. ***International Journal of Environmental Research and Public Health***, 7(3), 799-813.

Franklin, F. A., II, LaVeist, T. A., Webster, D. W., & Pan, W. K. (2010). Alcohol outlets and violent crime in Washington D.C. ***Western Journal of Emergency Medicine***, 11(3), 283-290.

Resko, S. M., Walton, M. A., Bingham, C. R., Shope, J. T., Zimmerman, M., Chermack, S. T., et al. (2010). Alcohol availability and violence among inner-city adolescents: a multi-level analysis of the role of alcohol outlet density. ***American Journal of Community Psychology***, 46(3-4), 253-262.

Popova, S., Giesbrecht, N., Bekmuradov, D., & Patra, J. (2009) Hours and days of sale and density of alcohol outlets: impacts on alcohol consumption and damage: a systematic review. ***Alcohol and Alcoholism***, 44(5), 500-516.

Gruenewald, P. (2008). Why do alcohol outlets matter anyway? A look into the future. ***Addiction***, 103(10), 1585-1587.

Huckle, T., Huakau, J., Sweetsur, P., Huisman, O., & Casswell, S. (2008). Density of alcohol outlets and teenage drinking: living in an alcogenic environment is associated with higher consumption in a metropolitan setting. ***Addiction***, 103(10), 1614-1621.

Jones-Webb, R., McKee, P., Hannan, P., Wall, M., Pham, L., Erickson, D., & Wagenaar, A. C. (2008). Alcohol and malt liquor availability and promotion and homicide in inner cities. ***Substance Use and Misuse***, 43(2), 159-177.

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Giacopassi, D. & Winn, R. (1995). Alcohol availability and alcohol related crashes: Does distance make a difference? ***American Journal of Drug and Alcohol Abuse***, 21: 407-416.

Scribner, R. A., MacKinnon, D. P., & Dwyer, J. H. (1994). Alcohol outlet density and motor vehicle crashes in Los Angeles County cities. ***Journal of Studies on Alcohol***, 55(4), 447-453.

Van Oers, J., & Garretsen, H. (1993). The geographic relationship between alcohol use, bars, liquor shops and traffic injuries in Rotterdam. ***Journal of Studies on Alcohol***, 54: 739-744.

Smith, D. I. (1992). Relationship between the number and type of alcohol outlets and mortality due to liver cirrhosis and traffic accidents. ***Drug and Alcohol Review***, 11(2), 145-151.

Smith, D. I. (1989). Effect on liver cirrhosis and traffic accident mortality of changing the number and type of alcohol outlets in Western Australia. ***Alcoholism: Clinical and Experimental Research***, 13(2), 190-195.

2.24 Direct Shipping, Interstate Shipping and Home Delivery

Various competing interests continue to debate changes in the laws concerning the direct shipping of alcohol, most commonly wine. Questions over how direct shipment might affect wholesalers, whether underage drinking will increase, and how states where wine is shipped will collect state-specific alcohol taxes and sales taxes, are some of the issues at the heart of these arguments. While the purchase of alcohol by minors through home delivery is likely not a widespread daily activity, it was experienced at some time by 7-10% of 17-20 year olds in a sample from Midwestern communities. While underage access may be the most important issue, it seems that the economic factors associated with the direct shipment of wine have taken center stage in this debate, most notably through 1986 legislation in California that demands reciprocity for any state that wishes to allow Californians to order wine directly. There are several key factors shaping this debate. First, small wineries in California and other states wish to be able to sell their product across the country without losing as much of their profit to wholesalers and retailers, who may also demand a higher volume of product than the winery is able to produce. Conversely, wholesalers and retailers do not want to lose profits from consumers who buy directly from wineries. Allowing interstate shipping will also change the market structure in a state, likely reducing prices for consumers but also potentially increasing consumption and related problems. States whose residents are buying wine directly from the producer have an interest in collecting the wine excise tax and sales tax associated with buying from a retailer in their own state. Finally, retailers and wholesalers are concerned that individuals might order wine for more than personal use, with the intent of resale. In an attempt to reach a

solution that favors wineries but considers state interests, a model act has been developed by the Coalition for Free Trade and National Conference on State Legislatures to address many of these issues. The act suggests that producers who wish to ship their wine out of state, directly to the consumer, must acquire a license to do so, pay sales tax to the state to which the wine is shipped, require a signature of someone 21 or older upon delivery, restrict the amount of wine that can be sent to one individual, and keep records of how much wine is being sold to each household and state. However, the costs of paperwork may be high and the authority of delivery services to legally verify age is questionable.

Key Articles Cited In Section 2.24

Riekhof, G. M., & Sykuta, M. E. (2005). Politics, economics, and the regulation of direct interstate shipping in the wine industry. *American Journal of Agricultural Economics*, 87(2), 439-452.

In reference to a law passed in California in 1986, which states that California residents cannot order direct shipments of wine from any state that does not allow its residents to buy directly from California wineries, this study examines the factors affecting the likelihood that a state will agree to the reciprocity agreement. Results showed that economic considerations from both the public and private sector are most responsible for whether a state would change its direct shipping laws to comply with California's law. Since the law was enacted in 1986, 43 states have considered changing their legislation and 23 states have adopted some form of shipment allowance.

Fletcher, L. A., Toomey, T. L., Wagenaar, A. C., Short, B., & Willenbring, M. L. (2000). Alcohol home delivery services: A source of alcohol for underage drinkers. *Journal of Studies on Alcohol*, 61(1), 81-84.

This study examined the occurrence of individuals under the age of 21 obtaining alcohol through home delivery services. The authors also describe the characteristics of such individuals and the grocery and liquor stores that provide home delivery services. Participants were from small to

medium Midwestern communities and were made up of a sample of 12th graders (N=4487), 18-20 years olds (N=1721) and grocery and liquor stores in the areas where participants lived (N=124). Results show that 10% of the 12th graders and 7.3% of the 18-20 years olds had made alcohol purchases through home delivery. Furthermore, 20.2% of the grocery and liquor stores surveyed provided home delivery services. Purchasing delivered alcohol was associated with being male, a high risk drinker (number of drinks on occasion), and recent and more frequent drinker. The presence of delivery services was most common in establishments that sell keg beer and/or single servings of alcohol.

Martin, S. L. (2000). Wine wars - direct shipment of wine: the Twenty-First Amendment, the Commerce Clause, and consumers' rights. *American Business Law Journal*, 38(1), 1-40.

In this article, the author argues that prohibition of ordering wine directly from the producer to ship across states is unconstitutional. The author contends that such a prohibition is lobbied for by wholesalers and distributors who wish to prevent the public from accessing wine directly from distributors, when this action is allowed for most other legal products. The author claims that these restrictions violate the Commerce Clause. Finally, the author puts forth a model act that follows the model direct shipment law proposed by The National Conference on State Legislatures and the Coalition for Free Trade. The main points of the act are: 1) Individuals who are licensed as alcoholic beverage producers in the U.S. may obtain an out-of-state shipping license from the State Liquor Authority. Out of state shippers may ship up to two cases of 9-liter bottles to any person out of state. However, records would need to be kept on the purchase history of each household shipped to and the total amount of wine shipped to each state each year. 2) Concerning the payment of taxes, each shipper must pay annually to the Taxation Authority all state and local taxes on sales to state residents. 3) Producers cannot ship wine to territories that prohibit the sale of alcoholic beverages. 4) All deliveries will require the signature of someone 21 or older, and deliveries cannot be made to intoxicated persons or persons failing to show proper identification. 5) Persons accepting deliveries must acknowledge that the wine is for personal use and not for resale. 6) The State Liquor Authority has the power to enforce these rules and revoke licenses if the rules are not followed. The author maintains that this act addresses the issues

commonly raised concerning out of state shipments of wine directly from distributors, such as the ability of states where wine is shipped to collect taxes, reducing the threat to wholesalers that individuals will order wine for the purpose of resale, and the concern that underage individuals will be able to order and receive wine.

Additional References Not Annotated for Section 2.24

Dunham, J., Eng, V. F., & Ronga, P. (2010). Direct ship blowout: How the Supreme Court's Granholm decision has led to a flood of non-taxed wine shipments (AAWE Working Paper No. 61) [Accessed: 2012-07-19. Archived by ***WebCite***® at ***http://www.webcitation.org/69HKGq1Pq***]. New York: American Association of Wine Economists.

Babor, T. F., Caetano, R., Casswell, S., Griffith, E., Giesbrecht, N., Graham, K., et al. (2003). ***Alcohol: No ordinary commodity***. Research and public policy. New York, NY: Oxford University Press.

Moore, W. J. (1997). Sour grapes on Capitol Hill. (Sale of alcohol by mail or over the internet). ***National Journal***, 29, 2424.

2.25 Restrictions on Hours and Days of Sale

The effect of restricting the days and hours of alcohol sales has generally been to reduce consumption and alcohol-related problems, although significant effects have not always been found. In New Mexico, one study found that allowing Sunday sales resulted in significantly more alcohol-related crashes and fatalities and an increase in the sale of spirits, while another study using different methodology did not find a significant increase in alcohol-related accidents. A study evaluating the effect of allowing Sunday sales in Canada found that while drinking on Sunday increased, there was no significant effect on overall alcohol consumption. In Western Australia, the extension of alcohol trading hours in hotels

resulted in significantly greater numbers of assaults and motor vehicle crashes. Restricting the hours during which alcohol can be sold in a city in Brazil resulted in fewer murders, but not significantly fewer assaults. In Sweden, lessening restrictions on days of sale led to an increase in alcohol sales but not to significant changes in alcohol-related problems including assaults and drinking and driving. Finally, it has also been observed that restrictions on the day and hours of alcohol sales can influence the purchase of alcohol from bordering states where restrictions might be different.

Key Articles Cited In Section 2.25

Rossow, I., & Norström, T. (2012). The impact of small changes in bar closing hours on violence. The Norwegian experience from 18 cities. *Addiction*, 107(3), 530-537.

This evaluation of 18 Norwegian cities that have changed on-premise closing hours found that each one-hour change to later closing hours increased violent crime during the hours between 10 pm and 5 am by 16%.

Kypri, K., Jones, C., McElduff, P., & Barker, D. (2011). Effects of restricting pub closing times on night-time assaults in an Australian city. *Addiction*, 106(2), 303-310.

This study evaluated a change in closing times for bars in an Australian city, finding that the earlier closing time reduced assaults by 37% as compared to a nearby city where no change in closing times occurred.

Carpenter, C. S., & Eisenberg, D. (2009). Effects of Sunday sales restrictions on overall and day-specific alcohol consumption: evidence from Canada. *Journal of Studies on Alcohol and Drugs*, 70(1), 126-133.

Using data on day of the week drinking from Canada's National Population Health Surveys for 1994 through 1999, this study evaluated the effects Sunday sales prohibition had on alcohol consumption during specific and non-specific days of the week. Results indicate that allowing

sales on Sundays increased drinking on Sundays by 7% to 15% but did not significantly affect overall consumption.

Stockwell, T., & Chikritzhs, T. (2009). Do relaxed trading hours for bars and clubs mean more relaxed drinking? A review of international research on the impacts of changes to permitted hours of drinking. *Crime Prevention and Community Safety*, 11(3), 153-171.

This review identified 49 studies on the topic of trading hours in the international literature since 1965. The quality of these studies was found to be generally poor with only 14 peer-reviewed studies, including identifying both baseline and control measures. The authors conclude that the evidence suggests that extended hours of sale for alcoholic beverages increase both alcohol consumption and related-harms. They also call for more well-controlled studies to confirm these conclusions.

Maloney, M. T., & Rudbeck, J. C. (2009). The outcome from legalizing Sunday packaged alcohol sales on traffic accidents in New Mexico. *Accident Analysis and Prevention*, 41(5), 1094-1098.

This study evaluates the impact of New Mexico's repeal of a Sunday sales prohibition in 1995 on alcohol-related accidents and fatal crashes in that state. No significant effect of allowing Sunday sales was found.

Duailibi, S., Ponicki, W., Grube, J., Pinsky, I., Laranjeira, R., & Raw, M. (2007). The effect of restricting opening hours on alcohol-related violence. *American Journal of Public Health*, 97(12), 2276-2280.

In July 2002, legislation was passed in Diadema, Brazil, to restrict the hours of on-premise alcohol sales, prohibiting sales after 11pm. This study looked at the effect of the legislation on homicide and violence against women. The authors found that the new restrictions resulted in nine less murders per month. Assaults also declined, although the effect was not significant.

Stehr, M. (2007). The effect of Sunday sales bans and excise taxes on drinking and cross-border shopping for alcoholic beverages. *National Tax Journal*, 60(1), 85-105.

This paper assessed the effects of Sunday sales bans on, within, and across state alcohol purchases from 1990-2004. The author concludes that, while the demand for spirits and beer is price elastic, 20-40% of the elasticity for spirits can be explained by the purchase of spirits from bordering states rather than a decrease in the amount being purchased in-state. The author also concludes that repealing Sunday sales bans leads to an increase in spirits sales, but beer sales are more apt to follow pre-existing trends in states where the ban has been repealed. Concerning the increase in spirits sales following a repeal of the ban on Sunday sales, about 80% of the increase comes from in-state purchases, while 20% comes from shopping in bordering states.

McMillan, G. P., & Lapham, S. (2006). Legalized Sunday packaged alcohol sales and alcohol-related traffic crashes and crash fatalities in New Mexico.(Ban on Sunday packaged alcohol sales). *The American Journal of Public Health*, 96(11), 1944-1948.

This study investigated the effect of New Mexico legislation lifting the ban on Sunday packaged alcohol sales on the relative risk of alcohol-related motor vehicle accidents. The authors found that, after the ban was lifted, there was a 29% increase in alcohol-related traffic crashes and a 42% increase in alcohol-related crash fatalities on Sundays.

Goodacre, S. (2005). The 2003 Licensing Act: An act of stupidity? *Emergency Medicine Journal*, 22(10), 682.

In attempt to foster a more relaxed approach to drinking and reduce negative alcohol related outcomes, the British government introduced the Licensing Act in 2003 which removed restrictions on the sale of alcohol in bars and pubs by extending the drinking time past 11pm. The rationale was that by allowing patrons to stay in the bars and drink past 11pm, the incidence of alcohol related accidents and violence after 11pm would be reduced. The author of this article makes the claim that this new act will

not reduce the number of alcohol related visits to the emergency room as claimed by proponents of the act, but will rather not have any effect on the number of alcohol related emergency room visits. Furthermore, the author claims that this act will do nothing to curb the increasing consumption of alcohol in the U.K.

Nörstrom, T., & Skog, O-J. (2003). Saturday opening of alcohol retail shops in Sweden: An impact analysis. *Journal of Studies on Alcohol*, 64(3), 393-401.

This study examined alcohol sales, assaults and drunk driving as a result of opening Swedish alcohol monopoly outlets on Saturdays in February 2000. Only stores in six countries were opened, while a control area of seven countries where stores were not opened was studied as a comparison. Results showed a significant increase in alcohol sales of 3.3% in the countries where stores were opened. There was no significant increase in assaults. While there was a significant increase in drunk driving, the authors posit that this might have been due to a change in the surveillance strategy of police.

Chikritzhs, T., & Stockwell, T. (2002). The impact of later trading hours for Australian public houses (hotels) on levels of violence. *Journal of Studies on Alcohol*, 63(5), 591-599.

These articles chronicle the effects of later alcoholic beverage trading hours in public houses in Perth, Western Australia, on violence, impaired driver road crashes and driver breath alcohol levels. In Western Australia, the Liquor Licensing Act of 1988 outlines closing times for premises which are licensed to sell alcoholic beverages. The act also allows these establishments to obtain an extended trading permit which allows for an hour of extra trading at closing times. When considering levels of violence, the authors compared the number of assaults associated with hotels that did and did not hold an extended trading permit. Results showed a significantly greater number of assaults associated with hotels which held extended trading permits. Concerning traffic crashes and driver breath alcohol content, the authors also found a significant difference associated with hotels which held extended permits. However, no association was

found between hotels that held extended trading permits and driver breath alcohol level.

Additional References Not Annotated for Section 2.25

Schofield, T. P., & Denson, T. F. (2013). Alcohol outlet business hours and violent crime in New York state [doi: 10.1093/alcalc/agt003]. ***Alcohol and Alcoholism***.

Graham, K. (2012). Commentary on Rossow and Norström (2012): when should bars close? ***Addiction***, 107(3), 538-539.

Paschall, M. J., Grube, J. W., Thomas, S., & Cannon, C. (2012). Relationships between local enforcement, alcohol availability, drinking norms, and adolescent alcohol use in 50 California cities. ***Journal of Studies on Alcohol and Drugs***, 73(4), 657-665.

Carpenter, C., & Dobkin, C. (2010). Alcohol regulation and crime [NBER Working Paper No. 15828] [Accessed: 2012-07-26. Archived by ***WebCite***® at ***http://www.webcitation.org/69RvqKVXu***]. New York: The National Bureau of Economics Research.

Popova S., Giesbrecht N., Bekmuradov D., & Patra J. (2009) Hours and days of sale and density of alcohol outlets: impacts on alcohol consumption and damage: a systematic review. ***Alcohol and Alcoholism***, 44(5), 500-516.

Vingilis, E., McLeod, A. I., Mann, R. E., & Seeley, J. (2008). A tale of two cities: the effect of extended drinking hours in licensed establishments on impaired driving and assault charges. ***Traffic Injury Prevention***, 9(6), 527-533.

McMillan, G. P., Hanson, T. E., & Lapham, S. C. (2007). Geographic variability in alcohol-related crashes in response to legalized Sunday packaged alcohol sales in Mew Mexico. ***Accident Analysis and Prevention***, 39(2), 252-257.

Vingilis, E. (2007). ***The Effects of Establishing Closing Hours in Juarez, Mexico***. Paper presented at the Limits on Hours of Sales and Service: Effects on Traffic Safety, Irvine, CA.

Voas, R. B., Romano, E., & Kelley-Baker, T. (2007). ***The Effects of Establishing Closing Hours in Juarez, Mexico***. Paper presented at the Traffic Safety and Alcohol Regulation: A Symposium, Irvine, CA.

Chikritzhs, T., & Stockwell, T. (2006). The impact of later trading hours for hotels on levels of impaired driver road crashes and driver breath alcohol levels. ***Addiction***, 101(9), 1254-1264.

Vingilis, E., McLeod, A. I., Seeley, J., Mann, R., Voas, R., & Compton, C. (2006). The impact of Ontario's extended drinking hours on cross-border cities of Windsor and Detroit. ***Accident Analysis & Prevention***, 38(1), 63-70.

Vingilis, E., McLeod, A. I., Seeley, J., Mann, R. E., Beirness, D., & Compton, C. P. (2005). Road safety impact of extended drinking hours in Ontario. ***Accident Analysis & Prevention***, 37(3), 549-556.

Foster, J. (2003). Extended alcohol licensing hours in England and Wales: There will be a large price to pay. ***Education, Prevention and Policy***, 10, 285-287.

Drummond, D. C. (2000). UK government announces first major relaxation in the alcohol licensing laws for nearly a century: Drinking in the UK goes 24-7. ***Addiction***, 95(7), 997-998.

Ligon, J., & Thyer, B. A. (1993). The effects of a Sunday liquor sales ban on DUI arrests. ***Journal of Alcohol and Drug Education***, 38(2), 33-40.

McLaughlin, K. L., & Harrison-Stewart, A. J. (1992). The effect of a temporary period of relaxed licensing laws on the alcohol consumption of young male drinkers. ***The International Journal of the Addictions***, 27(4), 409-423.

Smith, D. I. (1988). Effect on traffic accidents of introducing Sunday alcohol sales in Brisbane, Australia. ***The International Journal of the Addictions***, 23(10), 1091-1099.

2.26 Minimum Drinking Age Laws

Minimum legal drinking age (MLDA) laws include not only the legal designation of a minimum purchase age, but a variety of measures aimed at discouraging and preventing access to alcohol by those below the legal age limit. In general, a considerable amount of research supports the notion that increasing the minimum legal drinking age results in lower alcohol consumption and alcohol-related problems and fewer alcohol-related traffic fatalities among youth in the United States. Studies have also considered different kinds of outcomes linked to the minimum legal drinking age, for example youth suicide rates were found to be lower in states with a minimum age of 21. In contrast, one study suggested that increasing the minimum age may have resulted in a small increase in marijuana use, potentially through a substitution effect, due to the relative shift in the difficulty of access. However, research generally suggests that alcohol and marijuana are complements (see Section 2.14). Recent research has confirmed the effectiveness of the MLDA in reducing alcohol consumption and preventing alcohol-related harms. Studies of long term effects of lowered MLDA's in the 1970's has found that women exposed to lower MLDAs had higher rates of alcohol and drug use disorders as adults as well as greater risks for suicide and homicide.

Key Articles Cited In Section 2.26

Subbaraman, M. S., & Kerr, W. C. (2013). State panel estimates of the effects of the minimum legal drinking age on alcohol consumption, 1950-2002. ***Alcoholism: Clinical and Experimental Research*****, 37(Suppl. 1), E291-E296.**

This study evaluates the relationship between the MLDA and per capita alcohol consumption over the 1950 to 2002 period, covering the full time period of lowered and raised MLDA in the U.S. They find that the increase in the MLDA from 18 to 21 was associated with a 1.5% reduction in overall alcohol consumption with greater impacts on beer and spirits.

Grucza, R. A., Hipp, P. R., Norberg, K. E., Rundell, L., Evanoff, A., Cavazos-Rehg, P., & Bierut, L. J. (2012). The legacy of minimum legal drinking age law changes: long-term effects on suicide and homicide deaths among women. ***Alcoholism: Clinical and Experimental Research*****, 36(2), 377-384.**

Women born after 1960 who were exposed to MLDA's below 21 were found to be at increased risk for later homicide and suicide during the 1990-2004 period.

Carpenter, C., & Dobkin, C. (2011). The minimum legal drinking age and public health. ***Journal of Economic Perspectives*****, 25(2), 133-156.**

This paper considers the choice of the minimum legal drinking age in terms of conceptual arguments and different types of empirical evidence. They focus on the marginal costs and benefits of lower ages to those in the age groups affected and others who may be harmed by their behaviors. They conclude that the 21 MLDA is better from a cost benefit perspective than an MLDA of 18.

Lovenheim, M. F., & Slemrod, J. (2010). The fatal toll of driving to drink: the effect of minimum legal drinking age evasion on traffic fatalities. *Journal of Health Economics*, 29(1), 62-77.

This study considers county-level traffic fatality data from 1977 to 2002, when states had different legal drinking ages. It found that living in a state which had the drinking age at 21 and which was near a border with a lower drinking age, had increased traffic fatality risk for 18-19 year olds. It also found that counties farther than 25 miles from such a border had reduced risk in traffic fatalities. The study concluded that the uniform 21 drinking age prevents such border effects and warns against individual states lowering the MLDA.

Wechsler, H., & Nelson, T. F. (2010). Will increasing alcohol availability by lowering the minimum legal drinking age decrease drinking and related consequences among youths? *American Journal of Public Health*, 100(6), 986-992.

This review considers a variety of evidence and arguments related to the minimum legal drinking age of 21 in the U.S. They conclude that there is strong evidence supporting a MLDA of 21 for reducing deaths and other harms from alcohol use.

Miron, J. A., & Tetelbaum, E. (2009). Does the Minimum Legal Drinking Age Save Lives? *Economic Inquiry*, 47(2), 317-336.

This paper explores whether the Federal Uniform Drinking Age Act which directed all states in the U.S. to adopt a minimum legal drinking age of 21 resulted in saving lives as a result of fewer alcohol related traffic accidents. Reviewing state level data from the last 30 years, the authors conclude that any nationwide impact of raising the minimum legal drinking age occurred via states that chose to make this change prior to the demand set forth by the Federal act. Furthermore, the authors conclude that the impact of the age change was only short term and did not extend past the year it was adopted, even in states that were the first to raise the legal drinking age. Finally, the authors state that although the Federal mandate

has impacted teen drinking, that impact is minor. The authors attribute much of the decrease in traffic fatalities to improvements in automobile design and advances in medical technology.

Norberg, K. E., Bierut, L. J., & Grucza, R. A. (2009). Long-term effects of minimum drinking age laws on past-year alcohol and drug use disorders. *Alcoholism: Clinical and Experimental Research*, 33(12), 2180-2190.

Adults that had been allowed to legally drink at ages below 21 were found to have higher rates of alcohol and drug use disorders in their 40's and 50's, suggesting long-term implications of early legal access to alcohol.

Fell, J.C., Fisher, D.A., Voas, R.B., Blackman, K. & Tippetts, A.S. (2008). The relationship of underage drinking laws to reductions in drinking drivers in fatal crashes in the United States. *Accident Analysis & Prevention*, 40, 1430-1440.

In this study, laws prohibiting alcohol purchase and possession by those less than 21 years old reduced the number of alcohol related fatal traffic crashes by 11.2% for that age group. A further evaluation of 14 additional laws related to underage drinking found that making it illegal to use false identification reduced this ratio by 7.3%. Other laws were not found to have significant effects in these analyses.

Fell, J. C. V., Robert B; Fisher, Deborah A. (2007). *Status of 14 Under-Age-21 Drinking Laws in the United States*. Paper presented at the Traffic Safety and Alcohol Regulation, Irvine, CA.

This article highlights the complexity of alcohol control policy by discussing 14 types of laws relevant to the prevention of underage drinking, and listing the states that have enacted laws under each area. The law areas include possession, consumption, purchase, furnishing, age of servers and sellers of alcohol, zero tolerance for drinking and driving, keg registration, social host liability, graduated drivers licensing, and government control of alcohol sales. States are ranked in terms of

the number of these laws and regulations enacted with only seven states having 11 or more of the 14. These are Alabama, Maine, New Hampshire, Oregon, Pennsylvania, Utah and Washington, all of which are control states. The article also presents recommendations for limiting youth access to alcohol and provides a framework for future research by characterizing states in terms of these laws and regulations.

Ponicki, W. R., Gruenewald, P. J., & LaScala, E. A. (2007). Joint impacts of minimum legal drinking age and beer taxes on U.S. youth traffic fatalities, 1975 to 2001. *Alcoholism: Clinical and Experimental Research*, 31(5), 804-813.

This article examines the interdependent effects of minimum legal drinking age (MLDA) and beer taxes on youth traffic fatalities in the U.S. from 1975-2001. The authors found that, independently, MLDA's and higher beer taxes resulted in a reduction in youth traffic fatalities. However, the authors also found that when beer taxes are already high, raising the MLDA has a smaller effect on reducing traffic fatalities than when beer taxes are low. The authors concluded that the magnitude of the effect of MLDA's on traffic fatalities might depend on the current tax structure for beer.

Kypri, K., Voas, R.B., Langley, J.D., Stephenson, S.C.R., Begg, D.J., Tippetts, A.S., Davie, G.S., (2006). Minimum purchasing age for alcohol and traffic crash injuries among 15- to 19-year-olds in New Zealand. *American Journal of Public Health*, 96 (1), 126–131.

This study evaluates alcohol-involved crashes and hospitalized injuries as a result of the 1999 reduction in the MLDA in New Zealand from 20 to 18 years. Using injuries and hospitalizations among those aged 21-25 as a control group in a period of generally declining injury rates, this study finds that the MLDA reduction was associated with significantly increased alcohol-involved crash injuries among men and women aged 15-19, and among men aged 15-17.

Wagenaar, A. C., & Toomey, T. L. (2002). Effects of minimum drinking age laws: Review and analyses of the literature from 1960 to 2000. *Journal of Studies on Alcohol*. Special Issue: College drinking, what it is, and what do to about it: Review of the state of the science, (Suppl14), 206-225.

This article is a literature review focusing on the effects of minimum legal drinking age laws published from 1960-1999. The authors found that among the studies deemed high quality due to sample size, sampling design and research methodology; almost all showed an inverse relationship between legal drinking age and alcohol consumption, traffic accidents and other alcohol-related problems. The authors point out that more research on this relationship among college students is needed.

DiNardo, J. L., T. (2001). Alcohol, marijuana, and American youth: The unintended consequences of government regulation. *Journal of Health Economics*, 20(6), 991-1010.

The study is based on a sample of students from 43 states in the U.S. from the years 1980-1989 through the Monitoring the Future survey. The authors sought to determine the impact of changes in the minimum drinking age on alcohol and marijuana use among youth. Citing substitution effects, the authors found that raising the minimum legal drinking age slightly reduced alcohol consumption among the sample and slightly increased the consumption of marijuana.

Birckmayer, J., & Hemenway, D. (1999). Minimum-age drinking laws and youth suicide, 1970-1990. *American Journal of Public Health*, 89(9), 1365-1368.

This study looked at the relationship between the minimum legal drinking age and the occurrence of suicide among 18 to 20 year olds in the U.S. between the years of 1970 and 1990. The authors concluded that states with a minimum legal drinking age of 18 had a suicide rate that was 8% higher than states where the minimum legal drinking age was 21.

O'Malley, P. M., & Wagenaar, A. C. (1991). Effects of minimum drinking age laws on alcohol use, related behaviors and traffic crash involvement among American youth: 1976-1987. *Journal of Studies on Alcohol*, 52(5), 478-491.

In this study, the authors utilized the Monitoring the Future survey to determine the effect of raising the minimum drinking age on alcohol consumption and fatal alcohol-related traffic crashes among young adults in the United States. After analyses, the authors concluded that higher minimum drinking ages were associated with lower alcohol consumption, even after the youth became of age to consume alcohol. The authors also concluded that, as a result of lower consumption, particularly at bars and taverns, youth were involved in fewer fatal alcohol-related traffic accidents.

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2.27 Underage and College Alcohol Policies

Alcohol policies directed at underage drinkers, such as the minimum legal drinking age and zero tolerance drinking and driving policies have been shown to lower the rates of underage drinking and to have an effect on reducing alcohol-related harm in this population. General alcohol policies such as taxation and other policies that increase price have also been shown to reduce underage drinking, especially at the state level. The enforcement and awareness of alcohol policies both in the state and at the college campus level have been shown to increase the effectiveness of alcohol-related interventions. Policies such as random breath checks and the control of outlet densities have been found to have less of an effect on reducing underage drinking. Underage drinking has been shown to contribute to large societal costs from alcohol, particularly in areas such as alcohol-related physical and sexual violence, suicide and traffic crashes. Furthermore, it is estimated that these societal costs are greater than the sales and tax revenue generated from underage alcohol sales.

Key Articles Cited In Section 2.27

Ringwalt, C.L., & Paschall, M.J. (2011). The Utility of Keg Registration Laws: A Cross-Sectional Study. *Journal of Adolescent Health*, 48, 106-108.

Keg registration policies have become a common practice in many states that are seeking to reduce the harms of adolescent binge drinking. More longitudinal research is required to understand the links between keg registration policies and adolescent alcohol consumption and related problems.

Hingson, R. W. (2010). Magnitude and prevention of college drinking related problems. ***Alcohol Research and Health*****, 33(1-2), 45-54.**

This review highlights increases in binge drinking, DUI and alcohol-related injury deaths among college students from 1999 to 2005.

Saltz, R. F., Paschall, M. J., McGaffigan, R. P., & Nygaard, P. M. O. (2010). Alcohol risk management in college settings: the safer California universities randomized trial. ***American Journal of Preventive Medicine*****, 39(6), 491-499.**

This study evaluated a program focused on environmental strategies such as DUI checkpoints, social host ordinances and nuisance party enforcement to reduce drinking to intoxication among students in university communities. Students at intervention universities were found to drink to intoxication less than those at control universities.

Clapp, J. D., Martell, B., Woodruff, S., & Reed, M. B. (2012). Evaluating self-checkout lanes as a potential source of alcoholic beverages for minors. ***Journal of Studies on Alcohol and Drugs*****, 73(5), 713-717.**

This study used pseudo-underage buyers to evaluate ID checking in retail stores self-checkout lanes. They found that in 8.8% of buy attempts, no identification was requested, making this action a potential source of alcohol for underage drinkers.

Fell, J. C., Fisher, D. A., Voas, R. B., Blackman, K., & Tippetts, A. S. (2009). The impact of underage drinking laws on alcohol-related fatal crashes of young drivers. ***Alcoholism: Clinical and Experimental Research*****, 33(7), 1208-1219.**

This study evaluates the effects of six underage drinking laws on the fatal crash incidence ratio. It looked at the proportion of drinking to nondrinking drivers involved in fatal crashes by state from 1998 to 2005. Laws making it illegal for underage youth to possess or purchase alcoholic

beverage, zero tolerance laws for underage drivers, and "use and lose" laws mandating drivers' license suspension for alcohol law violations by underage youth were all found to reduce the fatal crash incidence ratio.

Fell, J.C., Fisher, D.A., Voas, R.B., Blackman, K. & Tippetts, A.S. (2008). The relationship of underage drinking laws to reductions in drinking drivers in fatal crashes in the United States. *Accident Analysis & Prevention*, 40, 1430-1440.

In this study laws prohibiting the possession and purchase of alcohol by those less than 21 years of age were found to reduce the ratio of drinking to non-drinking drivers aged 20 and younger involved in fatal traffic crashes by 11.2%. A further evaluation of 14 additional laws related to underage drinking found that making it illegal to use false identification reduced this ratio by 7.3%. Other laws were not found to have significant effects in these analyses.

Carpenter, C. S. K., Deborah D., O'Malley, P., and Johnston, L. (2007). Alcohol control policies and youth alcohol consumption: Evidence from 28 years of monitoring the future. *The B.E. Journal of Economic Analysis & Policy*, 7(1), 1-21.

Using data from the Monitoring the Future Survey, this article explored the effect of three alcohol policies, the minimum legal drinking age, beer taxes, and zero tolerance underage drunk driving laws on the drinking behaviors of high school seniors. Measured outcomes were drinking participation and heavy episodic drinking. The largest reductions in alcohol consumption were determined to be a result of minimum age drinking laws, although zero tolerance laws and beer taxes were also shown to reduce underage drinking in the sample.

Miller, T. R., Levy, D. T., Spicer, R. S., & Taylor, D. M. (2006). Societal costs of underage drinking. *Journal of Studies on Alcohol*, 67(4), 519-528.

This article examined the costs of underage drinking as it relates to traffic crashes, violence, property crime, suicide, burns, drowning, fetal alcohol

syndrome, high risk sex, poisoning, psychoses and dependency and treatment. These estimated costs were compared to the costs associated with alcohol sales. The authors concluded that while underage drinking accounted for 16% of alcohol sales in 2001, its cost to society in terms of deaths and other harmful events was $61.9 billion, 67% of which was attributable to quality of life costs. Overall costs were dominated by alcohol-related violence and car crashes. Outside the consideration of quality of life, the authors assessed societal harm at $1 per underage drink compared to the $0.90 purchase price and $0.10 in tax revenue.

Nelson, T. F., Naimi, T. S., Brewer, R. D., & Wechsler, H. (2005). The state sets the rate: the relationship among state-specific college binge drinking, state binge drinking rates, and selected state alcohol control policies. *The American Journal of Public Health*, 95(3), 441-446.

In this article, the authors explored the relationship between college binge drinking rates, the rates of binge drinking by adults in the general population and alcohol control policies. The authors found a strong correlation between college binge drinking and binge drinking in the general population. Students who attended colleges in states with lower binge drinking rates and stricter alcohol policies had lower binge drinking rates. The authors concluded that state of residence is a predictor in college binge drinking and binge drinking in the general population, and can be affected by state level alcohol policies.

Grube, J. W., & Nygaard, P. (2001). Adolescent drinking and alcohol policy. *Contemporary Drug Problems*, 28(1), 87-132.

This article is a literature review looking at the effectiveness of several alcohol policies on reducing underage drinking and its associated problems. The authors found that the most effective policies, according to the literature reviewed, are taxation or price increases, raising the minimum legal drinking age, and zero tolerance policies. Interventions such as random breath checks, sobriety check points and major changes in the condition of sale, show some promise. There is little research

examining their effectiveness with this population. Other alcohol-related policies such as outlet density, responsible beverage service and advertising restrictions have less support in the literature as being effective alcohol deterrents for young people. However, the authors concluded that the effectiveness of alcohol-related policies is directly related to the level of enforcement, the awareness of young people, and those who enforce the policies.

Grossman, M., & Markowitz, S. (1999). ***Alcohol Regulation and Violence on College Campuses*** **(National Bureau of Economic Research Working Paper Series No. 7129).**

This paper examined the relationship between the price of alcoholic beverages and the occurrence of violence on college campuses. Measures of violence included getting in trouble with the police, residence hall or other authorities; damaging property; getting into an argument or fight; and taking advantage of another person sexually, or being taken advantage of sexually. The authors found an inverse relationship between all indicators of violence and the price of beer in the state in which the participant attends college.

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without age identification in northeastern Minnesota, U.S.A. ***Addiction***, 89(6), 699-705.

Preusser, D. F., A.F., W., & Weinstein, H. B. (1994). Policing underage alcohol sales. ***Journal of Safety Research***, 25(3), 127-133.

Mayhew, D. R., Donelson, A. C., Beirness, D. J., & Simpson, H. M. (1986). Youth, alcohol and relative risk of crash involvement. ***Accident Analysis and Prevention***, 18(4), 273-287.

2.28 Server, Bar and Social Host Liability

Research on the effects of policies such as server liability, social host laws and responsible server programs on alcohol consumption and related harms, shows that these policies can be effective at reducing alcohol consumption and related harm if their consequences are public and if states have the legal means to publicize and prosecute such offenses. Publicity following server liability lawsuits has been shown to reduce injuries from traffic accidents and reduce the instances of over-serving at alcohol beverage establishments. However, maintaining effects over the long-term has proven difficult. More research is needed to determine the possible effects of policies such as social host liability laws and responsible beverage service training.

Key Articles Cited In Section 2.28

Jones, L., Hughes, K., Atkinson, A. M., & Bellis, M. A. (2011). Reducing harm in drinking environments: a systematic review of effective approaches. *Health and Place*, 17(2), 508-518.

This review found support for multi-component programs including community mobilization, responsible beverage service training and stricter enforcement of licensing policies in reducing assaults, traffic crashes and underage sales.

Rammohan, V., Hahn, R. A., Elder, R., Brewer, R., Fielding, J., Naimi, T. S., et al. (2011). Effects of dram shop liability and enhanced over-service law enforcement initiatives on excessive alcohol consumption and related harms: two community guide systematic reviews. *American Journal of Preventive Medicine*, 41(3), 334-343.

This review from the CDC finds strong evidence supporting the effectiveness of dram shop laws but insufficient evidence regarding over-service enforcement.

Lenk, K. M., Toomey, T. L., Erickson, D. J., Kilian, G. R., Nelson, T. F., & Fabian, L. E. A. (2010). Alcohol control policies and practices at professional sports stadiums. *Public Health Reports*, 125(5), 665-673.

Alcohol-related problems often occur around professional sports stadiums. This study looks at the alcohol policies that stadiums enact toward drinks, and found disparities in these policies across stadiums. It is, nevertheless, a starting point to establishing more effective policy so as to limit alcohol-related problems.

Toomey, T. L., Erickson, D. J., Lenk, K. M., Kilian, G. R., Perry, C. L., & Wagenaar, A. C. (2008). A randomized trial to evaluate a management training program to prevent illegal alcohol sales. *Addiction*, 103(3), 405-413.

This paper presents the results of a randomized trial of the Alcohol Risk Management (ARM) training program for owners and managers of alcohol establishments in a Midwestern city. The program included four, one to two hour training sessions designed to help the managers implement alcohol control policies in their establishments. The evaluation found that sales to pseudo-intoxicated patrons were reduced by 23% at the first follow-up, but no effect was seen in a 3 month follow-up. The authors conclude that management training alone is not sufficient to reduce alcohol-related problems.

Wagenaar, A. C., & Tobler, A. L. (2007). *Alcohol sales and service to underage youth and intoxicated patrons: Effects of responsible beverage service training and enforcement interventions*. Paper presented at the Traffic Safety and Alcohol Regulation, Irvine, CA.

This paper presents a comprehensive review of research on the effectiveness of responsible beverage service (RBS) training and enforcement. The review covers 34 papers in this area and concludes that the literature provides mixed evidence of modest effects. The authors also highlight the importance of direct enforcement of laws and the potential for mandatory RBS training to lay the groundwork for more consistent and high quality training, which may increase effectiveness.

Ker, K., & Chinnock, P. (2006). *Interventions in the alcohol server setting for preventing injuries*. Cochrane Database of Systematic Reviews(2), CD005244.

The article is a systematic review of the literature on server training designed to prevent injuries. Twenty relevant studies were identified including five in which injury was evaluated as an outcome. Overall methodological quality was judged to be poor. The author concludes that there is no reliable evidence that interventions in the alcohol server setting are effective in reducing injuries and suggests that compliance with the intervention is a key problem.

Wallin, E., Gripenberg, J., & Andréasson, S. (2005). Overserving at licensed premises in Stockholm: Effects of a community action program. *Journal of Studies on Alcohol*, 66(6), 806-814.

This study looked at the effect of a community action program targeting establishments who over-serve patrons. Results showed an increase in the refusal to serve intoxicated patrons after the introduction of interventions such as community mobilization, training in responsible beverage service and increased enforcement.

Stout, E. M., Sloan, F. A., Liang, L., & Davies, H. H. (2000). Reducing harmful alcohol-related behaviors: Effective regulatory methods. *Journal of Studies on Alcohol*, 61(3), 402-412.

This paper looked at the effectiveness of several methods intended to reduce the harms associated with alcohol. The authors found that tort liability laws on bars reduced self-reported drunk driving across levels of drinking, but did not reduce heavy episodic drinking among heavy drinkers. Furthermore, the authors found that social host liability laws reduced the self-reported probability of heavy episodic drinking, and drinking and driving across drinking levels.

Holder, H. D., Janes, K., Mosher, J., Saltz, R., Spurr, S., & Wagenaar, A. C. (1993). Alcoholic beverage server liability and the reduction of alcohol-involved problems. *Journal of Studies on Alcohol*, 54(1), 23-36.

This paper first identified possible legal barriers to states implementing server liability laws and then ranked each state according to this analysis. States that were determined to have the greatest access to server liability had the most publicity of such laws, higher awareness and concern on the part of alcohol beverage providers, and different serving practices, than states with the lowest liability exposure.

Wagenaar, A. C., & Holder, H. D. (1991). Effects of alcoholic beverage server liability on traffic crash injuries. *Alcoholism: Clinical and Experimental Research*, 15(6), 942-947.

This study looked at the effect that exposure to legal liability information had on alcohol beverage servers in Texas, and the frequency of injuries from motor vehicle crashes from 1978 to 1988. Following the filing of two major liability suits in 1983 and 1984, a decrease of 6.5% and 5.3% respectively was found for traffic related injuries.

Additional References Not Annotated for Section 2.28

Rivara, F. P., Boisvert, D., Relyea-Chew, A., & Gomez, T. (2012). Last call: decreasing drunk driving among 21-34-year-old bar patrons. ***International Journal of Injury Control and Safety Promotion***, 19(1), 53-61.

Clapp, J. D., Reed, M. B., Min, J. W., Shillington, A. M., Croff, J. M., Holmes, M. R., et al. (2009). Blood alcohol concentrations among bar patrons: A multi-level study of drinking behavior. ***Drug and Alcohol Dependence***, 102(1-3), 41-48.

Lenk, K. M., Toomey, T. L., & Erickson, D. J. (2006). Propensity of alcohol establishments to sell to obviously intoxicated patrons. ***Alcoholism: Clinical and Experimental Research***, 30(7), 1194-1199.

Wagenaar, A. C., Toomey, T. L., & Erickson, D. J. (2005). Preventing youth access to alcohol: outcomes from a multi-community time-series trial. ***Addiction***, 100(3), 335-345.

Toomey, T. L., Wagenaar, A. C., Erickson, D. J., Fletcher, L. A., Patrek, W., & Lenk, K. M. (2004). Illegal alcohol sales to obviously intoxicated patrons at licensed establishments. ***Alcoholism: Clinical and Experimental Research***, 28(5), 769-774.

Mosher, J. F., Toomey, T. L., Good, C., Harwood, E. M., & Wagenaar, A. C. (2002). State laws mandating or promoting training programs for alcohol servers and establishment managers: an assessment of statutory and administative procedures. ***Journal of Public Health Policy***, 23(1), 90-113.

Buka, S. L., & Birdthistle, I. J. (1999). Long-term effects of a community-wide alcohol server training intervention. ***Journal of Studies on Alcohol***, 60(1), 27-36.

Gehan, J. P., Toomey, T. L., Jones-Webb, R., Rothstein, C., & Wagenaar, A. C. (1999). Alcohol outlet workers and managers: focus groups on responsible service practices. ***Journal of Alcohol and Drug Education***, 44(2), 60-71.

Toomey, T. L., Wagenaar, A. C., Kilian, G., Fitch, O., Rothstein, C., & Fletcher, L. (1999). Alcohol sales to pseudo-intoxicated bar patrons. ***Public Health Reports***, 114(4), 337-342.

Toomey, T. L., Kilian, G. R., Gehan, J. P., Perry, C., Jones-Webb, R., & Wagenaar, A. C. (1998). Qualitative assessment of training programs for alcohol servers and establishment managers. ***Public Health Reports***, 113(2), 162-169.

Toomey, T., Kilian, G., Gehan, J., Wagenaar, A., Perry, C., & Jones-Webb, R. (1998). Qualitative assessment of responsible alcohol service training programs. ***Public Health Reports***, 113, 162-169.

Dresser, J., & Glicksman, L. (1998). Comparing statewide alcohol server training programs. ***Pharmacology, Biochemistry and Behavior***, 61, 150.

Saltz, R. F., & Stanghetta, P. (1997). A community-wide Responsible Beverage Service program in three communities: Early findings. ***Addiction***, 92 Suppl 2, S237-249.

Vaucher, S., Rehm, J., Benvenuti, J., & Müller, R. (1995). Young teenagers and access to alcohol in a Swiss canton: evidence from observational testing and from a telephone survey. ***Addiction***, 90(12), 1619-1625.

Holder, H. D., & Wagenaar, A. C. (1994). Mandated server training and reduced alcohol-involved traffic crashes: a time series analysis of the Oregon experience. ***Accident Analysis & Prevention***, 26(1), 89-97.

Sloan, F. A., Reilly, B. A., & Schenzler, C. (1994). Effects of prices, civil and criminal sanctions, and law enforcement on alcohol-related mortality. ***Journal of Studies on Alcohol***, 55(4), 454-465.

Howard-Pitney, B., Johnson, M. D., Altman, D. G., Hopkins, R., & Hammond, N. (1991). Responsible alcohol service: a study of server, manager, and environmental impact. ***American Journal of Public Health***, 81(2), 197-199.

McKnight, A. J. (1991). Factors influencing the effectiveness of server-intervention education. ***Journal of Studies on Alcohol***, 52(5), 389-397.

2.3 What are the effects of other types of marketing regulation such as advertising codes or bans in particular media?

2.31 Advertising bans and restrictions

Concerning the role of alcohol advertising in a person's decision to drink, it is unclear to what extent advertising is as important as other social, cultural and economic factors. Research on alcohol advertising includes studies on the relationship between advertising, consumption and other alcohol related problems, the effects of advertising on youth, and the effects of counter-promotion such as alcohol warning labels. While advertising has been shown to be associated with increased sales and consumption at an aggregate level, advertising has not been found to be strongly related to per capita consumption and research suggests that there is a point of diminishing returns concerning alcohol advertising expenditures. There is also support for a substitution effect where one form of banned advertising is replaced by an acceptable form of alcohol advertising, further complicating efforts to understand the relationship between advertising and consumption. Research on the self-enforcement of industry codes regulating content of advertisements indicates that these codes are routinely violated and that these violators rarely receive meaningful punishments. The estimated relationship between bans on alcohol advertising and consumption has been more clearly demonstrated than that between consumption and ad expenditures. Research estimates that a television advertising ban might decrease overall consumption by 5-8%. Furthermore, as banning advertising seem to follow consumption patterns, perhaps via windows of opportunity for public support, increases in consumption may result in more bans being passed, and decreases in consumption may be associated with bans being rescinded. In regards to the effect of advertising on youth, they are exposed to alcohol ads throughout their lives and research supports that enjoyment of alcohol ads as a child can affect drinking intentions later in life. Finally, counter-promotion efforts, such as warning labels, have been shown to increase public awareness and promote discussion of the potential harms associated with alcohol consumption. There is also some evidence of an effect on youth drinking.

Key Articles Cited In Section 2.31

Mosher, J. F., & Cohen, E. N. (2012). State Laws to Reduce the Impact of Alcohol Marketing on Youth: Current status and model policies [Accessed: 2012-07-31. Archived by *WebCite*® at *http://www.webcitation.org/69ZyKmNKi*]. Baltimore, MD: Center on Alcohol Marketing and Youth.

This report provides an overview and model policies for state-level restrictions on alcohol advertising and marketing covering all types of media, sponsorships and promotions.

Vendrame, A., Pinsky, I., e Silva, R. S., & Babor, T. (2010). Assessment of self-regulatory code violations in Brazilian television beer advertisements. *Journal of Studies on Alcohol and Drugs*, 71(3), 445-451.

This Brazilian study found that the five advertisements found to be most appealing by teenagers were also found to violate 11 of 16 guidelines in the Brazilian guidelines for alcohol marketing self-regulation, highlighting the ineffectiveness of self-regulation of advertising content.

Nelson, J. P., & Young, D. J. (2007). Effects of youth, price, and audience size on alcohol advertising in magazines. *Health Economics*, 17, 551-556.

The article examines how youth readership, costs of advertising and audience size affects alcohol advertising in 35 major magazines in the Unites States. After controlling for price of advertising, and adult demographics, the authors failed to find a relationship between alcohol advertising and youth readership, challenging the notion that alcohol companies target their ads to young readers.

Giesbrecht, N., Johnson, S. P., Anglin, L., Greenfield, T. K., & Kavanagh, L. (2004). Alcohol advertising policies in the United States: National promotion and control initiatives. *Contemporary Drug Problems*, 31(4), 673-710.

This article first provides a review of literature pertaining to alcohol advertising policies such as the relationship between advertising and consumption, alcohol advertising and youth, and counter-promotion. While studies have found that advertising has an effect on increasing the sales of alcohol, clear research evidence for an increase in per capita consumption has not been found. However, the authors also point out that this may be due to methodological weaknesses in research design. Also, research supports that bans on advertising of alcohol result in a reduction of consumption and alcohol related harms such as motor vehicle crashes. Concerning alcohol advertising and youth, research supports that some alcoholic advertising is particularly appealing to youth, that exposure to alcohol advertising begins at a young age, and is continuous throughout life. Additionally, some research supports a correlation between enjoyment of alcohol advertising and drinking intentions later in life. The federal requirement of warning labels on alcoholic beverages is an example of counter-promotion, designed at informing the public of the potential hazards of alcohol consumption. These methods have been shown to increase public awareness and discussions of the risks associated with alcohol such as drinking and driving and drinking while pregnant, but the role that they play in changing individual behavior is not as clear. The authors then use data provided by key informants to assess attitudes towards the implementation of five advertising related alcohol policies: 1) warning labels, 2) the SAFE Act: Sensible Advertising and Family Education Act, 3) The Comprehensive Alcohol Abuse Prevention Act, 4) Broadcast advertising of distilled spirits, and 5) Wine "health effects" labels. Themes discussed in the article around this legislation include, 1) the passage of legislation as a result of a window of opportunity, 2) the aforementioned policies being sequential and contingent on each other, 3) the political forces of the protection of free speech and a national disdain for government intrusion into the market, 4) regulatory vs. voluntary approaches, and 5) the relevance of the research.

Saffer, H. (2002). Alcohol advertising and youth. *Journal of Studies on Alcohol. Supplement(14)*, 173-181.

This study looked at whether alcohol advertising had an effect on the alcohol consumption of college students by creating a theoretical framework that suggests that advertising loses its effectiveness after a certain amount of aggregate advertising. The author concludes that advertising does increase alcohol consumption among college students. However, the author points out that partial bans might not reduce this effect since the banned material will likely be substituted with approved advertising for alcohol. The author suggests that, rather than attempt to garner public support for comprehensive alcohol advertising bans, counter-promotion campaigns aimed at youth might be a better method to reduce drinking among college students.

Saffer, H., & Dave, D. (2002). Alcohol consumption and alcohol advertising bans. *Applied Economics*, 34(11), 1325-1334.

This study utilized data pooled from 20 countries over 26 years to determine the effect of alcohol advertising bans on alcohol consumption. Results support that alcohol advertising bans decrease alcohol consumption, with one ban reducing consumption by an estimated 5-8%, and that an increase in consumption is related to new bans being passed, while a decrease in consumption often results in a ban being rescinded.

Slater, M. D., Karan, D. N., Rouner, D., & Walters, D. (2002). Effects of threatening visuals and announcer differences on responses to televised alcohol warnings. *Journal of Applied Communication Research*, 30(1), 27-49.

This article described a study in which 401 adult participants viewed televised alcohol warnings that were varied according to the voice of the announcer and the presence/absence of a threatening visual. Results showed that the presence of a threatening visual increased knowledge of alcohol risks conveyed in the warning but did not affect the perceived risk of drinking beer.

Nelson, J. P., & Young, D. J. (2001). Do advertising bans work? An international comparison. *International Journal of Advertising*, 20(3), 273-297.

This article studied data from 17 OECD (Organization for Economic Co-operation and Development) countries, from 1977-1995, with alcohol advertising bans to determine the effect of the ban on per capita alcohol consumption, liver cirrhosis mortality, and motor vehicle fatalities. Results show that the alcohol advertising bans in the countries studied did not result in a reduction of alcohol consumption or alcohol related problems such as liver cirrhosis and alcohol related mortality. The authors suggest that other social and cultural factors significantly outweigh the effects of advertising when considering why people consume alcohol.

Additional References Not Annotated for Section 2.31

Nelson, J. P. (2010). What is learned from longitudinal studies of advertising and youth drinking and smoking? A critical assessment. ***International Journal of Environmental Research and Public Health***, 7(3), 870-926.

Hollingworth, W., Ebel, B. E., McCarty, C. A., Garrison, M. M., Christakis, D. A., & Rivara, F. P. (2006). Prevention of deaths from harmful drinking in the United States: The potential effects of tax increases and advertising bans on young drinkers. ***Journal of Studies on Alcohol***, 67(2), 300-308.

Nelson, J. P. (2006). Alcohol advertising in magazines: Do beer, wine, and spirits ads target youth? ***Contemporary Economic Policy***, 24(3), 375-369.

Dorsett, J., & Dickerson, S. (2004). Advertising and alcohol consumption in the UK. ***International Journal of Advertising***, 23(2), 149-171.

Nelson, J. P. (2003). Advertising bans, monopoly, and alcohol demand: testing for substitution effects using state panel data. ***Review of Industrial Organization***, 22(1), 1-25.

Beccaria, F. (2001). The Italian debate on alcohol advertising regulation. ***Contemporary Drug Problems***, 28(4), 719-737.

Sheldon, T. (2000). Dutch tighten their rules on advertising of alcohol. ***British Medical Journal***, 320(7242), 1094.

Nelson, J. P. (1999). Broadcast advertising and U.S. demand for alcoholic beverages. ***Southern Economic Journal***, 65(4), 774-790.

Kelly, K. J., & Edwards, R. W. (1998). Image advertisements for alcohol products: Is there appeal associated with adolescents' intention to consume alcohol. ***Adolescence***, 33(129), 47-59.

Markowitz, S., & Grossman, M. (1998). Alcohol regulation and domestic violence towards children. ***Contemporary Economic Policy***, 16, 309-320.

Slater, M. D., & Domenech, M. M. (1995). Alcohol warnings in TV beer advertisements. ***Journal of Studies on Alcohol***, 56(3), 361-367.

Tremblay, C. H., & Tremblay, V. J. (1995). Advertising, price, and welfare: Evidence from the U.S. brewing industry. ***Southern Economic Journal***, 62(2), 367-321.

2.32 Advertising: additional issues

Messages conveyed through advertising and product packaging has been shown to elicit consumer reactions through a variety of mechanisms, such as rate of exposure, the evoking of emotion, and images particularly

appealing to specific subgroups. At the same time, the use of threatening images in alcohol warnings has been shown to intensify the message, yet not increase the viewer's perceived risk of drinking. It may be that the occasional warning about the risks of drinking, even accompanied by a threatening visual, cannot undo the repeated exposure of the consumer to advertisements portraying alcohol as a risk free activity associated with social, physical and financial success. In Brazil, televised alcohol advertisements were found to be shown 4.6% more frequently than advertisements for non-alcoholic beverages, and while 7.2% of the ads portrayed excessive drinking, most did not include information on how to drink moderately. In the U.S., a study with a sample of young adults showed that the participants associated alcohol advertisements with stress reduction, self-confidence, and improved sexual relationships. In an attempt to reduce the exposure of youth to alcohol advertisements and products, The Netherlands passed legislation in 2000 restricting sponsorship by alcoholic beverage companies and alcohol advertisements at events, and on products intended for those under 18. The legislation also restricted the sale of "alcopops", or alcoholic drinks that include fizzy soda and are packaged and labeled in ways appealing to youth. These changes came after the Ministry of Health released a report showing that the money spent on alcohol advertising was nearly 20 times what was spent for alcohol control campaigns.

Key Articles Cited In Section 2.32

Griffth, D. A., Chandra, A., & Ryans, J. K., Jr. (2003). Examining the intricacies of promotion standardization: Factors influencing advertising message and packaging. ***Journal of International Marketing*****, 11(3), 30-47.**

This article looked at the influence of market similarity, process standardization, environmental similarity, and mode of entry on advertising message and packaging. The authors found the effect of these four factors differed with respect to advertising message and packaging.

Jones, S. C., & Donovan, R. J. (2001). Messages in alcohol advertising targeted to youth. ***Australian and New Zealand Journal of Public Health*****, 25(2), 126.**

This study assessed youth reactions to three advertisements for an alcoholic beverage and whether the ads were consistent with the beverage company's voluntary code. Most of the reactions reported by the young adults were related to mood changes that they associated with the alcoholic beverage. The youth reported that the ads represented mood effects such as the reduction of stress, being carefree and increased enjoyment. Consuming the product was associated with self-confidence and improved sexual relationships. One in four youth in the 15-16 year old age group perceived the ads as being targeted to people their age and almost half of the 19-21 year olds perceived the ads to be aimed at individuals younger or much younger than them. These reactions go against the Alcoholic Beverage Advertising Code by portraying alcohol as contributing to social and sexual success, and mood improvement.

Pinsky, I., & Silva, M. T. A. (1999). A frequency and content analysis of alcohol advertising on Brazilian television. ***Journal of Studies on Alcohol*****, 60(3), 394-399.**

The authors in this study analyzed the frequency and content of alcohol beverage advertising on Brazilian television. Concerning frequency, alcohol advertisements were shown 4.6% more than advertisements for other products such as cigarettes and non-alcoholic beverages, but lower than advertisements for food. The frequency of alcohol vignettes was greater than for all other products. The most frequent themes found in the advertisements for alcohol were relaxation, national symbolism, conformity, camaraderie and humor. Most ads featured humans and most ads did not include information about quality and how to drink moderately, however 7.2% of the ads portrayed excessive drinking in an appealing manner.

Sheldon, T. (2000). Dutch tighten their rules on advertising of alcohol. *British Medical Journal*, 320(7242), 1094.

In 2000, the Dutch health minister passed legislation banning alcohol advertising and sponsorship of events and programs where more than a quarter of the viewers are under the age of 18. Furthermore, no advertisements can feature individuals under the age of 25. Billboards for alcoholic beverages must not be visible from schools, and alcoholic beverages were not to be labeled and promoted as " alcopops ". The legislation also affected regulations around "happy hours". Changes included the requirement that non-alcoholic beverages be available, alcoholic drinks cannot be discounted to more than half price, and that "happy hours" must not occur immediately before closing time.

Additional References Not Annotated for Section 2.32

Goodall, C. E., & Slater, M. D. (2010). Automatically activated attitudes as mechanisms for message effects: the case of alcohol advertisements. ***Communication Research***, 37(5), 620-643.

Kwate, N. O., & Meyer, I. H. (2009). Association between residential exposure to outdoor alcohol advertising and problem drinking among African American women in New York City. ***American Journal of Public Health***, 99(2), 228-230.

Collins, R. L., Ellickson, P. L., McCaffrey, D. F., & Hambarsoomians, K. (2007). Early adolescent exposure to alcohol advertising and its relationship to underage drinking. ***Journal of Adolescent Health***, 40(6), 527-534.

Jernigan, D., Ostroff, J., Ross, C., Naimi, T., and Brewer, R. (2007). Youth exposure to alcohol advertising in magazines--United States, 2001-2005. MMWR: ***Morbidity and Mortality Weekly Report***, 56(30), 763-767.

Saffer, H. (1997). Alcohol advertising and motor vehicle fatalities. ***Review of Economics and Statistics***, 79: 431-432.

2.33 Marketing, promotions, labeling and packaging

Research shows that buying alcohol in larger containers increases consumption and that larger size packages are more likely to be promoted. Bars near college campuses often have promotions for reduced price alcohol and all you can drink for a fixed price, which has been shown to raise students' intentions for how much they will consume. While counter-promotions stressing social responsibility around drinking are also present at these establishments, they may not impact the intentions of heavy drinkers. In 1988, Congress enacted a bill to mandate warning labels on alcoholic beverage containers (Public Law No. 100-690, 1988), coming into force nationally in 1989. A series of national surveys showed that public support for the warning label continued to rise after implementation through 2000, but had declined slightly for the first time by 2005, nevertheless remaining above 90%. Warning labels were the most supported alcohol policy of 11 policies assessed from 1989 to 2005. Although warning labels do not appear to have had long-term effects on reducing drinking among youth, and have not been found effective with ethnic minority pregnant women, their messages do reach heavy drinkers and may have had some effect upon attitudes and intentions regarding avoiding drinking and driving situations, and conversations related to health effects and drinking during pregnancy. There is some evidence that they may have positively influenced attempts to deter others from drinking and driving. In general there is more public support for individualistic behavioral interventions such as education, treatment, and warning labels, as compared to more effective interventions such as increased taxes, decreased hours of sales and other access restrictions. Standard drink and serving facts labels are not currently required on alcoholic beverage containers in the U.S. While these labels may improve drinkers knowledge of alcohol intake and calorie and nutrition content of alcoholic beverages, research indicates that college students would use standard drink information to identify stronger and cheaper drinks and that calorie and nutrition information may influence students to choose wine or spirits over regular beer. Because wine and spirits drinks are often higher in

alcohol content than beer drinks (see Section 3.4), these labels could result in heavier drinking by some individuals.

Key Articles Cited In Section 2.33

Kerr, W. C., & Stockwell, T. (2012). Understanding standard drinks and drinking guidelines. *Drug and Alcohol Review*, 31(2), 200-205.

This review highlights the importance of alcoholic beverage labeling with alcohol content and standard drinks for drinker's tracking of their own alcohol intake and for drinking within low-risk guidelines.

Bui, M., Burton, S., Howlett, E., & Kozup, J. C. (2008). What am I drinking? The effects of serving facts information on alcohol beverage containers. *The Journal of Consumer Affairs*, 42(1), 81-99.

This study evaluated college students' perceptions of beer, wine and spirits beverages with and without serving facts labels showing calorie, fat, carbohydrate, protein and alcohol content, and defining serving size and standard drinks. Exposure to serving facts labels significantly reduced students perceptions of calorie content for wine, fat for all beverage types and carbohydrates for wine and spirits. Overall the exposure to serving facts labels resulted in increased intention to drink wine, spirits and light beer and reduced intentions to drink regular beer.

Jones, S.C. & Parri, G. (2009) The impact of more visible standard drink labeling on youth alcohol consumption: Helping young people drink (ir)responsibly? *Drug and Alcohol Review* 28(3) 230-234.

This study used focus groups of college students and examined their knowledge of standard drinks and how standard drink label information was used. While knowledge of standard drinks was found to be high, the students indicated that they used the information to find stronger

beverages with a lower cost per standard drink to a greater extent than they used this information to limit drinking.

Tam, T. W., & Greenfield, T. K. (2008). ***Do alcohol warning labels influence men's and women's attempts to deter others from driving when intoxicated?*** **Paper presented at Applied Ergonomics International, Las Vegas, NV (Emeryville: ARG Working Paper E710).**

Based on ARG's national telephone surveys in 1993 and 1994, the study tested a theoretical model reflecting effects of exposure to the label's driving impairment message on taking actions to avert another's driving under the influence. The behavioral outcome was measured by five items: asking someone not to drive, offering to drive them home, suggesting they take a taxi, taking away car keys, or asking the person to stay over. After controlling for gender, age, ethnicity, and education, researchers found that for both males and females, heavier drinking and more often handling of alcoholic beverages affected both message recall and likelihood of intervening to deter another's drinking driving. Men, though drinking and handling alcoholic beverages more, and better recalling the drunk driving message, were somewhat less likely to take action to intervene on other's drunk driving than women. Younger and ethnic minority respondents were more likely to intervene than older and white individuals. An important preventive effect of the alcohol warning label may be to legitimate collateral attempts to avert drunk driving, given that other factors equal those reporting greater recall of the label's driving impairment message tended to say they had made more efforts to head off their associates from driving when they thought they had too much to drink.

Bray, J. W., Loomis, B., & Engelen, M. (2007). Correlates of in-store promotions for beer: differential effects of market and product characteristics. ***Journal of Studies on Alcohol and Drugs*****, 68(2), 220-228.**

This study examined the relationship between alcoholic beverage product characteristics such as type of beer, package size, and brand name, with the socioeconomic characteristics of the consumer market in which the product is sold. Results showed that products packaged in larger sizes were

more likely to be promoted, as were malt liquor beverages. Socioeconomic characteristics such as age, race, income and the geographic location of the consumer market area were not related to product characteristics. The authors posit that the differential marketing of small vs. large packages might increase alcohol consumption.

Christie, J., Fisher, D., Kozup, J. C., Smith, S., Burton, S., & Creyer, E. H. (2001). The effects of bar-sponsored alcohol beverage promotions across binge and nonbinge drinkers. ***Journal of Public Policy & Marketing;*****, 20(2), 240(214).**

This article describes a study on the effect of bar-sponsored alcoholic drink specials on college kids' intentions and beliefs and behaviors around drinking. The authors examined promotions such as reduced prices on wine and beer and all you can drink for a fixed price. Results showed that such promotions positively affect students' attitudes about patronizing the establishment and increase their expectations for the amount that they will drink. The authors also found that, for those characterized as binge drinkers, drinking intentions did not change in the presence counter-promotions, such as posters about not drinking and driving, when compared to non-binge drinkers.

MacKinnon, D. P., Nohre, L., Pentz, M. A., & Stacy, A. W. (2000). The alcohol warning and adolescents: 5-year effects. ***American Journal of Public Health*****, 90(10), 1589-1594.**

This study took place five years after the warning label legislation was passed in the U.S. and surveyed over 32,000, 10th and 12th grade students to assess the impact and awareness of the warning label. The authors reported that, initially after the bill was enacted, students reported an increase in awareness, exposure and memory of the warning label. However, after about 3.5 years, these effects wore off. The authors also found no change in alcohol consumption and alcohol related behaviors such as drinking and driving that could be attributed to the warning label.

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The multi-year NIAAA-funded evaluation of the mandated warning label was designed as a pre-repeated-post, control-intervention-group quasi-experiment to examine potential effects of the natural experiment (Greenfield & Kaskutas, 1998). Analyses of data gathered in the first years after implementation had found modest potential effects on individuals' precautionary behaviors that might reduce their likelihood of driving while intoxicated (Greenfield et al., 1993). This more recent quasi-experimental comparisons have shown mixed results. However, there was some indication that in the U.S. there was a significant relationship between seeing the label and deciding not to drive after drinking. The comparisons with Ontario, Canada, where there was no mandated label, indicated that the U.S. warning labels may have served to promote conversations about drinking and pregnancy and drink driving, partially offsetting the observed trend toward lower public concern about health risks of alcohol over the first five years of the 1990s.

Garretson, J. A., & Burton, S. (1998). Alcoholic beverage sales promotion: An initial investigation of the role of warning messages and brand characters among consumers over and under the legal drinking age. *Journal of Public Policy and Marketing*, 17(1), 35-47.

In this study, the authors examined how brand and warning information on alcohol beverages influenced drinking attitudes among young adults both above and below the legal drinking age. Results show that those in the study above the legal drinking age had more favorable attitudes and perceived drinking to be less risky than the participants who were under the legal drinking age. The study also looked at the role of who delivers the message when considering the effectiveness of alcohol warning messages. Results showed that the message was perceived as being most positive when it came from the beverage company itself rather than from the U.S. government. Finally, the authors report that the presence/absence of a character associated with the brand affected feelings about the product, with the presence of a character eliciting more positive feelings among participants.

Hilton, M. E., & Kaskutas, L. (1991). Public support for warning labels on alcoholic beverage containers. *British Journal of Addiction*, 86(10), 1323-1333.

This study used a random sample of 2006 adults in the U.S. to assess the motivations behind support for mandatory warning labels on alcohol which was enacted in 1989. Among the sample, which was surveyed before the warning label legislation was enacted, 87% supported the legislation. The biggest predictor of whether an individual supported the label was whether they abstained from alcohol themselves. Other alcohol policies that received support in the survey were alcohol education, server interventions, treatment and counter-promotion. Less people supported increased alcohol taxes, decreased store hours and a higher drinking age. Most felt that the heaviest drinkers would not be affected by the warning labels. The authors also assessed answers to similar questions over a 20 year period and determined that the current views of alcohol policy are following a trend of conservatism.

See also papers annotated in Public Opinion section 4.3, especially Greenfield et al (2007).

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Section 3:
Are All Types of Beverage Alcohol the Same?

3. *Are all types of beverage alcohol the same? Distilled spirits is often regulated differently than wine and beer and is generally taxed more heavily. What features might justify such discriminatory policies?*

3.1 Summary of differential regulations by beverage type.

Direct control of sales

A total of 17 U.S. states and two counties in Maryland have some form of direct government control over alcohol sales. These states include one third of the U.S. population and sell about 25% of all spirits. All of these states cover wholesale-level spirits, 14 cover retail spirits and four cover wine at both levels. Beer above a certain percentage alcohol by volume (%ABV) (as low as 4% in Utah) is sold by a few states, but all have some beer sold under license. These systems allow more control over prices, marketing and access and generate more revenue than licensing. Government control in other countries, including Scandinavia, covers all types of alcohol, and includes spirits and wine in most Canadian provinces.

Taxation

Tax rates are generally beverage-type specific and applied to liquid volume rather than ethanol (pure alcohol) content. Exceptions include the federal tax on spirit at $27 per gallon of ethanol and a few state spirits taxes. Many states also have a higher tax rate for fortified wine and a few tax higher %ABV beer at higher rates. Some states apply ad valorem taxes, or mark-up percentages (control states), resulting in higher taxes for high quality brands. The Federal tax per standard drink (0.6 ounces of ethanol) is spirits, 12.7 cents; wine, 4.2 cents (at 12 %ABV); and beer, 6.05 cents (at 4.5 %ABV). State taxes vary widely with spirits ranging from $1.50 to $12.80 per gallon and beer taxes ranging from two cents to $1.11 per gallon. Taxation based on beverage volume results in higher taxes on lower %ABV beverages within a type and class, giving the opposite incentive from the approach used in some countries where taxes increase

with ethanol concentration. The three beverage types have differential costs of production and distribution. Distilled spirits are more complicated to produce than beer or wine, but all three products have been adapted to modern mass production methods resulting in the possibility of very low cost production. Alcohol in the form of spirits is more concentrated than wine and wine more than beer, resulting in potentially lower costs of packaging, shipping, storage and other aspects of bringing the product to market. In the absence of government intervention through taxation, control of sales or minimum price, the lowest priced brands of spirits will most likely have the lowest cost per unit of alcohol in the U.S., followed by the lowest priced brands of wine. This may be an important consideration for taxation levels because equal tax treatment will leave this price structure in place. Alternative tax structures could seek to equalize price per standard drink across the beverage types or to make higher alcohol concentration beverages more expensive.

Outlet types

States differ widely in the types of outlets where beer, wine and spirits can be sold. Fifteen states allow all beer, wine and spirits in supermarkets, drug stores, convenience stores, gas stations and liquor stores. Other states offer a variety of combinations, with the most liberal treatment for beer in all cases. The most restrictive allow wine and spirits only in liquor stores, and beer separately in another type of store. Many states allow all three beverage types in all or most of their on-premise outlets. Some states, including large states like Florida, California and Texas, have a separate beer and wine only license covering about half of their total number of licenses. Beer and wine only or beer only licenses may encourage the consumption of these beverage types rather than spirits and are primarily used by restaurants. However, they may also result in many more on-premise alcohol buying opportunities compared to states without such an option. Some states allow no Sunday sales, but a number of others allow only beer or beer and wine. Hours of sale also differ by outlet type and will differ by beverage where these are sold in different outlet types. Some states and other countries may use this differential access to favor beer sales or low strength beer sales.

Advertising media

Through a voluntary agreement, spirits products were not advertised on broadcast television until 2012. These ads now appear on some later evening broadcasts. Wine and beer do advertise on broadcast television but in practice wine ads have been limited, while beer companies spend half a billion dollars per year. Total advertising includes billboards, radio, magazines, newspapers, internet, cable or satellite TV and other media that all three types utilize. Beer producers spend the most overall, about $1 billion a year. Cable and satellite TV have seen significant growth in spirits ad revenues from $0 before 2000 to $149 million in 2009.

Labeling

Spirits producers are required to list %ABV or proof on all containers while beer and wine producers are not. Proposed TTB labeling regulations may change this to allow %ABV and calorie per serving information on all alcoholic beverages. Standard drink labeling could also be used to help consumers limit their intake but this is not currently being considered.

Minimum drinking age

The U.S. minimum drinking age is 21 for all beverage types but some other countries have a higher minimum age for spirits than for beer and wine. For example, Germany has a minimum age of 16 for beer and wine and 18 for spirits. In the past some U.S. states have had a lower drinking age for low strength beer (4 %ABV or less).

3.2 Higher concentration beverages may have greater health risks of certain types. Health and mortality effects have also been found to vary by beverage type. However, beverage specific risks may be due to culture, cohort effects, existing policies, and other risk factors or drinking patterns related beverage preference, rather than the beverage itself. Caution is needed in interpreting research results.

In the U.S., popular beers range from 4 to 7% alcohol by volume (ABV), wines range from 8 to 15% ABV (17-22% for fortified wines) and spirits drinks are the most variable with a range from below 5% to 50% or more, depending on the degree of dilution. Only spirits can be drunk at high concentrations when drunk undiluted (shots or straight) or with small amounts of mixer. In most studies concentration differences are approximated by beverage type under the assumption that many spirits drinks have a higher %ABV than wine or beer drinks. For some alcohol related health problems the high concentration may accelerate or be an additional risk factor in the disease process. The effect of high ethanol concentration has been demonstrated most clearly for oral cancers where several studies have distinguished between beverage types.

In a sample of Puerto Rican males, only usual drinkers of undiluted liquor were at increased risk for oral cancers among non-smokers. Further, among moderate to heavy smokers, for a given volume of alcohol consumption, risks from diluted spirits were higher than for beer or wine and risk from undiluted spirits were two to four times higher than for diluted. A Spanish study found that spirits drinkers had two to four times higher risks for a given level of alcohol intake and smoking. Higher concentration beverages, as represented by spirits, are found to have the strongest association with oral cancer rates, especially in combination with cigarette smoking. Spirits consumption was found to be the only significant predictor in multivariate models. A one liter of ethanol increase in spirits consumption was associated with a 7% rise in oral cancers rates.

Differences have also been found for cirrhosis of the liver, colds, diabetes, heart disease, stroke, and self-reported health status. These studies have generally found higher risks or less protection from spirits, and lower risks or more protection from wine. However, there are exceptions to this and many of the observed relationships may not be causal due to a variety of confounds detailed in section 3.5. For example, U.S. studies and some covering other countries have found an association between spirits,

but not beer or wine consumption and cirrhosis mortality. However in wine-drinking countries like France and in a recent analysis of data from the UK, wine was found to have the closest association with cirrhosis suggesting that beverage-specific associations may be due to epidemiologic differences in population drinking patterns. Similarly for heart disease, wine has often been found to have a more favorable profile than beer or spirits, but in many countries, including the U.S., wine drinkers differ from beer and spirits drinkers in drinking pattern, diet, socio-economic status and other key risk factors and the current prevailing view is that alcohol, rather than beverage type, is responsible for any protective or harmful effects. Spirits have also been linked to risks of traffic crashes, homicides and suicides in the U.S. and in other countries. These associations may be due to detrimental drinking patterns associated with spirits or characteristics of drinkers who chose spirits but the degree of acute intoxication achievable through spirits drinking may also play an important role for these outcomes.

The choice of a particular alcoholic beverage by an individual is tied to the culture and history of the country or area, the birth cohort and age of the individual, their income, education and other aspects of socio-economic status, their race and ethnicity, and existing alcohol policies that lead to differential availability and prices of beverage types. Further, in particular societies, beverage types may be associated with heavier drinking or patterns such as heavy episodic drinking or very light drinking. The complexity of beverage-specific health associations across cultures can also be illustrated in the area of obesity/overweight related measures. In a study comparing France and Northern Ireland obese men drank more alcohol than non-obese men across all drink types, however, there was no association between obesity and the most popular beverage type, wine in France and beer in Northern Ireland, indicating the cultural complexity of beverage-specific associations. Studies of the risk of injury and drinking and driving have also shown that apparent beverage-specific association with beer drinking can be explained by other factors including age, gender, drinking pattern, and context of drinking. Further, U.S. analyses of birth cohort differences in drinking and beverage choice indicate differences between the pre-WWII generation, who prefer spirits, and the baby boom generation, who prefer beer, indicating that beverage-specific relationships with harm may shift over time. In general, it is prudent to be skeptical of beverage-specific relationships until studies controlling for the types of confounders described above have been conducted.

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3.3 There may be beverage-specific differences in the risk of acute effects through BAC dynamics, likelihood of higher risk drinking patterns, and overdose risk.

Rate of drinking may be faster for higher concentration beverages, potentially resulting in higher intake on a drinking occasion. Logically, more ethanol can be consumed more quickly at higher concentrations. Our study of specific spirits drink pours found that heavier drinkers chose stronger drinks. The resulting BAC from a given alcoholic beverage will also depend upon its ability to pass into the blood stream. Higher concentration beverages appear to result in more rapid increases in BAC

and in physiologic and subjective impairment for a given dose, although a full stomach may prevent this. Spirits uptake is the fastest on an empty stomach, but when the gastrointestinal system is saturated with a meal, the spirits may dissolve into the food while beer, with the alcohol already dissolved in water, has a faster uptake than spirits. The high concentration of spirits also increases the risk of achieving very high BAC levels and possible overdose, particularly when compared to beer.

Drinking patterns have often been associated with beverage choice in the U.S. and other countries. Although fortified wine is sometimes associated with heavy drinking, and was especially so in the 1950s when high taxes on spirits made it the cheapest source of alcohol, wine is generally associated with light and moderate drinking patterns in the U.S. and Canada. Both spirits and beer drinking have been more often associated with heavy drinking patterns, risk of becoming a heavy drinker and having alcohol-related problems. Beer and spirits drinkers have also been found to be more likely drink for the purpose of intoxication and to report requiring more drinks to feel drunk. Beer is the most popular beverage type in the U.S., especially for men, and has been found to be involved in the majority of hazardous and binge drinking occasions and to be particularly linked to driving while intoxicated. Spirits have also been found to be disproportionately popular among the heaviest drinkers.

Key Articles Cited In Section 3.3

Tujague, J., & Kerr, W. C. (2009). Energy intake estimates of respondent-measured alcoholic beverages. *Alcohol and Alcoholism*, 44(1), 34-41.

Spirits drinks were found to have the most calories on average due to both larger drink pours and the addition of caloric mixers.

Kerr, W. C., & Greenfield, T. K. (2007). Distribution of alcohol consumption and expenditures and the impact of improved measurement on coverage of alcohol sales in the 2000 National Alcohol Survey. *Alcoholism: Clinical and Experimental Research*, 31(10), 1714-1722.

The top 2.5% of drinkers were found to account for nearly 36% of all spirits drinks reported in the 2000 National Alcohol Survey of the U.S.

Kerr, W. C., Greenfield, T. K., & Midanik, L. T. (2006). How many drinks does it take you to feel drunk? Trends and predictors for subjective drunkenness. *Addiction*, 101(10), 1428-1437.

Beer and spirits drinkers were found to report needing more drinks to feel drunk than wine drinkers in a study of three U.S. National Alcohol Surveys.

Kuntsche, E., Knibbe, R., Gmel, G., & Engels, R. (2006). 'I drink spirits to get drunk and block out my problems...' beverage preference, drinking motives and alcohol use in adolescence. *Alcohol and Alcoholism*, 41(5), 566-573.

Among adolescents in Switzerland, beer and spirits drinkers were more likely to report drinking for enhancement motives (i.e. drinking to get drunk) than wine or alcopop drinkers.

Jensen, M. K., Andersen, A. T., Sorensen, T. I., Becker, U., Thorsen, T., & Gronbaek, M. (2002). Alcoholic beverage preference and risk of becoming a heavy drinker. *Epidemiology*, 13(2), 127-132.

Beer and spirits drinkers were found to be at higher risk of becoming heavy drinkers in a longitudinal study in Denmark.

Rogers, J. D., & Greenfield, T. K. (1999). Beer drinking accounts for most of the hazardous alcohol consumption reported in the United States. *Journal of Studies on Alcohol*, 60(6), 732-739.

In the 1995 National Alcohol Survey, beer was found to account for the majority of days on which a drinker consumed five or more drinks.

Smart, R. G. (1996). Behavioral and social consequences related to the consumption of different beverage types. *Journal of Studies on Alcohol*, 57(1), 77-84.

This literature review found that beer and spirits tend to lead to more alcohol problems than wine.

Roine, R. P., Gentry, R. T., Lim, R. T., Jr., Baraona, E., & Lieber, C. S. (1991). Effect of concentration of ingested ethanol on blood alcohol levels. *Alcoholism: Clinical and Experimental Research*, 15(4), 734-738.

Spirits uptake is the fastest on an empty stomach, but when the gastrointestinal system is saturated with a meal, the spirits may dissolve into the food while beer, with the alcohol already dissolved in water, has a faster uptake than spirits.

Additional References Not Annotated for Section 3.3

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Mäkelä, P., Hellman, M., Kerr, W. C., & Room, R. (2011). A bottle of beer, a glass of wine or a shot of whiskey? Can the rate of alcohol-induced harm be affected by altering the population's beverage choice? ***Contemporary Drug Problems***, 38(4), 599-619.

Room, R., Ferris, J., Bond, J., Greenfield, T. K., & Graham, K. (2011). Differences in trouble per litre of different alcoholic beverages – a global comparison with the GENACIS dataset. ***Contemporary Drug Problems***, 38(4), 493-516.

Siegel, M. B., Naimi, T. S., Cremeens, J. L., & Nelson, D. E. (2011). Alcoholic beverage preferences and associated drinking patterns

and risk behaviors among high school youth. ***American Journal of Preventive Medicine***, 40(4), 419-426.

Maldonado-Molina, M. M., Reingle, J. M., Tobler, A. L., & Komro, K. A. (2010). Effects of a beverage-specific alcohol consumption on drinking behaviors among urban youth. ***Journal of Drug Education***, 40(3), 265-280.

Pedersen, E. R., Neighbors, C., & Larimer, M. E. (2010). Differential alcohol expectancies based on type of alcoholic beverage consumed. ***Journal of Studies on Alcohol and Drugs***, 71(6), 925-929.

Srivastava, P. P. D., & Zhao, X. (2010). What do the bingers drink? Micro-unit evidence on negative externalities and drinker characteristics of alcohol consumption by beverage types. ***Economic Papers***, 29(2), 229-250.

Badawy, A. A., Morgan, C. J., & Thomas, R. (2009). Low-alcohol beers: contribution to blood-ethanol concentration and its elevation above the UK legal limit after 'topping-up'. ***Alcohol and Alcoholism***, 44(4), 403-408.

Baltieri, D. A., Daro, F. R., Ribeiro, P. L., & De Andrade, A. G. (2009). The role of alcoholic beverage preference in the severity of alcohol dependence and adherence to the treatment. ***Alcohol***, 43(3), 185-195.

Coder, B., Freyer-Adam, J., Lau, K., Riedel, J., Rumpf, H. J., Meyer, C., et al. (2009). Reported beverage consumed and alcohol-related diseases among male hospital inpatients with problem drinking. ***Alcohol and Alcoholism***, 44(2), 216-221.

Bui, M., Burton, S., Howlett, E., & Kozup, J. C. (2008). What am I drinking? The effects of serving facts information on alcohol beverage containers. ***The Journal of Consumer Affairs***, 42(1), 81-99.

Higgs, S., Stafford, L. D., Attwood, A. S., Walker, S. C., & Terry, P. (2008). Cues that Signal the Alcohol Content of a Beverage and their Effectiveness at Altering Drinking Rates in Young Social Drinkers. ***Alcohol and Alcoholism***, 1-6.

Lachenmeier, D. W., Nathan-Maister, D., Breaux, T. A., Sohnius, E. M., Schoeberl, K., & Kuballa, T. (2008). Chemical composition of

vintage preban absinthe with special reference to thujone, fenchone, pinocamphone, methanol, copper, and antimony concentrations. ***Journal of Agriculture and Food Chemistry***, 56(9), 3073-3081.

Burger, M., & Mensink, G. B. (2004). High alcohol consumption in Germany: Results of the German National Health Interview and Examination Survey 1998. ***Public Health Nutrition***, 7(7), 879-884.

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Buemann, B., & Astrup, A. (2001). How does the body deal with energy from alcohol? ***Nutrition***, 17(7-8), 638-641.

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Stevenson, R. J., Lind, B., & Weatherburn, D. (1999). The relationship between alcohol sales and assault in New South Wales, Australia. ***Addiction***, 94(3), 397-410.

Smart, R. G., & Walsh, G. W. (1995). Do some types of alcoholic beverages lead to more problems for adolescents? ***Journal of Studies on Alcohol***, 56(1), 35-38.

Hupkens, C. L., Knibbe, R. A., & Drop, M. J. (1993). Alcohol consumption in the European community: Uniformity and diversity in drinking patterns. ***Addiction***, 88(10), 1391-1404.

Geller, E. S., Kalsher, M. J., & Clarke, S. W. (1991). Beer versus mixed-drink consumption at fraternity parties: A time and place for low-alcohol alternatives. ***Journal of Studies on Alcohol***, 52(3), 197-204.

Klatsky, A. L., Armstrong, M. A., & Kipp, H. (1990). Correlates of alcoholic beverage preference: traits of persons who choose wine, liquor or beer. ***British Journal of Addiction***, 85(10), 1279-1289.

Pihl, R. O., Smith, M., & Farrell, B. (1984). Alcohol and aggression in men: a comparison of brewed and distilled beverages. ***Journal of Studies on Alcohol***, 45(3), 278-282.

3.4 Drink ethanol content appears to be larger for spirits drinks.

The most common definition of the U.S. standard drink corresponds to 0.6 ounces (18ml or 14 grams) of ethanol, equivalent to 12 ounces (355 ml) of five percent alcohol by volume (%ABV) beer, 1.5 ounces (44ml) of 40 %ABV spirits, or five ounces (148 ml) of 12 %ABV wine. Research on drink alcohol content indicates that spirits drinks consumed at home have 1.5 times the alcohol of the standard drink compared to wine drinks that were 1.1 times the standard and beer drinks that were smaller than the standard. Beer drinks were most often served in 12 ounce containers and about half the beer sold in the U.S. is light beer, typically 4.2%ABV, resulting in drinks that are 0.5 ounces of pure alcohol compared to 0.6 ounces for regular (5%ABV) beer. Spirits drinks were also found to be quite variable with many individual's drinks being two or three times the standard amount. A study of on-premise drinks in Northern California found that both wine and mixed spirits drinks contained more than 1.4 standard drinks on average, while draught beer drinks contained about 1.2 standard drinks with an average pour size of 14 ounces for the commonly used "pint" glasses. Spirits "shots" contained the least alcohol with an average of one standard drink. Spirits drinks with large mean alcohol content have also been found in studies conducted in Spain, Holland and the United Kingdom. In Spain, spirits drinks were twice the size of wine and beer drinks and in the UK, both spirits and wine drinks were twice the UK standard amount. These results suggest that efforts to educate the drinking public about differences in alcohol content by beverage type, strategies to pour standard drinks, and how to calculate drink alcohol content are needed. Improved labeling of alcoholic beverages to include %ABV, standard serving size and the number of standard drinks in the container could aid these efforts.

Calories from spirits drinks have been found to be higher than wine and beer drinks on average due both to larger alcohol pours and to mixing with caloric beverages such as soda and juice, or adding sugar. Spirits

drink calories are also more variable and can contain as little as the 7.1 calories per gram of pure alcohol, or 98 calories in a standard 1.5 ounce shot, while wine and especially beer will always contain more calories per standard drink (0.6 ounces of pure alcohol).

Key Articles Cited In Section 3.4

Kerr, W. C., Patterson, D., & Greenfield, T. K. (2009). Differences in the measured alcohol content of drinks between black, white and Hispanic men and women in a U.S. national sample. *Addiction*, 104(9), 1503-1511.

In this study of drink poured at home, with pour sizes measured with a provided measuring beaker, differences in average drink size by beverage type, gender and race/ethnicity were observed. African American men were found to have significantly larger drinks on average than both white men and African American women. Black men's drinks were 0.79 ounces of alcohol on average and adjustment for drink alcohol content increased their monthly average alcohol intake by 30%. These results indicate the importance of drink alcohol content adjustment for research where comparisons across gender and racial groups are made.

Kerr, W. C., Patterson, D., Koenen, M. A., & Greenfield, T. K. (2009). Large drinks are no mistake: glass size, not shape, affects alcoholic beverage drink pours. *Drug and Alcohol Review*, 28(4), 360-365.

This study was also based on the random sample of 80 on-premise establishments in 10 Northern California counties. Pictures of measured drinks were used to identify glass shape and size. Contrary to the suggestion of one previous study, bartenders did not pour more alcohol in short wide glasses as compared to tall thin glasses. Larger spirits glasses were found to contain more alcohol. However, wine glass size did not affect the amount of wine poured.

Kerr, W. C., Patterson, D., Koenen, M. A., & Greenfield, T. K. (2008). Alcohol content variation of bar and restaurant drinks in Northern California. *Alcoholism: Clinical and Experimental Research*, 32(9), 1623-1629.

This study involved the measurement of the alcohol content of a variety of beer, wine and spirits drinks at a random sample of bars and restaurants in 10 Northern California counties. Wine drinks, both red and white, were found to be the largest on average with 43% more alcohol than a standard drink. Mixed spirits drinks were almost as large with 42% more alcohol than the standard, while shots of spirits were relatively standardized at 0.6 ounces of ethanol with relatively little variation. Draft beer drinks contained 22% more alcohol than the standard on average. Few differences were observed by county.

Kerr, W. C., Greenfield, T. K., Tujague, J., & Brown, S. E. (2005). A drink is a drink? Variation in the amount of alcohol contained in beer, wine and spirits drinks in a U.S. methodological sample. *Alcoholism: Clinical and Experimental Research*, 29(11), 2015-2021.

In a national U.S. sample where home drink alcohol content was measured using the subject's own glassware and reported brands, spirits drinks were found to contain 0.89 ounces of pure alcohol, about 1.5 times the standard drink. Beer drinks contained less than the standard drink (0.56 ounces) and wine drinks contained about 11% more at 0.66 ounces. Substantial variation in individual drink alcohol content was found, especially for spirits and wine drinks.

Gill, J. S., & Donaghy, M. (2004). Variation in the alcohol content of a 'drink' of wine and spirit poured by a sample of the Scottish population. *Health Education Research*, 19(5), 485-491.

In a study of drinkers in Edinburgh, Scotland participants were found to poorly estimate their drink size as measured in a pouring exercise and to pour drinks of spirits and wine that were, on average, twice the UK standard drink amount (equal to 8 grams of pure alcohol).

Kaskutas, L. A., & Graves, K. (2000). An alternative to standard drinks as a measure of alcohol consumption. *Journal of Substance Abuse*, 12(1-2), 67-78.

Drink size was explored in a group of mostly African American and Native American women. The majority of drinkers were unable to accurately judge the size of their drinks. Malt liquor, fortified wine and spirits drinks were found to be much larger than the standard drink, six times larger for spirits.

Gual, A., Martos, A. R., Lligona, A., & Llopis, J. J. (1999). Does the concept of a standard drink apply to viticultural societies? *Alcohol and Alcoholism*, 34(2), 153-160.

Both home and on-premise drink pours in Spain were studied. Spirits drinks were found to contain twice as much alcohol (20 grams) as beer (10 grams) and wine (11 grams) drinks.

Lemmens, P. H. (1994). The alcohol content of self-report and 'standard' drinks. *Addiction*, 89(5), 593-601.

This study of home drink alcohol content in Holland found that spirits drinks contained the most alcohol on average, 26% more than the Dutch standard drink (10 grams of pure alcohol). Wine drinks were also larger than the Dutch standard.

Additional References Not Annotated for Section 3.4

Kerr, W. C., & Stockwell, T. (2012). Understanding standard drinks and drinking guidelines. ***Drug and Alcohol Review***, 31(2), 200-205.

Nielsen, S. J., Kit, B. K., Fakhouri, T., & Ogden, C. L. (2012). ***Calories consumed from alcoholic beverages by U.S. adults, 2007-2010***. NCH data brief, no. 110 (pp. 1-7). Hyattsville, MD: National Center for Health Statistics.

Greenfield, T. K., & Kerr, W. C. (2008). Alcohol measurement methodology in epidemiology: recent advances and opportunities. ***Addiction***, 103(7), 1082-1099.

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Kerr, W. C., Greenfield, T. K., & Tujague, J. (2006). Estimates of the mean alcohol concentration of the spirits, wine, and beer sold in the United States and per capita consumption: 1950 to 2002. ***Alcoholism: Clinical and Experimental Research***, 30(9), 1583-1591.

Kerr, W. C., Greenfield, T. K., Tujague, J., & Brown, S. E. (2006). The alcohol content of wine consumed in the U.S. and per capita consumption: New estimates reveal different trends. ***Alcoholism: Clinical and Experimental Research***, 30(3), 516-522.

Kerr, W. C., Brown, S., & Greenfield, T. K. (2004). National and state estimates of the mean ethanol content of beer sold in the U.S. and their impact on per capita consumption estimates: 1988 to 2001. ***Alcoholism: Clinical and Experimental Research***, 28(10), 1524-1532.

3.5 Alcohol and energy drinks.

The combination of alcoholic beverages and caffeinated energy drinks, and particularly alcoholic beverages containing caffeine and other typical energy drink ingredients, has become a major issue in recent years with the expansion of the energy drink market. The alcoholic energy drink market in the U.S. has disappeared due to legal pressure on manufacturers. This first lead to several brands from large companies being withdrawn from the market, however, the apparent gap left by these products was filled by smaller companies producing what are in some cases more extreme versions of these products containing as much as 500 milligrams of caffeine and four standard alcohol drinks in one 24 ounce container. Having both substances in the same drink, especially in high strength versions, may result in excess alcohol consumption because impairment is masked by the caffeine or excess caffeine consumption as heavy occasion drinking typically involves five or more drinks. Further legal pressure has eliminated the caffeine from these brands. Research in this area has confirmed that combining energy drinks with alcoholic beverages reduces the perception of intoxication and impairment without countering the effects of alcohol on cognitive skills, visual reactions or motor coordination. One survey of the use of alcohol and energy drinks together found that this was fairly common (24% of current drinkers) and was associated with more heavy drinking occasions and higher risk of alcohol-related consequences including injuries and riding with an intoxicated driver. Although combined alcohol and energy drinks are not currently a problem in the U.S., energy drinks and other caffeine enhanced foods are becoming increasingly common and their use in combination with alcoholic beverages remains a significant concern.

Key Articles Cited In Section 3.5

Alcohol Justice (2011). ***From Alcoholic Energy Drinks to Supersized Alcopops: A Rare Victory in Protecting Youth from Big Alcohol.*** **1-11.**

This document expresses concern that with the rise of alcoholic energy drinks, consumers, particularly younger ones, are prone to taking more risks. Although premixed drinks (AEDs) were pushed off the market in

2011, the alcohol industry responded by creating supersized alcopops, which do not contain caffeine, but which Alcohol Justice sees as the latest attempt to tempt young people into risky behavior.

Arria, A.M., Caldeira, K.M., Kasperski, S.J., Vincent, K.B., Griffiths, R.R., & O'Grady, K.E. (2011). Energy Drink Consumption and Increased Risk for Alcohol Dependence. ***Alcoholism: Clinical and Experimental Research*****, 35 (2), 1-11.**

This study looks at the relationship between energy drink use and alcohol dependence among college students at one public university and found that the two were strongly connected. The researchers call for further work on the underlying mechanisms of this connection.

Brache, K., & Stockwell, T. (2011) Drinking patterns and risk behaviors associated with combined alcohol and energy drink consumption in college drinkers. ***Addictive Behaviors*****, 1-8.**

These researchers start from the premise that few studies have examined the risk behaviors associated with the consumption of alcohol mixed with energy drinks (AmED). They argue that more knowledge is necessary in order to have a more informed prevention. They found that 105 students out of 465 surveyed had drunk AmED in the last 30 days and that students who consumed AmED had a greater risk of doing harm.

Cleary, K., Levine, D.A., & Hoffman, R.S. (2011). Adolescents and Young Adults Presenting to the Emergency Department Intoxicated From a Caffeinated Alcoholic Beverage: A Case Series. ***Annals of Emergency Medicine*****, 1-3.**

This study—based upon medical records in the emergency department—shows that those patients who became intoxicated with Four Loko, a caffeinated alcoholic drink, were younger than the legal drinking age, took on greater risks, and on many occasions were actually admitted to the hospital.

Schoffl, I., Kothmann, J.F., Schoffl, V., Rupprecht, H.D., & Rupprecht, T. (2011). "Vodka Energy": Too Much for the Adolescent Nephron? ***Pediatrics*****, 1-5.**

This study looks at the dangers involved in consuming alcohol mixed with energy drinks. A major concern is that ED manufacturers sponsor sports events, thus making an association between these drinks and health and athletics.

Doran, C. M., & Digiusto, E. (2010). Using taxes to curb drinking: A report card on the Australian government's alcopops tax. ***Drug and Alcohol Review*****. 1-4.**

In 2008, the Australian government imposed a tax on spirits-based alcopops (RTDs) in an effort to limit alcohol consumption and binge drinking among young people. This study demonstrates that while the tax did in fact limit the consumption of spirits-based alcopops, the consumption of wine-based RTDs and other alcoholic drinks increased. This study is inconclusive, however, as to whether the increases are due to the tax and a "substitution effect" or to longer-term trends. Other factors, such as the global financial crisis, advertising, and the government's anti-binge drinking campaign might have also contributed to this change.

Kaminer, Y. (2010). Problematic Use of Energy Drinks by Adolescents. ***Child Adolescent Psychiatric Clin N Am*****, 19, 643-650.**

This article is a literature review of the work conducted on energy drinks (EDs) and analyzes the potentially negative impact that these beverages have upon youth.

Thombs, D. L., O'Mara, R. J., Tsukamoto, M., Rossheim, M.E., Weiler, R.M., Merves, M.L., & Goldberger, B. A. (2010). Event-level analyses of energy drink consumption and alcohol intoxication in bar patrons. ***Addictive Behaviors*****, 35, 325-330.**

This article seeks to understand the relationship among the consumption of energy drinks, alcoholic intoxication, and the desire to drive an automobile after frequenting a bar. The researchers collected data from

802 patrons in a college bar district. They discovered that the clients who mixed energy and alcoholic drinks were three times more likely to leave the bar drunk and four times more likely to drink and drive. From these findings, the researchers believe that college students who consume energy drinks are at a greater risk of dangerous behavior.

Reissig, C. J., Strain, E. C., & Griffiths, R. R. (2009). Caffeinated energy drinks–a growing problem. *Drug and Alcohol Dependence*, 99(1-3), 1-10.

This article provides an overview of issues related to caffeinated energy drinks. Sales of these drinks in the U.S. and globally have increased dramatically between 2002 and 2006. Many energy drinks contain large doses of caffeine, as much as 500mg in a 24 ounce can. These drinks are not required to include warning on their labels, which would be required if they were in pill form. Caffeine intoxication may result from large does with symptoms including anxiety, dizziness, chest pain, headaches, insomnia and in rare cases may be fatal. Combining energy drinks with alcohol was highlighted as a particular concern because these drinks reduce the perception of alcohol impairment and keep intoxicated drinkers awake potentially increasing the risk of injury and drunk driving.

Curry, K., & Stasio, M. J. (2009). The effects of energy drinks alone and with alcohol on neuropsychological functioning. *Human Psychopharmacology*, 24(6), 473-481.

Twenty seven young women drank 16 ounces of an energy drink, an energy drink with 6% ABV alcohol or a flavored drink with no caffeine or alcohol. Results indicated that the drinkers of the energy drink with alcohol had poorer performance on a global measure of cognitive functioning.

O'Brien, M. C., McCoy, T. P., Rhodes, S. D., & Wagoner, A. (2008). Caffienated cocktails: energy drink consumption, high-risk drinking, and alcohol related consequences among college students. ***Academic Emergency Medicine*****, 15(5), 453-460.**

A web-based survey of college 4,271 college students found that 24% of past 30 day drinkers had consumed alcohol with an energy drink in the past 30 days. This combination was found to be associated with higher levels of heavy episodic drinking, weekly drunkenness and alcohol-realted consequences including injuries.

Ferreira, S. E., de Mello, M. T., Pompeia, S., & de Souza-Formigoni, M. L. (2006). Effects of energy drink ingestion on alcohol intoxication. ***Alcoholism, Clinical and Experimenal Research*****, 30(4), 598-605.**

In this study 26 young men were tested and evaluated after consumption of a dose determined by weight of an energy drink, vodka or both. All subjects were tested in each of the three conditions. Compared to alcohol alone, the alcohol and energy drink combination reduced the subjects' perception of impairment of motor coordination but did not improve their actual performance on motor coordination on visual reaction time tests nor did it alter breath alcohol concentration measurements.

Additional References Not Annotated for Section 3.5

Howland, J., & Rohsenow, D. J. (2013). Risks of energy drinks mixed with alcohol. ***The Journal of the American Medical Association***, 309(3), 245-246

Velazquez, C. E., Poulos, N. S., Latimer, L. A., & Pasch, K. E. (2012). Associations between energy drink consumption and alcohol use behaviors among college students. ***Drug and Alcohol Dependence***, 123(1-3), 167-172.

Verster, J. C., Aufricht, C., & Alford, C. (2012). Energy drinks mixed with alcohol: misconceptions, myths, and facts. ***International Journal of General Medicine***, 5, 187-198.

Wiklund, U., Karlsson, M., Ostrom, M., & Messner, T. (2009). Influence of energy drinks and alcohol on post-exercise heart rate recovery and heart rate variability. ***Clinical Phsiology and Functional Imaging***, 29(1), 74-80.

Copeland, J., Stevenson, R. J., Gates, P., & Dillon, P. (2007). Young Australians and alcohol: the acceptability of ready-to-drink (RTD) alcoholic beverages among 12-30-year-olds. ***Addiction***, 102(11), 1740-1746.

Malinauskas, B. M., Aeby, V. G., Overton, R. F., Carpenter-Aeby, T., & Barber-Heidal, K. (2007). A survey of energy drink consumption patterns among college students. ***Nutrition Journal***, 6(35), 7.

Oteri, A., Salvo, F., Caputi, A. P., & Calapai, G. (2007). Intake of energy drinks in association with alcoholic beverages in a cohort of students of the School of Medicine of the University of Messina. ***Alcoholism: Clinical and Experimental Research***, 31(10), 1677-1680.

Simon, M., & Mosher, J. (2007). ***Alcohol, Energy Drinks, and Youth: A dangerous mix***. San Rafael, CA: Marin Institute.

Marczinski, C. A., & Fillmore, M. T. (2006). Clubgoers and their trendy cocktails: implications of mixing caffeine into alcohol on information processing and subjective reports of intoxication. ***Experimental and Clinical Psychopharmacology***, 14(4), 450-458.

Ferreira, S. E., de Mello, M. T., Rossi, M. V., & Souza-Formigoni, M. L. (2004). Does an energy drink modify the effects of alcohol in a maximal effort test? ***Alcoholism, Clinical and Eperimental Research***, 28(9), 1408-1412.

Section 4:

Why Should States Be Allowed to Regulate Alcohol Differently from the Federal Government and from Each Other?

4. *Why should states be allowed to regulate alcohol differently from federal government and from each other?*

Historically and still today, states vary in both drinking patterns and public opinions regarding alcohol and alcohol policy. European researchers have long recognized and studied cultural differences in both patterns of drinking and associated problems, on the one hand and drinking cultures on the other, noting for example a north-south, dry-wet gradient that affects both alcohol problem expression and policy approaches. This work is beginning to be extended to more countries so that a global perspective of cultural differences in drinking, and their effects is beginning to emerge. Similarly, regional and state differences have long been noted in the U.S. with variation in abstention rates, heavy drinking, choice of preferred alcoholic beverages, certain types of alcohol-related problems, and the public's attitudes about alcohol. Recently, public opinions about alcohol control measures have been found to differ by state, reflecting this variation.

4.1 Do best practices differ depending on the historical, culture and economic environment?

In the U.S., before Prohibition and leading up to it, states varied widely in their alcohol policies and legislative solutions with moves to prohibit alcohol sales occurring at different times from the early 1900s through the eventual ratification of the 18th or Prohibition Amendment. The national movement to Repeal Prohibition led by corporate elites and especially John D. Rockefeller Jr. incorporated ideas on "Liquor control" from the earlier Committee of Fifty volumes that envisioned the jurisdiction for controlling alcohol sales mainly at the state level (and in some instances county level) with purity and control of illicit production as a federal responsibility. The continuing variation across states in demographics of drinking, heavy drinking and relative choices of beverage types and subtypes suggest the value of tailoring alcohol policy solutions to address the particular circumstances each state faces.

A number of general recommendations have been developed by public health and alcohol expert panels. There is wide scientific consensus that the following alcohol policy measures have an evidence base: Increased

taxes when leading to higher prices; minimum legal purchase age, given that much alcohol-attributable mortality especially injuries occurs at early ages; government retail monopolies reduce underage sales of regulated alcohol products, access and outlet density; absent monopolies, general availability measures, licensing and outlet regulations; and lowering of the legal BAC threshold in defining DWI, and lowering legal blood alcohol limits even further for youths. Campus, military and other institutional environmental policies have gained increasing attention as well. There is a research consensus regarding the importance of enforcement in regard to all such policies without which laws are more likely to be circumvented or ignored by drinkers and especially heavy drinkers.

Key Articles Cited In Section 4.1

Rehm, J. & Greenfield, T. K. (2008) Public alcohol policy: current directions and new opportunities. *Clinical Pharmacology and Therapeutics*.

This is a brief current summary article identifying the health and social basis of alcohol control and treatment policies. It reviews the findings of expert groups (e.g., Babor et al, 2003, below) and recent reviews on best practices as it relates to various policy measures (legislative policy interventions, law enforcement based measures, treatment system and brief interventions, and mass media/awareness campaigns). It summarizes evidence-based support for alcohol taxes, minimum legal purchase age, government retail monopolies, availability restrictions, and lowered BAC limits for drink driving definitions.

Kerr, W. C., Brown, S. & Greenfield, T. K. (2004). National and state estimates of the mean ethanol content of beer sold in the U.S. and their impact on per capita consumption estimates: 1988 to 2001. *Alcoholism: Clinical & Experimental Research*, 28(10), 1524-1532.

This article bears on the issue of state-specific patterns of consumption. It makes the point that average ethanol content of beer is a key factor in determining per capita alcohol consumption in the U.S. States vary widely in consumption of the beer types and state-specific mean beer ethanol estimates varied by state and year, reflecting state variation in market shares of various brands with varying strength by type, particularly

light beer (4.2% ABV and overall 45% of the market in 2001), import (increasingly sold, but declining from 4.94 to 4.73% ABV between 1996 and 2001, with increasing popularity of Corona), and malt liquor from 1993-2001 (averaging 6.22-6.52% ABV). Considering empirical beer ethanol, state (and time by state) variations in the market shares by type caused some states to increase per capita ethanol intake considerably, e.g., in 2000 by 4.7% in Mississippi, 4.0% in Montana (among the highest in beer consuming states), 4.4%, 4.5% and 5.1% in Michigan, Vermont and North Carolina, respectively (in the middle), and 5.0% in Washington to 6.2% for New York (among the lowest states in beer consumption). The average change was 3.8% in the U.S.

Babor, T. F., Caetano, R., Casswell, S., Edwards, G., Giesbrecht, N. A., Graham, K., Grube, J., Gruenewald, P., Hill, L., Holder, H. D., Homel, R. Õsterberg, E., Rehm, J., Room, R.., & Rossow, I. (2003). *Alcohol: No Ordinary Commodity*. Research and public policy. New York, NY: Oxford University Press.

This comprehensive book by a panel of recognized alcohol policy experts makes the case that alcohol is no ordinary commodity, in part based on epidemiological data on the resulting global burden of alcohol-related problems. Sections extensively review the evidence base for strategies and interventions to minimize alcohol-related social and health harms. A final section considers the policy development process. The book builds on its well-known predecessors Alcohol and the Public Good (Edwards et al., 1994) and the so-called purple book (Bruun et al., 1975).

Wagenaar, A. C., O'Malley, P. M., & LaFond, C. (2001). Lowered legal blood alcohol limits for young drivers: effects on drinking, driving, and driving-after-drinking behaviors in 30 states. *American Journal of Public Health*, 91(5), 801-804.

States that lowered legal blood alcohol limits even further for youths than for adults have shown reductions in both self-reported driving after drinking and reductions in crash injuries and fatalities among effected age groups. This 30 state analysis using Monitoring the Future nationwide school-collected data from 1984 through 1998 showed declines of 19% and 23% in self-reported driving after drinking and after heavy drinking, respectively, using a before-after design in the 30 states which had reduced

the BAC limit for youth (mostly, but not all, defined as those under age 21) between 1984 and 1997. Authors point out that this effect size, applied to all jurisdictions, aggregates to a major public health benefit, especially today, since the BAC of .02 or less for youth is now in effect in all states following enactment of 23 USCA §161 which penalized noncompliant states by a 10% loss of federal highway funds. Authors noted that findings were consistent with other studies that have shown reductions in car crash injuries and fatalities of 11% to 33% after introduction of lower youth BAC limits. They also emphasize the importance of publicizing such BAC limits since "public awareness is a core prerequisite for the general deterrent effect of a law."

Kerr, W. C. (2010). Categorizing US state drinking practices and consumption trends. *International Journal of Environmental Research and Public Health*, 7(1), 269-283.

This article in an open access journal characterizes alcohol consumption patterns and trends by U.S. states, and uses these to identify groups of states with similar drinking habits or cultures. Key variables defining the categorization are rates of heavy drinking and current abstention, and *per capita* apparent consumption levels. Six state groupings were identified: North Central and New England with the highest consumption and heavy drinking levels; Middle Atlantic, Pacific and South Coast with moderate drinking levels; and Dry South with the lowest drinking levels. The analysis updated the Hilton's earlier classic study of regional diversity in drinking practices. It should also be noted that based on multivariate analyses of trends by Greenfield in the period 1984-1995 it appears that regional differences may have much to do with population characteristics such as religion, educational attainment, urbanicity and race/ethnicity.

Koskikallio, I., Kerr, K. A. & Levine, H. G. (1987). Perspectives on prohibition and control [abstracts of papers by Ilpo Koskikallio, K. Austin Kerr, Harry Gene Levine, with discussion]. In S. Barrows, R. Room & J. Verhey (Eds.), *The Social History of Alcohol: Drinking and Culture in Modern Society* (pp. 39-55). Berkeley, CA: Alcohol Research Group.

This section of a book based on proceedings of an expert conference summarizes longer articles surrounding Prohibition and repeal in the

U.S., including discussions of the roles of such groups as the Anti Saloon League before and during prohibition, and factors leading up to its repeal during the early years of the Great Depression. It traces the origins of the Rockefeller Report that formed the basis for state alcohol controls in the Post Repeal era.

Additional References Not Annotated for Section 4.1

Wechsler, H., & Nelson, T. F. (2010). Will increasing alcohol availability by lowering the minimum legal drinking age decrease drinking and related consequences among youths? ***American Journal of Public Health***, 100(6), 986-992.

Bloomfield, K., Greenfield, T. K., Kraus, L. & Augustin, R. (2002). A comparison of drinking patterns and alcohol-use-related problems in the United States and Germany, 1995. ***Substance Use & Misuse***, 37(4), 399-428.

Room, R. & Bullock, S. (2002). Can alcohol expectancies and attributions explain Western Europe's north–south gradient in alcohol's role in violence? ***Contemporary Drug Problems***, 29, 619-648.

Simpura, J., & Karlsson, T. (2001) Trends in drinking patterns among adult population in 15 European countries, 1950 to 2000 – a review. ***Nordic Studies on Alcohol and Drugs***, 18 (English Supplement), S31-S53.

Greenfield, T. K., Midanik, L. T. & Rogers, J. D. (2000). A ten-year national trend study of alcohol consumption 1984-1995: is the period of declining drinking over? ***American Journal of Public Health***, 90(1), 47-52.

Room, R. & Mäkelä, K. (2000). Typologies of the cultural position of drinking. ***Journal of Studies on Alcohol***, 61, 475-483.

Edwards, G., Anderson, P., Babor, T. F., Casswell, S., Ferrence, R., Giesbrecht, N., Godfrey, C., Holder, H. D., Lemmens, P., Mäkelä, K.., Midanik, L. T., Norström, T., Österberg, E., Romelsjö, A., Room, R.,

Simpura, J., 7 Skog, O.-J. (1994). ***Alcohol Policy and the Public Good***. Oxford, UK: Oxford University Press.

Hilton, M. E. (1988). Regional diversity in United States drinking practices. ***British Journal of Addiction***, 83, 519-532.

Hauge, R. & Irgens-Jensen, O. (1987). Age, alcohol consumption and the experiencing of negative consequences of drinking in four Scandinavian Countries. ***British Journal of Addiction***, 82, 1101-1110.

Room, R. (1987). Alcohol monopolies in the U.S.: challenges and opportunities. ***Journal of Public Health Policy***, 8(4), 509-530.

Hauge, R. & Irgens-Jensen, O. (1986). The relationship between alcohol consumption, alcohol intoxication, and negative consequences of drinking in four Scandinavian countries. ***British Journal of Addiction***, 81, 513-524.

Skog, O.-J. (1985a). The collectivity of drinking cultures: A theory of the distribution of alcohol consumption. ***British Journal of Addiction***, 80, 83-99.

Skog, O.-J. (1985b). The wetness of drinking cultures: A key variable in epidemiology of alcoholic liver cirrhosis. ***Acta Medica Scandinavica***, 703, 157-184.

Bruun, K., Edwards, G., Lumio, M., Mäkelä, K., Pan, L., Popham, R. E., Room, R., Schmidt, W., Skog, O-J., Sulkunen, P. & Österberg, E. (1975). ***Alcohol Control Policies in Public Health Perspective*** (Vol. 25). Helsinki, Finland: The Finnish Foundation for Alcohol Studies.

4.2 How does one determine an optimal balance of policies to provide fair access to responsible drinkers while restricting sales in ways that reduce alcohol-related risks and harms? What methods are available for identifying best practices and their applicability to a particular state?

Only recently has this research agenda—choosing the most cost-effective alcohol policy mix to fit the economic development and cultural conditions of a jurisdiction (including its rates and patterns of drinking and associated social and health harms)—begun to be seriously considered, and research in this area has only recently begun. For example, a study entitled, "A Comprehensive Analysis of State Alcohol Policy Environment and Its Effects" has been funded by NIAAA at the University of Minnesota (Darin Erikson, PI). Most of the thinking has had an international focus involving follow-ups to the efforts to examine mortality and disabilities resulting from alcohol use disorders (alcohol abuse and alcoholism) in the context of World Bank and World Health Organization studies of the Global Burden of Disease. There are marked regional differences in the disease burden associated with alcohol. In the Americas (the region as a whole), alcohol has found to be the most important single preventable risk factor contributing to burden of disease, larger even than smoking, obesity, and high blood pressure.

Regarding specific approaches to selecting an optimal set of alcohol policies for a jurisdiction there is not yet a solid, widely-endorsed methodology. Cost studies in the U.S. help identify the larger contributors for example, injuries, criminal justice, health system and alcohol treatment costs. Efforts at NIAAA to update these are currently underway, as are efforts to calculate disability adjusted life years associated with alcohol and related conditions using large-scale public data sources. In principle, by analogy to a country, a state's profile of drinking patterns and harms, together with its population characteristics and economic and infrastructure resources, could help determine the relative expected effectiveness and cost effectiveness of various strategies for abating alcohol problems. Countries or states may both have different capabilities for implementing strategies that strengthen policies to reduce drinking problems like increasing alcohol taxation, enhancing on- and off-premise point-of-sale regulations including retail monopoly practices where present, increasing enforcement of DWI laws or altering the legal BAC

limits, increasing screening, brief intervention and referral to treatment (SBIRT) programs, and the like. These countries or states may also expect different results from such strategies if they are implemented, because it depends on the country or state's unique drinking patterns and resources. One example is that states' preemption laws differ greatly with respect to permitting local control opportunities (such as local retail outlet density regulation). As discussed below, public sentiment for such legislative and regulatory measures may also affect the viability of particular approaches. Although a beginning has been made, alcohol policy development (how to encourage passage of evidence based alcohol-related laws) remains more a political art than a science. It has been observed that the role of research tends to be more justificatory than initiatory, with some noteworthy exceptions such as mainly in the area of laws aiming to reduce drinking driving.

Key Articles Cited In Section 4.2

Anderson, P., Chisholm, D., & Fuhr, D. C. (2009). Effectiveness and cost-effectiveness of policies and programmes to reduce the harm caused by alcohol. *Lancet*, 373(9682), 2234-2246.

This is an extremely comprehensive, current review of the evidence for effectiveness of alcohol policies and programs, one of several Lancet papers in this edition focused on Alcohol and Global Health. It is broadly framed for relevance to both developed and developing countries, and most often it cites recent key reviews on particular alcohol policy topics. It breaks policies considered into nine "target areas": (1) Education and information, (2) Health-sector response, (3) Community programs, (4) Drink-driving policies and countermeasures, (5) Addressing the availability of alcohol, (6) Addressing the marketing of alcoholic beverages, (7) Pricing policies, (8) Harm reduction and (9) Reducing the public health effect of illegally and informally produced alcohol. In addition to marshalling current evidence of effectiveness, it notes that studies of social costs have been done in many countries, addressed by Rehm et al., in a companion Lancet article addressing the global burden of disease (GBD) attributable to alcohol use and alcohol-use disorders (AUD). The Anderson et al article updates an earlier WHO study of potential effects and costs of implementing effective policies, assessing the disability-adjusted life years (DALYs), estimated to be saved from

implementing policies in the first seven target areas, and what this is expected to cost per head. Recommendations are made with respect to best mixes of policies. For example, among six key policy approaches for countries where alcohol is normally available, the first deals with tax increases indexed to inflation, noting that in countries with large amounts of unrecorded consumption, like India, efforts should first be made to tax that portion rather than to increase overall taxes. The second recommends introducing (or maintaining) government monopolies for the retail sale of alcohol, with a minimum age of purchase of 18-21 years; when not feasible a licensing system limiting outlet density and hours of sale is recommended. Regarding policy development, the authors comment that for high income Anglophone or Scandinavian countries, adoption of such policies is "often a matter of recovering a lost policy tradition that has been abandoned in the face of the deregulatory phase of the past three or so decades" (p 2242).

Taylor, B., Rehm, J., Aburto, J. T. C., Bejarano, J., Cayetano, C., Kerr-Correa, F., Ferrand, M. P., Gmel, G., Graham, K., Greenfield, T. K., Laranjeira, R., Lima, M. C., Magri, R., Monteiro, M., Mora, M. E. M., Munne, M., Romero, M. P., Tucchi, A., & Wilsnack, S. (2007). *Alcohol, gender, culture and harms in the Americas PAHO Multicentric Study Final Report*. Washington: Pan American Health Organization.

Alcohol is a major risk factor for mortality and morbidity in the Americas (the WHO North and South America Region including the Caribbean). Overall in the Americas, alcohol consumption levels are higher than worldwide estimated average, while abstention rates for both men and women are consistently lower. With regard to the burden of disease in the Americas, this report finds that alcohol caused approximately 323,000 deaths, 6.5 million years of life lost, and 14.6 million disability-adjusted life-years, including acute and chronic disease outcomes throughout the lifespan. Men compared to women have higher levels of all alcohol-attributable burdens of disease, attributed mostly to their alcohol consumption profile, involving higher total volume and more harmful drinking patterns such as heavy episodic drinking. Data from 2005 GENACIS (Gender, Alcohol and Culture: An International Study) surveys are used to describe 10 countries' alcohol consumption profiles, alcohol-related predictors and outcomes. Included countries were: U.S.A, Canada, Argentina, Brazil, Belize, Nicaragua, Peru, Mexico, Costa Rica, and Uruguay. Wide differences were seen in volume of alcohol

consumption and heavy episodic drinking between countries, even those classified in the same WHO sub-region. In considering the fit between policy measures and the 10 countries studied, authors argued that given the relatively low tax rate in many of the American countries (especially in South and Central America) and given the high consumption of several, such as Canada, Belize, and Brazil, an increase of the taxation of alcoholic beverages should be a priority for alcohol policy in this region given its effect on consumption and its and cost-effectiveness. They cited newer economic literature reviewed in Chapter 6 of Alcohol: No Ordinary Commodity (Babor et al., 2003) finding clear evidence that even people with alcohol dependence react to prices of alcohol. Authors note that their analysis found that young people consume much of the alcohol, and consume it in a more dangerous way, than older age cohorts. Thus, the alcohol-attributable burden of disease for acute outcomes is especially high in these countries. They recommended, as particularly effective policy options for reducing the alcohol consumption, both price increases and raising the age at which young people can legally purchase liquor in on- and off-license establishments. They see enforcement of such laws in both developing and developed countries as a limitation that needs to be addressed for such measures to be effective.

Rehm, J., Greenfield, T. K. & Kerr, W. C. (2006). Patterns of drinking and mortality from different diseases – an overview. *Contemporary Drug Problems*, 33(2), 205-235.

The article reviews studies linking alcohol to a large burden of disease worldwide. Recent epidemiological research has shown that besides average volume, drinking patterns are causally involved in disease outcomes. The article was based on a systematic, computer-assisted search, and qualitative reviews. Results are that cardiovascular disease, especially ischemic heart disease, is linked to patterns of drinking: regular and light to moderate drinking, and drinking with meals are cardioprotective; heavy drinking occasions have been associated with detrimental outcomes and increases in disease risk. Regarding cancers, consumption of spirits is associated with higher cancer risks in the upper digestive tract. Spirits as well as heavy drinking occasions may also play causal roles in liver cirrhosis. Injuries are clearly related to high blood alcohol levels and also frequency of heavy drinking occasions. It is argued that alcohol epidemiology must include adequate pattern measures in the future. Further, while control policies focused on reducing per capita

consumption or average volume have generally been shown effective, it is valuable to add policies directed at changing patterns of drinking, often more acceptable in many modern societies. Knowledge about patterns of drinking may suggest new directions for policy, such as drink driving laws, as an example. The authors suggest new prevention and policy strategies need to be developed which focus on changing patterns, with some attempts underway in Australia and New Zealand.

Rehm, J. & Monteiro, M. (2005). Alcohol consumption and burden of disease in the Americas – implications for alcohol policy. *Revista Panamericana de Salud Publica*, 18(4/5), 241-248.

In the Americas, alcohol has been found to be the most important single preventable risk factor contributing to burden of disease, greater than smoking, obesity, and high blood pressure. The implications for alcohol policy development are summarized.

Greenfield, T. K., Giesbrecht, N. A., Kaskutas, L. A., Johnson, S., Kavanagh, L. & Anglin, L. (2004). A study of the alcohol policy development process in the United States: theory, goals, and methods. *Contemporary Drug Problems*, 31(Winter), 591-626.

This paper introduces a Special Edition of Contemporary Drug Problems covering results of a Robert Wood Johnson Foundation funded project on the alcohol policy development process in the United States. The project sought to identify factors influencing alcohol policy formation at the U.S. federal level, and also investigate the role played by research in policy development (see next). It explores the explanatory value for alcohol policy formation of John Kingdon's "Policy Stream" model involving three interacting policy streams: problem recognition, formulation of policy alternatives, and political contexts and events. A key concept described by Kingdon is time-limited "windows of opportunity" during which passage of legislation becomes more possible. Authors found some support for his view that each of the three streams is necessary but insufficient for policy measures to be enacted, and that if "coupling" of the streams does not occur swiftly, the opportunity passes. Federal alcohol policy cases studied included excise taxes, policies related to alcohol promotion, federal agency reauthorization, and federally mandated health warnings. Data sources

included 64 key-informant interviews collected using "snowball sampling", as well as archival sources. Qualitative analyses were undertaken of government documents, scientific journals, print and electronic media, trade magazines, and newsletters. The in-depth interviews were completed of public health activists, alcohol industry representatives, researchers, journalists, and members of the executive and legislative branches of the government. This paper summarizes the methods used, the challenges overcome, and provides an overview of interpretations that are detailed elsewhere in this special issue (including the following article).

Johnson, S., Greenfield, T. K., Giesbrecht, N., Kaskutas, L. A. & Anglin, L. (2004). The role of research in the development of U.S. federal alcohol control policy. *Contemporary Drug Problems*, 31(Winter), 737-758.

The article asks whether, in federal alcohol control policy development, research is used merely to inform policymakers and the public or rather to persuade them. Are research findings critical to the enactment of public policy, or just an afterthought? The researchers answered these questions by analyzing in-depth interviews with federal alcohol policy community members (see above) including researchers, interest groups and media professionals. Informants responded to semi-structured interviews with questions about the role of research in policymaking, both generally and in specific instances involving the informant. Interview narratives were content analyzed, as were governmental documents pertaining to policies mentioned by subjects. Informants saw scientific information as only one of many levers relevant to the policymaking process, with its role significantly constrained by rules governing policymaking. Some implications for improving usefulness of research are drawn.

Harwood, H. J. (2000). *Updating Estimates of the Economic Costs of Alcohol Abuse in the United States*. Estimates, update methods, and data. Rockville, MD: National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health.

This report updates estimates of the costs of alcohol in the U.S. for 1998. Total costs are estimated to be $184.6 billion with the most substantial areas of estimated costs being lost earnings due to alcohol-related illness ($86 billion) and premature death ($36 billion) and crashes, fires, criminal

justices cost and similar areas ($24 billion). The distribution of estimated costs between such areas can serve as a guide for choosing and prioritizing alcohol policy remedies designed to mitigate the economic burden of alcohol within the U.S.

Additional References Not Annotated for Section 4.2

Mosher, J. F., & Treffers, R. D. (2013) State per-emption, local control, and alcohol retail outlet density regulation. ***American Journal of Preventive Medicine***, 44(4), 399-405.

Rehm, J., Mathers, C., Popova, S., Thavorncharoensap, M., Teerawattananon, Y., Patra, J. (2009). Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. ***Lancet***, 373, 2223-2233.

Wells, S., Graham, K., & Purcell, J. (2009). Policy implications of the widespread practice of 'pre-drinking' or 'pre-gaming' before going to public drinking establishments: are current prevention strategies backfiring? ***Addiction***, 104(1), 4-9.

Rehm, J., Gnam, W. H., Popova, S., Patra, J., & Sarnocinska-Hart, A. (2008). ***Avoidable Cost of Alcohol Abuse in Canada 2002: Highlights***. Ontario: Centre for Addiction and Mental Health, University of Toronto.

Brand, D. A., Saisana, M., Rynn, L. A., Pennoni, F., & Lowenfels, A. B. (2007). Comparative analysis of alcohol control policies in 30 countries. ***PLoS Medicine***, 4(4), e151.

Giesbrecht, N. (2007). Reducing alcohol-related damage in populations: rethinking the roles of education and persuasion interventions. ***Addiction***, 102(9), 1345-1349.

Nelson, T. F., Naimi, T. S., Brewer, R. D., & Wechsler, H. (2005). The state sets the rate: the relationship among state-specific college binge

drinking, state binge drinking rates, and selected state alcohol control policies. ***American Journal of Public Health***, 95(3), 441-446.

Stockwell T, Gruenewald, P, Toubourou, J. & Loxley, W. (2005). Recommendations For New Directions in the Prevention of Risky Substance Use and Related Harms In Stockwell T, Gruenewald, P, Toubourou, J. & Loxley, W. (eds). ***Preventing Harmful Substance Use: The evidence base for policy and practice***. Chichester, UK: Wiley.

Karlsson, T & Tigerstedt, C. (2004) Testing new models in Finnish, Norwegian and Swedish alcohol policies. ***Nordic Studies on Alcohol and Drugs***, 21, 79-91.

Ludbrook, A. (2004) Effective and cost-effective measures to reduce alcohol misuse in Scotland: an update. Edinburgh. ***Scottish Executive***. (http://www.scotland.gov.uk/Publications/2005/01/20542/50240)

Rehm, J., Room, R., Monteiro, M., Gmel, G., Graham, K., Rehn, N., et al. (2004). Alcohol use. In M. Ezzati, A. D. Lopez, A. Rodgers & C. J. L. Murray (Eds.), ***Comparative Quantification of Health Risks: Global and regional burden of disease attributable to selected major risk factors.*** (Vol. 1, pp. 959-1108). Geneva, Switzerland: World Health Organization.

Villaveces, A., Cummings, P., Koepsell, T. D., Rivara, F. P., Lumley, T., & Moffat, J. (2003). Association of alcohol-related laws with deaths due to motor vehicle and motorcycle crashes in the United States, 1980-1997. ***American Journal of Epidemiology***, 157(2), 131-140.

Ludbrook, A., Godfrey, C., Wyness, L., Parrott, S., Haw, S., Napper, M. and van Teijlingen, E. (2002). Effective and cost-effective measures to reduce alcohol misuse in Scotland: a literature review. ***Scottish Executive*** Health Department. 2002. (http://www.alcoholinformation.isdscotland.org/alcohol_misuse/files/MeasureReduce_Full.pdf)

Jernigan, D. H., Monteiro, M., Room, R. & Saxena, S. (2000). Towards a global alcohol policy: alcohol, public health and the role of WHO. ***Bulletin of the World Health Organization***, 78(4), 491-499.

Whetten-Goldstein, K., Sloan, F. A., Stout, E. M., & Liang, L. (2000). Civil liability, criminal law, and other policies and alcohol-related motor vehicle fatalities in the United States: 1984–1995. ***Accident Analysis and Prevention***, 32(6), 723-733.

Holder, H. D. Kűlhorn, E., Nordlund, S., Ősterburg, E., Romelsjö, A., & Ugland, T (1998). ***European integration and Nordic alcohol policies: Changes in alcohol controls and consequences in Finland, Norway and Sweden.*** 1980-1997. Brookfield, U.S.A: Ashgate.

Room, R. (1990). Thinking about alcohol controls. In R. Engs (Ed.), ***Controversies in the addictions field*** (Vol. 1, pp. 68-75). Dubuque, Iowa: Kendall-Hunt.

Baillie, R. K. (1996). Determining the effects of media portrayals of alcohol: going beyond short term influence. ***Alcohol and Alcoholism***, 31(3), 235-242.

4.3 What is the role of citizen's opinions in relation to state, local or federal alcohol policy? What are public opinions on state control systems?

Most of the research has focused on public opinion on a national level, quite often involving cross-country comparisons (e.g., in several cases the U.S. and Canada, or multiple European and/or Scandinavian countries), or tracking how public opinion preceded or followed alcohol policy changes. There have been several single U.S. studies of alcohol policy opinions but few have examined state-specific differences. It has generally been believed that public opinion provides some legitimacy for chosen policies, and that favorable opinions on a policy should help sustain alcohol controls against efforts to erode them (or more often the reverse), but evidence on this point has relied on scattered case studies. These studies have shown a complex relationship between fluctuations in alcohol consumption and associated alcohol problems and public opinions about controls. In some but not all instances, increasing drinking and alcohol problems following erosion of controls including privatization or liberalizing alcohol

monopolies has led to some greater call for alcohol controls in a given jurisdiction. It is not clear if the weight of evidence supports the "long wave" theory of alcohol consumption proposing that as consumption and problems decline, a new generation forgets earlier alcohol problems and supports liberalization until alcohol problems re-emerge when the public may again push for regulation.

We know that whether or not poll items include a rationale for the policy, it affects people's likelihood of endorsing a given approach. Nevertheless, in the U.S., alcohol policy opinion research has revealed gaps in the public's understanding of evidence-based public health policy strategies. Long-term trend surveys over a 15-year period in the U.S. have shown a decline in support for eight of 11 alcohol policies monitored between the early 1990s and 2005. These include reduced support for raising alcohol taxes, access policies like shorter store hours and banning sales in corner stores, restricting advertising and promotion, and even support for increasing prevention and treatment programs. A number of personal characteristics such as religion, ethnicity, gender, age and of course drinking status affect policy opinions. Based on one study, marked differences in alcohol policy opinions have been observed between states. For example, compared to the overall average, Georgia shows very strong support for alcohol controls but is strongly against raising alcohol taxes or funding interventions and guaranteeing better treatment access. Conversely, Michigan does not support alcohol controls or taxes, but favors increasing treatment access. Pennsylvania is modestly lower than average on support for alcohol control measures and strongly dislikes taxes and paying for treatment access. Texas favors more controls and raising alcohol taxes, and interventions like responsible beverage service and alcohol education, but does not want to provide increased treatment access. Virginia modestly supports alcohol controls and interventions, but moderately dislikes taxes and is average in its views about enhancing treatment access. These findings, particularly if replicated, would support the position that states would have a case for choosing different alcohol regulatory policies on the basis that they were being responsive to differing positions of their voting publics.

Key Articles Cited In Section 4.3

Giesbrecht, N. (2007). [Editorial, introducing special edition] Alcohol policies and public opinion: Five case studies on recent developments in Europe and North America. *Journal of Substance Use*, 12(6): 385-388.

The editorial introducing the special edition of the journal on public opinions on alcohol policies notes the "striking contrast" between increasing rates of alcohol harms and ongoing tendencies to "increase access to alcohol, promote sales, and dismantle conventional control systems" (including retail monopolies).

Greenfield, T. K., Ye, Y. & Giesbrecht, N. A. (2007). Views of alcohol control policies in the 2000 National Alcohol Survey: What news for alcohol policy development in the U.S. and its states? *Journal of Substance Use*, 12(6), 429-445.

This paper examines public opinion in U.S. alcohol policies during the 1990s and their correlates in 2000, using five national telephone surveys including the 2000 National Alcohol Survey. Trend analyses of public opinion on 11 common alcohol policies and 14 alcohol policy items in 2000 are presented and used to examine demographic correlates of support for various policy areas. With the exception of the alcohol warning label policy, national support for alcohol policies declined (eight policies) or was unchanged in the 1990s for the measured policies. In 2000, four meaningful policy opinion factors were found; support for specific policies vary. Warnings on labels and advertisements have highest support (> 90%), than interventions like prevention, treatment, and responsible beverage service at 70% (a level similar to improving access to treatment). Alcohol controls show varied but lower support, from 25% for increasing severity of already strong measures (like raising the minimum drinking age still further), to above 60% for banning sales in corner stores. Only a third favor higher alcohol taxes and more restrictive hours of sale. Generally, women and those with lower socio-economic status show higher alcohol policy support. Heavier drinkers are least supportive of alcohol policies while ethnic minorities, especially Hispanics, are more favorable to alcohol controls, even raising alcohol taxes. Since evidence-based alcohol control policies show mixed but lower public support than treatment, prevention and consumer warnings, authors see a need for

community-based strategies to increase awareness of environmentally oriented alcohol policies and their public health benefits.

Slater, M. D., Lawrence, F., & Comello, M. L. G. (2009). Media influence on alcohol-control policy support in the U.S. adult population: the intervening role of issue concern and risk judgments. *Journal of Health and Communication*, 14(3), 262-275.

Using a general U.S. adult population telephone survey (n=1,272) authors tested hypotheses regarding the role of news media in support for alcohol-control policies, particularly stricter enforcement of existing laws such as restricting sales to minors and strengthening alcohol advertising limits. They also explored potential mediating factors such as expressed concern, and risk judgments. Results, with the limitation that they were based on a cross-sectional rather than longitudinal data, suggested that increased exposure and attention to crime and accident news coverage predicted support for enforcement of alcohol-controls and alcohol advertising restrictions (but not server liability laws). Models suggested that the mechanism for greater support might first involve elevated concern, and after this a perception that alcohol was more involved in deadly assaults, lethal motor vehicle crashes and other injury accidents. Of note was their finding of the public's mean attribution that 51% (±22%) of deadly assaults, 37% (±23%) of lethal motor vehicle crashes and 46% (±25%) of other lethal injury accidents involved alcohol as a "causative factor".

Greenfield, T. K., Johnson, S. P. & Giesbrecht, N. A. (2004). Public opinion on alcohol policy: a review of U.S. research. *Contemporary Drug Problems*, 31(Winter), 759-790.

Research on public opinion on alcohol policy is reviewed. Accelerating the research agenda in this area promises better understanding of the public health policymaking process. The paper reviews and critiques the major analyses of policy opinion in the U.S., discusses national support for specific alcohol policy options, and addresses American trends in policy opinion. The authors suggest that the dynamics of alcohol policy opinion are complex, allowing few generalizations. Environmentally based alcohol policies receive mixed levels of public support and in the U.S., general population surveys support has decreased somewhat throughout

the 1990s. Recommendations for continued monitoring and improved methods of policy opinion measurement are made.

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