

**Alaska Mental Health Board
Advisory Board on Alcoholism and Drug Abuse
431 N. Franklin St. Suite 200
Juneau, Alaska, 99801**



February 11, 2016

Representative Kurt Olson, Chairman
House Labor and Commerce Committee
Alaska State Capitol, Room 24
Juneau, Alaska 99801

BY HAND-DELIVERY

Re: Letter of Support for HB 248

Chairman Olson,

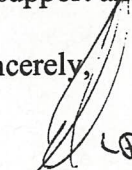
The Advisory Board on Alcohol and Drug Abuse and the Alaska Mental Health Board support efforts to increase and diversify Alaska's revenue and balance the budget. In October, 2015 the Boards passed a resolution encouraging executive and legislative leaders to consider all ways to generate needed revenue for public services. The Boards support HB 248 as one in a package of revenue and reform bills needed to balance the budget without crippling Alaska's economy.

The Boards have received significant input from our constituents about the importance of public health and safety, education, transportation, and employment services to their ability to live full and productive lives. Ensuring their sustainability is critical. For example, loss of the Alaska State Trooper station in Talkeetna has made it more difficult for the community to respond to mental health emergencies in a timely and safe manner. Because these diverse programs across public sectors depend upon general funds to operate effectively, the Boards support efforts to fill the general fund deficit.

HB 248 increases the excise tax on alcohol to generate much needed revenue for state operations. It fits into the wider scope of efforts, by the legislative leaders and the executive branch, to contain costs in the criminal justice and health care systems. Research has consistently shown that alcohol consumption is responsive to price, especially among underage youth. Higher alcohol prices and taxes are associated with reductions in excessive alcohol consumption and alcohol-related harms, such as drunk driving and other alcohol-related crimes, lost productivity, child neglect and maltreatment, and early death. The costs of substance abuse to Alaskans are over \$1b annually across public and private sectors.

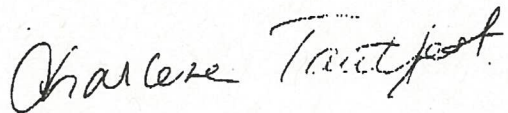
HB 248 provides revenue Alaska needs to sustain essential public services. HB 248 can also help reduce the incidence of alcohol abuse and related harms, which it turn can support cost containment in the corrections and health care systems. The Boards encourage the House Labor and Commerce Committee to support and pass HB 248.

Sincerely,



GUNNAR EBBESSON

Gunnar Ebbesson, Chairperson ABADA



Charlene Tautfest, Chairperson AMHB

Attachments:

The Economic Costs of Alcohol and Other Drug Abuse in Alaska, McDowell Report, 2012 Update
The Effectiveness of Tax Policy Interventions for Reducing Excessive Alcohol Consumption and Related Harms, 2010

The Economic Costs of Alcohol and Other Drug Abuse in Alaska, 2012 Update

Prepared for:
**Alaska Mental Health Board &
Advisory Board on Alcoholism
and Drug Abuse**

431 N. Franklin St., Suite 201
Juneau, Alaska 99801



Research-Based Consulting

Juneau
Anchorage

August 2012

Executive Summary

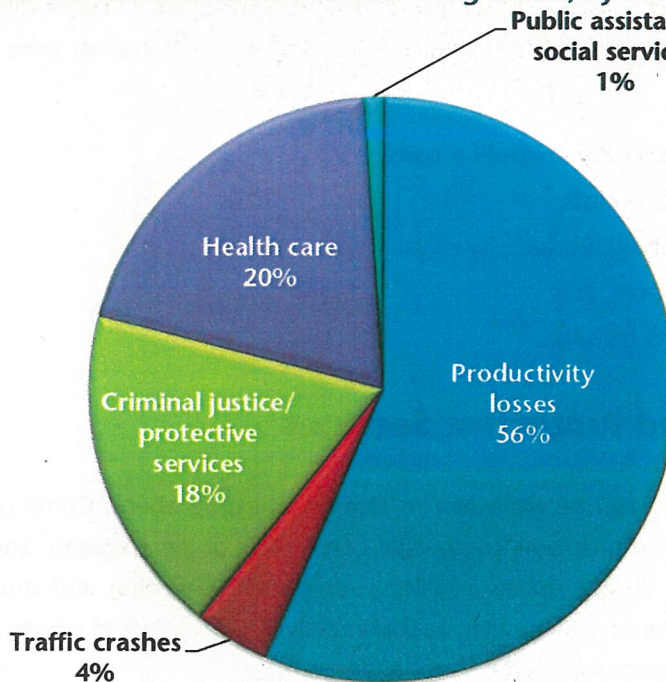
The Advisory Board on Alcoholism and Drug Abuse, through the Alaska Department of Health and Social Services, contracted with McDowell Group to update prior studies on the economic costs of alcohol and drug abuse in Alaska.

Alcohol and drug abuse impacts Alaska's economy in a variety of ways. It can lead to greater health risks and death, impaired physical and mental abilities, crime, greater reliance on public assistance, and a number of other adverse effects. This study addresses tangible economic costs such as lost earnings or costs of government programs. However, there are mental and emotional costs that result from alcohol and drug abuse that are extremely difficult to measure and are not included in this report.

In 2009, the National Survey on Drug Abuse and Health estimated that 9.5 percent of Alaska's population age 12 and older (55,700 residents) were dependent on or abusing alcohol or drugs. Costs to the economy in 2010 totaled \$1.2 billion. Costs by category include:

- \$673.2 million in productivity losses,
- \$50.5 million in traffic crash costs,
- \$217.7 million in criminal justice and protective services,
- \$237.3 million in health care, and
- \$13.2 million in public assistance and social services.

Economic Costs of Alcohol and Drug Abuse, by Category, 2010



- \$52.3 million in law enforcement costs,
- \$14.2 million in legal and adjudication costs,
- \$56.7 million in incarceration costs, and
- \$24.4 million in costs to victims.

Additionally, a large number of protective service costs are alcohol and drug abuse-related. Estimates for adult protective services are not available at this time. Child protective services attributed to alcohol and drug abuse in Alaska totaled \$70.1 million in 2010, including \$33.1 million for social workers and \$18.9 million in adoption and guardianship costs.

Health Care

A wide variety of health care costs are associated with alcohol and drug abuse, including hospital costs from injuries or illness, residential and outpatient treatment costs, pharmaceutical costs, nursing home and long-term care facility costs, and the costs of treating fetal alcohol syndrome, HIV/AIDS, and hepatitis B and C. Health care costs attributed to alcohol and drug abuse in Alaska totaled \$237.3 million in 2010.

- There were 45,500 days of hospital care attributed to alcohol or drug related injuries or illnesses, costing \$146.5 million. Alcohol-related incidents accounted for 41,500 days of care while drug related incidents accounted for 4,000 days of care.
- The Alaska Department of Health and Social Services, Division of Behavioral Health appropriated \$29.9 million to alcohol and drug residential and outpatient treatment, while \$5.4 million of Medicaid expenditures went to this cause in 2010.
- Medical outpatient treatment costs amounted to \$38.3 million in 2010 with 72,100 days of care.
- Prescription drug costs for the treatment of alcohol or drug dependence cost Alaska an estimated \$1.1 million in 2010.
- There were 2,239 nursing home and long-term care days that can be attributed to alcohol and drug abuse in 2010, costing \$1.1 million.
- In 2010, there were an estimated 15 fetal alcohol syndrome (FAS) births and 128 fetal alcohol spectrum disorder (FASD) births. Annual costs of treating these 15 new FAS patients added approximately \$286,500 to the existing costs of treating those previously born with FAS and FASD.
- There were 118 known cases of HIV or AIDS in Alaska in 2010 attributed to intravenous drug use; 57 HIV positive and 61 with HIV and AIDS. Annual costs of treatment are \$7.5 million.
- Of hepatitis B and C cases in Alaska in 2010, 437 can be attributed to intravenous drug use, with an annual cost of treatment of \$7.3 million.

Data on Alaska's alcohol and drug dependent and abusing population was drawn from the U.S. Substance Abuse and Mental Health Services Administration (SAMHSA), Office of Applied Studies *National Survey on Drug Use and Health, 2008-2009* which provides the most recent state-specific estimates.

In nearly all cases, Alaska specific data were not available on the amount of crime, health and medical costs, lost production, and public assistance that can be attributed to alcohol and other drug abuse. Estimates rely on national norms based on tested methodologies. Comprehensive development of Alaska specific data is recommended.

Organization of the Report

This report begins with an examination of productivity losses due to death, diminished productivity, incarcerations, and inpatient treatment or hospitalization as a result of alcohol and drug abuse. Chapter 2 measures the cost of alcohol or drug-related traffic crashes in Alaska. Chapter 3 follows with a look at criminal justice and protective services costs, including law enforcement, legal and adjudication, incarceration, and victimization costs. A variety of health care-related costs are described and calculated in Chapter 4. Chapter 5 provides estimates of the costs of public assistance and social services attributed to alcohol and drug abuse. Chapter 6 discusses the special case of co-occurring mental health and substance abuse disorders, while the costs of underage drinking are considered in Chapter 7. Finally, Chapter 8 briefly calculates employment and tax revenue from alcohol sales in Alaska.

Full report available at

<http://dhss.alaska.gov/abada/Documents/pdf/EconomicCostofAlcoholandDrugAbuse2012.pdf>

One of the fundamental laws of economics is that quantity demanded of a product is inversely related to its price (Law of Demand).⁴ Based on economic theory, therefore, increasing the price of alcohol would be expected to lower alcohol consumption. Alcohol taxes are promulgated primarily by federal and state governments, but can be instituted at the local or county level. Currently in the U.S., alcohol taxes are beverage-specific (i.e., they differ for beer, wine, and distilled spirits) and are usually “nominal” taxes, meaning they are based on a set rate per unit volume and are not adjusted for inflation (i.e., they generally remain stable as the cost of living increases). At the state and federal levels, inflation-adjusted alcohol taxes have declined considerably since the 1950s.⁵ Concordant with this decrease in the real value of these taxes from substantially higher levels, the inflation-adjusted price of alcohol decreased dramatically,⁶ reflecting the fact that changes in taxes are efficiently passed on through changes in prices.⁷ The goal of this systematic review is to assess the relationship between alcohol taxes or prices and public health outcomes related to excessive alcohol consumption to better inform decision makers about the potential utility of using tax policy as a means of improving those outcomes.

Health People 2010 Goals and Objectives

The intervention reviewed here is relevant to several objectives specified in *Healthy People 2010*, the disease prevention and health promotion agenda for the U.S. (Table 1).⁸ The objectives most directly relevant to this review are those that aim to reduce excessive alcohol consumption (26-11); reduce average annual alcohol consumption (26-12); and reduce key adverse consequences of excessive alcohol consumption (26-1, 26-2, and 26-5 through 26-8). In addition to these specific objectives, *Healthy People 2010* notes that excessive alcohol consumption is also related to several other public health priorities such as cancer, educational achievement, injuries, risky sexual activity, and mental health; thus, a reduction in excessive alcohol consumption should help to meet some of the national goals in these areas as well.

Recommendations from Other Advisory Groups

Several authors^{9–12} have suggested that increasing alcohol prices by raising alcohol excise taxes is among the most effective means of reducing excessive drinking and alcohol-related harms. Increasing alcohol excise taxes has been specifically recommended as a public health intervention by the IOM, Partnership for Prevention, the WHO, and the expert panel convened for the Surgeon General’s Workshop on Drunk Driving.^{13–16} These recommendations are based on studies^{14,17,18} showing that increased alcohol taxes are associated with decreased overall consumption, decreased youth consumption, decreased youth binge drinking, reduced alcohol-related motor-vehicle crashes, reduced mortality from liver cirrhosis, and reduced violence.

The Guide to Community Preventive Services—The current systematic review of the effects of alcohol taxes and prices on excessive alcohol consumption and related harms applies the stringent inclusion and assessment criteria of the *Guide to Community Preventive Services* (*Community Guide*).¹⁹ It was conducted under the oversight of the independent, nonfederal Task Force on Community Preventive Services (Task Force), with the support of USDHHS in collaboration with public and private partners. The CDC provides staff support to the Task Force for development of the *Community Guide*.

To support efforts to address important public health priorities, such as reducing excessive alcohol consumption and its related harms, the Task Force makes recommendations for practice and policies based on the results of *Community Guide* reviews such as this one. These recommendations are based primarily on the effectiveness of an intervention in improving important outcomes as determined by the systematic literature review process. In

language journal, book chapter, or technical report; (3) be conducted in a high-income economy; and (4) evaluate independent variables and outcome measures of interest.

Independent variables of interest—In addition to the other criteria noted above, to be included in this review, a study had to evaluate either the effects of a change in alcohol tax policy or the relationship between alcohol taxes or prices and outcomes of interest. Studies of the effects of alcoholic beverage prices were considered relevant to an evaluation of alcohol taxes because there is evidence that changes in alcohol taxes are passed on to the consumer in the form of higher or lower prices, with little or no lag time.⁷ In fact, there is some evidence that tax increases may be magnified as they are passed on to the consumer. For example, when the federal excise tax on beer increased by \$9 per barrel in 1991, it was estimated to have increased retail prices by \$15 to \$17.⁷

Outcome measures of interest—The outcome measures of interest in this review are direct measures or proxies relating to the two final boxes in Figure 1—that is, excessive alcohol consumption and the harmful consequences of such consumption. When excessive alcohol consumption is assessed directly, it is typically done through surveys assessing either the prevalence or frequency of binge drinking (four or more drinks per occasion for women, or five or more drinks per occasion for men); heavy drinking (more than seven drinks per week for women, or more than¹⁴ drinks per week for men); or underage drinking (defined by state or national laws). Measures of societal levels of alcohol sales or consumption were also considered an acceptable proxy for excessive consumption for two primary reasons. First, there is an extremely strong relationship between per capita alcohol consumption and various measures of excessive drinking.^{22,23} Furthermore, because people consuming greater quantities of alcohol may be more sensitive to price increases, reductions in societal levels of alcohol consumption subsequent to price increases may result in even larger declines in excessive consumption.²²

In addition to studies directly or indirectly assessing excessive alcohol consumption, studies assessing health related outcomes associated with excessive alcohol consumption (e.g., alcohol-related motor-vehicle crashes) were also included in this review. In some cases, a single paper reported multiple measures of a single general outcome (e.g., both single-vehicle nighttime crashes and total crashes reported as measures of alcohol-related crashes). In these instances, the measure that was most strongly associated with excessive alcohol consumption based on estimated alcohol attributable fractions was chosen as the primary result reported for that outcome.

Search for Evidence

Conducting a thorough search for studies of the effects of alcohol taxes or alcohol prices is challenging because the effects of alcohol taxes or prices are often studied in conjunction with many other variables. As a result, a search that targets “tax” or “price” may fail to identify many relevant studies. To address this issue, a search was conducted for relevant studies as part of a broad database search for terms related to several alcohol policy interventions of interest to the current review group, covering the period from database inception through July 2005. Using MeSH terms and text words, the following databases were searched: MEDLINE, EMBASE, PsycINFO, the ETOH database of the National Institute on Alcohol Abuse and Alcoholism, Web of Science, Sociological Abstracts, and EconLit. Search strategies are available at www.thecommunityguide.org/alcohol/supportingmaterials/SSincreasingtaxes.html. The reference lists of prior literature reviews, as well as reference lists from studies included in this review, were used to identify additional relevant articles. The search produced 5320 potentially relevant papers, of which 78 met the inclusion criteria.

completely independent. Second, many of these studies did not report results in a way that allowed for the calculation of CIs for their elasticities.

For studies that reported stratified results (e.g., separate price elasticities for beer, wine, and spirits), the median value across the relevant strata reported in that study was used for the calculation of summary statistics. This approach prevented studies that reported multiple outcomes from having undue influence on the summary statistics.

Evidence Synthesis

Description of Included Studies

A total of 78 papers^{24–101} reported on studies that met the review inclusion criteria. Only some of the outcomes from one study⁸³ were included because not all of its analyses met quality of execution criteria. Five other studies^{70,88–91} were excluded from the review because they failed to meet quality of execution criteria. Detailed descriptions of the included studies are available at www.thecommunityguide.org/alcohol/supportingmaterials/SETincreasingtaxes.html.

Most studies assessed total alcohol consumption at the societal level (i.e., per capita alcohol consumption). The design of these studies varied across countries. Most studies conducted outside the U.S. used interrupted time-series designs, because alcohol taxes in other countries tend to be set at the national level, and as such, it is generally not possible to do intra-country comparisons. In contrast, most of the U.S. studies used a panel study design, in which multiple states were assessed over time, allowing each to serve as a comparison for the others. These studies included both those that accounted for between-state differences using a fixed-effects approach (whereby stable between-state differences are controlled for by dummy coding) and those that used a random effects approach (whereby between-state differences in variables other than tax or price are controlled for by including important predictors of alcohol consumption in the model). The remaining studies assessed measures related to excessive drinking (e.g., the prevalence of underage or binge drinking) or alcohol-related harms, the most common being outcomes related to motor-vehicle crashes.

Intervention Effectiveness

Alcohol price and overall consumption—Of the studies in the review, 50 assessed overall alcohol consumption; 38 (76%) of these reported price elasticities^{25,27,33–38,40,43,45,47,48,52,53,57,63,65,67,71,73,74,77,78,80–82,84,92–95,97} (six of these studies came from one paper⁸⁰ that calculated elasticities for multiple countries). Almost all of these 38 studies (95%) reported negative price elasticities, indicating that higher prices were associated with lower consumption. These results were quite consistent across beverage type, with median elasticities ranging from -0.50 for beer to -0.79 for spirits (Figure 2). Similarly, interquartile intervals for beer, wine, and spirits were also consistent across beverage type, with the 25th percentile elasticity ranging from -0.91 to -1.03 , and the 75th percentile ranging from -0.24 to -0.38 . Results for studies of overall ethanol consumption across beverage types were somewhat more variable because of the presence of several outliers with very large elasticities; for this outcome, the 75th percentile was comparable to that for the other outcomes (-0.50), but the 25th percentile had a substantially larger absolute value (-2.00).

As indicated in Table 2, the price elasticities reported in the reviewed studies were also quite consistent when evaluated by study characteristics (i.e., design suitability, model type, time period, and location). Across all of the nine strata examined, median elasticities ranged from -0.51 to -0.90 , the 25th percentile elasticities ranged from -0.78 to -1.10 , and the 75th percentile elasticities ranged from -0.32 to -0.50 . The most notable differences in

resulted in a 30% to 50% decrease in the price of imported spirits.^{54,59} These studies found that the change was associated with a small (2.3%) increase in the prevalence of any drinking, and larger increases in measures of excessive alcohol consumption, specifically binge drinking (3.4%) and heavy drinking (9.3%). It is also noteworthy that the most marked increases in spirits consumption occurred among young men.

In summary, most studies that were included in this review found that higher taxes or prices were associated with reductions in alcohol consumption in general and excessive alcohol consumption in particular. Although these effects were not restricted to a particular demographic group, there is some evidence that they may be more pronounced among groups with a higher prevalence of excessive alcohol consumption (e.g., young men).

Alcohol price or taxes and alcohol-related harms—Twenty-two studies in the review evaluated the effects of changes in alcohol price^{28,44,51,61,72,83,93,100} or taxes^{24–26,29–31,66,69,85–87,98,101,103} on various alcohol related harms. The most common outcomes evaluated were motor-vehicle crashes (including crash fatalities), various measures of violence, and liver cirrhosis. The studies were primarily conducted in the U.S., using state-level data.

Motor-vehicle crashes and alcohol-impaired driving—Eleven studies evaluated the effects of alcohol price^{44,72,93,100} or taxes^{24,26,29,30,86,98,103} on motor-vehicle crashes (Table 3). These studies found that the relationship between alcohol prices or taxes and injuries and deaths due to motor-vehicle crashes was generally significant and of a comparable magnitude to the relationship between these variables and alcohol consumption. The numeric values of the reported elasticities are substantially higher for studies that assessed the effects of alcohol prices than for those that assessed changes in alcohol taxes. This reflects the fact that taxes represent a relatively small proportion of the total purchase price of alcoholic beverages, so a larger proportional increase in taxes is necessary to achieve the same effect on the final purchase price of alcoholic beverages as a smaller proportional increase in the price itself. The reported elasticities were also generally higher for studies that assessed outcomes more directly attributable to alcohol consumption (e.g., alcohol-related crashes) than to those for which the relationship to alcohol consumption was less direct (e.g., all crash fatalities).

Three studies evaluated the relationship between alcohol prices^{44,61} or taxes⁶⁶ and self-reported alcohol impaired driving. These studies consistently found that alcohol-impaired driving was inversely related to the price of alcoholic beverages. The estimated price elasticities were similar for samples of Canadian⁴⁴ and U.S.⁶¹ adults (range of -0.50 to -0.81 ; all $p < 0.05$). The U.S. study stratified their sample by age in addition to gender, and reported price elasticities of -1.26 to -2.11 (both with $p < 0.05$) for men and women aged 18–21 years, respectively.⁶¹ The estimated tax elasticities from the remaining study were substantially larger for women than men (-0.29 vs -0.06), but neither estimate was significant.⁶⁶

Non-motor-vehicle mortality outcomes—Six studies evaluated the effects of alcohol price^{25,28,72,83,93} or taxes³¹ on non-traffic deaths. Despite substantial variability in their individual effect estimates, all six studies found that higher alcohol prices were associated with decreased mortality.

Five studies evaluated the relationship between alcohol prices and deaths from liver cirrhosis.^{25,28,72,83,93} The two studies that reported results as elasticities produced substantially different elasticity estimates for this outcome, -0.90 ($p < 0.05$)⁹³ and -0.01 ($p < 0.05$).²⁸ Results of another study indicated that a \$1 increase in the spirits tax would lead

disposable income, such as underage drinkers, may be expected to be more sensitive to changes in alcohol prices than those with more disposable income.¹⁰⁴ Unfortunately, based on the studies in this review, it was not possible to determine whether alcohol price elasticities differ significantly on the basis of age or income. Furthermore, although the reviewed studies provided evidence that changes in alcohol prices affect excessive consumption (e.g., the prevalence and frequency of binge drinking), the available data were not adequate to assess potential differences in price elasticities based on drinking pattern (i.e., between excessive and nonexcessive drinkers).

Economic Efficiency

Our systematic economic review identified two studies that estimated the cost effectiveness of alcohol tax intervention based on modeling.^{10,105} The first study¹⁰⁵ assessed the costs and outcomes of 84 injury prevention interventions for the U.S. and found that an alcohol tax of 20% of the pretax retail price offered net cost savings (i.e., the savings outweigh the costs) even after taking into account the adverse economic impact of reduced alcohol sales. The second study¹⁰ analyzed the comparative cost effectiveness of alternative policies to reduce the burden of hazardous alcohol use for 12 WHO subregions and found that taxation was the most effective and cost-effective intervention in populations with a 5% or greater prevalence of heavy drinkers. The costs associated with this intervention included the cost of passing the legislation itself, and the cost of administering and enforcing the laws once they are passed. Effectiveness was assessed using disability-adjusted life-years (DALYs), a standard measure of global health impact that considers the impact of an intervention on healthy years of life lost as a result of either death or disability. For the Americas A region, consisting of the U.S., Canada, and Cuba, which is the region most relevant to this review, the intervention costs for current taxation were \$482,956 (converted to 2007 dollars using the Consumer Price Index) per 1 million population per year, based on a 10-year implementation period and discounted at 3% per year to reflect the time value of money. The cost was assumed to stay the same when the tax was increased by 25% or 50%. Current taxes were estimated to prevent 1224 DALYs per 1 million population per year, yielding an average cost-effectiveness ratio for this intervention of approximately \$395 per DALY averted. This is much less than the average annual income per capita in these three countries, a threshold for an intervention to be considered very cost effective that was proposed by the Commission on Macroeconomics and Health.¹⁰⁶ The DALYs averted increased to 1366 and 1489 per 1 million population per year when taxes were increased by 25% and 50%, respectively. Because these incremental DALYs averted could be achieved without any increase in costs, these increases in taxes improve cost-effectiveness estimates relative to the current tax scenario. To obtain country-specific estimates of the DALYs saved per country as a result of this intervention, the regional analysis needs to be adjusted using country-specific data. Such estimates are limited by the assumptions made and the data available.

Barriers to Implementation

The level of taxation of alcoholic beverages has economic effects on several groups, including federal, state, and local governments; affected industry groups; and the general population of alcohol consumers. Whereas raising alcohol taxes may provide an important source of revenue for governments, such tax increases may be resisted by some industry groups and consumers. However, public support for increased alcohol taxes increases substantially when tax revenues are specifically directed to fund prevention and treatment programs instead of being used as an unrestricted source of general revenue.¹⁰⁷

Other Benefits or Harms

In addition to the direct public health outcomes evaluated in this review, the primary benefit of increased alcohol excise taxes is that they can provide a source of revenue to support

review.¹⁰⁹ Similarly, a recent study of alcohol-related disease mortality found that substantial alcohol tax increases in Alaska in 1983 and 2002 resulted in estimated reductions of 29% and 11%, respectively.¹¹⁰

However, additional research is needed to assess:

1. Whether changes in alcohol prices differentially affect drinking behavior and health outcomes for important subgroups of the population, such as underage young people.
2. The relative benefits of increasing taxes on all alcoholic beverages simultaneously, versus selectively increasing taxes on specific beverage types. This evaluation should be considered in light of known differences in the beverage preferences of binge drinkers, historic changes in tax rates across beverage types, and the effect of inflation on real tax rates by beverage type.
3. The impact of different approaches to taxing alcoholic beverages on excessive alcohol consumption and related harms. Specific emphasis should be placed on the impact of alcohol sales taxes, where taxes are calculated as a proportion of the total beverage price; the potential impact of standardizing alcohol taxes across beverage types based on alcohol content; and the potential impact of alcohol taxes levied by local governments on a per-drink basis in on-premise, retail alcohol outlets (i.e., tippler taxes).

Acknowledgments

The work of Briana Lawrence and Aneeqah Ferguson was supported with funds from the Oak Ridge Institute for Scientific Education (ORISE).

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the CDC.

References

1. Mokdad AH, Stroup D, Marks J, Gerberding J. Actual causes of death in the U.S., 2000. *JAMA*. 2004; 291:1238–1245. [PubMed: 15010446]
2. NIAAA. Tenth Special Report to the U.S. Congress on alcohol and health. Bethesda MD: NIH; 2000.
3. CDC. Web-based Injury Statistics Query and Reporting System (WISQARS). 2008. www.cdc.gov/ncipc/wisqars.
4. Marshall, A. Principles of economics. 8th ed. London: Macmillan; 1920.
5. Alcohol Epidemiology Program. Alcohol policies in the U.S.: highlights from the 50 States. Minneapolis: University of Minnesota; 2000.
6. Olson, S.; Gerstein, DR. Alcohol in America: taking action to prevent abuse. Washington DC: National Academies Press; 1985.
7. Young DJ, Bielinska-Kwapisz A. Alcohol taxes and beverage prices. *Natl Tax J*. 2002; 55(1):57–73.
8. USDHHS. Healthy People 2010. 2nd ed.. Washington DC: U.S. Government Printing Office; 2000.
9. Babor TF, Caetano R. Evidence-based alcohol policy in the Americas: strengths, weaknesses, and future challenges. *Pan Am J Public Health*. 2005; 18:327–337.
10. Chisolm D, Rehm J, Van Omeren M, et al. Reducing the global burden of hazardous alcohol use: a comparative costeffectiveness analysis. *J Stud Alcohol*. 2004; 65:782–793. [PubMed: 15700517]
11. Holder, HD.; Treno, AJ. Moving toward a common evidence base for alcohol and other drug prevention policy. In: Stockwell, T.; Gruenewald, PJ.; Toumbourou, JW.; Loxley, W., editors. Preventing harmful substance use: the evidence base for policy and practice. New York: John Wiley and Sons; 2005. p. 351-366.

37. Johnson JA, Oksanen EH. Socioeconomic determinants of the consumption of alcoholic beverages. *Appl Econ*. 1974; 6(4):293–301.
38. Goel RK, Morey MJ. The interdependence of cigarette and liquor demand. *South Econ J*. 1995; 62(2):451–459.
39. Hoadley JF, Fuchs BC, Holder HD. The effect of alcohol beverage restriction on consumption: a 25-year longitudinal analysis. *Am J Drug Alcohol Abuse*. 1984; 10(3):375–401. [PubMed: 6528871]
40. Lee B, Tremblay VJ. Advertising and the US market demand for beer. *Appl Econ*. 1992; 24(1):69–76.
41. Ornstein SI, Hanssens DM. Alcohol control laws and the consumption of distilled spirits and beer. *J Consum Res*. 1985; 12(2):200–213.
42. Saffer H, Grossman M. Drinking age laws and highway mortality rates: cause and effect. *Econ Inq*. 1987; 25(3):403–417.
43. Wilkinson JT. Reducing drunken driving: which policies are most effective? *South Econ J*. 1987; 54:322–334.
44. Adrian M, Ferguson BS, Her M. Can alcohol price policies be used to reduce drunk driving? Evidence from Canada. *Subst Use Misuse*. 2001; 36(13):1923–1957. [PubMed: 11795585]
45. Wette HC, Zhang JF, Berg RJ, Casswell S. Effect of prices on alcohol consumption in New Zealand 1983–1991. *Drug Alcohol Rev*. 1993; 12(2):151–158. [PubMed: 16818324]
46. Grossman M, Chaloupka FJ, Sirtalan I. An empirical analysis of alcohol addiction: results from the monitoring the future panels. *Econ Inq*. 1998; 36(1):39–48.
47. Hogarty TF, Elzinga KG. The demand for beer. *Rev Econ Stat*. 1972; 54(2):195–198.
48. Mayo JR. An estimate of U.S. demand for alcoholic beverages, 1986–92. *Penn Econ Rev*. 9(1):1–4. 000.
49. Bourgeois JC, Barnes JG. Does advertising increase alcohol consumption? *J Advert Res*. 1979; 19(4):19–29.
50. Speer PW, Gorman DM, Labouvie EW, Ontkush MJ. Violent crime and alcohol availability: relationships in an urban community. *J Public Health Policy*. 1998; 19(3):303–318. [PubMed: 9798373]
51. Farrell S, Manning WG, Finch MD. Alcohol dependence and the price of alcoholic beverages. *J Health Econ*. 2003; 22(1):117–147. [PubMed: 12564720]
52. Gruenewald PJ, Madden P, Janes K. Alcohol availability and the formal power and resources of state alcohol beverage control agencies. *Alcohol Clin Exp Res*. 1992; 16(3):591–597. [PubMed: 1626661]
53. Manning WG, Blumberg L, Moulton LH. The demand for alcohol: the differential response to price. *J Health Econ*. 1995; 14(2):123–148. [PubMed: 10154654]
54. Kuo M, Heeb JL, Gmel G, Rehm J. Does price matter? The effect of decreased price on spirits consumption in Switzerland. *Alcohol Clin Exp Res*. 2003; 27(4):720–725. [PubMed: 12711936]
55. Gius MP. The effect of taxes on alcoholic consumption: an individual level of analysis with a correction for aggregate public policy variables. *Penn Econ Rev*. 2002; 11(1):76–93.
56. Laixuthai A, Chaloupka FJ. Youth alcohol use and public policy. *Contemp Policy Issues*. 1993; 11(4):70–81.
57. Heien DM, Pompelli G. The demand for alcoholic beverages: economic and demographic effects. *South Econ J*. 1989; 55(3):759–770.
58. Coate D, Grossman M. Effects of alcoholic beverage prices and legal drinking ages on youth alcohol use. *J Law Econ*. 1988; 31(1):145–171.
59. Heeb J-L, Gmel G, Zurbrugg C, Kuo M, Rehm J. Changes in alcohol consumption following a reduction in the price of spirits: a natural experiment in Switzerland. *Addiction*. 2003; 98(10):1433–1446. [PubMed: 14519181]
60. Pacula RL. Does increasing the beer tax reduce marijuana consumption? *J Health Econ*. 1998; 17:557–585. [PubMed: 10185512]
61. Kenkel DS. Drinking, driving, and deterrence: the effectiveness and social costs of alternative policies. *J Law Econ*. 1993; 36:877–911.

87. Chesson H, Harrison P, Kassler WJ. Sex under the influence: the effect of alcohol policy on sexually transmitted disease rates in the U.S. *J Law Econ.* 2000; 43:215–237. [PubMed: 19530397]
88. Brinkley G. The causal relationship between socioeconomic factors and alcohol consumption: a Granger-causality time series analysis, 1950–1993. *J Stud Alcohol.* 1999; 60(6):759–768. [PubMed: 10606487]
89. Niskanen, WA. Santa Monica CA: Rand Corp; 1960. Taxation and the demand for alcoholic beverages.
90. Sloan FA, Reilly BA, Schenzler C. Effects of tort liability and insurance on heavy drinking and drinking and driving. *J Law Econ.* 1995; 38(1):49–77.
91. Kendell RE, Ritson B. Effect of economic changes on Scottish drinking habits 1978–82. *Br J Addict.* 1983; 78:365–379. [PubMed: 6581824]
92. Adrian M, Ferguson BS. Demand for domestic and imported alcohol in Canada. *Appl Econ.* 1987; 19(4):531–540.
93. Cook, PJ. The effect of liquor taxes on drinking, cirrhosis, and auto accidents. In: Moore, MH.; Gerstein, D., editors. *Alcohol and public policy: beyond the shadow of prohibition.* Washington DC: National Academies Press; 1981. p. 255–285.
94. Duffy M. Advertising and the inter-product distribution of demand. *Eur Econ Rev.* 1987; 31:1051–1070.
95. Jones AM. Asystems approach to the demand for alcohol and tobacco. *Bull Econ Res.* 1989; 41(2): 85–101.
96. Kenkel DS. New estimates of the optimal tax on alcohol. *Econ Inq.* 1996; 34(2):296–319.
97. Leskinen E, Terasvirta T. Forecasting the consumption of alcoholic beverages in Finland. *Eur Econ Rev.* 1976; 8:349–369.
98. Mast BD, Benson BL, Rasmussen DW. Beer taxation and alcohol-related traffic fatalities. *South Econ J.* 1999; 66(2):214–249.
99. Ponicki W, Holder HD, Gruenewald PRA. Altering alcohol price by ethanol content: results from a Swedish tax policy in 1992. *Addiction.* 1997; 92(7):859–870. [PubMed: 9293045]
100. Whetten-Goldstein K, Sloan FA, Stout E, Liang L. Civil liability, criminal law, and other policies and alcohol-related motor vehicle fatalities in the U.S.: 1984–1995. *Accid Anal Prev.* 2000; 32:723–733. [PubMed: 10994599]
101. Cook, PJ.; Moore, MJ. NIAAA Research Monograph. Vol. 24. Rockville MD: NIAAA; 1993. Economic perspectives on reducing alcohol-related violence. *Alcohol and interpersonal violence: fostering multidisciplinary perspectives*; p. 193–212.
102. Stout EM, Sloan FA, Liang L, Davies HH. Reducing harmful alcohol-related behaviors: effective regulatory methods. *J Stud Alcohol.* 2000; 61(3):402–412. [PubMed: 10807211]
103. Saffer H, Grossman M. Beer taxes, the legal drinking age, and youth motor vehicle fatalities. *J Legal Stud.* 1987 Jun 16.:351–373.
104. Chaloupka FJ. Effects of price on alcohol-related problems. *Alcohol Health Res World.* 1993; 17(1):46–53.
105. Miller TR, Levy DT. Cost-outcome analysis in injury prevention and control: eighty-four recent estimates for the U.S. *Med Care.* 2000; 38(6):562–582. [PubMed: 10843309]
106. WHO. Macroeconomics and health: investing in health for economic development. Final report of the Commission on Macroeconomics and Health. Geneva, Switzerland: WHO; 2001.
107. Wagenaar AC, Harwood EH, Toomey TL, Denk CE, Zander KM. Public opinion on alcohol policies in the U.S.: results from a national survey. *J Public Health Policy.* 2000; 21:303–327. [PubMed: 11021045]
108. Richardson J, Crowley S. Optimum alcohol taxation: balancing consumption and external costs. *Health Econ.* 1994; 3(2):73–87. [PubMed: 8044214]
109. Wagenaar AC, Salois MJ, Komro KA. Effects of beverage alcohol price and tax levels on drinking: a meta-analysis of 1003 estimates from 112 studies. *Addiction.* 2009; 104:179–190. [PubMed: 19149811]

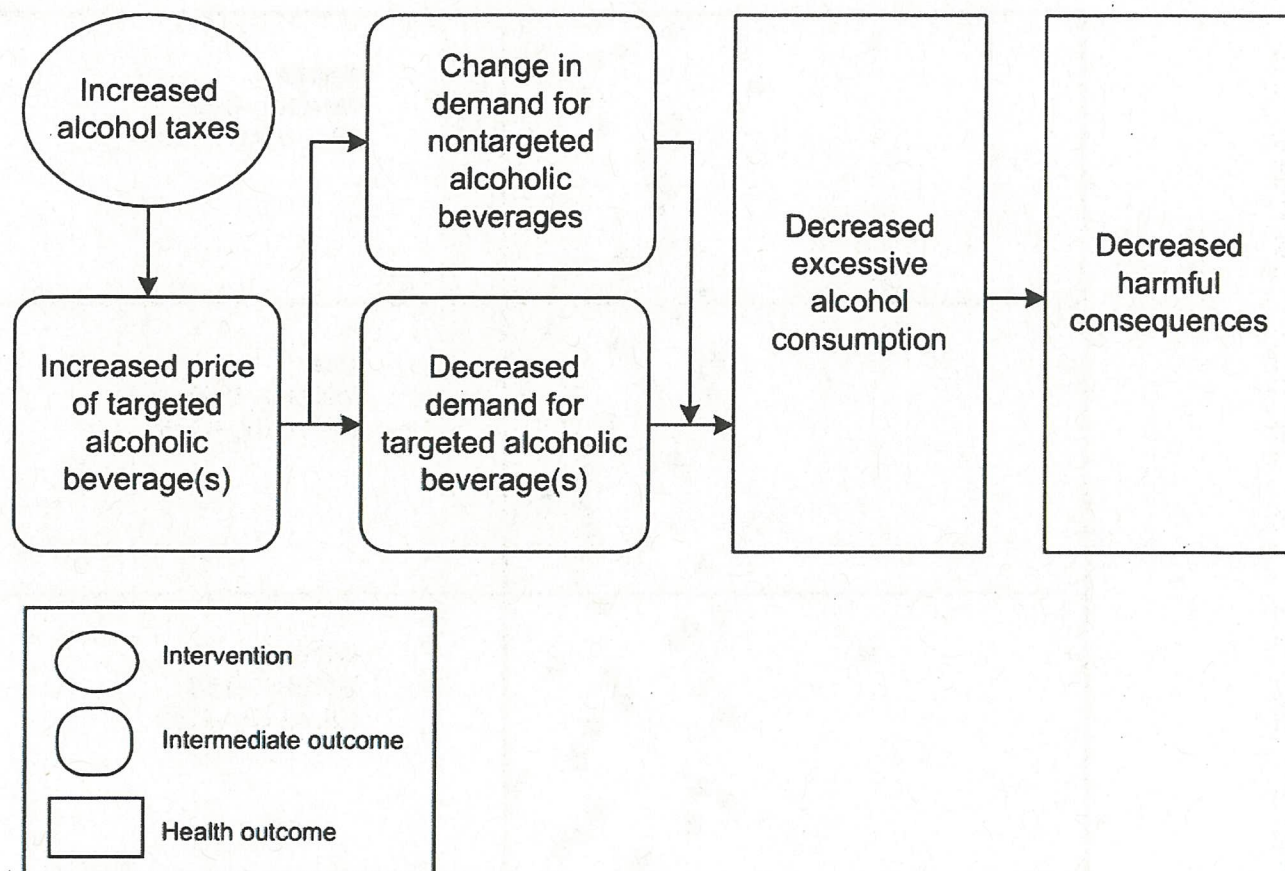


Figure 1. Conceptual model for the causal relationship between increased alcohol taxes and decreased excessive alcohol consumption and related harms (oval indicates intervention; rectangles with rounded corners indicate mediators or intermediate outcomes; and rectangles indicate outcomes directly related to improved health)

Table 1Selected *Healthy People 2010*⁸ objectives related to excessive alcohol consumption**Adverse consequences of substance use and abuse**

- 26-1 Reduce alcohol-related motor-vehicle fatalities^a
- 26-2 Reduce cirrhosis deaths
- 26-5 Reduce alcohol-related hospital emergency department visits
- 26-6 Reduce the proportion of adolescents who ride with drinking drivers
- 26-7 Reduce intentional injuries resulting from alcohol-related violence^a
- 26-8 Reduce cost of lost productivity due to alcohol use^a

Substance use and abuse

- 26-10a Increase proportion of adolescents not using^a
- 26-11 Reduce proportion of people^b engaging in binge drinking
- 26-12 Reduce average annual alcohol consumption
- 26-13 Reduce proportion of adults who exceed guidelines for low-risk drinking

^aObjective also relates to illicit drug use^bAged ≥12 years

Table 3

Results of studies evaluating the relationship between alcohol prices or taxes and motor-vehicle crashes

Study	Independent variable	Dependent variable	Elasticity (p-value)
Price elasticity studies			
Cook (1981) ⁹³	Ethanol price ^a	Fatalities	-0.70 (NR)
Adrian (2001) ⁴⁴	Ethanol price ^a	Alcohol-related crashes	-1.20 (<0.05)
Sloan (1994) ⁷²	Ethanol price ^a	Fatalities	<0 (>0.05)
Whetten-Goldstein (2000) ¹⁰⁰	Ethanol price ^a	Alcohol-related fatalities	<0 (>0.05)
Tax elasticity studies			
Chaloupka (1993) ²⁶	Beer tax	Alcohol-related fatalities, all ages	-0.097 (<0.05)
	Beer tax	Alcohol-related fatalities, youth aged 18–20 years	-0.156 (<0.05)
Evans (1991) ⁸⁶	Beer tax	Single-vehicle nighttime fatalities	-0.12 (<0.05)
Ruhm (1996) ³⁰	Beer tax	Nighttime fatalities, youth aged 15–24 years (by age)	-0.18 (<0.05)
Saffer (1987) ⁴²	Beer tax	Fatalities, youth aged 15–24 years (by age)	-0.18 to -0.27 (all <0.05)
Ruhm (1995) ²⁹	Beer tax	Fatalities	<0 (<0.05)
Mast (1999) ⁹⁸	Beer tax	Fatalities	<0 (<0.05)
Dee (1999) ²⁴	Beer tax	Nighttime fatalities, youth aged 18–20 years	<0 (<0.05)

^a Average price per ounce of ethanol across beer, wine, and spirits