

National Institute on Alcohol Abuse and Alcoholism

Alcohol Use in the United States

Prevalence of Drinking: According to the 2019 National Survey on Drug Use and Health (NSDUH), 85.6 percent of people ages 18 and older reported that they drank alcohol at some point in their lifetime,¹ 69.5 percent reported that they drank in the past year,² and 54.9 percent (59.1 percent of men in this age group and 51.0 percent of women in this age group³) reported that they drank in the past month.³



Prevalence of Binge Drinking and Heavy Alcohol Use: In 2019, 25.8 percent of people ages 18 and older (29.7 percent of men in this age group and 22.2 percent of women in this age group⁴) reported that they engaged in binge drinking in the past month,⁴ and 6.3 percent (8.3 percent of men in this age group and 4.5 percent of women in this age group⁵) reported that they engaged in heavy alcohol use in the past month.⁵ (See glossary for definitions

of binge drinking and heavy alcohol use.)

Emerging Trend—High-Intensity Drinking: High-intensity drinking is defined as consuming alcohol at levels that are two or more times the gender-specific binge drinking thresholds (See glossary for additional details about the definition of high-intensity drinking). Compared with people who did not binge drink, people who drank alcohol at twice the gender-specific binge drinking thresholds were 70 times more likely to have an alcohol-related emergency department (ED) visit, and those who consumed alcohol at 3 times the gender-specific binge thresholds were 93 times more likely to have an alcohol-related ED visit.⁶

Alcohol Use Disorder (AUD) in the United States

- People Ages 12 and Older: According to the 2019 NSDUH, 14.5 million (nearly 15 million) people ages 12 and older⁷ (5.3 percent of this age group⁸) had AUD. This number includes 9.0 million men⁷ (6.8 percent of men in this age group⁸) and 5.5 million women⁷ (3.9 percent of women in this age group⁸).
- Youth Ages 12 to 17: According to the 2019 NSDUH, an estimated 414,000 adolescents ages 12 to 17⁷ (1.7 percent of this age group⁸) had AUD. This number includes 163,000 males⁷ (1.3 percent of males in this age group⁸) and 251,000 females⁷ (2.1 percent of females in this age group⁸).

Treatment of AUD in the United States

According to the 2019 NSDUH, about 7.2 percent of people ages 12 and older who had AUD in the past year received any treatment in the past year. This includes about 6.9 percent of males and 7.8 percent of females with past-year AUD in this age group.⁹According to the 2019 NSDUH, about 6.4 percent of adolescents ages 12 to 17 who had AUD in the past year received any treatment in the past year. This includes about 6.4 percent of males and 6.4 percent of females with past-yearAUD in this age group.⁹

- According to the 2019 NSDUH, about 7.3 percent of adults ages 18 and older who had AUD in the past year received any treatment in the past year. This includes about 6.9 percent of males and 7.9 percent of females with past-year AUD in this age group.⁹
- Less than 4 percent of people with AUD were prescribed a medication approved by the U.S. Food and Drug Administration (FDA) to treat their disorder.¹⁰
- People with AUD were more likely to seek care from a primary care physician for an alcoholrelated medical problem, rather than specifically for drinking too much alcohol.^{11,12}

Alcohol-Related Emergencies and Deaths in the United States

- The rate of all alcohol-related ED visits increased 47 percent between 2006 and 2014, which translates to an average annual increase of 210,000 alcohol-related ED visits.¹³
- » Alcohol contributes to about 18.5 percent of ED visits and 22.1 percent of overdose deaths related to prescription opioids.¹⁴
- An estimated 95,000 people (approximately 68,000 men and 27,000 women) die from alcohol-related causes annually,¹⁵ making alcohol the third-leading preventable cause of death in the United States. The first is tobacco, and the second is poor diet and physical inactivity.¹⁶
- » Between 2011 and 2015, the leading causes of alcohol-attributable deaths due to chronic conditions in the United States were alcoholassociated liver disease, heart disease and stroke, unspecified liver cirrhosis, upper aerodigestive tract cancers, liver cancer, supraventricular cardiac dysrhythmia, AUD, breast cancer, and hypertension.¹⁵

Glossary

Alcohol-impaired driving fatality: A fatality in a crash involving a driver or motorcycle rider (operator) with a blood alcohol concentration (BAC) of 0.08 g/dL or more.*

Alcohol misuse: Drinking in a manner, situation, amount, or frequency that could cause harm to users or to those around them. For individuals younger than the legal drinking age of 21, or for pregnant females, any alcohol use constitutes alcohol misuse.

Alcohol use disorder: A chronic brain disorder marked by compulsive drinking, loss of control over alcohol use, and negative emotions when not drinking. AUD can be mild, moderate, or severe. Recovery is possible regardless of severity. The DSM-IV, published by the American Psychiatric Association, described two distinct disorders—alcohol abuse and alcohol dependence—with specific criteria for each. The fifth edition, DSM-5, integrates the two DSM-IV disorders into a single disorder called AUD, with mild, moderate, and severe subclassifications.

Any treatment: Treatment received at any location, such as a hospital (inpatient), rehabilitation facility (inpatient or outpatient), mental health center, ED, private doctor's office, self-help group, or prison/jail.

Binge drinking:

- The National Institute on Alcohol Abuse and Alcoholism (NIAAA) defines binge drinking as a pattern of drinking that brings BAC levels to 0.08 g/dL or higher. This typically occurs after a woman consumes 4 drinks or a man consumes 5 drinks—in about 2 hours.⁵⁶
- The Substance Abuse and Mental Health Services Administration (SAMHSA), which conducts the annual NSDUH, defines binge drinking as consuming 5 or more alcoholic drinks for males or 4 or more alcoholic drinks for females on the same occasion (i.e., at the same time or within a couple of hours of each other) on at least 1 dayin the past month.⁵⁷

*A BAC of 0.08 percent corresponds to 0.08 grams per deciliter, or 0.08 grams per 100 milliliters.

In 2015, alcohol-impaired driving fatalities accounted for 10,265 deaths (29.0 percent of overall driving fatalities).¹⁷

Economic Burden in the United States

- In 2010, alcohol misuse cost the United States \$249.0 billion.¹⁸
- Three-quarters of the total cost of alcohol misuse is related to binge drinking.¹⁸

Global Burden

- In 2016, 3 million deaths, or 5.3 percent of all global deaths (7.7 percent for men and 2.6 percent for women), were attributable to alcohol consumption.¹⁹
- Solution of the seventh of the se
- According to a 2014 World Health Organization (WHO) report, among people ages 15 to 49, alcohol misuse was the first-leading risk factor for premature death and disability.²⁰
- In 2016, approximately 14 percent of total deaths among people ages 20 to 39 are alcohol attributable.²¹
- In 2016, 5.3 percent of the burden of disease and injury worldwide (134 million disability-adjusted lifeyears [DALYs]) was attributable to alcohol consumption.¹⁹
- In 2018, WHO reported that alcohol contributed to more than 200 diseases and injury-related health conditions, ranging from liver diseases, road injuries, and violence, to cancers, cardiovascular diseases, suicides, tuberculosis, and HIV/AIDS.²²

Glossary (continued)

Disability-adjusted life-years: A measure of years of life lost or lived in less than full health.

Heavy alcohol use (or heavy drinking): SAMHSA defines heavy alcohol use as binge drinking on 5 or more days in the past month.

High-intensity drinking: Consumption of 2 or more times the gender-specific thresholds for binge drinking, which is to say 10 or more standard drinks (or alcoholic drinkequivalents) for males and 8 or more for females. High-intensity drinking is consistent with drinking at binge levels II and III. The levels correspond to one to two times (I), two to three times (II), and three or more times (III) the standard gender-specific binge thresholds.⁶

Patterns of drinking associated with AUD: Binge drinking and heavy alcohol use can increase an individual's risk of AUD. The U.S. Dietary Guidelines recommend that if alcohol is consumed, it should be in moderation, defined as up to 1 drink per day for women and up to 2 drinks per day for men, and only by adults of legal drinking age. Some individuals should avoid alcohol completely.

Underage drinking: Alcohol use by anyone under the age of 21. In the United States, the legal drinking age is 21.

In 2016, of all deaths attributable to alcohol consumption worldwide, 28.7 percent were due to injuries, 21.3 percent were due to digestive diseases (primarily cirrhosis of the liver and pancreatitis), 19 percent were due to cardiovascular diseases, 12.9 percent were due to infectious diseases (including tuberculosis, pneumonia, and HIV/AIDS), and 12.6 percent were due to cancers (most prominently those of the upper aerodigestive tract.)²¹

Consequences for Families in the United States

Approximately 10.5 percent (7.5 million) of U.S. children ages 17 and younger live with a parent with AUD, according to a 2017 report.²³

Underage Drinking in the United States

- » Prevalence of Underage Alcohol Use
 - Prevalence of Drinking: According to the 2019 NSDUH, 39.7 percent of 12- to 20-yearolds reported that they have had at least 1 drink in their lives.²⁵ About 7.0 million people ages 12 to 20²⁴ (18.5 percent of this age group²⁵) reported drinking alcohol in the past month (17.2 percent of males and 19.9 percent of females²⁵).

- **Prevalence of Binge Drinking:** According to the 2019 NSDUH, approximately 4.2 million people ages 12 to 20²⁴ reported binge drinking in the past month. This represents 11.1 percent of people in this age group (10.4 percent of males ages 12 to 20 and 11.8 percent of females ages 12 to 20²⁵).
- **Prevalence of Heavy Alcohol Use:** According to the 2019 NSDUH, approximately 825,000 people ages 12 to 20²⁴ reported heavy alcohol use in the past month. This represents 2.2 percent of this age group²⁵ (2.1 percent of males ages 12 to 20 and 2.3 percent of females ages 12 to 20²⁵).

» Trend in Underage Alcohol Use

• NSDUH findings have demonstrated a decline in underage drinking. From 2002 to 2019, the prevalence of past-30-day alcohol use decreased 41.1 percent for 16- to 17-year-olds, 54.7 percent for 14- to 15-year-olds, and 61.9 percent for 12- to 13-year-olds.²⁶

» Consequences of Underage Alcohol Use

- Research indicates that alcohol use during the teenage years can interfere with normal adolescent brain development and increase the risk of developing AUD. In addition, underage drinking contributes to a range of acute consequences, such as injuries, sexual assaults, alcohol overdoses, and deaths—including those from motor vehicle crashes.²⁷
- Alcohol is a factor in the deaths of thousands of people younger than age 21 in the United States each year. This includes:
 - 1,072 from motor vehicle crashes²⁸
 - 1,000 from homicides²⁹
 - 208 from alcohol overdose, falls, burns, and drowning²⁹
 - 596 from suicides²⁹

Alcohol and U.S. College Students

» Prevalence of Alcohol Use

- **Prevalence of Drinking:** According to the 2019 NSDUH, 52.5 percent of full-time college students ages 18 to 22 drank alcohol in the past month, compared with 44.0 percent of other persons of the same age.³⁰
- **Prevalence of Binge Drinking:** According to the 2019 NSDUH, 33.0 percent of full-time college students ages 18 to 22 reported binge drinking in the past month, compared with 27.7 percent of other persons of the same age.³⁰
- **Prevalence of Heavy Alcohol Use:** According to the 2019 NSDUH, 8.2 percent of fulltime college students ages 18 to 22 reported heavy alcohol use in the past month, compared with 6.4 percent of other persons of the same age.³⁰

» Consequences of Alcohol Use

- The most recent NIAAA statistics estimate that each year, 1,519 college students ages 18 to 24 die from alcohol-related unintentional injuries, including motor vehicle crashes.³¹
- The most recent NIAAA statistics estimate that each year, 696,000 students ages 18 to 24 are assaulted by another student who has been drinking.³²
- The most recent NIAAA statistics estimate that each year, 97,000 students ages 18 to 24 report experiencing alcohol-related sexual assault or date rape.³²
- According to the 2019 NSDUH, 8.7 percent of full-time college students ages 18 to 22 meet the criteria for AUD.³³

Alcohol and Pregnancy in the United States

According to the 2019 NSDUH, 9.5 percent of pregnant women ages 15 to 44 in the United States used alcohol in the past month.³⁴

- The prevalence of fetal alcohol syndrome in the United States was estimated by the Institute of Medicine in 1996 to be between 0.5 and 3.0 cases per 1,000.³⁵
- An NIAAA-supported study of more than 6,000 first graders across four U.S. communities estimated that as many as 1–5 percent of first-grade children have fetal alcohol spectrum disorders (FASD).³⁶

Alcohol and the Human Body

- In 2019, of the 85,688 liver disease deaths among individuals ages 12 and older, 43.1 percent involved alcohol. Among males, 53,486 liver disease deaths occurred, and 45.6 percent involved alcohol. Among females, 32,202 liver disease deaths occurred, and 39.0 percent involved alcohol.³⁷
- Among all cirrhosis deaths in 2015, 49.5 percent were alcohol related. The proportion of alcoholrelated cirrhosis deaths was highest (76.8 percent) among persons ages 25 to 34, followed by persons ages 35 to 44, at 72.7 percent.³⁸
- From 2010 to 2016, alcohol-related liver disease was the primary cause of almost 1 in 3 liver transplants in the United States, replacing hepatitis C virus infection as the leading cause of liver transplantation due to chronic liver disease.^{39,40}
- Research has shown that people who drink excessively have a greater risk of liver disease,⁴¹ heart disease, depression, stroke, and stomach bleeding, as well as cancers of the oral cavity, esophagus, larynx, pharynx,^{42,43} liver, colon, and rectum.⁴⁴ These individuals may also have problems managing conditions such as diabetes, high blood pressure, pain, and sleep disorders. They may increase their likelihood of unsafe sexual behavior.
- Moderate drinking, defined as up to 1 drink per day for women and 2 drinks per day for men, is associated with increased risk of drowning⁴⁵ and injuries from violence,^{46,47} falls,⁴⁷ and motor vehicle crashes.^{47,48} Moderate drinking is also associated with an increased risk of female breast cancer,^{44,49} oropharyngeal cancer,^{44,49} esophageal cancer (especially in individuals who inherit a deficiency in an enzyme involved in alcohol metabolism),^{39,44,50} and harmful medication interactions.^{51,52,53,56} Moderate drinking has been linked to risk for FASD in the offspring of women who consume alcohol during pregnancy.⁵⁵

For more information, please visit: <u>https://www.niaaa.nih.gov</u>

¹ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 2.17B – Alcohol Use in Lifetime among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2018 and 2019.

https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect2pe2019.htm#t ab2-17b. Accessed December 8, 2020.

² SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 2.18B – Alcohol Use in Past Year among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2018 and 2019.

https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect2pe2019.htm#t ab2-18b. Accessed December 8, 2020.

³ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 2.19B – Alcohol Use in Past Month among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2018 and 2019.

https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect2pe2019.htm#t ab2-19b. Accessed December 8, 2020.

⁴ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 2.20B – Binge Alcohol Use in Past Month among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect2pe2019.htm#t</u> ab2-20b. Accessed December 8, 2020.

- ⁵ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 2.21B Heavy Alcohol Use in Past Month among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect2pe2019.htm#t</u> <u>ab2-21b</u>. Accessed December 8, 2020.
- ⁶ Hingson, R.W.; Zha, W.; and White, A.M. Drinking beyond the binge threshold: Predictors, consequences, and changes in the U.S. *American Journal of Preventive Medicine* 52(6):717–727, 2017. PMID: 28526355
- ⁷ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 5.4A Alcohol Use Disorder in Past Year among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Numbers in Thousands, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect5pe2019.htm#t</u> <u>ab5-4a</u>. Accessed December 8, 2020.
- ⁸ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 5.4B Alcohol Use Disorder in Past Year among Persons Aged 12 or Older, by Age Group and Demographic Characteristics: Percentages, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect5pe2019.htm#t</u> ab5-4b. Accessed December 8, 2020.
- ⁹ Population prevalence estimates (%) are weighted by the person-level analysis weight and derived from the data set, defining "any treatment" as treatment or counseling designed to help reduce or stop alcohol use, including detoxification and any other treatment for medical problems associated with alcohol use, as well as defining AUD as alcohol abuse or alcohol dependence according to the 4th edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV). SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health (NSDUH-2019-DS0001). Public data set. <u>https://www.datafiles.samhsa.gov/study-dataset/national-survey-drug-use-and-health-2019-nsduh-2019-ds0001-nid19016</u>. Accessed December 8, 2020.
- ¹⁰ Mark, T.L.; Kassed, C.A.; Vandivort-Warren, R.; et al. Alcohol and opioid dependence medications: Prescription trends, overall and by physician specialty. *Drug and Alcohol Dependence* 99(1-3):345–349, 2009. PMID: 18819759
- ¹¹ Rehm, J.; Anderson, P.; Manthey, J.; et al. Alcohol use disorders in primary health care: What do we know and where do we go? *Alcohol and Alcoholism* 51(4):422–427, 2016. PMID: 26574600
- ¹² O'Connor, P.G.; Nyquist, J.G.; and McLellan, A.T. Integrating addiction medicine into graduate medical education in primary care: The time has come. *Annals of Internal Medicine* 154(1):56–59, 2011. PMID: 21200039
- ¹³ White, A.M.; Slater, M.E.; Ng, G.; et al. Trends in alcohol-related emergency department visits in the United States: Results from the Nationwide Emergency Department Sample, 2006 to 2014. *Alcoholism: Clinical and Experimental Research* 42(2):352–359, 2018. PMID: 29293274
- ¹⁴ Jones, C.M.; Paulozzi, L.J.; and Mack, K.M. Alcohol involvement in opioid pain reliever and benzodiazepine drug abuse-related emergency department visits and drug—related deaths—United States, 2010. *Morbidity and Mortality Weekly Report* 63(40):881–885, 2014. PMID: 25299603
- ¹⁵ Centers for Disease Control and Prevention (CDC). Alcohol and Public Health: Alcohol-Related Disease Impact (ARDI). Annual Average for United States 2011–2015 Alcohol-Attributable Deaths Due to Excessive Alcohol Use, All Ages. Available at: https://nccd.cdc.gov/DPH_ARDI/Default/Default.aspx. Accessed December 8, 2020. Methodology: According to CDC, due to scientific updates to ARDI, estimates of alcohol-attributable deaths or years of potential life lost generated in the current version of ARDI should not be compared with estimates that were generated using the ARDI default reports or analyses in the ARDI Custom Data Portal prior to July 30, 2020.
- ¹⁶ Mokdad, A.H.; Marks, J.S.; Stroup, D.F.; and Gerberding, J.L. Actual causes of death in the United States, 2000. *JAMA* 291(10):1238–1245, 2004. Erratum in *JAMA* 293(3):298, 2005. PMID: 15010446
- ¹⁷ National Center for Statistics and Analysis, National Highway Traffic Safety Administration. Alcohol-impaired driving. In: *Traffic Safety Facts: 2015 Data.* Washington, D.C.:U.S. Department of Transportation, 2016. <u>https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/812350</u>. Accessed December 8, 2020.
- ¹⁸ Sacks, J.J.; Gonzales, K.R.; Bouchery, E.E.; et al. 2010 national and state costs of excessive alcohol consumption. *American Journal of Preventive Medicine* 49(5):e73–e79, 2015. PMID: 26477807
- ¹⁹ WHO. Alcohol: Fact sheet. 2018. <u>https://www.who.int/en/news-room/fact-sheets/detail/alcohol</u>. Accessed December 8, 2020.
- ²⁰ GBD 2016 Alcohol Collaborators. Alcohol use and burden for 195 countries and territories, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet* 392(10152):1015–1035, 2018. https://www.thelancet.com/journals/lancet/article/PIIS0140-6736(18)31310-2/fulltext. Accessed December 8, 2020.
- ²¹ WHO. *Global Status Report on Alcohol and Health 2018.* Geneva, Switzerland: WHO Press, 2018, p. xv. https://apps.who.int/iris/bitstream/hand le/10665/274603/9789241565639-eng.pdf?ua=1. Accessed December 8, 2020.
- ²² WHO. Global Status Report on Alcohol and Health 2018. Geneva, Switzerland: WHO Press, 2018, p. vii. https://apps.who.int/iris/bitstream/handle/ 10665/274603/9789241565639-eng.pdf?ua=1. Accessed December 8, 2020.

- ²³ Lipari, R.N.; and Van Horn, S.L. *The CBHSQ Report: Children Living With Parents Who Have a Substance Use Disorder*. Rockville, MD: SAMHSA, Center for Behavioral Health Statistics and Quality, August 24, 2017. <u>https://www.samhsa.gov/data/sites/default/files/report_3223/ShortReport-3223.html</u>. Accessed December 8, 2020.
- ²⁴ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 2.32A Alcohol Use in Lifetime, Past Year, and Past Month and Binge and Heavy Alcohol Use in Past Month among Persons Aged 12 to 20, by Demographic Characteristics: Numbers in Thousands, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect2pe2019.htm#</u> <u>tab2-32a</u>. Accessed December 8, 2020.
- ²⁵ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 2.32B Alcohol Use in Lifetime, Past Year, and Past Month and Binge and Heavy Alcohol Use in Past Month among Persons Aged 12 to 20, by Demographic Characteristics: Percentages, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect2pe2019.htm#</u> <u>tab2-32b</u>. Accessed December 8, 2020.
- ²⁶ Methodology: Population prevalence estimates (%) are weighted by the person-level analysis weight and derived from Center for Behavioral Health Statistics and Quality. 2002 National Survey on Drug Use and Health Public Use File Codebook. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2015; and Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health Public Use File Codebook. Rockville, MD: Substance Abuse and Mental Health Services Administration, 2020. Public use data set. <u>https://www.datafiles.samhsa.gov/study-dataset/national-survey-drug-use-and-health-2019-nsduh-2019-ds0001-nid19016</u>. Accessed December 8, 2020.
- ²⁷ NIAAA. Underage drinking. 2020. <u>https://pubs.niaaa.nih.gov/publications/UnderageDrinking/UnderageFact.htm</u>. Accessed December 8, 2020.
- ²⁸ National Highway Traffic Safety Administration. Fatality Analysis Reporting System. <u>https://www.nhtsa.gov/FARS</u>. Accessed December 8, 2020.
- ²⁹ CDC. Alcohol and Public Health: Alcohol-Related Disease Impact (ARDI) public-use data file. Atlanta, GA: CDC, 2018. <u>https://nccd.cdc.gov/DPH_ARDI/Default/Report.aspx?T=AAM&P=1A04A664-0244-42C1-91DE-316F3AF6B447&R=B885BD06-13DF-45CD-8DD8-AA6B178C4ECE&M=32B5FFE7-81D2-43C5-A892-9B9B3C4246C7&F=AAMCauseGenderUnder21&D=H. Accessed December 8, 2020. Methodology: According to CDC, due to scientific updates to ARDI, estimates of alcoholattributable deaths or years of potential life lost generated in the current version of ARDI should not be compared with estimates that were generated using the ARDI default reports or analyses in the ARDI Custom Data Portal prior to July 30, 2020.</u>
- ³⁰ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 6.21B Types of Illicit Drug, Tobacco Product, and Alcohol Use in Past Month among Persons Aged 18 to 22, by College Enrollment Status and Gender: Percentages, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect6pe2019.htm#</u> <u>tab6-21b</u>. Accessed December 8, 2020.
- ³¹ Methodology for arriving at estimates described in Hingson, R.; Zha, W.; and Smyth, D. Magnitude and trends in heavy episodic drinking, alcohol-impaired driving, and alcohol-related mortality and overdose hospitalizations among emerging adults of college ages 18–24 in the United States, 1998–2014. *Journal of Studies on Alcohol and Drugs* 78(4):540–548, 2017. PMID: 28728636
- ³² Methodology for arriving at estimates described in Hingson, R.; Heeren, T.; Winter, M.; and Wechsler, H. 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, 2005. PMID: 15760289
- ³³ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 6.23B Alcohol Use Disorder in Past Year among Persons Aged 18 to 22, by College Enrollment Status and Demographic Characteristics: Percentages, 2018 and 2019.
 <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect6pe2019.htm#</u> tab6-23b. Accessed December 8, 2020.
- ³⁴ SAMHSA, Center for Behavioral Health Statistics and Quality. 2019 National Survey on Drug Use and Health. Table 6.17B Types of Illicit Drug, Tobacco Product, and Alcohol Use in Past Month among Females Aged 15 to 44, by Pregnancy Status: Percentages, 2018 and 2019. <u>https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect6pe2019.htm#</u> tab6-17b. Accessed December 8, 2020.
- ³⁵ Stratton, K.; Howe, C.; and Battaglia, F.; eds. *Fetal Alcohol Syndrome: Diagnosis, Epidemiology, Prevention, and Treatment.* Washington, D.C.: Institute of Medicine, The National Academies Press, 1996.
- ³⁶ May, P.A.; Chambers, C.D.; Kalberg, W.O.; et al. Prevalence of fetal alcohol spectrum disorders in 4 U.S. communities. JAMA 319(5):474–482, 2018. PMID: 29411031
- ³⁷ Estimated liver disease deaths include deaths with the underlying cause of death coded as alcoholic liver disease (K70), liver cirrhosis, unspecified (K74.0–K74.2, K74.6, K76.0, K76.7, and K76.9), chronic hepatitis (K73), portal hypertension (K76.6), liver cancer (C22), or other liver diseases (K71, K72, K74.3–K74.5, K75, K76.1–K76.5, and K76.8). Number of deaths from Multiple

Cause of Death Public-Use Data File, 2019 (<u>http://wonder.cdc.gov/mcd.htm</u>]). Alcohol-attributable fractions (AAFs) from CDC Alcohol-Related Disease Impact (<u>http://nccd.cdc.gov/DPH_ARDI/Default/Default.aspx</u>, accessed January 4, 2021. Prevalence of alcohol consumption from the National Survey on Drug Use and Health, 2019, for estimating indirect AAFs for chronic hepatitis and liver cancer.

- ³⁸ Yoon, Y.H.; and Chen, C.M. Surveillance Report #111: Liver Cirrhosis Mortality in the United States: National, State, and Regional Trends, 2000–2015. Rockville, MD: NIAAA, Division of Epidemiology and Prevention Research, April 2018. <u>https://pubs.niaaa.nih.gov/publications/surveillance111/Cirr15.pdf</u>. Accessed December 8, 2020.
- ³⁹ Lee, B.P.; Vittinghoff, E.; Dodge, J.L.; et al. National trends and long-term outcomes of liver transplant for alcohol-associated liver disease in the United States. *JAMA Internal Medicine* 2019 [epub ahead of print]. Accessed December 8, 2020. PMID: 30667468
- ⁴⁰ Cholankeril, G.; and Ahmed, A. Alcoholic liver disease replaces hepatitis C virus infection as the leading indication for liver transplantation in the United States. *Clinical Gastroenterology Hepatology* 16(8):1356–1358, 2018. PMID: 29199144
- ⁴¹ Grewal, P.; and Viswanathen, V.A. Liver cancer and alcohol. *Clinics in Liver Disease* 16(4):839–850, 2012. PMID: 23101985
- ⁴² Baan, R.; Straif, K.; Grosse, Y.; et al. Carcinogenicity of alcoholic beverages. *The Lancet: Oncology* 8(4):292–293, 2007. PMID: 17431955
- ⁴³ IARC Working Group on the Evaluation of Carcinogenic Risks to Humans. Personal habits and indoor combustions. Volume 100 E. A review of human carcinogens. *IARC Monographs on the Evaluation of Carcinogenic Risks to Humans* 100(Pt E):373–472, 2012. PMID: 23193840
- ⁴⁴ Bagnardi, V.; Rota, M.: Botteri, E.; et. al. Alcohol consumption and site-specific cancer risk: A comprehensive dose-response meta-analysis. *British Journal of Cancer* 112(3):580–593, 2015. PMID: 25422909
- ⁴⁵ Driscoll, T.R.; Harrison, J.A.; and Steenkamp, M. Review of the role of alcohol in drowning associated with recreational aquatic activity. *Injury Prevention* 10(2):107–113, 2004. PMID: 15066977
- ⁴⁶ Cherpitel, C.J. Alcohol and injuries: A review of international emergency room studies since 1995. *Drug and Alcohol Review* 26(2):201–214, 2007. PMID: 17364856
- ⁴⁷ Taylor, B.; Irving, H. M.; Kanteres, F.; et al. The more you drink, the harder you fall: A systematic review and meta-analysis of how acute alcohol consumption and injury or collision risk increase together. *Drug and Alcohol Dependence* 110(1–2):108–116, 2010. PMID: 20236774
- ⁴⁸ Taylor, B.; and Rehm, J. The relationship between alcohol consumption and fatal motor vehicle injury: High risk at low alcohol levels. *Alcoholism, Clinical and Experimental Research* 36(10):1827–1834, 2012. PMID: 22563862
- ⁴⁹ Bagnardi, V.; Rota, M.; Botteri, E.; et al. Light alcohol drinking and cancer: A meta-analysis. Annals of Oncology 24(2):301–308, 2013. PMID: 22910838
- ⁵⁰ Brooks, P.J.; Enoch, M.A.; Goldman, D.; et al. The alcohol flushing response: An unrecognized risk factor for esophageal cancer from alcohol consumption. *PLOS Medicine* 6(3):e50, 2009. PMID: 19320537
- ⁵¹ Weathermon, R.; and Crabb, D.W. Alcohol and medication interactions. *Alcohol Research and Health* 23(1):40–54, 1999. PMID: 10890797
- ⁵² van der Schrier, R.; Roozekrans, M.; Olofsen, E; et al. Influence of ethanol on oxycodone-induced respiratory depression: A dose-escalating study in young and elderly individuals. *Anesthesiology* 126(3):534–542, 2017. PMID: 28170358
- ⁵³ Breslow, R.; Dong, C.; and White, A. Prevalence of alcohol-interactive prescription medication use among current drinkers: United States, 1999–2010. *Alcoholism: Clinical and Experimental Research* 39(2):371–379, 2015. PMID: 25597432
- ⁵⁴ NIAAA. Harmful Interactions: Mixing Alcohol With Medicines. 2014. <u>https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/harmful-interactions-mixing-alcohol-with-medicines</u>. Accessed December 8, 2020.
- ⁵⁵ Kesmodel, U.S.; Nygaard, S.S.; Mortensen, E.L.; et al. Are low-to-moderate average alcohol consumption and isolated episodes of binge drinking in early pregnancy associated with facial features related to fetal alcohol syndrome in 5-year-old children? *Alcoholism: Clinical and Experimental Research* 43(6):1199–1212, 2019. PMID: 30977899
- ⁵⁶ NIAAA. NIAAA council approves definition of binge drinking. NIAAA Newsletter 3:3, Winter 2004. <u>https://pubs.niaaa.nih.gov/publications/Newsletter/winter2004/Newsletter_Number3.pdf</u>. Accessed December 8, 2020.
- ⁵⁷ SAMHSA. 2019 Methodological Summary and Definitions. <u>https://www.samhsa.gov/data/report/2019-methodological-summary-and-definitions</u>. Accessed December 8, 2020.





NIH . . . Turning Discovery Into Health® National Institute on Alcohol Abuse and Alcoholism https://www.niaaa.nih.gov • 301–443–3860