



Underage Drinking

A Review of Trends and Prevention Strategies

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Underage drinking and its associated problems have profound negative consequences for underage drinkers themselves, their families, their communities, and society as a whole, and contribute to a wide range of costly health and social problems. There is increased risk of negative consequences with heavy episodic or binge drinking. Alcohol is a factor related to approximately 4,300 deaths among underage youths in the U.S. every year. Since the mid-1980s, the nation has launched aggressive underage drinking prevention efforts at the federal, state, and local levels, and national epidemiologic data suggest that these efforts are having positive effects. For example, since 1982, alcohol-related traffic deaths among youth aged 16–20 years have declined by 79%. Evidence-based or promising strategies for reducing underage drinking include those that limit the physical, social, and economic availability of alcohol to youth, make it illegal for drivers aged <21 years to drive after drinking, and provide mechanisms for early identification of problem drinkers. Strategies may be implemented through a comprehensive prevention approach including policies and their enforcement, public awareness and education, action by community coalitions, and early brief alcohol intervention and referral programs. This paper focuses on underage drinking laws and their enforcement because these constitute perhaps the most fundamental component of efforts to limit youth access to and use of alcohol.

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Introduction

Underage drinking and its associated problems have profound negative consequences for underage drinkers themselves, their families, their communities, and society as a whole. This paper discusses the epidemiology of underage drinking in the U.S., describes the federal effort to reduce underage drinking, and discusses evidence-based prevention practices that have contributed to reductions in underage drinking and its consequences. The paper focuses on

underage drinking laws and their enforcement because these constitute perhaps the most fundamental component of efforts to limit youth access to and use of alcohol.

Underage Drinking in America: Progress and Challenges

Alcohol continues to be the most widely used substance of abuse among America's youth and young adults, and a higher proportion use alcohol than tobacco or other drugs. For example, according to the 2013 Monitoring the Future (MTF) study, 25.7% of tenth-graders reported using alcohol in the past 30 days, 18.0% reported marijuana use, and 9.1% reported cigarette use in the same period.¹

Underage drinking contributes to a wide range of costly health and social problems, including motor vehicle crashes (the greatest single mortality risk for youth and young adults aged 12–20 years); suicide; interpersonal violence (e.g., homicides, assaults, rapes); unintentional injuries such as burns, falls, and drowning; brain impairment; risky sexual activity; academic problems; and alcohol and drug poisoning. On average, alcohol is a factor in the deaths of approximately 4,300 youths in the U.S. per year, shortening their lives by an

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average of 60 years.² Alcohol consumption involves youth in the criminal justice system, both through arrests for violating laws against underage possession and through the illegal and harmful consequences of their actions while intoxicated.³

Binge drinking is the most common underage consumption pattern, and is defined by the Substance Abuse and Mental Health Services Administration as consuming five or more drinks on one occasion on at least 1 day in the past 30 days. Binge rates increase rapidly with age. As age increases, the proportion of youth who binge drink goes from about one in three (of those who have used alcohol in the last month) at age 13 years, to half at age 15 years, to two of three by age ≥ 18 years.⁴ In 2013, approximately 5.4 million youth and young adults aged 12–20 years (14.2%) reported binge drinking in the past month.⁵ Although youth and young adults generally consume alcohol less frequently than adults and consume less alcohol overall than adults, when they do drink they are much more likely to binge drink.⁶

The prevalence of alcohol abuse or dependence among young people is quite high. According to National Survey on Drug Use and Health combined 2013–2014 data, about one in ten (10.4%) of those aged 18–20 years, 4.7% of those aged 15–17 years, and 0.7% of those aged 12–14 years met criteria for alcohol dependence or abuse as defined by the DSM-IV.⁶

Significant Progress Has Been Made

By 1988, the legal drinking age was raised to 21 years in all states in response to increases in alcohol-related traffic deaths that occurred among people aged < 21 years after the lowering of drinking ages in some states prior to 1984.^{7,8} Declines in past-month underage drinking and binge drinking began when states raised the drinking age to 21 years. Data for the last decade indicate there have been further meaningful reductions in underage

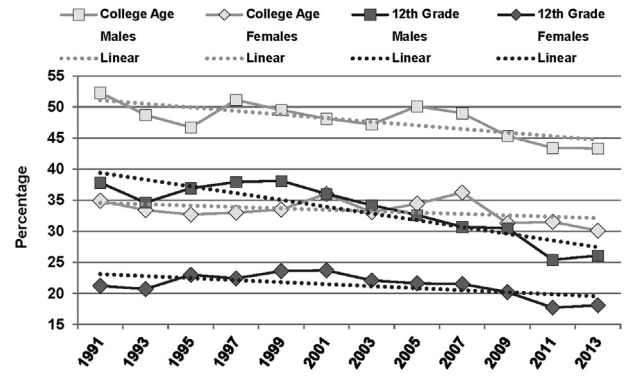


Figure 2. Rates of binge drinking in the past 2 weeks among male and female twelfth-graders and college students, 1991–2013.¹

drinking, particularly among younger age groups. From 2004 to 2013, youth aged 12–20 years showed statistically significant declines in both past-month alcohol use and binge alcohol use.⁵

Since 1991, rates of binge drinking have been steadily declining for male and female students in college and 12th, tenth, and eighth grade (Figures 1 and 2).^{1,9,10} Across all grade groups, male binge drinking rates have been decreasing faster than female rates. This is most easily seen in the trend data (straight dashed lines) in Figures 1 and 2. In 1975, when only a minority of states had a legal drinking age of 21 years, there was a 23–percentage point spread between the rates; in 2013, it was 8.0 points.¹¹

Risky behaviors associated with underage drinking and driving also declined in the past decade. O’Malley and Johnston¹¹ report longitudinal data for high school seniors (previous 2 weeks) on driving after drinking any alcohol and after five or more drinks, and being a passenger when the driver has had any alcohol and has had five or more drinks. As shown in Figure 3, all four of these behaviors decreased between 2001 and 2013.¹¹ According to the U.S. Department of Transportation,

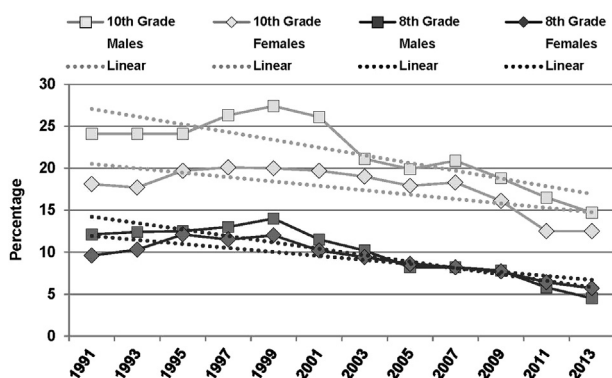


Figure 1. Rates of binge drinking in the past 2 weeks among male and female eighth- and tenth-graders.¹

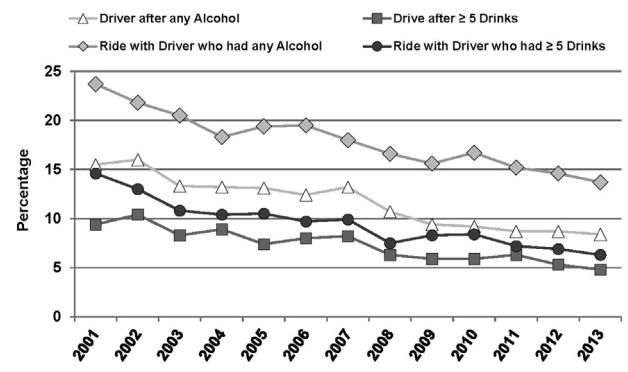


Figure 3. Trends in percentage of twelfth-graders reporting driving after alcohol use or riding after alcohol use by the driver.¹¹

the greatest declines in alcohol-related traffic deaths since the early 1980s have been among those aged 16–20 years, and declines in that age group have exceeded reductions in non-alcohol-related traffic deaths.¹² Analyses by the National Highway Traffic Safety Administration indicate that minimum drinking age laws have prevented more than 30,000 alcohol-related traffic deaths since 1975.^{13,14}

Challenges Remain

Despite these encouraging data, challenges in addressing underage drinking remain. Rates of underage drinking and associated consequences are unacceptably high. Although risky behavior related to drinking and driving has decreased among underage individuals, rates remain at a dangerous level. In 2013, of the 1,691 drivers aged 15–20 years who were killed in motor vehicle traffic crashes, 492 (29%) had a blood alcohol concentration (BAC) of ≥ 0.01 .¹⁵ Each 0.02 increase in BAC increases fatal crash risk for younger drinking drivers more than that for those aged ≥ 21 years. Increased fatal crash risk begins at 0.02% BAC.¹⁶ Nearly half the people who die in crashes involving a drinking driver aged < 21 years are persons other than the drinking driver.¹⁷

Special attention is warranted for those aged 18–20 years, as this group exhibits higher rates of alcohol-related risky behaviors and slower progress in reducing these behaviors than other age groups. As discussed previously, the rates of binge drinking and alcohol abuse or dependence increase as underage drinkers get older.

Overall rates of college student drinking and binge drinking exceed those of same-age peers who do not attend college.¹⁸ Binge drinking rates among college students have shown only modest decline since 1993.¹⁸ Underage college students drink about 48% of the alcohol consumed by students at 4-year colleges.¹⁹

Consequences of underage drinking in college are widespread and serious.²⁰ One study²¹ estimated that in a single year, more than 696,000 college students aged 18–24 years were assaulted by another student who had been drinking and another 599,000 were injured because of drinking. Further, 474,000 students had unprotected sex as a result of drinking and 97,000 were the victims of alcohol-related sexual assaults.²¹ About 25% of college students report negative academic consequences as a result of their drinking, including missing class, falling behind, doing poorly on exams or papers, and receiving lower grades overall.²² Taken together, these findings suggest that college environments have a negative influence on drinking practices and related consequences.^{23–25}

A Department of Defense survey of military personnel in 2011 found that although nearly half (48.2%) of those

aged 18–20 years abstained from alcohol consumption; more than one fourth (26.6%) were infrequent or light drinkers; and 14.5% were moderate or heavy drinkers.²⁶ Though 18–20-year-olds in the military were less likely than their civilian counterparts to engage in binge drinking (21.5% vs 33.6%), they were twice as likely (5.9% vs 2.5%) to be heavy alcohol users (14 or more drinks per week for men and seven or more drinks per week for women).²⁶

Increased alcohol outlet density (i.e., more alcohol outlets in a designated area) often occurs near college campuses and military bases. This exposes vulnerable populations to increased alcohol availability and is linked to excessive alcohol consumption and related harms. Research^{27–30} has shown an association between retail outlet density near college and university campuses and military bases, and heavy and frequent drinking among college students and military personnel, including those who were underage. In addition, studies^{31,32} have identified associations between outlet density in college communities with campus rape offense rates and public disturbances related to alcohol.

The National Response to Underage Drinking

Federal efforts to respond to this public health crisis have been growing since 1984, when the National Minimum Age Drinking Act was enacted.^{7,8,33} The efforts have intensified since the early 2000s, as the federal government initiated a multipronged national effort to prevent underage drinking that involved federal, state, and local governments as well as community coalitions and organizations and concerned individuals.³

With the release of the report *Reducing Underage Drinking: A Collective Responsibility*³⁴ in 2003, the National Research Council and Institute of Medicine called for a cooperative effort to curb underage drinking that involved all levels of government, the alcohol industry and retailers, and community organizations and parents. *The Surgeon General's Call to Action to Prevent and Reduce Underage Drinking*,¹⁷ released in 2007, also called upon governments, the private sector, and individuals to coordinate efforts to reduce underage drinking. In 2004, Congress mandated the formation of the Interagency Coordinating Committee for the Prevention of Underage Drinking (ICCPUD), composed of representatives from 15 federal agencies. The ICCPUD has played a leadership role on the issue of underage drinking by initiating biennial town hall meetings to prevent underage drinking in cooperation with community-based organizations around the country. Meetings support community and state efforts to

promote, implement, and sustain science-based prevention approaches shown to reduce underage drinking. Between 2006 and 2014, more than 8,000 community town hall meetings were held.³⁵

In 2006, the Sober Truth on Preventing (STOP) Underage Drinking Act, Public Law 109-422, was enacted, which directs that the ICCPUD “shall guide policy and program development across the Federal Government with respect to underage drinking” and provide resources to state and local governments as well as citizen groups. To this end, the STOP Act, administered by the Substance Abuse and Mental Health Services Administration’s Center for Substance Abuse Prevention, provides funding for annual grants to community coalitions that work to prevent and reduce underage drinking. In 2012, a total of 81 new grants were funded for the upcoming 4 years. States were encouraged to form committees like ICCPUD and to develop strategic plans to prevent and reduce underage drinking. Thirty-eight states have formed such committees and developed strategic plans.³ Through the town hall meetings and coordination among its member agencies, the national ICCPUD aims to ensure that the efforts of the state-level interagency committees and community coalitions receiving STOP Act grants are complementary and synergistic.

The STOP Act also requires the ICCPUD to submit an annual report to Congress on federal underage drinking prevention programs and policies along with data on the prevalence and patterns of underage drinking from federal research surveys and other sources, and an annual report on state underage drinking prevention and enforcement activities. These two reports are produced jointly as the *Report to Congress on the Prevention and Reduction of Underage Drinking*. Data reported in this article derive from the work of the ICCPUD agencies and their state partners in coordinated prevention efforts, and from data collection and analyses conducted by these agencies for the annual *Report to Congress*.³

A Comprehensive Approach to Underage Drinking

Identifying Effective Underage Drinking Prevention Policies

The identification of effective prevention strategies is a key aspect of the national initiative to prevent underage drinking. For the past 3 decades, the federal government (with the National Institute on Alcohol Abuse and Alcoholism [NIAAA] as lead agency) has sponsored a variety of research studies to evaluate a number of prevention strategies—as single interventions and in combination. Results have produced an impressive

knowledge base to guide prevention efforts at the federal, state, and local levels.

Conceptual Framework Issues

Over the past 30 years, scientists working on the prevention of adolescent alcohol use and related problems have broadened their focus from proximal variables, largely at the level of schools, families, and individuals, to comprehensive programs addressing both proximal variables and more-distal variables, including state and community policies and their enforcement, norms, price and taxation, and drinking environments. This broader focus has led researchers to describe the etiology of and effective responses to adolescent drinking as systems composed of individual characteristics and environments interacting over time. These conceptualizations have led to a greater recognition of the role of limiting the availability of alcohol and increasing the safety of drinking contexts—the “social ecology of drinking”—on the one hand and the importance of a continuing emphasis on individual, family, and community risk factors on the other.^{36–39} The latter suggests an emphasis on education and skills training whereas the former leads to an emphasis on changes in the policy and social environments of drinking that affect the availability of alcohol and limit the consequences of drinking (e.g., violence, traffic crashes). Balancing these two approaches is one conceptual underpinning of the federal prevention approach. To date, the risk factors approach has had greater visibility, both nationally and internationally, than the social-ecologic approach, although it is clear from the federally sponsored research discussed below that the research foundation for the social-ecologic perspective is also strong.⁴⁰

Federally Sponsored Research

Four distinct federally sponsored or funded sources have synthesized the federally sponsored research on and developed recommendations regarding specific, evidence-based prevention research strategies:

- Community Preventive Services Task Force (*Guide to Community Preventive Services: Preventing Excessive Alcohol Consumption*, www.thecommunityguide.org/alcohol/index.html).⁴¹
- The Surgeon General (*The Surgeon General’s Call to Action to Prevent and Reduce Underage Drinking*, 2007)¹⁷
- Institute of Medicine (*Reducing Underage Drinking: A Collective Responsibility*, 2004)³⁴
- NIAAA (*Planning Alcohol Interventions Using NIAAA’s CollegeAIM Alcohol Intervention Matrix*, 2015)⁴²

Policies reviewed and recommended in these reports fall into four general categories and have varying levels of

research support. Evidence-based prevention strategies identified in at least two of the reports include the following.

Retail Availability

- **Enforcement of underage furnishing laws using regular routine compliance checks** (laws, regulations, or policies under which an underage operative working with law enforcement attempts to purchase alcohol to determine merchant compliance with underage furnishing laws)⁴³
- **Dram shop liability** (laws that impose civil liability upon commercial alcohol providers for harms caused by their intoxicated or underage drinking patrons)^{44,45}
- **Mandatory/discretionary server–seller training** (laws establishing requirements or incentives for retail alcohol outlets to participate in server training programs, i.e., Responsible Beverage Service)^{46–48}
- **False identification** (laws that ban underage use or supply of false ID to obtain alcohol, or that assist retailers in avoiding sales to buyers who present false ID)^{49–51}
- **Keg registration** (laws requiring recording of purchaser information when selling beer kegs to discourage beer service to underage individuals)^{52,53}

Social Availability

- **Hosting of underage drinking parties** (laws that impose criminal or other liability against individuals who allow underage drinking events on property they own, lease, or otherwise control)^{34,54}
- **Social host liability** (laws that impose civil liability on noncommercial alcohol providers for harms caused by their intoxicated or underage drinking guests)^{45,55}

Pricing

- **Increasing alcohol tax rates** (laws specifying the three major types of taxes levied on beer—“specific excise taxes” (taxes levied on the quantity of a beverage) and “ad valorem excise taxes” and “sales taxes” (taxes levied on the price of a beverage)^{56–64}
- **Restrictions on drink specials** (laws that restrict on-premises retailers from using price- or volume-related marketing tactics such as happy hours, two-for-one specials, and free drinks)^{24,65,66}

Drinking and Driving

- **Graduated drivers’ licenses** (laws designed to delay full licensure for teenage automobile drivers through a minimum supervised learners’ period or an

intermediate license period that limits driving in high-risk situations)⁶⁷

- **Youth BAC limits** (laws establishing blood alcohol concentration limits for underage drivers)^{8,68–70}

A just-published research study provides additional support for many of these policies. Fell et al.⁷¹ examined the ratio of drinking to non-drinking drivers in the U.S. in all states from 1982 to 2012 using the Fatality Analysis Reporting System. Structural equation modeling compared drivers aged ≤ 20 years versus those aged ≥ 26 years. Nine laws targeting underage drinkers significantly reduced alcohol-related traffic deaths: prohibiting possession of alcohol (–7.7%), prohibiting purchase of alcohol (–4.2%), zero tolerance laws that make it illegal to drive with measurable blood alcohol levels (–2.9%), requirements for bartenders to be aged ≥ 21 years (–4.1%), responsible beverage service laws (–3.8%), dram shop liability laws (–2.5%), and social host liability laws (–1.7%). Collectively, these nine types of laws prevent 1,135 alcohol-related traffic deaths per year and 210 more lives would be saved annually if all states passed these laws.⁷¹

In light of the evident efficacy of these and other policies, the STOP Act directed the ICCPUD to assess the extent to which policies are being implemented across the country. Detailed descriptions and information on state adoption of these policies are in Chapter 4.3 of the annual *Report to Congress*.³

Comprehensive Prevention Programming: A Multilevel Approach

Identifying specific, evidence-based, individual underage drinking prevention policies is only one aspect of the federal government’s ambitious research agenda. There now exists a body of evidence suggesting that effective prevention initiatives require a coordinated effort among a wide array of federal, state, and local organizations and agencies in multiple sectors including policymakers, law enforcement, educational institutions, the healthcare community, the mass media, and concerned citizens.^{72–80} This multilevel approach must also be multifaceted, employing strategies such as education, enforcement, media, and early intervention in combination to maximize impact on underage drinking.^{3,81–83} Over the past 2 decades, initiatives based on a comprehensive approach have been sponsored by federal agencies that are part of the ICCPUD as well as by state and local governments and community coalitions, and evidence supporting this approach has continued to accumulate. These comprehensive programs show that the existence of potentially effective prevention policies and laws is insufficient; action is needed to ensure their enforcement and build

community support and knowledge of the laws through media programs and other community organizing activities.

Research has also shown that comprehensive prevention initiatives are greatly enhanced when combined with early intervention and referral programs.^{79,84} Expanding evidence indicates that alcohol screening and brief counseling interventions are not only effective with adults but also with adolescents.⁸⁵ In one national survey of 15-year-olds, more than 80% were seen by a doctor in the past year and more than half were asked about their drinking. However, only 40% were advised by healthcare providers about risks linked to drinking, and fewer than one in five were advised to reduce or stop drinking.⁸⁶

Enforcement of Underage Drinking Laws

As noted, enforcement of underage drinking laws is a critical component of any comprehensive prevention effort. Studies that have tested enforcement interventions in relation to outcomes (e.g., incidents of drinking and driving and underage drinking parties) make clear that enforcement can result in greater compliance and better public health outcomes.⁸⁷

Enforcement agencies have a number of strategies at their disposal, including those targeted at individuals (minors in possession arrests, operations to arrest adults who buy alcohol for minors, and underage drinking party patrol operations) and those targeted at retailers (compliance checks, fines, and other sanctions).³⁴ Compliance checks are endorsed as a best practice for preventing underage drinking by the Community Preventive Services Task Force and in the Surgeon General's Call to Action and the IOM Report.^{17,34,41} One study (The Community Trials Project) found that a compliance check intervention resulted in an immediate 17% reduction in underage sales. However, if enforcement efforts are not maintained, results may decay. For example, in the previous study, when compliance checks were not conducted on a routine basis, the reduction of underage sales decayed completely for off-sale premises, and by half for on-sale premises over a 3-month period.⁸⁸

Some studies have included media campaigns to increase public awareness of enforcement efforts, the perception of risk of arrest, or the perception of risk of sanctions. These perceptions can play an important role in compliance. When community-based interventions to prevent underage drinking or other alcohol-related harms include a media campaign, this may increase public perception of the likelihood that the law will be enforced, and that violators will be sanctioned.^{73,77,88,89}

The Saving Lives Program was a comprehensive, multifaceted program undertaken in six Massachusetts communities to reduce alcohol-impaired driving and related problems.⁸⁹ In addition to enhanced enforcement and educational programs, media campaigns were implemented to increase public awareness of the issue. Among other results, these communities showed a 42% decline in alcohol-related fatal crashes relative to the rest of the state. Awareness of enforcement notably increased among teenagers. For example, the percentage of this group that believed the license of a person caught drinking and driving could be suspended before a trial increased from 61% to 76% in the test communities, compared with no change in the rest of the state.

The Community Trials Project also combined enhanced enforcement with local media coverage.⁸⁸ Highly visible enhanced enforcement, such as roadside checkpoints, also served to increase both actual enforcement and perceived risk of arrest, resulting in lower volumes of self-reported drinking and fewer night-time crashes.^{73,77}

A key determinant of enforcement effectiveness is the resources devoted to enforcement actions. A study⁹⁰ that examined the relationship among underage alcohol laws in 50 California cities, enforcement of these laws, and adolescent alcohol use, identified an inverse relationship between the funding of enforcement of underage drinking laws and frequency of past-year underage alcohol use. Similarly, a study⁹¹ of binge drinking among college students found a significant association between binge drinking rates and state ratings for resources devoted to enforcement.

Enforcement of underage drinking laws is often uneven, inconsistent, and sporadic, and outcomes generally diminish over time.^{33,87,92–97} Therefore, increased attention to enforcement is one important component of ensuring progress in addressing underage drinking and related problems in the future.

Conclusions

Data presented in this paper demonstrate that meaningful progress has been made in reducing underage drinking prevalence and related problems. Passage of the National Minimum Age Drinking Act was critical to initiating the process. As noted, other laws targeting people aged <21 years further enhanced the benefits. The process of educating the public about those laws and their enforcement has reinforced and strengthened the effects of these policies.

Factors contributing to this progress are varied and complex, but one clear factor has been increased attention to this issue at all levels of society. Federal initiatives,

together with efforts by the national media, state and local governments, and interested private organizations, have moved underage drinking to a prominent place on the national public health agenda, created a policy climate in which significant legislation has been passed by states and localities, raised awareness of the importance of systematic and consistent enforcement, and engaged communities in addressing underage drinking. These changes are mutually reinforcing and have provided a framework for a sustained national commitment to reducing underage drinking.

Nevertheless, underage drinking rates are still alarmingly high, particularly among youth aged 18–20 years, causing preventable and tragic health and safety consequences. Evidence indicates that wider dissemination and multifaceted implementation of the strategies discussed in this paper can result in further progress in reducing underage drinking and its health and social consequences.

To enhance this progress, future research should address such issues as the following:

- What are the most effective combinations of policies and other strategies in reducing underage drinking?
- What is the minimum level of enhanced enforcement required to produce greater compliance with underage drinking laws?
- How efficacious is focusing prevention strategies on particular age groups among youth?
- Do programs targeting both underage drinking and risky adult drinking have greater effects on underage drinking than just efforts to reduce underage drinking?
- By reducing underage drinking, will there be carryover benefits in adult life?
- How can reductions in underage drinking be sustained and increased in the most cost-effective way?

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