Effectiveness of multicomponent programs with community mobilization for reducing alcohol-impaired driving

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CRD summary
This review concluded that there was strong evidence that carefully planned well-executed multicomponent programmes in conjunction with community mobilisation were effective in reducing alcohol-related crashes and costs. However, given the methodological limitations of the included studies and risk of missing data, the authors' conclusions appeared to be overstated and may not be reliable.

Authors' objectives
To assess the effectiveness and cost effectiveness of multicomponent programmes with community mobilisation for reducing alcohol-impaired driving.

Searching
MEDLINE, PsycINFO, Social SciSearch, NTIS, Transportation Research Information Services, Ei Compendex and EMBASE were searched for full English-language papers published in peer-reviewed journals, government reports or technical reports between January 1980 and June 2005. Bibliographic reference lists were checked and topic experts were contacted for further studies. Further details of the strategy were available online.

Study selection
Studies that met Community Guide minimum criteria for study design and quality criteria and that assessed the effects of a multicomponent intervention programme with community mobilisation to reduce alcohol-related crashes were eligible for inclusion in the review. The primary outcome was alcohol-related motor vehicle crashes.

Included studies assessed a variety of different intervention programmes that varied in focus and level of community involvement and funding. All included studies implemented responsible beverage service activities. Other interventions included enforcement of minimum legal drinking age laws and controlling alcohol outlet density. Two thirds of the included studies implemented intervention programmes in more than one community (range three to seven). All of the interventions were implemented between 1988 and 2001 in multiple settings within each intervention community. Communities were all located in US states (California, Massachusetts, Minnesota, Missouri, Rhode Island, South Carolina, Texas and Wisconsin). Some of the included studies used established proxy measures for alcohol-related crashes, which included single-vehicle night-time injury crashes. Other reported outcomes included underage drinking and other risky driving behaviours such as speeding, disorderly conduct, alcohol-related injuries and violence, access to alcohol treatment or substance misuse in general. Follow-up duration ranged from 30 to 120 months (median 48 months).

The authors did not state how papers were selected for review.

Assessment of study quality
Methodological quality of the studies was assessed independently by two authors according to Community Guide standards. Study methodology was rated according to whether the study used a concurrent control group and assessed exposure and outcomes prospectively. Nine criteria were assessed and included: study population and intervention descriptions; sampling methodology; exposure and outcome measurement; data analysis; interpretation of results (follow-up, bias and confounding); and other factors. Studies that fulfilled all criteria or only failed to meet one criterion were rated good, those that failed to meet two to four criteria were rated fair and those that failed to meet five or more criteria were rated as limited. Only studies rated good or fair were included in the review.

Data extraction
The number of alcohol-related motor vehicle crashes was extracted and used where possible to calculate effect sizes. Where studies included a comparison group, the difference in percentage change between intervention and comparison
groups was calculated. For studies without a control group (such as time series or that used another regression-based design) the percentage change estimated from the study models was used. Where available effect measures were selected that compared alcohol-related crash outcomes to crash outcomes not related to alcohol (such as ratio of had-been drinking crashes to had-not-been-drinking crashes) over the same time period to help control for potential confounding factors (such as the long-term downward trend in total fatal crashes) and factors that influenced the total number of crashes (such as weather, economic conditions, vehicle miles travelled and safety characteristics of vehicles and roads).

The authors stated that the review team extracted data and calculated effect sizes.

Methods of synthesis
Studies were grouped by outcome in a narrative synthesis.

Results of the review
Six studies were included in the review; most population estimates for the included communities ranged from 20,000 to 100,000. Study designs included two time series with concurrent comparison groups, two before-and-after studies with concurrent comparison groups and two group randomised controlled trials. All of the studies were judged as having suitable study designs and to be of fair methodological quality.

Two studies reported declines in fatal crashes of 9% and 42%. One study reported a reduction of 10% in injury crashes. Another study assessed crashes among young drivers aged 16 to 20 years and reported a decline of 45%. One study reported no change in the incidence of single-vehicle late-night and weekend crashes among young male drivers. The final study examined injury crashes among underage drivers and reported small net reductions. Percentage change in crashes could not be calculated as actual numbers were not reported.

Cost information
Three studies evaluated the costs associated with two of the multicomponent programmes undertaken to reduce alcohol-impaired driving. Estimated savings associated with implementation of an intervention programme ranged from $6.56 to $15.72 for each US dollar invested.

Authors' conclusions
There was strong evidence that carefully planned well-executed multicomponent programmes in conjunction with community mobilisation were effective in reducing alcohol-related crashes and costs.

CRD commentary
This review answered a well-defined research question with clear but broadly defined inclusion criteria for study design, population and intervention. A number of electronic databases were searched for studies. As only English-language publications were eligible for inclusion, there was some risk of publication bias (as acknowledged by the authors). Multiple reviewers assessed methodological quality of the included studies with published criteria and extracted data to calculate effect sizes, which reduced risks of reviewer error and bias; it was unclear how many reviewers assessed studies for inclusion. The quality of the studies was assessed using relevant criteria considering the different study designs under review. Overall, the quality of the studies was judged as fair, but the authors acknowledged that a number of the individual studies had limitations that could affect data reliability. Studies tended to use designs considered to be in the lower levels of the study design hierarchy. Given the differences in study designs, populations, interventions and outcome measures, use of narrative synthesis methods appeared appropriate. However, given the methodological limitations of the included studies and the risk of missing data, the authors conclusions appeared to be overstated and may not be reliable.

Implications of the review for practice and research
Practice: The authors stated that effective programmes included sobriety checkpoints, responsible beverage service training, efforts to limit access to alcohol (particularly among young people), public education campaigns and media advocacy efforts to gain the support of policymakers and the public. Planners needed to assess whether they had adequate resources and a supportive environment in which to implement an programme in order for it to be effective.
Research: The authors stated that further large-scale community programmes and studies were required to assess whether community mobilisation increased the effectiveness of multicomponent programmes and if so how and to what extent. Studies were required to assess how differences in community ethnicity and socioeconomic status affected the effectiveness of interventions and to what extent specific individual components included in the interventions contributed to the overall effectiveness.

Funding
None reported.

Bibliographic details

PubMedID
19765509

DOI
10.1016/j.amepre.2009.07.005

Original Paper URL
http://www.thecommunityguide.org/mvoi/AID/multicomponent.html

Indexing Status
Subject indexing assigned by NLM

MeSH
Accidents, Traffic /prevention & control /statistics & numerical data; Alcoholic Intoxication /economics /prevention & control; Automobile Driving /legislation & jurisprudence /statistics & numerical data; Community Health Services /standards; Humans; Outcome Assessment (Health Care); Program Evaluation; United States

AccessionNumber
12009109889

Date bibliographic record published
20/01/2010

Date abstract record published
27/10/2010

Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.