

## Youth Impaired Driving: Causes and Countermeasures

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Traumatic injury is responsible for more deaths among American adolescents and young adults age 14-24 than all other causes combined (Paulson 1983). Far and away the leading cause of traumatic injuries is traffic crashes (Robertson 1981; Lewis 1987). Traffic crashes have been cited as the cause of about half of all accidental deaths in adolescents and young adults and have also been cited as the cause of half of all spinal cord injuries (Robertson 1981). Not only adolescent drivers, but also their passengers (who tend to be adolescents) are at significantly increased risk when compared to older age groups (Insurance Institute for Highway Safety 1984).

The exact contribution of alcohol use to youth traffic crashes has been debated (e.g., Zylman 1973; Cameron 1982). However, the conclusion appears inescapable that alcohol is a major causal factor (Cameron 1982; Lewis 1987). Young drivers are overrepresented in alcohol-related fatal crashes even when driving exposure is controlled (Vegega 1984). Although teen alcohol-related traffic fatalities steadily decreased from 1982 to 1985, they increased again in 1986 to a level just below that of 1983 (DOT 1987). Unpublished Fatal Accident Reporting System data for 1987 suggest another downturn, but overall death rates still exceed those observed in 1985. The reasons for this downturn are not clear but may reflect increasing public awareness and intolerance and recent changes in legislation.

The most compelling evidence for a causal link between alcohol and youthful crash involvement comes from studies of changes in minimum alcohol purchase age (e.g., Fell 1988; Smith et al. 1984; Hingson et al. 1983; Wagenaar 1982a, b, 1983b). Although results have varied from State to State and from study to study, consistent reductions in youthful crash involvement have been observed following increases in the minimum purchase age. Interestingly, most studies that examined the effects of purchase age changes failed to find meaningful differences in youthful alcohol consumption (Moskowitz 1989). This may simply reflect the difficulties associated with measuring changes in consumption as opposed to changes in crash rates. Alternately, it may be that the relationship between minimum purchase age and crash involvement is not mediated simply by consumption, but rather reflects more complex changes in youth drinking patterns and drinking locations.

Crash data reflect only a small segment of the youth drinking/driving problem. Overall, youthful drivers are much more likely than their older counterparts to report driving after drinking (Hingson et al. 1988). Recent survey data gathered from the Nation's high schools (Bachman et al. 1987) revealed that approximately one in four seniors had driven after drinking in the 2 weeks predating the survey, and approximately one in six had driven after having five or more drinks in a row. During the same 2-week period, two in five seniors had ridden with a drinking driver, and one in five believed the driver had consumed five or more drinks. Driving while impaired (DWI) and riding with

impaired drivers (RWID) would appear to be a regular occurrence for a significant minority of American youth.

## Causes and Correlates

Any successful attempt to reduce the extent of impaired driving and riding with impaired drivers among youth must be rooted in an understanding of the factors that predispose, reinforce, and enable these behaviors. However, current knowledge of the causes and correlates of youth DWI/RWID is incomplete. The majority of relevant studies have focused on alcohol consumption and related problems rather than on DWI per se, and only a very limited number of studies have focused on factors related to riding with impaired drivers. In addition, predisposing, reinforcing, and enabling factors have often been studied in isolation, complicating assessments of the relative contribution of different variables or classes of variables to DWI/RWID.

### Individual Characteristics

Perhaps the largest body of correlate research has focused on characteristics of individual youths. These studies noted that personality factors such as aggressiveness, intolerance of authority, nonconformity, escapism, and immaturity may be associated with increased probability of driving after drinking (Lightsey and Sweeney 1985; Boyd and Huffman 1984; DOT 1975; Kraus et al. 1970). DWI has also been associated with poor academic performance, greater participation in social activities, access to cars including car ownership, more discretionary income, and working part time (Klitzner et al. 1987, 1988; Williams et al. 1986).

Other individual-level studies have focused on the stresses of transition from adolescence to adulthood (Pelz and Schuman 1971) and on the relationship between stress and alcohol consumption (e.g., Forney et al. 1984; Wagenaar 1983a; Koningsberg et al. 1983; Cameron 1982). A recent study of adolescent DWI offenders (Farrow 1987) suggested that offenders are more likely than nonoffenders to use risky driving as a stress management technique.

Studies that assessed young people's awareness of the physiological and psychological effects of alcohol revealed that young people are generally ignorant of the effects of alcohol (Forney et al. 1984; Blane 1983; Hetherington et al. 1979) and are unable to identify the amount of alcohol that impairs driving performance (Pawlowski 1982).

Several studies have explored the effects on DWI risk of positive attitudes toward drinking and drinking and driving. Most have focused on attitudes toward alcohol (Krohn et al. 1982; Milgram 1982; Lowman 1981; Douglass 1983; DOT 1975; Kraus et al. 1970). These studies suggest that normative acceptance of drinking by youth increases both alcohol consumption and DWI risk. Two recent studies by Klitzner et al. (1987, 1988) found that normative acceptance of DWI was also strongly related to both alcohol consumption and actual DWI/RWID behavior.

### Social Influences

A second broad area of correlate research has focused on social influences, especially those associated with peer groups. Numerous studies have reported increased alcohol consumption among youth who associate with peers who drink and/or approve of drinking (Vejnoska 1982; Scoles and Fine 1981; Krohn et al. 1982; Nusbaumer and Zusman 1981; Biddle et al. 1980). A study by Finley (1983) implied that peer influence may be so pervasive as to negate the effect of countervailing influences such as fear of legal sanctions or parental disapproval. Group centeredness, a probable component of

susceptibility to peer influence, has also been found to increase DWI risk (Kraus et al. 1970; DOT 1975), and a recent study by DiBlasio (1988) found that peer modeling plays an important role in decisions to ride with intoxicated drivers.

Jessor (1987) recently extended Problem-Behavior Theory (Jessor and Jessor 1977) to youthful risky driving, including DWI. Problem-Behavior Theory has a 25-year history as a major theoretical orientation for understanding youth substance abuse and related problems. Jessor's recent work demonstrated that youth who are more influenced by friends than parents, and whose friends model risky driving behaviors, are more likely to report risky driving.

Studies of social influence have also focused on the effects of mass media, especially alcohol advertising, on youth alcohol consumption and DWI. Most advertising research has examined general populations and has failed to find consistent effects (Frankena et al. 1985). Studies that looked specifically at youth (Atkin et al. 1983, 1984; Strickland 1983) reported possible effects of advertising exposure on both alcohol consumption and DWI, but methodological weaknesses in these studies limit the strength of conclusions that may be drawn from them (Moskowitz 1989).

### Characteristics of Youth Drinking and Youth Driving

A third broad approach to understanding the youth DWI problem has been to explore the special characteristics of youth drinking and youth driving. For young drivers, risk of crash involvement begins to increase at very low blood alcohol concentrations (BACs), and studies suggest that any measurable BAC can result in a significantly increased risk for younger drivers (Simpson et al. 1982; Farris et al. 1976; Perrine et al. 1971). Thus, the gap between risky and illegal BACs for youth in most States is large, and "safe" consumption guidelines publicized for adults may be dangerously misleading for youth. The more rapid impairment of the younger drinker is reflected in the fact that crash-involved adolescents are likely to have lower BACs than their older counterparts (Cameron 1982), and in the higher risk of fatal crashes for young drivers when compared to adults with comparable BACs (Bergeron and Joly 1986).

The simultaneous acquisition of driving skills and drinking experience may further increase the likelihood of crashes (O'Day 1970; Lewis 1987), and youth who DWI may tend to be riskier drivers in general (Bergeron and Joly 1986). Nataanen and Summala (1976) also noted the importance of considering the "extra motives" (beyond simple transportation) that driving may fulfil for youth. These include tension reduction, meeting the need for competition, showing off, and deliberate risk-taking. Summala (1987) found that these extra motives may be more important than lack of driving skill in contributing to poor youth driving performance.

Research conducted in preparation for a National Institute on Alcohol Abuse and Alcoholism (NIAAA) youth and alcohol media campaign pointed to a number of structural and contextual factors that may serve to associate youth drinking with youth driving (URSA/Pacificon 1980). These data suggest that, for many youth, the automobile represents the only place where privacy may be relatively certain. Drinking and other negatively sanctioned behaviors are most likely go undetected when undertaken in cars. Consistent with this assumption, data from the 1986 yearly survey of high school seniors (Bachman et al. 1987) revealed that over half of all seniors who drank had done so in cars, and approximately 28 percent reported doing so "some of the times" or "most of the times." Similarly, a national survey conducted by Grey Advertising (DOT 1975) revealed that among students who drank, 38 percent reported drinking "while driving around," and 20 percent reported drinking at drive-in movies within the previous 3 months. Driving constitutes a social occasion for youth, and the ride to and from a social event constitutes a prelude to and continuation of that event (Farrow 1987). Thus, drinking in cars may be a simple extension of other teen drinking.

The NIAAA planning data indicated that youth are more likely than adults to drink all that they possess at any given time, thus eliminating problems of storage or hiding of contraband alcohol. Moreover, data reported by Vegega and Klitzner (in press), Farrow (1987), and Bachman et al. (1987) showed that the great majority of teen drinking occurred outside the home. Thus, the structure of teen drinking may lead to the consumption of large quantities of alcohol in settings that subsequently require some sort of transportation home.

### Multiple Correlate Studies

In an effort to assess the relative contribution to DWI/RWID of a variety of risk factors discussed in the literature, Klitzner and colleagues (1988; Vegega and Klitzner in press) surveyed and/or interviewed a convenience sample of approximately 1,550 youth in grades 7 through college in six U.S. cities. In one study (Klitzner et al. 1988), 1,323 youth completed anonymous questionnaires that assessed lifestyle variables (friends' drinking practices, participation in parties and dates, access to cars), alcohol use variables, DWI/RWID risk factors, and self-reported DWI/RWID behavior. Of nine risk factors studied, only one—perceived deviance of DWI—was strongly related to DWI and RWID. Two other factors—use of alternative modes of transportation and decisionmaking skills—were related to DWI and RWID, but only insofar as they predicted drinking practices. The remaining six risk factors—awareness of alternative modes of transportation, self-concept, communications skills, alcohol knowledge, knowledge of local DWI laws, and susceptibility to peer influence—predicted neither drinking practices nor DWI/RWID. Despite the failure of these risk factors to predict drinking or DWI/RWID directly, all nine risk factors were interrelated. Thus, the factors that did not directly predict drinking, DWI, or RWID may still contribute to overall risk. Drinking practices were themselves strong predictors of both DWI and RWID, a point discussed later.

In a second study (Vegega and Klitzner in press), indepth interviews were conducted with 120 youth who reported DWI and 121 youth who reported having ridden with an intoxicated driver. This study focused on the contribution of situational factors to youth DWI/RWID. Among the factors assessed were social context variables; social pressures to drink, drive, and/or ride; perception of immediate risk; destination variables; and availability of alternative transportation. In general, the results showed that DWI/RWID is largely a function of the role alcohol plays in the youth culture. Many respondents suggested that DWI and RWID are "inevitable" because drinking is an "inevitable" component of adolescent lifestyles.

Despite the current popularity of "peer pressure" as an explanation of youth drinking and related problems, only about 15 percent of Vegega and Klitzner's DWIs reported any pressure to drink, and only 13 percent reported any pressure to drive after drinking. Among RWIDs, less than 7 percent reported that peer pressure contributed to their decision to ride with the impaired driver. To the extent that DWI and RWID were situationally determined, they were controlled largely by a perceived need to get home or to get a passenger home. This finding is consistent with data reported by Farrow (1987), who found that home was the most common destination for youth engaging in a variety of risky driving behaviors, including DWI/RWID.

Vegega and Klitzner described a special case of RWID that occurred when the impaired driver was a parent or other adult relative. In this case, which represented slightly more than a quarter of the reported RWID incidents, the youths' apparent inability to affect parental DWI or to utilize alternative modes of transportation effectively precluded any protective action (other than fastening a safety belt) on the part of the affected youngster. Here, parents and other adult relatives appeared to make a significant contribution to the DWI-related risk experienced by youth.

## Summary

In general, the factors that predispose, reinforce, and enable youth DWI and RWID appear to be similar to those risk factors associated with other adolescent health risk behavior (Jessor 1987). Social and normative influences, risk-taking orientation, and individual differences in attitudes toward and beliefs about drinking and drinking and driving all appear to contribute to increased or decreased risk.

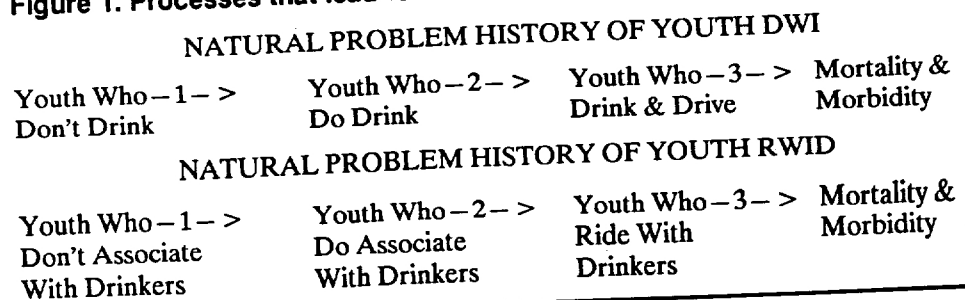
Of particular import in considering DWI and RWID specifically, however, is the powerful role played by alcohol consumption per se in increasing risk of both DWI and of RWID (for which consumption is not a prerequisite). Indeed, Klitzner et al.'s (1988) data revealed that DWI/RWID risks increased directly and potently as a function of both quantity and frequency of alcohol consumption. Moreover, among Vegega and Klitzner's (in press) sample of DWIs and RWIDs, alcohol use was perceived to be an inextricable part of the youth culture, and DWI/RWID were viewed as "inevitable" results of the strong association between youth socializing and youth drinking. Thus, it seems unlikely that meaningful reductions in youth DWI/RWID can be realized without significant attention to changes in youth drinking practices.

## Countermeasures for Youth

The past two decades have witnessed a rapid expansion in the number and types of programs and strategies employed to prevent youthful DWI and RWID. A review of 133 youth DWI prevention models (Vegega and Klitzner 1988) revealed enormous diversity of focus, underlying assumptions, and activities. Youth DWI/RWID countermeasures include school curricula, clubs, alternative transportation, alternative (alcohol-free) parties, teen retreats, and youth-focused legislation and regulation.

Current DWI/RWID prevention strategies can be grouped into three major categories—those mainly concerned with the prevention of drinking, those mainly concerned with separating drinking and driving, and those concerned with preventing mortality and morbidity when and if DWI/RWID occur. The differences among these approaches can be illustrated by considering the natural history of DWI and RWID. Figure 1 presents, in highly simplified flow diagrams, the processes that lead to DWI/RWID and related mortality and morbidity.

**Figure 1. Processes that lead to DWI/RWID**



These flow diagrams indicate three points at which DWI/RWID strategies and programming can be directed. Point 1 represents strategies that have as their primary objective the prevention of youth drinking and the establishment of nondrinking lifestyles among youth. Such programs attempt to alter the factors that either predispose, reinforce, or enable drinking among individual youth (e.g., school curricula, "say no" organizations, intervention programs for users) and attempt to reduce youth access to

alcohol (e.g., alcohol-free alternative parties, minimum purchase age increases, server training, limited outlets, education of retail clerks). Strategies at point 1 would not, of course, address the problem of youth who RWID when parents or other adults are the drivers.<sup>1</sup>

Point 2 represents strategies that attempt to disassociate drinking and driving. Here, although youth alcohol use may still be of concern, the major objective is to address risk factors that lead drinking youth to drive, or that lead youth who associate with drinkers to be passengers. Examples of strategies at point 2 include SafeRides, designated driver, alternative transportation, direct intervention (e.g., taking keys), parent/student transportation "contracts," general and specific deterrence, and a variety of licensing strategies.

Point 3 represents strategies that attempt to limit morbidity and mortality among drinking drivers, their passengers, and those with whom they crash. Examples of these strategies include passive restraints, other vehicle-related technologies, highway design elements such as breakaway sign posts, and so on.<sup>2</sup>

### Point 1 Strategies

Many point 1 strategies (those that attempt to reduce youth drinking) have been extensively studied. In particular, school-based strategies of various types have been the object of intense research scrutiny for at least two decades. Programs have been developed and evaluated that focus on arousal of fear of negative consequences, provision of information, development of "life skills" (e.g., positive self-regard, communication skills, assertiveness, decisionmaking, coping), clarification of values, and, most recently, "resistance" training.

The literature on school-based alcohol and other drug prevention programs has been repeatedly reviewed (e.g., Moskowitz 1989; Klitzner 1987; Goodstadt 1985; Wittman 1982). In general, these reviews concur that evidence in support of school-based alcohol and drug prevention programs is sparse. Although increases in knowledge and changes in attitudes are often reported, effects on behavior have been weak, inconsistent, transient, and sometimes in the wrong direction. The failure to demonstrate educational program effects has been attributed to failures in program models, to failures in program implementation, and (more optimistically) to weak or inappropriate research designs (Klitzner and Bell 1987; Moskowitz 1983). Whatever the causes, no scientific mandate currently exists for adopting any particular school-based approach to alcohol use reduction and prevention.

Emerging strategies focusing on family education (e.g., DeMarsh and Kumpfer 1985), management of early antisocial behavior (e.g., Hawkins and Lishner in press), changes in school and classroom structure (Gottfredson 1987), and school drug and alcohol policies (Moskowitz 1987) have shown promise and hold out the hope of more effective responses to youth alcohol-related problems in the future. Until such time as these strategies are thoroughly researched, however, their appeal remains largely theoretical.

Several strategies to control youth access to alcohol have been studied with varying results. The uniform purchase age of 21 (e.g., Fell 1988; Hingson et al. 1983; Wagenaar 1982a, b, 1983b) and increased taxation (Saffer and Grossman 1985; Coate and Grossman 1985) have been shown to have an impact on the sequelae of consumption including

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1 Some DWI/RWID program developers have labeled point 1 programs as "prevention programs" in order to distinguish them from point 2 programs, which have been labeled as "intervention programs." This distinction seems somewhat artificial, since both types of strategies seek to prevent the occurrence of DWI/RWID.

2 These strategies are the topic of a separate background chapter and will not be discussed further.

youthful crashes, although effects on consumption per se, have been difficult to document. Failure to document effects on consumption may be due to methodological difficulties in measuring such effects, or it may result from the inadequacy of a simple, direct model of the effects of youth access to alcohol on consumption and related problems.

The effect of numbers of alcohol outlets per capita on consumption has also received some scrutiny, although no studies have focused directly on youth. The results of these studies have been mixed, with one study demonstrating lower consumption in States with fewer outlets (Ornstein and Hannens 1985) and two studies failing to find such effects (Hoadley et al. 1984; Schweitzer et al. 1983). A fourth study revealed a correlation between numbers of outlets and alcohol-related problems including felony and misdemeanor DWI arrests in 213 California cities (Watts and Rabow 1983). This study did not include direct measures of consumption.

Student assistance programs to intervene with alcohol- and drug-using youth (e.g., Chambers and Morehouse 1983; Morehouse 1982) have been studied from a process perspective, but rigorous assessments of student drinking outcomes are not available. Other popular approaches (e.g., prevention "clubs," alcohol-free recreation, concerned parent groups) have received minimal research attention.

## Point 2 Strategies

Of the available strategies aimed at point 2 (separating drinking from driving), perhaps the most extensively discussed is deterrence. Unfortunately for the current discussion, existing research does not generally address specific effects on youth. Ross (1984, 1985) and Moskowitz (1989) provided extensive reviews of various deterrence-based strategies, including increased penalties, per se laws, enforcement crackdowns, and administrative license revocation. In general, these reviews showed that enforcement crackdowns, especially when accompanied by extensive media coverage, can have short-term (months to a few years) effects. On the other hand, a study of increased enforcement in France that focused specifically on drivers under 25 (Jayet 1986) failed to find a deterrent effect.

Recently, concern over the risk of crashes associated with even very low BACs in youth has motivated some States to adopt a lower legal BAC limit for youth than for adults. In most of these States, license revocation is either an automatic or discretionary penalty for violations. Drummond et al. studied a zero BAC limit for first-year drivers in Australia. Preliminary data disclosed that this law reduced nighttime, weekend driving—a peak time for youth crash involvement (e.g., Farrow 1987; Robertson 1981). However, actual crash data concerning the Australian zero BAC law were not available at the time the research report was prepared.

Hingson et al. (1986, in press) studied the effects of a 0.02 BAC limit and administrative license revocation for 1 year on youth in Maine. Initial results (Hingson et al. 1986) revealed that self-reported DWI and self-reported nonfatal crash involvement among drivers 19 and under declined significantly when compared to Massachusetts teens and Maine adults. Declines were most dramatic for teens who were aware of the law. In addition, actual injury and fatal crashes among Maine teens increased at a much lower rate than for drivers 20 years old and over. Followup results (Hingson et al. in press) have generally mirrored the 1986 findings, although differences between Maine and Massachusetts teens have declined to a nonsignificant level. This lack of difference appears due to a "catching-up" on the part of Massachusetts teens, perhaps owing to the high level of antidrug and anti-DWI activity in that State. Hingson et al. also noted that enforcement of the 0.02 BAC law has become sporadic, and police appear to arrest juveniles with less regularity than adult offenders.

Several States have experimented with license revocation as a sanction against youth

possession of alcohol and other drugs. In recent testimony before the National Commission Against Drunk Driving (NHTSA, October 1987), Judge C. Foley of Milwaukee, Wisconsin, credited such a law with significant reductions in youth DWI between 1982 and 1986. However, the existence of a zero BAC law in Wisconsin, increased public awareness of the youth DWI problem, and the lack of comparison data render interpretation of these reductions difficult. At this time, the effects of license revocation as a sanction for youthful alcohol and other drug possession are unproven.

A recently popular strategy for separating drinking from driving is to issue youth restricted licenses that limit the hours during which they may operate a vehicle. Impetus for such a strategy derives from the previously cited observation that youth DWI as well as youth fatal crashes are most likely in the evenings, especially weekend evenings. As reported by Williams (1987), at least 18 States have some sort of curfew restrictions. Williams cited a study of restrictions in four States by Preusser et al. (1984) that reported dramatic reductions in crashes during the restricted hours. He also cited additional data from New York, Louisiana, and Maryland that supported the efficacy of restricted driving hours for youth. Despite one study of the Maryland law that did not find effects on crash rates (McKnight et al. 1983), Williams concluded that curfew restrictions can substantially reduce youth crash involvement.

Other licensing approaches to reducing youth crashes include making drivers' licenses more difficult to obtain and presenting the license in juvenile court to both the youths and their parents. Preliminary data from California (Hagge and Marsh 1986) suggested positive results from making licenses more difficult to obtain, although, as noted by Williams (1987), the California program had so many facets that it was impossible to determine which elements contributed to the positive results and which did not.

Separation of youth drinking from youth driving has also been attempted through educational strategies. There is little evidence that such programs reduce crash rates (Williams 1987; Moskowitz 1989). One well-conducted Canadian evaluation of a drinking/driving education program (Albert and Simpson 1985) demonstrated decreased intentions to DWI, but these decreases were realized at the cost of an increase in reported drinking frequency. Some critics of drivers' education (Robertson 1980; Robertson and Zador 1978) have suggested that such programs may actually increase crash rates by increasing the licensure of 16- and 17-year-olds. However, as discussed by Moskowitz (1989), these claims are based on short-term results and may not justify possible long-term negative effects of discontinuing drivers' education.

Cognizant of the general failure of drinking/driving education programs, the National Highway Traffic Safety Administration (NHTSA) sponsored the development of a Peer Intervention Program (McPherson et al. 1983) aimed at enabling and motivating youngsters to intervene in the drinking and driving behavior of their peers. The program provided 8 hours of role-playing as well as 1 hour of alcohol and traffic safety information. A true experiment with random assignment compared the Peer Intervention Program to a traditional drinking and driving education program (McKnight and McPherson 1986). Students in the Peer Intervention Program reported statistically significant gains in intervention behavior at followup intervals of 1 to 4 months. The actual magnitude of these effects appeared small, although the description of the behavioral measure provided by McKnight and McPherson is too sketchy to determine the meaning of the differences reported.

Students Against Driving Drunk (SADD) (Anastas 1983) represents an attempt to change school and community norms with regard to youth DWI/RWID. Klitzner et al. (1987) conducted an evaluation of SADD in two cities in the Western United States. This quasi-experimental study failed to find effects of SADD on any drinking or drinking/driving variables. However, weak program implementation in the SADD



schools, high subject attrition from the research study, and other design confounds limit the strength of these conclusions.

Alternative transportation (e.g., SafeRides, designated driver) as a means of separating drinking from driving has not been well evaluated (Klitzner et al. 1988). Klitzner et al. (1987) provided preliminary data on parent/student contracting. These data showed that signing contracts increases the likelihood that youth will call parents for a ride. However, no differences in DWI or RWID as a result of signing the contracts were observed. This somewhat puzzling result suggests that although signers are calling home, safer transportation does not result.

Critics of alternative transportation strategies have objected to these approaches on the grounds that they implicitly sanction youth drinking. Klitzner et al. (1987) failed to find evidence that signing parent/student contracts had effects on youth drinking or related problems. On the other hand, Klitzner et al. (1988) found that heavier drinkers also reported using more transportation alternatives. The meaning of this latter result is unclear. It may, indeed, confirm the fears of critics of alternative transportation strategies, or it may simply reflect the fact that heavier drinkers have more reasons for using and opportunities to use transportation alternatives.

### Multicomponent Strategies

One common indictment of many attempts to prevent alcohol- and drug-related problems among youth is too narrow a programmatic focus (Klitzner 1987; Klitzner and Bell 1987; Goodstadt 1986; Huba et al. 1980). That is, communities have tended to focus on one kind of response (e.g., a school curriculum, a SADD club, a police crackdown) to the exclusion of other types of responses.

Recently, some communities have attempted to overcome the narrowness and fragmentation of past responses to youth DWI by instituting communitywide, systemic responses that attempt to institute a coordinated and comprehensive package of mutually reinforcing countermeasures. Thus, a community might institute a strong anti-alcohol use school policy, work to restrict alcohol sales to minors through increasing alcohol beverage control enforcement, rigorously enforce DWI laws, institute roadblocks, aggressively prosecute and heavily sanction youthful DWI offenders, and develop community resources for the treatment of addicted teens. Ten communities that are attempting to implement communitywide responses are described by Pacific Institute (in press).

The communitywide model has considerable theoretical and conceptual appeal, and many of the strategies communities appear to be using have been shown to be effective in their own right (e.g., increased enforcement, reductions in alcohol availability to youth). To date, however, rigorous evaluations of multicomponent, communitywide anti-DWI programs have been extremely limited.

Perhaps the most relevant research is the Lackland Air Force Base Experiment (Barmark and Payne 1961), which effectively reduced DWI among airmen through a variety of normative, informational, and enforcement strategies. However, strategies shown effective in the highly insular and controlled environment of a military installation will not necessarily be effective in the less well-controlled environments of most American communities.

The communitywide model has shown promise in other health areas, notably the reduction of risk factors associated with cardiovascular disease (Farquhar et al. 1977; Puska et al. 1985). However, the effectiveness and feasibility of systemwide responses to the youth DWI problem awaits further research.

## Summary

Current research into youth drinking and driving countermeasures suggests that effective strategies are available for reducing youth access to alcohol and for separating youth drinking from youth driving. However, despite the continuing popularity of strategies focused on developing or changing individual knowledge, attitudes, and skills, almost all the effective countermeasures reviewed in this chapter have been regulatory or legislative in nature.

Recent evidence indicates that the most effective countermeasures will likely be those that focus on minimum purchase age, alcohol pricing, limiting alcohol outlets, lower legal BACs for youth, curfew restrictions on youth driving and other licensing restrictions, and enforcement. This is not to imply that the search for effective programs focused on individual youth should be discontinued. However, many individually focused prevention approaches popular in the 1970s and 1980s appear to have outlived their usefulness.

## Issues and Recommendations

Proven technologies exist for reducing the death and disability suffered by youth as a result of drinking and driving. As discussed, these include restrictions on youth access to alcohol and restrictions on youth driving. The problem is not so much one of finding effective countermeasures as it is overcoming societal inertia to implement them. Thus far, the uniform alcohol purchase age is the only proven countermeasure to be adopted nationwide. In some States, even the threatened loss of Federal highway funds did not guarantee speedy legislative action.

Williams (1987) posed the question of whether society is ready to take the steps necessary to improve the current situation with regard to youth drinking and driving. He responded: "To the extent that legislative restrictions are necessary to rectify the situation, [this] question can at present be answered in the negative." A major item on the Nation's public health agenda should be to educate parents, legislators, and other concerned citizens about the regulatory measures that can be taken to realize additional meaningful reductions in youth DWI.

Of course, regulatory responses will only be effective to the extent that they are enforced (Ross 1984). In general, the quality of enforcement of novel DWI laws decreases over time, an effect observed in Maine's experience with 0.02 legislation enacted in 1982 (Hingson et al. in press). Public support must be developed for the vigorous and continued enforcement of new laws as well as for their enactment.

It is also clear that regulation alone will never be a complete answer to the youth DWI/RWID problem. Youth will always have access to alcohol and cars. Indeed, licensing restrictions will never affect all teenagers, since a significant minority of teen drivers are unlicensed (Klitzner et al. 1988; Williams et al. 1985). Moreover, the high crash rates of teens continues into the early twenties — an age group to whom purchase age restrictions do not apply. Thus, in addition to regulatory responses, continued efforts should be made to develop prevention programs that affect the drinking and drinking/driving choices of individual young people.

Prevention program development and research need to break away from the unsuccessful models of the past. New approaches are needed that are firmly grounded in an understanding of the factors that predispose, reinforce, and enable youth alcohol use and DWI/RWID. Given the current state of knowledge, such an understanding will require a program of additional research into the etiology of youth drinking and DWI/RWID. This is not to imply that the testing of new program models should be delayed until a comprehensive and widely accepted set of etiological models is available.

Rather, program research and etiologic research should be seen as complementary endeavors, with data from one area of inquiry informing theory development and research activities in the other.

Significant programmatic attention must be paid to youth alcohol consumption per se. It is possible, in theory, to separate youth drinking from youth driving. However, these behaviors are currently so inextricably intertwined that successful DWI/RWID prevention programs may ultimately be those with a heavy emphasis on reducing alcohol consumption.

The youth DWI/RWID problem is not limited to impairment due to alcohol. Data from a 1983 survey of 18- to 24-year-olds (Elliot 1987) revealed that one in five respondents had driven while high on marijuana, and nearly one in ten had driven while high on other drugs. Moreover, the prevalence rate for DWI was twice as high for multiple drug users as it was for youth who only used alcohol. More research is needed on the contribution of marijuana and other drugs to crash-related mortality and morbidity, and future discussions of the youth DWI/RWID problem should specifically address these substances.

An effort should be made to involve physicians in the national effort to combat youth drinking/driving. Questions about alcohol use patterns, driving, and seatbelt use should be part of all doctor visits for teens and should be specifically explored when a presenting complaint suggests alcohol involvement (AAP 1987; Klitzner and Schonberg 1988). Moreover, parents of preteens should be counseled concerning the effects of their own drinking and drinking/driving attitudes and behavior on the behavior of their children. Parents should also be encouraged by physicians to disallow alcohol consumption by their adolescent children, including restrictions on attending parties where alcohol is served (AAP 1987).

Finally, continued efforts should be made to change social norms regarding youth alcohol use and DWI/RWID. It has been argued that changes in social norms and values as a result of two decades of antismoking activities and programs have contributed significantly to the efficacy of smoking cessation and prevention programs (Polich et al. 1984; Moskowitz 1983; Leventhal and Cleary 1980). Similar changes in drinking and DWI/RWID norms toward greater intolerance can facilitate the adoption of effective regulatory measures (Moskowitz 1989) and can also have a direct impact on youth behavior (Klitzner et al. 1988). The communitywide approach discussed earlier is one appealing strategy for effecting normative change because it attempts to involve all segments of the community in combating the youth drinking/driving problem.

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