

MAGNITUDE AND PREVENTION OF COLLEGE DRINKING AND RELATED PROBLEMS

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In 2002, the National Institute on Alcohol Abuse and Alcoholism (NIAAA) issued a report entitled A Call to Action: Changing the Culture of Drinking at U.S. Colleges. Data on the magnitude of college drinking problems in 1998 to 1999 were reported. From 1999 to 2005, the proportion of college students aged 18–24 who drank five or more drinks on a single occasion in the past month increased from 41.7 percent to 45.2 percent. The proportion who drove under the influence of alcohol increased from 26.1 percent to 29.2 percent. Higher percentages of 21- to 24-year-olds engaged in those behaviors than 18- to 20-year-olds, and between 1999 and 2005 the percentage increased among 21- to 24-year-olds but not among those aged 18–20. From 1998 to 2005, unintentional alcohol-related injury deaths increased 3 percent (from 1,442 to 1,825) per 100,000 college students aged 18–24. Alcohol misuse by college students often harms other people through traffic crashes and sexual/other assaults. Research regarding ways to reduce college drinking problems has shown that individual-oriented interventions, particularly screening and brief motivational counseling interventions, social norms interventions, environmental policy changes such as the minimum legal drinking age of 21 and drinking-and-driving laws, and comprehensive college–community programs, can reduce college drinking and related morbidity and mortality. There is a growing need for colleges and surrounding communities to implement interventions shown through research to reduce alcohol misuse among college-aged people. KEY WORDS: Underage drinking; college student; undergraduate student; problematic alcohol and other drug (AOD) use; AOD use (AODU) patterns; heavy episodic drinking; binge drinking; AOD-related (AODR) consequences; AODR injury; interventions; policy

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NIAAA published a landmark report on college drinking in 2002, with a follow-up report in 2007 (NIAAA, Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism 2002; NIAAA 2007). This review updates these reports. It examines (1) trends from 1998 to 2005 in the magnitude of morbidity and mortality associated with college drinking among 18- to 24-year-old students (earlier reports examined data from 1998 through 2001) and (2) interventions established through scientific research to reduce alcohol misuse among college students.

Heavy Episodic Drinking and Driving Under the Influence of Alcohol

National surveys indicate that from 1999 to 2005 (Substance Abuse and Mental Health Services Administration 2000, 2002, 2006) the percentage of 18- to 24-year-old college students who drank five or more drinks on an occasion in the previous 30 days increased from 41.7 percent to 45.2 percent, a significant 8 percent proportional increase. Among 18- to 24-year-olds not in college, the percentage increased from 36.5 percent to 40.2 percent, a significant proportional 10 percent increase.

A greater percentage of 18- to 24-year-old college students compared with noncollege respondents drank five or more drinks on an occasion. However, because only one-third of 18- to 24-year-olds are in college, the number not in college who consumed five or more drinks on an occasion in 2005 exceeded the number of college students who did so (7,884,398 vs. 4,351,887). From 1999 to 2005, among 18- to 24-year-olds, the proportion of college students who drove under the influence of alcohol increased significantly from 26.1 percent to 29.2 percent. Among those in the same age-group who are not in college, the proportion also increased significantly from 19.8 percent to 22.8 percent.

Of note, the increases from 1999 to 2005 in binge drinking and driving under the influence of alcohol occurred among respondents aged 21–24, not those ages 18–20. In each year examined, a greater percentage of 21- to 24-year-olds than 18- to 20-year-olds engaged in these behaviors. Among both 21- to 24-year olds and 18- to 20-year olds, college students were more likely than same-age respondents not enrolled in college to report these behaviors (Hingson and Zha 2009).

Total Alcohol-Related Unintentional Injury Deaths

Among 18- to 24-year-old college students, deaths from all alcohol-related unintentional injuries, including traffic and other unintentional injuries, increased from 1,442 in 1998 to 1,825 in 2005, corresponding to increases in rates of death from 18.5 to 19.0, a 3 percent increase per 100,000 college students that approached, but did not reach, statistical significance (relative risk 1.03 [95 percent CI 0.96–1.1]) (Hingson and Zha 2009). Among all 18- to 24-year-olds, alcohol-related unintentional injury deaths increased from 4,809 in 1998 to 5,534 in 2005. Most of the injury deaths resulted from traffic crashes involving alcohol (1,357 among college students ages 18–24 and 4,114 among all individuals in that age-group) in 2005.

NIAAA reports have documented that heavy-drinking college students not only place their own health at risk, they jeopardize the well-being of others. As many as 46 percent of the 4,553 people killed in 2005 in crashes

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involving 18- to 24-year-old drinking drivers were people other than the drinking driver. Further, a national survey in 2001 indicated that over 690,000 college students that year Nationwide were hit or assaulted by a drinking college student, and 97,000 students were the victim of a date rape or assault perpetrated by a drinking college student (Hingson and Zha 2009).

INTERVENTIONS TO REDUCE COLLEGE DRINKING

The increase in the past 7 years in alcohol-related traffic and other unintentional injury deaths among 18- to 24-year-olds, both in college and not in college, underscores the need for colleges and their surrounding communities to expand and strengthen interventions demonstrated to reduce excessive drinking among college students and those in the same age-group who do not attend college. Numerous individually oriented counseling approaches, environmental interventions, and comprehensive community interventions can reduce drinking and related problems among college students and the college-aged population.

Individual-Level Interventions

Carey et al. (2007) conducted a meta-analysis of 62 randomized controlled studies of individual-level interventions to reduce college student drinking between 1985 and 2007 with 13,750 participants and 98 intervention conditions. At short-term followup (4–13 weeks postintervention), intervention participants reduced their quantity and frequency of heavy drinking and alcohol-related problems. At intermediate followup (14–26 weeks postintervention), participants reduced the quantity of alcohol consumed and frequency of heavy drinking. At long-term followup (27–195 weeks postintervention), frequency of drinking days and alcohol-related problems were reduced. The authors concluded that their findings demonstrate that individually oriented alcohol risk reduction interventions of various forms can reduce quantity and frequency of drinking as well as alcohol-related problems reported by college drinkers.

Intervention characteristics influenced problem outcomes. Interventions delivered to individuals rather than groups and interventions that used motivational interviewing provided feedback on expectancies or motives, normative comparison, and included decisional balance exercises (e.g., exercises that engage subjects in exploring the pros and cons of particular decisions) were more successful at reducing alcohol-related problems than a range of comparison conditions. In contrast, interventions that used skills training or expectancy challenge components were less successful at reducing alcohol-related problems. They also reported that the magnitude of the effect on drinking diminished over time. In contrast, reduction in alcohol-related problems took longer to emerge but continued in long-term follow-up.

Larimer and Cronce (2002, 2007) also reviewed individually oriented interventions in studies published between 1984 and 2006. They found no support for the effectiveness of approaches that only provide information about the health risks linked to alcohol misuse. However, brief motivational interventions (BMIs) received strong support in the initial review by Larimer and Cronce (2002). This approach was found to be effective in reducing drinking problems in all eight studies that examined that approach in their initial review. In a follow-up review (Larimer and Cronce 2007), 14 studies examined this approach. Of those, 10 reported significant reductions on outcome measures, prompting the conclusion that research continues to strongly support BMIs with personalized feedback delivered individually in groups or as stand-alone feedback with no in-person contact.

Of note, seven studies of mandated populations were reviewed. These were conducted since the first NIAAA report (NIAAA, Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism 2002). Mandated populations consist of students instructed to undergo BMIs because they violated alcohol policies. Five of seven studies found that brief motivational feedback interventions were associated with reduced alcohol use or negative consequences (Larimer and Cronce 2007). Research conducted in the 2 years since publication of this Larimer and Cronce review supports the effectiveness of BMIs for reducing alcohol consumption as well as the use of other drugs (LaBrie et al. 2008; Welch et al. 2008), including computer-based interventions (BMI) (Elliott et al. 2008; Butler and Correia 2009; Neighbors et al. 2009).

Schaus et al. (2009), in an experimental study of college students attending a student health service clinic, found that students screened for heavy episodic drinking who received a two-session brief motivational counseling intervention had significant reductions in typical blood alcohol concentration (BAC), peak BAC, and several other drinking outcome measures at 3 and 6 months followup. This is important because most college students at that university went to the student health service at least annually. Fleming et al. (2010) recently replicated these findings at five different university health services. These latter two studies are important because routine screening in that setting could have population-wide effects.

Normative Re-education Interventions

Research suggests that college students often overestimate the amount of alcohol consumed by fellow students. Misperceptions of normative drinking behavior lead some students to consume more alcohol in an effort to reflect what they perceive to be normal group behavior. A growing body of literature has explored whether informing students of the true norms for alcohol consumption on their campus leads some students to curtail their drinking. This general approach is known as normative re-education or social norms marketing.

A Cochrane review (Moreira et al. 2009) identified 22 randomized trials with 7,275 participants assessing the impact of social norms interventions on college students. It studied the effects of Web/computer feedback, individual face-to-face feedback, group face-to-face feedback, mailed feedback, and social marketing campaigns. The Web/computer feedback programs achieved significant reductions up to 16 months after the interventions in alcohol problems, peak BACs, frequency of drinking, quantity of drinking, and binge drinking. Individual face-to-face feedback produced declines in frequency of drinking at the 6-month followup and alcohol-related problems at 4–6 month and 17-month followups. Group face-to-face effects on quantity of drinking and binge drinking lasted only 3 months, and mailed feedback produced no effects. Results from two social marketing studies were inconsistent (DeJong et al. 2006, 2009). Of note, in Larimer and Cronce's recent review (2007), four of eight studies examining individual normative feedback found reductions in drinking.

Parent Initiatives

Ichijima et al. (2009) used an experimental design to test the effects of sending parents a 45-page handbook for talking with college students about alcohol. Parents in the comparison group received a brochure detailing university alcohol policies and consequences of alcohol policy violations (Ichijima et al. 2009).

Of 347 parents in the intervention group, 72 percent evaluated the handbook and 83 percent said they had read most or all of it. Students who did not drink prior to college whose parents reviewed the handbook were less likely to start drinking, and those already drinking were less likely to show growth in drinking over the freshman year. This latter finding resulted from effects on female, but not male, students. Turrisi et al. (2009), in an experimental study, found that this parental intervention, in combination with a brief motivational intervention, produced lower levels of alcohol consumption and high-risk drinking among college students compared with a control group. These new findings are important in that parental influence can extend into college-aged youth.

Environmental Interventions: Legal Drinking Age of 21

In 1984, when 17 States had a legal drinking age of 21, the U.S. Congress passed legislation that would withhold highway construction funding for States that did not make it illegal to sell alcohol to people younger than age 21. By 1988, all States adopted the law (Fell et al. 2009).

However, there are some important exceptions. In 24 States, individuals under 21 can possess alcohol with parental or guardian consent and/or presence. In 31 States, parents can legally furnish alcohol to their children who are under 21. Only 31 States and the District of Columbia explicitly prohibit consumption by a person under 21. In 47 States, people under 21 can serve alcohol (NIAAA 2010).

In August 2008, a group of 130 college presidents called for a debate about whether the drinking age should be lowered to age 18. Some suggested, after receiving education about safe drinking levels, that 18-year-olds should be given drinking licenses that would be rescinded if their drinking posed dangers to themselves or others. Given this widely publicized challenge to the legal drinking age of 21, it is worth reviewing evidence on the topic. Figure 1 examines trends in the frequency of binge drinking from 1982 to 2007 (five or more drinks on an occasion) from Monitoring the Future, a yearly survey assessment of the attitudes, behaviors, and values of nearly 50,000 8th, 10th, and 12th graders (Johnson et al. 2007). According to the survey data, binge drinking among high-school seniors dropped from 40 percent to just over 25 percent. Among individuals 1 to 4 years past high school, the declines were less, from 40 percent to just under 35 percent. Little change was seen among full-time college students. Figure 2 examines trends in alcohol-related traffic fatalities among individuals aged 18–20 targeted by the drinking age changes and those aged 21–24 not targeted. Both groups experienced proportional declines, but the declines were greater in the 18- to 20-year age-group than in the 21- to 24-year age-group (60 percent vs. 44 percent).

A review of 49 studies of the legal drinking age changes revealed that in the 1970s and 1980s, when many States lowered the drinking age, alcohol-related traffic crashes among people younger than 21 increased 10 percent. In contrast, when States increased the legal drinking age to 21, alcohol-related crashes among people younger than 21 decreased 16 percent (Shults et al. 2001). Wagenaar and Toomey (2002) reviewed 48 studies of the effects of drinking-age changes on drinking and 57 studies on traffic crashes. They concluded that increases in the legal age of alcohol purchase and consumption have been the most successful interventions to date in reducing drinking and alcohol-related crashes among people under 21.

Miron and Tetelbaum (2009) found significant declines in traffic fatalities among individuals under 21 in States that changed the minimum legal drinking age to 21 prior to the 1984 Federal mandate to raise the drinking age to 21. However, in States that raised the drinking age after the Federal legislation, the minimum legal drinking age increases were not associated with significant declines in traffic deaths. Miron and Tetelbaum's analyses controlled for whether States had a seatbelt law, the legal blood alcohol limit, beer taxes, and vehicle miles traveled.

Of note, Miron and Tetelbaum did not explore whether the traffic deaths were alcohol related. After adjusting for changes in the population for that age during the time period 1982 to 2007, alcohol-related traffic fatalities among people aged 16–20 declined 64 percent, whereas those that did not involve alcohol increased 17 percent (see figure 3) (Hingson and White 2010).

In 2009, Fell et al. (2009) examined trends in the ratio of drinking to nondrinking drivers in fatal crashes in each State annually from 1982 to 2004 (unlike Miron and

Tetelbaum's [2009] analyses). This analysis controlled for zero-tolerance laws, graduated license night restrictions, and use/lose laws that target drivers under 21 and could influence their involvement in alcohol-related crashes. Fell et al. also controlled for 0.10 percent and 0.08 percent BAC, per se, legal limits, mandatory seatbelt laws, per capita beer consumption, unemployment rates, vehicle miles traveled, frequency of sobriety checkpoints, number of licensed drivers, and the ratio of drinking to nondrinking drivers aged 26 or older in fatal crashes.

Fell et al.'s findings are quite informative. Adoption of the minimum legal drinking age of 21 was associated with a 16 percent decline in the ratio of drinking to nondrinking drivers in fatal crashes involving those under 21, even after controlling for all the other factors listed above. Of note, other laws targeting drivers under 21 independently predicted lower involvement of drinking drivers in fatal crashes. Use/lose laws and zero-tolerance laws were each

associated with 5 percent declines. Further, laws aimed at adult drivers also independently contributed to declines in the ratio of drinking to nondrinking drivers in fatal crashes: 0.08 percent BAC laws were independently associated with an 8 percent decline, 0.10 BAC percent laws a 7 percent decline, administrative license revocation a 5 percent decline, and seatbelt laws a 3 percent decline. Thus, the preponderance of evidence suggests that raising the drinking age to 21 reduced alcohol involvement in fatal crashes involving drivers under 21 and that other laws aimed at drivers of all ages can also reduce alcohol-related fatal crashes involving drivers under the age of 21.

Of note, a recent analysis (Norberg et al. 2009) of over 33,000 adult respondents in two national surveys 10 years apart compared respondents who grew up in States where they legally were allowed to drink prior to age 21 with respondents who grew up in States where the legal drinking age was 21. The analysis, which controlled for numerous

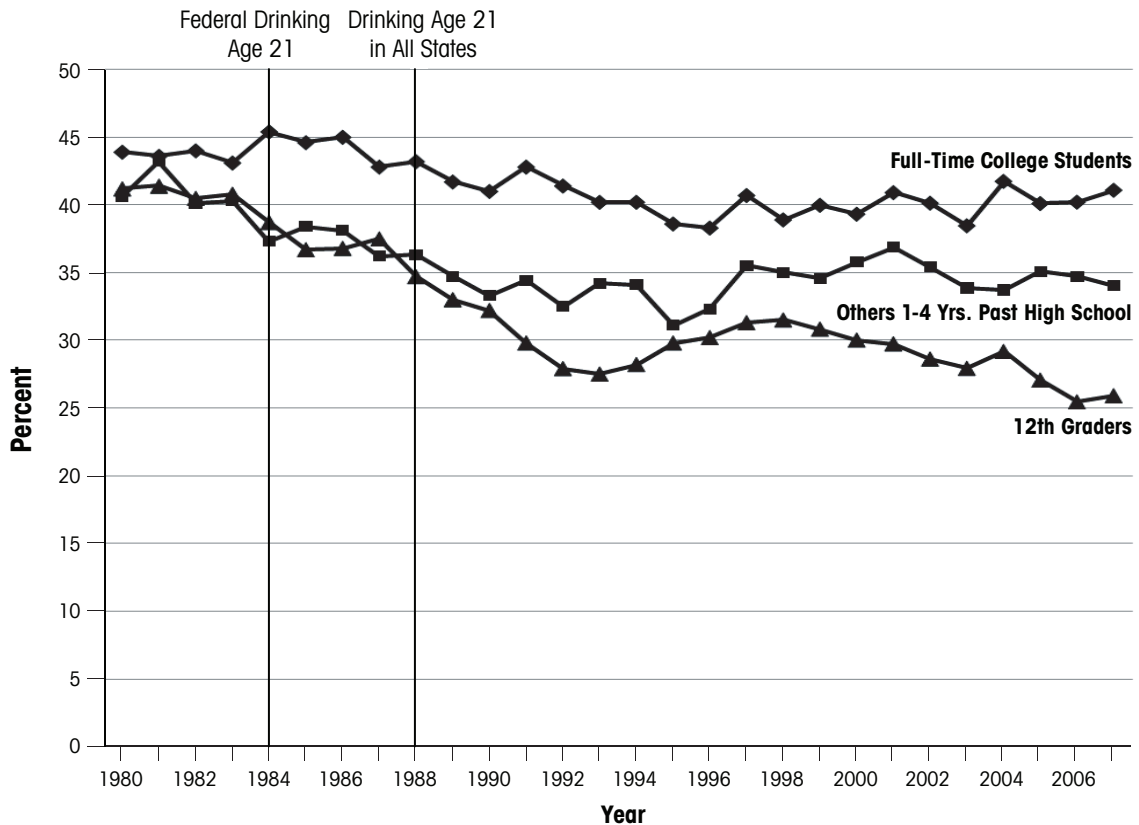


Figure 1 Trends in 2-week prevalence of five or more drinks in a row among college students versus others 1–4 years beyond high school.

SOURCE: Johnston, L.D.; O'Malley, P.M.; Bachman, J.G.; and Schulenberg, J.E. *Monitoring the Future National Survey Results on Drug Use, 1975–2007. Volume I: Secondary School Students.* Bethesda, MD: National Institute on Drug Abuse, 2007 (NIH Publication No. 07–6205). Johnston, L.D.; O'Malley, P.M.; Bachman, J.G.; and Schulenberg, J.E. *Monitoring the Future National Survey Results on Drug Use, 1975–2007. Volume II: College Students and Adults Ages 19–45.* Bethesda, MD: National Institute on Drug Abuse, 2007 (NIH Publication No. 07–6205).

potential confounding variables, found that those allowed legally to drink prior to age 21 were more likely as adults to meet alcohol and drug use disorder criteria.

Zero-Tolerance Law

Zero-tolerance laws, which make it illegal in every State for those under the age of 21 to drive after any drinking, also have contributed to declines in alcohol-related traffic deaths among people younger than 21 (Hingson et al. 1994; Liang and Huang 2008; Voas et al. 2000; Wagenaar et al. 2001).

Unfortunately, despite their demonstrated benefits, legal drinking age and zero-tolerance laws generally have not been vigorously enforced (Jones and Lacey 2001). Young drivers are substantially underrepresented in the driving-while-intoxicated (DWI) arrest population relative to their contribution to the alcohol-related crash problem (Voas and Williams 1986). Stepped-up enforcement of alcohol purchase laws aimed at sellers and buyers can be effective in reducing alcohol misuse and related problems (Preusser et al 1992; Wagenaar et al. 2000).

Price of Alcohol

The majority of published studies have reported an inverse relation between the tax on or price of alcohol and alcohol misuse and related negative health outcomes. The National Academy of Sciences (National Research Council Institute of Medicine of the National Academies 2004) reviewed the literature on price of alcohol and alcohol-related problems and recommended that Congress and State legislatures raise excise taxes to reduce underage alcohol consumption and to raise additional revenues to reduce underage drinking problems. Further research is needed about the effects of price increases on (1) college students relative to others the same age and (2) college-age people relative to older people.

Three recent extensive literature reviews examined the relation of alcohol price and tax with consumption and related harms (Elder et al. 2010; Wagenaar et al. 2009; World Health Organization Regional Office for Europe 2009). Wagenaar et al's (2009) analysis of 1,003 separate estimates from 112 studies reported "overwhelming evidence of the effects of alcohol prices on drinking. Price

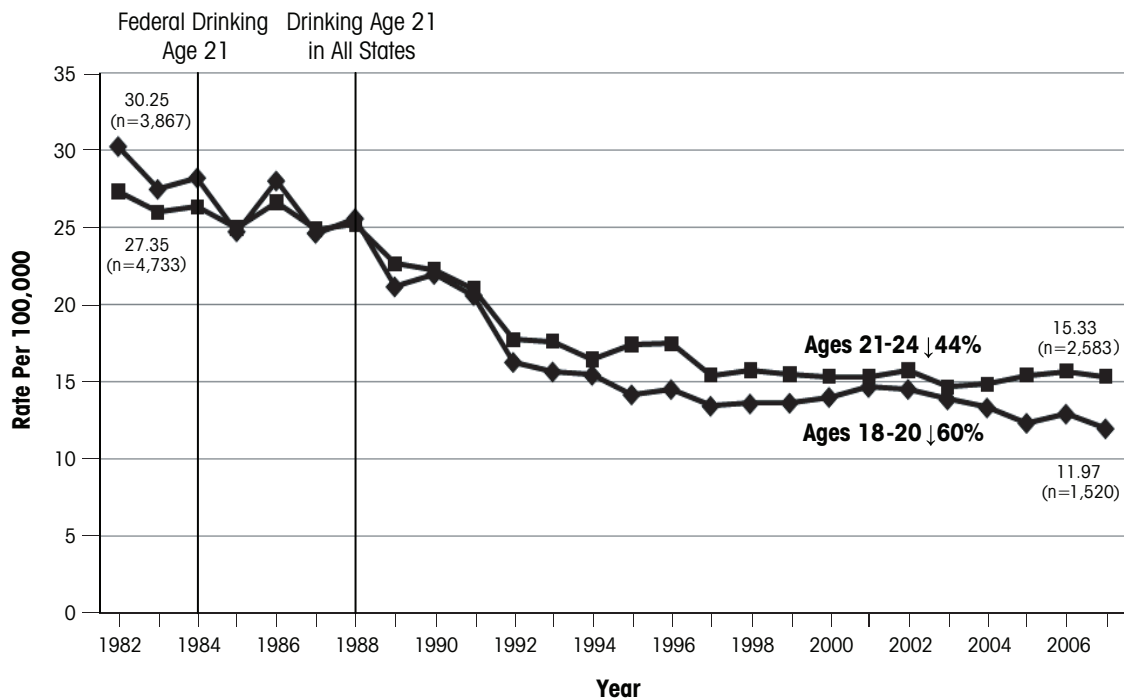


Figure 2 Alcohol-related traffic fatalities, rate per 100,000, ages 18-20 vs. 21-24, United States, 1982-2007.

SOURCE: Johnston, L.D.; O'Malley, P.M.; Bachman, J.G.; and Schulenberg, J.E. *Monitoring the Future National Survey Results on Drug Use, 1975-2007. Volume I: Secondary School Students.* Bethesda, MD: National Institute on Drug Abuse, 2007 (NIH Publication No. 07-6205). Johnston, L.D.; O'Malley, P.M.; Bachman, J.G.; and Schulenberg, J.E. *Monitoring the Future National Survey Results on Drug Use, 1975-2007. Volume II: College Students and Adults Ages 19-45.* Bethesda, MD: National Institute on Drug Abuse, 2007 (NIH Publication No. 07-6205).

affects drinking of all types of beverages and across the population of drinkers, from lightest to heavy drinkers.” They concluded “we know of no other preventive intervention to reduce drinking that has the numbers of studies and consistency of effects seen in the literature on alcohol taxes and prices.”

Elder et al.’s (2010, p. 226) review of 78 alcohol tax studies meeting the Centers for Disease Control and Prevention’s Community Guide inclusion criteria found “consistent evidence that higher alcohol prices and taxes are associated with reductions in both excessive alcohol consumption and related subsequent harms. Results were robust across different countries, time periods, study designs, analytic approaches, and outcomes.”

A World Health Organization review (2009, p. 13) concluded “When other factors are held constant, such as income and the price of other goods, a rise in alcohol prices leads to less alcohol consumption and less alcohol-related harm, and vice versa....Policies that increase alcohol prices delay the time when young people start to drink, slow their progression toward drinking large amounts, and reduces their heavy drinking and volume of alcohol drunk on an occasion.” Although very high prices for

alcohol might stimulate illegal production, in the United States alcohol prices have not kept pace with inflation over the past 60 years.

Alcohol Outlet Density

Higher alcohol outlet density has been associated with increased alcohol-related problems in both cross-sectional and prospective studies, and reducing outlet density may, in turn, reduce drinking-related problems (Campbell et al. 2009). Prospective research is needed to specifically test whether reducing outlet density will reduce consumption, related problems, and specific effects on college students. One recent study (Scribner et al. 2010) found that higher alcohol outlet density near colleges was related to higher campus rape offense rates.

Comprehensive Community Interventions

Several community-based initiatives have successfully reduced drinking- and/or alcohol-related problems among young people. These programs typically coordinate efforts from the following:



Figure 3 Trends in alcohol-related and non-alcohol-related traffic fatalities, persons ages 16–20, United States, 1982–2007.

SOURCE: Johnston, L.D.; O’Malley, P.M.; Bachman, J.G.; and Schulenberg, J.E. *Monitoring the Future National Survey Results on Drug Use, 1975–2007. Volume I: Secondary School Students.* Bethesda, MD: National Institute on Drug Abuse, 2007 (NIH Publication No. 07–6205). Johnston, L.D.; O’Malley, P.M.; Bachman, J.G.; and Schulenberg, J.E. *Monitoring the Future National Survey Results on Drug Use, 1975–2007. Volume II: College Students and Adults Ages 19–45.* Bethesda, MD: National Institute on Drug Abuse, 2007 (NIH Publication No. 07–6205).

- City officials from multiple departments of city government, school, health, police, and alcohol beverage control, etc.
- Concerned private citizens and their organizations and students, parents, and merchants who sell alcohol.
- Often multiple intervention strategies are incorporated into the programs, including school-based programs involving students, peer leaders, and parents; media advocacy; community organizing and mobilization; environmental policy change to reduce alcohol availability to youth; and heightened enforcement of laws regulating sales and distribution of alcohol and laws to reduce alcohol-related traffic injuries and deaths.

Six comprehensive community programs have achieved reductions in alcohol problems among college-aged youth:

- **Communities Mobilizing for Change Program** (Wagenaar et al. 2000)—This program attempted to reduce the flow of alcohol to youth from illegal sales by retail establishments and from the provision of alcohol to youth by adults in the community
- **Community Trials Program** (Holder et al. 2000)—Communities formed coalitions aimed at reducing illegal sales of alcohol to youth, implementing responsible beverage service and decreasing drunk driving offenses by increasing awareness of consequences.
- **Saving Lives Program** (Hingson et al. 1996)—This program tried to reduce drunk driving and related consequences through media campaigns, police training, high-school peer-led education, college prevention programs, increased alcohol outlet surveillance, and other measures.
- **Fighting Back Program** (Hingson et al. 2005)—This program tried to reduce availability of alcohol through environmental policies and expanded substance abuse screening, counseling, and treatment.
- **Sacramento Neighborhood Alcohol Prevention Project** (Treno et al. 2007)—This program included community mobilization, a public awareness campaign, responsible beverage service training, legal drinking age enforcement, and intoxicated patron law enforcement.
- **Reduce Underage Drinking Through State Coalitions** (Wagenaar et al. 2006)—This initiative used a community coalition model at the State level in 10 States to mobilize citizens, increase media coverage, and implement policy changes such as alcohol price and tax changes and greater restrictions on commercial and social access to alcohol.

Five studies completed since the initial NIAAA report (2002) have now explored elements of the comprehensive community-organizing model as a method for reducing

drinking or alcohol-related harms specifically among college students. Clapp et al. (2005) adapted some of the community trials (Holder et al. 2000) interventions to a college setting. At an experimental university, there was a marked increase in driving-while-under-the-influence (DUI) enforcement coupled with a media campaign. The prevention campaign featured DUI checkpoints, media coverage, and a student-designed social marketing campaign designed to increase student perception of risk of arrest for DUI. DUI checkpoints were operated jointly by campus and local city police. Telephone surveys of randomly selected students revealed significant declines in self-reported DUI from pre- to posttest.

Weitzman et al. (2003) evaluated the impact of The Matter of Degree college–community partnership’s implementation of environmentally based interventions to reduce drinking and related problem behaviors among college students. Interventions included keg registration, mandatory responsible beverage service, campus–community police collaboration on increased wild-party enforcement, substance-free residence halls, and a variety of media efforts. Significant reductions were achieved in binge and frequent binge drinking, frequent intoxication, driving after drinking, alcohol-related injury, and a variety of other alcohol-related problems.

McCartt et al. (2009) studied a comprehensive community program focusing on underage drinking and drinking and driving among 16- to 24-year-olds in Huntington, West Virginia, home of Marshall University (enrollment 18,000 students). Morgantown, West Virginia, home to West Virginia University, with 40,000 students, was selected for comparison. During late winter 2006 and spring 2007, local, university, and State enforcement agencies increased enforcement of drinking and driving laws, including zero-tolerance laws, through low-manpower sobriety checkpoints, saturation patrols, and stepped-up DUI directed patrols. The State Alcohol Beverage Control Administration, with assistance from local and State law enforcement agencies, increased enforcement of the minimum legal drinking age laws. This included enforcement of laws aimed at servers/sellers and underage people, including use of fake identifications. A multimedia campaign that included paid and earned print and broadcast media publicized these efforts.

Roadside surveys of nighttime drivers conducted alcohol breath tests during the fall of 2006, spring of 2007, and fall of 2007. A compliance check survey of underage alcohol purchase attempts produced declines in successful buy attempts, from 43 percent to 18 percent in the intervention city. Little change occurred in the comparison city. Reductions in BACs at the roadside surveys in the intervention city showed marked declines in the proportions of drivers aged 16–20, 21–24, and 25 or older at 0.02 percent, 0.05 percent, and 0.08 percent, respectively. Little change was found in the comparison city.

Saltz et al. (2009) examined a college–community partnership at Western Washington University and another

at Washington State University. Police patrols focused on off-campus student parties, and compliance check surveys were used to restrict sales of alcohol to minors. Public forums brought community residents, students, and police together for dialogues about disruptive parties and other neighborhood issues. The colleges also offered alcohol-free late-night activities. Significant restrictions in the prevalence of heavy drinking (five or more consecutive drinks) were observed at the two intervention colleges relative to a comparison college (Saltz et al. 2009).

Wood et al. (2009) evaluated the Common Ground Program, a University of Rhode Island/community partnership featuring increased driving-while-intoxicated and minimum-legal-drinking-age enforcement, a media campaign, and a safe-rides program. Although the program resulted in increased student awareness of alcohol control measures and a greater perceived likelihood of apprehension for underage drinking, as well as a reduction in police-reported alcohol-related incidents, no changes were observed or reported regarding alcohol use or alcohol-impaired driving by college students (Wood et al. 2009).

Taken together, these studies underscore the potential for comprehensive community and college collaborative interventions to specifically reduce alcohol misuse and problems among the difficult-to-reach college student population. Key questions about this approach that warrant future investigation include the following:

1. Will a combination of (a) environmental interventions to reduce alcohol availability and enforce alcohol policies, such as minimum legal drinking ages, drinking-and-driving laws, and (b) efforts to expand screening and brief interventions or other individually oriented counseling approaches achieve greater problem reductions than either alone?
2. Are programs that target people of all ages more effective in reducing college student alcohol problems than those that focus only on college students?
3. Will programs that reduce alcohol misuse among college students and college-aged individuals produce carry-over benefits into adult life?
4. Will programs that delay the onset of alcohol use among individuals before they reach their college years reduce drinking and related problems among people in college?
5. How can comprehensive campus–community collaborations be sustained over time?
6. Which college–community interventions are most effective in reducing alcohol misuse and related problems with the least cost?

CONCLUSIONS

It is ironic that binge drinking and driving under the influence of alcohol continued to rise, and unintentional injuries attributable to alcohol did not decline during a period of time when there was a considerable expansion of the scientific literature and knowledge base regarding how to reduce drinking and related harms among college students. An important research question is how to translate our new knowledge into reductions in alcohol misuse and related problems in the future. Research also is needed in colleges and universities that serve minority populations, an area that has been underrepresented in college research initiatives.

There is now a sizable scientific literature which demonstrates that individually oriented approaches such as screening and brief motivational interventions can reduce drinking not only among students who voluntarily seek out these programs but also among those mandated to receive counseling because of alcohol-related disciplinary actions. Unfortunately, these interventions are not reaching a sizeable portion of college students with problematic drinking practices.

Although nearly 20 percent of college students meet DSM–IV alcohol dependence or abuse criteria, less than 5 percent of them have sought counseling or treatment (NIAAA 2007). An important challenge is to sufficiently expand screening and counseling so that these effective individually oriented interventions can achieve general population-level effects. Establishing alcohol screening and brief intervention as a routine part of student health service encounters and use of the Internet screening and advice might help remedy this situation.

Also, a variety of environmental policy interventions that reduce availability of alcohol and deter driving while impaired by alcohol have been shown to be effective in reducing drinking and driving and alcohol-related crash involvement of college-aged individuals. These policies must, however, be implemented and enforced at the community level. Recent research evidence now indicates that colleges and universities can reduce harmful drinking and drinking and driving among college students through the use of comprehensive cooperative college–community multi-component approaches that include heightened enforcement of the legal drinking age and other laws aimed to reduce drinking and driving.

But clearly colleges by themselves cannot resolve the alcohol problems of all college-aged people. For every 18- to 24-year-old college student, two 18- to 24-year-olds are not in college. Further, many college students develop problematic drinking habits before they enter college. Analyses of the national College Alcohol Survey indicates that the younger college students were when they first drank to intoxication, the greater the likelihood that they experienced alcohol dependence while they were in college, rode with drinking drivers, drove after drinking, were injured under the influence of alcohol, and had unplanned and unprotected sex after drinking (Hingson

et al. 2003a, b). Hence, community conditions and the availability of alcohol to those under 21 contributes to college drinking problems. Further, many of the problems experienced as a result of excessive college student alcohol consumption affect people other than the college drinkers themselves.

Consequently, colleges and surrounding communities need to work together to implement multifaceted programs at various levels of intervention. Collectively, they need to involve multiple departments of city government as well as concerned private citizens and organizations and multiple sectors of the college community, presidents, deans, other administrators, campus security, residence counselors, health service providers, alumni, faculty, and students if they want to most effectively reduce harmful drinking and the myriad of health and social problems linked to harmful drinking. ■

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The author declares that he has no competing financial interests.

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