

2010 National and State Costs of Excessive Alcohol Consumption



Jeffrey J. Sacks, MD, MPH,¹ Katherine R. Gonzales, MPH,² Ellen E. Bouchery, MS,³
Laura E. Tomedi, PhD, MPH,⁴ Robert D. Brewer, MD, MSPH⁵

Introduction: Excessive alcohol use cost the U.S. \$223.5 billion in 2006. Given economic shifts in the U.S. since 2006, more-current estimates are needed to help inform the planning of prevention strategies.

Methods: From March 2012 to March 2014, the 26 cost components used to assess the cost of excessive drinking in 2006 were projected to 2010 based on incidence (e.g., change in number of alcohol-attributable deaths) and price (e.g., inflation rate in cost of medical care). The total cost, cost to government, and costs for binge drinking, underage drinking, and drinking while pregnant were estimated for the U.S. for 2010 and allocated to states.

Results: Excessive drinking cost the U.S. \$249.0 billion in 2010, or about \$2.05 per drink. Government paid for \$100.7 billion (40.4%) of these costs. Binge drinking accounted for \$191.1 billion (76.7%) of costs; underage drinking \$24.3 billion (9.7%) of costs; and drinking while pregnant \$5.5 billion (2.2%) of costs. The median cost per state was \$3.5 billion. Binge drinking was responsible for > 70% of these costs in all states, and > 40% of the binge drinking-related costs were paid by government.

Conclusions: Excessive drinking cost the nation almost \$250 billion in 2010. Two of every \$5 of the total cost was paid by government, and three quarters of the costs were due to binge drinking. Several evidence-based strategies can help reduce excessive drinking and related costs, including increasing alcohol excise taxes, limiting alcohol outlet density, and commercial host liability. (Am J Prev Med 2015;49(5):e73–e79) © 2015 American Journal of Preventive Medicine. All rights reserved.

Introduction

Excessive alcohol consumption causes about one in ten deaths among working-age adults in the U.S. annually,¹ and cost the U.S. an estimated \$223.5 billion in 2006.^{2,3} However, these economic costs have not been re-evaluated despite ongoing concerns about the public health impact of excessive drinking, underutilization of prevention strategies,⁴ and economic changes in the U.S. since 2006. This study's purpose is

to update national and state cost estimates to inform the planning and implementation of prevention strategies.⁵

Methods

Excessive alcohol consumption was defined as binge drinking (four or more drinks per occasion for women; five or more drinks per occasion for men); heavy drinking (more than eight drinks per week for women; and ≥ 15 drinks per week for men); any alcohol consumption by youth aged <21 years; and any alcohol consumption by pregnant women.

The methodology for the 2006 estimates is described in detail elsewhere.^{2,3} Briefly, alcohol-attributable fractions from studies were used to assess the proportion of 26 costs (e.g., lost productivity, health care, criminal justice) that could be attributed to excessive drinking. For each component, a state-level measure was selected as an allocator to distribute a portion of that national total to states. Estimates of the cost to government and costs due to binge drinking, underage drinking, and drinking during pregnancy were calculated nationally and allocated to states.

From March 2012 to March 2014, each of the 2006 cost components was projected to 2010 based on incidence and price (Appendix 1, available online). The incidence trend reflected the

From the ¹Sue Binder Consulting, Inc., Atlanta, Georgia; ²Bureau of Disease Control, Prevention and Epidemiology, Michigan Department of Community Health, Lansing, Michigan; ³Mathematica Policy Research, Washington, District of Columbia; ⁴Substance Abuse Epidemiology Section, Epidemiology and Response Division, New Mexico Department of Health, Santa Fe, New Mexico; and ⁵Alcohol Program, National Center for Chronic Disease Prevention and Health Promotion, CDC, Atlanta, Georgia

Address correspondence to: Jeffrey J. Sacks, MD, MPH, Sue Binder Consulting, Inc., 201 W. Ponce de Leon Ave., Unit 38, Decatur GA 30030-3267. E-mail: sacksj@bellsouth.net.

0749-3797/\$36.00

<http://dx.doi.org/10.1016/j.amepre.2015.05.031>

2006–2010 change in occurrence of an event (e.g., alcohol-attributable deaths, hospital discharges, patients in alcohol abuse treatment), whereas the price trend adjusted for change in cost per occurrence due to inflation and other factors (e.g., mean hourly wage). The government share of costs was estimated separately for 2010 for each of the 26 components (Appendix 2, available online).

Each state's costs were estimated as a share of the national cost estimate on a line item–specific basis (Appendix 3, available online). State allocators were adjusted to reflect differences in state wages, given the significant contribution of productivity losses to costs.

The number of standard drinks per state was estimated by multiplying the number of gallons of ethanol sold⁶ by the specific gravity of ethanol (0.79); weight of 1 gallon of water (8.33 pounds); and number of grams in 1 pound (453.59), and then dividing by the number grams of ethanol in a standard drink (14.0).⁷ The state cost was divided by the number of standard drinks. The per capita costs were calculated by dividing the state cost by the 2010 state population.⁸

Results

The estimated cost of excessive drinking in 2010 was \$249.0 billion. This equates to \$2.05 per drink or \$807 per person. Lost productivity comprised 71.9% of costs, health care comprised 11.4%, and other comprised 16.7%. The cost to government was \$100.7 billion (\$0.83 per drink, \$306 per capita) (Tables 1 and 2).

Binge drinking costs (\$191.1 billion) represented 76.7% of total costs (Table 1). Binge drinking accounted for \$78.7 billion (78.2%) of the \$100.7 billion in government costs.

Underage drinking cost \$24.3 billion, which was 9.7% of the total cost in 2010. Drinking while pregnant accounted for \$5.5 billion in costs, or 2.2% of the total cost of excessive drinking.

The median state cost was \$3.5 billion and ranged from \$35.0 billion (California) to \$488 million (North Dakota). The median state cost per drink was \$2.05 and ranged from \$2.77 (New Mexico) to \$0.92 (New Hampshire). The median state per capita cost was \$769 and ranged from \$1,526 (District of Columbia) to \$592 (Utah) (Table 2).

The median state government cost was \$1.4 billion (range, \$14.5 billion [California] to \$183 million [North Dakota]). The proportion of costs paid by government ranged from 43.5% (Utah) to 36.3% (Mississippi). Government costs per drink ranged from \$1.19 (Utah) to \$0.36 (New Hampshire); per capita costs ranged from \$619 (District of Columbia) to \$257 (Utah) (Table 2).

The median state cost of binge drinking was \$2.6 billion. Binge drinking was responsible for a median of 76.3% of state costs (range, 83.3% [Louisiana] to 72% [Oregon]) (Table 2). More than 40% of binge drinking–related costs in states were paid by government.

The median state cost of underage drinking was \$350 million, a median of 10.0% of total state cost (range, 16.2% [Utah] to 4.6% [District of Columbia]). The median state cost of drinking while pregnant was \$60 million, a median of 2.3% of total cost (range, 4.8% [Nebraska] to 0.5% [Tennessee]) (Appendix 4, available online).

Discussion

Despite the severe economic recession in the U.S. from late 2007 to mid-2009, the cost of excessive drinking increased about 2.7% annually from \$223.5 billion in 2006 to \$249.0 billion in 2010, significantly outpacing the 1.9% annual inflation rate during this four-year time period. Had the recession not occurred, the cost of excessive drinking in 2010 might have been even higher than estimated in this study given the significant reduction in labor force participation that occurred as a result of the recession, and the significant contribution (71.9%) of productivity losses to the total cost of excessive drinking in 2010. Nonetheless, the proportion of the total cost of excessive drinking caused by binge drinking (76.7%) and paid by government (40.4%) were similar to the proportion of total costs in 2006 (76.4% and 42.1%, respectively).

Differences in state costs were probably influenced by factors that are independent of alcohol consumption, including differences in economic conditions (e.g., state budgets, population shifts) and other factors (e.g., access to medical services). However, differences in cost per drink and per capita also reflect differences in per capita sales of alcohol (a proxy for excessive drinking) and the prevalence of excessive alcohol use, which are influenced by social and cultural factors (e.g., demographics and religion) and state alcohol control policies, particularly those related to the price and availability of alcohol.^{9–13}

Limitations

This study had limitations. The trending factors for some component costs may have misestimated the 2010 costs because several were based on changes in broader outcomes (e.g., total hospitalizations) that were not specific to alcohol. For most cost components, change in price drove trending more than change in incidence (price factors were always greater than 1.0, but some incidence factors were less than 1.0) (Appendix 1, available online). In addition, some allocators may not have accurately distributed national costs to states. State adjustment factors were unavailable for some items (e.g., medical care, motor vehicle repair) resulting in imprecision. However, the 2010 national and state estimates are likely to substantially underestimate the actual cost of excessive

Table 1. Excessive Alcohol Consumption Costs (in Millions), by Category, U.S., 2010

Category of cost	Total costs (\$)	Government costs (\$)	Binge drinking (\$)	Underage drinking (\$)	Drinking while pregnant (\$)
Total	249,026.4	100,674.8	191,126.9	24,268.3	5,494.1
Health care	28,379.1	16,915.1	16,273.8	3,795.8	2,830.0
Specialty care for abuse/dependence	12,044.6	9,031.3	8,245.2	2,120.4	—
Hospitalization	5,948.5	2,828.1	2,007.5	198.9	48.6
Ambulatory care	1,524.5	524.0	1,070.8	144.4	7.0
Nursing home	1,166.8	691.6	863.4	2.1	0.5
Drugs/services	1,545.5	471.6	1,085.5	146.4	7.1
Fetal alcohol syndrome	2,750.0	1,248.5	1,160.5	449.5	2,750.0
Prevention and research	1,048.8	1,048.8	496.1	454.4	10.1
Training	34.8	11.5	16.4	6.3	—
Health insurance administration	2,315.6	1,059.7	1,328.5	273.3	6.7
Lost productivity	179,084.9	57,219.0	134,035.4	13,666.6	2,290.0
Impaired productivity at work	76,858.6	25,440.2	52,614.1	1,924.3	—
Impaired productivity at home	6,218.0	—	4,256.6	205.0	—
Absenteeism	4,619.9	1,529.2	4,619.9	201.5	—
Impaired productivity while in specialty care	1,983.4	656.5	1,358.6	349.1	—
Impaired productivity while in hospital	228.4	75.6	64.1	6.4	2.6
Mortality	75,204.5	24,892.7	58,373.4	6,044.2	170.7
Incarceration of perpetrators	9,150.5	3,028.8	9,150.5	3,855.3	—
Crime victims	2,704.8	895.3	2,704.8	734.7	—
Fetal alcohol syndrome	2,116.8	700.6	893.3	346.0	2,116.8
Other	41,562.5	26,540.7	40,817.7	6,806.0	374.1
Crime victim property damage	559.4	—	559.4	216.1	—
Criminal justice: corrections	15,865.9	15,865.9	15,865.9	1,842.0	—
Criminal justice: alcohol-related crimes	2,160.0	2,160.0	1,631.4	478.6	—
Criminal justice: violent and property crimes	5,998.8	5,998.8	5,998.8	2,117.6	—
Criminal justice: private legal	228.1	—	228.1	72.8	—
Motor vehicle crashes	13,461.9	—	13,461.9	1,490.2	—
Fire losses	2,914.3	2,142.0	2,914.3	527.5	—
Fetal alcohol syndrome (special education)	374.1	374.1	157.9	61.1	374.1

Note: Cost to government and costs for binge, underage, and drinking while pregnant are all subsets of total costs. Binge drinking, underage drinking, and drinking while pregnant are not mutually exclusive and may overlap.

Table 2. Estimated Total, Governmental, and Binge Drinking Costs of Excessive Alcohol Consumption, by State, 2010

	Total cost			Cost to government			Binge drinking		
	2010 cost (millions, \$)	Cost per drink, \$	Cost per capita, \$	2010 cost (millions, \$)	Cost per drink, \$	Cost per capita, \$	% of total cost	2010 cost (millions, \$)	% of total cost
U.S.	249,026.4	2.05	807	100,674.8	0.83	326	40.4	191,126.9	76.7
State median	3,520.2	2.05	769	1,386.6	0.79	307	40.3	2,561.2	76.3
Alabama	3,724.3	2.27	779	1,386.6	0.85	290	37.2	3,035.7	81.5
Alaska	827.2	2.25	1,165	347.0	0.95	489	42.0	637.8	77.1
Arizona	5,946.4	2.27	930	2,434.5	0.93	381	40.9	4,539.8	76.3
Arkansas	2,073.3	2.27	711	772.9	0.85	265	37.3	1,692.3	81.6
California	35,010.6	2.44	940	14,468.7	1.01	388	41.3	25,786.9	73.7
Colorado	5,056.5	2.14	1,005	2,193.0	0.93	436	43.4	3,765.7	74.5
Connecticut	3,029.0	2.04	847	1,204.1	0.81	337	39.8	2,297.9	75.9
Delaware	803.8	1.64	895	332.6	0.68	370	41.4	626.4	77.9
District of Columbia	918.4	2.14	1,526	372.3	0.87	619	40.5	715.3	77.9
Florida	15,322.2	1.82	815	6,126.6	0.73	326	40.0	11,854.0	77.4
Georgia	6,930.9	2.12	715	2,805.7	0.86	290	40.5	5,612.4	81.0
Hawaii	937.4	1.58	689	369.2	0.62	271	39.4	702.0	74.9
Idaho	1,137.9	1.62	726	452.6	0.64	289	39.8	865.6	76.1
Illinois	9,715.7	1.86	757	3,795.8	0.73	296	39.1	7,412.1	76.3
Indiana	4,468.2	1.96	689	1,804.4	0.79	278	40.4	3,476.5	77.8
Iowa	1,933.6	1.59	635	766.9	0.63	252	39.7	1,454.4	75.2
Kansas	2,075.8	2.18	728	802.5	0.84	281	38.7	1,636.6	78.8
Kentucky	3,194.5	2.36	736	1,281.2	0.95	295	40.1	2,561.2	80.2
Louisiana	3,801.4	1.91	839	1,521.9	0.77	336	40.0	3,168.4	83.3
Maine	938.7	1.58	707	394.8	0.66	297	42.1	690.3	73.5
Maryland	4,964.7	2.22	860	2,098.6	0.94	363	42.3	3,852.9	77.6
Massachusetts	5,634.6	1.93	861	2,256.4	0.77	345	40.0	4,134.3	73.4

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Table 2. Estimated Total, Governmental, and Binge Drinking Costs of Excessive Alcohol Consumption, by State, 2010 (continued)

	Total cost			Cost to government				Binge drinking	
	2010 cost (millions, \$)	Cost per drink, \$	Cost per capita, \$	2010 cost (millions, \$)	Cost per drink, \$	Cost per capita, \$	% of total cost	2010 cost (millions, \$)	% of total cost
Michigan	8,161.7	2.10	826	3,326.8	0.86	337	40.8	6,072.3	74.4
Minnesota	3,886.4	1.74	733	1,533.5	0.69	289	39.5	2,898.3	74.6
Mississippi	2,277.4	2.05	768	827.0	0.74	279	36.3	1,901.3	83.5
Missouri	4,603.6	1.83	769	1,790.4	0.71	299	38.9	3,676.0	79.8
Montana	870.8	1.73	880	335.0	0.67	339	38.5	666.8	76.6
Nebraska	1,166.5	1.61	639	491.3	0.68	269	42.1	879.8	75.4
Nevada	2,296.3	1.49	850	935.9	0.61	347	40.8	1,742.1	75.9
New Hampshire	959.9	0.92	729	376.5	0.36	286	39.2	714.7	74.5
New Jersey	6,175.2	1.70	702	2,540.7	0.70	289	41.1	4,632.8	75.0
New Mexico	2,232.9	2.77	1,084	914.2	1.13	444	40.9	1,680.2	75.2
New York	16,330.2	2.28	843	6,937.8	0.97	358	42.5	12,261.9	75.1
North Carolina	7,034.2	2.11	738	2,801.1	0.84	294	39.8	5,568.4	79.2
North Dakota	487.6	1.40	725	182.7	0.52	272	37.5	372.2	76.3
Ohio	8,519.8	2.10	739	3,404.6	0.84	295	40.0	6,447.2	75.7
Oklahoma	3,081.2	2.49	821	1,205.2	0.97	321	39.1	2,443.6	79.3
Oregon	3,520.2	2.08	919	1,486.7	0.88	388	42.2	2,534.6	72.0
Pennsylvania	9,544.2	1.92	751	3,895.5	0.78	307	40.8	7,487.0	78.4
Rhode Island	886.5	1.82	842	358.2	0.73	340	40.4	657.1	74.1
South Carolina	3,982.9	2.13	861	1,458.7	0.78	315	36.6	3,161.7	79.4
South Dakota	598.2	1.59	735	241.0	0.64	296	40.3	446.2	74.6
Tennessee	4,683.8	2.25	738	1,807.3	0.87	285	38.6	3,760.9	80.3
Texas	18,820.6	1.99	748	7,342.0	0.78	292	39.0	14,968.1	79.5
Utah	1,636.1	2.74	592	711.4	1.19	257	43.5	1,291.5	78.9
Vermont	513.0	1.66	820	212.2	0.69	339	41.4	377.6	73.6

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Table 2. Estimated Total, Governmental, and Binge Drinking Costs of Excessive Alcohol Consumption, by State, 2010 (continued)

	Total cost			Cost to government			Binge drinking		
	2010 cost (millions, \$)	Cost per drink, \$	Cost per capita, \$	2010 cost (millions, \$)	Cost per drink, \$	Cost per capita, \$	% of total cost	2010 cost (millions, \$)	% of total cost
Virginia	6,126.0	2.06	766	2,496.6	0.84	312	40.8	4,782.4	78.1
Washington	5,805.1	2.23	863	2,479.6	0.95	369	42.7	4,286.2	73.8
West Virginia	1,334.9	2.20	720	510.0	0.84	275	38.2	1,051.5	78.8
Wisconsin	4,452.9	1.62	783	1,845.4	0.67	324	41.4	3,387.1	76.1
Wyoming	593.1	2.33	1,052	239.2	0.94	424	40.3	459.2	77.4

drinking for many reasons.^{2,3} For example, the mortality, morbidity, and associated lost productivity estimates were based only on the primary cause of death/illness and did not include alcohol-related contributing causes. Intangible costs like pain and suffering were not included. Multiple additional sources of underestimation appear in Table 3 of the national report.²

Conclusions

It is clear that excessive alcohol consumption is very expensive, that these costs are largely due to binge drinking, and that a substantial proportion of these costs are borne by taxpayers, including non-drinkers. There are several evidence-based strategies to reduce excessive drinking and the related harms, including increasing alcohol excise taxes, limiting alcohol outlet density, and commercial host liability.^{14,15} Screening and brief intervention for excessive alcohol use has also been recommended for adults.¹⁶ Yet, many of these interventions are underused.⁴ Unless this changes, the economic cost of excessive drinking is likely to increase, placing an ever-greater burden on the excessive drinker, their family, society, and taxpayers.

The authors acknowledge the assistance of: Marissa Esser, MPH, Alcohol Program, National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP), CDC; Dafna Kanny, PhD, Alcohol Program, NCCDPHP, CDC; Yong Liu, MD, MS, Division of Population Health, NCCDPHP, CDC; and Jessica B. Mesnick, MPH, Alcohol Program, NCCDPHP, CDC.

Dr. Sacks received funding for this project from CDC via contract 200-2013-M-57540. All authors participated in (1) study conception/design and data acquisition; (2) data analysis and interpretation; or (3) both. All authors either wrote parts of the article or revised the article for important intellectual content. All authors read and approved the final version of the submitted manuscript.

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

No financial disclosures were reported by the authors of this paper.

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Appendix

Supplementary data

Supplementary data associated with this article can be found at <http://dx.doi.org/10.1016/j.amepre.2015.05.031>.