

# REPORT TO CONGRESS ON THE PREVENTION AND REDUCTION OF UNDERAGE DRINKING

## Chapter 1

### Underage Drinking: Public Health Consequences and Prevention Efforts

2017



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES  
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# CHAPTER 1

## Underage Drinking: Public Health Consequences and Prevention Efforts

## Introduction

Consumption of alcohol by individuals under 21 has been recognized as a pervasive public health and safety problem for many years. Despite laws against underage drinking in all 50 states, the efforts of federal, state, and local governments spanning decades, the dedicated work of many private groups and organizations, and significant progress, alcohol is still the most widely consumed substance among America's youth, used more often than tobacco or marijuana. Alcohol use often begins at a young age and underage drinkers tend to drink more at one time than adults do and without regard for consequences.

Underage drinking has profound costs not just for underage drinkers, but also for their families, their communities, and society as a whole. In response, the federal government, together with state and local governments, has sought to develop effective approaches to reduce underage drinking and its associated costs and consequences.

This combined report is required by the Sober Truth on Preventing (STOP) Underage Drinking Act (Pub. L. 109-422), which was enacted by Congress in 2006 and reauthorized in December 2016 (Pub. L. 114-255). The STOP Act requires the Interagency Coordinating Committee on the Prevention of Underage Drinking (ICCPUD) to submit an annual report to Congress addressing underage drinking prevention programs and policies, along with data on prevalence and patterns of underage drinking. The STOP Act calls for three separate reports, published together in this document:

1. A report to Congress from the Secretary of the U.S. Department of Health and Human Services (HHS; Chapters 1 through 3) that includes:
  - A description of all federal agency programs and policies designed to prevent and reduce underage drinking
  - The extent of progress in preventing and reducing underage drinking nationally
  - Information related to patterns and consequences of underage drinking
  - Measures of the exposure of underage populations to messages regarding alcohol in advertising and the entertainment media, as reported by the Federal Trade Commission (FTC)
  - Surveillance data, including information about the initiation and prevalence of underage drinking, consumption patterns, and the means of underage access
  - Other information about underage drinking that the Secretary determines appropriate
2. A report on state underage drinking prevention and enforcement activities (Chapter 4 and the individual state reports) that includes:
  - A set of measures used in preparing the report on best practices
  - Categories of underage-drinking-prevention policies, enforcement practices, and programs (see Chapter 4 for a list of specific categories)
  - Additional information on state efforts or programs not specifically included in the Act
3. A report on the national media campaign mandated by the STOP Act (Chapter 5), including the production, broadcasting and evaluation of the campaign, and the effectiveness of the campaign

This chapter describes the harmful public health consequences of underage drinking and provides background on the ongoing national effort to prevent and reduce underage drinking.

## Adverse Consequences of Underage Drinking

Underage drinking affects the health and well-being of the individual drinker, families of drinkers, the community, and society.

The individual health and social impacts of underage drinking include, foremost, the risk of death due to motor vehicle crashes; other unintentional injuries (such as burns, falls, and drowning); alcohol and drug poisoning; and suicide.

Additional risks include brain impairment; interpersonal violence; engagement in risky sexual activity; involvement with the legal system; and academic problems. The family of the adolescent who drinks alcohol may experience a disruption of normal relationships and a family crisis. The social costs include risks to other drivers and passengers, risk of violence, and enormous economic costs. In 2010, almost \$24.3 billion (about 10 percent) of the total \$249 billion economic costs of excessive alcohol consumption were related to underage drinking (Sacks, Gonzales, Bouchery, Tomedi, & Brewer, 2015). It is estimated that 64.1 percent of underage drinking costs can be attributed to lost productivity; most of that is due to premature mortality from alcohol-attributable conditions involving underage youth (Bouchery, Harwood, Sacks, Simon, & Brewer, 2011). Underage drinking not only imposes societal costs in its own right, but also, given the increased risk that those who drink at young ages will develop alcohol use disorders later in life, contributes indirectly to the costs of excessive adult alcohol use.

### Individual Consequences

#### Mortality and Injury from Traffic Crashes

The greatest mortality risk for underage drinkers continues to be from motor vehicle crashes. In 2015, of the 1,886 drivers ages 15 to 20 who were killed in motor vehicle traffic crashes:

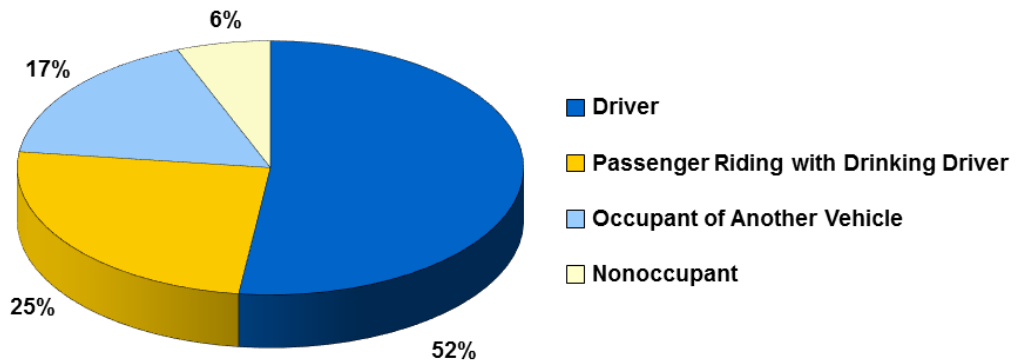
- 494 (26 percent) had a BAC of 0.01 or higher.
- 97 (5 percent) had a BAC of 0.01 to 0.07 g/dL.
- 397 (21 percent) had a BAC of 0.08 g/dL or higher (National Center for Statistics and Analysis [NCSA], 2015).

In 2015, 975 people were killed in motor vehicle traffic crashes involving a 15- to 20-year-old driver with a BAC of .01 or higher. The distribution of fatalities by person type in 2015 is shown in Exhibit 1.1.

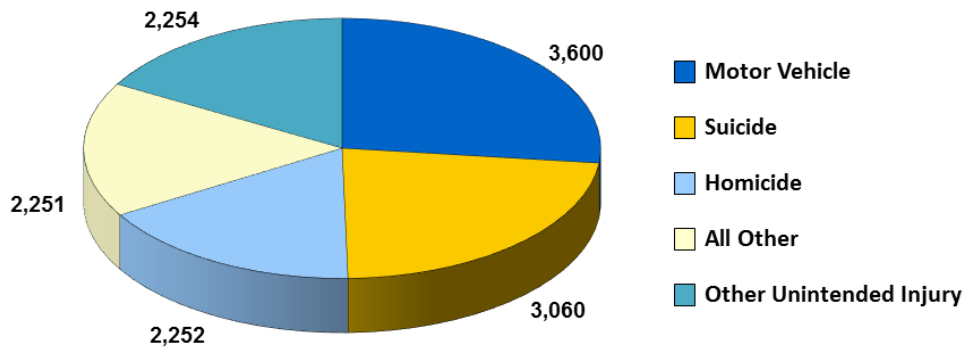
#### Other Leading Causes of Death in Youth

In addition to contributing to motor vehicle crashes, underage drinking contributes to all major causes of fatal and nonfatal injuries experienced by young people. Suicide, other unintentional injuries, and homicide, along with motor vehicle traffic crashes, are the four leading causes of death among youths ages 12 to 20 (Exhibit 1.2) (CDC, 2015a).

**Exhibit 1.1: Distribution of Fatalities in Motor Vehicle Traffic Crashes Involving a 15- to 20-Year-Old Driver with a BAC of 0.01 or Higher by Person Type in 2015**  
(NCSA, 2016)



**Exhibit 1.2: Leading Causes of Death for Youth Ages 12–20: 2015**  
(Centers for Disease Control and Prevention [CDC], 2015)



In 2015 (the latest date for which these data are available), 2,254 youths ages 12 to 20 died from unintentional injuries other than motor vehicle crashes, such as poisoning, drowning, falls, and burns (CDC, 2015). Previous research on the population suggests that about 40 percent of these deaths involved alcohol use (Smith, Branas, & Miller, 1999).

Data from 17 states show that among people who died by suicide who were ages 10 to 19 (all under the legal drinking age in the United States) and were tested, 12 percent had BACs >0.08 g/dL (Crosby, Espitia-Hardeman, Hill, Ortega, & Clavel-Arcas, 2009). Smith and colleagues (1999) estimated that, for the population as a whole, nearly one third (31.5 percent) of homicides and almost a quarter (22.7 percent) of suicides were attributable to alcohol (i.e., involved a deceased person with a BAC of 0.10 g/dL or greater). Another study focusing on youth suicide estimated that 9.1 percent of hospital-admitted suicide acts by those under age 21 involved alcohol, and of those cases, 72 percent were attributable to or caused by alcohol use (Miller, Levy, Spicer, & Taylor, 2006).

## Brain Impairment

Adverse effects on normal brain development are a potential long-term risk of underage alcohol consumption. During adolescence, dramatic changes to the brain’s structure, neuron connectivity (“wiring”), and physiology occur (Restak, 2001). These changes affect everything from emerging sexuality to emotionality and judgment. However, not all parts of the brain mature at the same time. Differences in maturational timing across the brain can result in impulsive decisions or actions, disregard for consequences, and emotional reactions that can lead to alcohol use or otherwise put teenagers at serious risk.

Neurobiological research suggests that adolescence may be a period of unique vulnerability to the effects of alcohol. For example, research on adolescents with alcohol use disorders shows that early heavy<sup>6</sup> alcohol use may have negative effects on the actual physical development of the brain structure (Brown & Tapert, 2004) as well as on brain functioning. Negative effects indicated by neuropsychological studies include decreased ability in planning, executive functioning, memory, spatial operations, and attention, all of which play important roles in academic performance and future levels of functioning (Brown, Tapert, Granholm, & Dellis, 2000; Giancola & Mezzich, 2000; Tapert & Brown, 1999; Tapert et al., 2001; Winward, Hanson, Bekman, Tapert, & Brown, 2014).

As Brown and colleagues (2000) noted, these deficits may put alcohol-dependent adolescents at risk for falling farther behind in school, putting them at an even greater disadvantage relative to nonusers. Some of these cross-sectional findings are supported by longitudinal analyses (Squeglia, Jacobus, & Tapert, 2009). A 10-year prospective study (Hanson, Medina, Padula, Tapert, & Brown, 2011) found that having a history of heavy (defined as five or more drinks in a row) alcohol or other substance use during adolescence appears to be more important in determining cognitive deficits than whether individuals continued to have substance-related problems into their mid-twenties.

*Adverse consequences include death, injury, and brain impairment.*

The Adolescent Brain Cognitive Development (ABCD) study, launched in 2015, is expected to provide information on factors that contribute to adolescent alcohol and other substance use and its long-term effects on brain development and associated life outcomes. The ABCD study is the “largest long-term study of brain development and child health in the United States,” according to the study website (<http://abcdstudy.org>). The study will enroll about 10,000 children ages 9 and 10 at 19 research institutions across the country and follow them for 10 years, into early adulthood. Researchers will use noninvasive neuroimaging and cognitive, academic, social, emotional, and biological assessments to determine how childhood experiences interact with children’s changing biology to affect brain development and other outcomes.

An initiative of the National Institutes of Health (NIH), the Collaborative Research on Addiction at NIH (CRAN) is a partnership comprising the National Institute on Drug Abuse (NIDA), the National Institute on Alcohol Abuse and Alcoholism (NIAAA), and the National Cancer Institute (NCI). CRAN is leading the ABCD study in partnership with other NIH Institutes.

<sup>6</sup> For purposes of this study, heavy alcohol use is defined as five or more drinks in a row.

### **Risky Sexual Activity**

Underage drinking plays a significant role in risky sexual behavior, including unwanted, unintended, and unprotected sexual activity as well as sex with multiple partners. Such behavior increases the risk for unplanned pregnancy and contracting sexually transmitted diseases, including infection with HIV, the virus that causes AIDS (Cooper & Orcutt, 1997). When pregnancies occur, underage drinking may result in fetal alcohol spectrum disorders, including fetal alcohol syndrome, which remains a leading cause of intellectual disabilities (Jones, Smith, Ulleland, & Streissguth, 1973; Stratton, Howe, & Battaglia, 1996; Warren & Bast, 1988).

### **Impaired Academic Performance**

In general, cross-sectional studies have found that students who do poorly in school drink more than students whose school performance is better (Bryant, Schulenberg, O'Malley, Bachman, & Johnston, 2003). For example, students who report binge drinking are three times more likely to report earning mostly Ds and Fs on their report cards than non-binge drinkers (Miller, Naimi, Brewer, & Jones, 2007).

However, the evidence from longitudinal studies is less clear cut, and in some cases the data suggest that academic failure leads to increased drinking rather than the reverse. Using data from the Youth Development Study (Mortimer, 2003), Owens, Shippee, and Hensl (2008) tracked a panel of youth from their freshman to senior years in high school. The authors failed to find a significant link across the high school years between increased drinking and diminishing academic performance.

A 1-year longitudinal analysis of middle school and high school students using the National Longitudinal Study of Adolescent Health found that, independent of consumption levels, students who drank experienced modest declines (one tenth of a letter grade) in academic achievement (Crosnoe, Muller, & Frank, 2004). Using a similar design, Crosnoe (2006) found a stronger association between number of classes failed and later alcohol use than between alcohol use and academic performance. Academic failure appeared to lead to increased drinking through weakened bonds that traditionally control problem behavior, especially bonding to teachers. Interestingly, both Mortimer (2003) and Owens and colleagues (2008) found that increasing GPAs were associated with increasingly frequent drinking occasions. The authors speculated that good grades may bring a measure of parental freedom.

Renna (2008) tracked educational attainment and alcohol use at ages 19 and 25 among two cohorts of 18-years-olds in 1982 and 1983, using data from the National Longitudinal Survey of Youth. Binge drinking in the senior year of high school reduced the probability of receiving a high school diploma and increased the probability of graduating later in life with a general education development diploma (and hence realizing lowered earning potential). Also of interest, the study found that increases in the minimum legal drinking age (MLDA) increased the probability of people graduating by age 19 by 5.3 percentage points.

College-age drinking also has educational impacts. About 25 percent of college students report academic consequences as a result of their drinking, including missing class, falling behind, doing poorly on exams or papers, and receiving lower grades overall (White & Hingson, 2013).



## Social Costs

### Mortality and Injury

Individuals other than the drinker experience the consequences of underage alcohol use through destruction of property, unintentional injury, violence, and even death. For example, in 2015, 48 percent of all deaths in traffic crashes involving a 15- to 20-year-old driver with a blood alcohol concentration of 0.08 or higher were people other than the drinking driver (e.g., passengers, occupants of other vehicles) (NCSA, 2016).

Police and child protective services records suggest that those under age 21 commit 30 percent of murders, 31 percent of rapes, 46 percent of robberies, and 27 percent of other assaults (Miller et al., 2006). As the authors note, relying on victim reports rather than agency records would yield higher estimates. For the population as a whole, an estimated 50 percent of violent crime is related to alcohol use by the perpetrator (Harwood, Fountain, & Livermore, 1998). The degree to which violent crimes committed by those under 21 are alcohol related is yet unknown.

A review article by Nolen-Hoeksema cited a number of studies suggesting that underage drinking by both victim and assailant increases the risk of physical and sexual assault (Abbey, 2011; Nolen-Hoeksema, 2004).

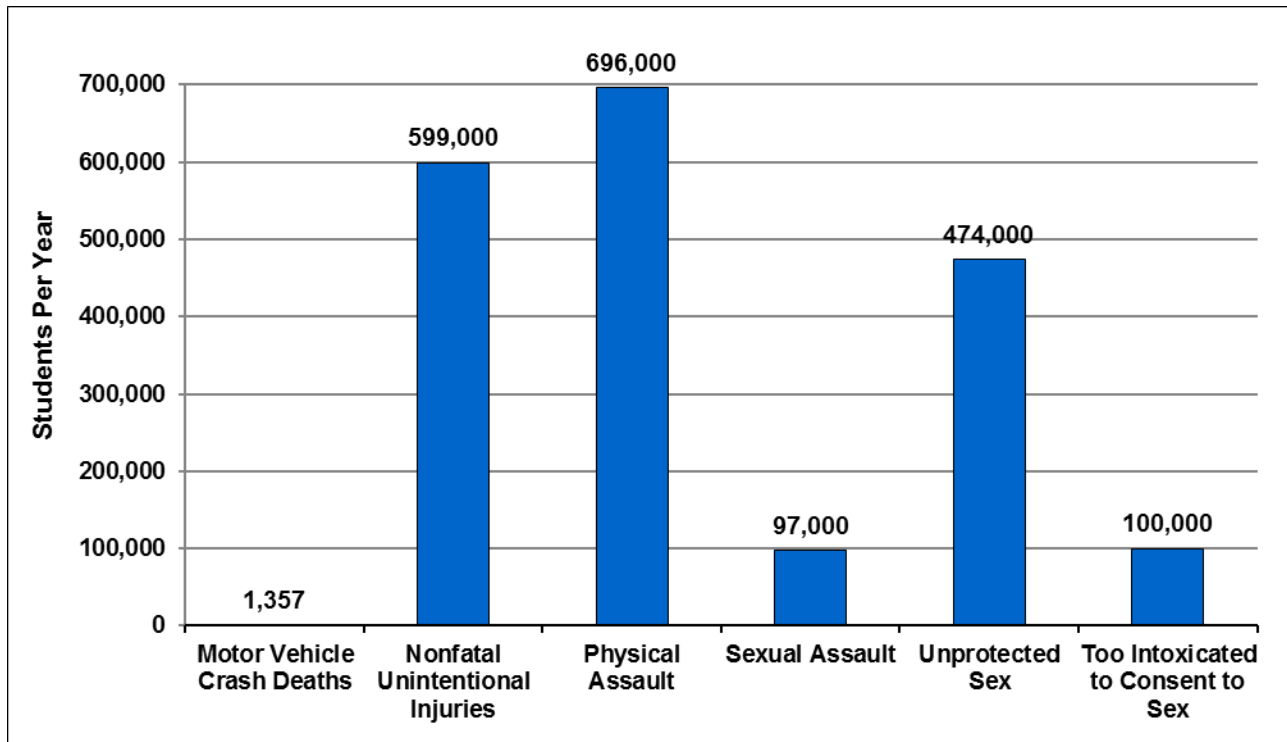
### Social Costs on College Campuses

The problems associated with college drinking include sexual assault, including date rape, and other violent crime on college campuses (White & Hingson, 2013). A study of roughly 5,500 college women on two campuses revealed that nearly 20 percent experienced some form of sexual assault while at college (Krebs, Lindquist, Warner, Fisher, & Martin, 2009). One estimate based on a national survey of college students is that 97,000 students may be victims of alcohol-related sexual assault in a given year (Hingson, Heeren, Winter, & Wechsler, 2005). However, the incidence of college sexual assaults is difficult to measure and different studies report different rates (DeMatteo & Galloway, 2015).

A review by Abbey (2011) of three relevant studies concluded that approximately half of all reported and unreported sexual assaults involve alcohol consumption by the perpetrator, victim, or both (Abbey, Zawacki, Buck, Clinton, & McAuslan, 2004; Seto & Barbaree, 1995; Testa, 2002). Abbey and colleagues further reported that typically, if the victim consumes alcohol, the perpetrator does as well. Estimates of perpetrators' intoxication during the incident ranged from 30 percent to 75 percent.

Many other adverse social consequences are linked with college alcohol consumption. Hingson, Zha, and Weitzman (2009) estimated that annually, more than 696,000 college students were assaulted or hit by another student who had been drinking, and another 599,000 were unintentionally injured while under the influence of alcohol. In addition, they estimated that roughly 474,000 students ages 18 to 24 have had unprotected sex while under the influence of alcohol, and each year more than 100,000 students ages 18 to 24 report having had sexual intercourse when so intoxicated they were unable to consent (Hingson et al., 2005) (Exhibit 1.3). About 11 percent of college student drinkers report having damaged property while under the influence of alcohol (Hingson et al., 2005).

**Exhibit 1.3: Prevalence of Alcohol-Related Morbidity and Mortality Among College Students Ages 18–24** (calculated using methods of Hingson et al., 2005)



### Increased Risk of Developing an Alcohol Use Disorder Later in Life

Early-onset alcohol use, alone and in combination with increased drinking in adolescence, has been noted as a risk factor for developing alcohol-related problems in later life (Agrawal et al., 2009; Grant et al., 2005; Dawson, Goldstein, Chou, Ruan, & Grant, 2008; Hingson, Heeren & Winter, 2006; Hingson & Zha, 2009; Pitkänen, Lyyra, & Pulkkinen, 2005; York, Welte, Hirsch, Hoffman, & Barnes, 2004). Grant and Dawson (1997) found that more than 40 percent of people who initiated drinking before age 13 met DSM-IV diagnostic criteria for alcohol dependence at some time in their lives.<sup>7</sup>

The onset of alcohol consumption in childhood or early adolescence is associated with later use of drugs, drug dependence, and drug-related crash involvement (Hermos, Winter, Heeren, & Hingson, 2008; Hingson, Heeren, & Edwards, 2008). Use of both alcohol and marijuana or alcohol, marijuana, and cigarettes before age 16 is associated with a spectrum of young adult substance use problems, as well as substance use disorder diagnoses (Moss, Chena, & Yi, 2014).

Adults who started drinking at age 14 were three times more likely to report driving after drinking too much ever in their lives than were those who began drinking after age 21. Crashes were four times more likely for those who began drinking at age 14 than for those who began drinking after age 21 (Hingson, Heeren, Levenson, Jamanka, & Voas, 2001).

<sup>7</sup> Note that the criteria for alcohol-related disorders in the DSM-V (APA, 2013) do not specifically address adolescents.

## The National Effort to Reduce Underage Drinking

Over the past 30 years, a comprehensive national effort to address underage drinking has been initiated and subsequently intensified, as the multidimensional consequences associated with underage drinking have become more apparent. Substantial progress has been made through strengthening federal policy, implementing national media campaigns, increasing and supporting the involvement of communities through grants and other mechanisms, and collaborating with private agencies, such as the Robert Wood Johnson Foundation.

Development and evaluation of different approaches to prevention have been ongoing at the national level for the past three decades, with NIAAA playing a key role. Prevention efforts have focused on both the individual level, aimed at changing individual behavior, and the environmental level, aimed at limiting the availability of alcohol while increasing the safety of drinking contexts. This combined approach incorporates changes in policy and social environments along with continued education and skills training for individuals, family members, and the community (Harding et al., 2016).

Federal efforts are coordinated through the Interagency Coordinating Committee on the Prevention of Underage Drinking (ICCPUD), which includes representatives from HHS's Office of the Surgeon General (OSG), CDC, Administration for Children and Families, Office of the Assistant Secretary for Planning and Evaluation, and NIH, including NIAAA and NIDA; U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention (OJJDP); Office of Safe and Healthy Students; Department of Transportation, NHTSA; White House Office of National Drug Control Policy (ONDCP); Department of the Treasury; U.S. Department of Defense; and FTC.

The federally sponsored research has been synthesized into several publications summarizing evidence-based prevention research strategies. The most recent is the 2016 *Facing Addiction in America, The Surgeon General's Report on Alcohol, Drugs and Health*. Other key documents include the Surgeon General's 2007 *Call to Action* (discussed in more detail below); the Community Preventive Services Task Force (*Guide to Community Preventive Services: Preventing Excessive Alcohol Consumption*, based on systematic reviews conducted between 2006 and 2012); the 2003 Institute of Medicine report entitled *Reducing Underage Drinking: A Collective Responsibility* (2004); the 2002 NIAAA report, *A Call to Action; Changing the Culture of Drinking at U.S. Colleges*; and the NIAAA CollegeAIM (the College Alcohol Intervention Matrix), also detailed below.

The national efforts aimed at the reduction of alcohol-related deaths and disability and associated healthcare costs are outlined below. Individual states have also adopted comprehensive policies and practices (detailed in Chapters 3 and 4) that can alter individual and environmental factors that contribute to underage drinking and its consequences.

### Adoption of the Minimum Legal Drinking Age

After Prohibition ended in 1933, states assumed authority for alcohol control, including enactment of laws restricting youth access to alcohol. Most states designated 21 as the MLDA for "purchase or public possession" of alcohol. But beyond setting a minimum drinking age, the nation largely ignored alcohol problems through the 1960s (NIAAA, 2005b) until, on December 31, 1970,

Congress established NIAAA to “provide leadership in the national effort to reduce alcohol problems through research.”

Between 1970 and 1976, 29 states lowered their MLDA from 21 to 18, 19, or 20 years old, in part because the voting age had been lowered (Wagenaar, 1981). However, studies conducted in the 1970s found that motor vehicle crashes increased significantly among teens, resulting in more traffic injuries and fatalities (Cucchiari, Ferreira, & Sicherman, 1974; Douglass, Filkins, & Clark, 1974; Wagenaar, 1983, 1993; Whitehead, 1977; Whitehead et al., 1975; Williams, Rich, Zador, & Robertson, 1974). As a result, 24 of the 29 states raised their MLDA between 1976 and 1984, although to different minimum ages. Some placed restrictions on the types of alcohol that could be consumed by people younger than 21. Only 22 states set an MLDA of 21. These differences across states led to youths driving across borders to buy and drink alcohol in neighboring states, with increased mortality (NHTSA, 2001). In response, Congress enacted the National Minimum Drinking Age Act of 1984, which mandated reduced federal highway funds to states that did not raise their MLDA to 21. By 1987, all remaining states had raised their MLDA to 21 in response to the federal legislation (although exceptions based on parental permission, location, and other factors exist in many states). While enforcement varies across states, the age-21 MLDA has led to significant reductions in traffic crashes among youths (NHTSA, 2014).

### **Congressional Actions Between 1992 and 2004**

In 1992, Congress created the Substance Abuse and Mental Health Services Administration (SAMHSA) to “focus attention, programs, and funding on improving the lives of people with or at risk for mental and substance abuse disorders.” In 1998, Congress mandated that the Department of Justice, through the Office of Justice Programs’ OJJDP, establish and implement the Enforcing the Underage Drinking Laws (EUDL) program, a state- and community-based initiative.

As national concern about underage drinking grew, in part because of advances in science that increasingly revealed adverse consequences, Congress appropriated funds for a study by the National Academies to examine the relevant literature to “review existing Federal, state, and nongovernmental programs, including media-based programs, designed to change the attitudes and health behaviors of youth.” The National Research Council (NRC) and the Institute of Medicine (IOM) issued the report, *Reducing Underage Drinking: A Collective Responsibility*, in 2004 (NRC and IOM, 2004).

### **Interagency Coordinating Committee on the Prevention of Underage Drinking**

The conference report accompanying H.R. 2673, the “Consolidated Appropriations Act of 2004,” directed the HHS Secretary to establish the ICCPUD (see member list, above) and to issue an annual report summarizing all federal agency activities related to the problem. The HHS Secretary directed the SAMHSA Administrator to convene ICCPUD in 2004.

ICCPUD coordinates federal efforts to reduce underage drinking and served as a resource for the development of *A Comprehensive Plan for Preventing and Reducing Underage Drinking*, for which Congress called in 2004. ICCPUD received input from experts and organizations representing a wide range of parties, including public health advocacy groups, the alcohol

industry, ICCPUD member agencies, and the U.S. Congress. The latest research available at the time was analyzed and incorporated into the plan, which HHS reported to Congress in January 2006. It included three goals, a series of federal action steps, and three measurable performance targets for evaluating national progress in preventing and reducing underage drinking.

## The STOP Act

In December 2006, Congress passed the Sober Truth on Preventing (STOP) Underage Drinking Act, Public Law 109-422, popularly known as the STOP Act. The Act states, “A multi-faceted effort is needed to more successfully address the problem of underage drinking in the United States. A coordinated approach to prevention, intervention, treatment, enforcement, and research is key to making progress. This Act recognizes the need for a focused national effort, and addresses particulars of the federal portion of that effort, as well as federal support for state activities.” The STOP Act requires the HHS Secretary, in collaboration with other federal officials enumerated in the Act, to “formally establish and enhance the efforts of the interagency coordinating committee (ICCPUD) that began operating in 2004.”

## The Surgeon General’s 2007 Call to Action

In fall 2005, ICCPUD sponsored a national meeting of the states to prevent and reduce underage alcohol use. At the meeting, the Surgeon General announced his intent to issue a Call to Action on the prevention and reduction of underage drinking. Subsequently, OSG worked closely with SAMHSA and NIAAA to develop the report. ICCPUD agencies collaborated to provide information and data for the *Surgeon General’s Call to Action to Prevent and Reduce Underage Drinking* (henceforth termed *SG’s Call to Action*). The 2006 Federal Comprehensive Plan set forth three general goals:

1. Strengthening a national commitment to address underage drinking
2. Reducing demand for, availability of, and access to alcohol by people younger than 21 years
3. Using research, evaluation, and scientific surveillance to improve the effectiveness of policies and programs designed to prevent and reduce underage drinking

In 2007, the *SG’s Call to Action* was issued (OSG, 2007). By issuing the *SG’s Call to Action*, the Surgeon General sought to raise public awareness and foster changes in American society—goals similar to those described to Congress in the Comprehensive Plan. The *SG’s Call to Action* built on the Comprehensive Plan. Based on the latest and most authoritative research, particularly on underage drinking as a developmental issue, the *SG’s Call to Action* outlined a comprehensive national effort to prevent and reduce underage alcohol consumption. The goals listed in the *SG’s Call to Action* are:

1. Foster changes in American society that facilitate healthy adolescent development and help prevent and reduce underage drinking.
2. Engage parents and other caregivers, schools, communities, all levels of government, all social systems that interface with youth, and youth themselves in a coordinated national effort to prevent and reduce underage drinking and its consequences.
3. Promote an understanding of underage alcohol consumption in the context of human development and maturation that takes into account individual adolescent characteristics as well as ethnic, cultural, and gender differences.
4. Conduct additional research on adolescent alcohol use and its relationship to development.

5. Work to improve public health surveillance on underage drinking and on population-based risk factors for this behavior.
6. Work to ensure that laws and policies at all levels are consistent with the national goal of preventing and reducing underage alcohol consumption.

The strategies for implementing these goals for parents and other caregivers, communities, schools, colleges and universities, businesses, the healthcare system, juvenile justice and law enforcement, and the alcohol and entertainment industries are included in the full *SG's Call to Action*, at <http://www.surgeongeneral.gov/topics/underagedrinking/calltoaction.pdf>.

ICCPUD agencies implemented a variety of federal programs to support the *SG's Call to Action's* goals. For example, SAMHSA and NIAAA worked with OSG to support rollouts of the *SG's Call to Action* in 13 states; SAMHSA collaborated with ICCPUD to support more than 7,000 town hall meetings, using the *SG's Call to Action's Guide to Action for Communities* (OSG, 2007) as a primary resource; and SAMHSA asked community coalitions funded under the STOP Act to implement strategies contained in the *SG's Call to Action*. These and other programs are described in more detail in Chapter 3.

## The Surgeon General's 2016 Report

In 2016, the Surgeon General released *Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs, and Health*, addressing the use and misuse of substances, including alcohol (HHS, 2016). The report is broad, covering substance use by all age groups, public health consequences, prevention, and treatment.

The report describes the extent of the substance use problem in the United States; the neurobiology of substance use, misuse, and addiction; prevention programs and policies; early intervention, treatment, and management of substance use disorders; the many services and systems that support the recovery process; the integration of healthcare systems and substance use services; and a vision for the future, including a public health approach, and concrete recommendations for reducing substance misuse and related harms.

The report provides a list of risk and protective factors for substance initiation and misuse by adolescents and young adults that operate at the individual, family, school, and community levels. The report also describes evidence-based prevention programs and policies in three different categories:

- Universal (aimed at all members of a given population, such as all children of a certain age)
- Selective (aimed at a subgroup determined to be at higher risk, such as youth involved with the justice system)
- Indicated (aimed at individuals who are already using substances but have not developed a substance use disorder)

Prevention programs and policies that have been proven effective with various groups of underage people, including the 0–10 age group, 10–18 age group, young adults, and college students, are highlighted in the report. Programs aimed at individuals and families include:

- Nurse–Family Partnership
- Raising Healthy Children/SSDP
- Good Behavior Game

- LifeSkills Training
- Keepin' it REAL
- Strengthening Families Program 10-14
- Guiding Good Choices
- Positive Family Support/Family Check-Up
- BASICS

Environmental policies that have been shown to be effective in preventing or reducing underage drinking include:

- MLDA of 21
- Compliance checks of retailers to enforce the MLDA
- Zero tolerance laws that prohibit people under age 21 from driving with any detectable blood alcohol content
- Use/lose laws that take away the driver's licenses of people under age 21 caught driving after drinking
- Laws that hold social hosts criminally liable for hosting underage drinking parties
- Laws that allow social hosts to be sued for hosting underage drinking parties
- Proposals to reduce underage people's exposure to alcohol advertising, although the evidence on effectiveness is mixed

## **NIAAA's CollegeAIM**

As described in more detail in Chapter 2, the problem of college drinking has been particularly persistent; college drinking and bingeing rates have declined more slowly than for other groups of underage drinkers. For many years, NIAAA has invested substantial resources in supporting studies on individual and environmental interventions to address college drinking. As a result, knowledge about best practices continues to grow.

In 2015, NIAAA launched a major new resource, CollegeAIM (the College Alcohol Intervention Matrix) to help college officials address harmful and underage student drinking. The centerpiece of CollegeAIM is a comprehensive, easy-to-use, matrix-based tool that helps inform college staff about potential alcohol interventions and guides them to evidence-based interventions. Although college officials have numerous options for alcohol interventions, these are not all equally effective. CollegeAIM is designed to help schools make informed choices among available strategies, thereby increasing the schools' chances for success and helping to improve student health and safety.

CollegeAIM compares and rates nearly 60 types of interventions on effectiveness, anticipated costs and barriers to implementation, public health reach, and research amount and quality. The matrix interventions are classified as either environmental-level strategies or individual-level strategies (Exhibits 1.4 and 1.5). Environmental-level strategies target the campus community and student population as a whole. Individual-level strategies focus on individual students, including those in higher risk groups such as first-year students, student-athletes, and members of Greek organizations. See <http://www.stopalcoholabuse.gov> for more detail about the strategies; go to Report to Congress, Supplemental Information [CollegeAIM Alcohol Intervention Matrix].

## Exhibit 1.4: NIAAA College Alcohol Intervention Matrix, Individual-Level Strategies

**INDIVIDUAL-LEVEL STRATEGIES:**

Estimated Relative Effectiveness, Costs, and Barriers; Public Health Reach; Research Amount; and Primary Modality<sup>1</sup>



COSTS: Combined program and staff costs for adoption/implementation and maintenance				
		Lower costs \$	Mid-range costs \$\$	Higher costs \$\$\$
<b>EFFECTIVENESS: Success in achieving targeted outcomes</b>	<b>Higher effectiveness</b> ★★★	<b>IND-3</b> Normative re-education: Electronic/mailed personalized normative feedback (PNF)—Generic/other <sup>2</sup> [#], B, ●●●, online/offsite  <b>IND-10</b> Skills training, alcohol focus: Self-monitoring/self-assessment <i>alone</i> <sup>3</sup> [#], F, ●●, online/offsite  <b>IND-21</b> Personalized feedback intervention (PFI): eCHECK UP TO GO (formerly, e-CHUG) <sup>2</sup> [#], B, ●●●, online	<b>IND-9</b> Skills training, alcohol focus: Goal/intention-setting <i>alone</i> <sup>3</sup> [#], F, ●●, IPI  <b>IND-12</b> Skills training, alcohol plus general life skills: Alcohol Skills Training Program (ASTP) <sup>2</sup> [#], F, ●●●, IPG  <b>IND-16</b> Brief motivational intervention (BIM): In-person—individual (e.g., BASICS) [#], F, ●●●●, IPI  <b>IND-22</b> Personalized feedback intervention (PFI): Generic/other <sup>2</sup> [#], B, ●●●●, online	<b>IND-17</b> Multi-component education-focused program (MCEFF): AlcoholEdu <sup>®</sup> for College <sup>2</sup> [#], B, ●●, online  <b>Interventions Delivered by Health Care Professionals</b>  Strategies in which health care professionals identify and help students whose drinking patterns put them at risk for harm, or who are already experiencing alcohol-related problems:  <b>IND-23</b> Screening and behavioral treatments <b>IND-24</b> Medications for alcohol use disorder  These approaches can reduce harmful drinking, according to studies conducted mainly in general adult populations (ages 18–65).  <i>The differences in research populations, along with wide variations in costs and barriers across campuses, precluded ratings relative to other strategies. See page 18 for more information.</i>
	<b>Moderate effectiveness</b> ★★		<b>IND-8</b> Skills training, alcohol focus: Expectancy challenge interventions (ECI)—Experiential [#], F, ●●●, IPG  <b>IND-13</b> Skills training, alcohol plus general life skills—Parent-based alcohol communication training [#], F, ●●, offsite  <b>IND-14</b> Skills training, alcohol plus general life skills or general life skills only: Generic/other <sup>2</sup> [#], F, ●●●●, IPG  <b>IND-15</b> Brief motivational intervention (BIM): In-person—Group [#], F, ●●, IPG	
	<b>Lower effectiveness</b> ★	<b>IND-2</b> Normative re-education: Electronic/mailed personalized normative feedback (PNF) Event-specific prevention (21st birthday cards) [#], B, ●●, online/offsite	<b>IND-4</b> Normative re-education: In-person norms clarification <i>alone</i> <sup>3</sup> [#], F, ●●, IPG	
	<b>Not effective</b> X	<b>IND-7</b> Skills training, alcohol focus: Expectancy challenge intervention (ECI)—By proxy/didactic/discussion <i>alone</i> <sup>3</sup> [#], F, ●●, IPG	<b>IND-1</b> Information/knowledge/education <i>alone</i> <sup>3</sup> [#], B, ●●●●, IPG <b>IND-5</b> Values clarification <i>alone</i> <sup>3</sup> [#], F, ●●, IPG	
	<b>Too few studies to rate effectiveness</b> ?	<b>IND-11</b> Skills training, alcohol plus general life skills: Alcohol 101 Plus™ <sup>2</sup> [#], B, ●, online  <b>IND-19</b> Personalized feedback intervention (PFI): CheckYourDrinking (beta 1.0 version) <sup>2</sup> [#], B, ●, online  <b>IND-20</b> Personalized feedback intervention (PFI): College Drinker's Check-up <sup>2</sup> [#], B, ●, online	<b>IND-6</b> Skills training, alcohol focus: Blood alcohol concentration feedback <i>alone</i> <sup>3</sup> [#], F, ●, IPI  <b>IND-18</b> Multi-component education-focused programs (MCEFF): Miscellaneous <sup>2</sup> [#], B, ●, online	

See brief descriptions and additional ratings for each individual-level strategy on the summary table beginning on page 13.

<sup>1</sup> **Effectiveness** ratings are based on the percentage of studies reporting any positive outcomes (see legend). Strategies with three or fewer studies were not rated for effectiveness due to the limited data on which to base a conclusion. **Cost** ratings are based on the relative program and staff costs for adoption, implementation, and maintenance of a strategy. Actual costs will vary by institution, depending on size, existing programs, and other campus and community factors. **Barriers** to implementing a strategy include cost and opposition, among other factors. **Public health reach** refers to the number of students that a strategy affects. Strategies with a broad reach affect all students or a large group of students (e.g., all underage students); strategies with a focused reach affect individuals or small groups of students (e.g., sanctioned students). **Research amount** refers to the number of randomized controlled trials (RCT) of a strategy (see legend).

<sup>2</sup> Strategies are listed by **brand name** (e.g., CheckYourDrinking) if they were evaluated by at least two RCTs; strategies labeled **generic/other** have similar components and were not identified by name in the research or were evaluated by only one RCT; strategies labeled **miscellaneous** have the same approach but very different components.

<sup>3</sup> Although this approach is a component of larger, effective programs such as BASICS and ASTP, it is evaluated here as a stand-alone intervention.

## Emerging Issues in Underage Drinking and the Government Response

Although prevention efforts have had an effect, there is a need for ongoing monitoring of trends in the marketplace and emerging public health issues. Not only are new products introduced, but youth behavior and experimentation regarding different ways to consume alcohol may change over time. Two products that have generated governmental response at the federal and/or state levels are caffeinated alcoholic beverages and powdered alcohol.

### Federal and State Actions to Address Caffeinated Alcoholic Beverages

The combination of alcohol with caffeine may pose a public health issue for young people with the increase in availability of energy drinks (which often contain large quantities of caffeine). Due to federal and state actions, premixed caffeinated alcoholic beverages (CABs) are no longer on the market, but young people may still mix these substances on their own.

Research suggests that mixing alcohol and caffeine poses public health and safety risks, because the caffeine can mask the depressant effects of alcohol without changing the alcohol's intoxicating properties (<http://www.cdc.gov/alcohol/fact-sheets/cab.htm>). This could lead





- The Alcohol and Tobacco Tax and Trade Bureau letters warned that adulterated caffeinated malt beverages were mislabeled under the Federal Alcohol Administration Act. The letters stated that further action, including seizure and injunction, was possible.<sup>8</sup>

In response, the four companies ceased using added caffeine in their products; by summer 2011, with few (if any) exceptions, malt-based CABs were no longer available in the United States. For more references and details on health and safety risks associated with caffeinated alcoholic beverages and successful efforts to remove them from the marketplace, see the *2012 Report to Congress on the Prevention and Reduction of Underage Drinking* (SAMHSA, 2012). In parallel with the federal actions against CABs, numerous states enacted statutory or administrative bans on such beverages.

Young people continue to mix alcohol and energy drinks on their own, despite the federal government's removal of CABs from the marketplace. An NIAAA-funded research study assessed the extent of this practice and its public health and safety effects on college students (Patrick & Maggs, 2014). A sample of 508 students reported alcohol and energy drink use on 4,203 days over four consecutive semesters, starting in their freshman year. Of the sample, 30.5 percent reported combined use at least once, and respondents consumed energy drinks on 9.6 percent of the days when they reported drinking alcohol. Heavier drinking, longer times drinking, and increased negative effects occurred when alcohol was combined with energy drinks, compared with drinking occasions without energy drinks. The research suggests that continued attention to this issue is needed among policymakers and educators.

## Federal and State Actions Regarding Powdered Alcohol

On March 10, 2015, the U.S. Alcohol and Tobacco Tax and Trade Bureau (TTB), which approves alcohol labeling, issued label approvals for Palcohol, a powdered alcoholic product. A container of Palcohol contains 1 ounce of powder, which when mixed as directed with 200 milliliters of water, results in a beverage with 10 percent alcohol by volume. The company—Lipsmark, LLC—has approval to market five versions: vodka, rum, cosmopolitan, lemon drop, and powderita (margarita flavor). Public health professionals and state government officials raised concerns that because powdered alcohol is easy to conceal and transport, it would appeal to underage drinkers (Naimi & Mosher, 2015). They also argued that the product raises safety issues—drinks made from powdered alcohol could intentionally or unintentionally be made much stronger than standard drinks and could be consumed in other ways that may prove harmful (see Firger, 2014). Two recent studies suggest that underage drinkers would consume powdered alcohol if they had access to it (Stogner, Baldwin, Brown, & Chick, 2015; Vail-Smith, Chaney, Martin, & Chaney, 2016). Given this evidence, the American Medical Association (AMA) adopted a policy on June 14, 2016, calling for a ban on powdered alcohol in the United States (AMA News Release, 2016).<sup>9</sup>

The states have authority to determine which alcohol products may be sold within their borders. The sale of powdered alcohol has been illegal in Alaska since 1995. As of February 2017, 32 other states have enacted a permanent or temporary ban on the sale of powdered alcohol.

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<sup>8</sup> See <http://www.fda.gov/ForConsumers/ConsumerUpdates/ucm233987.htm#2>. The FDA investigation and warning letters involved companies that produced malt-based alcoholic beverages and did not include wine- and spirits-based products. The investigation did not address products that contain naturally brewed caffeine (e.g., coffee-based drinks).

<sup>9</sup> <https://www.ama-assn.org/new-ama-policy-calls-ban-powdered-alcohol>

Alabama, California, Connecticut, Georgia, Hawaii, Idaho, Illinois, Indiana, Kansas, Kentucky, Louisiana, Maine, Massachusetts, Michigan, Nebraska, Nevada, New Jersey, New York, North Carolina, North Dakota, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Utah, Vermont, Virginia, Washington, and West Virginia statutorily prohibit the sale of powdered alcohol. Maryland enacted a temporary 2-year statutory ban on powdered alcohol that expires on June 30, 2018. Three states—Colorado, Delaware, and New Mexico—have expanded the statutory definition of alcohol so that powdered alcohol can be regulated under their existing alcohol statutes. Prior to legislatively banning powdered alcohol, two control states—Massachusetts and Pennsylvania—stated they would not sell powdered alcohol in their state stores. Visit <http://www.stopalcoholabuse.gov> for complete legal citations; go to Report to Congress, Supplemental Information [State Report and Legal Citations].

As of February 2017, the Palcohol owner, Lipsmark, LLC, stated on its website that it is auctioning off its “secret manufacturing process” to a representative in each country rather than manufacture and distribute the powdered alcohol product itself. Currently, Palcohol is not available for purchase in the United States.