

# Excessive Alcohol Use in Minnesota

## DATA BRIEF: 2016 CSTE ALCOHOL INDICATORS

Excessive alcohol use remains a serious public health issue in Minnesota, accounting for an average of 1,269 deaths per year during 2006 to 2010, and an estimated 33,233 years of potential life lost annually (1).

Adult binge drinking is defined as males having five or more drinks and females having four or more drinks on one occasion at least once in the past month. This measure has remained steady since 2009 while age-adjusted rates for liver disease mortality have increased from 6.3 per 100,000 in 2009 to 9.9 per 100,000 in 2015.

In Minnesota, hospital-treated alcohol related injuries increased from 8,226 in 2000 to 22,660 in 2014 (2). This data brief analyzes data from a number of data sources including death certificates, Minnesota Department of Public Safety (DPS) crash reports, and survey data to examine the differences in consumption and mortality by age group, race/ethnicity, and gender.

## Alcohol Indicators

The Council of State and Territorial Epidemiologists (CSTE) established a Substance Abuse Subcommittee in 2006 to develop substance abuse and mental health surveillance indicators for state and local public health departments (3). In 2010, Sacks and coauthors calculated that excessive alcohol consumption cost the U.S. \$249 billion or about \$2.05 per drink through lost productivity, increased health care expenditures, burden on criminal justice system, and other costs (4). They estimated it cost Minnesota \$3.9 billion or about \$1.74 per drink in 2010 of which 75% was attributed to binge drinking.

Due to economic cost, disability, suffering, and mortality from alcohol abuse, CSTE has recommended five surveillance indicators for alcohol abuse detailed below (5). These indicators coincide with Healthy People 2020's objectives to reduce binge drinking, cirrhosis deaths, and other deaths attributable to alcohol (6). Data sources are referenced at the end of this Data Brief.

## Youth Binge Drinking

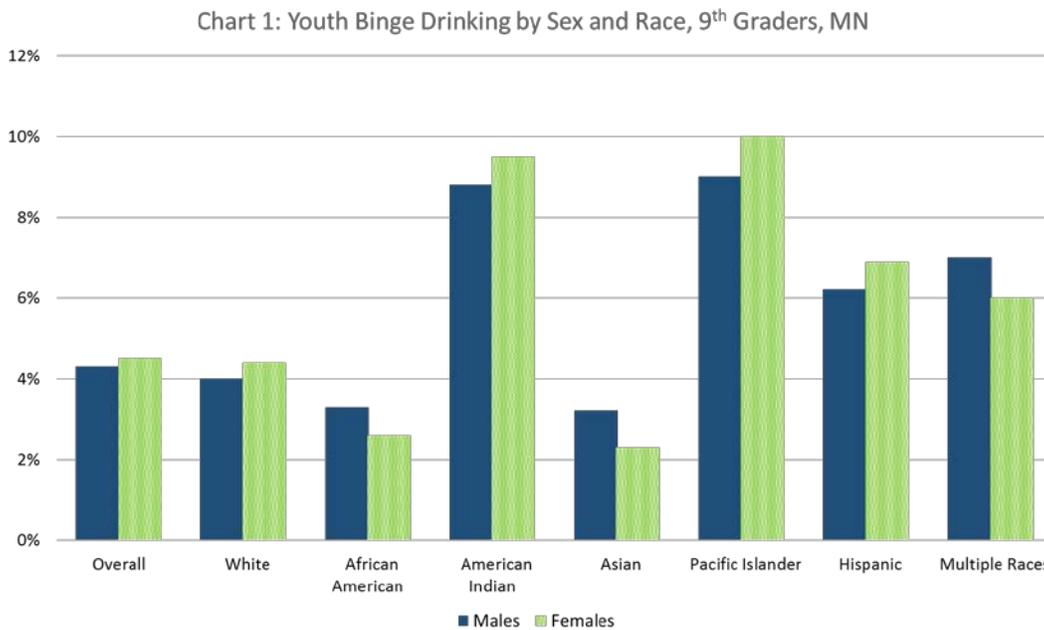
Underage drinking cost the U.S. an estimated \$3.7 billion in 2006 (7). Youth binge drinking (having greater than or equal to five drinks of alcohol within a couple of hours at least once in the past month) also correlates with adult binge drinking (8).

Of high school students in the U.S., 17.7% reported binge drinking in 2015 (9). During 2006 to 2010, excessive alcohol use among those under 21 accounted for 250 deaths in Minnesota (1), with an average of 3,037 years of potential life lost each year; each of these decedents had their lives shortened by an average of 60 years.

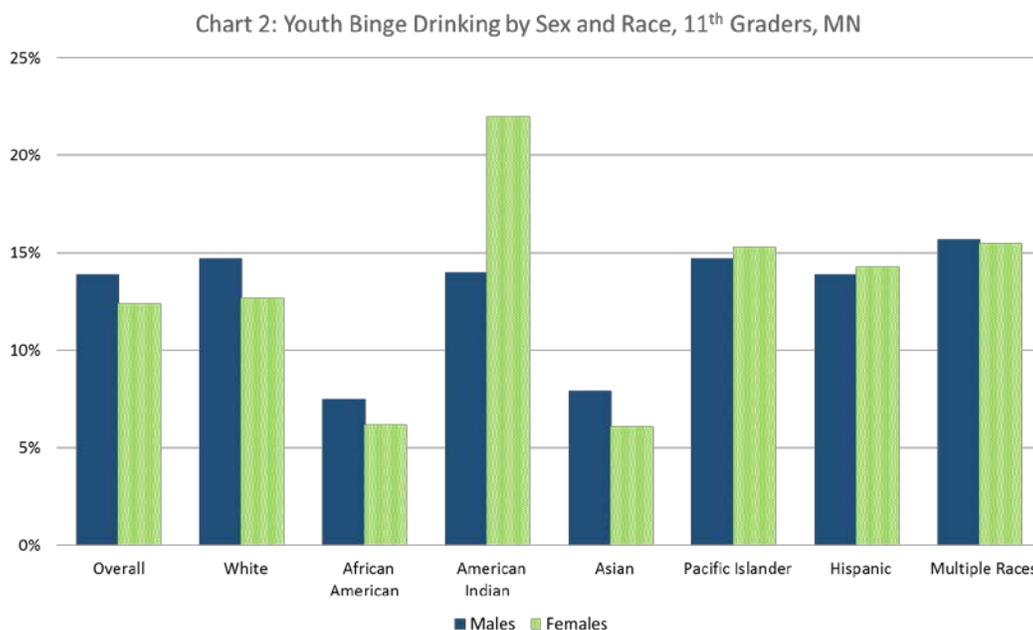
## EXCESSIVE ALCOHOL USE DATA BRIEF

In Minnesota in 2016, 4.4% of 9th graders reported binge drinking in the Minnesota Student Survey (MSS). However, results from the survey are consistently lower than the National Youth Risk Behavior Surveillance data. Males and females tend to have similar rates, but rates for American Indians and Pacific Islanders are significantly higher. For 11<sup>th</sup> graders, 13.1% reported binge drinking with males and females having similar rates. The Northwest and Northeast EMS regions of Minnesota had the highest rates among 11<sup>th</sup> graders at 15.3% and 17.4% respectively. For more information on county or regional data, see data sources.

### 9<sup>th</sup> Grade Binge Drinking Highest among American Indian & Pacific Islanders



## American Indian 11<sup>th</sup> Grade Females have Highest Rate of Binge Drinking



*Charts 1 and 2: American Indian 11<sup>th</sup> grade females had significantly higher youth binge drinking prevalence while American Indian males stayed consistent with other 11<sup>th</sup> graders. In both grades, Asians and African Americans had lower rates. MSS 2016.*

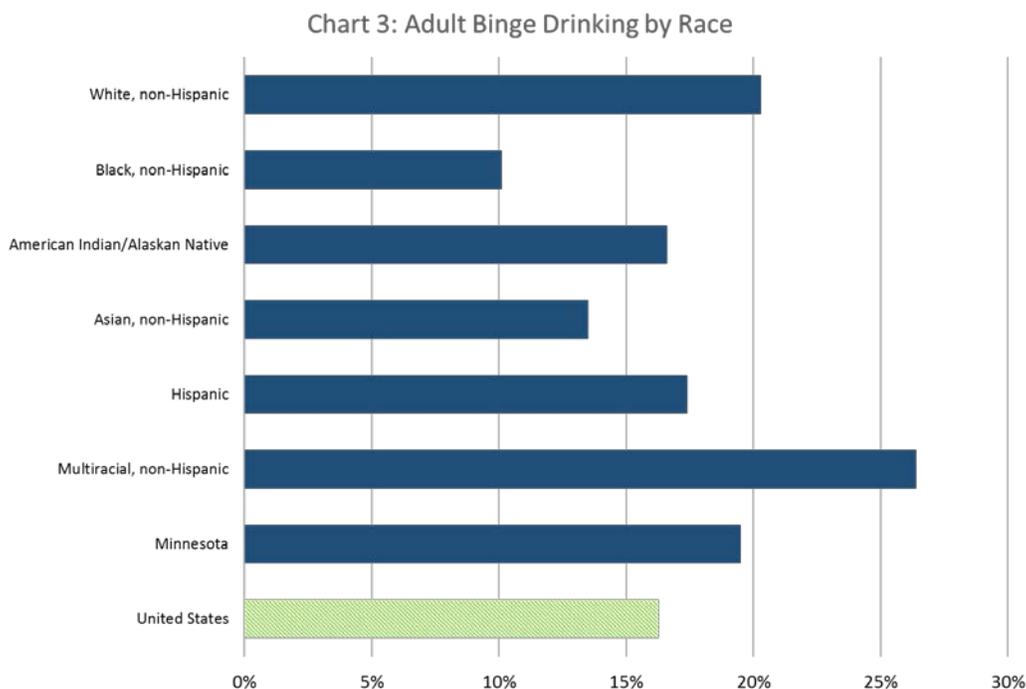
## Adult Binge Drinking

Adult binge drinking means males having five or more drinks and females having four or more drinks on one occasion at least once in the past month.

Binge drinking is a risk factor for many conditions, such as sexually transmitted diseases, fetal alcohol syndrome, suicide, hypertension, acute myocardial infarction, and sudden infant death syndrome (10, 11). In 2015, 16.3% of adults in the U.S. reported binge drinking. It ranged from 10.3% to 24.1% among the states.

In Minnesota in 2015, 20.6% of adults reported binge drinking, the sixth highest age-adjusted rate in the nation. The prevalence has changed little over the last five years. Young adults ages 18 to 34 have the highest prevalence rates of binge drinking in Minnesota at about 29.4%. The rates decrease steadily as age increases. Binge drinking was also much higher in males than females (25.2% vs 14%). Those of multiple races reported higher binge drinking rates (26.4%), and rates among Blacks (10.1%) and Asians (13.5%) were the lowest. In Minnesota in 2011, 33.1% of mothers reported binge drinking three months before pregnancy (12).

## Minnesota has Much Higher Adult Binge Drinking Rate among Whites & Multiracial than U.S. Average



*Chart 3: There is variation among race groups, but no striking differences. Consistent with the youth binge drinking prevalence, African Americans and Asians tended to have lower rates of binge drinking. However, among adults, American Indians reported lower rates of binge drinking than average while those who reported multiple races had much higher rates. BRFSS 2015.*

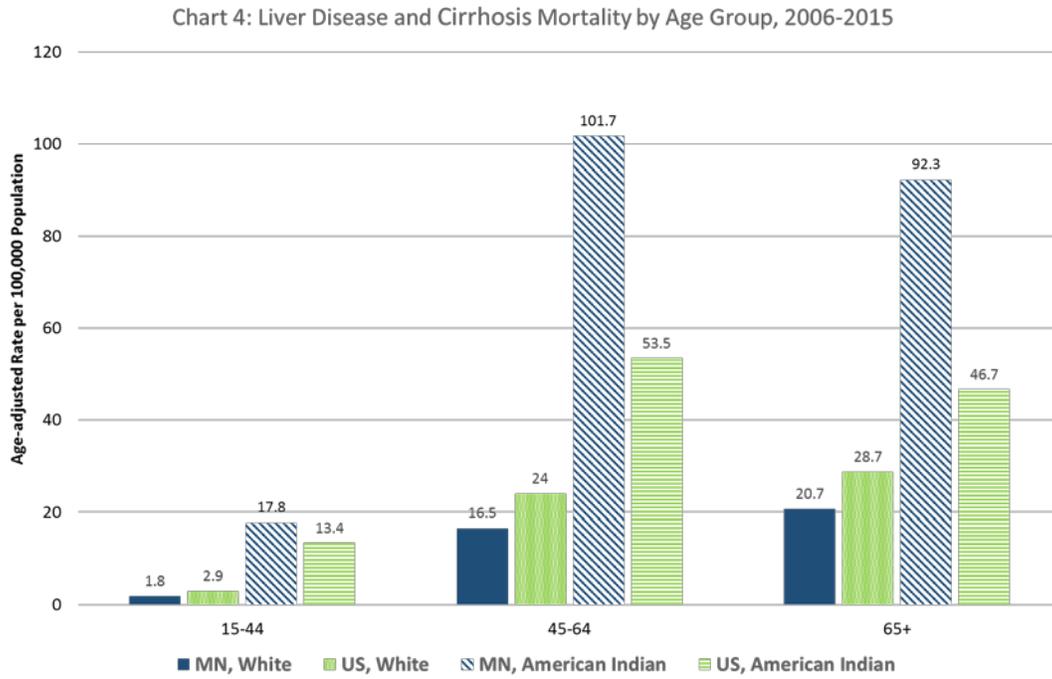
### Liver Disease Mortality

The leading cause of chronic liver disease and cirrhosis is sustained alcohol consumption (13). In the United States, the age-adjusted rate of liver disease mortality is 10.8 per 100,000.

Minnesota and Wisconsin have the eighth lowest state rates in the nation. In 2015, 543 individuals died of chronic liver disease in Minnesota, 60% of whom were males. Chronic liver disease and cirrhosis is the 11<sup>th</sup> leading cause of death in Minnesota with an age-adjusted rate of 8.6 per 100,000 persons. The liver disease mortality rate increases with age and peaks among 65-74 year olds (26.6 per 100,000 persons). Males had a higher rate than females with age-adjusted rates of 10.6 vs 6.7 per 100,000 persons.

The Northwest EMS region of Minnesota have the highest rates. There are significant disparities between American Indian and White residents. The disparity rate ratio in 2015 was 5.5 times higher among American Indians compared to Whites. This is most likely due to structural inequities like inadequate education, discrimination in health services, and cultural differences (14). For more information on county or regional data, see data sources.

## American Indians Experience Large Disparity in Liver Disease Mortality



*Chart 4:* From 2006 to 2015 according to death certificates, American Indians experienced a large disparity in liver disease mortality reaching over 100 per 100,000 among those ages 45 to 64. Other races were very similar to Whites, with Asians having the lowest rates. This contrasts with the adult binge drinking prevalence where American Indians reported lower prevalence of binge drinking than whites. According to BRFSS, among those who binge drink, American Indians did tend to binge drink more frequently; however, this would not explain the magnitude of the disparity. Perhaps American Indians are represented disproportionately in the multiracial group (which has the highest adult binge drinking rate) rather than as American Indian only.

## Alcohol-related Crash Deaths

According to Minnesota Department of Public Safety there were 137 alcohol-related crash fatalities in 2015 (see Methods for definition). Of those, seven were under the age of 21, and four were drivers who had used alcohol. This trend has been declining with 19 drivers under 21 and under the influence killed in 2004, and seven in 2010. In addition, alcohol-related traffic crashes caused 1,015 moderate to severe injuries, 28 of which were in children under the age of 15. For the past decade, alcohol-related crashes have accounted for about 31 to 39% of all traffic-related deaths in Minnesota. The estimated cost of alcohol-related crashes in Minnesota in 2015 was \$234,163,592 (15).

In 2015, there was an overall age-adjusted rate of 2.54 alcohol-related crash deaths per 100,000 persons. The highest rate was among middle-aged adults 45 to 54 at 4.3 per 100,000 and the lowest among those were adults over 65 with a rate of 1.37 per 100,000. From 2013 to 2015 the rates have annually increased among those older than 45. There was variation from year to year among all other age groups with no apparent trends. However, the overall increase

in all-cause mortality among White middle-aged adults related to drugs/alcohol (16) is mirrored by our motor vehicle crash data.

## State Excise Alcohol Tax

The excise alcohol tax rate refers to the taxes levied by the state per gallon of beverage at the wholesale or retail level. It is levied or imposed separately by beverage type (i.e. beer, wine, and distilled spirits). Research has shown its effectiveness as a deterrent, and the Community Preventive Services Task Force recommends increasing the price of alcohol by increasing taxes to reduce excessive alcohol consumption (17).

As of January 1, 2016, Minnesota's excise tax rates on beer, wine and spirits were \$0.15, \$0.30, and \$5.03 per gallon, respectively. Minnesota, as compared to its neighboring states, has the highest excise tax rate on distilled spirits and the second lowest on both wine and beer. The excise tax on alcohol has not changed in Minnesota since 1987, despite research showing that taxes decrease consumption (17).

**Table 1: Excise Taxes on Alcohol**

	Beer (price/Gallon)	Wine (price/Gallon)	Spirits (price/Gallon)
Iowa	\$0.19	\$1.75	Control▪
<b>Minnesota<sup>‡</sup></b>	<b>\$0.15</b>	<b>\$0.30</b>	<b>\$5.03</b>
North Dakota <sup>°</sup>	\$0.16	\$0.50	\$2.50
South Dakota	\$0.27	\$0.93	\$3.93
Wisconsin	\$0.06	\$0.25	\$3.36
Federal*	\$0.58	\$1.07	\$10.80
U.S. Median	\$0.19	\$0.70	\$3.68

APIS, 2016

<sup>‡</sup>Minnesota-\$0.08 is taxed on beers with ≤4% alcohol content

<sup>°</sup>North Dakota-Beer sold in bulk containers is taxed \$0.08/gallon

\*Federal-\$4.05 is taxed for spirits of 15% alcohol content

▪Iowa-A state is classified as control if the state sets the price of and gains profit/revenue directly from the wholesale or retail system.

## Prevention

Reducing and preventing excessive alcohol use involves a comprehensive public health approach that targets behavior, policy and environmental change. An effective approach includes education and health promotion, school-based initiatives, policies that support

appropriate use and limit alcohol availability to underage youth, treatment and relapse prevention, and improved enforcement. In 2009, Minnesota Department of Health (MDH) prepared a [Community-based Primary Prevention Plan to Reduce High-Risk and Underage Alcohol Use](#) to guide local communities' efforts:

<http://www.health.state.mn.us/divs/hpcd/chp/cdr/alcohol/alcpdf/communitypreventionplanreducealcohol.pdf>

The Community Prevention Services Task Force recommends evidence-based strategies for reducing excessive alcohol use, such as binge and underage drinking, including increasing alcohol taxes, regulating alcohol outlet density, and enacting commercial host liability laws.

Policies to reduce alcohol consumption in adults have also been shown to reduce youth alcohol consumption significantly, and policies affecting the price and availability of alcohol have the greatest impact on binge drinking in adults (18).

Through local public health funds, Minnesota community health boards are able to implement alcohol prevention. Examples of local strategies include health education messages, beverage server training, alcohol compliance checks, screening and counseling in health care settings, and social host ordinances.

The Centers for Disease Control and Prevention's (CDC) Preventive Block Grant provides \$150,000 annually to the Minnesota Department of Health (MDH) to employ a staff member to plan, develop policy and provide technical assistance for alcohol-related injury and harms. In 2017, MDH received \$150,000 annually for an alcohol epidemiologist to interpret, analyze, and report alcohol-related data pertaining to injury and violence in Minnesota.

The Minnesota State Epidemiological Outcomes Workgroup (SEOW), a Minnesota Department of Human Services (DHS) initiative funded by the Substance Abuse and Mental Health Services Administration (SAMHSA), was established to monitor trends in alcohol and substance use, related consequences and risk factors to encourage data-informed decision making (19).

Since 2008, SEOW has run the [Substance Use in Minnesota](http://sumn.org/) - <http://sumn.org/> website, which includes state, regional, and county data that is customizable to generate tables, maps, graphs and charts. Estimates on prevention needs for adolescents and adults comes from the Minnesota Student Survey (MSS) and the Minnesota Survey of Adult Substance Abuse (MNSASU). The website also links to community resources, publications, other websites, and tools/tips regarding data collection, analysis, reporting, and use.

The Minnesota Legislature provides \$2 million per year to address, understand and prevent Fetal Alcohol Spectrum Disorders (FASD). Through the Minnesota Organization on Fetal Alcohol Syndrome (MOFAS), DHS and MDH, these funds and other donations are used to provide family and community support groups to help mothers with alcohol and other substance abuse disorders, provide trainings, increase public awareness, educate providers, increase screening and diagnosis of FASD, and provide support for individuals with FASD. The MDH and CDC sponsor the Pregnancy Risk Assessment Monitoring System (PRAMS) to monitor maternal

behaviors including alcohol use. This data is used to develop maternal and child health programs, inform policy, and monitor trends and progress.

## Methods

**Youth Binge Drinking:** In 2016, the Minnesota Student Survey collected information from 85% of public high schools in Minnesota following a census methodology. It is collected from 9<sup>th</sup> and 11<sup>th</sup> graders within the state of Minnesota public schools every 3 years. Participation was voluntary, with 71% of ninth graders and 61% of 11<sup>th</sup> graders participating in the 2016 survey administered during the first half of the year. The prevalence of youth binge drinking is the prevalence of students who reported having  $\geq 5$  drinks of alcohol in a row, that is, within a couple of hours on  $\geq 1$  day during the past 30 days.

*Limitations:* The indicator does not convey the frequency of binge drinking or the specific amount of alcohol consumed. The definition of binge drinking used in the data source is not gender-specific (as it is for adults). As with all self-reported sample surveys, Minnesota Student Survey data might be subject to systematic error resulting from non-coverage (e.g., no participation by certain schools), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias). These data only apply to youth who are attending school in regular classrooms, and thus may not be representative of all persons in this age group.

**Adult Binge Drinking:** This indicator used the question on binge drinking from the Behavioral Risk Factor Surveillance System (BRFSS) dataset. The prevalence rate of binge drinking is defined as those who report having  $\geq 5$  drinks (men) or  $\geq 4$  drinks (women) on  $\geq 1$  occasion during the previous 30 days. We used an age-adjusted weighted prevalence per 100 respondents.

*Limitations:* This indicator does not convey the frequency of binge drinking or the specific amount of alcohol consumed. As with all self-reported sample surveys, the Behavioral Risk Factor Surveillance System (BRFSS) data might be subject to systematic error resulting from non-coverage (e.g., college campuses or the military), nonresponse (e.g., refusal to participate in the survey or to answer specific questions), or measurement (e.g., social desirability or recall bias). A recent study using BRFSS data found that self-reports identify only 22%–32% of presumed alcohol consumption in states, based on alcohol sales (20).

**Liver Disease Mortality:** Death data come from Certificates of Death registered with the Minnesota Office of Vital Records for 2015, and population estimates from the U.S. Census Bureau. Using the ICD-10 codes of K70, K73, or K74 as an underlying cause of death, residents who died from liver disease and cirrhosis in the calendar year were included. Age adjusted rates were standardized to the year 2000 standard U.S. population distribution.

*Limitations:* Because alcohol-related disease can have a long latency, changes in behavior or clinical practice affecting population mortality might not be apparent for years. Not all chronic liver disease deaths are alcohol-attributable (13). In addition, causes of death and other variables listed on the death certificate might be inaccurate.

**Alcohol-related Crash Deaths:** 2015 data come from the Minnesota Department of Public Safety and the U.S. Census Bureau for population estimates. Alcohol-related deaths include deaths of persons involved in a crash of a motor vehicle traveling on a public roadway which occurred within 30 days of the crash. Deaths are considered alcohol-related if either a driver or non-occupant had a blood alcohol concentration (BAC)  $\geq 0.01$  g/dL, or police suspect alcohol. Age adjusted rates were standardized to the year 2000 standard U.S. population distribution.

*Limitations:* Injuries severe enough to result in death represent only a small proportion of the overall burden of injury. Additionally, the data are jurisdictional instead of population based; a Minnesotan who crashed and died outside of Minnesota under the influence of alcohol would not be included. The Office of Traffic Safety in the Department of Public Safety (DPS) does not include non-traffic crashes, such as those occurring on driveways and

other private property. Also, not everyone is tested or able to be tested and thus are subject to the police's intuition.

State Excise Tax on Alcohol: Data came from the Alcohol Policy Information System (APIS). The rates were the state taxes levied per gallon of beverage at the wholesale or retail sale, by beverage type in the most recent year.

*Limitations:* Taxes other than excise taxes that can affect the price of alcoholic beverages (e.g., sales taxes, which are levied as a percentage of the beverage's retail price) are not reported. The Alcohol Policy Information System (APIS) reports taxes for the most commonly sold container size and therefore does not include data on the taxes levied on alcoholic beverages sold in other container sizes. This measure is for overall alcohol consumption but is not a direct measure of alcohol abuse.

## Data Sources

**2016:** Minnesota Department of Health. [Minnesota Student Survey](#). Published 2016.

<http://www.health.state.mn.us/divs/chs/mss/>

County level data available at <http://sumn.org/>.

**2016:** Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion. [Behavioral Risk Factor Surveillance System](#) (BRFSS), released 2016. <https://www.cdc.gov/brfss/index.html>

**2006-2015:** Minnesota Department of Health. Minnesota Center for Health Statistics, [Vital Statistics Death Query](#), released 2016. <https://pgc.health.state.mn.us/mhsq/frontPage.jsp>

County level data available.

**2015:** Centers for Disease Control and Prevention, National Center for Health Statistics. Underlying Cause of Death on [CDC WONDER](#) Online Database, released 2016.

<https://wonder.cdc.gov/ucd-icd10.html>

County level data available.

**2004-2015:** Minnesota Department of Public Safety. Office of Traffic Safety. [Annual Crash Facts](#). <https://dps.mn.gov/divisions/ots/reports-statistics/Pages/crash-facts.aspx>

County level data available at <http://sumn.org/>.

**2016:** National Institute on Alcohol Abuse and Alcoholism. Alcohol Policy Information System (APIS). <https://alcoholpolicy.niaaa.nih.gov/>

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3. Council of State and Territorial Epidemiologists. *Cross Cutting: Substance Abuse*. <http://www.cste.org/group/SubstanceAbuse>

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## Suggested Citation

Blood T, Wright N, Roesler J. CSTE Alcohol Indicators in Minnesota-Data Brief. Saint Paul, MN: Minnesota Department of Health, June 2017.

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06/15/2017

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