

local safety council chapter or a child safety group release the news. The release can still quote police officials and offer enforcement details, but the main sense of the story should be something like, "A safety group supports new police policy of increased seat belt enforcement. Details of police enforcement plan also released. Data shows lives, dollars saved." The safety group may be seen as being in a more neutral position than police on this issue and can therefore provide *outside support* for enforcement.

- *Include authentic community voices as spokesperson and prepare them to make supportive remarks about the appropriateness of enforcement on this issue.* Seek educated participation by such peoples the leader of a parent-teacher group, a college or high school student, a businessperson, an EMS worker and a local government budget analyst. Including their supportive and explanatory comments in your written news release, or including them as spokespersons in a news event or news conference will provide enough variety of input that reporters will probably not feel compelled to seek additional input from an outside person whose views will be contrary but uneducated on the issue. Helping them to come forward to explain why enforcement is a useful tool in preventing traffic safety crashes, injuries, deaths and expenditures is part of a helpful community-wide discussion.
- *Release data, drawings, photos, videos, quotes by out of town experts, or other materials which will support the appropriateness of enforcement activities.* After all, research and experience consistently demonstrate that *enforcement + public information = traffic safety prevention of injuries, deaths and expenditures*. Advocates should, therefore, frequently share details with the public through news work.
- *Hold news events which portray police officers and enforcement activities on this issue in a positive light.* Advocates can set up fun, positive outdoor news events that cast traffic officers as community heroes.

On Valentine's Day in Vallejo, California, Michael Sparks and his co-workers at Vallejo Fighting Back provided roses for police officers to hand out to non-drinking drivers at Zero Tolerance DUI checkpoints run by the city police and the California Highway Patrol. In Kenner, Louisiana, officers passed out Thanksgiving hams and turkeys to drivers who had their belts buckled at a checkpoint. TV news gleefully reported the good news at both events, portraying the officers, the departments, and their communities in positive terms. Of course, the news stories also carried seat belt safety data. And authentic voices from the community spoke to news reporters on the scenes. Well-designed, ongoing, community-based media activities can provide just the right positive support to assure that enforcement activities will be forthcoming.

APPENDIX C3

ENVIRONMENTALLY BASED PREVENTION POLICIES AT THE LOCAL LEVEL

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INTRODUCTION

Over the last decade, the number of deaths and injuries related to impaired driving has declined significantly in the United States as well as in other industrialized countries. For example, in 1982, 57 percent of all highway fatalities in the U.S. involved a driver or pedestrian with a measurable blood alcohol level. By 1995, this figure had decreased to 41 percent of fatalities. The total number of traffic fatalities decreased from 43,945 in 1982 to 41,465 in 1995 (a decline of 6%) while alcohol-related fatalities decreased from 25,170 to 17,130 in the same time period (a decline of 32%) (NHTSA 1995).

Similar reductions have occurred in other industrialized countries, including Great Britain, Germany, the Netherlands, Canada, and Australia (Transportation Research Board 1994). Some countries have experienced slight increases in the last few years, causing some concern. The general trend, however, has been very encouraging. The harm that has been avoided is truly monumental. For example, in the United States, if alcohol-involved crash rates had continued unchanged since 1982, almost 13,000 more people would have died in 1993. Many thousands of serious injuries were also avoided.

In recent years, the political and economic mood has been such that policies that require centralized government control or funding are less popular and acceptable. A host of strategies exist, however, that can be implemented at the local level. This paper will provide an overview of research evidence regarding the effectiveness of common environmentally based strategies that can be implemented at the community or local level.

Environmental approaches are defined as strategies that are applied widely to whole populations or groups and that are designed to change the legal or social environment in order to change when people drink, how much they drink, and how they transport themselves after they drink. These approaches are distinct from treatment or other strategies designed to affect individual problem drinkers and drivers.

The strategies can be loosely divided into seven types:

- Availability of alcohol
- Sales and service policies
- Minimum purchase age
- Information strategies
- Controls on alcohol advertising and promotion
- Impaired driving strategies
- Transportation strategies

AVAILABILITY OF ALCOHOL

In the U.S., as well as most other countries, there has been a long history of governmental policies of varying stringency to control the availability of alcohol. These policies have been implemented at the federal, state or provincial, and local level both as a means of controlling consumption and generating and controlling tax revenues. In general, the theory underlying this type of policy strategy is that when obtaining alcohol is less convenient, less will be consumed and fewer problems will result (Edwards et al. 1994). In some cases, the restrictions are intended to decrease overall availability (and hence consumption); some strategies are designed to decrease availability in situations or at times when consumption is considered inappropriate (e.g., on Sundays or in public parks).

Availability strategies that will be discussed here are those that can be implemented at the local level, including limits on the location and density of alcohol outlets, controls on the hours and days of alcohol sale, and other local controls on availability.

Location and Density of Alcohol Outlets

Restricting the density of alcohol outlets is one way of making the purchase of alcohol less convenient, and therefore, possibly decreasing use. Fewer outlets per capita or per square mile can result in reductions in consumption and related problems (Rush, et al., 1986; Gliksman and Rush, 1986; Watts and Rabor, 1983; Gruenewald, Ponicki and Holder, 1993). Some analysts have speculated that if alcohol outlets are farther apart more motor vehicle crashes may occur as drivers travel to and from outlets (Colon et al., 1982). Recent research has shown, however, that *increased* alcohol outlet density is associated with *increased* alcohol-related traffic crashes (Scribner, MacKinnon, and Dwyer 1994).

Neighborhoods that are characterized by extremely high outlet densities may experience a variety of problems resulting from the presence of the outlets themselves, only partially related to levels of consumption. For example, the outlets can be a source of local nuisance problems (League of Cities, forthcoming). Alaniz and Parker (1994) report preliminary data that "indicate that alcohol outlet density contributes to youth violence rates even when poverty, ethnic and racial composition, family structure, and population density are held constant." In a study of 256 cities over a 20-year period, Parker and Rebhun (1995) found a strong correlation between alcohol outlet density and homicide rates even when beer consumption rates, poverty, inequality, region, racial composition, and population were held constant.

Communities can use zoning ordinances to space outlets farther apart and restrict outlets from certain locations. Communities can also require outlets to obtain conditional use permits, thus providing a tool for limiting density on a case-by-case basis (Wittman and Shane, 1988).

Hours and Days of Sale

Some studies have found effects on both alcohol consumption and related problems resulting from restrictions on hours and days of sale. Smith (1988) reports an increase in traffic crashes following the introduction of Sunday alcohol sales in Brisbane, Australia. Olsson and Wikstrbm (1982) found a reduction in alcohol sales as well as a reduction in intoxicated persons and police interventions in domestic disturbances when Swedish retail liquor stores were closed on Saturday on an experimental bases. Similarly, when Norwegian stores were closed on Saturdays, police reports of drunkenness and domestic problems on Saturdays and early Sundays decreased dramatically. There was little effect, however, on overall consumption.

Other Local Policies on Availability

In many jurisdictions, local governments apply various other restrictions to alcohol availability. For example, cities may prohibit alcohol in public parks or at beaches or they may have rules about how alcohol may be served at events in public places (such as at sports arenas and community centers). Gliksman and colleagues (1995) described the application of local option ordinances in Ontario as they are applied to such events as community celebrations, sports banquets, and fund raisers. Ordinances that may mandate management practices include such things as requiring server training for servers at events, making low alcohol drinks and food available, and providing safe transportation for the impaired. Many municipalities that have adopted these types of policies report reductions in problems such as underage drinking, fighting, and vandalism.

ALCOHOL SERVICE ISSUES

In recent years it has been increasingly recognized that when patrons of bars and restaurants drink to excess, the potential for a variety of problems, especially impaired driving, is increased. Roadside surveys show that 30 to 50 percent of drivers on the road who have been drinking are coming from bars and restaurants (O'Donnell 1985). Other possible negative outcomes of such drinking include violence or non-traffic injuries. Thus, environmental strategies that focus on alcohol service in establishments have received considerable attention.

Responsible beverage service is a technology that has been developed to decrease the probability that patrons of licensed establishments will drink to excess or suffer harmful consequences of drinking. These techniques include management policies (e.g., prohibiting reduced-price drinks, providing food and non-alcoholic beverages, avoiding overcrowding—which prevents servers from keeping track of patrons' consumption) and service techniques (e.g., recognizing signs of intoxication and learning to slow or refuse service to patrons who may be

intoxicated, finding alternate transportation for driving patrons who are impaired).

Evaluations of formal programs to train managers and servers in these techniques have shown them to be effective. Glicksman and colleagues (1993) found some changes in server knowledge and behavior after training. Other studies have found effects on beliefs and knowledge but not on behavior (Howard-Pitney et al. 1991). McKnight (1991) reported that a six-hour program delivered to servers and managers in 100 licensed establishments resulted in interventions by servers in 20 percent of cases where a patron appeared to be intoxicated; seven percent of these cases resulted in termination of service.

It is illegal in most if not all jurisdictions in the United States to serve alcohol to an intoxicated patron. Thus, the role of law enforcement can be important. In McKnight's study (1991) following the introduction of an enforcement effort in one county in Michigan, refusals of service to patrons who appeared intoxicated rose from 17.5 percent to 54.3 percent. At the same time, the proportion of arrested impaired drivers coming from bars and restaurants declined. In a comparison county, refusals of service rose to a significantly smaller extent and there was no change in the percentage of arrested impaired drivers coming from bars and restaurants. Thus, the combination of server training and enforcement of laws against service to intoxicated patrons seems to be much more effective than the training alone.

MINIMUM PURCHASE AGE

There is strong research evidence that establishment of 21 as the uniform minimum drinking age for alcohol has reduced alcohol-related crashes among young people (United States Government Accounting Office, 1987). In fact, the National Highway Traffic Safety Administration estimates that more than 14,000 traffic deaths have been averted since States started raising the minimum drinking age (NHTSA, 1995). There is also evidence that raising the drinking age to 21 has significantly reduced deaths due to suicide, pedestrian injuries, and other unintentional injuries as well as traffic fatalities (Jones et al., 1992). Parker and Rebhun (1995) recently reported that increases in the minimum purchase age decreased youth homicide, especially in those homicides in which the victim and the offender knew each other.

Increasing the drinking age also seems to reduce the amount of drinking even after age 21. O'Malley and Wagenaar (1991) found that early legal access to alcohol was associated with higher rates of drinking at ages 21 to 25 while youth who did not have legal access until 21 not only drank less during the 18 to 20 period, but drank less at ages 21 to 25. Thus, there does not seem to be any "rebound" effect of increased drinking once legal age is achieved. Similarly, raising the drinking age to 21 may not simply delay the occurrence of alcohol problems until a later age. Rather these problems seem to be permanently averted (Wagenaar, 1993).

Despite the minimum purchase age laws, young people continue to have access to alcohol and many of them drink. In 1991 the Office of the Inspector General of the U.S. Public Health Service released a report stating that loopholes in many states' minimum drinking age laws are one reason youth have easy access to alcohol (Office of the Inspector General, 1991). In addition, current laws are not well enforced. Wagenaar and Wolfson (1994) estimate that only two out of every 1,000 occasions of underage drinking results in an arrest. Moreover, the vast majority of arrests are of the minors themselves rather than the outlets or adults furnishing the alcohol to minors.

A number of strategies have been adopted by police and alcohol beverage control agencies to prevent underage drinking. Some of these strategies are aimed at sales outlets while others are directed at youth. The most common type of enforcement technique is "decoy" or "sting" operations. Underage decoys are sent into establishments to attempt to purchase alcohol. If an establishment sells alcohol to the decoy, it can be penalized. The use of successive sting operations in Denver, along with letters to establishments, was found to reduce sales to minors. Prior to the program, decoys were able to purchase alcohol in 59 percent of attempts compared to 32 percent of purchase attempts after the enforcement program had been implemented (Preusser, Williams, and Weinstein 1994).

INFORMATION STRATEGIES

A wide range of strategies designed to inform people about alcohol-related issues and thus (it is hoped) to change their behavior have been implemented for many years. These strategies may provide factual information, emotional appeals, and persuasive messages through a variety of media (school classrooms, television, posters in alcohol sale outlets). In general, informational campaigns have had limited effects on behavior (e.g., Vingilis and Coultas 1990). Two notable exceptions are an informational campaign designed to reduce impaired driving through the use of blood alcohol level calculators (Worden et al. 1989) and informational campaigns designed to publicize enforcement campaigns (Blomberg 1992).

CONTROLS ON ALCOHOL ADVERTISING AND MARKETING

People have consumed alcohol and suffered adverse consequences for thousands of years without any assistance from advertising. The current intensity and omnipresence as well as the provocative content of advertising and other marketing practices, however, have raised concerns from alcohol policy makers that advertising contributes to a variety of negative consequences. There are concerns that advertising:

- Pairs drinking with potentially dangerous activities, such as driving;

- Glamorizes drinking or associates it with sexual conquest, social success, or other highly motivating goals;
- Makes drinking appeal to young people under the legal drinking age; and
- Normalizes drinking and encourages the impression that everyone drinks, that drinking is appropriate in a wide variety of situations, that not drinking is unusual and nonnormative.

In assessing issues related to advertising (that is, advertisements in magazines, newspapers and on billboards as well as commercials on television and radio), it is also necessary to consider other marketing practices, such as promotional activities (e.g., distribution of novelty items, displays in alcohol outlets, special pricing), development and promotion of various beverage types (e.g., high alcohol beers, wine coolers, premixed cocktails), sponsorship of community and sports events by alcohol manufacturers, and so forth.

Policies that have been implemented or proposed at the local level to regulate advertising include:

- Controls on time and place of advertising (e.g., prohibiting billboards advertising alcohol in areas near churches or schools);
- Limitations on other types of marketing practices (e.g., restricting promotions on college campuses); and
- Elimination of some types of alcohol promotions (e.g., sponsorship by alcohol manufacturers of community events or events that are incompatible with drinking such as car races).

The research on alcohol advertising attempts to provide evidence in two general areas: 1) Whether policies restricting alcohol advertising are effective in reducing adverse effects; and 2) Whether there is a link between exposure to alcohol advertising and adverse consequences from alcohol use.

Bans on alcohol advertising in other countries provide some information concerning the effects of advertising on consumption, although the research is far from conclusive. A 14 month ban on all alcohol advertising in British Columbia was found to have little effect on consumption (Smart and Cutler, 1976). Similarly, a ban on beer advertising in Manitoba found no effects on consumption (Ogbourne and Smart, 1980). These bans only applied locally, however, and advertising from national media continued.

Prohibition of alcohol advertising in Norway and Finland provide a more clear test of the effects of advertising as outside media influences are more limited in these countries. Analysis of alcohol consumption rates before and after the bans were applied showed no effects of the ban (Holder 1993). Another study compared consumption rates in several different countries (Hungary, Finland, Norway, Denmark, the Netherlands, Australia, and

Japan) with varying rules concerning advertising. Per capita consumption varied widely among the countries but there were no obvious differences between the countries with and without restrictions (Simpson et al. 1985).

Pooled data from 17 countries analyzed by Saffer (1991) indicated that banning broadcast advertising of alcohol resulted in reductions in alcohol abuse as measured by liver cirrhosis and highway fatality rates.

Ornstein and Hanssens (1985) examined limited restrictions within the United States on billboard advertising, consumer novelties and price advertising. Higher spirits consumption was found in states that allow price advertising and consumer novelties. No effect on beer consumption was found from billboard advertising and consumer novelties, while some increase in consumption was associated with price advertising. In contrast, Wilcox (1985) found no effects from price advertising in Michigan.

Thus, research on the effects of various aspects of alcohol advertising on alcohol consumption and related problems is inconsistent. One reason for this inconsistency may be that control of advertising is imperfect. As Smart (1988) concluded:

Given the global nature of mass media, total advertising bans are almost impossible to achieve. An additional problem is that advertising effects may persist for a long time after a ban has been imposed and hence effects on sales may be long delayed. Perhaps an entire generation never exposed to alcohol advertising would drink less than those exposed to advertising for years and then a ban.

Particular concern has been expressed regarding the effects of exposure to alcohol advertising on children and youth. Grube et al. (1991) examined the awareness of television beer advertising among fifth and sixth graders as related to their beliefs about alcohol, intentions to drink when they were older, and knowledge about beer brands and slogans. The study found that children tend to believe the commercial messages in that beer is associated with good times, not with health consequences. Children who pay more attention to beer commercials were found to be less skeptical about the messages and children who are exposed to more commercials are more likely to expect to drink as an adult.

Grube and Wallack (1991) concluded that "awareness of advertising *causes* children to be more favorably predisposed to alcohol and drinking." It must be kept in mind here, however, that among the children in the sample (all from the same Northern California community), the range of exposure to advertising is probably quite narrow. Beer advertising is so pervasive in American society that children are unlikely to be able to avoid it.

Other research has examined the appeal of advertising to small children. Several studies have focused in particular on the effects of advertisements including the use of the "Joe

Camel" character, finding, for example, that 30 percent of three year olds and over 90 percent of six year olds could match the camel character with cigarettes (Fischer 1991). Another study showed the success of the "Joe Camel" campaign in increasing sales of Camels (Pierce, 1991). While these studies focus on cigarette advertising, it is likely that such findings might result from similar alcohol advertising campaigns.

Many communities have attempted to take control of local advertising and promotions. Some have questioned the traditional sponsorship of community and sporting events by alcohol companies. For example, people in Oakland, California challenged the planned distribution of flashlights with Bud Lite inscribed on them at a baseball game. Annheuser-Busch intended to give the flashlights to anyone at the ballpark 16 years of age or older (*Prevention File*, 1993). Other communities have passed ordinances against alcohol advertising on billboards (controlling billboard density, content, location, or, in some cases, banning billboards altogether). Low income and minority communities have become increasingly aware of the fact that their communities often have a greater density of alcohol and tobacco billboards. Some have been galvanized to take quite militant action against the billboards and the companies that sponsor them (The Marin Institute, 1993). Some communities have implemented conditional use permits for alcohol outlets limiting the nature of advertising and the use of promotional materials in the outlets (for example, limiting or prohibiting advertisements visible from the street) (The Marin Institute, 1993).

The effects of any of these actions on alcohol consumption and related problems has not been measured. It seems likely, however, that such actions and the attention they attract from the community at large raise awareness of alcohol-related problems and the fact that the community can, to some extent, take control of the environment surrounding alcohol use and misuse. It is possible that this awareness and the increasingly proactive stance of the public and policy-makers can contribute to reductions in alcohol-related problems.

IMPAIRED DRIVING POLICIES

This paper will discuss the research evidence related to impaired driving policies that can be implemented at the local level. These include enforcement programs and some sanctions.

Enforcement

It is important to note, in any discussion of enforcement, that in terms of traffic safety, detecting impaired drivers and removing them from the road can have only a small effect. No matter how effective the police are and how many impaired drivers they arrest and take off the highway, they can never hope to catch more than a tiny proportion of the impaired drivers on the road. Currently, officials estimate

that the chances that a drinking driver will be arrested are as low as one in 1,000 (Sweedler 1991). Inevitably, many of these drivers will be involved in crashes before they are caught by police. By far the most effective way of preventing crashes is to prevent drinking and driving before it occurs. One way of doing this is to convince the driving public that if they drink and drive, they are likely to be caught and promptly punished in a significant way. Some changes in enforcement policy have both increased the likelihood of apprehension and the public's perception of the likelihood.

The most well-known enforcement approach in increasing deterrence is random breath testing. The experience of the Australian states of New South Wales and Victoria provides the most dramatic examples of its effectiveness. Random breath testing was introduced in New South Wales in 1982. There was an immediate 36 percent drop in alcohol-related fatal crashes, as compared to the previous three years (Homel, Carseldine and Kearns 1988), with a sustained 24 percent decrease in single-vehicle night-time accidents over the next five years (Homel, McKay, and Henstridge 1995). In Victoria, the proportion of drivers killed over the legal blood alcohol limit (.05 percent) declined from 49 percent in 1977 (when random breath testing was introduced) to 21 percent in 1992 (Moloney 1995).

The success of random breath testing in these Australian states is attributed to the principles laid out by Homel and colleagues (1988). They found that in order to be maximally effective, the campaign should be highly visible, conducted as often as possible, rigorously enforced so as to ensure credibility, and well publicized. For example, in Victoria it was found that when random breath testing was carried out by officers in normal police vehicles in combination with their other duties it was not nearly as effective as when it was carried out using highly conspicuous special purpose vehicles. Testing is carried out at times and in places designed to attract public and media attention and is combined with saturation advertising (Moloney 1995).

Random breath testing efforts in Sweden and in New Zealand have had less dramatic results, perhaps because the campaigns were not carried out with the vigor and persistence that characterizes the efforts in New South Wales and Victoria (Törnros 1995; Bailey 1995).

In the United States, random breath testing is not constitutionally permissible. Instead, some jurisdictions use sobriety checkpoints. The key difference between random breath testing and sobriety checkpoints is that in a sobriety checkpoint, the enforcement officer cannot ask for a breath sample unless there is probable cause to believe that the driver has been drinking. Research has indicated that officers do not detect a substantial portion of drinking drivers under these circumstances (Jones and Lund 1985). The use of passive breath sensors substantially increases the effectiveness of sobriety checkpoints (Voas, Rhodenizer, and Lynn 1985).

Researchers have observed that aggressiveness and conspicuousness of the sobriety checkpoints and widespread publicity surrounding them is important to their full success as deterrents (Hurst 1991). A study by Ross indicated that communities that used sobriety checkpoints experienced significant decreases in alcohol-related traffic crashes. The programs tended to be short-lived, however, as police turned to other crime problems, such as drugs (Ross 1992). Unfortunately, the harm reduction potential of sobriety checkpoints was likely to be much greater than that of the other police priorities.

Penalties

In recent years, new penalties for impaired driving have been tried, especially with multiple offenders. Increasingly popular are vehicle-based sanctions. In several states, the vehicle driven by a multiple offender may be impounded, immobilized with a "club" or "boot" device, or confiscated. In some jurisdictions, the license plate, rather than the vehicle, is confiscated or impounded, or a special tag is issued identifying the vehicle as being owned by an offender. Another vehicle-based sanction is the installation of ignition interlock devices which prevent a vehicle from being driven unless the driver produces a breath sample that is free from alcohol. Each type of penalty results in logistical and legal problems. Evaluations of some of these strategies have shown positive effects. For example, in Oregon, the use of a special sticker on the cars of convicted impaired driving offenders led to a significant decrease both in recidivism among the drivers who received the sticker and in overall impaired driving in the state (Voas and Tippetts 1994). Evaluations are currently under way for some of these penalties, but outcome results are not yet available (Voas 1992). Many of these penalty programs can be imposed by local jurisdictions.

CHANGES IN THE TRANSPORTATION ENVIRONMENT

The characteristics of the transportation environment can affect the degree to which consumption of alcohol results in traffic crashes. Americans depend on private automobiles, making driving after drinking more likely. Approaches have been tried based on providing alternative means of transportation. Efforts have also been made to improve the safety of roads so that crashes are avoided or minimized. The safety of the vehicle itself is critical once a crash has already occurred.

Transportation Policy

Changes in transportation policy have not been widely considered as a way of decreasing impaired driving in the U.S., nor has the nature of the transportation environment usually been a part of the examination of alcohol availability. For example, many bars are located in places

where the only possible transportation are private automobiles. Similarly, public transportation in most U.S. cities stops running hours before bars close. In many European countries, public transportation is more available and more widely used.

Strategies to provide alternative means of transportation include designated driver programs and "safe rides" programs that provide free or reduced priced taxi rides or other forms of transportation. In Scandinavian countries, the use of designated drivers who do not drink or who drink very little has been widespread for many years. In the United States, such practices (especially the designated driver) are frequently not used appropriately (Stewart et al. 1995).

Concerns have been raised that the provision of transportation alternatives may encourage drinking to the point of serious impairment, thus leading to other negative effects of alcohol, including crime, violence, and non-traffic accidental injury (DeJong and Wallack 1992). Recent research indicates that among a college student sample, 22 percent of students who use a designated driver drank more than their usual amount the last time they were the passenger of a designated driver (DeJong, Wechsler, and Winsten, under review).

Improved Roadway and Vehicle Safety

Roadway and vehicle safety policies have not received widespread attention as a way of decreasing alcohol-related traffic injuries. Unsafe driving will always occur and in many cases will involve alcohol. Thus, reducing the hazards on roadways and improving the crashworthiness of vehicles can make a life-or-death difference when prevention and deterrence efforts have failed.

The modification of roadside hazards provides one example of how roads can be made safer. A frequent type of alcohol-related fatal crash involves hitting a roadside hazard, such as a tree or utility pole. Perchonok et al. (1978) found that the frequency of collisions with utility poles declined by about five percent for every six feet of distance between the poles and the roadway.

Another important strategy for decreasing alcohol-related injuries is to increase safety belt use. Mandatory seat belt use laws have been shown to decrease traffic fatalities by between five and 15 percent (Lund et al. 1987; Skinner and Hoxie 1988). This percentage is lower than might be hoped because the vehicle occupants who are most likely to be involved in crashes, including impaired drivers, are least likely to wear safety belts (Williams and Lund 1988). It can be assumed, however, that as safety belt usage increases to very high levels (as seen, for example, in the United Kingdom where use rates approach 90 percent) even impaired drivers are more likely to buckle up. Local efforts to enforce or encourage seat belt use may be effective in increasing usage.

CONCLUSIONS

While some effective programs for the reduction of impaired driving must be imposed by State or Federal governments, many powerful strategies can be implemented at the local level by communities who are committed to the safety and welfare of their residents. Moreover, communities with this sort of commitment can eventually influence higher levels of government to maintain and reinstate important safety priorities.

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APPENDIX C3A

LOWERING STATE LEGAL BLOOD ALCOHOL LIMITS TO 0.08%: THE EFFECT ON FATAL MOTOR VEHICLE CRASHES

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ABSTRACT

The first five states that lowered legal blood alcohol limits to .08% to reduce alcohol-related fatal traffic crashes were paired with five nearby states that retained a .10% legal standard. Within each pair the maximum equal available number of pre- and post-law years were compared. States adopting .08% laws experienced 16% and 18% relative post law declines in the proportions of fatal crashes

involving fatally injured drivers with blood alcohol levels at .08% or higher, and .15% or higher. If all states adopted .08% legal blood alcohol limits at least 500-600 fewer fatal crashes could occur annually.

INTRODUCTION

In 1994 16,589 people died and nearly 297,000 persons were injured in alcohol-related traffic crashes.¹ Driver impairments begin at blood alcohol levels well below the .10% legal standard in most states. Experimental laboratory studies have shown that at .08%, a level reached by a 150-pound person consuming four drinks an hour on an empty stomach, there is reduced peripheral vision, poorer recovery from glare, poor performance on complex visual tracking, and reduced divided attention performance.² Driver simulation and road course studies have revealed poor parking performance, impaired driver performance at slow speeds and steering inaccuracies.³ Roadside observational studies have identified speeding and breaking performance deterioration.⁴ A national comparison of drivers in single vehicle fatal crashes with drivers not in fatal crashes stopped at roadside surveys indicate that each .02% increase in blood alcohol level nearly doubles the risk of fatal crash involvement. In all age and sex groupings the fatal crash risk at a blood alcohol level of .05%-.09% was at least 9 times greater than at zero blood alcohol.⁵

To reduce alcohol related fatal traffic crashes 14 states have lowered the legal blood alcohol limit from .10% to .08%. Johnson and Walz⁶ monitored six different measures of driver involvement in alcohol related fatal crashes in the first five states to adopt .08% laws. Nine of the thirty pre- to post-law comparisons identified statistically significant decreases. However, comparison areas were not included to assess whether the post law declines were independent of general regional trends.

This study assessed whether relative to nearby states, states adopting a .08% legal limit experienced a reduction in the proportion of fatal crashes involving

- Fatally injured drivers with blood alcohol levels above .08% or higher and .15% or higher.
- Any driver with a blood alcohol level at .08% or higher and .15% or higher.

METHODS

Prior to 1992 five states lowered legal blood alcohol limits from .10% to .08%: Utah in August 1983, Oregon in November 1983, Maine in August 1988, California in January 1990 and Vermont in July 1991.

Each of those states was paired with a nearby state that retained a .10% legal limit. Within each pair the maximum equal number of available pre- and post-law years were compared. Utah was compared to Idaho from August 1976 to July 1991, Oregon with Washington from November