Effectiveness of Mass Media Campaigns for Reducing Drinking and Driving and Alcohol-Involved Crashes

A Systematic Review

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Abstract: A systematic review of the effectiveness of mass media campaigns for reducing alcohol-impaired driving (AID) and alcohol-related crashes was conducted for the *Guide to Community Preventive Services* (*Community Guide*). In eight studies that met quality criteria for inclusion in the review, the median decrease in alcohol-related crashes resulting from the campaigns was 13% (interquartile range: 6% to 14%). Economic analyses of campaign effects indicated that the societal benefits were greater than the costs. The mass media campaigns reviewed were generally carefully planned, well executed, attained adequate audience exposure, and were implemented in conjunction with other ongoing prevention activities, such as high visibility enforcement. According to *Community Guide* rules of evidence, there is strong evidence that, under these conditions, mass media campaigns are effective in reducing AID and alcohol-related crashes.
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Introduction

Many mass media campaigns on alcohol-impaired driving (AID) have been implemented in the past several decades. The goals of these campaigns are generally to persuade individuals to either take personal steps to avoid drinking and driving or try to prevent others from drinking and driving. Theory suggests that, as with other preventive health efforts, mass media campaigns are most likely to reduce drinking and driving if their messages are reinforced by other efforts.[1,2] Reinforcing factors may include law enforcement efforts, grassroots activities, and other media messages related to drinking and driving. In locales that devote the considerable resources needed to develop high-quality mass media campaigns, such prevention activities may be particularly strong. It is difficult to objectively evaluate the importance of such factors in the success of mass media campaigns targeting AID, however, because the campaigns are seldom implemented or measured in a manner that allows for control of their effects.

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Content and Delivery of Mass Media Campaigns

Several aspects of mass media campaigns may influence their effectiveness. These can be categorized into variables related to message **content** and to message **delivery**.

Message content. One important aspect of message content involves the themes used to motivate the desired behavior change. Some common motivational themes in mass media campaigns to reduce AID include: fear of arrest and legal consequences of arrest; promotion of positive social norms; fear of harm to self, others, or property; and stigmatizing drinking drivers as irresponsible and dangerous. The actions promoted by the campaigns also vary, ranging from messages related to abstinence or moderation to more specific behavioral recommendations such as using a designated driver or taking the keys from an intoxicated person who plans to drive. Decisions related to message content are generally made based on the opinions expressed by experts or focus groups rather than on evidence of effectiveness in changing behavior.

Another aspect of message content relates to the optimal amount of anxiety produced.[3–8] The effectiveness of "fear-based" campaigns is the subject of a long-standing controversy. Some level of anxiety arousal is generally seen as a desirable motivator. However, several authors have cautioned that generat-

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ing intense anxiety by emphasizing the severity of a problem and the audience's susceptibility to it can cause some people to ignore or discount the campaign messages.[3–5]Although this caution appears to be justified, increasing the strength of a fear appeal also increases the probability that the audience will change their attitudes, intentions, and behaviors.[6] These changes are maximized, and defensive avoidance minimized, when the anxiety-arousing message is accompanied by specific information about actions that people can take to protect themselves.[6] The degree of persuasion versus defensive avoidance produced may be influenced by interactions between the message content and characteristics of the recipient. For instance, strong fear appeals may be more effective for motivating a response among segments of the audience that initially do not view the problem addressed as being important or relevant to them.[7] They may also be more persuasive to people who are already engaging in the desired behavior.[8]

Message delivery. A mass media campaign cannot be effective unless the target audience is exposed to, attends to, and comprehends its message. Two important aspects of message delivery are control over message placement and production quality.[9,10] Control over message placement helps to ensure that the intended audience is exposed to the messages with sufficient frequency to exceed some threshold for effectiveness. It also allows for the optimal timing and placement of those messages. This control can only be assured with paid campaigns. Those that rely solely on donated public service time may attain adequate exposure, but message placement and frequency are ultimately left to media schedulers and station management; paid advertising time always gets preferential placement. Assuming that the target audience is adequately exposed, high production quality of the campaign messages may maximize the probability that the audience will pay attention to them. High production quality may also improve the chances of eliciting the intended emotional impact.

Message Pretesting. Pretesting of campaign themes and messages is also thought to be important for a successful outcome.[11–13] Pretesting can help to assess which themes or concepts are most relevant to the target audience. It can also help to ensure that the target audience will attend to and comprehend the specific messages presented. The importance of pretesting is highlighted by an evaluation of a mass media campaign designed to prevent alcohol-related problems by encouraging drinking in moderation.[14] No pretesting of ads was done for this campaign, and a survey conducted at midcampaign found that over a third of respondents thought that the ads were **promoting** alcohol consumption. Many mistook them for beer ads.

Prior Reviews of Mass Media Effects

Several reviews of mass media campaigns have addressed AID. The scope of these reviews has varied, with focuses on AID,[3,10,11,15] alcohol use,[16] traffic safety,[1] and health promotion in general.[17,18] These reviews reached differing conclusions about the effectiveness of mass media campaigns for preventing AID. The most consistent finding from these reviews is that the quality and volume of research in this area are too low to draw any firm conclusions. Despite recommendations of past reviewers to conduct more high-quality studies,[10] few such studies have been published in recent years.

Methods

The goal of this systematic review was to assess whether, and under what conditions, mass media campaigns are helpful in preventing AID and alcohol-related crashes. The review was conducted according to the methods of the *Guide to Community Preventive Services* (*Community Guide*). These methods have been described in detail elsewhere.[19,20] The conceptual framework that guided the review is shown in Figure 1.

Inclusion Criteria

A comprehensive search was conducted for peer-reviewed journal articles and technical reports. To be included, a study had to (1) be primary research published in English before December 31, 2001; (2) provide objective data on one or more outcomes related to AID (e.g., single-vehicle nighttime crashes); and (3) meet minimum quality criteria for study design and execution.[19] When multiple papers by the same authors used similar methods to evaluate a specific intervention, only the paper with the longest postintervention follow-up time was included in the review.

Crashes and measured blood alcohol concentration (BAC) were chosen as outcome measures because they are objective and are clearly related to the ultimate outcome of interest—crash-related injuries. As Wilde[17] has noted, intermediate outcomes such as message recall or knowledge and attitude change may be only weakly related to actual behavior. Thus, it is not possible to draw firm conclusions about "bottom-line" effectiveness from such intermediate measures.

It can be difficult to estimate the independent effects of mass media campaigns because they are usually accompanied by other AID prevention activities. To address this issue, only studies were included in which either (1) levels of other AID prevention activities did not change substantially during the media campaign; or (2) there were changes in other AID prevention activities, but the effects of these activities were accounted for by using statistical models. Therefore, some mass media campaigns that were combined with changes in laws or involved increases in enforcement were excluded (e.g., most sobriety checkpoint campaigns). The review was also limited to mass media campaigns employing persuasive messages to prevent drinking and driving. Therefore, the effects of earned media, such as news stories related to alcohol-impaired driving, were not evaluated, nor were the effects of ads promoting alcoholic beverages.

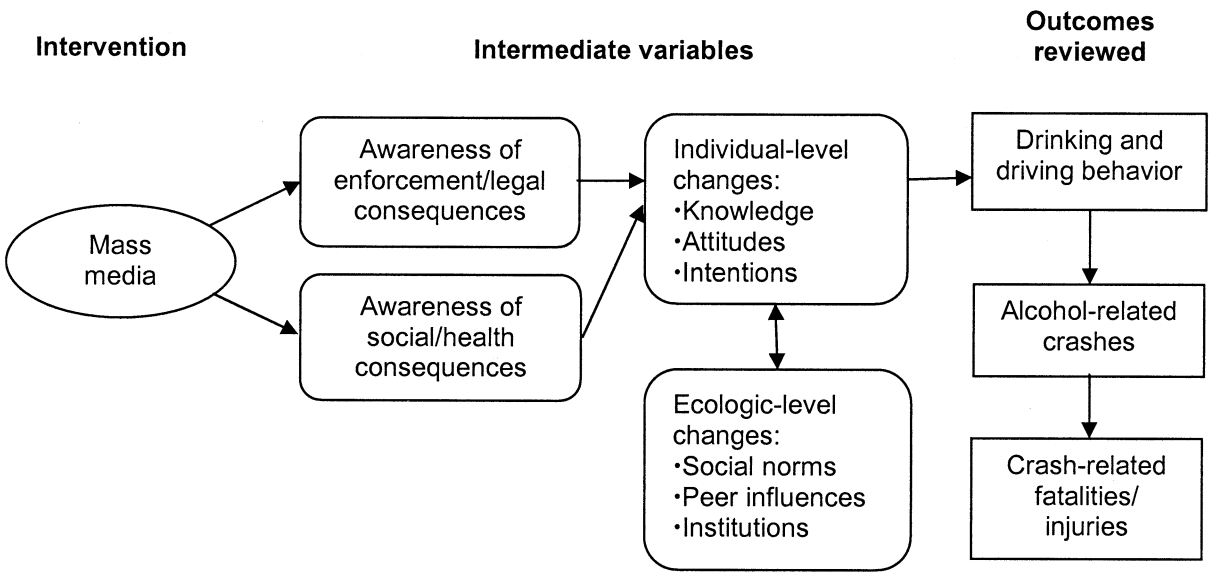


Figure 1. Conceptual framework for reviews of the effects of mass media campaigns on injuries from alcohol-related crashes.

Classification of Studies by Theme

Studies were classified according to whether their themes focused primarily on the **legal consequences** or the **social and health consequences** of drinking and driving. These are broad categories, and message content can vary greatly within each. Although formal evaluation of variables such as audience exposure, production quality, and message pretesting was not possible, information on these variables for each study reviewed is reported when available.

Calculating Summary Effect Measures

Separate effect estimates were calculated for fatal crashes, fatal and nonfatal injury crashes, and property damage crashes (e.g., police-reported "had-been-drinking" crashes). Most of the included studies used proxy variables for alcohol-related crashes (e.g., single-vehicle nighttime fatal crashes). Due to the imperfect association between these proxy variables and alcohol-related crashes, the resulting effect estimates are biased towards the null. The degree of bias is more pronounced for proxies with weaker association with alcohol involvement.

When available, effect measures were selected that compared alcohol-related crash outcomes to non–alcohol-related crash outcomes (e.g., comparing single vehicle nighttime crashes to multivehicle daytime crashes). Such effect measures help control for both the long-term downward trend in total crashes and other factors that influence the total number of crashes, such as safety characteristics of vehicles and highways, weather, economic conditions, and vehicle miles traveled.[21] To further address potential confounding, whenever possible effect measures were also selected that incorporated a concurrent comparison group such as drivers in communities that were not exposed to the media campaign. For studies incorporating comparison groups, results are reported in the form of the net change, reflecting the difference between the percent change for the intervention group and the comparison group. For studies using interrupted time series or other regression-based designs, results are reported in terms of the percent change estimated from the model.

Results

Nine papers were identified that included 11 studies or study arms evaluating changes in the number of crashes or in blood alcohol test results following the implementation of mass media campaigns.[9,22–29] In accordance with *Community Guide* criteria, results from distinct study arms reported in a single paper were treated as independent estimates. Eight studies met the quality criteria for inclusion in this review.[9,22–26] Five of these studies indicated that some form of pretesting was used to ensure that campaign messages would be relevant to the target audience.[9,24,26] In general, levels of audience exposure were also high, and most campaigns used paid advertising. These campaigns were also generally implemented in communities that had existing AID prevention activities, including strong enforcement efforts.

Details of the included studies are presented in Table 1. In addition, details of the specific messages used in these campaigns and an overview of some important methodologic issues in individual studies are presented below.

Studies of Campaigns with Legal Deterrence Themes

Three of the evaluated campaigns focused heavily on raising public awareness of enforcement activities and of the legal consequences of drinking and driving.[22–24] All of these campaigns were evaluated in areas where actual enforcement levels during the campaign were at approximately the same levels as prior to the campaign.

Table 1. Studies evaluating effectiveness of mass media campaigns for decreasing alcohol-impaired driving and alcohol-related crashes

Studies emphasizing legal consequences

Author (year)[ref] (Study period) Design Evaluation setting (Comparison details)	Intervention Details: Scope (national, state, community) Message theme (tagline) Delivery method Cost Other details	Results/other information	Summary value(s)	Follow-up period
McLean (1991)[22] (7 weeks before and after March 26 [Easter], 1989) Time series Adelaide, South Australia (Comparison to previous Easter period – 1983)	State Enforcement activity Primarily TV Expenditures increased from AU$9,280 in Jan and Feb., 1989 to AU$43,676 in March and April. Enforcement activity remained at a constant high level before and after campaign.	Proportion of drivers (N=6373) above .08 g/dL BAC decreased 40% (95% CI: –61, –18) from baseline of 4.2% (net change = –30%).	Drivers above illegal BAC limit: –30%	2 months
Epperlein (1987)[23] (1972 – 1983, monthly) Interrupted time series with concurrent comparison Arizona (Comparisons to daytime crashes and to crashes with no identified drinking drivers)	Community (metropolitan Phoenix and Tuscon) Enforcement activity/Legal consequences TV, radio, and billboard Not provided Campaign implemented in late February and March of 1982 with no associated change in enforcement activity.	Nighttime fatal crashes decreased by 27% ($p < .05$) from monthly mean of 28 (net change = –16%); Nighttime injury crashes decreased by 12.5% ($p < .05$) from monthly mean of 724 (net change = –7%); Had-been-drinking crashes decreased by 14% ($p < .05$) from monthly mean of 1036 (net change = –13%).	Fatal crashes: –16% Injury crashes: –7% Other crashes: –13%	21 months
Worden (1975)[24] (5/72 – 5/74) Before-and-after with concurrent comparison Vermont (Comparison to counties receiving no intervention)	Community Enforcement activity, supplemented by information on preventing AID Primarily radio, plus TV, drive-in theater spots, and various other attempts to foster interpersonal communication Used donated media time, market research, campaign development, and production facilities. Campaign conducted from 6/72–5/74 as part of an Alcohol Safety Action Project. Target group was young males and messages applied 'best practices' for health promotion. Enforcement remained at a high level throughout study period.	The proportion of "high-risk" male drivers (those who report consuming three or more drinks at least once a week) above 0.05 g/dL BAC: - at mid-campaign (May, 1973) decreased 37% from a baseline of 10 of 48 drivers to 9 of 69 (95% CI: –72%, +42%; net change = –158%); - immediately following the campaign (May, 1974) decreased 67% (95% CI: –88%, –7%; net change = –111%). The proportion of had-been-drinking to total fatal crashes decreased 6% from a baseline of 9 of 20 to 8 of 19 (95% CI: –54%, +91%; net change = 0%). Very small sample sizes result in unstable estimates.	Drivers above 0.05 g/dL BAC: –158% Fatal crashes: 0%	24 months

Table 1. *(continued)*

Studies emphasizing social and health consequences

Author (year)[ref] (Study period) Design Evaluation setting (Comparison details)	Intervention Details: Scope (national, state, community) Message theme (tagline) Delivery method Cost Other details	Results/other information	Summary value(s)	Follow-up period
Cameron (1998)[26] (1/90 – 6/97, quarterly) Time series with concurrent comparison New Zealand (Comparison of crashes during high alcohol consumption hours to those during low alcohol consumption hours)	National Crash risk/consequences, including graphic crash scenes (Drink and drive – You're a bloody idiot!) Primarily TV Approximately NZ$7 million per year Campaign modeled after Victorian Transport Accident Commission ads, often featuring graphic crash scenes; exposure to AID-themed ads increased approximately 12-fold to 678–770 target audience rating points per month. Over the course of the evaluation, stops at sobriety checkpoints decreased 7.5%, while total stops increased 13%.	In 1996–97, campaign estimated to result in: a 33% decrease in urban high alcohol hour serious injury crashes (95% CI: –40%, –25%; net change = –7%); a 32% decrease in rural high alcohol hour serious injury crashes (95% CI: –41%, –22%; net change = –18%). In 1995–96, campaign estimated to result in: a 16% decrease in urban high alcohol hour serious injury crashes (95% CI: –24%, –6%; net change = –2%); a 6% decrease in rural high alcohol hour serious injury crashes (95% CI: –18%, 7%; net change = –5%).	Injury crashes Arm 1 (Urban): –7% Arm 2 (Rural): –18%	24 months
Newstead (1995)[25] Cameron (1993)[31] (1983 – 1992, monthly) Time series (evaluated using double log regression) Victoria, Australia	State Primarily crash risk/consequences, including graphic crash scenes; one of four ads also highlighted sobriety checkpoints (Drink and drive – You're a bloody idiot!) Primarily TV (approximately 70%) AU$23 million between 1989 and 1992 Sobriety checkpoints increased over study period, but were included in the regression model along with terms for linear trend, month, and unemployment rate.	Nighttime serious casualty crashes estimated to be approximately 14% lower than expected in the absence of campaign. The level of advertising exposure was inversely related to serious casualty crashes in both Melbourne (regression coefficient = –0.0249, $p < .05$) and rural Victoria (regression coefficient = –0.0316, $p < .05$). Contrary to expectations, the trend term of the regression model indicates that injury crashes would increase over time if the other variables modeled remained constant.	Injury crashes: –14%	37 months
Lastovicka (1987)[9] Murry (1993)[30] (1/83 – 9/87, monthly) Before-and-after with concurrent comparison Wichita, Kansas Kansas City, Kansas (Comparison to Omaha, Nebraska)	Community Primarily crash risk/consequences, including models for appropriate behavior; one of six radio spots included enforcement message Television, radio, newspapers, theatres & billboards Planning, production, and evaluation of messages cost $442,000. Media placement costs for Wichita were $90,000 (equivalent to $25 million on a national level). Kansas City arm used free media (PSAs). Messages targeted towards 18–24-year-old males (secondary targets 15–24-year-old males and females) were developed using extensive market research. Campaign ran for 6 months (March—August 1986). Kansas City PSAs attained about half the audience exposure of the Wichita campaign.	Relative to the prior year, among 15- to 24-year-olds during the campaign period: Serious injury crashes in Wichita decreased 17% from a baseline of 20/month (net change = –14%) Nighttime serious injury crashes in Wichita decreased 7% from a baseline of 9/month (net change = –19%) Serious injury crashes in Kansas City decreased 13% from a baseline of 18/month (net change = –6%) The proportion of 18- to 24-year-old male drivers who reported driving in the past month after drinking four or more drinks: In Wichita decreased by 20% from a baseline of 0.35 (net change = –36%, $p < .05$) In Kansas City decreased by 17% from a baseline of 0.37 (net change = –33%, $p < .05$) Interrupted time series results also indicate significant (one-tailed) campaign benefits.	Injury crashes Arm 1 (Wichita; paid ads): –14% Arm 2 (Kansas City; PSAs): –6%	6 months

AID, alcohol-impaired driving; BAC, blood alcohol concentration; CI, confidence interval; g/dL, grams per deciliter; PSA, public service announcement.

The campaign messages were credible, however, because enforcement levels were already quite high.

McLean et al.[22] evaluated the short-term effects of a South Australian media campaign publicizing a sobriety checkpoint program that had been ongoing for several years. They assessed the proportion of drivers at roadside surveys who had illegal BAC levels before and during the 7-week campaign. Adjustment for potential seasonal effects on levels of drinking and driving was made by comparing the observed changes to those from a previous year in which enforcement and publicity did not change.

Epperlein[23] evaluated an Arizona media campaign highlighting police enforcement activities. When this campaign was conducted, there was not only a high level of police enforcement, but also unpaid media coverage of high-profile alcohol-related crashes and impending changes in driving under the influence (DUI) legislation. These other activities may have had a synergistic effect with the deterrent messages of the campaign. The study used an interrupted time series analysis to attempt to disentangle the effects of a media campaign from the effects of changes in DUI laws that followed shortly thereafter. For the evaluation, separate time series were conducted and compared for crashes likely to involve alcohol and for crashes less likely to involve alcohol (e.g., nighttime vs daytime fatal crashes), allowing the adjustment for potential confounders. The short (5-month) period between implementation of the campaign and changes in the DUI laws does, however, raise some questions about the stability of the time series results.

A third campaign[24] included both deterrence messages and an educational component concerning the steps that the audience should take to avoid drunk driving. The campaign took place in Vermont while an intensive alcohol safety action project was underway. Some counties were exposed to the media campaign with additional enforcement, some were exposed to the campaign alone, and some were used as comparison areas. Despite the careful attention paid to study design, the sample sizes obtained for the outcome measures examined were very small. Consequently, the resulting estimates are very unstable. For example, the estimated net effect of the campaign was a decrease of 158% in intoxicated drivers; this estimate was based on a 37% decrease in the intervention community (95% confidence interval [CI]:−72% to +42%) and a 121% increase in the comparison community (95% CI: −14% to +465%).

Studies of Campaigns with Social and Health Consequences Themes

Five studies reviewed evaluated campaigns that highlighted various social and health consequences of AID.[9,25,26,30,31] One campaign[9,30] used state-of-the-art marketing methods to influence drinking and driving among young males in Wichita, Kansas. Campaign messages depicted relatively mild consequences of drinking and driving and modeled desirable behavior. Some also included references to the legal consequences of AID. Interrupted time series analyses and pre–post comparisons on several crash outcome measures and examining several population groups generally indicated that the campaign reduced crashes likely to involve alcohol. The same campaign messages were also presented as public service announcements in Kansas City, Kansas, where they attained approximately half as much audience exposure as did the paid ads in Wichita. The estimated effect for this study arm was approximately half as strong as that observed for the paid media campaign.

A campaign developed by the Transport Accident Commission (TAC) of Victoria, Australia, used television ads depicting realistic and graphic scenes of crashes to highlight the devastating physical and emotional consequences of drinking and driving. Each ad ended with the tag line, "Drink and drive—You're a bloody idiot!" Evaluations suggested that this campaign was successful at decreasing alcohol-related crashes,[25,31] and it inspired similar campaigns in other Australian states and New Zealand. However, there has been controversy over both the theoretical basis for this campaign and the appropriateness of its evaluation.[32–35] Some authors have criticized the TAC ads for their attempts to motivate the audience with a strong fear-based approach with limited emphasis on modeling desirable behaviors.[32] Critiques of the evaluation focus on the issue of whether other factors that may have contributed to changes in alcohol-related crashes were correctly accounted for in the analysis. These factors include an increase in the use of sobriety checkpoints and an economic downturn during the period of the evaluation. One troubling aspect of this model is that it estimates that, other things being equal, injury crashes are expected to increase over time. This finding is contrary to the common belief that factors such as improvements in vehicle safety generally lead to an overall decrease in injury crashes over time.

Despite the controversy surrounding the evaluation of the Victorian mass media campaign, its results are quite consistent with the findings from the evaluation of a New Zealand campaign using similar ads and a similar degree of audience exposure to them.[26] Separate regression analyses for urban and rural areas each indicate that the campaign was associated with a decrease in injury crashes. In contrast to the Victorian campaign, the New Zealand campaign was conducted in the context of a stable economy and a stable, high level of AID enforcement activity. There have also been critiques of the New Zealand evaluation, and alternative analyses have produced smaller estimates of effectiveness.[33,36]

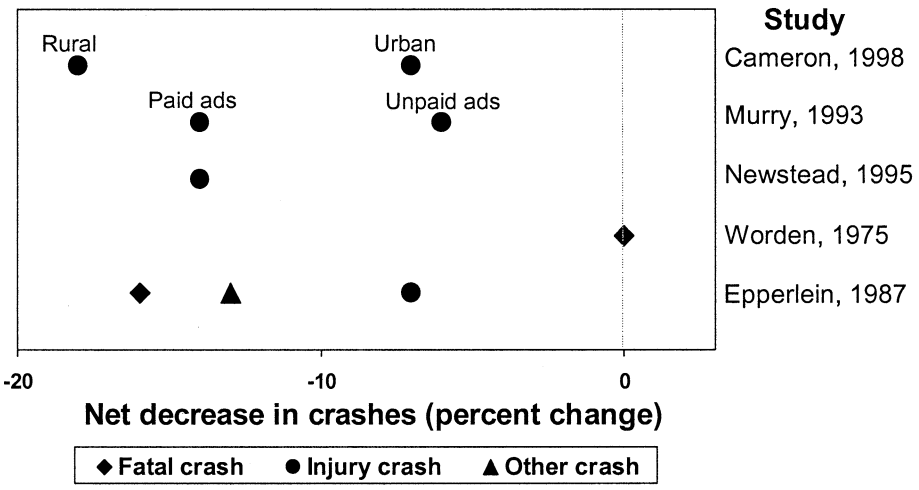


Figure 2. Percent change in crashes likely to involve alcohol after implementing mass media campaigns to prevent alcohol-impaired driving.

Summary of Study Results

Figure 2 presents the results of the studies that estimated the effects of mass media campaigns on traffic crashes. The median decrease in crashes across all studies and all levels of crash severity was 13% (interquartile range [IQR]: 6% to 14%). The median decrease in injury-producing crashes, the most common crash outcome, was 10% (IQR: 6% to 15%). The two studies that used roadside BAC test results as outcome measures showed net decreases of 158% and 30% in the proportion of drivers with BAC levels that suggest alcohol impairment (0.05 g/dL and 0.08 g/dL, respectively).[22,24] There was no clear difference in the effectiveness of campaigns that used legal deterrence messages and those that used social and health consequences messages.

Economic Analyses

Cost–benefit analyses were conducted for two of the campaigns evaluated in this review,[25,30] and their results have been adjusted to 1997 U.S. dollars. An analysis of the first 23 months of the Victorian campaign indicated that it cost $403,174 per month for advertisement development, supporting media, media placement, and concept research.[31] Estimated savings from medical costs, productivity losses, pain and suffering, and property damage were $8,324,532 per month, with $3,214,096 of these savings accruing from averted medical costs.

The 6-month campaigns in Wichita (using paid media) and Kansas City (using public service announcements) had total costs of $454,060 and $322,660, respectively.[37] Included are costs for planning and evaluation research, message production, and media scheduling. Total savings from averted costs of insurance administration, premature funerals, legal and court expenses, medical payments, property damage, rehabilitation, and employers' losses were estimated at $3,431,305 for the Wichita campaign and $3,676,399 in Kansas City.

In all three sites evaluated, the estimated societal benefits substantially exceeded the costs of developing and airing the campaign messages.

Discussion

The studies reviewed here indicate that under some conditions, well-executed mass media campaigns can contribute to a reduction in AID and alcohol-related crashes. They also suggest that such campaigns are cost saving.

None of the studies reviewed provides unequivocal evidence that a given campaign actually reduced AID or alcohol-related crashes. However, across the body of evidence reviewed, which contains studies subject to confounding variables likely to be unique to the given situations observed, the estimated effects of the campaigns consistently indicated beneficial results. This pattern is unlikely to be an artifact of methodologic flaws in the studies evaluated, and suggests that the campaigns were in fact effective. One potential bias that could distort the conclusion, however, is the possibility that studies with positive findings are more likely to be published or to be identified in a systematic literature search.

Mass media campaigns likely have indirect effects in addition to those evaluated in this review. For instance, several authors have suggested that the mass media can play an "agenda-setting" role by influencing public perceptions of the importance of social issues, such as AID.[17,38–40] As media coverage increases the perceived importance of the AID problem, public support for actions to address it may also increase. A recent study provides evidence suggesting such a process. This study

found that most of the observed association between news coverage of AID and the observed decrease in alcohol-related crashes between 1978 and 1996 could be accounted for by legislative initiatives associated with the news coverage rather than by direct effects of that coverage on people's behavior.[41] According to some authors,[3,41,42] using the mass media to influence social policies offers much larger potential benefits than attempting to change individual behavior. Thus, they suggest that future mass media campaigns should explicitly focus on these broader goals. If such campaigns were conducted, it would be instructive to compare their influence on public support for changes in social policy to that of traditional campaigns intended to foster individual behavior change.

No clear difference in effectiveness was observed between campaigns that highlighted the legal deterrence of AID and those that highlighted the social and health consequences. Nonetheless, it is possible that some types of messages are better suited than others for promoting different types of change. For example, some authors have suggested that campaigns with legal deterrence themes may be the most efficient strategy for effecting individual behavior change, at least in the short term.[43] These authors present evidence that such ads can be effective even when they use relatively low-cost production approaches. On the other hand, they argue that emotionally intense ads that emphasize the personal and social costs of drinking and driving may be more likely to lead to community support for greater preventive measures. Studies systematically evaluating the impact of ads with different themes on the beliefs and intentions of the target audience may help to clarify these issues.

Regardless of their thematic approach, the campaigns evaluated in this review were developed using practices that probably maximized their effectiveness. These practices included pretesting of messages and efforts to maximize the length and frequency of audience exposure. The studies reviewed represent a highly select sample of mass media campaigns targeting AID, and their results cannot be generalized beyond such high-quality, high-intensity campaigns. Historically, many mass media campaigns targeting AID have used public service announcements rather than paid media, devoted minimal resources into the crafting and testing of messages, and devoted very little effort to ensuring adequate exposure levels.[3,9] Although no formal evaluations of such campaigns were found that met the inclusion criteria, anecdotal evidence suggests that they also have not been effective at changing behavior. As others have pointed out, it would be a surprise if an entrenched lifestyle behavior such as AID were easily affected by such minimal efforts.[44]

Decision making based on the success or failure of previous health-promotion campaigns is complicated by the **efficacy paradox**.[45] According to this paradox, the results of poorly implemented programs are of questionable value for making generalizations about the potential utility of such programs. On the other hand, with typical resource constraints it is often impossible to implement programs that meet all the requirements for maximal efficacy. Given these facts, it is incumbent upon planners to assess whether they have adequate resources and a supportive environment to implement an effective mass media campaign. If not, the campaign should not be undertaken.

The characteristics of the campaigns evaluated in this review may serve as a preliminary guide to evaluating the potential for success of a proposed mass media campaign, but several research questions will need to be addressed to maximize the effectiveness and efficiency of future programs. A list of such questions is provided in Table 2. Foremost among these is the question of the relative effectiveness of specific campaign themes and messages. It is unlikely that all potential messages are equally effective for changing drinking and driving behavior, and some may prove not to be effective at all or even to be counterproductive. Another important question relates to the potential impact of the changing media market, with increasing market segmentation, emerging technology to allow

Table 2. Future research questions

Evaluating message content effects
What is the relative effectiveness and cost-effectiveness of various campaign themes (e.g., law enforcement, legal penalties, social stigma, guilt, injury to self and others) for reducing AID and alcohol-related crashes? For influencing public support for stronger prevention activities?
Evaluating message delivery effects
What is the dose–response curve for varying levels of advertising exposure (e.g., none, light, moderate, and heavy)? Does the shape of this curve vary according to message content and the outcome evaluated?
What is the relative effectiveness and cost-effectiveness of different media types (TV, radio, etc.)? Paid advertising and public service announcements?
What is the optimal exposure schedule for AID mass media campaigns (e.g., intermittent waves of messages vs a steady flow)?
How should mass media campaigns be adapted to the changing media environment (e.g., market segmentation, Internet, message filtering devices)?
Evaluating message/recipient interactions
To what extent are certain population groups more or less likely to be influenced by mass media campaigns?
Are some themes more likely than others to influence "hard-to-reach" target groups (e.g., enforcement themes for "hard-core" drinking drivers)?
Improving research design
What measurement issues need to be addressed to improve assessment of media and message exposure? What research designs can best address problems in measuring exposure?

AID, alcohol-impaired driving.

consumers to avoid exposure to broadcast messages, and opportunities for individually tailored message delivery via the Internet. The impact of these changes should be evaluated and future campaigns adapted to the changing media environment.

The campaigns reviewed tended to take place in areas with relatively high levels of law enforcement and other activities to prevent AID. These activities may have helped provide a context in which the audience was predisposed to react positively to the campaign messages. It is not clear whether these campaigns might have had similar effects in a setting where strong AID-prevention activities were not in place.

According to *Community Guide* rules of evidence,[19] the studies reviewed here provide 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 enhanced AID law enforcement, are effective in reducing alcohol-impaired driving and alcohol-related crashes.

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