# An Overview of Prevention Research: Issues, Answers, and New Agendas

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**Synopsis**

*Efforts to curtail alcohol abuse and alcoholism can be divided into primary, secondary, and tertiary prevention. Primary prevention attempts to stop a problem or illness from occurring in the first place. Secondary prevention identifies persons in the early stages of problematic or illness behavior and refers them for counseling or treatment, which is considered tertiary prevention. Five research areas concerned with primary and secondary prevention are selected for discussion: youth, the mass media, the worksite, blacks and Hispanics, and alcohol-related behavior that increases the risk of AIDS. Several of these themes have been in the forefront of alcohol prevention research; others such as AIDS are emergent areas of inquiry.*

*The discussion to follow briefly summarizes research approaches, key findings, methodological shortcomings, and suggested issues for future investigation. Although scientifically solid prevention studies have been conducted, more rigorous, more comprehensive, and more innovative research is needed. Given the dynamic sociocultural and economic systems in which prevention occurs, research techniques that can address this complexity are required. A range of appropriate methodologies is described.*

BECAUSE OF social and moral imperatives, alcohol abuse and alcoholism in the United States are continuous catalysts for counteractions aimed at reducing and minimizing the deleterious effects of alcohol problems. Systematic and episodic prevention activities are inherently part of the larger sociocultural dynamic that promotes alcohol use and abuse, on the one hand, and alcohol control, on the other. Responsibility for the prevention of alcohol abuse rests officially with governmental agencies, the alcohol industry, and consumers of alcohol; but populist movements and organized constituencies within the citizenry at large also play critical roles in designing and implementing prevention strategies.

Ideally, interventions to reduce the incidence and prevalence of alcohol-induced problems should be based on scientific evidence of the effectiveness of the proposed interventions. Proof of benefit, net benefit, absence of benefit, or actual harm can have pragmatic as well as theoretical implications for the prevention process. This information can contribute to and influence the dialogue and debate on appropriate strategies for action, adding objectivity and rigor to the decision-making endeavor. However, the armamentarium of evidence favoring or disfavoring particular interventions is still in the stage of early development. Much remains to be learned about the short- and long-term effectiveness of various social technologies for inducing behavioral change. The extent of the knowledge base depends on the type of prevention approach and the nature of the target group.

In the absence of proven prevention strategies, community pressure to curtail alcohol abuse may necessitate the selection of interventions on the basis of prudence rather than proof (*1*). Since prudence is the exercise of sound judgment, those who shape prudent prevention policies must be guided by the weight of available evidence. It is incumbent on them to consider research findings concerning the benefits, risks, and costs of tested

approaches to prevention. Strategies that signal promise of eventual success deserve special attention, and failures can be teaching experiences in their own right.

Alcohol prevention research focuses on a wide range of endpoints related to drinking behavior, addiction, sequelae of alcoholism (such as cirrhosis), and deleterious consequences of alcohol abuse (such as traffic accidents, violence, and absenteeism). The outcome measure depends to a large degree on the target problem, target population, and choice of intervention. For example, mortality can serve as an endpoint for strategies to prevent alcohol-induced traffic accidents (*2a*) but not for interventions aimed at reducing fetal alcohol syndrome (*2b*).

Efforts to prevent alcohol problems can be divided into primary, secondary, and tertiary prevention (*3*). This article is concerned only with primary and secondary prevention. Primary prevention attempts to stop the problem or illness from occurring in the first place; secondary prevention identifies persons in the early stages of problematic or illness behavior and refers them for counseling or treatment. (Tertiary prevention consists of the actual counseling or treatment.)

The discussion to follow summarizes prevention research in five selected areas: youth, the mass media, the worksite, blacks and Hispanics, and alcohol-related behavior that increases the risk of AIDS. Each of these areas offers rich opportunities to enhance the state of science in prevention research. Topics addressed elsewhere in this issue are deliberately not considered here, including research on traffic safety and State and local laws that control alcohol availability and the minimum drinking age.

## Youth and Young Adults

Epidemiologic analyses reveal that alcohol use and abuse constitute a serious problem among youth and young adults. (*2c,2d,4*). This problem is expressed in the preadolescent onset of drinking behavior, heavy drinking among high school and college students, and the overrepresentation of legal intoxication among young males involved in fatal accidents (*2d,2e,4*).

A growing public awareness and social concern have led to the development of a variety of prevention strategies, many designed for school settings (*2c,2f,5*). Some strategies are directly or indirectly theory-based, while others spring from reasoned hunches or intuition (*6,7*). Three intervention models are used: increasing knowledge and changing attitudes, teaching values and decision-making skills, and developing social competency skills (*2f*). Studies of the effects of prevention frequently blur distinctions between alcohol, cigarettes, and other drugs, making it difficult to measure the impact of the interventions on alcohol use per se (*5,8*).

Evaluations of alcohol-targeted prevention strategies, including two recent meta-analyses, suggest that school-based interventions have not been particularly effective, especially the more traditional didactic approaches (*2f,5–11*). In some cases, an increase in students' knowledge about alcohol has even led to increased use of alcohol (*5–10*).

The newer approaches (teaching peer refusal and social skills, correcting perceptions of social norms) show some promise but lack uniform success (*2f,6–10*). Attitude and behavior change is more substantial in the highest intensity, multimodal programs, using peer or parent leaders and "booster" sessions in later years (*2f,6–10*). Although costly, so-called "alternatives programs" (that provide healthy opportunities for stimulation, recognition, and learning) show moderate success for special population groups, such as drug abusers or juvenile delinquents (*9*). Prevention efforts on college campuses have yielded variable yet encouraging results (*2f,12–17*). Multi-session efforts, preferably coupled with field experiences, have resulted in actual changes in drinking patterns and in drinking and driving behavior (*12–14,17*).

In assessing and interpreting reported studies, one confronts a number of methodological problems. The absence of a consensus regarding prevention goals (for example, abstinence versus moderation) can confuse or constrain the choice of outcome measures (*5,7,11*). Illustrations of other methodological difficulties include the lack of appropriate comparison groups (*5,6,8,9,11*); inadequate or biased samples (*5–9,11*); lack of pretest, posttest, or followup measures (*5,6,8,11*); high attrition rates (*5–7,11*); questionable validity of the dependent variable (*5–8,11*); questionable validity of the dependent variable (*5–8,11*); absence of outcome linkages to behavior (*5,6,8,9,11*); and inappropriate statistical analyses (*5–9,11*). Some studies have also been criticized for selective reporting and self-serving interpretations (*8,11*).

Recommendations for enhancing research utility include longer followup periods to determine impact durability and delay (*5,7,8*); measurement instruments that provide better reliability, validity, and comparability (*5,7,11*); examination of effects

on various subpopulations (*5,7–9,11*); thorough process evaluation and implementation assessment (*7,8,11*); additional replication studies; and, possibly, more secondary analyses (*7,8,11*) and archiving of data (*8* and Moskowitz, J., Berkeley, CA, personal communication 1988). Suggested foci for prevention strategies include (*a*) adapting interventions to particular developmental stages (*5,7,9*); (*b*) addressing adolescent risk-taking behaviors (*5,7,18*); (*c*) utilizing parents as teachers of normative behavior (*7,8*); and (*d*) developing special strategies for nonschool youth (*5,7*) and the community (*7,10,11*).

## Advertising and Media

The literature on media and alcohol consumption reveals two central research questions: Does advertising by the alcohol industry influence the use or abuse of alcoholic beverages? And do prevention-oriented media campaigns and countermeasures influence drinking behavior?

Controversy surrounds the extent to which alcohol advertising and marketing affect the American public. Some suggest that advertising increases overall consumption (*19,20*). Others contend that it simply causes the already drinking public to shift from one brand or type of alcoholic beverage to another (*21–23*). Results of relevant research are inconclusive.

A major issue that needs to be addressed in future research is how to separate the overall impact of alcohol advertising from the broader social context of drinking (*24*). The Board of Trustees of the American Medical Association (AMA) recommended that "additional well-designed research be conducted under impartial and independent auspices to provide more definitive evidence on whether, and in what manner, advertising contributes to alcohol abuse" (*25*). Research results could have implications for public policy concerning alcohol advertising. The AMA has noted that no Federal legislation on this issue has been enacted since the repeal of Prohibition in 1933.

In addition to the billion dollar a year advertising campaigns of the alcohol industry, television programs themselves may inadvertently promote a positive perception of alcohol consumption (*26*). Content analyses of television programs indicate that alcohol consumption is depicted as acceptable and glamorous and that realistic and undesirable potential consequences of alcohol abuse are rarely shown (*26, 27*).

It appears that the media are most effective in imparting knowledge, less so in changing attitudes, and least effective in changing behavior (*28–30*). Media campaigns seem to be particularly effective when combined with some type of interpersonal communication (*3*), as occurred in Project CRASH (with informal conversation) and the Stanford Heart Study (with structured group training) (*28,31*). Of course, labor-intensive programs can increase costs.

Although television is obviously a popular medium (*26*), successful prevention campaigns may need to involve several types of media. Both the message and the medium should be specifically tailored to the target population (*30*). As examples, radio may be better than television in reaching college students (*28,29*), and billboards may be especially useful in reaching the driving population.

The full potential of the media as a prevention strategy has yet to be determined. The same kinds of problems that typify studies of youth and alcohol (for example, the lack of a theoretical base and inadequate samples, designs, and methods) have also characterized research on the media. There is a particular need for sophisticated designs that will permit causal inferences to be drawn (*28*).

## Worksite Research

The worksite can only be fully understood within the context of the larger society and economy. Social scientists have long been aware of the potential effects of economic conditions on the mental health of the work force. For example, Brenner (*32*) demonstrated that an inverse relationship exists between the state of the economy and various kinds of mental health problems, including alcoholism. Moreover, the choice of prevention strategies in the workplace reflects the social climate and ideologies of contemporary society. One current illustration is the expansion of prohibitions against smoking on the job.

Historically, the worksite has been permeated by various movements and innovations designed to improve employee productivity and efficiency. Some of these have focused on changing the individual; others have focused on changing the work environment. One such innovation is the Employee Assistance Program (EAP). The twofold goal of the EAP is to improve employee performance while simultaneously attending to alcohol, drug abuse, and mental health problems among workers.

Researchers and policy makers have searched for

causes of alcohol problems in the workplace. Some contend that the workplace may contribute to the development of drinking problems (*33*) while others (*34–36*) claim that employees bring these disorders with them into the workplace. Each perspective has received attention in the models that have been suggested to guide research on workplace alcohol problems (*37–41*). Among these models are those relating to workplace culture, social control, alienation, social stress, and availability. The rapid growth, expansion, and investigation of EAPs over the past decade have resulted in an emphasis on the social control model. Proponents of this model (*35,42,43*) claim that "research supports the idea that progressive, positive discipline, containing expressions of emotional support and offers of help, combined with realistic confrontations about poor job performance, is an effective deterrent to alcohol problems" (*41*).

Primary and secondary prevention of alcohol abuse at the worksite can occur in many ways. It can come about informally "as in the Sandhogs where AA members say, 'you do not have to be drunk to do this job' " (*41*). It also can take place administratively through the adoption and implementation of normative standards concerning a variety of issues: limiting the availability of alcohol on the job and in the adjacent community, refusing to reimburse expenditures for alcohol, having alcohol-free company parties, and discouraging the abuse of alcohol in nonwork settings.

Secondary prevention has been the major focus of alcohol research at the worksite. Although it is important to advance this line of inquiry, it is also critical to stimulate innovative worksite research in primary prevention. One testable question is whether EAPs can play a facilitating role in primary prevention or if a completely different labor-management orientation is required.

## Blacks and Hispanics

Blacks compose about 12 percent of the United States population, and Hispanics number more than 6 percent (*2g*). Despite the sizes of these two ethnic minorities, relatively little research has focused on their respective use and abuse of alcohol (*2g,44–48*). Much of the limited literature on prevention strategies among these groups is merely descriptive or impressionistic (*47*). In general, neither the epidemiologic nor the prevention efforts have addressed the wide cultural diversity within the black and Hispanic populations (*46–50*).

A review of medical and psychosocial difficulties reveals that, except for drunken driving, black men reported higher rates of problem drinking than white men (*2h*). Among Hispanic males, about 18 percent reported having one or more alcohol-related problems (*2h,50–52*). Moreover, mortality rates associated with drinking (rates for cirrhosis of the liver, various cancers, and unintentional injuries) are higher in the minority populations than in the general population (*50,53,54*). It is interesting to observe that although alcohol consumption among white men was found to be high for the 18- to 29-year olds and then declined after age 30, consumption among blacks was relatively low for the 18- to 29-year-olds but rose sharply among those in their thirties (*55*).

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Prevention strategies are discussed in the literature (44–46,52,56–61) but not from a research perspective. In particular, there is a dearth of information on programs that have been evaluated and found effective (*47,48*). In one study, the reaction of black parents to three popular parent-training programs was tested; many of the components were not accepted by the lower-income parents, who emphasized discipline as the vehicle to respect and obedience (*2i*). Although education efforts are necessary (*62*), they have not been found to be successful by themselves as a prevention strategy (*46*). Thus, in two Hispanic communities in California, an intervention project that relied heavily on a media campaign failed to prevent alcohol problems (*63*).

Recommendations in the literature for new directions in prevention research highlight the need for epidemiologic studies of alcohol use and abuse that recognize the diversity within black and Hispanic populations (*44–48,50*). Prevention strategies should be designed with strong evaluation components to determine what is effective and for whom (*45–48,50*). Careful attention must be paid to the cultural values and social norms of the target population (*2j,44–48,50,64–67*). For example,

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among Hispanics, the influence of the Catholic Church should be taken into consideration (*50*) along with the strong Hispanic commitment to family and community (*44,46,58*). Likewise, religious beliefs and practices and the family play significant roles among blacks (*45–48,68*). Cultural heritage and pride may also represent effective dimensions of prevention efforts (*46,50,68,69*), and socioeconomic and environmental factors cannot be ignored (*44–47,50,55,70,71*). One specific area of inquiry might be the development and testing of prevention strategies to counter the influence of liquor advertising that is aimed at minority groups (*46,70,72*).

## Alcohol and AIDS

Studies of patients with acquired immunodeficiency syndrome (AIDS) and cohorts at risk of AIDS suggest that the use and abuse of alcohol may increase the chance of infection from the human immunodeficiency virus (HIV) that causes AIDS (*73–79*). Associations between alcohol and AIDS may in part reflect biological processes whereby alcohol compromises the capacity of the immune system to resist the onset and progression of infection (*80,81*). Possibly more important, however, might be the contribution of alcohol to unsafe sexual practices and drug use.

Alcohol may have a direct impact on exposure to HIV (and its transfer) through the mechanism of disinhibition (*79,81,82*)—that is, a disregard for social norms, moral obligations, and behavioral restraint. Alternatively, the relationship between alcohol and AIDS may be indirect through such processes as selection, attribution (*83,84*), and environmental juxtaposition. Thus, people who abuse alcohol may take additional risks in their sexual or drug-use behavior without any cause and effect relationship, but simply a correlation through selection. Excess drinking also may be deliberately undertaken as an excuse (attribution) for behavior that could not otherwise be explained or rationalized, such as indiscriminate sex. The pretext may actually be self-fulfilling if disinhibition as an anticipated excuse becomes a reality. Finally, it is important to recognize the instrumental function of the tavern or bar as an environment for meeting and entertaining potential sexual partners or making drug connections (*79,85–87*).

The National Institute on Alcohol Abuse and Alcoholism is encouraging research on alcohol-related behavior that increases the risk of AIDS (*88*): studies that explore the nature and dynamics of these behaviors, or that test the effectiveness of prevention strategies, or both. Studies of gay men indicate that users and abusers of alcohol and other drugs during sexual activity constitute a hard-core group that is particularly resistant to adopting and maintaining safe sex techniques (*75,78,79*). Unprotected sexual activity among the heterosexual community (*89,90*) may also be associated with or aggravated by alcohol and drug use (*9*).

One approach to AIDS prevention might be anticipatory education, alerting alcohol users and abusers to their high-risk situation (*75,76*). It may be additionally necessary to confront such issues as the perceived benefits of alcohol for sexual arousal (*75,79*), alcohol use as excusatory behavior (*75*), and the implications of the bar as a context for social interaction. Alcohol-free alternatives have been proposed (*75*). Where there is dependency on alcohol, it may be essential to address the problem of alcohol addiction per se, as well as its relevance to AIDS. In this respect, expanded treatment of intravenous drug abuse has been advocated as a prevention strategy for AIDS (*92*), not simply education regarding sterilization of injection equipment.

## Research Methodologies

A variety of research designs and analytical strategies have been applied to prevention research concerning alcohol problems. Qualitative and quantitative methods have both proved fruitful, including ethnographic observations of drinking behavior in natural settings. Examples of ethnographic-observational research are studies of blue collar workers and family drinking (*93*), public drinking and drinking contexts (*94–98*), and worksite behavior (*99*).

Social and health problems associated with alcohol can be viewed in a broad historical perspective. Historical analysis, using both domestic and international data sources, offers promising opportuni-

ties for prevention research (*100–103*). Community, school, and worksite prevention trials reflect combinations of several relevant theories and research traditions (for example, learning, organization, communication, behavior change, health education, and medical and social marketing). Interest in such designs has been stimulated by the success of health promotion programs to reduce heart disease (*104,105*). Such approaches have also seen limited use in studies of community interventions for alcohol problems at schools (*106*), studies of local availability of alcohol (*107*), and studies of the mass media (*31*).

Given the difficulty of random assignment in field studies, quasi-experimental designs (*108*) have been used. These designs are often employed in policy analyses of natural experiments, such as changes in alcohol availability. One statistical tool is the interrupted time series analysis (*109,110*), which has more power to deal with problems of autoregression, seasonality, and trending than conventional least-squares regression (*111–114*). Quasi-experimental designs are also employed using nonequivalent control groups or conditions (*108*). These designs frequently rely on multivariate analysis techniques to increase statistical power. Examples include evaluations of server intervention (*115*), happy-hour bans (*116*), prevention among college students (*16*), cross-cultural drinking beliefs, parental influences on adolescent drinking behavior (*117*), and alcohol taxes (*118*).

Studies conducted within the laboratory permit researchers to examine the role that critical experimental factors may play in prevention programs or policies. For example, the potential role of retail price in influencing alcohol consumption has been demonstrated in a laboratory setting in which an actual retail drinking situation is simulated and price is manipulated (*119*). Examples of other analog studies can also be found (*120,121*).

Given the complex and dynamic social, cultural, and economic systems in which prevention occurs, techniques are necessary that can address such complexity. One relevant set of tools is computer modeling. It has particular utility for prevention research because "experiments" can be conducted with the computer to predict potential outcomes prior to expensive field implementation. Examples of applications of computer modeling include Holder and Blose (*122,123*) and Katzper and coworkers (*124*). Econometric modeling has been employed to examine the sensitivity of drinking and alcohol problems to changes in price levels (*125,126*).

One problem confronting prevention research, particularly research most relevant to public policy deliberations, is a need to study real-life situations outside the laboratory. Such research does not provide the precision and opportunity to manipulate variables afforded by laboratory experimentation. Field research is difficult to undertake, often expensive to conduct, and analytically "messy." On the other hand, prevention research undertaken in the laboratory may not be generalizable to the real world because of the controlled, or "hot house," conditions imposed.

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# Alcohol Dependency Prevention and Early Intervention

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**Synopsis**

*Current data on efforts to prevent alcoholism indicate that we are better able to prevent some of the consequences of alcohol misuse, such as alcohol-related car crashes and fetal alcohol syndrome, than chronic alcohol dependence itself.*

*A review of data on outcomes of treatment for long-term alcohol dependence indicates that 9 of 10 alcohol dependent persons receive no treatment for the disorder in any given year. When treatment is provided for long-term alcohol dependent persons, it has only slightly positive results. As a result, many clinicians and researchers have concluded that rather than exclusive preoccupation with long-term alcoholics, early intervention with persons who are just beginning to abuse alcohol may be a more effective use of resources.*

ALCOHOL ABUSE and dependence are a major public health problem in the United States. Alcohol abuse is estimated to have cost almost $117 billion in 1983, the latest year for which such data are available. Of this amount, nearly $71 billion was attributed to lost employment and reduced productivity. Another $15 billion was for health care costs. In 1988, these costs will likely approach $150 billion (*1*).

Forty-eight percent of all persons convicted of crimes in the United States in 1983 had been using alcohol when they committed the crime (*1*).

In 1980, alcohol use and abuse was either the main or a contributing cause in almost 100,000 deaths (see table). In 20 percent of these deaths, including those attributable to alcoholic cirrhosis and alcoholic cardiomyopathy, alcohol was the main cause. In an additional 40 percent, those that resulted from alcohol-related automobile and other types of accidents, alcohol was a contributing cause in that death would likely not have occurred had alcohol not impaired judgment and driving ability. In the remaining 40 percent of the deaths, alcohol use accelerated an ongoing physical disease process (*2*).

Alcoholism exacts a terrible, increasing toll in our society that fully justifies our best efforts to prevent and to treat the condition.

## Outcomes of Treatment

Data on outcomes of treatment for long-term alcohol dependence are sufficiently discouraging to justify a concentrated search for alternatives. Prevention and early intervention are the most effective alternatives.

In any given year in this country, no more than 10 percent of those who meet accepted criteria for alcohol dependence are treated. These figures include persons whose treatment largely involves contact with self-help groups as well as those treated by professionals. Probably, an even lower percentage of women, minorities, youth, and the