

The Surgeon General's
Call to Action
To Prevent and Reduce
Underage Drinking
2007



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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MESSAGE FROM THE
HONORABLE MICHAEL O. LEAVITT

SECRETARY OF HEALTH AND HUMAN SERVICES

Each person at the Department of Health and Human Services shares the profound charge of helping Americans live longer, healthier lives.

I'm convinced that we need to create a culture of wellness in our society: To teach people about small steps they can take, and good choices they can make, that lead to better health.

Learned early, the lessons of good health will last a lifetime. Similarly, bad habits and the consequences of unhealthy choices also can have lasting effects.

That is why this *Surgeon General's Call to Action To Prevent and Reduce Underage Drinking* is so important.

This *Call to Action* is a reminder that underage drinking has serious social costs and often tragic personal consequences. More than that, this Call to Action demonstrates that each of us has the opportunity to prevent underage drinking.

The *Call to Action* also offers a way forward through the collaborative effort of societal change involving parents, police officers, colleges, and communities. This type of societal change requires the discipline and

determination to take small steps toward reducing underage drinking each day.

Many of these efforts are already underway, but much more must be done. The time to act is now.

It won't be easy. But the hard way is often the best way and the benefits of reducing underage drinking are significant and substantial.

I urge everyone to work with the Surgeon General and me so that together we can answer the call to reduce underage drinking, encourage good choices, and create a culture of wellness across the Nation.

Michael O. Leavitt

FOREWORD FROM THE ACTING SURGEON GENERAL

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

Alcohol is the most widely used substance of abuse among America's youth. A higher percentage of young people between the ages of 12 and 20 use alcohol than use tobacco or illicit drugs. The physical consequences of underage alcohol use range from medical problems to death by alcohol poisoning, and alcohol plays a significant role in risky sexual behavior, physical and sexual assaults, various types of injuries, and suicide. Underage drinking also creates secondhand effects for others, drinkers and nondrinkers alike, including car crashes from drunk driving, that put every child at risk. Underage alcohol consumption is a major societal problem with enormous health and safety consequences and will demand the Nation's attention and committed efforts to solve.

For the most part, parents and other adults underestimate the number of adolescents who use alcohol. They underestimate how early drinking begins, the amount of alcohol adolescents consume, the many risks that alcohol consumption creates for adolescents, and the nature and extent of the consequences to both drinkers and nondrinkers. Too often, parents are inclined to believe, "Not my child." Yet, by age 15, approximately one-half of America's boys and girls have had a whole drink of alcohol, not just a few sips, and the highest prevalence of alcohol dependence in any age group is among people ages 18 to 20.

I have issued this *Surgeon General's Call to Action To Prevent and Reduce Underage Drinking* to focus national attention on this enduring problem and on new, disturbing research which indicates that the developing

adolescent brain may be particularly susceptible to long-term negative consequences from alcohol use. Recent studies show that alcohol consumption has the potential to trigger long-term biological changes that may have detrimental effects on the developing adolescent brain, including neurocognitive impairment.

Fortunately, the latest research also offers hopeful new possibilities for prevention and intervention by furthering our understanding of underage alcohol use as a developmental phenomenon—as a behavior directly related to maturational processes in adolescence. New research explains why adolescents use alcohol differently from adults, why they react uniquely to it, and why alcohol can pose such a powerful attraction to adolescents, with unpredictable and potentially devastating outcomes.

Emerging research also makes it clear that an adolescent’s decision to use alcohol is influenced by multiple factors. These factors include normal maturational changes that all adolescents experience; genetic, psychological, and social factors specific to each adolescent; and the various social and cultural environments that surround adolescents, including their families, schools, and communities. These factors—some of which protect adolescents from alcohol use and some of which put them at risk—change during the course of adolescence. Because environmental factors play such a significant role, responsibility for the prevention and reduction of underage drinking extends beyond the parents of adolescents, their schools, and communities. It is the collective responsibility of the Nation as a whole and of each of us individually.

The process of solving the public health problem of underage alcohol use begins with an examination of our own attitudes toward underage drinking—

and our recognition of the seriousness of its consequences for adolescents, their families, and society as a whole. Adolescent alcohol use is not an acceptable rite of passage but a serious threat to adolescent development and health, as the statistics related to adolescent impairment, injury, and death attest.

A significant point of the *Call to Action* is this: Underage alcohol use is not inevitable, and schools, parents, and other adults are not powerless to stop it. The latest research demonstrates a compelling need to address alcohol use early, continuously, and in the context of human development using a systematic approach that spans childhood through adolescence into adulthood. Such an approach is described in this *Call to Action*. Such an approach can be effective when, as a Nation and individually, we commit ourselves to solving the problem of underage drinking in America. We owe nothing less to our children and our country.

Kenneth P. Moritsugu, M.D., M.P.H.

SECTION 1

Underage Drinking in America: Scope of the Problem

Underage¹ alcohol consumption in the United States is a widespread and persistent public health and safety problem that creates serious personal, social, and economic consequences for adolescents, their families, communities, and the Nation as a whole. Alcohol is the drug of choice among America's adolescents, used by more young people than tobacco or illicit drugs (Johnston et al. 2006a; Johnston et al. 2006b; Substance Abuse and Mental Health Services Administration [SAMHSA] 2006). The prevention and reduction of underage drinking and treatment of underage youth² with alcohol use disorders (AUDs) are therefore important public health and safety goals. *The Surgeon General's Call to Action To Prevent and Reduce Underage Drinking* seeks to engage all levels of government as well as individuals and private sector institutions and organizations in a coordinated, multifaceted effort to prevent and reduce underage drinking and its adverse consequences.

The impetus for this *Call to Action* is the body of research demonstrating the potential negative consequences of underage alcohol use on human

¹ For the purpose of this document, *underage* refers to persons under the minimum legal drinking age of 21.

² For the purpose of this document, *youth* refers to children and adolescents under the age of 21.

maturation, particularly on the brain, which recent studies show continues to develop into a person's twenties (Giedd 2004). Although considerable attention has been focused on the serious consequences of underage drinking and driving, accumulating evidence indicates that the range of adverse consequences is much more extensive than that and should also be comprehensively addressed. For example, the highest prevalence of alcohol dependence in the U.S. population is among 18- to 20-year-olds (Grant et al. 2004) who typically began drinking years earlier. This finding underscores the need to consider problem drinking within a developmental framework. Furthermore, early and, especially, early heavy drinking are associated with increased risk for adverse lifetime alcohol-related consequences (Hingson et al. 2000, 2001, 2002). Research also has provided a more complete understanding of how underage drinking is related to factors in the adolescent's environment, cultural issues, and an adolescent's individual characteristics. Taken together, these data demonstrate the compelling need to address alcohol problems early, continuously, and in the context of human development using a systematic approach that spans childhood through adolescence into adulthood.

Underage drinking remains a serious problem despite laws against it in all 50 States; decades of Federal, State, Tribal, and local programs aimed at preventing and reducing underage drinking; and efforts by many private entities. Underage drinking is deeply embedded in the American culture, is often viewed as a rite of passage, is frequently facilitated by adults, and has proved stubbornly resistant to change. A new, more comprehensive and developmentally sensitive approach is warranted. The growing body of research in the developmental area, including identification of risk and protective factors for underage alcohol use, supports the more complex prevention and reduction strategies that are proposed in this *Call to Action*.

Underage Alcohol Use Increases With Age. As Figure 1 indicates, alcohol use is an age-related phenomenon. The percentage of the population who have drunk at least one whole drink (see Appendix A for the definition of a drink) rises steeply during adolescence until it plateaus at about age 21. By age 15, approximately 50 percent of boys and girls have had a whole drink of alcohol; by age 21, approximately 90 percent have done so.

**Alcohol Use Increases
Dramatically During Adolescence**

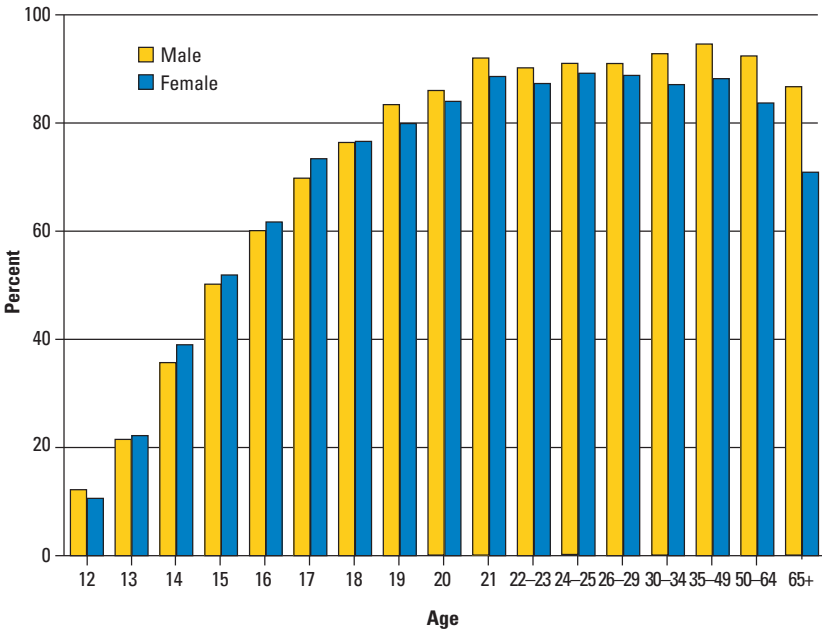


Figure 1: Percentage of Americans Who Have Ever Drunk Alcohol (A Whole Drink).

Source: SAMHSA data from 2005 National Survey on Drug Use and Health (NSDUH)

18- to 20-Year-Olds Have the Highest Prevalence of DSM-IV Alcohol Dependence

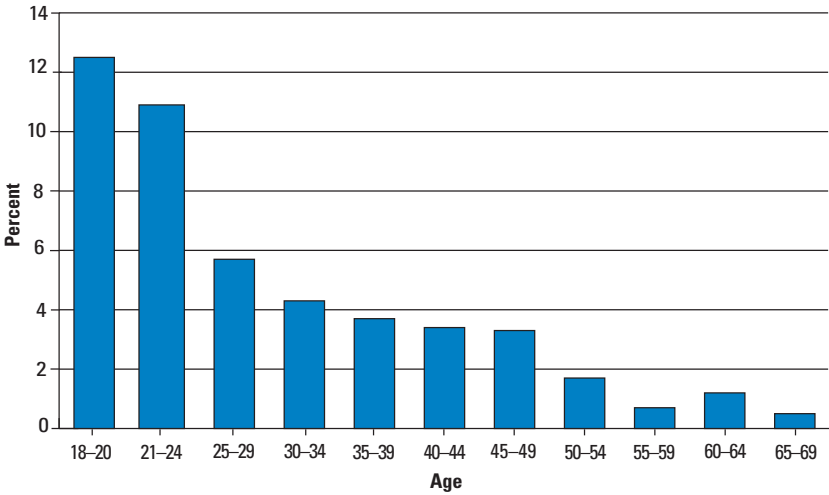


Figure 2: Prevalence of Past-Year DSM-IV Alcohol Dependence—U.S.

Source: Grant et al. 2004 (data from the National Epidemiologic Survey on Alcohol and Related Conditions)

There Is a High Prevalence of Alcohol Use Disorders Among the Young.

Early alcohol consumption by some young people will result in an alcohol use disorder—that is, they will meet diagnostic criteria for either alcohol abuse or dependence (see Appendix B). Figure 2 shows that the highest prevalence of alcohol dependence is among people ages 18–20. In other words, the description these young people provide of their drinking behavior meets the criteria for alcohol dependence set forth in the most recent editions of the *Diagnostic and Statistical Manual of Mental Disorders (DSM)*—*DSM-IV* and *DSM-IV-TR* (American Psychiatric Association 1994, 2000).

Even some youth younger than age 18 have an alcohol use disorder. According to data from the 2005 National Survey on Drug Use and Health (NSDUH), 5.5 percent of youth ages 12–17 meet the diagnostic criteria for alcohol abuse or dependence (SAMHSA 2006).

THE NATURE OF UNDERAGE DRINKING

Underage alcohol use is a pervasive problem with serious health and safety consequences for the Nation. The nature and gravity of the problem is best described in terms of the number of children and adolescents who drink, when and how they drink, and the negative consequences that result from drinking.

Alcohol Is the Most Widely Used Substance of Abuse Among America's Youth. As indicated in Figure 3, a higher percentage of youth in 8th, 10th, and 12th grades used alcohol in the month prior to being surveyed than used tobacco or marijuana, the illicit drug most commonly used by adolescents (Johnston et al. 2006b).

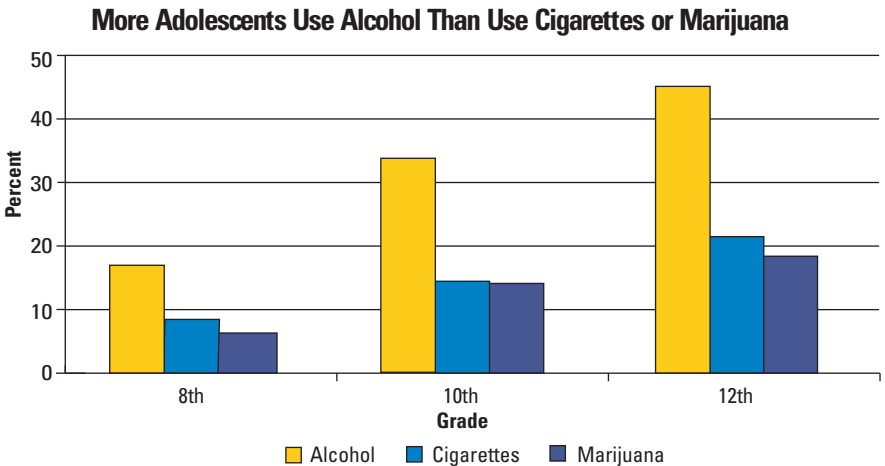


Figure 3: Past-Month Adolescent Alcohol, Cigarette, and Marijuana Use by Grade.

Source: Data from 2006 Monitoring the Future Survey

A Substantial Number of Young People Begin Drinking at Very Young Ages. A number of surveys ask youth about the age at which they first used alcohol. Because the methodology in the various surveys differs, the data are not consistent across them. Nonetheless, they do show that a substantial number of youth begin drinking before the age of 13. For example, data from recent surveys indicate that:

- Approximately 10 percent of 9- to 10-year-olds have started drinking³ (Donovan et al. 2004).
- Nearly one-third of youth begin drinking³ before age 13 (Grunbaum et al. 2004).
- More than one-tenth of 12- or 13-year-olds and over one-third of 14- or 15-year-olds reported alcohol use (a whole drink) in the past year (SAMHSA 2006).
- The peak years of alcohol initiation are 7th and 8th grades (Faden 2006).

Adolescents Drink Less Frequently Than Adults, But When They Do Drink, They Drink More Heavily Than Adults. When youth between the ages of 12 and 20 consume alcohol, they drink on average about five drinks per occasion about six times a month, as indicated in Figure 4. This amount of alcohol puts an adolescent drinker in the binge range, which, depending on the study, is defined as “five or more drinks on one occasion” or “five or more drinks in a row for men and four or

Adolescents Drink Less Often but More Per Occasion Than Adults

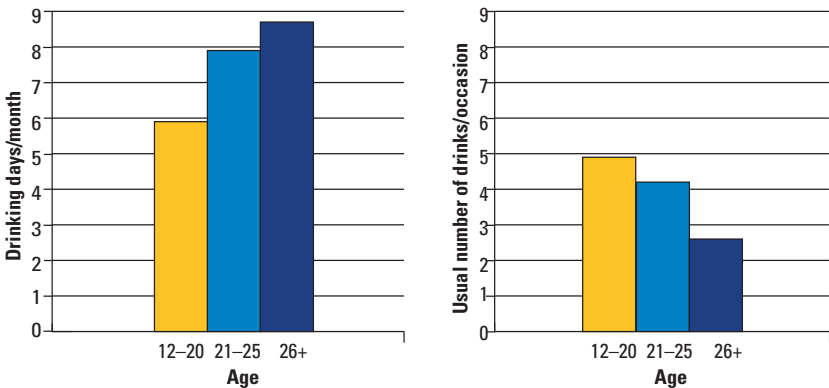


Figure 4: Number of Drinking Days per Month and Usual Number of Drinks per Occasion for Youth (12–20), Young Adults (21–25), and Adults (26 and older).

Source: SAMHSA data from 2005 NSDUH

³ Alcohol use in these studies was assessed by a single question asking youth whether they had ever consumed more than a few sips of alcohol.

more drinks in a row for women.” By comparison, adult drinkers age 26 and older consume on average two to three drinks per occasion about nine times a month (SAMHSA 2006).

Figure 5 provides a more detailed breakdown by age showing the number of days in the last month on which five or more drinks were consumed by adolescents and adults. (These data come from the NSDUH, which uses “5+” drinks as the definition of binge drinking for both males and females [SAMHSA 2006].) Distinct age-related patterns are evident for both boys and girls, with a steady increase in binge drinking days for girls through age 18 and boys through age 20.

Among Adolescents Who Drink, the Number of Binge Drinking Days Increases With Age

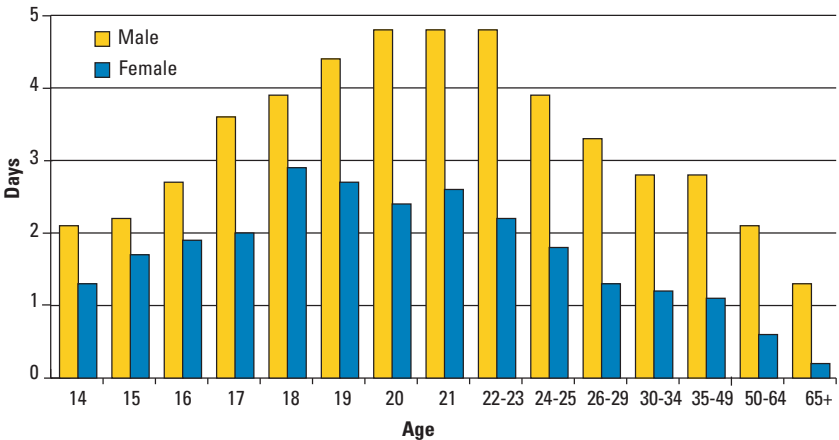


Figure 5: Number of Days in the Past 30 in Which Drinkers Consumed Five or More Drinks, by Age and Gender.

Source: SAMHSA data from 2005 NSDUH

Differences in Underage Alcohol Use Exist Between the Sexes and Among Racial and Ethnic Groups. Despite differences between the sexes and among racial and ethnic groups, overall rates of drinking among most populations of adolescents are high. In multiple surveys, underage males generally report more alcohol use during the past month than underage females. Boys also tend to start drinking at an earlier age

than girls, drink more frequently, and are more likely to binge drink. When youth ages 12–20 were asked about how old they were when they started drinking, the average age was 13.90 for boys and 14.36 for girls for those adolescents who reported drinking (Faden 2006). Interestingly, the magnitude of the sex-related difference in the frequency of binge drinking varies substantially by age (see Figure 5). Further, data from the Monitoring the Future survey show that while the percentages of boys and girls in the 8th and 10th grades who binge drink are similar (10.5 and 10.8, and 22.9 and 20.9, respectively), among 12th graders, boys have a higher prevalence of binge drinking compared to girls (29.8 compared to 22.8) (Johnston et al. 2006b).

While the percentage of adolescents of all racial/ethnic subgroups who drink is high, Black or African-American and Asian youth tend to drink the least, as shown in Figure 6 (SAMHSA 2006).

Alcohol Use and Binge Drinking Vary by Race/Ethnicity and Gender

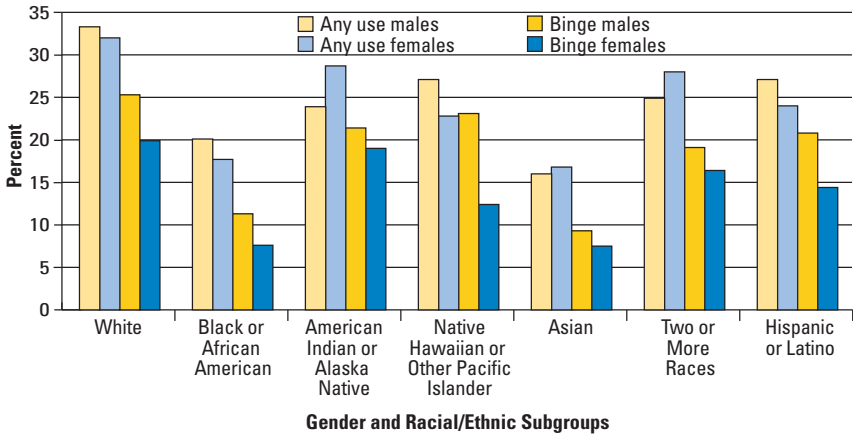


Figure 6: Alcohol Use and Binge Drinking in the Past Month Among Persons Ages 12–20 by Race/Ethnicity and Gender, Annual Averages Based on 2002–2005 Data.⁴ Source: SAMHSA, Office of Applied Studies, NSDUH (special data analysis)

⁴ Data were combined over 4 years to achieve a sufficient sample size for all racial/ethnic subgroups. It should be noted that, except for the “Hispanic or Latino” group, the racial/ethnic groups discussed in this report include only non-Hispanics. The category “Hispanic or Latino” includes Hispanics of any race.

Binge Drinking by Teens Is Not Limited to the United States. As shown in Figure 7, in many European countries a significant proportion of young people ages 15–16 report binge drinking. In all of the countries listed, the minimum legal drinking age is lower than in the United States. These data call into question the suggestion that having a lower minimum legal drinking age, as they do in many European countries, results in less problem drinking by adolescents.

A Significant Proportion of 15- to 16-Year-Old Students in Many European Countries Report Binge Drinking

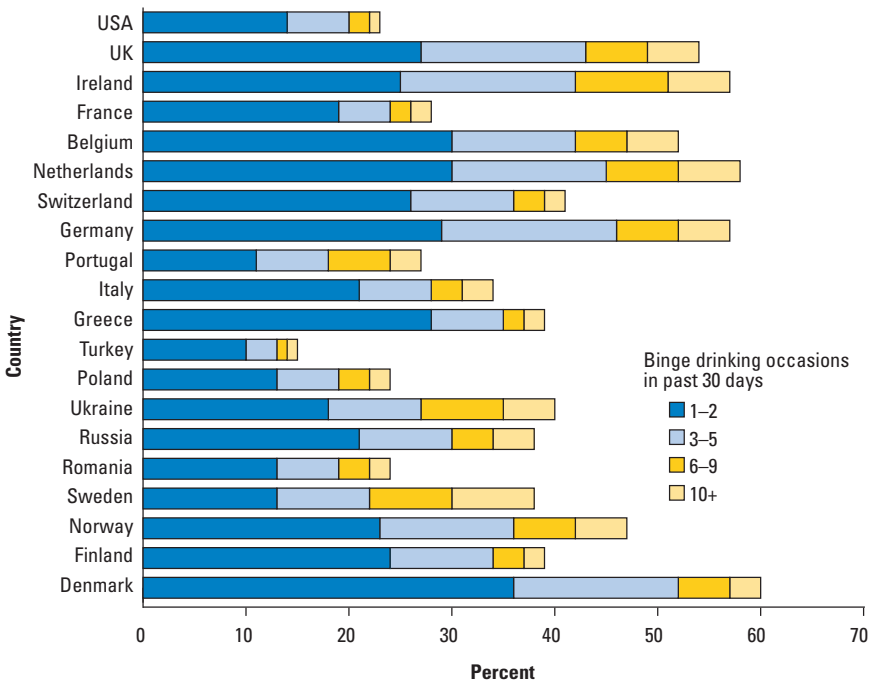


Figure 7: Percentage of European Students Ages 15–16 Who Have Engaged in Binge Drinking (5+ Drinks) Within the Past 30 Days.

Source: Hibell et al. 2004 (data from European School Survey Project on Alcohol and Drugs, 2003)

ADVERSE CONSEQUENCES OF UNDERAGE DRINKING

The short- and long-term consequences that arise from underage alcohol consumption are astonishing in their range and magnitude, affecting adolescents, the people around them, and society as a whole. Adolescence is a time of life characterized by robust physical health and low incidence of disease, yet overall morbidity and mortality rates increase 200 percent between middle childhood and late adolescence/early adulthood. This dramatic rise is attributable in large part to the increase in risk-taking, sensation-seeking, and erratic behavior that follows the onset of puberty and which contributes to violence, unintentional injuries, risky sexual behavior, homicide, and suicide (Dahl 2004). Alcohol frequently plays a role in these adverse outcomes and the human tragedies they produce. Among the most prominent adverse consequences of underage alcohol use are those listed below. Underage drinking:

- Is a leading contributor to death from injuries, which are the main cause of death for people under age 21. Annually, about 5,000 people under age 21 die from alcohol-related injuries involving underage drinking. About 1,900 (38 percent) of the 5,000 deaths involve motor vehicle crashes, about 1,600 (32 percent) result from homicides, and about 300 (6 percent) result from suicides (Centers for Disease Control and Prevention [CDC] 2004; Hingson and Kenkel 2004; Levy et al. 1999; National Highway Traffic Safety Administration [NHTSA] 2003; Smith et al. 1999).
- Plays a significant role in risky sexual behavior, including unwanted, unintended, and unprotected sexual activity, and sex with multiple partners. Such behavior increases the risk for unplanned pregnancy and for contracting sexually transmitted diseases (STDs), including infection with HIV, the virus that causes AIDS (Cooper and Orcutt 1997; Cooper et al. 1994).
- Increases the risk of physical and sexual assault (Hingson et al. 2005).

- Is associated with academic failure (Grunbaum et al. 2004).
- Is associated with illicit drug use (Grunbaum et al. 2004).
- Is associated with tobacco use (Shiffman and Balabanis 1995).
- Can cause a range of physical consequences, from hangovers to death from alcohol poisoning.
- Can cause alterations in the structure and function of the developing brain, which continues to mature into the mid- to late twenties, and may have consequences reaching far beyond adolescence (Brown et al. 2000; Crews et al. 2000; De Bellis et al. 2000; Swartzwelder et al. 1995*a*, 1995*b*; Tapert and Brown 1999; White and Swartzwelder 2005).
- Creates secondhand effects that can put others at risk. Loud and unruly behavior, property destruction, unintentional injuries, violence, and even death because of underage alcohol use afflict innocent parties. For example, about 45 percent of people who die in crashes involving a drinking driver under the age of 21 are people other than the driver (U.S. Department of Transportation Fatality Analysis Reporting System 2004). Such secondhand effects often strike at random, making underage alcohol use truly everybody's problem.
- In conjunction with pregnancy, may result in fetal alcohol spectrum disorders, including fetal alcohol syndrome, which remains a leading cause of mental retardation (Jones and Smith 1973).

Further, underage drinking is a risk factor for heavy drinking later in life (Hawkins et al. 1997; Schulenberg et al. 1996*a*), and continued heavy use of alcohol leads to increased risk across the lifespan for acute consequences and for medical problems such as cancers of the oral cavity, larynx, pharynx, and esophagus; liver cirrhosis; pancreatitis; and hemorrhagic stroke (reviewed in *Alcohol Research & Health* 2001).

Early Onset of Drinking Can Be a Marker for Future Problems, Including Alcohol Dependence and Other Substance Abuse.

Approximately 40 percent of individuals who report drinking before age 15 also describe their behavior and drinking at some point in their lives in ways consistent with a diagnosis for alcohol dependence. This is four times as many as among those who do not drink before age 21 (Grant and Dawson 1997).

Besides experiencing a higher incidence of dependence later in life, youth who report drinking before the age of 15 are more likely than those who begin drinking later in life to have other substance abuse problems during adolescence (Hawkins et al. 1997; Robins and Przybeck 1985; Schulenberg et al. 1996a); to engage in risky sexual behavior (Grunbaum et al. 2004); and to be involved in car crashes, unintentional injuries, and physical fights after drinking both during adolescence and in adulthood. This is true for individuals from families both with and without a family history of alcohol dependence (Hingson et al. 2000, 2001, 2002). Delaying the age of onset of first alcohol use as long as possible would ameliorate some of the negative consequences associated with underage alcohol consumption.

The Negative Consequences of Alcohol Use on College Campuses Are Widespread.

Alcohol consumption by underage college students is commonplace, although it varies from campus to campus and from person to person. Indeed, many college students, as well as some parents and administrators, accept alcohol use as a normal part of student life. Studies consistently indicate that about 80 percent of college students drink alcohol, about 40 percent engage in binge drinking,⁵ and about 20 percent

⁵ In college studies, *binge drinking* is usually defined as "five or more drinks in a row for men and four or more drinks in a row for women" (National Institute on Alcohol Abuse and Alcoholism [NIAAA] National Advisory Council). The definition was refined by the NIAAA National Advisory Council in 2004 as follows: "A 'binge' is a pattern of drinking alcohol that brings blood alcohol concentration (BAC) to 0.08 gram percent or above. For the typical adult, this pattern corresponds to consuming 5 or more drinks (male), or 4 or more drinks (female), in about 2 hours." It is a criminal offense in every State for an adult to drive a motor vehicle with a blood alcohol level of 0.08 gram percent or above.

engage in frequent episodic heavy consumption, which is bingeing three or more times over the past 2 weeks (National Institute on Alcohol Abuse and Alcoholism [NIAAA] 2002). The negative consequences of alcohol use on college campuses are particularly serious and pervasive. For example:

- An estimated 1,700 college students between the ages of 18 and 24 die each year from alcohol-related unintentional injuries, including motor vehicle crashes (Hingson et al. 2005).
- Approximately 600,000 students are unintentionally injured while under the influence of alcohol (Hingson et al. 2005).
- Approximately 700,000 students are assaulted by other students who have been drinking (Hingson et al. 2005).
- About 100,000 students are victims of alcohol-related sexual assault or date rape (Hingson et al. 2005).

Underage Military Personnel Engage in Alcohol Use That Results in Negative Consequences. According to the most recent (2005) Department of Defense Survey of Health-Related Behaviors Among Military Personnel, 62.3 percent of underage military members drink at least once a year, with 21.3 percent reporting heavy alcohol use.⁶ Problems among underage military drinkers include: serious consequences (15.8 percent); alcohol-related productivity loss (19.5 percent); and as indicated by AUDIT scores,⁷ hazardous drinking (25.7 percent), harmful drinking (4.6 percent), or possible dependence (5.5 percent) (Bray et al, 2006).

Children of Alcoholics Are Especially Vulnerable to Alcohol Use Disorders. Children of alcoholics (COAs) are between 4 and 10 times more likely to become alcoholics than children from families with no

⁶ Heavy alcohol use in this survey refers to drinking five or more drinks per typical drinking occasion at least once a week.

⁷ The Alcohol Use Disorders Identification Test (AUDIT), which was developed by the World Health Organization consists of 10 questions scored 0 to 4 that are summed to yield a total score ranging from 0 to 40. It is used to screen for excessive drinking and alcohol-related problems. Scores between 8 and 15 are indicative of hazardous drinking, scores between 16 and 19 suggest harmful drinking, and scores of 20 or above warrant further diagnostic evaluation for possible alcohol dependence.

alcoholic adults (Russell 1990) and therefore require special consideration when addressing underage drinking. COAs are at elevated risk for earlier onset of drinking (Donovan 2004) and earlier progression into drinking problems (Grant and Dawson 1998). Some of the elevated risk is attributable to the socialization effects of living in an alcoholic household, some to genetically transmitted differences in response to alcohol that make drinking more pleasurable and/or less aversive, and some to elevated transmission of risky temperamental and behavioral traits that lead COAs, more than other youth, into increased contact with earlier-drinking and heavier-drinking peers.

SECTION 2

Alcohol Use and Adolescent Development

Adolescence, the period between the onset of puberty⁸ and the assumption of adult roles, is a time of particular vulnerability to alcohol use and its consequences for a variety of developmental reasons, some specific to the individual and others related to the biological and behavioral changes produced by adolescence itself. It also is a time when the developing brain may be particularly susceptible to long-term negative effects from alcohol use (Brown et al. 2000; Crews et al. 2000; De Bellis et al. 2000; Swartzwelder et al. 1995*a*, 1995*b*; Tapert and Brown 1999; White and Swartzwelder 2005). New research indicates that the brain continues to develop into the twenties (Giedd 2004), creating a significant and extended period during its development of potential exposure to alcohol's harmful effects, particularly because so many youth drink alcohol, so many start drinking relatively early (Johnston et al. 2006*a*; Johnston et al. 2006*b*; SAMHSA 2006), and so many binge drink (Johnston et al. 2006*a*; Johnston et al. 2006*b*; SAMHSA 2006). Preventing and reducing underage alcohol use is a complex process, however. To succeed, it must involve not only parents but other adults, youth, schools, communities, govern-

⁸ For the purpose of this document, *puberty* is defined as a sequence of events by which a child becomes a young adult characterized by secretions of hormones, development of secondary sexual characteristics, reproductive functions, and growth spurts.

ments at all levels, private institutions, and society itself. This section will describe:

- The developmental characteristics of adolescents that make them particularly vulnerable to alcohol involvement.
- Emerging research on potential long-term consequences of early alcohol use, including effects on the brain.
- The dynamic interaction between internal characteristics (e.g., personality) of adolescents and their external environment (e.g., school, family, peers).
- The developmental approach that provides a means by which the Nation as a whole can address underage alcohol use in a systematic, integrated way.

Adolescence is the extraordinary period of dynamic change when a person moves from childhood to adulthood. During this transition, adolescents must cope with dramatic changes in their bodies, feelings, perspectives, and environments. They face new sexual and aggressive urges, the drive for autonomy, and the demands of their peer group as they seek to develop a stronger sense of themselves. They will experience unfamiliar situations, pressures, desires, and challenges for which they have no prior frame of reference and often are not fully prepared to deal with effectively on their own. Furthermore, adolescence is associated with increased freedom, decreased monitoring by adults, and an increased affiliation with peers. This period of dramatic change and expanding opportunities “may herald a risky passageway until the regulatory capacity develops to manage new skills, opportunities or impulses” (Masten 2004).

Adolescence is a time of heightened risk taking, independence seeking, and experimentation, although the extent of these behaviors varies widely among individuals. It is “a period when an appetite for adventure, a predilection for risks, desire for excitement, and inclination toward passionate

action, seem to reach naturally high levels” (Dahl and Hariri 2004). During this period, alcohol can present a special allure to some adolescents for social, genetic, psychological, and cultural reasons. This attraction occurs at the very time adolescents may not be fully prepared to anticipate all the effects of drinking alcohol and when they are more vulnerable to certain of its adverse consequences. Further, alcohol has been shown to impair one’s ability to evaluate risk and reward when making decisions (George et al. 2005).

Adolescents operate within many different social systems, which both influence them and are, in turn, influenced by them (Bronfenbrenner 1979). As shown in Figure 8, these systems include the adolescent’s family, peers, school, extracurricular and community activities, sports teams and clubs, religious institutions, other diverse organizations with which the adolescent interacts, part-time work, the community itself, the culture, and even influences from around the world accessed through the Internet and other electronic resources. Each of these social systems exposes the

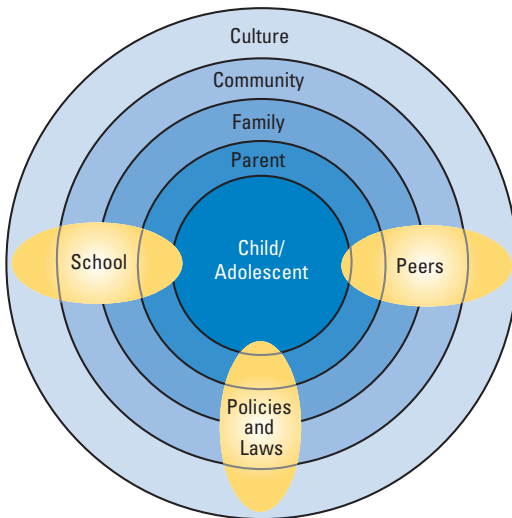


Figure 8: Systems That Influence Adolescent Behavior.

This schematic represents the multiple systems in which adolescents are embedded. Their relative influences vary across development.

adolescent to both positive and negative influences, potentially increasing or decreasing the adolescent's risk of alcohol use. The multiple systems also overlap—reinforcing or contradicting each other—and they interact: each is affected in some way by the other.

Because adolescents are involved in multiple systems, all of which may affect their decision to use alcohol, each system plays a part in that decision. For example, a stable family environment contributes to positive outcomes, as does a supportive community. To properly protect adolescents from alcohol use, parents and other adults must engage in multiple social systems as individuals, citizens, and voters. By understanding the role these systems play in the teen's life and by acting strategically on the basis of established and emerging research, the Nation can reduce the risk and consequences of underage alcohol use.

A DEVELOPMENTAL FRAMEWORK

Underage alcohol use is best addressed and understood within a developmental framework, because this behavior is directly related to the processes that occur during adolescence. Recent advances in the fields of epidemiology, developmental psychopathology, human brain development, and behavioral genetics have provided new insights into adolescent development and its relationship to underage alcohol use. Research indicates that adolescent alcohol consumption is a complex behavior influenced by:

- Normal maturational changes that all adolescents experience (e.g., biological and cognitive changes, such as sexual development and differential maturation of specific regions of the brain, and psychological and social changes, such as increased independence and risk taking).
- Multiple social and cultural contexts (i.e., the social systems) in which adolescents live (e.g., family, peers, and school).
- Genetic, psychological, and social factors specific to each adolescent.

- Environmental factors that influence the availability and appeal of alcohol (e.g., enforcement of underage alcohol policies by schools and others, community support for enforcement of underage drinking laws, marketing practices, pricing, and the physical availability of alcohol).

The development of adolescent alcohol use involves multiple processes that influence one another. Biological factors internal to the adolescent, such as genes and hormones, interact with factors external to the adolescent, which range from peers to school to the overall culture, in determining whether he or she will use alcohol. Some external factors are chosen by the adolescent, such as peers, and some are determined for them, such as family and neighborhood. Internal and external factors influence each other in reciprocal ways as the adolescent's development unfolds over time. For example, a tendency toward risky behavior may lead the adolescent to join a risk-taking peer group, which, in turn, may encourage the adolescent to take greater risks. Importantly, because of the interplay of internal and external factors in a given individual, youth are not at uniform risk for alcohol consumption nor are individual adolescents uniformly at risk over the span of their own adolescence. Instead, the relative influence of various risk and protective factors shifts throughout adolescence.

THE DEVELOPING ADOLESCENT BRAIN

Age, experience, and overall physical maturation, including puberty, are among the multiple factors influencing brain development. In adolescence, brain development is characterized by dramatic changes to the brain's structure, neuron connectivity (i.e., "wiring"), and physiology (Restak 2001). For example, during late childhood and early adolescence the number of neural connections increases. By contrast, in later adolescence the number of connections is reduced through selective pruning at the same time that myelination of neurons is increasing, thereby enhancing the efficiency of the brain. These changes in the brain affect everything

from emerging sexuality to emotionality and judgment. Because not all parts of the adolescent brain mature at the same time, the adolescent may be at a disadvantage in certain situations (Dahl 2004). For example, the limbic areas of the brain, which are thought to regulate emotions and are associated with an adolescent's lowered sensitivity to risk and propensity for novelty and sensation seeking, mature earlier than the frontal lobes, which are thought to be responsible for self-regulation, judgment, reasoning, problem-solving, and impulse control. This difference in maturational timing across the brain can result in impulsive decisions or actions, a disregard for consequences, and emotional reactions that can put teenagers at serious risk in ways that may surprise even the adolescents themselves. There is, however, tremendous individual variability among adolescents, the pathways they follow, and the outcomes they experience. For example, the emotional and physical energy that is characteristic of adolescence can be channeled into sports, academics, music, art, and various causes as well as in negative directions that produce adverse outcomes, including alcohol use (Dahl and Hariri 2004). Experiences that promote self-reliance and self-regulation may involve some risk, but they contribute to the attainment of the adolescent's independence—a principle that holds true even though adolescents follow different pathways.

ADOLESCENT DECISIONMAKING AROUND ALCOHOL

Despite a body of literature suggesting that adolescents have not yet reached full cognitive maturity, they generally do as well as adults when called upon to make reasoned decisions using abstract processes in emotionally neutral situations. Differences in decisionmaking between adults and adolescents are most evident in situations with heightened social or emotional overtones. Such contexts may intensify the innate drive adolescents experience for novelty and sensation seeking. As a result, they may be more likely to make decisions that place themselves at greater risk when peers are present and/or in emotionally charged settings (Steinberg 2004). Given that certain situations can override an adolescent's good

intentions and sound decision-making capacity, it is important to structure the social system surrounding youth to minimize negative outcomes.

Although all adolescents are subject to having their decisions influenced by peers and/or emotional arousal, those who associate with a more deviant peer group may be at additional risk because of the kinds of activities with which this peer group may be involved. Relevant to underage drinking, studies show that adolescents who spend more time with peers who consume alcohol are more likely to drink (Colder and Chassin 1999; Curran et al. 1997; Sieving et al. 2000; Stice et al. 1998).

STRESS, PUBERTY, AND SIGNIFICANT ADOLESCENT TRANSITIONS

The physical effects of puberty create dramatic changes in the sexual and social experience of maturing adolescents that require significant psychological and social adaptation. Together with hormonally induced mood and behavior changes, these sexual and social maturation stressors may contribute to increased consumption of alcohol during the adolescent period (Tschann et al. 1994). In graduating from elementary to middle school, from middle school to high school, and from high school to college or the workplace, adolescents move in and out of different social contexts and peer groups, which exposes them to new stressors. These transitions lead to increased responsibilities and academic expectations, which are also potential sources of stress. This is important because research shows a link between stress and alcohol consumption. For example, research on nonhuman primates shows that adolescent monkeys double their alcohol intake under stress and that excessive alcohol consumption is related to changes in stress hormones and serotonin (reviewed in Barr et al. 2004).⁹

⁹ Serotonin is a *neurotransmitter* that modifies neuron function, exerting its effects by interacting with receptors on the neuron's surface.

Significant contextual transitions and achievement of milestones for adolescents often occur at specific ages, not at specific developmental periods. For example, the moves to middle and high school and the acquisition of a driver's license and job experience are generally age-based. As a result, some adolescents may be developmentally out of step with the majority of their peers or with the demands of their social environment, particularly in the case of early- and late-maturing adolescents. A mismatch between social pressures and the cognitive and emotional abilities of an adolescent may increase vulnerability to involvement with alcohol. In the case of early-maturing adolescent girls, for example, having an older or adult boyfriend raises the risk for underage use of alcohol and other drugs and the adoption of delinquent behaviors (Castillo Mezzich et al. 1999). For boys, same-gender peers rather than older romantic interests tend to increase the risk for initiation into alcohol and other drug use (Dishion et al. 1994; Elliot and Menard 1996; Fergusson and Horwood 1996, 1999; Hawkins et al. 1992; Kandel 1978; Sampson and Laub 1993). During significant transitions, adolescents can benefit from extra support to avoid alcohol use.

CHANGE IN EXPECTATIONS¹⁰ ABOUT ALCOHOL USE IN ADOLESCENCE

Expectations about the effects of drinking alcohol are measurable in children before they begin to drink and can influence how early a child drinks and how much he or she will drink at initiation. Research suggests that people who have expectations of more positive experiences from drinking tend to drink more than others and are at highest risk for excessive drinking. Children in general shift from a primary emphasis on the negative or adverse effects of drinking alcohol before about age 9 to a primary emphasis on the positive and arousing effects of alcohol by about age 13 (Dunn and Goldman 1996, 1998). Those at highest risk for excessive drinking show the largest emphasis on alcohol's positive or arousing

¹⁰ This concept is commonly referred to as *expectancies* in the alcohol research literature.

effects. Therefore, it is important to be aware of the messages about alcohol use that youth receive and the attitudes that these messages engender in children and adolescents about alcohol and its use.

PERSONALITY TRAITS, MENTAL DISORDERS, AND ADOLESCENT ALCOHOL USE

Research studies on adolescent drinking have examined the impact of particular personality traits on drinking risk. These studies have repeatedly failed to find specific sets of traits that uniquely predict alcohol use in adolescents. Despite the fact that no set of traits has been found that predicts alcohol use, research does show that adolescents who are heavy alcohol users or have alcohol use disorders (AUDs) often exhibit certain personality traits (which also are shared by some adolescents who do not abuse alcohol). High levels of impulsiveness, aggression, conduct problems, novelty seeking (Gabel et al. 1999), low harm avoidance (Jones and Heaven 1998), and other risky behaviors in childhood and early adolescence may be associated with future heavy alcohol use and AUDs (Soloff et al. 2000).

Depression and anxiety also are risk factors for alcohol problems because some people use drinking as a coping strategy for dealing with internal distress. And, more generally, adolescents with defined mental disorders have significantly elevated rates of alcohol and other drug use problems. In these cases, early treatment of mental disorders, such as depression or excessive anxiety, is warranted before an adolescent begins to drink as well as after initiation of drinking. Furthermore, it is important to recognize that youth who use alcohol are also more likely to use other substances and vice versa. Because many young people are involved not only with alcohol but also with other substances and may have a mental disorder, interventions should be designed to address this complexity.

ADOLESCENTS FROM FAMILIES WITH A HISTORY OF ALCOHOL DEPENDENCE

Children from families of alcoholics are at increased risk for alcohol dependence throughout their lives. More than three decades of research has firmly established that genes account for over half of the risk for alcohol dependence, and environmental factors account for the remainder. Researchers have succeeded in identifying regions of chromosomes associated with an altered risk of developing alcohol dependence and, in some cases, individual genes and candidate genes¹¹ but no single gene that accounts for the majority of risk. The development of a complex behavioral disorder such as alcohol dependence likely depends on specific genetic factors interacting with one another, multiple environmental factors, and the interaction between genetic and environmental factors. Important when considering underage drinking is research suggesting that genes have a stronger influence over the development of problem use, whereas environment seems to play a greater role in the initiation of alcohol use (Rhee et al. 2003).

SENSITIVITY TO THE EFFECTS OF ALCOHOL USE

Animal research indicates that adolescents in general are more sensitive than adults to the stimulating effects of alcohol and less sensitive to some of the aversive effects of acute alcohol intoxication, such as sedation, hangover, and ataxia (loss of muscular coordination) (Doremus et al. 2003; Little et al. 1996; Silveri and Spear 1998; Varlinskaya and Spear 2004; White et al. 2002; for review, see Spear 2000 and Spear and Varlinskaya 2005). This difference in sensitivity between adolescents and adults may make adolescents more vulnerable to certain harmful effects of alcohol use. For example, adolescents are able to drink more than adults (who might pass out or be inclined to go to sleep) and therefore are

¹¹ A *candidate gene* is a gene that has been implicated in causing or contributing to a particular disease. For a review of candidate genes that may contribute to alcohol dependence, see *Alcohol Research & Health* 28(3):133–142, 2004/2005.

more likely than adults to initiate activities when they are too impaired to perform them competently, such as driving, and also are more likely to drink to the point of coma. Furthermore, in the case of driving, each drink increases impairment more for adolescents than adults (Hingson and Winter 2003). Children with alcoholic parents may be at even greater risk for excessive drinking resulting from a combination of genetic and developmental factors that lower sensitivity to alcohol.

THE EFFECTS OF ALCOHOL ON PHYSIOLOGICAL PROCESSES AND BIOLOGICAL DEVELOPMENT

A question of primary concern is whether adolescent alcohol consumption can disrupt physiological processes and biological development to produce long-term negative consequences. Recent research shows that adolescent alcohol use has the potential to trigger long-term biological changes that may alter an adolescent's development as well as affect the adolescent's immediate behavior. The resulting adverse outcomes may include mental disorders such as anxiety and depressive disorders. Furthermore, early alcohol use may have detrimental effects on the developing brain, including neurocognitive impairment (Brown and Tapert 2004).

Animal studies show that a sustained pattern of binge-like drinking in adolescence affects memory, alters sensitivity to motor impairment, and damages frontal-anterior cortical regions (Crews et al. 2000; Spear and Varlinskaya 2005; White and Swartzwelder 2005). The frontal cortex is important in the development of self-regulation, judgment, reasoning, problem-solving, and impulse control. Studies in animals indicate that alcohol consumption before and during adolescence produces long-lasting effects that increase alcohol consumption in adulthood (reviewed in Rodd et al. 2004 and Siciliano and Smith 2001), which may help explain the correlation between early use and later dependence in humans. Moreover, human studies indicate that long-term heavy alcohol use continued throughout one's lifetime can result in more severe effects on the

brain's structure and functioning (Jacobson 1986; Pfefferbaum et al. 2001; Victor et al. 1989). Although there have been only a few studies, there is some indication that adolescents who drink heavily may experience adverse effects that disrupt normal growth and affect liver, bone, and endocrine development (*Alcohol Research & Health* 28(3), 2004/2005 [see Table on p. 127]).

INTERVENING AMIDST COMPLEXITY

Underage alcohol use is a highly complex phenomenon with multiple potential scenarios and unpredictable outcomes. Young people who are vulnerable to alcohol involvement as pre-adolescents can acquire positive, health-promoting, low-risk behaviors upon reaching adolescence. Others who are at low risk as pre-adolescents can develop substantial problems with alcohol in later adolescence. A developmental approach to preventing and reducing underage alcohol use takes into account the complex forces and factors that shape how an adolescent will respond to the availability of alcohol in different situations at different times across the span of adolescence. Complex interactions among biological, social, cultural, and environmental factors also evolve as maturation proceeds; thus, the same adolescent at age 13 and later at age 17 will have different developmental needs and require different protective structures and skills to succeed. To further complicate matters, periods of rapid transition, reorganization, and growth spurts alternate with periods of quiet and consolidation—all within a social context that is changing. A developmental approach to prevention and reduction of underage drinking recognizes the importance of all the environmental and social systems that affect adolescents as well as their own maturational processes and individual characteristics.

SECTION 3

Prevention and Reduction of Alcohol Use and Alcohol Use Disorders in Adolescents

To succeed, prevention and reduction efforts must take into account the dynamic developmental processes of adolescence, the influence of an adolescent's environment, and the role of individual characteristics in the adolescent's decision to drink. The goals of interventions aimed at underage alcohol use¹² are to:

- Change societal acceptance, norms, and expectations surrounding underage drinking.
- Prevent adolescents from starting to drink.
- Delay initiation of drinking.
- Intervene early, especially with high-risk youth.¹³
- Reduce drinking and its negative consequences, including progression to AUDs, when initiation already has occurred.

¹² The ultimate goal is to increase the age of initiation to the minimum legal drinking age of 21, thereby eliminating drinking by individuals under 21 and its consequences; however, underage drinking is so strongly embedded in the Nation's culture that the more realistic goals of increasing the average age of initiation and reducing underage drinking and its negative consequences are included as incremental steps.

¹³ Examples of high-risk youth include children with externalizing disorders, children from families with a history of alcohol dependence, youth who exhibit a special predilection for sensation seeking, and youth who have experienced trauma. These are risk factors not only for alcohol use but for other substance abuse and mental disorders as well.

- Identify adolescents who have developed AUDs and who would benefit from additional interventions, including treatment and recovery support services.

In essence, these efforts form a continuum designed to help children and adolescents make sound choices about alcohol use. Scientific research provides the foundation for the design of interventions that accomplish these goals and the means for determining which interventions are effective.

Prevention efforts have typically approached the issue of underage drinking through two avenues: by seeking to change the adolescent and by seeking to change the adolescent's environment. Interventions aimed at adolescents themselves seek to change expectations, attitudes, and intentions; impart knowledge and skills; and provide the necessary motivation to better enable adolescents to resist influences that would lead them to drink. Environmental interventions seek to reduce opportunities for underage drinking (i.e., the availability of and access to alcohol for adolescent consumption). Examples include (1) increasing enforcement of and penalties for violating the minimum legal drinking age for youth who drink or attempt to purchase alcohol, for merchants who sell to youth, and for people who provide alcohol to underage youth, and (2) reducing community tolerance for underage alcohol use.

ADOPTING A DEVELOPMENTAL APPROACH

A developmental approach to interventions retains the same fundamental goals as the traditional approach and, in addition, incorporates an understanding of the dynamic, complex nature of adolescent development. The objective of this approach is to ensure the emergence of a self-reliant, competent, and healthy adult at the end of the adolescent maturation process. It focuses on identifying and countering, weakening, or eliminating risk factors for underage alcohol use while identifying and strengthening

protective factors—all based on the adolescent’s maturational stage, internal characteristics, and the characteristics of the external environment.

The developmental approach addresses the multilayered environment, or social systems, in which adolescents exist. It promotes creating opportunities for positive growth and development by recognizing youth for their assets and abilities and by engaging them in their communities through such activities as volunteering, sports, music, academics, and leadership (Benson et al. 1998; Lerner 2002; Scales et al. 2000). There is evidence that youth who spend more time engaged in these types of activities are less likely to engage in risky behaviors, such as alcohol use.

INTEGRATED STRUCTURES TO PROTECT THE ADOLESCENT

A scaffold is a temporary, supportive structure used in the construction of buildings and other large structures. In this context, the term “scaffolding” (Gauvain 2001; Vygotsky 1978; Wood et al. 1976) is used to represent the structured process through which positive development is facilitated and risk is minimized by providing protection from the natural risk-taking, sensation-seeking tendencies of the adolescent. It is a fitting metaphor for the supports and protections that parents and society provide children and youth to help them function in a more mature way until they are ready to function without that extra support. Through scaffolding, parents and societies can provide young people—who can be viewed as “adults under construction”—with supports that ensure their safe and healthy maturation from birth to adulthood (e.g., curfews that change as children get older and are ready for greater responsibility).

Throughout childhood and especially during adolescence, effective scaffolding requires frequent readjustment because individuals and their situations are continually changing. This external support system, or scaffold, around the adolescent promotes healthy development and provides protection

from alcohol use and other risky behaviors by facilitating good decision-making, mitigating risk factors, and buffering against potentially destructive outside influences that draw adolescents to alcohol use. *Buffering* refers to protecting adolescents by intercepting or moderating adverse pressures or influences on them so that they are not overwhelmed and can rely on their own adaptive capacities for self-protection.

Ideally, effective scaffolding is:

- *Developmentally based and culturally appropriate:* The protective extent of the scaffold matches the child's developmental stage and maturation level, is culturally appropriate, and is modified as needed, especially during significant transition points in the adolescent's life.
- *Comprehensive:* Scaffolding is multifaceted, consisting of elements constructed by parents, school, community, and society. Scaffolding is the responsibility of the Nation as a whole, for which underage alcohol use is a public health and safety problem.
- *Integrated:* The various components of the scaffold (e.g., community, school, and parents) are aligned, complement and reinforce each other, and create synergy. When some weaken, others are strengthened.
- *Evolving:* The scaffold is modified as the child matures to remain developmentally appropriate to the adolescent's maturational level to encourage the development of autonomy and, ultimately, the adoption of adult roles. The scaffold should protect, but not suffocate, allowing adolescents to interact with, and contribute to, the world in which they live and ultimately achieve the developmental goals of independence and self-reliance.
- *Initiated early:* The scaffold is initiated early, before puberty begins. However, it is better to construct a scaffold later than not at all.

- *Long-term:* Some form of scaffold should remain in place throughout adolescence, but elements should be carefully removed to facilitate the development of independence and self-reliance.

A shift in significant support structures, such as parental divorce or a move to a new town, can increase the risk for alcohol use and may require that additional elements be added to strengthen the scaffolding, at least temporarily.

A developmental approach to underage drinking recognizes that not all adolescents drink, and those who do drink differ in their drinking patterns (the way in which they tend to drink—e.g., daily drinking, bingeing, weekends only) and their drinking trajectories (how and when they started drinking and how their drinking plays out over time). No single trajectory or pattern of consumption describes the course of alcohol use for all or even most young people (Schulenberg et al. 1996a, 1996b). The trajectories and patterns of consumption vary considerably as adolescents grow into young adults and may be altered by their experiences, including treatment for AUDs (Chung et al. 2003). Developmental differences in consumption trajectories and patterns may have important implications for interventions, determining, for example, what types of messages are relevant to specific groups of young people. Some interventions have proved effective for youth who have not initiated alcohol use but not for youth who have (Perry et al. 1996, 2002).

INTERVENING WITH ADOLESCENTS WHO HAVE ALCOHOL PROBLEMS, INCLUDING AUDS

Based on their responses to a survey conducted in 2004, approximately 3.7 million or 9.8 percent of American youth ages 12–20 met criteria for AUDs and/or received treatment at a specialty facility¹⁴ for an alcohol problem. Interventions for youth with AUDs are an essential component

¹⁴ *Specialty treatment* is defined as treatment received at hospitals (inpatient only), drug or alcohol rehabilitation facilities (inpatient or outpatient), or mental health centers. It excludes treatment in an emergency room, private doctor's office, self-help group, prison or jail, or hospital as an outpatient.

of the protective structure society should provide for its adolescents and one end of the continuum of interventions that prevents and reduces underage alcohol use. Of the 3.7 million, only 232,000 received treatment in a specialty facility, suggesting an unmet need for screening,¹⁵ referral, and treatment of adolescent AUDs and associated behavioral problems. Contributing factors may include the cost of intervention, lack of insurance coverage, limited access to care, and lack of awareness of the problem. For example, not all pediatricians systematically screen adolescent patients for substance abuse (Kulig and American Academy of Pediatrics Committee on Substance Abuse 2005). Furthermore, pediatric health care providers underestimate alcohol use and AUDs among adolescents (Wilson et al. 2004). In addition, a subset of young people receives much of their medical care in an emergency department where it is unlikely they will be asked about their alcohol use. Further, limited availability of developmentally and culturally appropriate treatment and, in rural areas, the need to travel long distances to receive care may present additional barriers to intervention.

When adequate screening is in place, adolescents with alcohol-related problems, including those who do not meet formal diagnostic criteria, can be identified, referred for, and provided with appropriate interventions (including brief interventions) to prevent them from progressing to deeper alcohol involvement. However, diagnosing AUDs among adolescents is a challenging task. Criteria used to diagnose AUDs in adolescents were derived largely from clinical and research experience with adults (Chung et al. 2005). Yet, numerous developmental differences between adolescents and adults may affect the applicability of AUD criteria to youth. Developmental differences in alcohol use patterns indicate the need to adapt existing criteria to make them relevant to, and properly scaled for, an adolescent's stage of maturation (Brown 1999; Chung and Martin 2001, 2005; Martin et al. 1996). Current diagnostic criteria may overestimate problems in some adolescents while failing to capture hazardous

¹⁵ *Screening* refers to the process of evaluating members of a population (e.g., all patients in a physician's practice) to estimate their likelihood of using alcohol and/or having alcohol-related problems.

practices in others (Martin and Winters 1998). Of primary importance is the need for a more valid diagnostic system for assessing the nature and magnitude of adolescent problem drinking that is appropriate to an adolescent's stage of maturation.

Early evidence on the effectiveness of brief motivational interventions in reducing or eliminating alcohol-related problems in adolescents indicates that they may be effective in reducing both drinking and its consequences, such as drunk driving (reviewed in Larimer and Cronce 2002; see also Tevyaw and Monti 2004). However, further analysis is necessary to determine both the duration of effects and which adolescents are likely to benefit from this type of intervention based on their drinking patterns, trajectories, and behaviors. As appropriate, adolescents can be referred for more extensive and/or intensive treatment for their AUDs.

Most current specialized treatment services are not optimally designed for access and engagement by youth (Brown 2001). Consequently, alternative treatment formats, attention to developmental transitions, and social marketing are needed to more adequately address alcohol use and alcohol-related problems emerging in adolescence (Brown 2001; Kypri et al. 2004; O'Leary et al. 2002). Further, treatment for adolescents frequently requires integrating interventions for alcohol use, other drug use, mental disorders, and family problems. Some of the most promising interventions for adolescents with AUDs have incorporated multiple components and systems, such as family-based intervention, group or individual cognitive-behavioral therapy, and therapeutic community interventions (see, e.g., Swensen et al. 2005 and Waldron and Kaminer 2004).

SECTION 4

Taking Action: A Vision for the Future

Underage alcohol use is a complex problem that has proved resistant to solution for decades. Established and emerging research, however, suggests a new evidence-based approach with considerable promise. It is that approach—and the possibilities it holds for the Nation’s youth—that inspires the vision of *The Surgeon General’s Call to Action To Prevent and Reduce Underage Drinking*.

PRINCIPLES

The *Call to Action* is based on several overarching principles from which its goals and the means for achieving them were derived. These principles are:

1. *Underage alcohol use is a phenomenon that is directly related to human development.* Because of the nature of adolescence itself, alcohol poses a powerful attraction to adolescents, with unpredictable outcomes that can put any child at risk.
2. *Factors that protect adolescents from alcohol use as well as those that put them at risk change during the course of adolescence.* Internal characteristics, developmental issues, and shifting factors in the adolescent’s environment all play a role.

3. *Protecting adolescents from alcohol use requires a comprehensive, developmentally based approach* that is initiated before puberty and continues throughout adolescence with support from families, schools, colleges, communities, the health care system, and government.
4. *The prevention and reduction of underage drinking is the collective responsibility of the Nation.* Scaffolding the Nation's youth is the responsibility of all people in all of the social systems in which adolescents operate: family, schools, communities, health care systems, religious institutions, criminal and juvenile justice systems, all levels of government, and society as a whole. Each social system has a potential impact on the adolescent, and the active involvement of all systems is necessary to fully maximize existing resources to prevent underage drinking and its related problems. When all the social systems work together toward the common goal of preventing and reducing underage drinking, they create a powerful synergy that is critical to realize the vision.
5. *Underage alcohol use is not inevitable,* and parents and society are not helpless to prevent it.

GOALS

The healthy development of America's youth is a national goal that is threatened by underage alcohol consumption and the adverse consequences it can bring. In sometimes subtle and sometimes dramatic ways, underage alcohol use can sidetrack the trajectory of a child's life—or end it. The freedom to fulfill one's potential and to develop without the impairment of alcohol's negative consequences is a significant part of the vision for the future described in this *Call to Action*. The fulfillment of that vision rests on the achievement of six goals that the Surgeon General has proposed for the Nation. Those goals are:

- Goal 1:** Foster changes in American society that facilitate healthy adolescent development and that help prevent and reduce underage drinking.
- Goal 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.
- Goal 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 environmental, ethnic, cultural, and gender differences.
- Goal 4:** Conduct additional research on adolescent alcohol use and its relationship to development.
- Goal 5:** Work to improve public health surveillance on underage drinking and on population-based risk factors for this behavior.
- Goal 6:** Work to ensure that policies at all levels are consistent with the national goal of preventing and reducing underage alcohol consumption.

TAKING ACTION

It is a basic assumption of the *Call to Action* that the goals represent a series of coordinated actions that are mutually supportive and mutually necessary. These goals are not stand-alone objectives but highly integrated components of an overall approach to prevent and reduce underage drinking in America.

This section of the *Call to Action* describes the rationale that supports each of the six goals. It identifies challenges associated with realizing those goals and suggests specific strategies for achieving them. These strategies emanate from the integration of a broad body of scientific knowledge. Some are derived directly from empirical studies, whereas others are extensions of the cumulative knowledge accrued in multiple fields.

Goal 1: Foster Changes in American Society That Facilitate Healthy Adolescent Development and That Help Prevent and Reduce Underage Drinking.

Rationale

Culture generally is thought to mean the set of attitudes, values, norms, customs, and beliefs that distinguishes one group of people from another group. Nations, communities, ethnic and religious groups, schools, and peer groups all have distinct cultures. The various cultures in which an adolescent lives have a significant influence on his or her decisions about alcohol use. The attitudes and values of an adolescent's community with regard to underage alcohol use and appropriate adult use form an important part of the social structure that protects youth from alcohol use—or puts them at risk—because they determine the extent to which the community itself and the adults within that community will encourage or discourage underage drinking.

Alcohol, in its many forms, is familiar to children and adolescents and often appears relatively benign, if not openly enticing. Yet it is not benign for underage drinkers. Reducing cultural forces that encourage or support underage alcohol consumption lessens both the attraction of alcohol and the likelihood that it will be consumed by youth.

A culture in which youth feel that underage drinking is accepted, acceptable, or even expected promotes underage drinking. Society as a whole needs to send the message that it strongly disapproves of underage alcohol use because of its potentially adverse consequences and that it will not condone or permit it. At the same time, it is necessary to work to increase those societal forces that facilitate and support an alcohol-free childhood and adolescence.

Challenges

Culture is complex, and changing it requires sustained efforts on the part of multiple segments of society. The culture around drinking in the United States is especially difficult to change because alcohol use is embedded in American society, is legal and acceptable for most adults, and is often regarded as a rite of passage for youth. Many young people believe that drinking is not only acceptable but expected of them and a way for them to feel more grown-up. Finally, alcohol holds a powerful attraction for adolescents because of the nature of adolescence itself.

Strategies

For parents and other caregivers: Parents have a responsibility to help shape the culture in which their adolescents are raised, particularly the culture of their schools and community. Parental strategies include the following:

- Partner with other parents in their child's network to ensure that parties and other social events do not allow underage alcohol consumption, much less facilitate its use or focus on it.
- Collaborate with other parents in coalitions designed to ensure that the culture in the schools and community support and reward an adolescent's decision not to drink.
- Serve as a positive role model for adolescents by not drinking excessively, by avoiding alcohol consumption in high-risk situations (e.g., when driving a motor vehicle, while boating, and while operating machinery), and by seeking professional help for alcohol-related problems.

For colleges and universities: Given the prevalence of underage drinking on college campuses, institutions of higher education should examine their policies and practices on alcohol use by their students and the extent to which they may directly or indirectly encourage, support, or facilitate

underage alcohol use. Colleges and universities can change a campus culture that contributes to underage alcohol use. Some measures to consider are to:

- Establish, review, and enforce rules against underage alcohol use with consequences that are developmentally appropriate and sufficient to ensure compliance. This practice helps to confirm the seriousness with which the institution views underage alcohol use by its students.
- Eliminate alcohol sponsorship of athletic events and other campus social activities.
- Restrict the sale of alcoholic beverages on campus or at campus facilities, such as football stadiums and concert halls.
- Implement responsible beverage service policies at campus facilities, such as sports arenas, concert halls, and campus pubs.
- Hold all student groups on campus, including fraternities, sororities, athletics teams, and student clubs and organizations, strictly accountable for underage alcohol use at their facilities and during functions that they sponsor.
- Eliminate alcohol advertising in college publications.
- Educate parents, instructors, and administrators about the consequences of underage drinking on college campuses, including secondhand effects that range from interference with studying to being the victim of an alcohol-related assault or date rape, and enlist their assistance in changing any culture that currently supports alcohol use by underage students.
- Partner with community stakeholders to address underage drinking as a community problem as well as a college problem and to forge collaborative efforts that can achieve a solution.
- Expand opportunities for students to make spontaneous social choices that do not include alcohol (e.g., by providing frequent

alcohol-free late-night events, extending the hours of student centers and athletics facilities, and increasing public service opportunities).

For communities: Adolescents generally obtain alcohol from adults who sell it to them, purchase it on their behalf, or allow them to attend or give parties where it is served. Therefore, it is critical that adults refuse to provide alcohol to adolescents and that communities value, encourage, and reward an adolescent's commitment not to drink. A number of strategies can contribute to a culture that discourages adults from providing alcohol to minors and that supports an adolescent's decision not to drink. Communities can:

- Invest in alcohol-free youth-friendly programs and environments.
- Widely publicize all policies and laws that prohibit underage alcohol use.
- Work with sponsors of community or ethnic holiday events to ensure that such events do not promote a culture in which underage drinking is acceptable.
- Urge the alcohol industry to voluntarily reduce outdoor alcohol advertising.
- Promote the idea that underage alcohol use is a local problem that local citizens can solve through concerted and dedicated action.
- Establish organizations and coalitions committed to establishing a local culture that disapproves of underage alcohol use, that works diligently to prevent and reduce it, and that is dedicated to informing the public about the extent and consequences of underage drinking.
- Work to ensure that members of the community are aware of the latest research on adolescent alcohol use and, in particular, the adverse consequences of alcohol use on underage drinkers and

other members of the community who suffer from its secondhand effects. An informed public is an essential part of an overall plan to prevent and reduce underage drinking and to change the culture that supports it.

- Change community norms to decrease the acceptability of underage drinking, in part, through public awareness campaigns.
- Focus as much attention on underage drinking as on tobacco and illicit drugs, making it clear that underage alcohol use is a community problem. When the American people rejected the use of tobacco and illicit drugs as a culturally acceptable behavior, the use of those substances declined, and the culture of acceptance shifted to disapproval. The same change process is possible with underage drinking.

*For the criminal and juvenile justice systems and law enforcement.*¹⁶ The justice system and law enforcement can:

- Enforce uniformly and consistently all policies and laws against underage alcohol use and widely publicize these efforts.
- Gain public support for enforcing underage drinking laws by working with other stakeholders to ensure that the public understands that underage drinking affects both the public health and safety.
- Work with State, Tribal, and local coalitions to reduce underage drinking.

For the alcohol industry: The alcohol industry has a public responsibility relating to the marketing of its product, since its use is illegal for more than 80 million underage Americans. That responsibility can be fulfilled

¹⁶ For the purposes of this document, *law enforcement* includes any enforcement agency that provides agents or officers who can enforce or regulate any Federal, State, Tribal, or local law or ordinance.

through products and advertising design and placement that meet these criteria:

- The message adolescents receive through the billions of dollars spent on industry advertising and responsibility campaigns does not portray alcohol as an appropriate rite of passage from childhood to adulthood or as an essential element in achieving popularity, social success, or a fulfilling life.
- The placement of alcohol advertising, promotions, and other means of marketing do not disproportionately expose youth to messages about alcohol.¹⁷
- No alcohol product is designed or advertised to disproportionately appeal to youth or to influence youth by sending the message that its consumption is an appropriate way for minors to learn to drink or that any form of alcohol is acceptable for drinking by those under the age of 21.
- The content and design of industry Web sites and Internet alcohol advertising do not especially attract or appeal to adolescents or others under the legal drinking age.

For the entertainment and media industries: Because of their reach and potential impact, the entertainment and media industries have a responsibility to the public in the way they choose to depict alcohol use, especially by those under the age of 21, in motion pictures, television programming, music, and video games. That responsibility can be fulfilled by creating and distributing entertainment that:

- Does not glamorize underage alcohol use.

¹⁷ The U.S. Federal Trade Commission currently is conducting a study of alcohol advertising and marketing, including the effectiveness of industry efforts to prevent undue exposure of youth to messages about alcohol.

- Does not present any form of underage drinking in a favorable light, especially when entertainment products are targeted toward underage audiences or likely to be viewed or heard by them.
- Seeks to present a balanced portrayal of alcohol use, including its attendant risks.
- Avoids gratuitous portrayals of alcohol use in motion pictures and television shows that target children as a major audience. This is important because children's expectations toward alcohol and its use are, in part, based on what they see on the screen (Dunn and Yniguez 1999; Kulick and Rosenberg 2001; Sargent et al. 2006).

For governments and policymakers: Governments and policymakers can:

- Focus as much attention on underage drinking as on tobacco and illicit drugs, making it clear that underage alcohol use is an important public health problem.
- Ensure that all communications are clearly written and culturally sensitive.

Goal 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.

Rationale

It is easy to assign to someone else responsibility for changing public attitudes toward underage drinking and for reducing its prevalence. However, the responsibility for preventing and reducing underage alcohol use belongs to everyone in America. It will take a national commitment with active participation by the citizenry as a whole to achieve the vision of the *Call to Action* and to accomplish the goals that support it. Cooperation, coordination, and collaboration among parents, schools, communities, private sector organizations, governmental entities, and young people themselves all will be required.

The developmental approach to understanding underage alcohol use makes it clear that adolescents require external support to resist the considerable temptation to use alcohol. Particularly in highly emotional situations or social settings where the pressure to drink is strong, adolescents may not be in a position to make decisions that reject alcohol use without some degree of protective support from their environment. For example, adolescents may be tempted to drink in order to fit in with their peers, gain status, or protect themselves from ridicule. The external support they need to resist drinking in such situations might come from family, other peers, a respected adult, community norms, and policies and laws promulgated by various levels of government that, in combination, provide protection from the negative influences in the adolescent's environment. In some cases, it may be a parental rule or a law that restricts an adolescent's choices and keeps him or her from drinking, as happens, for example,

when laws setting the minimum legal drinking age at 21 reduce an under-age adolescent's access to alcohol.

Challenges

For the most part, parents and other adults underestimate the number of adolescents who use alcohol, how early drinking begins, the amount of alcohol adolescents consume, the various risks to adolescents, and the extent and nature of the consequences to both drinkers and nondrinkers. In addition, parents and other adults often are unaware of effective prevention and reduction strategies, principles, and techniques that can be used to protect their teenagers from alcohol use and its consequences. Because greater knowledge will increase the sense of urgency among adults to act more decisively in this area and to utilize the most effective means possible to protect adolescents from underage drinking, all sectors must be engaged in reaching out to their respective audiences.

Strategies

Strategy 1: Provide positive scaffolding for children and adolescents to protect them from alcohol use.

For parents and other caregivers: Throughout a child's life, parental actions do make a difference. Parents can facilitate healthy development and help protect their children from the consequences of alcohol use by increasing protective factors and reducing risk factors related to alcohol use. A developmental approach to preventing and reducing underage drinking suggests such steps as these that parents can take to protect their children and adolescents:

- Create a stable family environment and practice, as parents, being supportive, involved, and loving. Research indicates that children of such parents have better developmental outcomes and are less likely to use alcohol than children raised in less supportive

homes. Parental support includes monitoring an adolescent's activities and supporting his or her independence while setting appropriate limits (Barnes et al. 2000; Bogenschneider et al. 1998; Davies and Windle 2001; DiClemente et al. 2001; Reifman et al. 1998; Steinberg et al. 1994).

- Provide opportunities for the adolescent to be valued at home, for example, by contributing to the family's well-being (e.g., chores, part-time job, caring for a younger sibling).
- Facilitate a willingness on the part of the adolescent to share information about his or her life. Research indicates that such adolescent sharing may be associated with better outcomes around alcohol use, and, therefore, the source of parental information about their children's activities is important (Stattin and Kerr 2000).
- Recognize that regardless of how close the parent–child relationship may be, that relationship alone is not sufficient to prevent underage alcohol use. Parents must support construction of scaffolds in the other social systems that influence their adolescent's behavior: schools, community, institutions, government, and the culture as a whole. It is the combined strength afforded by the interactions of all the scaffolds in all the social systems that is most effective in preventing underage drinking.
- Clearly and consistently communicate with their underage children so that the expectation that they are not to drink is understood.
- Know the basic facts and statistics about underage alcohol use and its consequences. Armed with this knowledge, parents will feel more confident when they talk with their children about alcohol.

- Reduce or eliminate adolescent access to alcohol and do not provide alcohol to adolescents. To do otherwise sends a mixed message at best, or a supportive message at worst, about underage alcohol use.
- Ensure that all parties attended by their adolescents are properly supervised and alcohol free, including the parties their own children give.
- Respond to known instances of alcohol use with appropriate disciplinary actions.
- Recognize the link between adolescent alcohol use and suicide, other substance use, mental disorders, and risky sexual behaviors.
- Seek professional intervention if they have concerns about their child's alcohol involvement.
- Support enforcement and criminal or juvenile justice systems' efforts to uphold underage drinking laws.

Parental monitoring

Monitoring by parents and other caregivers is associated with better outcomes around adolescent alcohol use. As part of effective monitoring, parents and other caregivers should:

- Be aware of their adolescent's whereabouts.
- Know their adolescent's friends.
- Be knowledgeable of their adolescent's activities.
- Enforce the parental rules they've set.
- Strengthen their adolescent's skills in refusing alcohol.

Factors that increase risk

Parents and other caregivers should be aware of specific factors that may increase the risk of their adolescent becoming involved with alcohol or experiencing an adverse alcohol-related consequence. These factors include:

- A history of conduct problems.
- Depression and other mental disorders.
- A family history of alcohol dependence, which raises the risk of problematic alcohol involvement.
- Significant transitions (such as acquisition of a driver's license, a parental divorce, graduation from middle school to high school, or the move from high school to college or the workforce), which may increase the adolescent's stress level and/or exposure to different peers and opportunities, making it more likely that he or she will use alcohol.
- Interaction with peers involved in deviant activities.

An ongoing dialog

Parents and other caregivers should initiate and sustain with their adolescent an ongoing dialog about alcohol, as with other risky behaviors. In that dialog, parents should:

- Encourage input from their adolescent and respect that input.
- Enhance their adolescent's knowledge about drinking and its consequences.
- Clarify parental expectations.
- Set clear rules around not drinking.
- Establish specific consequences for alcohol use.

- Set clear limits, including never driving with any alcohol in their system or riding with a driver who has been drinking.
- Discuss laws concerning underage drinking, such as minimum legal drinking age and zero tolerance.¹⁸

For schools: School has a significant impact on an adolescent's life. The climate and cohesiveness of a school can play an important role in the development of an adolescent's self-identity, because students who are involved with their schools have increased opportunities for building self-confidence, developing relationships with others, and achieving success in their areas of interest. Schools can:

- Work to increase students' involvement in their school, a factor that has been found to predict less alcohol use (Catalano et al. 2004).
- Produce an environment that allows students to explore their talents and follow their passions, be they academic, musical, sports, or social and community causes.
- Provide positive outlets for adolescents' considerable energy and opportunities for validation and belonging.
- Serve as the source of a mentor, a valued teacher, or another caring adult, which has been shown to increase positive outcomes in adolescents.
- Implement evidence-based programs and practices to prevent underage drinking.
- Provide information to parents on the consequences of underage alcohol use, school policies and practices on alcohol use, and local resources.
- Recognize that significant social transitions, such as moving from elementary school to middle school, moving from middle school

¹⁸ *Zero-tolerance laws* prohibit a driver under the age of 21 with any detectable amount of alcohol in his or her system from operating a vehicle.

to high school, and obtaining a driver's license, are accompanied by increasing responsibility, added freedom, greater social pressure, and/or more demanding academic requirements. These factors may make it more likely that adolescents will use alcohol, in part because they increase adolescent stress levels. At such times of potentially increased risk, teachers and staff can be particularly alert and supportive, making a special effort to connect students at high risk or evidencing increased stress with an adult who can serve as a mentor and confidant.

- Recognize that children who mature earlier or later than the majority of their peers may be at increased risk.
- Provide and promote multiple venues where adolescents can get together with their friends.

For colleges and universities: Colleges should be safe places where students can thrive academically, grow personally, and mature socially without peer pressure to use alcohol. However, colleges can be settings where underage alcohol use is facilitated—inadvertently or otherwise—and even openly accepted as a rite of passage and actively encouraged by some students and organizations. In fact, some parents and administrators appear to accept a culture of drinking as an integral part of the college experience. Such attitudes need to change and can change through a recognition of the seriousness of the consequences of underage drinking in a university environment and a recognition of the university's responsibility to keep its campus safe for its students. Institutions of higher learning that accept this responsibility can build a developmentally appropriate protective scaffolding around their underage students by taking the following actions:

- Foster a culture in which alcohol does not play a central role in college life or the college experience.
- Recognize that the early part of freshman year is a time of increased risk for alcohol use.

- Provide appealing, alcohol-free locations (e.g., coffeehouses and food courts) where students can gather with their friends to socialize or study.
- Expand opportunities for students to make spontaneous social choices that do not include alcohol (e.g., by providing frequent alcohol-free late-night events, extending hours of student centers and athletics facilities, and increasing public service opportunities).
- Offer alcohol-free dormitories¹⁹ that promote healthy lifestyles.
- Provide easy access to information about alcohol's effects, the risks of using alcohol, and the school's alcohol policies.
- Provide referral and facilitate access to brief motivational counseling and treatment for alcohol and mental health problems as appropriate.

For communities: Communities can:

- Provide appealing, alcohol-free locations where adolescents can gather with their friends.
- Provide youth with opportunities to express their interests, explore their talents, pursue their passions, achieve success, commit themselves to positive endeavors, and earn status among their peers without having to use alcohol.
- Increase volunteer opportunities, including opportunities for younger adolescents, because they offer a way to experience self-fulfillment and achieve a sense of meaning and purpose.
- Work to ensure access to education about alcohol use and its consequences, brief motivational counseling, and treatment for alcohol use disorders (AUDs).

¹⁹ Offering this lifestyle option to students does not imply that underage alcohol use is either appropriate or acceptable in dormitories that are not designated as alcohol-free.

For the criminal and juvenile justice systems and law enforcement: The justice system and law enforcement can:

- Increase the knowledge of judges and others in the justice system about the nature and scope of underage drinking and make them more aware that youth experiencing stressful events such as divorce or abuse may be at increased risk for alcohol involvement.
- Increase the knowledge of judges and others in the justice system about adolescent development and the nature and scope of consequences resulting from underage alcohol use.
- Require appropriate therapeutic interventions for parents with substance use disorders who are before the courts, because their children are at heightened risk for underage drinking.
- Improve identification of AUDs and work to ensure timely access to treatment.

Strategy 2: Decrease the risk of adolescent alcohol use and the associated negative consequences.

For parents and other caregivers:

- The action steps in strategy 1 are applicable here.
- Be aware that scare tactics are ineffective (Perry et al. 2003).

For schools: Schools can:

- Discourage violation of alcohol rules by consistently enforcing them.
- Provide students with the knowledge, skills, and motivation they need to resist peer and other pressures to drink (rather than using scare tactics, which have been shown to be ineffective).
- Identify students who are using alcohol and refer them for appropriate interventions.

- Ensure that school nurses are trained to recognize alcohol-related problems, to intervene appropriately when problems are found, and to be familiar with the referral network.
- Work with the community to ensure that the necessary infrastructure is in place so that students who need services and treatment can be referred to the appropriate personnel or health care provider.

For colleges and universities: Colleges and universities have a responsibility to reduce risk factors associated with underage alcohol use and an obligation to students to protect them from adverse consequences of their own or others' alcohol use, such as accidents, assaults, and rapes. Some of the measures available to colleges are to:

- Establish clear policies with specific penalties and consistent enforcement that prohibit alcohol use on campus by underage students.
- Distribute the school's alcohol policy to all incoming and returning students and their parents. Display the alcohol policy prominently on the school Web site and post it in school venues such as dormitories and sports facilities.
- Require all student groups, including fraternity and sorority members, athletes, and members of student organizations and clubs, to comply with campus and community policies related to alcohol use.
- Restrict or eliminate alcohol sales at concerts and at athletic and other campus events.
- Reinstate Friday classes to shorten the elongated weekend.
- Ensure that the student health center provides screening, brief motivational interventions, and/or referral to treatment for students concerned about their drinking and/or at high risk for

alcohol-related problems (e.g., those who binge drink or those with a mental disorder requiring treatment).

- Work with the local community to coordinate efforts at preventing and reducing underage drinking on and around campus. Easy access to alcohol on a college campus can undermine community efforts to reduce alcohol use by junior high and high school students.
- Work with the local community to control or reduce the number of bars and other alcohol outlets located near the campus and to eliminate or restrict high-volume, low-price drink specials and other promotions that encourage underage drinking. Easy, low-cost access to alcohol for underage youth off campus can undermine efforts on campus to reduce underage drinking.
- Work with the local community to ensure that bars and other alcohol outlets located near the campus comply with server training regulations and enforce all policies and laws with respect to underage youth.
- Work with the community to eliminate loud house parties and other disruptive events in which underage alcohol use is likely to be involved.

For communities: Communities can:

- Make adequate, affordable services available to youth who are at high risk of developing alcohol-related problems (e.g., those who binge drink or those who have a mental disorder needing treatment).
- Make adequate, affordable services available to youth identified as having AUDs.

For the criminal and juvenile justice systems and law enforcement: The justice system and law enforcement can:

- Provide screening and appropriate interventions for youth who interface with the criminal justice system, including those who are incarcerated (e.g., in juvenile correctional facilities, detention centers, or jails). Although prisons often have such programs, jails usually do not; these programs provide a unique opportunity to intervene with high-risk youth.

For the health care system: The health care system is a powerful arena for screening, referrals, and interventions around underage drinking. The health care system can:

- Identify adolescents who use alcohol (e.g., when providing clinical preventive services and in the emergency department) and intervene where appropriate, including with those youth who may not meet the diagnostic criteria for alcohol abuse or dependence and those at high risk. Interventions also should address coexisting mental health and substance use problems in an integrated manner.
- Work in collaboration with parents, schools, and communities to develop and maintain a system for screening and referring adolescents with alcohol problems.
- Provide expanded services that are developmentally appropriate for adolescents and create a functional referral network so adolescent patients can be directed to appropriate services (lack of a referral system often is cited as a reason not to screen for alcohol use).
- Educate families, schools, and the community about the effectiveness of prevention efforts.
- Inform the public of the adverse consequences of underage drinking.

- Encourage partnerships between parents, schools, health care providers, faith-based groups, and other community organizations in prevention and reduction efforts aimed at underage drinking.
- Promote research on underage drinking in the context of adolescent development.

Strategy 3: Raise the “cost” of underage alcohol use.

The “cost” of underage drinking refers not just to the price of alcohol but to the total sacrifice in time, effort, and resources required to obtain it as well as to penalties associated with its use. Research indicates that increasing the cost of drinking can positively affect adolescent decisions about alcohol use (Coate and Grossman 1988; Grossman et al. 1987, 1998; Kenkel 1993; Ruhm 1996; Sutton and Godfrey 1995). In addition to price, the cost of underage drinking can be affected by a variety of measures:

- Enforcement of minimum drinking age laws and other measures that directly reduce alcohol availability. Enforcement should target underage drinkers, merchants who sell alcohol to youth, and people who provide alcohol to youth.
- Appropriate parental penalties for adolescent alcohol use, such as loss of privileges (e.g., allowance, going out with friends, use of the car).
- Holding adults accountable for underage drinking at house parties, even when those adults are not at home.
- Enforcement of zero-tolerance laws that ban underage youth from driving with a blood alcohol content (BAC) above detectable levels.
- Any measure that decreases the availability of alcohol to youth and so raises the cost of getting it.

- Elimination of low-price, high-volume drink specials, especially in proximity to college campuses, military bases, and other locations with a high concentration of youth.

In raising the cost of underage drinking, care has to be taken to balance the conflicting goals of different parties, including adults for whom alcohol use is legal, and to avoid unintended consequences. For example, if the penalty for underage alcohol use at an institution of higher learning is too severe, it may be entered on a student's permanent record, potentially restricting future educational and employment opportunities. In addition, there may be reasons to invoke civil rather than criminal penalties for certain adult infractions, such as violating social host laws. Some strategies also will have an impact on adults, forcing a decision on what additional cost society is willing to bear in order to protect its youth from the adverse consequences of alcohol use.

For communities: Communities can:

- Publicize existing laws against underage alcohol use as well as their enforcement.
- Publicize existing laws that reduce alcohol availability to minors and underage access to alcohol, including age verification of Internet and other alcohol sales, as well as their enforcement.
- Restrict adolescent access to alcohol as is appropriate for community norms and goals.

For the criminal and juvenile justice systems and law enforcement: The justice system and law enforcement can:

- Enforce consistently and uniformly all existing laws against underage alcohol use.

- Enforce consistently and uniformly existing laws that reduce alcohol availability to minors and underage access to alcohol, including age verification for Internet and other alcohol sales.

For governments and policymakers: Like schools and communities, governments at all levels—including local, Tribal, State, and Federal—can increase the cost of adolescent alcohol use and restrict adolescent access to alcohol by:

- Coordinating efforts by the public and private sectors to increase public knowledge of the scope of the problem of underage drinking in the United States, the adverse consequences that accompany it, the public health and safety problem it creates, and effective measures for preventing and reducing it, with special emphasis on the Nation's collective responsibility to do so.
- Supporting adequate enforcement of laws and regulations.

Goal 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.

Rationale

Underage alcohol use is strongly influenced by human development and the unique characteristics of adolescence. To properly deal with its threat requires some understanding of the complex interplay of developmental, individual, and environmental forces creating the risk and protective factors that lead adolescents toward or away from alcohol use.

Challenges

Adolescence is a developmental period characterized by special vulnerabilities to alcohol use and by an especially wide range of individual differences in maturation. Just as a 12-year-old and a 15-year-old are very different, so there is considerable variability among 12-year-olds themselves. As a result, strategies and scaffolds designed to protect adolescents from alcohol use must be tailored to the particular adolescent as well as to adolescents as a group, which means not only to the general attributes of adolescents but also to a particular adolescent's maturational stage, to his or her individual characteristics, and to the particulars of the environment in which the adolescent lives. Furthermore, the components of the scaffold should evolve as the adolescent matures.

Strategies

For parents and other caregivers:

- Youth of different ages are developmentally different and require different strategies, approaches, and types of scaffolds that are developmentally appropriate. Risk and protective factors related to alcohol

use shift throughout adolescence, and parents need to be alert to these shifts.

- The protective scaffolding that parents provide to support the positive development of their children in relation to alcohol use should begin before puberty and continue throughout the span of adolescence into young adulthood.
- Parents need to appreciate that the nature of adolescence makes alcohol especially appealing to youth and understand how, from a developmental perspective, to reduce that appeal and the demand it creates for alcohol.
- Parents need to be aware of adolescents' particular vulnerability to alcohol's effects.
- During periods of high stress, such as a parental divorce, and during times of significant social transitions, such as the move from elementary school to middle school and from middle school to high school, the risk for alcohol involvement may increase. Parents need to be especially watchful during these periods and, if necessary, temporarily increase the supportive scaffolding around their adolescents.

For schools:

- Schools should be sensitive to the complex nature of the relationship between alcohol use and development and to the developmental needs of adolescents, both as a group and individually, when implementing programs related to alcohol use.
- Sanctions for infractions of alcohol use policies should be developmentally appropriate and avoid unintended outcomes. For example, suspension from school may provide additional free time for drinking whereas required participation in student/parent education programs and community service does not.

For communities:

- Communities need to work to address underage drinking in the context of overall adolescent development. This includes making a commitment to provide as many opportunities for positive experiences as possible for all youth but especially for those at high risk for alcohol use and other negative outcomes.
- Recognize that status is especially important to adolescents and provide positive ways for adolescents of different genders, socioeconomic backgrounds, ethnicity, and race to achieve status.
- Communities can encourage identification and early intervention for high-risk youth.

For the health care system: Health care practitioners can:

- Be sensitive to adolescence as a time of risk for alcohol use as well as be aware of individual differences in development and other personal characteristics in the adolescent that may heighten that risk.
- Discuss alcohol use with their young patients, taking into account the latest scientific information about the relationship of alcohol to human maturation.
- Identify alcohol use in their adolescent patients.
- Be familiar with and strengthen referral networks for adolescents.
- Make education about alcohol use and its consequences and brief motivational intervention widely available.

For the criminal and juvenile justice systems and law enforcement:

- Penalties for violations should be developmentally appropriate and avoid unintended outcomes. For example, community service

can serve both as a penalty (loss of leisure time) as well as an opportunity for personal growth.

For governments and policymakers: Governments and policymakers can:

- Understand, through a developmental perspective, why merely providing adolescents with information about alcohol is ineffective in preventing and reducing underage alcohol use.
- Understand why restrictions on adolescent access to alcohol and on alcohol availability need to be in place to prevent and reduce underage alcohol use and its consequences.
- Give careful consideration to providing special protection for populations at high risk.

Goal 4: Conduct Additional Research on Adolescent Alcohol Use and Its Relationship to Development.

Rationale

New, more effective, and enduring interventions are needed to prevent and reduce underage drinking as well as to treat youth with AUDs. Existing interventions should be refined on the basis of the latest scientific findings, including research on adolescent development. To understand more about underage alcohol use, including the risk and protective factors associated with it, additional knowledge about alcohol and its relationship to adolescence will be required. By studying the problem of underage alcohol use in the context of adolescence as a developmental phenomenon and as a function of individual characteristics and environmental factors, it will be possible to increase understanding of the problem and to improve the effectiveness of interventions.

Challenges

Underage alcohol use is a complex phenomenon driven by multiple inter-related, interacting causes. It is highly dependent on the individual adolescent and on the developmental stage of that adolescent as well as on the environment in which the adolescent lives. Additional research will be necessary to specify how the risk and protective factors around underage alcohol use unfold during adolescence and interact with biological and social development and how parents, schools, communities, and the Nation can more effectively protect their youth from alcohol use.

Strategies

- Develop and implement new and more potent prevention and reduction approaches based on the latest scientific data, including advances in understanding the role of human maturation and development in adolescent alcohol use.
- Conduct additional research to refine interventions and identify risk and protective factors on the basis of gender, ethnicity, and socioeconomic level, particularly in potentially high-risk cases such as early-maturing adolescents and children with a family history of alcohol dependence.
- Conduct research to better understand the short- and, especially, the intermediate- and long-term consequences of underage alcohol use, particularly as it relates to brain development and function, organ maturation, and susceptibility to later AUDs.
- Better understand how adult drinking behavior influences underage alcohol use.
- Evaluate interventions, including media messages and educational programs, to determine those that are most effective.
- Conduct studies and/or amend ongoing surveys to collect more detailed data on actual adolescent alcohol consumption (e.g., actual consumption as a category rather than “5+ drinks”), on preadolescent alcohol use, and on secondhand effects.
- Conduct animal studies to develop data on alcohol’s effect on maturation processes and on brain and organ development and function, because animal research makes it possible to perform certain studies that cannot be conducted in human adolescent research.

- Conduct research to identify genetic influences on both alcohol use and the development of alcohol-related problems in adolescents.
- Conduct research to refine the diagnostic criteria used for identifying alcohol problems in youth that require intervention.
- Track policy changes at the State level (because underage drinking policies vary widely across States) and evaluate their impact on underage alcohol use and consequences.²⁰

²⁰ The Alcohol Policy Information System (APIS; <http://www.alcoholpolicy.niaaa.nih.gov>) is an online resource that provides detailed information on a wide variety of alcohol-related policies in the United States at both State and Federal levels. It features compilations and analyses of alcohol-related statutes and regulations.

Goal 5: Work to Improve Public Health Surveillance on Underage Drinking and on Population-Based Risk Factors for This Behavior.

Rationale

State, Tribal, and local public health agencies; policymakers; and the general public need complete and timely information on patterns and trends in youth alcohol consumption in order to develop and evaluate prevention strategies.

Challenges

Despite the extent and impact of underage drinking, gaps remain in our knowledge of alcohol use by youth, which undermine our ability to effectively address this important public health problem.

Strategies

- Collect more detailed data on the quantity and frequency of adolescent alcohol consumption.
- Collect information on the secondhand effects of underage drinking.
- Collect information on preadolescent alcohol use.
- Routinely test all injury deaths in people under age 21 for alcohol involvement to better estimate the extent of alcohol-related consequences.
- Conduct ongoing public health surveillance on the type(s) of alcohol and the quantity and frequency with which they are used by age.
- Conduct ongoing, independent monitoring of alcohol marketing to youth to ensure compliance with advertising standards.

- Build State and Federal public health capacity in alcohol epidemiology to ensure the timely analysis and dissemination of these and other data on underage drinking and to ensure that these data are used to support public health practice.
- Support close collaboration between State and Federal public health and substance abuse agencies in the assessment of underage drinking and related harms and in the design and evaluation of population-based prevention strategies.
- When appropriate, engage youth in the process of collecting data related to underage drinking.
- When appropriate, conduct multimethod research using ethnographic methods in addition to epidemiological and experimental studies.

Goal 6: Work to Ensure That Policies at All Levels Are Consistent With the National Goal of Preventing and Reducing Underage Alcohol Consumption.

Rationale

Policymakers and administrators at all levels of government have a responsibility to develop and implement appropriate policies that facilitate safe adolescent development, protect against underage alcohol use and its consequences, and avoid creating unacceptable risk around alcohol use.

Challenges

The goal of policies and laws directed toward underage alcohol use is to reduce underage demand for alcohol, prevent underage access to alcohol, and ensure that adolescents who need some form of intervention concerning their alcohol use receive it. Among the challenges in this area is ensuring that penalties for underage alcohol use are appropriate (i.e., neither too lenient to be effective nor too harsh to prevent enforcement), well publicized, and uniformly enforced. A further complication is the need to balance the interests of competing parties and to weigh the impact of such laws on nonadolescent members of society, such as adults and young adults over 21.

Strategies

For parents and other caregivers: The influence of parents alone is not sufficient to prevent adolescents from using alcohol. Adolescents need additional scaffolding from their schools and communities in the form of policies designed to protect them from alcohol use and its consequences. Parents can:

- Work with the schools to ensure that protective rules around adolescent alcohol use are in place, that the penalties are well known, and that enforcement is sure and uniform.

- Work with organizations and institutions in the community to develop a broad commitment to preventing and reducing underage drinking through appropriate policies, recognizing that adolescent alcohol use is not a parental problem alone but a community problem that requires a collaborative effort to solve.

For schools: Schools can play a significant role in preventing and reducing underage alcohol use. They can:

- Establish and enforce strict policies against alcohol use on campus.
- Sponsor only interventions that research has confirmed are effective in preventing and reducing underage alcohol use.

For colleges: Colleges can support the national goal of preventing and reducing underage drinking. They can:

- Establish and enforce clear policies that prohibit alcohol use by underage students on their campuses.
- Sponsor only interventions that research has confirmed are effective in preventing and reducing underage alcohol use.

For communities: By publicizing both penalties and enforcement of laws against providing alcohol to minors, driving under the influence (DUI), and drinking before age 21, communities emphasize their seriousness about preventing and reducing underage drinking. Communities have at their disposal a variety of additional measures to reduce underage drinking. These measures include:

- Implementing an ongoing media campaign that makes people within the jurisdiction aware of existing policies and laws designed to restrict underage access to alcohol and the penalties for violating such laws.

- Requiring compliance training as a condition of employment for all sellers and servers of alcohol in restaurants and bars.
- Supporting enforcement of penalties for use of false IDs.
- Restricting drinking in public places, including at community events.
- Providing for restrictions on youthful drivers, which gradually are removed based on age and driving experience.
- Detecting and stopping underage drinking parties.
- Conducting regular and comprehensive programs to check restaurants, retail outlets, and other vendors of alcohol products for compliance with underage drinking laws (e.g., through keg registration programs) and applying substantial fines that increase with each violation and temporary or permanent license revocation for repeated violations.

For the criminal and juvenile justice systems and law enforcement: The justice system and law enforcement can:

- Enforce consistently and uniformly all laws related to underage alcohol use, including those against the use of false IDs, those that restrict drinking in public places, and those related to vendors of alcohol products.
- Enforce graduated driver's license laws for novice teenage drivers that include nighttime driving restrictions, requiring novice drivers to drive accompanied by an adult parent or guardian, and restricting the number of other teenage passengers.
- Enforce zero-tolerance laws and laws addressing driving risks associated with driving after drinking among people under the age of 21 (e.g., speeding, running red lights, and failure to wear safety belts).

- Seek to provide appropriate screening and interventions in all criminal justice settings that interface with adolescents.

For professional health care associations: To ensure that all who need it receive appropriate care, including screening, assessment, and treatment for heavy drinking and alcohol-related problems (including AUDs), professional health care associations can:

- Support widespread dissemination and implementation of screening and brief motivational interventions, particularly in emergency departments and trauma centers.
- Support provision of a full range of treatment services.

For governments and policymakers: Like communities, governments at all levels have a variety of means to prevent and reduce underage drinking. Governments can consider measures that:

- Support use of cost-effective technologies, such as the Internet, to make education about alcohol use and its consequences and brief motivational interventions more accessible and affordable.
- Encourage early intervention for high-risk children and access to a full range of treatment options for youth with alcohol problems.

Conclusion

Underage alcohol use remains a major public health and safety problem in the United States, creating serious personal, social, and economic consequences for adolescents, their families, communities, and the Nation as a whole. An emerging body of research on the effects of underage alcohol use on human maturation adds new urgency to the decades' long effort by the public and private sectors to prevent and reduce underage drinking.

Pervasive drinking by youth and the emergence of alcohol misuse and dependence in late adolescence are intertwined with developmental processes. Therefore, the prevention and reduction of underage drinking must be addressed within a developmental framework, which takes into account the dynamic processes of human maturation, the influence of social systems within an adolescent's environment, and the role of individual characteristics in the adolescent's decision to drink. Because adolescent development unfolds within many contexts in American society, including family, peers, school, extracurricular and community activities, part-time work, the community itself, and the overall culture, every American has a responsibility to help protect adolescents from the potentially adverse consequences of alcohol use.

As the *Call to Action* makes clear, each of us has an important role to play in the prevention and reduction of underage drinking through our individual and collective efforts, ensuring that the future America offers its youth is neither shortened nor impaired by the consequences of alcohol use. This *Call to Action* is exactly that—a call to every American to join with the Surgeon General in a national effort to address underage drinking early, continuously, and in the context of human development. Underage alcohol use is everybody's problem—and its solution is everybody's responsibility.

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APPENDIX

Definition of a Standard Drink

A standard drink is any drink that contains about 14 grams of pure alcohol (about 0.6 fluid ounces or 1.2 tablespoons). Below are standard drink equivalents. These are approximate, as different brands and types of beverages vary in their actual alcohol content.

beer or cooler	malt liquor 8.5 oz. shown in a 12-oz. glass that, if full, would hold about 1.5 standard drinks of malt liquor	table wine	fortified wine (such as sherry or port) 3.5 oz. shown	cordial, liqueur, or aperitif 2.5 oz. shown	brandy (a single shot)	spirits (a single shot of 80-proof gin, vodka, whiskey, etc.) Shown straight and in a highball glass with ice to show level before adding mixer*
						
~5% alcohol	~7% alcohol	~12% alcohol	~17% alcohol	~24% alcohol	~40% alcohol	~40% alcohol
12 oz.	8.5 oz.	5 oz.	3.5 oz.	2.5 oz.	1.5 oz.	1.5 oz.

Many people do not know what counts as a standard drink, and thus are unaware of how many standard drinks are held in the containers in which these drinks are often sold. Some examples:

- For **beer**, the approximate number of standard drinks in
 - 12 oz. = 1
 - 16 oz. = 1.3
 - 22 oz. = 2
 - 40 oz. = 3.3
- For **malt liquor**, the approximate number of standard drinks in
 - 12 oz. = 1.5
 - 16 oz. = 2
 - 22 oz. = 2.5
 - 40 oz. = 4.5
- For **table wine**, the approximate number of standard drinks in
 - a standard 750 mL (25 oz.) bottle = 5
- For **80-proof spirits**, or “hard liquor,” the approximate number of standard drinks in
 - a mixed drink = 1 or more*
 - a fifth (25 oz.) = 17
 - a pint (16 oz.) = 11
 - 1.75 L (59 oz.) = 39

***Note:** It can be difficult to estimate the number of standard drinks served in a single mixed drink made with hard liquor. Depending on factors such as the type of spirits and the recipe, one mixed drink can contain from one to three or more standard drinks.

APPENDIX B

DSM–IV–TR Diagnostic Criteria for Alcohol Abuse and Dependence

ALCOHOL ABUSE

(A) A maladaptive pattern of drinking, leading to clinically significant impairment or distress, as manifested by at least one of the following occurring within a 12-month period:

- Recurrent use of alcohol resulting in a failure to fulfill major role obligations at work, school, or home (e.g., repeated absences or poor work performance related to alcohol use; alcohol-related absences, suspensions, or expulsions from school; neglect of children or household)
- Recurrent alcohol use in situations in which it is physically hazardous (e.g., driving an automobile or operating a machine when impaired by alcohol use)
- Recurrent alcohol-related legal problems (e.g., arrests for alcohol-related disorderly conduct)
- Continued alcohol use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of alcohol (e.g., arguments with spouse about consequences of intoxication).

(B) Never met criteria for alcohol dependence.

ALCOHOL DEPENDENCE

(A) A maladaptive pattern of drinking, leading to clinically significant impairment or distress, as manifested by three or more of the following occurring at any time in the same 12-month period:

- Need for markedly increased amounts of alcohol to achieve intoxication or desired effect; or markedly diminished effect with continued use of the same amount of alcohol
- The characteristic withdrawal syndrome for alcohol; or drinking (or using a closely related substance) to relieve or avoid withdrawal symptoms
- Drinking in larger amounts or over a longer period than intended.
- Persistent desire or one or more unsuccessful efforts to cut down or control drinking
- Important social, occupational, or recreational activities given up or reduced because of drinking
- A great deal of time spent in activities necessary to obtain, to use, or to recover from the effects of drinking
- Continued drinking despite knowledge of having a persistent or recurrent physical or psychological problem that is likely to be caused or exacerbated by drinking.

(B) No duration criterion separately specified, but several dependence criteria must occur repeatedly as specified by duration qualifiers associated with criteria (e.g., “persistent,” “continued”).