11
Effectiveness of Health Promotion in Preventing Alcohol Related Harm*

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About 4% of the global burden of disease is attributed to alcohol, which contributes to 3.2% of deaths and 4.0% of the disability-adjusted life years lost. Of the 2 billion alcohol consumers worldwide, over 76 million have been diagnosed with alcohol use disorders (Room et al., 2005). As well as being the leading risk factor for disease burden in low mortality developing countries, alcohol consumption is the third largest risk factor for developed countries (Doran, 2003; WHO, 2004).

Despite the scope of alcohol related problems globally and the difficulty in preventing them, there is increasing evidence of effectiveness of some prevention strategies, especially those aimed at reducing alcohol-related traffic injuries. Over the past three decades, high-income countries have experienced a substantial reduction in mortality and morbidity from alcohol-related traffic crashes (Peden et al., 2004). The majority of this reduction is attributed to behavioral changes associated with public education, organizational policies, legislation, law enforcement, and economic actions, in multiple settings involving multiple sectors (Commonwealth Department of Health and Aging, 2003; Hingson & Sleet, 2006).

This chapter reviews evidence regarding the effectiveness of interventions aimed at reducing alcohol-related problems, considered within a health promotion framework (Howat et al., 2004). It illustrates these interventions, using examples primarily drawn from high income countries, and discusses the potential benefits of a synergistic application of these interventions. There is a paucity of literature on the effectiveness of interventions aimed at minimizing alcohol-related problems in low-income countries. While these countries can learn much from the high-income countries (Doran, 2003), caution is recommended in extrapolating the likely effectiveness of these interventions.

* The findings and conclusions in this chapter are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention of the Department of Health and Human Services or Curtin University.

The Health Promotion Framework

Although people must assume personal responsibility for maintaining their health, there is wide recognition that environmental cues and reinforcers exert an important influence on behavioral choices and outcomes (Geller et al., 1991). Drinking behavior is shaped by individual choices and motivation, and also strongly influenced by organizational, economic, environmental, and social factors (WHO, 2004; WMA, 2005). Therefore, approaches that attempt to bring about change in drinking behavior through education alone are likely to have limited or no success (Gielen & Sleet, 2003; Howat et al., 2004; Peden et al., 2004; Sleet et al., 1989), whereas those that combine educational with other behavioral, environmental, policy and organizational changes are likely to be the most effective (Shults et al., 2001; Waller 1998; WHO, 1986)

During the past two decades there has been a significant increase in evidence that various aspects of the environment influence alcohol use. These influences may include social cues, such as use by family members and peers, or images of alcohol use promulgated by advertising and media (USDHHS, 1997a). Environmental influences also include availability, cost and the nature of the alcoholic beverages offered for sale (Stockwell et al., 1997). Measham and Brain (2005) in their recent review on binge drinking and British alcohol policy identified that intoxication was encouraged by economic deregulation and constrained by legislative change, highlighting that poor policy can contribute to alcohol related harm.

A health promotion approach to the prevention of alcohol-related problems incorporates an appropriate balance of individually-focused behavior change strategies and those that produce environments that support healthy behaviors. One definition of health promotion is:

> a combination of *educational, organizational, .economic* and *political* actions designed with consumer participation, to enable individuals, groups and whole communities to increase control over, and to improve health through changes in knowledge, attitudes, behavior, policy, and social and environmental conditions (Howat et al., 2003)

This definition builds on and incorporates aspects of earlier definitions of health promotion (Green & Kreuter 1999; WHO, 1986). An example of how this approach could be applied to alcohol-related problems is provided (Figure 11.1). Figure 11.1 presents a logic model and framework for how the components of health promotion (economic actions, policy actions, organizational actions, and health education) can cumulatively contribute to changes in knowledge, attitudes, behaviors, policies, and the social and physical environment that are necessary to reduce alcohol-related problems. These changes have the potential to reduce alcohol-related harm, ultimately improving health status of individuals and the community (Pinder, 1994; USDHHS, 1997b; WHO, 1984)

Within each component, there is a wide range of strategies employed to reduce alcohol related problems. For some strategies, there is While some

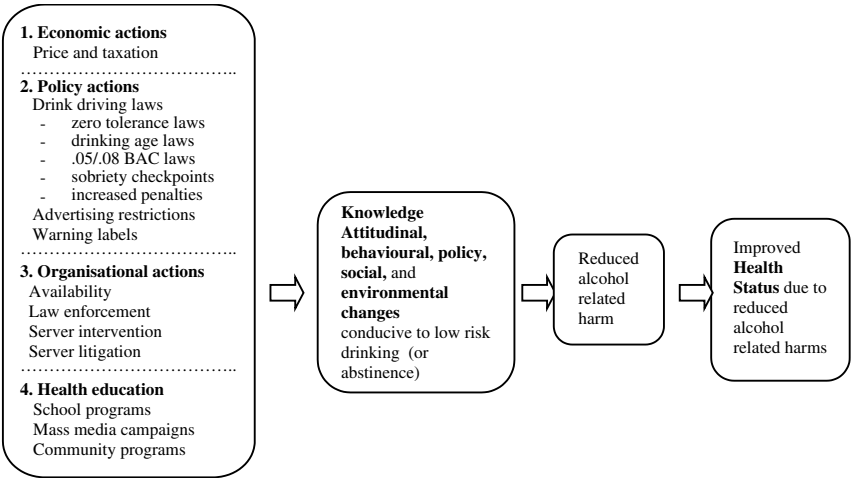

FIGURE 11.1. A health promotion framework for reducing alcohol related harm.

single interventions serve as strong supporting actions, they might not be proven to be effective on their own; therefore, although advocating for strategies with demonstrated effectiveness within a comprehensive framework is critical, practitioners should also continue to support research on interventions that currently have only moderate or insufficient evidence. This chapter reviews these strategies embedded within the components of the health promotion framework.

Economic Interventions

Price and taxation: Pricing policies are regarded as among the most effective measures to reduce total alcohol consumption and hence alcohol-related problems. Studies have indicated that a rise in price will lead to a drop in consumption (Babor et al., 2003; Waller, Naidoo & Thom, 2002; WHO, 2004) and a decrease in price will likely result in additional alcohol related deaths (Schancke, 2005). One estimate indicated that a 10% increase in the price of alcoholic beverages in the United States would reduce alcohol-impaired driving by about 8% for females and about 7% for males (Babor et al., 2003). Another estimate is that a 17% increase ($1) in the price of alcohol for a six pack of beer could lead to a 3.3% reduction of current alcohol-attributable mortality in the USA (Hollingworth et al., 2006). Pricing policies are likely to be particularly effective in reducing consumption by young people, as they are more likely to be sensitive to price changes due to their smaller disposable incomes. Moreover, an increase in the real price of alcohol has been shown to significantly reduce alcohol attributable harms among Indigenous peoples where high levels of overall alcohol consumption and related harms are of particular concern (Chikritzhs et al., 2005)

In both Australia and the United States, there has been widespread support from public health advocates for alcoholic beverages to be taxed based on their alcohol content, and for tax rates to be periodically adjusted to reflect changes in real costs to the consumer (Crosbie & Stockwell 1998; IOM, 2003; The Royal Australian College of Physicians, 2005).

Organizational Interventions

Alcohol Licensing: Prevention regulations that are aimed at the sellers of alcohol are more effective than prevention programs that rely only on education directed at individual drinkers. The licensing of sellers of alcoholic beverages is crucial for the adoption of many organizational interventions and is a central component of effective prevention. The power to revoke or suspend a license for breaches of sales regulations is an effective strategy for controlling the rates of alcohol related problems, including traffic crashes (Babor et al., 2003).

Alcohol Availability: There is substantial evidence that alcohol availability is correlated with levels of consumption and ultimate harm (Waller et al., 2002; WHO, 2004). Some studies have described a clear epidemiological link between alcohol consumption and suicide and violence (Rossow, 2000; Rossow, Grøholt & Wichstrom, 2005). Availability of alcohol can be controlled by restrictions on hours and days of sales, and by controlling the number, location, and type of liquor outlets. There is evidence of the benefits of bans on sales to specific groups such as minors (Shults et al., 2001), or in specific circumstances such as during sporting events (Douglas, 1998; Gray et al., 1995).

There is strong evidence that off-premise monopoly systems can limit both the levels of alcohol consumption and alcohol related problems (WHO, 2004). Examples from Finland and Sweden illustrate substantial rises in consumption, including by minors, associated with availability of alcohol in grocery stores (Babor et al., 2003). When Swedish grocery stores were no longer permitted to sell 4.5% beer, a significant drop in traffic crashes followed (Babor et al., 2003).

There is inconsistent evidence on the effectiveness of changing hours of sale of alcohol, but strategic restrictions on hours of alcohol sales and service appear to be beneficial. A number of studies indicate that changing the hours or days of alcohol sales can influence the incidence of alcohol related problems (Babor et al., 2003; Chikritzhs & Stockwell, 2002; Chikritzhs & Stockwell, 2006, McMillan & Lapham, 2006)

Server intervention and drinking environments: Server intervention programs involve training servers employed to serve alcohol beverages in alcohol retail establishments, often in conjunction with training for managers and door staff. Their main objective is to prevent intoxication and drunk driving by their clients. Recommended serving practices include providing food, slowing service to drinkers showing signs of intoxication, refusing service to intoxicated or underage drinkers, and taking steps to prevent intoxicated patrons from driving. Increasing attention is being paid to such issues of server training and the safety

of drinking environments in the United States, Australia, Sweden and Canada (Babor et al., 2003; Daly et al., 2002; Loxley et al., 2004; Shults et al., 2001). A review of server interventions found evidence of effectiveness, under conditions of face-to-face instruction and strong management support (Shults et al., 2001) and mandatory regulations and meaningful enforcement (Stockwell, 2006).

The introduction of voluntary "Alcohol Accords" or codes of practice in Australia between local alcohol retailers, police, local government and community representatives is one method to promote responsible service policies. Despite a number of Alcohol Accords in place throughout Australia, the evidence of their effectiveness is equivocal (Daly et al., 2002), and they are likely to have only minimal impact on reducing alcohol-related harm

Server litigation: In Australia, alcohol-consuming patrons involved in subsequent traffic crashes have successfully sued bar and hotel proprietors following traffic crashes, claiming they were served dangerous levels of alcohol (Stockwell, 2001). These actions may have the potential to reduce the prevalence of driving while intoxicated (DWI), especially if they foster improved service practices (Stockwell, 2001). Studies from the United States have found that alcohol-related crashes decreased following high-profile server liability cases (Wagenaar & Holder, 1991), and that states with statutes or case law permitting server liability tend to have lower fatality rates from alcohol-related crashes (Chaloupka et al., 1993; Whetten-Goldstein et al., 2000).

Policy Interventions

McGinnis et al., (2002) argue for the central role of policy development in health promotion. The clearest evidence of the impact of policy interventions comes from the literature on alcohol related traffic crashes.

Drink driving legislation: The enactment of laws, along with enforcement and informational efforts, have resulted in substantial declines in the rate of alcohol related traffic crashes in countries such as the United States, Australia and New Zealand (Henstridge et al., 1997; Jones & Lacey, 2001; Dellinger et al., 2007). Some examples of laws where evidence supports such benefits include:

- A reduction of the legal BAC to .05% in Australia and .08% in the United States (Howat et al., 1992; Shults et al., 2001)
- Sobriety checkpoints and testing (Jones & Lacey, 2001; Shults et al., 2001)
- Stricter enforcement of drink driving legislation (Holder, 1998)
- An increase in the legal drinking age (Shults et al., 2001)

Reducing Blood Alcohol Concentration (BAC) limits: Many countries have laws, known as illegal "per se" laws that specify BAC limits at which it is illegal to operate motor vehicles. Recent literature reviews indicate that lowering the "per se" limit to 0.08 g/dL or lower has been effective for decreasing alcohol-related crashes in the United States (Shults et al., 2001) and other countries (Mann et al., 2001; Howat et al., 1991). In the United States, Congress required States to .08 g/dL BAC

laws by October 2003 to avoid the withholding of federal highway construction funds (Shults et al., 2001). Lower BAC limits specifically for young or inexperienced drivers are also effective at decreasing alcohol-related crashes (Shults et al., 2001). All 50 U.S. states have such laws, as do Australia, New Zealand, Austria and parts of Canada (Homel, 1994; Hollingworth et al., 2006; Shults et al., 2001).

There is an interesting benefit of tougher DWI laws that set low legal blood alcohol limits for drivers under the age of 21 years. An estimated reduction of 7% to 10% in suicide for among young males between 15 and 20 years is attributed to such laws in the USA for the period 1981–1998 (Carpenter, 2004).

Sobriety checkpoints: Sobriety checkpoints allow law enforcement officers to assess drivers for alcohol impairment. In Australia and a number of European countries, drivers are systematically stopped and given a breath test to measure their blood alcohol concentrations (BACs). In the United States, police must suspect a driver has consumed alcohol before they can demand a breath test. Both of these breath test procedures are usually accompanied by extensive publicity in an attempt to alert drivers to the consequences of drink driving and to increase their perceived risk of arrest (Jones & Lacey, 2001; Shults et al., 2001). Evaluations of the effects of sobriety checkpoints on crashes in the United States and Canada indicate that they decrease alcohol-related crashes by approximately 20% (Elder et al., 2002; Jones & Lacey, 2001). In Australia, sobriety checkpoints are credited with about 30% of the reduction of fatal traffic injuries (Henstridge et al., 1997). The success of checkpoint programs is dependent on both the level of enforcement and on publicity campaigns (Elder et al., 2002; Henstridge et al., 1997; Jones & Lacey, 2001).

Increased penalties for drink driving: Australian data indicates that harsh penalties for drink-drivers has the highest level of public support (89%) among the many policy-oriented interventions (AIHW, 1999), yet there is little evidence of substantial benefits from increased fines or mandatory jail time (Homel, 1981; Villaveces et al., 2003).

Drinking age: A recent global review of alcohol policies (WHO, 2004) indicated a relationship between raising the drinking age and a reduction in alcohol consumption and alcohol related problems among young people. Conversely, there is new evidence of an increase in hospitalized injuries associated with alcohol-related traffic crashes when the legal drinking age was lowered from 20 to 18 years in New Zealand (Kypri et al., 2006). Studies in the United States have produced strong evidence that increasing the drinking age to 21 years resulted in substantially fewer alcohol-related crashes among young people (Shults et al., 2001; Wagenaar & Toomey, 2002). Similarly, alcohol related problems in the UK decreased after the minimum age for drinking in public places was raised (Waller et al., 2002).

Multiple policy interventions: The implementation of multiple policies to reduce alcohol-related harms is generally preferable to reliance on any single strategy due to the potential for synergistic effects (Howat et al., 2004; Green & Kreuter, 2005; Howat et al., 2003; Shults et al., 2002).

An analysis of alcohol control policies in 97 American cities showed a relationship between the number of regulations and alcohol related traffic fatalities. Cities with less than 10 of 20 listed alcohol control regulations had 1.46-times more deaths than cities with 15 or more of these regulations (Cohen et al., 2001). Economic research in Australia indicated substantial economic benefits from employing multiple interventions and the combination of strategies (such as sobriety checkpoints, lower legal BAC limits, mass media publicity, higher penalties and stricter enforcement of penalties) was considered particularly effective (Commonwealth Department of Health and Aging, 2003).

The key to the success of drink driving legislative interventions is a change in the public perception of the risk of being involved in an alcohol related crash, of being arrested for drink driving, or both (WHO, 2004). Public media campaigns can be effective in raising awareness, increasing knowledge, and improving the acceptance of traffic regulations, making legislation both possible and acceptable (Stockwell et al., 1998). Public information and education was a major factor for the success of sobriety checkpoints in Australian States in the 1980's (Henstridge et al., 1997; Homel, 1994; Howat et al., 1992), and was essential in a successful US community-based intervention (Holder, 1998).

Restrictions on advertising and promotion: The alcoholic beverage industry has vigorously promoted its products through direct and indirect advertising. Advertising and marketing strategies once used by the tobacco industry have been employed to increase the market share of alcoholic beverages (Jernigan et al., 2005; Mosher & Johnsson, 2005; USDHHS, 1997a) An aim of alcohol promotion is to "normalize" regular drinking, to encourage non-drinkers to try alcoholic products, and to encourage current drinkers to consume more (Donovan et al., 2007; WHO, 2004).

There is increasing evidence that advertising and promotion act as reinforcing factors for consumption (WHO, 2004; Wyllie et al., 1998) and there seems to be a link between advertising and increased consumption of alcohol by young people (Hastings et al., 2005; Wyllie et al., 1998). Hollingworth and colleagues (2006) estimated that a complete ban on alcohol advertising could result in a 16.4% decrease in alcohol-related life years lost in the USA. A partial ban could lead to a 4% reduction.

In Australia, the United States, and other countries, regulations governing the promotion of alcohol have been relatively ineffective at reducing alcohol-related harms (Donovan et al., 2007; Roberts, 2002). Voluntary codes of advertising have been adopted by the industry as part of a philosophy of self-regulation (ICAP, 2001). Mosher (1994) concluded that the codes adopted by the alcohol industry were "vague, too narrow and unenforceable." In a recent review, Casswell and Maxwell (2005) reiterated this view that attempts to restrict marketing globally, primarily by voluntary codes, are inadequate. This apparent failure of voluntary restrictions has led some researchers to conclude that restrictions on the advertising and promotion of alcohol should be only one part of the implementation of more comprehensive set of alcohol control policies (Donovan et al., 2007; Jones & Donovan, 2002;).

Mandatory health and safety warnings: Mandated alcoholic beverage container warning labels were introduced in the United States in 1989. The dangers of operating machinery or driving a vehicle when impaired by alcohol are prominent among these warnings (Babor et al., 2003). However, the long-term efficacy of warning labels on consumption and risk behaviors is unproven (The Royal Australian College of Physicians, 2005; WHO, 2004).

Health Education, School and Community Interventions

Direct health education aimed at altering alcohol related behaviors has met with limited success, although few interventions have been well designed or adequately evaluated, and many suffer from inadequate data reporting and analysis (Foxcroft et al., 2003; McBride, 2003). While the evidence is mixed on the relation between education alone and sustained behavior change, it is important to recognize that education underpins all of the other interventions discussed in this paper. Without a clear understanding by policy makers and community members of the harms associated with alcohol and the need for specific interventions to address these harms, there would be little support for such initiatives.

The evidence suggests that for behavior change to be effective, a supportive environment (via organizational, economic and political actions) is usually necessary (Hingson et al., 1996; Holder, 1998; Howat et al., 2004). It is important, therefore, that education programs encourage community members to seek changes in policies and practices that help reduce alcohol related problems. Specific education efforts also need to be directed at opinion leaders and policy makers, to support structural changes.

School programs: Evidence for the effectiveness of school-based alcohol interventions is unclear. Many designs and program evaluations are methodologically flawed (Black et al., 1998; Foxcroft et al., 2003; McBride, 2003; Waller et al., 2002; White & Pitts, 1998). Many school programs have been short term and have operated in isolation from other alcohol control initiatives in the broader community (Catford, 2001). Even for those programs with sound research designs, their effects on behavior are often small (Foxcroft et al., 2003; McBride et al., 2004; White & Pitts, 1998).

School programs resulting in positive outcomes have been generally grounded in educational and behavioral change theory and used life skills training to target drinking behaviors of young people (Marlatt & Witkiewitz, 2002; McBride et al., 2004). There is some evidence indicating that well designed and implemented peer led prevention programs are more effective than those led by a teacher (Black et al., 1998), as are those that use interactive approaches fostering interpersonal skills (Tobler et al., 2000; Elder et al., 2005)

School policies in Australia, the UK, and other European countries are increasingly adopting a harm reduction rather than abstinence focus (McBride, 2003). Empirical studies demonstrate that harm reduction approaches are at least as effective as abstinence oriented strategies in reducing alcohol consumption and alcohol related harm (Marlatt & Witkiewitz, 2002). In addition to providing

opportunities to engage students, the school setting may also be appropriate as a venue to engage parents in programs, but such approaches have not undergone sufficient empirical research to measure effectiveness.

Tertiary institution programs: Research suggests that most prevention programs in the university setting have had limited success in preventing hazardous drinking (Mitic, 2003). Research in NZ and the USA has investigated the efficacy of brief interventions as a harm-reduction approach to alcohol consumption (Baer et al., 2001; Kypri & Langley, 2003; Marlatt et al., 1998). Findings from a study among high-risk students who were provided with a brief intervention based on principals of motivational interviewing showed significant reductions in drinking rates and harmful consequences, as well as a significantly greater deceleration of drinking rates and problems over time compared with a control group (Baer et al., 2001; Marlatt et al., 1998). A study reported by Newman et al., (2006) used a health promotion approach to develop and implement a combination of individual and environmental interventions. Reductions in binge drinking and self reported harms followed implementation of these interventions.

Mass media campaigns: Mass media strategies have been used extensively to promote health-enhancing behaviors and are the most common examples of counter advertising. There is evidence that well devised and adequately resourced programs incorporating mass media can improve health related behaviors (Donovan & Henley, 2003; Henley et al., 2007).

Mass media campaigns in isolation have had limited effectiveness in reducing or preventing alcohol-related problems (Donovan & Henley, 2003; Loxley et al., 2004). Furthermore, despite evidence of cost-effectiveness at the societal level (Elder et al., 2004), they can be costly and more difficult to sustain than policy or organizational interventions. Nonetheless, mass media campaigns can play an important role in:

- Raising awareness about alcohol issues, and generating public debate;
- Reinforcing health related messages;
- Changing perceived norms regarding alcohol use and drink driving; and
- Providing support for other health promotion initiatives, including policies and environmental and organizational changes.

A recent systematic review (Elder et al., 2004) found strong evidence that mass media campaigns that are carefully planned, well-executed, attain adequate audience exposure, and are implemented in conjunction with other ongoing prevention activities, such as law enforcement, are effective in reducing alcohol-impaired driving and alcohol related crashes. Such campaigns can be effective whether they are focused on publicizing laws and enforcement activities or on the health and social consequences of drinking and driving.

Community mobilization: There is some evidence that community mobilization or community action projects involving local groups have been effective in contributing to changes related to reducing alcohol-related harm (Hanson et al., 2000; Hingson et al., 2005; Howat et al., 1992). In New Zealand the use of community organization along with mass media were effective in

influencing support for alcohol policy changes (Casswell & Gilmore, 1989). In the US, using a variety of community interventions resulted in a 42% reduction in fatal crashes involving alcohol (Hingson et al., 1996) and a five-community comprehensive intervention significantly reduced alcohol availability and fatal traffic crashes (Hingson et al., 2005)

Media advocacy and public communication efforts can shape policies that have significant benefits to the community. Local leaders are generally supportive of such an approach, which is consequently likely to be more sustainable than other approaches that depend on substantial funding, such as ongoing community education programs. For example, Mothers Against Drunk Driving in the United States has been very effective in organizing community action for change in drunk driving (El-Guebaly, 2005; Webb, 2001).

Discussion

Effective health promotion leads to changes in the determinants of alcohol-related problems, both those within the control of individuals (such as decision-making) and those outside their direct control in the social, economic and environmental arenas (such as pricing, promotion, sales, availability, peer pressure, and alternative transportation) (IUHPE, 2000). According to this perspective, the most effective means of changing drinking behavior is through a combination of educational, organizational, economic and political actions.

The evidence of effectiveness for various component strategies within the health promotion framework varies, from strong evidence for some policies to inadequate evidence for some education efforts directed at individuals. Effective component strategies include economic and retailer interventions, taxation tied to alcohol content, reducing alcohol availability, server litigation, sobriety checkpoints, random breath testing, lowering the legal BAC limit, minimum legal drinking age laws, supportive media promotions and other relevant laws/regulations. These interventions have had their greatest impact when administered in the context of other on-going interventions in the community (Foxcroft et al., 2003; Gielen & Sleet, 2003; Shults et al., 2001; Shults et al., 2002; Waller et al., 2002).

The effectiveness of other component approaches is moderate, with evidence for some isolated interventions either absent or inconclusive. Strategies such as those that restrict advertising and promote counter advertising may under some conditions be influential in addressing alcohol related harm. Although some authors have demonstrated that interventions specifically focusing on server responsibility, modifying physical drinking environments, conducting school drug and alcohol education programs, incorporating community mobilization initiatives, college and worksite programs, and enforcing compulsory health and safety warning labels can have some positive outcomes, the overall evidence supporting their individual efficacy is inconclusive (Hingson et al., 2007).

In this review of component strategies within the health promotion framework, one of the weaknesses is that many of the interventions reviewed were implemented and evaluated without benefit of understanding and controlling other potential

synergistic effects. The ecologic effects of implementing numerous interventions simultaneously are difficult to evaluate, but important to consider in any multi-level effort to reduce alcohol-related problems.

A second limitation in this overview is that the impact of specific interventions was limited to research in high-income countries. Consequently, the generalizability of these data to other countries may be questionable. The transferability of these strategies from high-income to low or middle-income countries needs further examination (Peden et al., 2004; WHO, 2004). There is potential to fund some of these interventions from revenue gained from enforcement of policies and ultimately from reductions in health care costs.

Educating and informing the public and policy-makers regarding effective prevention strategies, and the need for them, is an important aspect of health promotion. This information can be helpful in modifying community attitudes and behaviors, and fostering a receptive climate for implementing effective policies and organizational change.

Approaches with limited evidence of effectiveness on their own may nevertheless prove useful in a multi-faceted program, as the stronger components in the framework will drive change, and the weaker ones may reinforce and support change. Consequently, while advocating for strategies with demonstrated effectiveness within a comprehensive framework, practitioners should not stop supporting research on interventions that currently have only moderate or insufficient evidence. Health promotion approaches require consideration of the many ways in which change in alcohol related harms can occur, and the many opportunities for leveraging a community's resources to reduce alcohol related problems and improve health. Use of the health promotion framework to plan and implement comprehensive community-based programs to reduce alcohol related problems offers our best hope for success.

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References

AIHW. Australian Institute of Health and Welfare. 1999, *1998 National drug strategy household survey: First results*, AIHW, Canberra.

Babor, T, Caetano, R, Casswell, S, Edwards, G, Giesbrecht, N, Graham, K, Grube, J, Gruenewald, P, Hill, L, Holder, H, Homel, R, Osterberg, E, Rehm, J, Room, R & Rossow, I. 2003, *Alcohol: No ordinary commodity – research and public policy*, Oxford University Press, Oxford.

Baer, J, Kivlahan, D, Blume, A, McKnight, P & Marlatt, G. 2001, "Brief intervention for heavy-drinking college students: 4-year follow-up and natural history", *American Journal of Public Health*, vol. 91, no. 8, pp. 1310–1316.

Black, D, Tobler, N & Sciacca, J. 1998, "Peer helping/involvement: An efficacious way to meet the challenge of reducing alcohol, tobacco, and other drug use among youth?" *J. School Health*, vol. 68, no. 3, pp. 878–893.

Carpenter, C. 2004, "Heavy alcohol use and youth suicide: Evidence from tougher drunk driving laws", *Journal of Policy Analysis and Management*, vol. 23, no. 4, pp. 831–842.

Casswell, S, Maxwell, A. 2005, Regulation of alcohol marketing: A global view, *J Public Health Policy*. vol. 26, no. 3.

Casswell, S & Gilmore, L. 1989, "An evaluated community action project on alcohol", *J. Stud. Alc*., vol. 50, pp. 339–346.

Catford, J. 2001, "Illicit drugs: Effective prevention requires a health promotion approach", *Health Promotion International*, vol. 16, no. 2, pp. 107–110.

Chaloupka, F, Saffer, H & Grossman, M. 1993, "Alcohol control policies and motor vehicle fatalities", *J. Legal Stud*., vol. 22, pp. 161–186.

Chikritzhs, T, Stockwell, T & Pascal, R. 2005, "The impact of the Northern Territory's Living With Alcohol Program", 1992–2002: Revisiting the evaluation. *Addiction*, no.100, pp. 1625–1636.

Chikritzhs, T & Stockwell, T. 2002, "The impact of late trading hours for Australian public houses (hotels) on levels of violence", *To stud. Alc.,* vol. 63. pp. 591–599.

Chikritzhs, T & Stockwell, T. 2006, "The impact of later trading hours for hotels on levels of impaired driver road crashes and driver breath alcohol levels", *Addiction*, no. 101, pp. 1254–1264.

Cohen, D, Mason, K & Scriber, R. 2001, "The population consumption model, alcohol control practices, and alcohol-related traffic fatalities", *Prev. Med*., vol. 34, pp. 187–197.

Commonwealth Department of Health and Ageing. 2003, *Returns in investment in public health*, Canberra, Australia.

Crosbie, D & Stockwell, T. 1998, *Alcohol, taxation reform and public health in Australia*', National Centre for Research into the Prevention of Drug Abuse, Perth.

Daly, J, Campbell, E, Wiggers, J & Considine, R. 2002, "Prevalence of responsible hospitality policies in licensed premises that are associated with alcohol related harm", *Drug Alc. Rev*., vol. 21, pp. 113–120.

Dellinger, A, Sleet, DA, Jones, BH. 2007, Drivers, Wheels, and Roads: Motor Vehicle Safety in the Twentieth Century. In: J. Ward & C. Warren (eds) *Silent victories: The history and practice of public health in twentieth-century America*. Oxford University Press, New York. pp. 343–362.

Donovan, K, Donovan, R, Howat, P & Weller, N. 2007, "The content and frequency of alcoholic beverage advertisements and sales promotions in popular magazines", *Drug Alc. Rev*., vol. 26, no.1, pp. 73–81.

Donovan, R & Henley, N. 2003, *Social marketing: Principles and practice* IP Communications, Melbourne.

Doran, C. 2003, *Economic impact assessment of non-communicable diseases on hospital resources in Tonga, Vanuatu and Kiribati. A report for the Pacific Action for health project: Secretariat of the Pacific Community, AusAID*, National Drug and Alcohol Research Centre, Sydney.

Douglas, M. 1998, "Restriction of the hours of sale of alcohol in a small community: A beneficial impact", *Australian and New Zealand Journal of Public Health*, vol. 22, no. 6, pp. 714–719.

El-Guebaly, N. 2005, "Don't drink and drive; the successful Mothers Against Drunk Driving (MADD)", *World Psychiatry*, vol. 4, no. 1, pp. 35–36.

Elder, R, Shults, R, Sleet, D, Nichols, J, Thompson, R, Rajab, W & Services. 2004, "Effectiveness of mass media campaigns for reducing drinking and driving and alcohol-involved crashes: A systematic review", *Am. J. Prev. Med*., vol. 27, no. 1, pp. 57–65.

Elder, R, Shults, R, Sleet, D, Nichols, J, Zaza, S & Thompson, R. 2002, "Effectiveness of sobriety checkpoints for reducing alcohol-involved crashes", *Traffic Inj. Prev*., vol. 3, pp. 266–274.

Elder, RW, Nichols, JL, Shults, RA, Sleet, DA, Barrios, LC, Compton, R, and Task Force on Community Preventive Services. 2005, Effectiveness of school-based programs for reducing drinking and driving and riding with drinking drivers: A systematic review. *American Journal of Preventive Medicine* vol. 28, no. 5S, pp. 288–304.

Foxcroft, D, Ireland, D, Lister-Sharp, D, Lowe, G & Breen, R. 2003, *Primary prevention for alcohol misuse in young people*, The Cochrane Library, Oxford.

Gielen, A & Sleet, D. 2003, "Application of behavioral-change theories and methods to injury prevention", *Epidemiol. Rev*, vol. 25, pp. 65–76.

Geller, ES, Elder, J, Hovell, M, Sleet, D. 1991, Behavioral Approaches to Drinking-Driving Interventions. In: W. Ward, F.M. Lewis (eds) *Advances in health education & promotion*, Jessica Kingsley Press, UK. vol. III, pp. 45–68.

Gray, D, Drandich, M, Moore, L, Wilkes, T, Riley, R & Davies, S. 1995, "Aboriginal well-being and liquor licensing legislation in Western Australia", *Australian Journal of Public Health*, vol. 192, pp. 177–185.

Green, L & Kreuter, M. 1999, *Health promotion planning: An educational and ecological approach*, Mayfield, Mountain View.

Green, L & Kreuter, M. 2005, *health program planning: An educational and ecological approach (4th edition)*, McGraw Hill, New York.

Hanson, B, Larrson, S & Rastam, L. 2000, "Time trends in alcohol habits – results from the Kirseberg Project in Malmo, Sweden", *Subst. Use Misuse*, vol. 35, no. 1 & 2, pp. 171–187.

Hastings, G, Anderson, S, Cooke, E & Gordon, R. 2005, "Alcohol marketing and young people's drinking: A review of the Research", *J Public Health policy*, vol. 26, no. 3, pp. 296–311.

Henstridge, J, Homel, R & Mackay, P. 1997, *The long-term effects of random breath testing in four Australian states: A time series analysis, CR 162*, Federal Office of Road Safety, Canberra.

Henley, N, Donovan, R, Francas, M. 2007, Developing and implementing communication messages. In: L. Doll, S. Bonzo, J. Mercy, D. Sleet (eds) *Handbook of injury and violence prevention*. Springer, New York.

Hingson, R & Sleet, DA. 2007, Modifying alcohol use to reduce motor vehicle injury. Chapter 11 In: AC. Gielen, D.A. Sleet, R. DiClemente (eds) *Injury and violence prevention: Behavior Change theories, methods and applications*. Jossey-Bass, San Francisco, CA. pp. 234–256.

Hingson, R, Swahn, M, Sleet, DA. 2006, Interventions to prevent alcohol-related injuries. Chapter 16. In: L. Doll, S. Bonzo, J. Mercy, D. Sleet (eds) *Handbook of injury and violence prevention*. Springer, New York.

Hingson, R, McGovern, T, Howland, J et al. 1996, "Reducing alcohol-impaired driving in Massachusetts: The Saving Lives Program", *Am J Public health*, vol. 86, pp. 791–797.

Hingson, R, Zakocs, R, Heeren, T, Winter, M, Rosenbloom, D & DeJong, W. 2005, "Effects on alcohol related fatal crashes of a community based initiative to increase substance abuse treatment and reduce alcohol availability", *Injury Prevention*, vol. 11, pp. 84–90.

Holder, H. 1998, "Can local action on alcohol reduce harm? Results of the community trials project in the United States", In: T. Stockwell (ed) *Drug trials and tribulation: Lessons for Australian drug policy*, Curtin University, Perth.

Hollingworth, W, Ebel, B, McCarty, C, Garrison, M, Christakis, D & Rivara, F. 2006, "Prevention of deaths from harmful drinking in the United States: The potential effects of tax increases and advertising bans on young drinkers", *Journal of Studies on Alcohol*, vol. 67, no. 2, pp. 1–9.

Homel, R. 1981, "Penalties and the drink-driver: A study of one thousand offenders", *Aust. NZ J Criminol*., vol. 14, pp. 225–241.

Homel, R. 1994, "Drink driving law enforcement and the legal blood limit in New South Wales", *Accid. Anal. Prev*., vol. 26, pp. 147–155.

Howat, P, Maycock, B, Cross, D, Collins, J, Jackson, L, Burns, S & James, R. 2003, "Towards a more unified definition of health promotion", *Health promotion Journal of Australia*, vol. 14, no. 2, pp. 82–84.

Howat, P, Sleet, DA, Smith, DI. 1991, "Alcohol and driving: Is The 0.05% blood alcohol concentration limit justified?" *Drug and Alcohol Review* (Australia), vol. 10, no. 1, pp. 151–166.

Howat, P, O'Connor, J & Slinger, S. 1992, "Citizen action groups and health policy", *Health Promotion Journal of Australia*, vol. 2, no.3, pp. 16–22.

Howat, P, Sleet, D, Elder, R & Maycock, B. 2004, "Preventing alcohol related traffic injury: A health promotion approach", *Traffic Inj. Prev. (special issue)*, vol. 5, no. 3, pp. 208–219.

Institute of Medicine. National Research Council. 2003, *Reducing underage drinking: A collective responsibility. Committee on developing a strategy to reduce and prevent underage drinking*, The National Academies Press, Washington, DC.

International Centre for Alcohol Policies. 2001, *Self-regulation of beverage alcohol advertising*, ICAP, Washington DC.

International Union for Health promotion and Education. 2000, *The Evidence of Health Promotion Effectiveness: Shaping Public Health in a New Europe* (A report for the European Commission). 2nd edition. Paris: Jouve Composition & Impression.

Jernigan, D, Ostroff, J & Ross, C. 2005, "Alcohol advertising and youth: A measured approach", *J Public Health Policy*, vol. 26, no. 3, pp. 312–325.

Jones, R & Lacey, J. 2001, *Alcohol and highway safety*, National Highway Traffic Safety Administration, Washington DC.

Jones, S & Donovan, R. 2002, "Self-regulation of alcohol advertising: Is it working for Australia", *J Public Affairs*, vol. 2, no. 3, pp. 153–165.

Kypri, K & Langley, J. 2003, "Perceived social norms and their relation to university student drinking", *Journal of studies in Alcohol*, vol. 64, pp. 829–834.

Kypri, K, Voas, R, Langley, J, Stephenson, S, Begg, D, Tippetts, A & Davie, G. 2006, "Traffic crash injuries among 15–19 year olds and minimum purchasing age for alcohol in New Zealand", *American Journal of Public Health*, vol. 96, no.1, pp. 126–131.

Loxley, W, Toumbourou, J & Stockwell, T. 2004, *The prevention of substance use, risk and harm in Australia: A review of the evidence*., The National Drug Research Institute and the Centre for Adolescent Health, Ministerial Council on Drug Strategy, Commonwealth of Australia, Canberra.

Mann, R, Stoduto, G, Macdonald, S, Sheikh, A, Bundy, S & Jonah, B. 2001, "The effects of introducing or lowering legal per se blood alcohol limits for driving: An international review", *Accid. Anal. Prev*., vol. 33, pp. 61–75.

Marlatt, G, Baer, J, Kivlahan, D, Dimeff, L, Larimer, M, Quigley, L et al. 1998, "Screening and brief intervention for high-risk college student drinkers: Results from a 2-year follow-up assessment", *Journal of Consulting and Clinical psychology*, vol. 66, no. 4, pp. 604–615.

Marlatt, G & Witkiewitz, K. 2002, "Harm reduction approaches to alcohol use: Health promotion, prevention, and treatment", *Addictive Behaviors*, vol. 27, pp. 867–886.

McBride, N. 2003, "A systematic review of school drug education", *Health Educ. Res*., vol. 18, no. 6, pp. 729–742.

McBride, N, Farrington, F, Midford, R, Meuleners, L & Phillips, M. 2004, "Harm minimization in school drug education: Results of the School Health and Alcohol Harm Reduction project (SHAHRP)", *Addiction*, vol. 99, pp. 278–291.

McGinnis, JM, Williams-Russo, P, Knickman, J. 2002, "The case for more active policy attention to health promotion", *Health Affairs*, vol. 21, no. 2, pp. 78–86.

McMillan, G & Lapham, S. 2006, "Effectiveness of bans and laws in reducing traffic deaths: legalized Sunday packaged alcohol sales and alcohol-related traffic crashes and crash fatalities in New Mexico", *American J Public Health.* vol. 96, no. 11, pp. 1944–1948.

Measham, F & Brain, K. 2005, " 'Binge' drinking, British alcohol policy and the new culture of intoxication", *Crime, Media, Culture*, vol. 1, no. 3, pp. 262–283.

Mitic, W. 2003, "Alcohol and university student drinking – not a class act", *Canadian Journal of Public Health*, vol. 94, pp. 13–15.

Mosher, J. 1994, "Alcohol advertising and public health: An urgent call for action", *American Journal of Public Health*, vol. 84, pp. 180–181.

Mosher, J & Johnsson, D. 2005, "Flavored alcohol beverages: An international marketing campaign that targets youth", *J Public Health Policy*, vol. 26, no. 3, pp. 326–342.

Newman, I, Shell, D, Major, L, Workman, T. 2006, "Use of policy, education, and enforcement to reduce binge drinking among university students: The NU Directions project", *The International J Drug Policy*, vol. 17, pp. 339–349.

Peden, M, Scurfield, R, Sleet, DA, Mohan, D, Hyder, AA, Jarawan, E, Mathers, C. (eds) 2004, World report on road traffic injury prevention. Geneva, Switzerland: World Health Organization.

Pinder, L. 1994, *The federal role in health promotion: Art of the possible*, WB Saunders, Toronto.

Roberts, G. 2002, *Analysis of alcohol promotion and advertising*, Centre for Youth Drug Studies, Australian Drug Foundation, Available: [www.adf.or.au/cyds/alcohol_advertising.pdf].

Room, R, Babor, T & Rehm, J. 2005, "Alcohol and Public Health", *www.thelancet.com*.

Rossow, I. 2000, "Suicide, violence and child abuse: A review of the impact of alcohol consumption on social problems", *Contemporary Drug Problems*, vol. 27, no. 3, pp. 397–433.

Rossow, I, Grøholt, B & Wichstrom, L. 2005, "Intoxicants and suicidal behaviour among adolescents: Changes in levels and associations from 1992 to 2002", *Addiction*, vol. 100, no. 1, pp. 79–88.

Schancke, VA. 2005, *Forebyggende og helsefremmende arbeid, forskning til praksis*, Nordnorsk kompetansesenter-Rus, ved Nordlandsklinikken, Narvik.

Shults, R, Elder, R, Sleet, D, Nichols, J, Alao, M, Carande-Kulis, V, Azaz, S, Sosin, D & Thompson, R. 2001, "Reviews of evidence regarding interventions to reduce alcohol-impaired driving", *Am J Prev. Med*., vol. 21, no. 4S, pp. 66–88.

Shults, R, Sleet, D, Elder, R, Ryan, G & Sehgal, M. 2002, "Association between state level drinking and driving countermeasures and self reported alcohol impaired driving", *Injury Prevention*, vol. 8, pp. 106–110.

Sleet, D, Wagenaar, A & Waller, P. 1989, "Drinking, driving and health promotion", *Health Educ. Quartely*, vol. 16, no. 3, pp. 329–333.

Stockwell, T. 2001, "Responsible alcohol services: Lessons from evaluations of server training and policing initiatives", *Drug Alc. Rev*., vol. 20, pp. 257–265.

Stockwell, T, Single, E, Hawks, D & Rehm, J. 1997, "Sharpening the focus of alcohol policy from aggregate consumption to harm and risk reduction", *Addiction Research,* vol. 5, pp. 1–19.

Stockwell, T, Masters, L, Philips, M, Daly, A, Gahegan, M, Midford, R & Philp, A. 1998, "Consumption of different alcoholic beverages as predictors of local rates of night-time assault and acute alcohol-related morbidity", *Australian & New Zealand Journal of Public Health*, vol. 22, no. 2, pp. 237–242.

Stockwell, T. 2006, "Alcohol supply, demand, and harm reduction: What is the strongest cocktail?" *International Journal of Drug Policy*, vol. 17, no. 4, pp. 269–277.

The Royal Australian College of Physicians. 2005, *Alcohol policy: Using evidence for better outcomes*, Sydney.

Tobler, N, Rooner, M, Ochshorn, P, Marshall, D, Streke, A & Stackpole, K. 2000, "School-based adolescent drug prevention programs: 1998 meta-analysis", *J. Prim. Prev*., vol. 20, pp. 275–336.

US Department of Health and Human Services. 1997a, *Youth drinking: Risk factors and consequences. Alcohol Alert No. 37 July 1997*, National Institute on Alcohol Abuse and Alcoholism, Rockville.

US Department of Health and Human Services. 1997b, *Reducing tobacco use among youth: Community based-approaches*, Substance Abuse and Mental Health Services Administration. Centre for Substance Abuse Prevention, Rockville, DHHS Publication No. (SMA)97–3146.

Villaveces, A, Cummings, P, Koepsell, T, Rivara, F, Lumley, T & Moffat, J. 2003, "Association of alcohol-related laws with deaths due to motor vehicle and motorcycle crashes in the United States, 1980–1997", *Am J. Epidemiology*, vol. 157, pp. 131–140.

Wagenaar, A & Holder, H. 1991, "Effects of alcohol beverage server liability on traffic crash injuries", *Alcohol Clin. Exp. Res*., vol. 15, pp. 942–947.

Wagenaar, A & Toomey, T. 2002, "Effects of minimum drinking age laws: Review and analyses of the literature from 1960–2000", *J. Stud. Alc*., vol. Suppl. 14, pp. 206–225.

Waller, P. 1998, "Alcohol, aging and driving", In: E. Gomberg, A. Hegedus & R. Zucker (eds) *Alcohol problems and aging: NIAAA research monograph No. 33 NIH Pub No. 98–4163*, NIAAA, Bethesda.

Waller, S, Naidoo, B & Thom, B. 2002, *Prevention and reduction of alcohol misuse*, Health Development Agency, London.

Webb, M. 2001, "Research as an advocate's toolkit to reduce motor vehicle occupant deaths and injuries", *Am J Prev. Med*., vol. 21, no. 4S, pp. 7–8.

Whetten-Goldstein, K, Sloan, F, Stout, E & Liang, L. 2000, "Civil liability, criminal law and other policies and alcohol-related motor vehicle fatalities in the United States: 1984–1995", *Accid. Anal. Prev*., vol. 32, pp. 723–733.

White, D & Pitts, M. 1998, "Educating young people about drugs: A systematic review", *Addiction*, vol. 93, no. 10, pp. 1475–1487.

World Health Organisation. 1984, *Discussion document on the concept and principles of health promotion*, European Office of the World Health Organization, Copenhagen.

World Health Organisation. 1986, *Ottawa charter for health promotion*, WHO, Geneva.

World Health Organisation. 2004, *Global status report: Alcohol policy*, WHO, Geneva.

World Medical Association. 2005, *WMA Statement on reducing the global impact of alcohol on health and society*, World Medical Association, France.

Wyllie, A, Zhang, J & Caswell, S. 1998, "Responses to televised alcohol advertisements associated with drinking behaviour of 10–17 year olds", *Addiction*, vol. 93, pp. 361–371.