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A Review of Evaluations of Social Marketing Campaigns in Occupational Injury, Disease or Disability Prevention

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A Review of Evaluations of Social Marketing Campaigns in Occupational Injury, Disease or Disability Prevention

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A Review of Evaluations of Social Marketing Campaigns in Occupational Injury, Disease or Disability Prevention

Main research findings

- At present, typical levels of provincial expenditures on occupational health social marketing campaigns are in the range of $100 per 100 workers
- A total of 30 of the 56 campaigns described in this review were judged to be reported to a high quality standard
- Of these 30 campaigns reported to a high quality standard, a majority reported measures of injury, disease or disability outcomes
- Of the 30 campaigns reported to a high quality standard, one targeted infection control, 14 targeted injury prevention, three targeted disease prevention, four targeted sun protection behaviors and seven targeted the prevention of disability following the onset of a work-related injury or disease
- Social marketing intervention in occupational health and safety apply a wide range of strategies. A minority of campaigns reported to a high quality standard relied exclusively on public communications. The reported effects of these campaigns were weak. A majority of campaigns reported to a high quality standard integrated public communications with educational programs, consulting services or targeted inspection and enforcement. The reported effects of these campaigns were stronger.
- Only a small minority of social marketing campaigns reported information on campaign expenditures and provided estimates of the economic value of campaign outcomes. It is not possible, as a result, to estimate the cost-effectiveness of social marketing campaigns targeting occupational health.

Prevention policy implications

- Social marketing approaches have demonstrated effectiveness in many domains of public health
- There is emerging evidence that these methods can be effective in improving and protecting the health of workers
- The quality of information available on the effectiveness and cost-effectiveness of social marketing is very weak
- This weakness can be addressed if investments in social marketing campaigns incorporate resources to support high quality evaluations
- High quality evaluations need to address the following requirements
    - give substantial attention to internal validity
    - measure intermediate outcomes **and** final outcomes
    - respect the importance of replicating campaign evaluations conducted in other settings
    - assemble comprehensive documentation of social marketing campaign activities
    - examine the role of content and communication provided through the internet

Executive Summary

Each year in Canada, more than 350,000 workers are disabled by occupational injury or disease. Each year in Canada, more than 1,000 adults die as a result of traumatic occupational injuries or occupational disease (Sharpe, 2006).

More than 60% of Canadians believe workplace accidents and injuries are an inevitable part of life. Many provincial workers' compensation agencies are focusing on the challenge of changing these public attitudes to embrace values that see preventable workplace death, injury, illness and disease as unacceptable. A number of Workers' Compensation Boards in Canada have provided leadership in funding social marketing campaigns that focus on the prevention of occupational injury, disease or disability. At present, typical levels of provincial expenditures on workplace social marketing campaigns are in the range of $100 per 100 workers. Refining the effectiveness and efficiency of these campaigns is an important program objective. The findings of this review of evaluations of social marketing campaigns in the field of occupational health protection will, hopefully, be of value in realizing this objective.

The primary objective of this review was to conduct a review of evaluations of social marketing campaigns in the fields of occupational injury prevention, occupational disease prevention or the prevention of disability. In pursuing this objective, our purpose was to identify those evaluations conducted to higher quality standards and to describe the most important results reported from these higher quality studies. A secondary objective was to examine the quality of economic evaluations conducted in this field and to complete, if feasible, an assessment of the cost-effectiveness of social marketing interventions in occupational injury, disease or disability prevention.

In this review, we define social marketing to be the application of theories and techniques drawn from behavioral theory, persuasion psychology and marketing science to promote changes in socially important behaviors. These methods have traditionally been applied to influence behaviors related to consumer behavior. Where consumer marketing aims to influence individual's preferences and product purchasing decisions, social marketing aims to influence behaviors such as drug use, smoking or reproductive behaviors or behaviors related to personal protection and safety. Social marketing campaigns will often use mass media communication as one instrument to promote changes in socially important behaviors.

The methods of this review have followed a systematic methodology for conducting a review of research evidence. This methodology proceeds through 4 steps: 1) a systematic search of relevant electronic databases (and supplemental sources) to comprehensively identify all potential research or evaluation reports relevant to the objective of the protocol, 2) a review of the titles and published abstracts identified in the first step, and the selection of those research or evaluation reports that are deemed relevant to the objective of the protocol, 3) a critical assessment of the quality of the research methods in the research or evaluation reports retained in the second step, and the selection of those reports meeting an explicit quality criteria and 4) a summary of the empirical results from the studies retained in step 3.

There are substantial challenges in realizing a high-quality evaluation of a social marketing campaign. An ideal evaluation would comprehensively measure the causal pathway leading from campaign exposure to campaign awareness, knowledge,

attitudes, beliefs, behavioral intentions, behaviors and finally to the measurement of health outcomes. In addition, an ideal evaluation would have strong internal validity, best achieved with a research design that measures the population of interest before and after the intervention and that has a comparison or control group not exposed to the intervention but otherwise equivalent to the target population. Rarely are all of these attributes incorporated in a social marketing evaluation. In our assessment of social marketing campaigns included in this review, we have given prominent emphasis to campaign evaluations that combined comprehensive measurement of the causal pathway linking campaign exposure to occupation injury, disease or disability outcomes with evaluation designs of high internal validity.

Summary of Findings from the Review

Quality of research designs

A total of 30 of the 56 campaigns described in this review were judged to be reported to a high quality standard. Of these 30 campaigns, 9 were evaluated using a randomized controlled trial, 7 were evaluated using a pre and post-test design with a comparison group and thirteen were evaluated using a time series design. These evaluations have stronger internal validity.

Outcomes described in the campaign evaluations

In this review, measures of awareness, knowledge, attitudes and beliefs are classified as intermediate outcomes and measures of the incidence of injury, disease or disability are classified as final outcomes. On the basis of this framework, campaigns have been classified into three primary groups: campaign evaluations that reported intermediate outcomes only (N=27), campaign evaluations that reported both intermediate and final outcomes (N=20) and campaign evaluations that reported only final outcomes (N=7) (Table 2). Campaigns judged to be reported to a high quality standard were more likely to include measures of final outcomes than campaigns judged to be reported to a lower quality standard. Eighteen of 30 higher quality campaign evaluations contained measures of final outcomes.

The type of social marketing intervention

Defining a clear boundary between social marketing campaigns in occupational health and safety and more traditional education or consulting activities is not possible. For the purposes of this review, an occupational health and safety campaign combining the use of public communication media with educational activities targeting individual workers in multiple workplaces and/or consulting activities targeting multiple workplaces has been classified as a social marketing campaign.

There is great diversity in the types of social marketing interventions reviewed in this report. Only a minority of campaigns rely exclusively on public communication strategies. Seven campaigns judged to be reported to a high quality standard rely exclusively on public communications. Five of these seven campaigns relied exclusively on direct mail communication to reach their target audiences.

Much more frequently, occupational health and safety campaigns with a public communication component will also integrate educational programming, consulting programming or are aligned with targeted inspection and enforcement activities.
Five campaigns judged to be reported to a high quality standard emphasize public communications that promote regulatory compliance. Eighteen campaigns judged to be

reported to a high quality standard integrate public communications with other intervention components, such as a combination of both educational interventions delivered to workers and consulting services delivered to workplaces.

Objectives of social marketing campaigns

Of the 56 reports described in this review, 43 described campaigns with primary prevention objectives. One half of these campaigns were judged as reported to a high quality standard. Of these higher quality standard reports, one campaign targeted infection control practices, 14 targeted the prevention of injuries, three campaigns targeted the prevention of disease and 4 campaigns targeted sun protection behaviors related to the prevention of skin cancer.

Eleven reports described campaigns with secondary prevention objectives. These campaigns focused on workers experiencing an episode of disability and offered guidance concerning appropriate practices related to health care treatment or return-to-work. Seven of these eleven reports were classified as reported to a high quality standard. In addition, two campaigns with high quality evaluation designs have not yet released evaluation findings (2, 6).

Two campaigns had the objective of notifying workers of exposures or diagnoses related to occupational disease risk. One of these campaigns was classified as reported to a high quality standard.

Assessment of the economic costs and consequences of the social marketing campaign

Eleven of the 30 campaigns judged to be evaluated to a high quality standard included information on full or partial campaign expenditures. Only a minority of these higher quality campaign evaluations also included estimates of the economic value of the campaign outcomes. As a consequence of this limited attention to the measurement and reporting of the economic costs and consequences of social marketing campaigns, this review cannot provide an assessment of the cost-effectiveness of specific approaches to social marketing in the protection of the health of workers.

In the following table, we have summarized estimates of the economic costs and economic benefits from four of the higher quality campaign evaluations. Each of these four campaigns integrated mass media communication with well-planned education or consulting activities.

Campaign	Campaign Costs	Campaign Benefits	Cost/Benefit Ratio
Australia (001)	$10,100,000 (AUD)	$40,000,000 (AUD)	1 : 4
Germany (005)	€10,360,000	€47,000,000	1 : 4.7
Germany (014)	€340,000	€5,916,000	1 : 17
Austria (101)	€1,800,000	€10,900,000	1 : 6

Advice and Recommendations arising from the Review

This review has described 56 campaigns that used some form of public communication to reduce hazards, risks or burdens in occupation health. These campaigns addressed a

wide range of health concerns, across a wide range of country settings and focused on a wide range of economic sectors. Approximately one half of the campaigns were judged to be evaluated to a higher quality standard.

This review has not completed a summary of the empirical results from the campaigns judged to be reported to a higher quality standard. The wide diversity of campaign objectives, campaign methods and campaign outcomes prevented summarizing results across individual campaigns.

The review can offer some constructive advice concerning the integration of high-quality evaluation methods in the design and execution of social marketing campaigns targeting a reduction in the burden of injury, illness and disability experienced by workers.

Evaluation designs with high internal validity are feasible

The internal validity of a research design refers to the confidence with which we can infer that a change in attitudes, behaviors or health can be attributed to an occupational health intervention, rather than to some other explanation. Integrating a comparison group not exposed to the intervention in the evaluation design is a crucial feature to establish internal validity. Because social marketing campaigns often target complete populations, it is sometimes argued that comparison groups are not feasible. The examples from this review demonstrate that comparison groups are feasible. The evaluation design implemented in Alberta (Project 002) recruited a comparison sample from the neighbouring province of Saskatchewan. As an alternate to a comparison group of individuals, evaluation design may also consider measuring comparison conditions. As an example, a campaign in Austria (Project 101) targeting the prevention of workplace injuries arising from slips, trips and falls used a time series comparison of other causes of workplace injuries to demonstrate the effectiveness of the social marketing campaign.

Only two Canadian occupational health social marketing campaigns were judged to have evaluation designs with high internal validity (Project 002, Project 035)

Measuring both intermediate and final outcomes

As is discussed in the body of the report, this review found that 28 campaigns reported intermediate outcomes only (defined as awareness of the campaign, knowledge, attitudes or beliefs) and seven campaigns reported final outcomes only (defined as behaviors or the incidence of injury, disease or disability). Of the 19 campaigns that reported both intermediate and final outcomes, 13 were judged to be reported to a higher quality standard. The measurement of both intermediate and final outcomes is a crucial characteristic for a high quality evaluation. Evidence that a campaign changed attitudes, knowledge and beliefs but did not reduce the incidence of injuries, illness or disability would suggest the program design or the intensity of the social marketing campaign was incomplete or weak.

The value of replication

Well-designed, well-executed campaigns with strong evidence of program effectiveness are attractive models to adopt and implement. The Australian back disability prevention campaign (Project 001) has led to replications in Scotland (Project 006), Norway (Project 008) and Alberta (Project 002). A number of European jurisdictions have implemented intensive social marketing campaigns to reduce the burden of injuries arising from slips, trips and falls. Program developers should include program evaluation replication when

considering adopting and implementing social marketing campaigns demonstrated as successful in other jurisdictions.

Comprehensive Documentation of Campaign Activities

Information on the intensity of a social marketing campaign is crucial to understanding the relationship between an individuals' exposure to the campaign and subsequent changes in behavioral or health outcomes. Across the program evaluations identified in this review, there was a general lack of information provided describing the frequency, duration and coverage of mass media communication. Where a social marketing campaign integrated mass media communication with other program activities (frequently education or consultation services) there was also a general lack of information describing the frequency and coverage of these complementary activities. An excellent example of both the feasibility of describing campaign activities and of optimal clarity is contained in the summary table report in Project 008.

Special Challenges in Evaluating Campaigns with Multiple Components

This review has described a substantial number of occupational health campaigns that have integrated mass media communications or public communications with program components delivering educational services directly to workers or consulting services directly to workplaces. There are good indications that these integrated campaigns, if sustained over a period of time, have effects on knowledge attitudes and beliefs as well as on behaviors and health outcomes. What is much less clear is the attribution of positive program outcomes to specific components of the intervention. For example, what proportion of the reduction in slip, trip and fall injuries in the German intervention described in Project 005 can be attributed to the mass media component of the campaign, and what proportion can be attributed to the targeted consulting services provided to workplace safety representatives?

Learning more about the cost-effectiveness of different allocation ratios between the public communication component of a campaign and components related to education, consulting or enforcement would be a priority for future research.

What is the role of the internet as a public communication instrument?

Many of the more recent campaigns described in this review made active, and sometimes central, use of the internet as a public communication media. This review of occupational health and safety campaigns did not identify a specific evaluation report that measured the contribution of internet-based resources on knowledge, attitudes, beliefs or behaviors. It is clear that website companions to mass media communications do attract visitors. In 2006, the young worker injury prevention website sponsored by the Ontario WSIB and linked to a seasonal mass media campaign had more than 150,000 visits. Research and evaluation efforts to identify the characteristics of website visitors and the consequences of website visits on attitudes, knowledge, beliefs and behaviors will be valuable in establishing the effectiveness of this communication instrument.

Introduction

Each year in Canada, more than 350,000 workers are disabled by occupational injury or disease. Each year in Canada, more than 1,000 adults die as a result of traumatic occupational injuries or occupational disease (Sharpe, 2006).

More than 60% of Canadians believe workplace accidents and injuries are an inevitable part of life. Many provincial workers' compensation agencies are focusing on the challenge of addressing this fatalism, exploring approaches to changing public attitudes to embrace values that see preventable workplace death, injury, illness and disease as unacceptable. A number of Workers' Compensation Boards in Canada have provided leadership in funding social marketing campaigns that focus on the prevention of occupational injury, disease or disability. At present, typical levels of provincial expenditures on workplace social marketing campaigns are in the range of $100 per 100 workers. Refining the effectiveness and efficiency of these campaigns is an important program objective. The findings of this review of evaluations of social marketing campaigns in the field of occupational health protection will, hopefully, be of value in realizing this objective.

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In this review, we define social marketing to be the application of theories and techniques drawn from behavioral theory, persuasion psychology and marketing science to promote changes in socially important behaviors (Andreasen, 1995). Andreasen has offered the following definition:

Social marketing is the application of commercial marketing technologies to the analysis, planning, execution and evaluation of programs designed to influence voluntary behavior of target audiences in order to improve their personal welfare and that of society.

Where consumer marketing aims to influence individual's preferences and product purchasing decisions, social marketing aims to influence behaviors such as drug use, smoking or reproductive behaviors. Social marketing will use mass media communication as one instrument to promote changes in socially important behaviors.

The methods of this review have followed a systematic methodology for conducting a review of research evidence. This methodology proceeds through 4 steps: 1) a systematic search of relevant electronic databases (and supplemental sources) to comprehensively identify all potential research or evaluation reports relevant to the objective of the protocol, 2) a review of the titles and published abstracts identified in the first step, and the selection of those research or evaluation reports that are deemed relevant to the objective of the protocol, 3) a critical assessment of the quality of the research methods in the research or evaluation reports retained in the second step, and

the selection of those reports meeting an explicit quality criteria and 4) a summary of the empirical results from the studies retained in step 3.

The review summarized in this report has applied methods used in a number of recent reviews completed by the Institute for Work & Health examining the effectiveness of prevention interventions in occupational health and safety (Cole et al, 2005, Robson et al, 2005), and a recently conducted systematic review on effectiveness of exercise therapy for treatment of low back pain (Hayden et al., 2005a; Hayden et al., 2005b).

The international research literature reporting evaluations of social marketing interventions targeting the prevention of occupational injury, occupational disease or occupational disability has sufficient quantity and quality to support a descriptive review of the effectiveness of these interventions. Evidence compiled in this review will be of value, we believe, in clarifying the appropriate level and duration of social marketing expenditures aimed at changing attitudes, beliefs and behaviors in the area of workplace safety and occupational health.

Review of the Research Evidence for the Effectiveness of Social Marketing in Health Behavior Change

Mass media communication, through instruments such as television, newspapers, magazines, radio and the internet are fundamental components of modern society. Mass media communications provide information to citizens about their local community, their national state and about international events. Mass media communications are also important vehicles for creating consumer demand and for informing consumer choices. In addition, mass media communication has been effective in influencing public attitudes, values and beliefs in political, social and health realms.

In the realm of social attitudes, values and behaviors, mass media interventions have been effective in influencing health behaviors and health care utilization practices. Social marketing campaigns have been demonstrated to increase the use or adoption of effective health behaviors and to suppress or reduce the practice of un-desirable behaviors (Elder et al, 2004, Flay, 1987, Grilli et al., 2001, Moyer et al., 1994, Seale, 2003).

The means by which mass media interventions affect health behaviors is complex (Hornick and Yanovitzky, 2003). There are a range of theoretical frameworks available to understand the pathways of causation from mass media communication of information through to behaviors and actions taken by target audiences. In addition, there is a growing evidence base identifying the characteristics of effective (or ineffective) health campaigns (Morton and Duck, 2001).

However, mass media interventions are often implemented without the inclusion of high quality evaluation strategies, and those interventions that have been evaluated may not have been published in the peer-reviewed scientific literature. Given the relatively high cost of mass media interventions, a thorough and complete assessment of existing evidence on this topic is warranted. Evaluation of the literature and exploration of important characteristics that determine the impact media interventions will provide an opportunity to improve our understanding and inform future activities.

Theories of the diffusion of innovations
Everett Rogers is among the most respected theorists of the social processes involved in the adoption and diffusion of social innovations (Rogers, 1995; Rogers, 1976; Rogers and Kincaid, 1981). Diffusion is the process by which an innovation is communicated to members of a social system. Diffusion theory generally defines five steps in the process of the adoption of an innovation: 1) knowledge, 2) persuasion, 3) decision, 4) implementation and 5) confirmation. Roger's work, and the work of others, has examined the adoption of innovative agricultural practices among farmers (Diaz, 1976), and the adoption of health behavior innovations such as contraceptive use in high-fertility developing countries (Piatrow et al, 1997). Many of these programs have relied extensively on mass media campaigns to initiate and sustain processes of social change involving the adoption of new practices and behaviors. Roger's work has served as a foundation for much contemporary social marketing in the public health realm that seeks change population-level attitudes, beliefs and practices, including an important international health communication program supported by the Rockefeller Foundation (Figueroa, 2002; Gray-Felder, 1999).

Theories of health behavior change
There are three dominant theories of health behavior change that have influenced the development of effective health communication campaigns. These theories are relevant frameworks for the assessment and synthesis of the research literature on the effectiveness of mass media interventions. The health belief model (Janz and Becker, 1984) suggests that individuals must believe they are at risk for having serious negative health outcome in order to practice a recommended health behavior. Social cognitive theory (Bandura, 1997) contends that there are two main factors that influence the personal decision to adopt a health-protective behavior: 1) a belief that the positive outcomes outweigh the negative outcomes, and 2) a personal appraisal of competence to perform the behaviour. A third theory of health behavior is the theory of reasoned action (Fishbein and Ajzen, 1975, Ajzen and Fishbein, 1980). This theory proposes that behavior is determined by the strength of intentions, which is in turn influenced by a person's attitudes and perceived subjective norms. Other authors (Hornick and Yanovitsky, 2003, Fishbein and Yzer, 2003) have incorporated these theories into an integrated theoretical model which can be used to assess characteristics that determine the impact of mass media interventions – the goal of the intervention, the target population, and the selection of messages.

Evidence of the effectiveness of social marketing in health behavior change
Research on the impact of social marketing campaigns has established a number of characteristics related to the effectiveness of this approach to influencing health behaviors.

There is good evidence that well-designed and sustained social marketing campaigns can influence 'behavioral mediators'. These factors include increasing awareness and knowledge of the consequences of a behavior or preference and altering values and beliefs concerning the desirability or feasibility of adopting the behavior.

In general, the impacts of social marketing campaigns on behavioral adoption are smaller than are the impacts on the behavioral mediators (awareness, knowledge, values and beliefs) that are thought to be antecedent to behavioral adoption.

Social marketing campaigns in the field of public health are generally designed and applied in contexts where there is a broad consensus in support of a sustained policy commitment. Examples of contexts with strong policy consensus include the promotion of sun protection behaviors as a strategy to reduce skin cancer risk (Smith, 2002) or the public policy objective of reducing the rates of smoking initiation among youth and young adults (Flay, 1987). In these contexts, there are typically a wide range of policy and program instruments brought to bear on the objective of reducing health risks. In the case of tobacco control, these instruments include increasing tobacco product sales tax, establishing regulations restricting access at point-of-sale and regulations restricting tobacco use in indoor environments. When a social marketing campaign is implemented to support integrated policy and program initiatives, there can frequently be difficulty in clearly identifying the unique and specific contribution of the social marketing campaign on the observed changes in population health behavior. In a review of 48 social marketing campaigns in the US based on the use of mass media, the average effect of social marketing campaigns accounted for about 9% of the favourable changes in health risk behaviors (Snyder, 2002).

Systematic Reviews of the effectiveness of public communication or social marketing in related health behavior fields

Workplace parties, regulatory institutions and compensation insurance authorities have indicated a need for timely access to high-quality research evidence to contribute to decision-making. Despite the generally high quality of Canadian and international research on workplace health, most potential research users find that thorough, high-quality research evidence is difficult to access, often difficult to understand and frequently is not presented in formats which support the use of this research evidence in decision-making.

A systematic review can address these challenges. A systematic review is a method for summarizing the evidence from across a number of different research studies that have investigated a similar question. A systematic review has a clearly formulated question and uses systematic and explicit methods to identify, select and critically appraise relevant research, and to collect and analyze data from the original studies that are included in the review. Unlike a traditional review, a systematic review minimizes the chances of surveying a biased sample of the literature by explicitly stating how the search for literature was designed, the inclusion and exclusion criteria for the studies, and reports on the quality of the research designs of the studies included in the final review.

<u>Mass media interventions: effects on health services utilization</u>
In 2001, a Cochrane review, “Mass media interventions: effects on health services utilization” was published, synthesizing the evidence from primary studies up to 1999 (Grilli et al., 2001) A total of 20 studies were included in this review: 15 evaluated the impact of formal mass media campaigns and five of media coverage of health issues. All 20 used interrupted time series design of variable methodological quality. The authors concluded that there is evidence that these channels of communication may have an important role in influencing the use of health care interventions. The authors also reported substantial heterogeneity of target populations, conditions, and interventions that need to be considered in assessing the overall effectiveness of mass media communication in influencing health behaviors.

Mass media and smoking cessation: a critical review
This review, published in 1987 (Flay, 1987), assessed the effectiveness of 40 mass media programs or campaigns designed to influence cigarette smoking.

Effectiveness of mass media campaigns for reducing drinking and driving
This review, published in 2004, summarized the evidence from 8 studies for the effectiveness of mass media campaigns for reducing alcohol-impaired driving and alcohol-related crashes (Elder, 2004). The median decrease in alcohol-related crashes resulting from the campaigns was 13%. The review notes that the mass media campaigns were generally carefully planned, well executed, attained adequate audience exposure and were implemented in conjunction with other prevention activities, particularly high-visibility enforcement. Economic analyses of campaign effects indicate that the social benefits substantially exceeded the campaign costs.

Review of the effectiveness of social marketing: alcohol, tobacco and substance misuse interventions
This review, completed in 2006, assessed evidence presented in 35 studies for the effectiveness of social marketing to influence behaviors related to alcohol, tobacco and substance misuse (Stead, 2006). Of the interventions described in these studies, 10 were community-based, 16 were school-based and 4 interventions relied solely on mass-media. Of the evaluation designs applied to assess these interventions, a very large majority used randomized controlled trials or quasi-experimental designs. Of the 21 evaluations of smoking prevention interventions, 13 of 18 reported positive effects on smoking prevalence outcomes at 12 months , 7 of 11 reported positive effects on smoking prevalence outcomes at 12-24 months and 2 of 5 reported positive sustained effects on followup durations longer than 24 months. Results were also reported for alcohol use and substance use.

Review of the effectiveness of social marketing: physical activity interventions
This review, completed in 2006, assessed evidence presented in 22 studies for the effectiveness of social marketing to influence behaviors related to physical activity (Gordon, 2006). Of the interventions described in these studies, 14 were community-based, 7 were school-based and one intervention relied solely on mass-media. Of the evaluation designs applied to assess these interventions, 10 studies were based on randomized controlled trials, 3 used a randomized cross-over design, 6 applied quasi-experimental methods and 5 were observational studies or other uncontrolled designs. Of the 22 reports, 10 reported an overall positive effect, 8 reported mixed results and four found no effect on overall outcomes.

Review of the effectiveness of social marketing: nutrition interventions
This review, completed in 2006, assessed evidence presented in 31 studies for the effectiveness of social marketing to influence behaviors related to nutrition (McDermott, 2006). Of the interventions described in these studies, 9 were community-based and the remainder involved programs delivered through youth centres, family, church or other settings. Of the 31 studies, the very large majority (26) were evaluated using randomized trials or quasi-experimental designs. Of the 18 studies examining intervention effects on fruit and vegetable intake, 10 were judged to be effective overall. Eight of 18 interventions were found to have an effect on fat intake, Six of fifteen interventions focused on other dietary behaviors were judged to be effective overall.

Methodology

Objectives
The primary objective of this review was to conduct a review of evaluations of social marketing campaigns in the fields of occupational injury prevention, occupational disease prevention or the prevention of disability. In pursuing this objective, our purpose was to identify those evaluations conducted to higher quality standards and to describe the most important results reported from these higher quality studies. A secondary objective was to examine the quality of economic evaluations conducted in this field and to complete, if feasible, an assessment of the cost-effectiveness of social marketing interventions in occupational injury prevention.

Methods
The research methods of this review have followed a standardized methodology for conducting a systematic review. This methodology proceeds through 4 steps: 1) a systematic search of relevant electronic databases (and supplemental sources) to comprehensively identify all potential research or evaluation reports relevant to the objective of the protocol, 2) a review of the titles and published abstracts identified in the first step, and the selection of those research or evaluation reports that are deemed relevant to the objective of the protocol, 3) a critical assessment of the quality of the research methods in the research or evaluation reports retained in the second step, and the selectionof those reports meeting an explicit quality criteria and 4) a summary of the empirical results from the studies retained in step 3.

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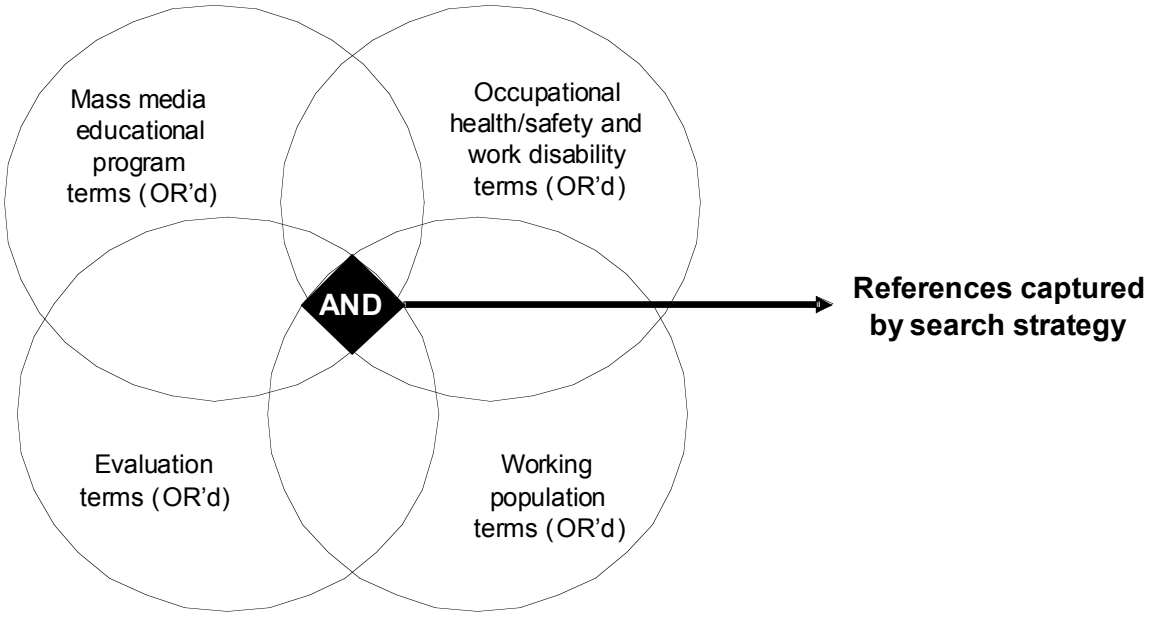
Step 1: Search of Electronic Databases and Supplemental Sources
To address the objective of this review, a search strategy was developed to address four broad categories of search terms: (1) mass media educational program, (2) occupational health/safety and work disability, (3) evaluation, and (4) working population (see Appendix B for a list of search terms).

The mass media terms include both specific mass media terms (e.g., mass media) and more general terms (e.g., health promotion) to reflect the wide variation in the language used to describe social marketing programs involving mass media. The occupational health/safety and work disability terms include terms that could describe the outcomes of either occupational injury/illness prevention programs or general population health programs that have an impact on worker functioning. The evaluation terms were used to restrict the captured references to those that involved completed or planned evaluations. Finally, the working population terms were used to select references concerned with this population (the occupational health/safety and work disability search terms were unable to achieve this focus because some of these terms were non-specific (e.g., musculoskeletal disorders, immunization) and, therefore captured references irrelevant to a working population).

The application of the search strategy involved combining the terms within each category using the “OR” Boolean operator and combining the terms between the four

categories using the “AND” Boolean operator. To be captured by the search strategy, a reference was required to have one term identified in each of the four categories (see Figure 1).



The following eleven electronic reference databases were searched: MEDLINE, EMBASE, PsychInfo, Cumulative Index to Nursing & Allied Health (CINAHL), Health and Safety Science Abstracts, Public Affairs Information Service (PAIS), Communication Abstracts, Education Resources Information Center (ERIC), Communication Studies, Applied Social Sciences Index, and the Canadian Centre for Occupational Health and Safety (CCOHS). The search strategy was customized for each database. No restrictions were placed on year of publication or language. However, because only English language search terms were used, only references containing the appropriate English terms (in either the abstract, title, or indexed fields) were captured by the search strategy.

The sensitivity of the search was tested using seven “must have” references (i.e., references known to be relevant before starting the review). The initial search strategy did not capture one of the seven “must have” references and was, therefore, revised. Two additions were made to ensure the search strategy was sensitive enough to capture the missed reference: (1) the uncontrolled term “campaign” was added to the “mass media” terms, and (2) the uncontrolled term “farm*” (* allows for all suffix variations) was added to the “work-related” terms (see Appendix B).

To increase the likelihood of identifying all relevant evaluations, it is standard systematic review procedure to contact experts in the field and to examine the reference lists of both included papers and relevant literature reviews (the search strategy described above has captured 17 such reviews). Due to time constraints, these activities have not been completed at this time.

Another method used to increase the likelihood of identifying all relevant evaluations is to search the unpublished, or “grey”, literature. The review team did make some

progress in this area, conducting basic searches on the websites of a number of national and international occupational health and safety communication bodies. However, due to the labour-intensive nature of searching the grey literature, this work has not been completed at this time.

Step 2: Selection of Relevant Reports

The broad search strategy captured many references not relevant to our research question. The relevance of references was determined in two successive stages. In the first stage, a single reviewer evaluated the report title, and where available, the report abstract, applying three criteria (see the following table for a description of these criteria). Those references deemed relevant in the first stage were further evaluated in the second stage. At this stage, two independent reviewers evaluated the information contained in the complete report against the same three criteria. Disagreements were resolved using consensus. At each stage, reviewers were given detailed guidance on how to apply the criteria (see Appendix C).

#	Evaluation Selection Question	Exclusionary Response
1	Is the material concerned with an educational program delivered via mass media (in part or whole)?	No
2	Is the program delivered in more than one work site?	No
3	Does the program evaluation involve a work-related outcome?	No

To determine the bias associated with using only one reviewer to select evaluations at the first stage of the review, a quality control check was conducted midway through this stage. More specifically, a quality control reviewer examined a stratified, random sample of 60 references: 30 references were selected from the pool that had passed the first stage of the review and 30 from the pool that had been excluded.

With a kappa of 0.40, the level of agreement between the quality control reviewer and the original reviewer can be classified as “fair” (Koepsell and Weiss, 2003). However, a closer examination of the disagreements revealed that the low Kappa reflected a lack of specificity on the part of the original reviewer, not a lack of sensitivity. Of the 29 disagreements, 28 (97%) were instances where the original reviewer had passed the reference on to the next stage of the review and the quality control reviewer had excluded the reference. In other words, the original reviewer was more inclusive than the quality control reviewer. Since references passed on to the second stage of the review were examined by two independent reviewers, the over inclusiveness of the original reviewer did not introduce bias into the evaluation selection phase of the review.

Step 3: Assessment of the Quality of Research Methods

In the review of reports retained in Step 2, it became clear that there was substantial heterogeneity across reports in both the characteristics of the campaign and in the evaluation methods. To determine if there were a sufficient number of reports with similar objectives and methods to justify a detailed appraisal and summary of evidence, we conducted a preliminary appraisal of the qualities of the campaign reports (see table below for a summary of information obtained in this preliminary appraisal). This

assessment was conducted by two independent reviewers and disagreements were resolved using consensus. Detailed guidance was provided for each data extraction item (see Appendix D).

Summary of Preliminary Data Extraction Items

Campaign characteristics

1. Objective
2. Target population
a. Location (country, province/state)
b. Industry (if applicable)
c. Occupation (if applicable)
d. Population size
3. Calendar time of campaign delivery
4. Sponsoring agency(ies)
5. Cost information
6. Type of prevention
7. Target behaviour(s)/practice(s)
8. Type(s) of mass media
9. Type(s) of co-interventions

Evaluation characteristics

10. Outcome(s) examined
11. Evaluation design(s)
12. Final evaluation results publicly available

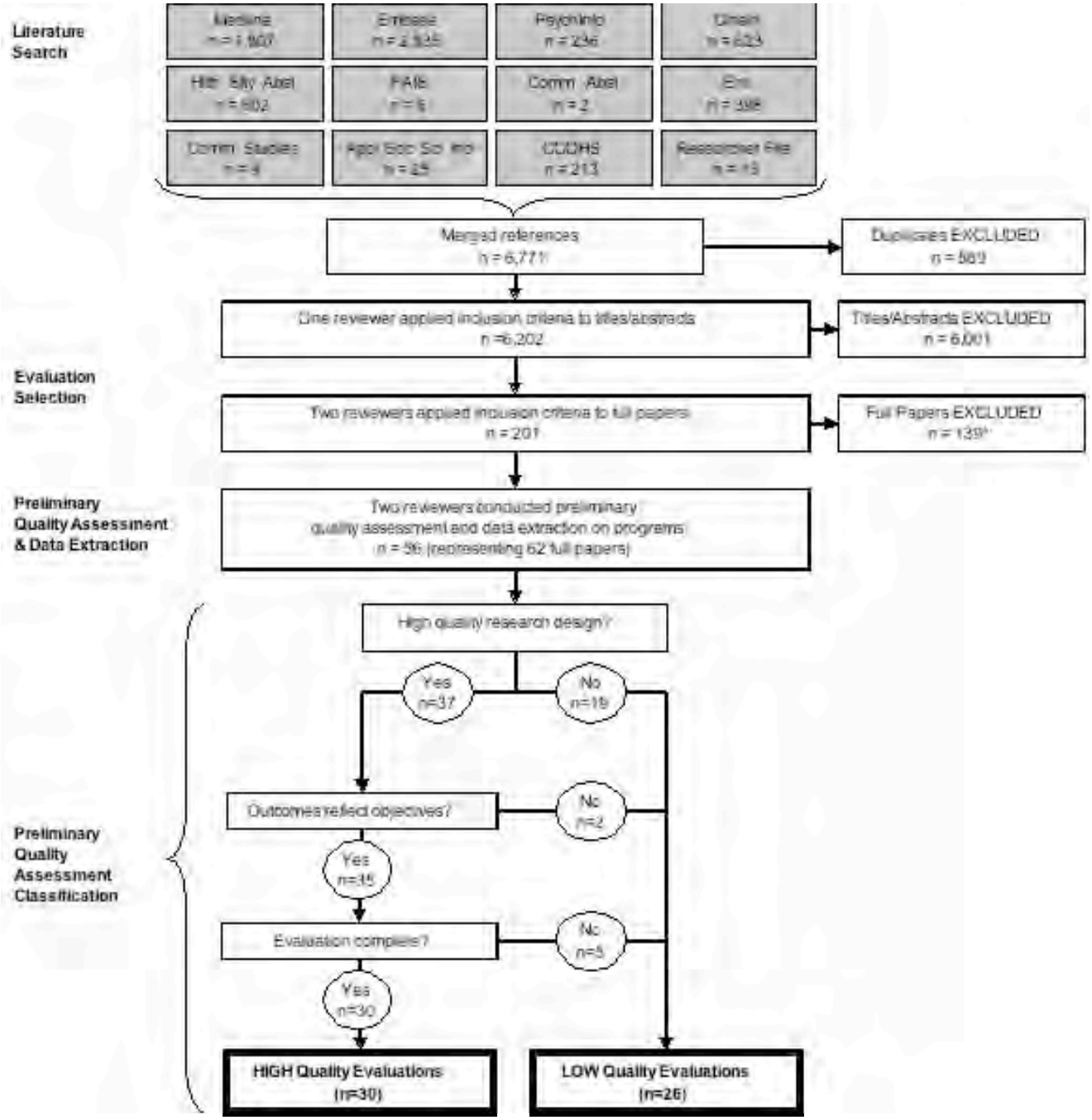
A preliminary assessment of the quality of campaign reports was made using four characteristics: 1) the campaign objective, 2) the outcomes reported, 3) the evaluation design, and 4) the availability of final evaluation results. Each campaign report was classified as either high or low quality. To be classified as high quality, the study had to meet the following three criteria:

1. Outcomes examined in the evaluation must be aligned with the objectives of the campaign (e.g., if a campaign's objective is to reduce injury, the evaluation must include measures of injury)
2. The evaluation design (used to examine the impact of the campaign on the outcomes identified in #1 above) must involve a control group, a comparison group or a time series
3. The final evaluation results must be publicly available

Summary of Results to the Conclusion of Step 3

A total of 6,771 references were identified through the search strategy (see Figure 2). After removing duplicates, 6,202 remained for review. Based on the review of the titles and, where available, abstracts in Step 1, 6,001 references were excluded. After reviewing the remaining 201 full papers in Step 2, 62 were deemed relevant to the research question. These 62 references represent 56 unique campaigns (the search strategy captured two or three references each for four campaigns). According to the criteria outlined above, 30 of these evaluations were judged to be of high quality and 26 of low quality.

Figure 2: Search Results



**This number (n=139) includes 18 papers that have been ordered, but not yet received.*

Findings from the Review

In Appendix A, we have provided structured summaries of the 56 occupational health and safety social marketing campaigns selected for description in this review. Each of these campaigns has been assigned a reference number, which is referred to in this section summarizing the findings of the review.

In this section, we describe these 56 studies by the following characteristics:

- The quality of the research design
- The outcomes described in the campaign evaluation
- The type of social marketing intervention
- The primary prevention or secondary prevention objective of the social marketing campaign
- The economic sector targeted by the social marketing campaign
- The reporting of information relevant to the assessment of the economic costs and consequences of the social marketing campaign

There are substantial challenges in realizing a high-quality evaluation of a social marketing campaign. An ideal evaluation would comprehensively measure the causal pathway leading from campaign exposure to campaign awareness, knowledge, attitudes, beliefs, behavioral intentions, behaviors and finally to the measurement of health outcomes. In addition, an ideal evaluation would have strong internal validity, best achieved with a design that measures the population of interest before and after the intervention and has a comparison or control group not exposed to the intervention but otherwise equivalent to the target population. Rarely are all of these attributes incorporated in a social marketing evaluation. In our assessment of social marketing campaigns included in this review, we have given prominent emphasis to campaign evaluations that combined comprehensive measurement of the causal pathway linking campaign exposure to occupation injury, disease or disability outcomes with evaluation designs of high internal validity.

As noted in the methods section, we have considered three factors in our appraisal of the quality of evaluations. The first factor emphasizes the attributes of the research design. The second factor is concerned with the correspondence between the campaign objectives and outcomes evaluated. The third factor considers whether or not the evaluation information is publicly available. In applying these three criteria, we have classified a total of 30 campaigns as reported to a high quality standard. Referring to the campaign reference numbers (see Appendix A), the following campaigns are judged as reported to a high quality standard (1, 5, 8, 11, 14, 23, 24, 25, 28, 36, 38, 42, 43, 44, 46, 50, 51, 53, 54, 55, 64, 65, 66, 69, 70, 72, 74, 77, 80, 101). A total of 26 campaigns were deemed “low” quality: 19 campaigns because the research design did not involve a control group or a time series (3, 7, 10, 13, 18, 19, 29, 30, 41, 45, 52, 57, 59, 60, 62, 67, 71, 73, & 75); two because the objectives of the campaign were not reflected in the outcomes evaluated (37 & 56); and five because the results of the evaluation were not publicly available at the time this report was prepared (2, 4, 6, 26, & 35).

Classifying Occupational Health and Safety Campaigns by the Quality of the Evaluation Design

In table 1, we present campaign reports and descriptions on the basis of the quality of evaluation designs. A total of 10 campaigns were evaluated using a randomized controlled trial, and of these campaigns, 9 were judged to be of high quality (23, 28, 36, 46, 53, 64, 65, 69, 74). Eight campaigns were evaluated using a pre and post-test design with a comparison group, one using a post-test only with comparison group design and seven campaigns were evaluated using a time series design, also with a comparison group. All but two of these 16 campaign reports were judged to be of high quality (8, 24, 38, 44, 51, 54, 55, 66, 14, 42, 70, 72, 80, 101).

The remaining 26 campaigns reported evaluation designs with important limitations, particularly the absence of a comparison group.

Table 1
Quality of Evaluation Design for Occupational Health and Safety Campaigns

	High Quality		Low Quality		Total	
	N	%	N	%	N	%
Randomized controlled trial	9	16.1	1	1.8	10	17.9
Pre and post-test with a comparison group	7	12.5	1	1.8	8	14.3
Time series with a comparison group	6	10.7	1	1.8	7	12.5
Post-test only with a comparison group	1	1.8	0	0.0	1	1.8
Time series without a comparison group	7	12.5	4	7.1	11	19.6
Other	0	0.0	19	33.9	19	33.9
Total	30	53.6	26	46.4	56	100

Classification of Outcomes Evaluated in Occupational Health and Safety Campaigns

An optimal evaluation design for a public communication campaign or social marketing campaign in the field of occupational health and safety would measure target audience characteristics comprehensively along a causal pathway beginning with audience awareness of the campaign and including changes in knowledge attitudes and beliefs, changes in practices and behaviors and, finally changes in the incidence of injury, disease or disability. In this review, we have classified measures of awareness, knowledge, attitudes and beliefs as intermediate outcomes. With a small number of exceptions, we have also defined measures of behaviors as intermediate outcomes. In describing these characteristics as intermediate outcomes, we are expressing two principles. First, changes in awareness, knowledge, attitudes, beliefs and behaviors are generally understood to be necessary in order for a campaign to have impacts on behaviors and practices that are involved in the incidence of injury, disease or disability. Second, changes in the incidence of injury, disease and disability will normally be the primary objectives of social marketing campaigns in the field of occupational health and safety.

For the majority of campaigns included in this review, we have defined final outcomes as measures of the incidence of injury, disease or disability. In a small number of cases, we have defined a measure of behavior as a final outcome.

To aid readers in understanding the diversity of evaluation objectives represented in the 56 campaigns described in this survey, we have classified campaigns into three primary groups: campaign evaluations that reported intermediate outcomes only (N=27), campaign evaluations that reported both intermediate and final outcomes (N=20) and campaign evaluations that reported only final outcomes (N=7). Two studies only reported on measures of campaign implementation (e.g., number of pamphlets circulated) (Table 2).

Campaigns judged to be reported to a high quality standard were more likely to include measures of final outcomes than campaigns judged to be reported to a lower quality standard. Eighteen of 30 higher quality campaign evaluations contained measures of final outcomes, compared to 9 of 26 lower quality campaign evaluations.

Table 2
Type of Outcomes Evaluated in Occupational Health and Safety Campaigns

	High Quality		Low Quality		Total	
	N	%	N	%	N	%
Intermediate Outcomes Only	12	21.4	15	26.8	27	48.2
Both Intermediate and Final Outcomes	13	23.2	7	12.5	20	35.7
Final Outcomes Only	5	8.9	2	3.6	7	12.5
No Outcomes	0	0.0	2	3.6	2	3.6
Total	30	53.6	26	46.4	56	100

Classifying Occupational Health and Safety Campaigns by the Type of Intervention

There is wide diversity in the design of intervention campaigns reviewed in this report. Only a minority of campaigns rely exclusively on public communication strategies. Seven campaigns judged to be reported to a high quality standard rely exclusively on public communications (23, 43, 44, 64, 65, 74, and 80) (Table 3). Five of these seven campaigns relied exclusively on direct mail communication to reach their target audiences.

Much more frequently, occupational health and safety campaigns with a public communication component will also integrate educational programming, consulting programming or are aligned with targeted inspection and enforcement activities. These integrated campaigns often demonstrate strengths in aligning resources to address a common objective. And, as we will discuss at other places in this document, integrated campaigns often present very substantial challenges in evaluating the relative contribution of public communications to the overall achievements of the campaign.

Five campaigns judged to be reported to a high quality standard emphasize public communications that promote regulatory compliance (36, 42, 53, 69, 70). The remaining eighteen campaigns judged to be reported to a high quality standard integrate public communications with at least one of the following co-interventions: consulting services delivered to workplaces, offer of free product/financial incentive, education or training services provided to workers, or inspections (1, 5, 8, 11, 14, 24, 25, 28, 38, 46, 50, 51, 54, 55, 66, 72, 77, 101).

Table 3
Type of Occupational Health and Safety Campaign

	High Quality		Low Quality		Total	
	N	%	N	%	N	%
Public Communication only	7	12.5	6	10.7	13	23.2
Public Communication with multiple or other components	18	32.1	17	30.4	35	62.5
Public Communication with education	0	0.0	2	3.6	2	3.6
Public Communication promoting regulatory compliance	5	8.9	1	1.8	6	10.7
Total	30	53.6	26	46.4	56	100.0

Classifying Occupational Health and Safety Campaigns by the Objective of the Campaign

Of the 56 reports described in this review, 43 described campaigns with primary prevention objectives (Table 4). Slightly over one half of these campaigns (n=22) were judged as reported to a high quality standard. Of these higher quality standard reports, one campaign targeted infection control practices (38), 14 targeted the prevention of injuries (5, 11, 24, 25, 42, 50, 51, 53, 54, 55, 70, 74, 80, 101), three targeted the prevention of disease (14, 36, 44) and 4 campaigns targeted sun protection behaviors related to the prevention of skin cancer (28, 46, 66, 77).

Eleven reports described campaigns with secondary prevention objectives. These campaigns focused on workers experiencing an episode of disability and offered guidance concerning appropriate practices related to health care treatment or return-to-work. Seven of these eleven reports were classified as reported to a high quality standard (1, 8, 23, 64, 65, 69, 72) In addition, two campaigns with high quality research designs have not yet released evaluation findings (2, 6).

Two campaigns had the objective of notifying workers of exposures or diagnoses related to occupational disease risk. One of these campaigns was classified as reported to a high quality standard (43).

Table 4
Classification of Occupational Health and Safety Campaigns by Campaign Objective

	High Quality		Low Quality		Total	
	N	%	N	%	N	%
Primary Prevention: Injury	14	25.0	11	19.6	25	44.6
Primary Prevention: Infection	1	1.8	6	10.7	7	12.5
Primary Prevention: Disease	3	8.9	4	7.1	7	12.5
Primary Prevention: Sun protection	4	7.1	0	0.0	4	7.1
Prevention of Disability	7	12.5	4	7.1	11	19.6
Disease Notification	1	1.8	1	1.8	2	3.6
Total	30	53.6	26	46.4	56	100.0

Campaigns with primary prevention objectives

There were 14 campaigns judged to be reported to a high quality among the 25 campaigns focused on the primary prevention of injury. These campaigns reported to a higher quality were focused on the prevention of slips, trips and falls in the general labour force (5, 101), the prevention of farm injuries (24, 54, 55, 74), the prevention of construction injuries (11, 51), transportation injuries (42), assault and violence in health care settings (50), hearing protection in mining (53), eye protection in manufacturing (70) and material handling (80).

The two campaigns targeting slip, trip and fall injuries in the general labour force are particularly strong examples of campaigns that successfully integrated public communications with technical consulting services provided to workplaces (5,101). On the basis of information available from program descriptions, it would appear that the public communication component of these campaigns represented no more than 25% of total program resources. Both campaigns reported strong effects on injury outcomes.

Seven campaigns with primary prevention objectives targeted the control of infection risk among workers. Only one of these campaigns was judged to be reported to a high quality standard (38). The campaigns judged to be reported to a low quality standard targeted immunization (29,57,62), needlestick injury prevention (60) and hand hygiene practices (52,67) among health care workers.

Four campaigns with primary prevention objectives targeted sun exposure behaviors and practices. All of these campaigns were judged to be reported to a high quality standard (28, 46, 66, 77). The campaigns targeted outdoor recreation workers (46,77), agricultural workers (66) and outdoor utility workers (28). In general, these campaigns were of moderate intensity and reported small program effects.

It is useful to note that two of the campaigns targeting occupational sun exposure were conducted as components of a population-based sun protection behavior campaign in the Australian state of Victoria. This campaign was conducted over an approximately 10 year period and involved a broad coalition of public agencies, community organizations and employer groups.

Seven campaigns had primary prevention objectives targeting the prevention of occupational disease (14, 19 ,36 ,41 ,44 ,45 ,56). Three of these campaigns were judged to be reported to a high quality standard; a campaign targeting the prevention of latex exposure in health care workers (14), a campaign targeting disease hazard recognition and control among workworkers in small businesses (36) and a campaign targeting respiratory disease risk among indoor agricultural workers (44). The latex allergy prevention campaign conducted in Germany was an intensive campaign targeting all non-public healthcare and welfare workers. While the campaign included direct mail communication to workers, the campaign's primary intervention was based on integrated intensive consultation and education services to health care institutions. The campaign reported substantial changes in the use of high allergen latex gloves and substantial reductions in disability compensation claims for latex allergy disease. The woodworker campaign and the indoor agricultural worker campaign, using direct mail communication, reported weak intervention effects.

Campaigns with secondary prevention objectives

Five of the reports in this review reported high quality evaluation results for campaigns that targeted workers experiencing an episode of disability. Two additional high quality evaluation designs in progress have not yet reported results.

It is noteworthy that three of the social marketing campaigns in this category are replications of an important campaign conducted in Australia in the period 1998-1999 (001: Back Pain: Don't Take It Lying Down, Australia). This campaign used television advertising, supported by radio and print advertising, outdoor billboards, posters, seminars, and visits to workplaces, to target the general population of Victoria, Australia. An intensive direct mail campaign was used to target all health care professionals treating back pain in Victoria, Australia. The campaign had the objective of altering beliefs about back pain, influencing medical management, and reducing disability and costs of compensation due to back pain. The very high quality evaluation design demonstrated substantial (positive) changes in back pain beliefs within the general population, reduced medical care expenditures, reduced low back pain disability and lower wage replacement compensation expenditures.

The Australian Victorian Workcover Authority sponsored the campaign and a total of $10.1M Australian dollars were invested over three years. Given the well-documented impact of this social marketing campaign, programs aiming to replicate the campaign design have been implemented in Alberta (002), Scotland (006) and Norway (008). The Alberta and Scottish campaigns have not yet reported evaluation results. Findings from the Norwegian campaign, which was less intensive in duration than the Australian campaign, have demonstrated changes in population back pain beliefs but did not replicate the Australian findings of reduced medical care expenditures, reduced low back pain disability and lower wage replacement expenditures.

A relatively low intensity intervention in Norway, using direct mail only to target workers receiving work disability benefits in two Norwegian cities did report important effects on the duration of sickness absence (023). This intervention was sponsored by the Norwegian National Insurance Office. Conversely, a long-term moderate-intensity mass media campaign in the United Kingdom targeting care-seeking behaviors for the treatment of depressive disorders has had mixed results (072). Public attitudes to depression treatment appear to have changed in a direction consistent with the

campaign objectives. However, the prevalence of sickness and invalidity benefits for depressive disorders increased steadily in the three year period before the campaign and over the three year period following the initiation of the campaign.

Classifying Occupational Health and Safety Campaigns by Economic Sector

The majority of public communications campaigns surveyed in this review targeted general or working age populations in all economic sectors (26 of 56 campaigns) (Table 5). Nine campaigns were documented in each of two economic sectors: agriculture and health care. In the case of agriculture, 7 of 9 campaigns were judged to be reported to a high quality standard (24,25,44,54,55,66,74). Five of the seven high quality campaigns in agriculture targeted injury prevention and two targeted disease prevention. In the case of health care only 2 of 9 campaigns were reported to a high quality standard (14,50). Of the two high quality campaigns in the health care sector, one targeted latex exposures and the other targeted reduction in exposure to violence.

Table 5
Classification of Occupational Health and Safety Campaigns by Economic Sector

	High Quality		Low Quality		Total	
	N	%	N	%	N	%
Agriculture	7	12.5	2	3.6	9	16.1
Health Care	2	3.6	7	12.5	9	16.1
General Population	10	17.9	16	28.6	26	46.4
Other Sectors	11	19.6	1	1.8	12	21.4
Total	30	53.6	26	46.4	56	100.0

Social Marketing Campaigns in Canadian provinces

At the initiative of this review, the project team had the objective of describing the occupational health and safety social marketing campaigns in four provinces in English Canada: Nova Scotia, Manitoba, Ontario and British Columbia. The project team was successful in completing program descriptions for the provinces of Nova Scotia and Manitoba. A synopsis of these two provincial programs is provided below.

Nova Scotia: Work Safe. For Life (7)

This campaign uses television and print advertising to target all workers in Nova Scotia. The campaign, initiated in 2004 and continuing to the present, had the objective of influencing attitudes and beliefs concerning occupational health and safety. Program evaluation information is available from telephone surveys of target audience members conducted following a communication campaign period. No comparison group is available. The campaign is implemented by the Nova Scotia Workers' Compensation Agency.

Manitoba: SAFE Manitoba (4)

This campaign uses television, radio, print media and direct mail integrated with targeted inspection and enforcement and consulting activities to target the working age population in Manitoba. Approximately 25% of campaign resources are allocated to the public communication component of the overall intervention. The campaign, initiated in

2003 and continuing to the present, has the objective of increasing workplace hazard recognition and prevention to reduce compensated occupational injuries by 25% over a five year period. Evaluation information includes repeated annual telephone surveys monitoring campaign awareness and respondents attitudes and behavioral intentions. No comparison group is available. The campaign is funded by the Manitoba Worker's Compensation Board.

Both the Nova Scotia and Manitoba campaigns appear to have well-designed and well-executed mass media communication plans that have been sustained over multiple years. The integration of mass media communications with targeted inspection and enforcement and with coordinated education and consultation services is a strength of the Manitoba social marketing program. Although the quality of the social marketing programs appears to be high, for the purposes of this review, the relatively weak evaluation information available for these two campaigns resulted in both campaigns being reported to a lower quality standard.

Economic evaluations of program costs and program benefits
One objective of this review was to assess information provided in campaign evaluation material describing program costs and the valuation of program benefits

The following table summarizes the availability of information on the economic valuation of program costs.

	High Quality		Low Quality		Total	
	N	%	N	%	N	%
Cost information reported	11	19.6	10	17.9	21	37.5
Cost information not reported	19	33.9	16	28.6	35	62.5
Total	30	53.6	26	46.4	56	100.0

In general, only a small number of high quality studies included information on both the economic costs of the campaign and provided an estimate of the economic benefits of the campaign.

Project 1: 'Don't take it lying down', Australia
Over the three year period of the campaign, campaign costs totaled $10.1M (AD). Over the same period, cost savings estimated on the basis of a reduction in compensation claims filed for back pain disability were in the range of $40M (AD)

Project 5: 'On the Right Foot' Campaign, Germany
Over the two year period of the campaign, expenditures on social marketing represented the equivalent of 1,360,000 € and consulting services provided to workplaces can be estimated as the equivalent of 140 FTE (representing an estimated expenditure of €9,000,000). One year reduction in compensated slip, trip and fall injuries of 23% was estimated to represent a reduction in accident compensation cost of $47,000,000 €

Project 14: Latex Allergy Prevention Campaign, Germany
Over the two year period of the campaign, approximately 340,000 € was invested in promotion and consulting services to reduce health care workers' latex exposure. In the target population of 5,000,000 employees in non-public health care institutions, the

estimated economic benefits of the reduction in allergic disease cases was 2,499,000 € in 2001 and 3,417,000 € in 2002 (based on a cost-per-averted case of 51,000 €)

Project 101: 'Safety with every step' Campaign, Austria

Over the two year period of the campaign, expenditures on social marketing and information, consulting and education materials totaled approximately 1,000,000 € and personnel costs represented approximately 800,000 €. The reduction in compensated injuries caused by falls was approximately 24%, compared to a reduction in the incidence of all other causes of compensated injury of 15%. The Austria workers' compensation agency estimated the value of the avoided accident compensation cost to represent approximately 10,900,000 €.

Implications for Future Research on Occupational Health

This review has described 56 campaigns that used some form of public communication to reduce hazards, risks or burdens in occupation health. These campaigns addressed a wide range of health concerns, across a wide range of country settings and focused on a wide range of economic sectors. Approximately one half of the campaigns were judged to be evaluated to a higher quality standard.

This review has not completed a summary of the empirical results from the campaigns judged to be reported to a higher quality standard. The range of campaign objectives, campaign methods and campaign outcomes were sufficiently diverse to effectively summarize results across individual campaigns.

The review can offer some constructive advice concerning the integration of high-quality evaluation methods in the design and execution of social marketing campaigns targeting a reduction in the burden of injury, illness and disability experienced by workers.

Evaluation designs with high internal validity are feasible

The internal validity of a research design refers to the confidence with which we can infer that a change in attitudes, behaviors or health can be attributed to an occupational health intervention, rather than to some other explanation. Integrating a comparison group not exposed to the intervention in the evaluation design is a crucial feature to establish internal validity. Because social marketing campaigns often target complete populations, it is sometimes argued that comparison groups are not feasible. The examples from this review demonstrate that comparison groups are feasible. The evaluation design implemented in Alberta (Project 002) recruited a comparison sample from the neighbouring province of Saskatchewan. As an alternate to a comparison group of individuals, evaluation design may also consider measuring comparison conditions. As an example, a campaign in Austria targeting the prevention of workplace injuries arising from slips, trips and falls used a time series comparison of other causes of workplace injuries to demonstrate the effectiveness of the social marketing campaign.

Only two Canadian occupational health social marketing campaigns were judged to have evaluation designs with high internal validity (Project 002, Project 035)

Measuring both intermediate and final outcomes

As is discussed in the body of the report, this review found that 28 campaigns reported intermediate outcomes only (defined as awareness of the campaign, knowledge, attitudes or beliefs) and seven campaigns reported final outcomes only (defined as behaviors or the incidence of injury, disease or disability). Of the 19 campaigns that reported both intermediate and final outcomes, 13 were judged to be reported to a higher quality standard. The measurement of both intermediate and final outcomes is a crucial characteristic for a high quality evaluation. Evidence that a campaign changed attitudes, knowledge and beliefs but did not reduce the incidence of injuries, illness or disability would suggest the program design or the intensity of the social marketing campaign was incomplete or weak.

The value of replication

Well-designed, well-executed campaigns with strong evidence of program effectiveness are attractive models to adopt and implement. The Australian back disability prevention campaign (Project 001) has led to replications in Scotland, Norway and Alberta. A

number of European jurisdictions have implemented intensive social marketing campaigns to reduce the burden of injuries arising from slips, trips and falls. Program developers should include program evaluation replication when considering adopting and implementing social marketing campaigns demonstrated as successful in other jurisdictions.

Comprehensive Documentation of Campaign Activities

Information on the intensity of a social marketing campaign is crucial to understanding the relationship between an individuals' exposure to the campaign and subsequent changes in behavioral or health outcomes. Across the program evaluations identified in this review, there was a general lack of information provided describing the frequency, duration and coverage of mass media communication. Where a social marketing campaign integrated mass media communication with other program activities (frequently education or consultation services) there was also a general lack of information describing the frequency and coverage of these complementary activities. An excellent example of both the feasibility of describing campaign activities and of optimal clarity is contained in the summary table report in Project 008.

Special Challenges in Evaluating Campaigns with Multiple Components

This review has described a substantial number of occupational health campaigns that have integrated mass media communications or public communications with program components delivering educational services directly to workers or consulting services directly to workplaces. There are good indications that these integrated campaigns, if sustained over a period of time, have effects on knowledge attitudes and beliefs as well as on behaviors and health outcomes. What is much less clear is the attribution of positive program outcomes to specific components of the intervention. For example, what proportion of the reduction in slip, trip and fall injuries in the German intervention described in Project 005 can be attributed to the mass media component of the campaign, and what proportion can be attributed to the targeted consulting services provided to workplace safety representatives?

Learning more about the cost-effectiveness of different allocation ratios between the public communication component of a campaign and components related to education, consulting or enforcement would be a priority for future research.

What is the role of the internet as a public communication instrument?

Many of the more recent campaigns described in this review made active, and sometimes central, use of the internet as a public communication media. This review of occupational health and safety campaigns did not identify a specific evaluation report that measured the contribution of internet-based resources on knowledge, attitudes, beliefs or behaviors. It is clear that website companions to mass media communications do attract visitors. In 2006, the young worker injury prevention website sponsored by the Ontario WSIB and linked to a seasonal mass media campaign had more than 150,000 visits. Research and evaluation efforts to identify the characteristics of website visitors and the consequences of website visits on attitudes, knowledge, beliefs and behaviors will be valuable in establishing the effectiveness of this communication instrument.

Implications for Policy and Prevention

Social marketing approaches have demonstrated effectiveness in many domains of public health.

There is emerging evidence that social marketing methods can be effective in improving and protecting the health of workers. On the basis of the 56 campaigns identified in this review, we can offer the following three points of guidance to prevention policies:

- Campaigns based exclusively on mass media communication do not appear to be as effective in reducing the incidence of work-related injury, disease or disability as campaigns that integrate mass media communication with well-designed and well-resourced companion programs involving consultation services, inspection and enforcement or education and training.
- To be effective in reducing the incidence of work-related injury, disease or disability, campaigns need to have sufficient resources to reach the target audience and to provide sustained target audience exposure to the campaign
- Campaigns with a precise focus on specific hazards and risks may be more effective in reducing the incidence of work-related injury, disease or disability than campaigns with an emphasis on general awareness.

This review has found the quality of information available on the effectiveness and cost-effectiveness of social marketing campaigns in the area of worker health protection to be relatively weak. This weakness can be addressed in the future if investments in social marketing campaigns incorporate resources to support high quality evaluations

High quality evaluations need to address the following requirements

- give substantial attention to internal validity
- measure intermediate outcomes **and** final outcomes
- respect the importance of replicating campaign evaluations conducted in other settings
- assemble comprehensive documentation of social marketing campaign activities

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Stead M, McDermott L, Gordon R, Angus K, Hastings G. Review of the effectiveness of social marketing: alcohol, tobacco and substance misuse interventions. National Social Marketing Centre, University of Sterling and The Open University. NSMC Report 3, 2006

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001: Don't Take It Lying Down

This campaign used primarily television advertising, supported by radio and print advertising, outdoor billboards, posters, seminars, and visits to workplaces, to target the general population of Victoria, Australia. Direct mail was used to target all health care professionals treating back pain in Victoria, Australia. The campaign, delivered in 1998-1999, had the objective of altering beliefs about back pain, influencing medical management, and reducing disability and costs of compensation due to back pain. The evaluation involved mixed methods: a pre-test, post-test, with comparison group design was used to assess the impact of the campaign on beliefs (two post-test assessments) and medical management (one post-test assessment), while a time series with no comparison group was used to examine changes in disability. The campaign improved back pain beliefs and medical management, and reduced low back pain disability and corresponding compensation costs. The Victorian Workcover Authority sponsored the campaign ($10.1M AUD over three years).

Reference(s):

Buchbinder R, Wyatt M, Jolley D. Report to the Victorian WorkCover Authority: Evaluation of the back pain public health campaign, 1997-2000. Victoria, Australia: Victorian WorkCover; 2006.

Buchbinder R, Jolley D. Effects of a media campaign on back beliefs is sustained 3 years after its cessation. Spine 2005;30(11):1323-30.

Buchbinder R, Jolley D, Wyatt M. 2001 Volvo award winner in clinical studies: Effects of a media campaign on back pain beliefs and its potential influence on management of low back pain in general practice. Spine 2001;26(23):2535-42.

Buchbinder R, Jolley D, Wyatt M. Population based intervention to change back pain beliefs and disability: three part evaluation. BMJ 2001 Jun 23; 322(7301): 1516-20.

002: Back Pain-Don't Take It Lying Down

This campaign used primarily radio advertising, but was supported by posters and a website, to target the general population of Alberta, Canada. The campaign also received widespread endorsement from local health associations (physicians, surgeons, physiotherapy, and chiropractic). The campaign, delivered in 2005-2006, had the objective of altering back pain, influencing medical management of back pain and corresponding health care costs, and reducing disability caused by back pain and corresponding compensation costs. The evaluation involved mixed methods: a pre-test, post-test, with comparison group design was being used to assess the impact of the campaign on beliefs (two post-test assessments), while a time series with concurrent comparison group was being used to examine changes in health care and disability. The results of the evaluation are expected in 2009. The campaign replicated an intervention implemented in Australia (001). The Workers' Compensation Board of Alberta and Albertan Ministry of Labour sponsored the campaign ($390K (CAD) for one year).

Reference(s):

Gross DP. The Alberta Back Pain Initiative Study: Application for the Alberta Heritage Foundation for Medical Research Independent Investigator. 2005.

Gross DP, Ferrari R, Russell AS, Battie MC, Schopflocher D, Hu RW, et al. A population-based survey of back pain beliefs in Canada. Spine 2006 Aug 15;31(18):2142-5.

003: Backs 2005!
This campaign uses radio advertising, a website and unpaid news media communication (motivated by campaign press releases, interviews and public launch activities) as well as consultation, education and inspection activities, to target the working population of the United Kingdom. The campaign, initiated in 2005 and continuing to present, had the objective of reducing the incidence rate of musculoskeletal disorder ill health by 8% (16,320 cases) by 2008. To-date, the evaluation has involved a post-test only with no comparison group design, wherein interviewed managers, supervisors and employees reported attitude and behaviour changes resulting from exposure to the campaign. No measures of injury or illness were reported and no explicit plans to conduct such an evaluation were indicated. The campaign was sponsored by the Health and Safety Executive and local authorities (□1.84M (GBP), for public communication component).

Reference(s):
Health and Safety Executive. Backs! 2005 Initiative, Interim Summary Results. London, England: Health and Safety Executive; 2005 Oct.

Health and Safety Executive. Backs! 2005 Initiative, Final Report. London, England: Health and Safety Executive; 2006 Oct.

004: Safe Manitoba
This campaign uses television, radio, and print advertising, posters inside and outside of the workplace and direct mail as well as consultation, education and inspection activities. The umbrella campaign ("SAFE Manitoba") targets the general population of Manitoba, Canada (n=1,170,000) and the sub-campaign specific to safety at work ("SAFE Work") targets the working population of Manitoba, Canada (n=780,000). The campaign, initiated in 2003 and continuing to present, had the objective of reducing workplace injuries by 25% within five years. To-date, the evaluation has used a time series with no comparison group design (new sample at each time point), to assess the attitudes and behavioural intentions of the general population (telephone survey) as well as workplace accidents (compensation claim statistics). Improved safety attitudes and behavioural intentions were observed over time and the injury rate had decreased by 22% in 2005 (compared to 2003). The Workers Compensation Board of Manitoba and Manitoba Ministry of Labour sponsored the campaign (Approx. $1M (CAD) per year for public communication component, $2-3M (CAD) per year for other activities and program management).

Reference(s):
Preece W. SAFE Manitoba Campaign. Oral presentative delivered at the 2005 Public Forum Conference. 2005.

005: On the Right Foot
This campaign used television and print advertising, posters and pamphlets as well as consultation and inspection activities to target the 30,000,000 all workers insured by the Statutory Accident Insurance & Prevention Association in Germany. The campaign, delivered from 2003 to 2005, had the objective of reducing the incidence of workplace accidents arising from slips, trips, and falls by 15% over two years. The evaluation involved mixed methods: a pre-test, post-test, with comparison group design was used to assess the impact of the campaign on workplace conditions (two post-test

assessments), while a time series with no comparison group was used to evaluate change in injury rates over time. Improved workplace conditions and decreased injury rates were observed over time. The Statutory Accident Insurance & Prevention Association in Germany sponsored the campaign (€1.36M (EUR) over two years for public communication component).

Reference(s):

BG Institute for Occupational Safety and Health (BGAG). Evaluation of the On the Right Foot Campaign (translated by the Institute for Work and Health). Dresden, Germany: BG Institute for Occupational Safety and Health (BGAG); 2005 Jun 23.

006: Working Backs Scotland

This campaign used radio advertising, a website and unpaid news media communication, to target the working age population of Scotland. Direct mail packages were used to target the 35,000 health care professionals treating back pain in Scotland. The campaign, initiated in 2000 and continuing (in the form of booster campaign) to present, had the objective of altering back pain beliefs and medical management of back pain. The evaluation of this campaign is based on a time series design without a comparison group. Evaluation measures will include campaign awareness and back pain beliefs obtained from telephone surveys. Work absence days for back pain will also be monitored. Evaluation reports have not yet been released. Based on a preliminary report of the evaluation results, the evaluation did not involve a comparison group and both beliefs and workplace disability have been positively affected by the campaign. The final evaluation results are expected in 2007. The Health Education Board for Scotland and the Health and Safety Executive sponsored the campaign.

Reference(s):

Anonymous. "Working Backs Scotland": Changing the culture of back pain - and lessening its impact. The BackLetter 2004;19(2):13-20-23.

Glyngell E. Annex I - Working Backs Scotland. London, England: Health and Safety Commission; 2003 Oct 13. Report No.: 03/67.

007: Work Safe. For Life.

This campaign uses television, radio and print advertising, posters and a website to target the working population in Nova Scotia, Canada. The campaign, initiated in 2004 and continuing to present, had the objective of increasing awareness of occupational health and safety issues. The evaluation to-date has consisted of two post-test only with no comparison group investigations (following each of the 2004 and 2005 campaigns), wherein telephone surveys are used to assess occupational health and safety attitudes and behavioural intentions. Increased concern for occupational health and safety was demonstrated. No measures of injury or illness were reported and no explicit plans to conduct such an evaluation were indicated. The Workers' Compensation Board of Nova Scotia sponsored the campaign (Approx. $1M (CAD) per year for public communication component).

Reference(s):

Corporate Research Associates Inc. Workers' Compensation Board of Nova Scotia, 2005 Youth Advertising Study, 2005. Nova Scotia, Canada: Corporate Research Associates Inc; 2005 Sep.

Corporate Research Associates Inc. Workers' Compensation Board of Nova Scotia, 2004 Advertising Assessment Study, Final Report. Nova Scotia, Canada: Corporate Research Associates Inc; 2005 Jan.

Corporate Research Associates Inc. Workers' Compensation Board of Nova Scotia, 2004 Youth Health and Safety Ad Recall Study, Final Report. 007. Nova Scotia, Canada: Corporate Research Associates Inc.; 2004 Sep.

Corporate Research Associates Inc. Workers' Compensation Board of Nova Scotia, 2005 Spring Advertising Assessment Study, Final Report. Nova Scotia, Canada: Corporate Research Associates Inc; 2005 Jul.

Rowan S. From board table to supper table: Work Safe. For Life. Campaign. Oral presentative delivered at the 2005 Public Forum Conference. 2005.

008: Active Backs

This campaign used television, radio and print advertising, posters, direct mail and a website to target the general population of two Norwegian counties (Vestfold, population size = 221,000 and Aust-Agder , population size = 166,000). Other activities occurred simultaneously to target workplaces, health professionals and social security officers. The campaign, delivered from April 2004 to 2005, had the objective of altering back pain beliefs, medical management and disability. The evaluation consisted of a pre-test, post-test with comparison group design (wherein a third Norwegian county acted as the comparison group). The campaign had a positive effect on back pain beliefs and referrals for imaging, but did not affect sickness absence or rates of surgery for disc herniation. The campaign replicated an intervention implemented in Australia (001). The Hospital of Rehabilitation and Norwegian Back Pain Network sponsored the campaign ($531K USD).

Reference(s):

Werner E, Ihlebaek C. Low back pain media campaign: Effect on beliefs, but also on sickness behaviour? Spine. In press 2007.

Werner E, Ihlebaek C, Laerum E, Wormgoor M, Indahl A. Low back pain beliefs: Effect of a low-budget media campaign. Spine. In press 2007.

010: Good Health is Good for Business

This campaign used television, radio, and print advertising, posters, billboards, a website, and unpaid news media communication (motivated by campaign press releases, interviews and public launch activities) combined with consultation, education and inspections to target the working population of the United Kingdom. The campaign, delivered from 1991 to 1995, had the objective of reducing the number of organizations not taking action to manage health risks by 10%. The evaluation used a post-test only design with no comparison group, wherein telephone surveys were conducted with employers to determine change in attitudes towards occupational health and safety, knowledge of regulations and costs of poor worker health/injury, and self-reported occupational health and safety practices. No measures of injury or illness were reported and no explicit plans to conduct such an evaluation were indicated. Intermediate outcomes were reported to be positively affected by the campaign. The Health and Safety Executive sponsored the campaign.

Reference(s):

Entec UK Ltd. Evaluation of the Good Health is Good Business campaign. London, England: Entec UK Ltd; 2000. Report No.: 272/2000.

011: Site Safe '83

This campaign used pamphlets, posters in workplaces, and information packets along with consultation and education activities to target construction workers, safety officers and contract managers in the United Kingdom. The campaign, delivered in 1983, had the objective of increasing awareness regarding construction hazards and improving construction safety attitudes and behaviours. The evaluation involved mixed methods: the impact of the campaign on attitudes and self-reported safety practices were assessed using a post-test only with no comparison group design, while change in the number of injuries was evaluated using a pre-test, post-test with no comparison group design (two pre-test measures). Though attitudes and safety practices reportedly improved, there was no corresponding change in the number of injuries. The Construction Industry Advisory Committee of the Health and Safety Executive sponsored the campaign.

Reference(s):

Glendon I, Hale A. Taking stock of Site Safe '83. Health and Safety at Work 1984 Apr;April:19-21.

Langford D, Webster P. No magic answer: An assessment of the Site Safe '83 and its impact on management. Building Technology and Management 1986 Aug 31;August/September:19-22.

013: Watch Your Step

This campaign used a website and unpaid news media communication (motivated by campaign public relation activities) as well as consultation and inspection activities to target the 10.98 million workers in the United Kingdom. The campaign (along with the activities of the broader Health and Safety Executive's Slips and Trips Priority Program), delivered in 2005, has the objective of reducing the incidence of workplace accidents attributable to slips, trips and falls by 5.1% by 2008. No evaluation report is available and one will not likely be available before 2009. The Health and Safety Executive sponsored the campaign.

Reference(s):

Anonymous. HSE Watch Your Step - Briefing note for Lord Hunt Interview with Plant and Works Engineering Magazine. 11-10-2005.

Anonymous. Watch Your Step Campaign: Working together to make a difference. London, England: Health and Safety Executive; 2006 Jan. Report No.: 1.

Health and Safety Executive. Intervention protocol for the "Watch Your Step" campaign, An awareness campaign including workplace inspections: Monday 3 October to Friday 28 October 2005. 2007.

014: Latex Allergy Campaign

This campaign used direct mail as well as consultation and education activities to target the five million non-public healthcare and welfare employees in Germany. The campaign, delivered from 1997 to 1998, had the objective of reducing exposure to powdered high-allergen latex gloves in hospitals and dental practices. The evaluation involved mixed methods: a post-test only with no comparison group design was used to assess change in glove use (as reported by a healthcare institution representative on a self-administered survey), while a time series with two different comparison groups was used to evaluate changes in latex allergy compensation claim rates. There was a reported decrease in the use of latex gloves and, relative to the comparison groups, a reduced rate of latex allergy compensation claim rates in the intervention group. The

Statutory Accident Insurance & Prevention Association, Union for Non-Public Healthcare and Welfare providers in Germany sponsored the campaign (€340,000).

Reference(s):
Latza U, Haamann F, Baur X. Effectiveness of a nationwide interdisciplinary preventive programme for latex allergy. International Archives of Occupational & Environmental Health 2005;78(5):394-402.

018: Noise in the Workplace
This campaign used television, radio, and print advertising, posters inside and outside the workplace, pamphlets, direct mail and unpaid news media communication (motivated by campaign press releases) as well as consultation activities to target the working population of the Netherlands. The campaign, delivered from 1987 to 1988, had the objective of increasing awareness of the regulations concerning noise in the workplace. The available campaign evaluation information is restricted to implementation measures (i.e., reach, number of mailings and advertisements, and requests for materials). These implementation measures demonstrate good coverage of the campaign. No measures of attitude, behaviour, injury or illness were reported. The Dutch Ministry of Labour and Social Affairs sponsored the campaign (□169K (GBP)).

Reference(s):
Netherlands Directie Gezondheid PFD. Evaluation of information campaign: Noise in the workplace. London, England: Heath and Safety Executive Translation Services; 2007. Report No.: 89/62a.

Thomson Laboratories Ltd., Building Use Studies Ltd. Attitudes towards noise as an occupational hazard, Volume three: Literature survey and review of public awareness campaigns. London, England: Thomson-MTS Ltd. and Building Use Studies Ltd.; 1993. Report No.: 55/1993.

019: Publicizing Control of Substances Hazardous to Health Regulations
This campaign used print advertising, leaflets, and unpaid news media communication (motivated by campaign press relation activities) as well as consultation and education activities to target the working population of the United Kingdom. The campaign, delivered in 1988, had the objective of increasing awareness of the new regulations, Control of Substances Hazardous to Health (COSHH) and providing guidance and support in order to help industry carry out their obligations under the legislation. Campaign evaluation information is limited, but suggests a pre-test, post-test with no comparison group design showed an increase in both awareness of COSHH and, for workplaces with 25-50 employees, an improvement in the self-reported safety practices recommended by the COSHH. No measures of injury or illness were reported. The Health and Safety Executive sponsored the campaign (□250K (GBP)).

Reference(s):
Thomson Laboratories Ltd., Building Use Studies Ltd. Attitudes towards noise as an occupational hazard, Volume three: Literature survey and review of public awareness campaigns. London, England: Thomson-MTS Ltd. and Building Use Studies Ltd.; 1993. Report No.: 55/1993.

023: Sick Leave Minimal Postal Intervention
This campaign delivered a pamphlet, by direct mail, to a select group of persons certified as disabled for longer than 14 days with musculoskeletal or mental disorders in two northern Norway cities, Tromsø and Harstad. The campaign, delivered in select months of 1997 and 1998, had the objective of reducing the amount of time claimants spent on

sick leave. The evaluation involved a randomized controlled trial, wherein the claimants were randomly assigned to the intervention (received direct mail pamphlet) or control group (did not direct mail pamphlet). The intervention group experienced shorter sickness absences than did the control group. The Royal Ministry of Health and Social Affairs and the National Insurance Office provided funding and support for the campaign and evaluation.

Reference(s):

Fleten N, Johnsen R. Reducing sick leave by minimal postal intervention: a randomised, controlled intervention study. Occupational & Environmental Medicine 2006 Oct;63(10):676-82.

024: Tractor Risk Abatement and Control (TRAC)

This campaign distributed information packages and used unpaid news media communication (motivated by campaign press relation activities) as well as consultation and education activities to target all farmers and farm families in one county in Iowa, United States. The campaign, delivered from 1991 to 1996, had the objective of increasing awareness of the hazards associated with the use of tractors. The evaluation used a pre-test, post-test with comparison group (another Iowa county) design to assess changes in roll-over protective structures (ROPS) sales and tractor-related fatality rate. Relative to the comparison county, the intervention county experienced a greater increase in ROPS sales and decrease in tractor-related fatality rate. The Injury Prevention Research Centre at the University of Iowa's Institute of Agricultural Medicine and Occupational Health provided funding for the campaign and evaluation.

Reference(s):

Lehtola C. A tractor injury intervention program. Michigan, United States: American Society for Agricultural Engineers (ASAE); 1993 Dec 14. Report No.: 93-1588.

025: SafeFarm

This campaign used unpaid radio-delivered public service announcements and unpaid news media communication (motivated by press release activities) as well as consultation and education activities to target 104,000 full-time and part-time Iowa farm operators and members of their family. The campaign, delivered in 1992, had the objective of increasing awareness of the occupational health and safety issues associated with agricultural work. The evaluation used a pre-test, post-test with no comparison to assess the impact of the campaign on attitudes, knowledge, behaviours and injuries. Improvements were observed for attitudes, knowledge and behaviours, but no improvement was reported in frequency of injuries. The Iowa State University (ISU) Extension sponsored this campaign and the National Institute of Occupational Safety and Health funded the evaluation.

Reference(s):

Rodriguez LA, Schwab CV, Peterson JW, Miller LJ. Safe Farm: The impact of an Iowa public information campaign. Journal of Agricultural Safety and Health Vol 3 1997;3(2):109-23.

Schwab CV, Miller LJ. Evaluation of a farm safety and health communication campaign. Michigan, United States: American Society for Agricultural Engineers (ASAE);

026: Safe Lifting

This campaign used television and print advertising, pamphlets, calendars and stickers, in addition to providing consultation services to workplaces to target approximately 120,000 employers and 1,200,000 employees in four economic sectors in Switzerland (construction, manufacturing, transportation, and agriculture). The campaign, conducted over a 24 month period in 1999-2000, had the objective of increasing awareness of the risks of musculoskeletal injury associated with manual lifting and handling of materials. The evaluation design involved a baseline survey and two follow-up surveys of workplace safety representatives. Measures of knowledge, attitudes, self-reported behavior change and back pain were collected. The evaluation information available in English was incomplete. The campaign was funded by the Swiss Accident Insurance Fund (500K CHF).

Reference(s):

Chilvers C. Evaluation of the SIPRO III Campaign, Final report to the Federal Coordination Commission for Occupational Safety. Luzern, Switzerland: Swiss Accident Insurance Fund (SUVA); 2001 Sep 28.

028: Cover Yourself Against Skin Cancer

This campaign used posters and direct mail as well as educational activities to communicate to outdoor employees working for a single employer (Telecom Australia) in one of three geographic districts. This company-based campaign was delivered at the same time as a statewide program called “SunSmart”, which involved unpaid public service announcements, community coalition activities, policy development and school programs. The Telecom campaign, delivered from 1989 to 1990, was primarily focused on increasing sun protection behaviours, though a small amount of information focused on early detection of skin cancer. The campaign evaluation used a randomized controlled trial, wherein six Telecom districts were assigned to the intervention group (received intervention) or to the comparison group (received “normal occupational health and safety care”). Over the course of the campaign, the intervention group increased their use of shirts more than the comparison group, but there was no difference between the two groups with respect to change in use of hats or shade. No measures of sun exposure disease were reported. The employer (Telecom Australia) sponsored the company-based campaign (at a cost of $80K (AUD), with $20K devoted to developing the materials and $60K to preparing and distributing the materials to 20K employees at a cost of $3/employee) and the Anti-Cancer Council of Victoria sponsored the SunSmart campaign.

Reference(s):

Borland RM, Hocking B, Godkin GA, Gibbs AF, Hill DJ. The impact of a skin cancer control education package for outdoor workers. Medical Journal of Australia 1991 May 20;154(10):686-8.

Godkin GA. Changing workplace behaviour. Skin cancer protection. Journal of Occupational Health & Safety - Australia & New Zealand 1991;7(6):477-82.

Hocking B. Economic aspects of skin cancer prevention. Journal of Occupational Health & Safety - Australia & New Zealand 1991;7(6):473-6.

029: Massachusetts Hepatitis C Campaign

This campaign used information packages, delivered by direct mail and distribution to hospitals, to target 116,000 licensed Registered Nurses in Massachusetts. The campaign, conducted in 2001, had the objective of increasing knowledge of, and safety behaviours to protect against, the Hepatitis C virus (HCV). The evaluation used a pre-

test, post-test with no comparison group to assess the impact of the campaign on nurses' HCV risk perception, knowledge, intention to be tested, and self-reported use of safety equipment and patient counseling. The campaign did not have an effect on any of the outcomes examined. No measures of illness were reported. The Massachusetts Department of Public Health sponsored the campaign.

Reference(s):

Keller S, Daley K, Hyde J, Greif RS, Church DR. Hepatitis C prevention with nurses. Nursing & Health Sciences 2005;7(2):99-106.

030: UnitedHealthcare Asthma Intervention

This campaign used direct mail as well as telephone consultation and product/incentive distribution to target parents of asthmatic children insured members of the Unitedhealthcare group (United States insurance company). This campaign, delivered in 1999, had the objective (of interest to this review) of reducing parental work absenteeism associated with caring for an asthmatic child. The evaluation consisted of a pre-test, post-test with no comparison group. Reduced work absenteeism was observed over time. The Unitedhealthcare Group & Integrated Therapeutics Group (ITG) sponsored the campaign.

Reference(s):

Georgiou A, Buchner DA, Ershoff DH, Blasko KM, Goodman LV, Feigin J. The impact of a large-scale population-based asthma management program on pediatric asthma patients and their caregivers. Annals of Allergy, Asthma, & Immunology 2003;90(3):308-15.

035: Fort McMurray Demonstration Project in Social Marketing

This campaign used a media campaign on cable television and public activities in the community to target approximately 35,000 residents of the Alberta city of Fort McMurray. The campaign, conducted over the period 1992-1995, had the objective of increasing safety-related practices in the community and in workplaces. The evaluation employed two research designs: while a pre-test, post-test with *no* comparison was used to assess the impact of the campaign on self-reported safety practices, a time series *with* comparison was used to examine the effect of the campaign on injuries treated by health care professionals. The results of the evaluation are not yet available. The campaign was implemented with initial funding from the Alberta Occupational Health and Safety Heritage Grant Program.

Reference(s):

Guidotti TL, Watson L, Wheeler M, Jhangri GS. The Fort McMurray demonstration project in social marketing: Health- and safety-related behaviour in a prosperous industrial community. Int J Consumer Saf Vol 4 1997;4(2):53-65.

Guidotti TL, Ford L, Wheeler M. The Fort McMurray Demonstration Project in Social Marketing: Theory, design, and evaluation. American Journal of Preventive Medicine 2000;18(2):163-9.

036: Cabinetmaker Mailed Information Campaign

This campaign involved direct mail to target a select group of small business cabinetmakers in Queensland, Australia. The campaign, delivered in 1997, had the objective of increasing occupational health and safety issues associated with cabinetmaking work. The evaluation involved a randomized controlled trial (with post-

test measures only) to assess the impact of the campaign on knowledge and injury. No differences in knowledge or injury experience were observed between the control and intervention group. The National Occupational Health and Safety Commission and the Division of Workplace Health and Safety in Queensland sponsored this campaign.

Reference(s):
Mayhew C, Young C. The impact of an intensive mailed OHS information campaign on small business cabinetmakers. Journal of Occupational Health & Safety - Australia & New Zealand 1999;15(1):47-52.

037: ThinkSafe
This campaign uses television, radio and print advertising, posters inside and outside of the workplace, a website as well as consultation and education activities. The campaign, initiated in 1996 and continuing to present, has the objective of reducing fatal injuries by 50% by 2000 in the state of Western Australia. The evaluation consists of a time series with no comparison group to assess the impact of the campaign on safety-related attitudes, knowledge, behavioural intentions and employers' self-reported behaviours. The campaign did not affect any of the outcomes examined. No measures of injury or illness were reported. WorkSafe Western Australia sponsors the campaign.

Reference(s):
Bartholomaeus N. Futuresafe 98, Sydney, 14-17 June 1998: 'ThinkSafe' behavioural and cultural change campaign. Journal of Occupational Health & Safety - Australia & New Zealand 1998;14(5):481-6.

038: HIV Prevention Program for Sex Workers
This campaign used cassette tapes, comic books, leaflets and posters in the workplace as well as peer- and nurse-led educational activities to target female commercial sex workers in Sungai Kolok, Narathiwat, Thailand. At the time of this local campaign, a national campaign, called the 100% Condom Campaign, was delivered in Thailand; this national campaign involved government efforts to enforce a condom-use-only policy that required all sex workers to use condoms with every customer. The campaign, delivered in 1994, had the objective of reducing HIV infection. The evaluation used a pre-test, post-test with comparison group (another town in Thailand, also exposed to the 100% Condom Campaign) to assess the impact of the campaign on knowledge, perceived vulnerability, self-reported behaviours, and prevalence and incidence of HIV infection. The campaign did not affect any of the outcomes examined. The Royal Thai Ministry of Public Health sponsored the campaign.

Reference(s):
Van Griensven GJP, Limanonda B, Ngaokeow S, Ayuthaya SIN, Poshyachinda V. Evaluation of a targeted HIV prevention programme among female commercial sex workers in the south of Thailand. Sexually Transmitted Infections 1998;74(1):54-8.

041: Work Wisely
This campaign used posters, brochures and unpaid news media communication (motivated by campaign press relation activities) to target all employers and employees who work with carcinogenic chemicals in the Netherlands. The campaign, delivered in 1991, had the objective of reducing the incidence of occupational cancer. The evaluation used a pre-test, post-test with no control group design to determine the impact of the campaign on attitudes, knowledge, behavioural intentions and behaviours related to working with carcinogenic substances. The authors did not provide a

comparison between the pre- and post-test measures, but instead provided an efficacy analysis by comparing those directly or indirectly exposed to the campaign to those not exposed. Small differences were observed in the outcomes examined. No measures of disease incidence were reported. The Dutch Cancer Society and the Ministry of Labour and Social Affairs sponsored the campaign.

Reference(s):
Moonen IPP, Van der Rijt GAJ, Van Koppen KFCJ, Van der Gulden JWJ. Evaluation of an information campaign about working safely with carcinogenic substances. Safety Science 1995;21(2):131-44.

042: Easy Trucker

This campaign delivered cassette tapes, by direct mail, to 30,000 commercial truck drivers in Sweden. The campaign, conducted in 1998, had the objective of reducing hazards experienced by road construction and maintenance workers by encouraging truck drivers to decrease speed and increase distance (from the side of the road) when approaching road workers. The evaluation consisted of a pre-test, post-test with comparison group (car drivers were used as the comparison). Relative to car drivers, truckers increased the distance left between themselves and the side of the road following the campaign. The campaign did not reduce truckers' speed. No measures of injury or illness were reported. The Swedish Road Administration sponsored the campaign.

Reference(s):
Summala H, Pihlman M. Activating a safety message from truck drivers memory: An expriment in a work zone. Safety Science 1993;16(5-6):675-87.

043: Asbestos Awareness Campaign

This campaign used television and radio public service announcements as well as unpaid news media communication (motivated by campaign press relations activities) to target asbestos-exposed individuals in the general population of the United States. The campaign, delivered from 1978 to 1979, had the objective of increasing awareness of the nature, extent and seriousness of asbestos exposure. The evaluation used a time series with no comparison group to determine the effect of the campaign on knowledge about illnesses, occupations and medical recommendations associated with asbestos exposure. Following the campaign, perceived personal risk increased, knowledge concerning asbestos-associated illnesses and the recommendation to seek medical care increased; no change was observed for awareness of the asbestos risk associated with brake line installation or the recommendation to quit smoking. The Department of Health Education and Welfare and the National Cancer Institute sponsored the campaign.

Reference(s):
Freimuth VS, Van Nevel JP. Channels and vehicles of communication: The asbestos awareness campaign. American Journal of Industrial Medicine 1993;23(1):105-11.

044: Educational Intervention for Swine Confinement Workers

This campaign used direct mail to deliver a series of six educational home-study models and reference materials to Iowa swine confinement workers participating in an evaluation study. The campaign, delivered in 19XX, had the objective of improving attitudes towards, knowledge about, and practice of, safety behaviours in swine

confinement work. The evaluation consisted of a pre-test, post-test with no comparison. Improvements were observed in attitudes, knowledge and self-reported safety behaviours. No measures of illness or injury were reported. The National Heart, Lung and Blood Institute provided funding for the campaign and evaluation.

Reference(s):

Gjerde C, Ferguson K, Mutel C, Donham K, Merchant J. Results of an educational intervention to improve the health knowledge, attitudes and self-reported behaviors of swine confinement workers. Journal of Rural Health 1991;7(3):278-86.

045: Health Education for Farmers

This campaign used posters and brochures as well as lectures/talks to target all farmers who work with hay, grain, and/or straw in North-Western Ireland. The campaign, delivered before 1980, aimed to inform farmers about farmer's lung. The evaluation used a post-test only with no comparison group to determine the effect of the campaign on farmers' awareness of farmer's lung, knowledge of preventive measures, self-reported preventive actions taken, and farmer's lung symptoms. The North-Western Health Board of Ireland sponsored the campaign.

Reference(s):

O'Brien J, Dean G. Farmer's lung disease: An evaluation of health education in the North-West of Ireland. Irish Medical Journal 1982;75(10):359-61.

046: Sun Smart

This campaign used posters and pamphlets in the workplace along with education, consultation, and product promotion incentives to target ski resort employees in 13 selected ski resorts in Canada and the United States. The campaign, delivered in 2002, had the objective of increasing sun protection awareness and behaviours and decreasing the incidence of sun burn. The evaluation used a randomized, controlled trial to examine the impact of the campaign on the stated objectives. Employees in the intervention ski resorts experienced a 14% reduction in sunburns compared to an 8% reduction amongst employees in the control resorts ($p<0.05$). The National Cancer Institute provided funding for this research study.

Reference(s):

Buller DB, Andersen PA, Walkosz BJ, Scott MD, Cutter GR, Dignan MB, et al. Randomized trial testing a worksite sun protection program in an outdoor recreation industry. Health Education & Behavior 2005 Aug;32(4):514-35.

050: Zero Tolerance

This campaign combined public communication, primarily posters and news media, with consultation services to health care facility managers, to target health care workers and the general population of the United Kingdom. The campaign, initiated in 1999 and continuing to present, aimed to reduce the incidence of violence at work by 10% by the end of 2003. The evaluation used a time series with no comparison group design to monitor work-related assaults in the health care industry over time. The preliminary results suggest that the frequency of work-related assaults in the health care industry is decreasing, but the evaluation is not yet complete. The campaign was directed by the National Health Service (NHS) Executive.

Reference(s):
Comptroller and Auditor General. A safer place to work: Protecting NHS hospital and ambulance staff from violence and aggression. London, England: The Stationary Office; 2003 Mar. Report No.: HC 527 Session 2002-2003: 27 March 2003.

Rew M, Ferns T. A balanced approach to dealing with violence and aggression at work. British Journal of Nursing 2005 Feb 24;14(4):227-32.

Lepper J. NHS stands up to violence against staff. PRWeek , 20. 17-11-2006. Georgia, United States, TNS Media Intelligence.

051: Øresund Link Construction Safety Campaign

This campaign combined public communication, primarily leaflets and newsletters, with education programming, to target construction workers on a large civil construction project (with multiple locations and multiple contractors) in Denmark. The campaign, conducted in the period 1996-1998, had the objective of reducing the frequency of time-loss injuries among construction workers. The campaign evaluation involved mixed methods. A questionnaire was administered to a sample of workers 1.5 years following the initiation of the campaign to determine campaign awareness and employee-reported changes in work routines. The incidence of time loss injuries was examined using a times series with no comparison group design. More than 75% of employees were aware of the campaign and time loss injuries declined by 25%. However, only 10% of surveyed employees reported changes in work routines following campaign initiation. Though the time series design did not involve a comparison group, the authors did, in the discussion, compare the injury rate of workers involved in the Øresund Link construction project to the injury rate of a workers involved in a similar project (i.e., the Great Belt Link project) and the rate of injury in the entire Danish building and construction industry: the injury rate of the Øresund Link construction project workers was lower than both comparison groups. The campaign was funded by the prime contractor, A/S Oresundsforbindelsen ($50M DKK).

Reference(s):
Spangenberg S, Mikkelsen KL, Kines P, Dyreborg J, Baarts C. The construction of the Oresund link between Denmark and Sweden: The effect of a multi-faceted safety campaign. Safety Science 2002;40(5):457-65.

052: Clean Your Hands

This campaign used posters in the workplace, stickers and aprons (worn by health care workers), and leaflets directed towards patients along with education, consultation and provision of hand gel sanitizer to target all employees in two departments of six trusts in England. The campaign was piloted in 2003-2004 with the objective of improving hand hygiene compliance and reducing Healthcare Associated Infections (HCAIs). The evaluation used a pre-test, post-test with no comparison group design to determine the impact of the campaign on observed hand hygiene guideline compliance. Compliance rates increased from 2% in the first two months of the campaign to 63% in the last six months. There was a corresponding increase in product use, from 1171ml s in June 2003 to 2943mls in January 2004. No measures of illness were reported. The National Patient Safety Agency sponsored the campaign.

Reference(s):
National Patient Safety Agency. The economic case, Implementing near-patient alcohol handrub in your trust. London, England: National Patient Safety Agency; 2004.

National Patient Safety Agency. Achieving our aims, Evaluating the results of the pilot CleanyourHands campaign. London, England: National Patient Safety Agency; 2004.

National Patient Safety Agency. Flowing with the go, The complete year two campaign maintenance handbook for cleanyourhands partner trusts, The sequal to Ready, steady, go. London, England: National Patient Safety Agency; 2006.

Storr J. The effectiveness of the national cleanyourhands campaign. Nursing Times 2005 Feb 22;101(8):50-1.

053: Always Wear Hearing Protection

This campaign used posters inside the workplace and direct mail to target miners from selected coal mines in Pennsylvania, United States. The campaign, delivered in 2003, had the objective of increasing use of hearing protection. The evaluation consisted of a randomized, controlled trial, wherein 23 coal mines were randomly assigned to one of four groups which differed with respect to the message promoted (negative, neutral, positive, or no message). Changes in hearing protection attitudes, behavioural intentions and self-reported behaviours were observed in the miners in the "positive" and "neutral" message groups, but not in the "negative" or no message groups. The National Institute for Occupational Safety and Health sponsored the campaign.

Reference(s):

Stephenson MT, Witte K, Vaught C, Quick BL, Booth-Butterfield S, Patel D, et al. Using persuasive messages to encourage voluntary hearing protection among coal miners. Journal of Safety Research 2005;36(1):9-17.

054: Promoting Roll-Over Protection Systems and Seat Belts on Family Farm Tractors

This campaign used direct mail, posters in workplaces, unpaid radio public service announcements and unpaid news media communication (motivated by campaign press release type materials) as well as consultation, education and financial incentive activities to target all farmers in two Kentucky counties. The campaign, delivered from 1997 to 1999, had the target of increasing number of ROPS installed and seat belts used on tractors by 25%. The evaluation used a pre-test, post-test with comparison group (one other Kentucky county) to examine changes in farmers' attitudes towards the ability of ROPS to injury prevention capabilities of ROPS, installation of ROPS, and the ability of ROPS to prevent injury, Though changes in attitudes were observed, there was no increase in the number of ROPS used on farms. No measures of injury or illness were reported. The National Institute of Occupational Safety and Health sponsored the campaign through the Southeast Center for Agricultural Health and Injury Prevention (University of Kentucky) (approximately $383K (USD) for the entire intervention, including the media costs).

Reference(s):

Cole HP, Westneat SC. The Kentucky ROPS Project, Final technical report for partners in prevention: Promoting ROPS and seat belts on family farm tractors. Kentucky, United States: University of Kentucky, Southeast Center for Agricultural Health and Injury Prevention; 2001 Feb 15.

Myers ML, Cole HP, Westneat SC. Cost-effectiveness of a ROPS retrofit education campaign. Journal of Agricultural Safety & Health 2004 May;10(2):77-90.

Richardson C. Community Partners for Healthy Farming (CPHF) Project/The Kentucky ROPS Project. In: Volpe R, Lewko J, editors. Preventing neurotrauma: A casebook of evidence based practices.Toronto: University of Toronto; 2004. p. 184-219.

055: Fresh Market Vegetable Grower Intervention

This campaign used unpaid news media communication (motivated by the campaign's production and distribution of press release packets as well as public demonstrations) to target approximately 450 fresh market vegetable growers in Wisconsin, United States. The campaign, delivered in 1997, had the objective of increasing the awareness of musculoskeletal hazards in material handling tasks. The evaluation involved a pre-test, post-test with comparison group (strawberry growers in the same area acted as the control group). Relative to strawberry growers, fresh market vegetable growers reported greater use of some recommended material handling practices following the intervention. No measures of injury or illness were reported. The National Institute of Occupational Safety and Health provided funding for the campaign and evaluation.

Reference(s):

Chapman LJ, Newenhouse AC, Meyer RH, Taveira AD, Karsh BT, Ehlers JJ, et al. Evaluation of an intervention to reduce musculoskeletal hazards among fresh market vegetable growers. Applied Ergonomics 2004 Jan;35(1):57-66.

056: NIOSH Latex Allergy Alert

This campaign used direct mail to health care institution managers in the United States. The campaign, conducted in 1998, had the objective of increasing awareness of a NIOSH advisory concerning recommended control measures to reduce the risk of latex allergy among health care workers. The evaluation method was based on a randomized controlled trial. Respondents were asked to report intentions to undertake four latex control measures in their institutions. No follow-up measures were obtained. No measures of disease outcome were obtained. The campaign was funded by NIOSH.

Reference(s):

Maxfield A, Lewis J, Lachenmayr S, Tisdale J, Lum M. A National Institute for Occupational Safety and Health ALERT sent to hospitals and the intentions of hospital decision makers to advocate for latex allergy control measures. Health Education Research 2000 Aug 31;15(4):463-7.

Maxfield AM, Lewis MJ, Tisdale JA, Lachenmayr S, Lum M. Effects of a preventive message in the organizational context: occupational latex allergy in hospitals. American Journal of Industrial Medicine 1999 Sep;(Suppl 1):125-7.

057: National Health Service Employee Immunization Promotion

This campaign involved posters in the workplace and direct mail as well as the offer of a free influenza vaccination to target all National Health Service employees in Grampian (a region in Scotland, United Kingdom). The campaign, delivered in 2000, had the objective of increasing influenza immunization rates. The evaluation used a post-test only with no comparison to determine factors associated with immunization uptake. Exposure to a promotional poster increased the odds of vaccination uptake (OR = 11.01, 95% CI = 2.13-56.80). The National Health Service sponsored the campaign and evaluation.

Reference(s):

Qureshi AM, Hughes NJ, Murphy E, Primrose WR. Factors influencing uptake of influenza vaccination among hospital-based health care workers. Occupational Medicine (Oxford) 2004 May;54(3):197-201.

059: Dairy Farmer Intervention

This campaign used unpaid news media communication (motivated by the campaign's production and distribution of press release packets as well as public demonstrations) to target approximately 4300 dairy farm operations in eight contiguous northeast Wisconsin counties. The campaign, delivered in 1998, had the objective of increasing the awareness and adoption of three safe dairy farming practices: barn lights, bag silos, and calf feed mixing site. The evaluation involved a pre-test, post-test with no comparison group, wherein farm operators' knowledge and self-reported adoption of the practices were assessed in a mailed survey before and one year after the intervention began. Small increases were observed in dairy farm operators' knowledge and self-reported adoption of barn lights as well as their knowledge of calf feed mixing sites. No measures of injury or illness were reported. The National Institute of Occupational Safety and Health provided funding for the campaign and evaluation.

Reference(s):

Chapman LJ, Taveira AD, Josefsson KG, Hard D. Evaluation of an occupational injury intervention among Wisconsin dairy farmers. Journal of Agricultural Safety & Health 2003 Aug;9(3):197-209.

060: Be Sharp Be Safe Campaign

This campaign used communication media to target 325,000 registered nurses in the United Kingdom. The campaign, initiated in 2000 and apparently continuing to present, has the objective of increasing awareness of policies and procedures to prevent needlestick injuries and the risk of blood-borne infection among health care workers. Limited information is provided on the communication, education and consultation intervention. Evaluation information is very limited. A voluntary network of 15 institutions is collecting and reporting the incidence of needlestick injuries. The campaign is sponsored by the Royal College of Nurses.

Reference(s):

Pearce L. Silent epidemic. Nursing Standard 2001 May;15(35):16-7.

Trim JC, Adams D, Elliott TS. Healthcare workers' knowledge of inoculation injuries and glove use. British Journal of Nursing 2003 Feb 27;12(4):215-21.

Watterson L. Monitoring sharps injuries: EPINet surveillance results. Nursing Standard 2004 Sep;19(3):33-8.

062: Primary health care/nursing home immunization

This campaign used direct mail and workplace posters as well as the offer of a free influenza vaccination to target approximately 3000 health care workers in two health authorities in the United Kingdom. The campaign, conducted in the fall of 1999, had the objective of increasing influenza immunization. The evaluation design randomly allocated one half of workers to an enhanced educational intervention from a public health nurse. No differences in immunization rates were observed between the intervention and control groups. However, the between-group comparison only shows that no value was added by the public health nurse. To determine the effect of the direct mailings and posters, one would need to compare the immunization rate of the group exposed to the mailings/posters to either (1) the exposed group's rate the year prior to

the campaign or (2) the rate of a group unexposed to the campaign materials. The authors refer to this latter type of comparison in the discussion section, noting that the immunization rate observed in the study is higher than the rate observed for other health care workers. No data is provided for this comparison nor is there any comment about the comparability of the study group to the comparison group. Therefore, for the purposes of estimating the effect of the mass media materials, this study represents a post-test only with no comparison group design and, accordingly, it is impossible to draw conclusions about the effect of the mass media materials on immunization rates. The campaign was implemented by the Bury and Rochdale Health Authority.

Reference(s):

Dey P, Halder S, Collins S, Benons L, Woodman C. Promoting uptake of influenza vaccination among health care workers: a randomized controlled trial.[see comment]. Journal of Public Health Medicine 2001 Dec;23(4):346-8.

064: Good News about Back Pain

This campaign used direct mail to target approximately 1,000 workers with disabling back pain in the US state of Vermont. The campaign, conducted in 1996-1997, has the objective of influencing disability behaviors related to back pain. The evaluation method used a randomized controlled trial. No differences in disability status or days of disability were found between the treatment and control groups. The campaign was funded by the National Institute on Disability and Rehabilitation Research.

Reference(s):

Hazard RG, Reid S, Haugh LD, McFarlane G. A controlled trial of an educational pamphlet to prevent disability after occupational low back injury. Spine 2000 Jun 1;25(11):1419-23.

065: Direct mail smoking cessation

This campaign used direct mail to target approximately 2,600 men aged 30-45 years of age living in western Norway who had been identified in a community screening survey at high risk of lung cancer or obstructive lung disease as a consequence of being smokers with potential exposure to asbestos. The campaign, conducted in 1990, had the objective of increasing smoking cessation. The evaluation design randomly allocated one half of workers to a direct mail intervention. Smoking cessation rates 12 months after the intervention were 13.7% in the intervention group vs 9.9% in the control group ($p<0.01$). The campaign was implemented with funding from the Research Council of Norway and the Norwegian Cancer Society.

Reference(s):

Humerfelt S, Eide GE, Kvale G, Aaro LE, Gulsvik A. Effectiveness of postal smoking cessation advice: a randomized controlled trial in young men with reduced FEV1 and asbestos exposure. European Respiratory Journal 1998 Feb;11(2):284-90.

066: Farm Skin Cancer Control Project

This campaign used direct mail, television, radio, and print advertising, as well as educational activities within schools and at community fairs to target approximately 6,000 farm households in Michigan. The campaign, conducted in 1992-1993, had the objective of increasing skin cancer prevention and detection behaviors in farming households. The evaluation design was based on a pre-test, post-test design with a comparison group. Small intervention effects were found for improvements in preventive

behaviors and health care seeking behaviors. The campaign was funding by the National Institute for Occupational Safety and Health.

Reference(s):
Mullan PB, Gardiner JC, Rosenman K, Zhu Z, Swanson GM. Skin cancer prevention and detection practices in a Michigan farm population following an educational intervention. Journal of Rural Health 1996;12(4 Suppl):311-20.

067: Glove Promotion Campaign

This campaign placed posters in the workplace, purchased a new type of glove and conducted educational activities to target anaesthetists (consultants, registrars and senior house officers) and their assistants (nurses, operating department assistants and practitioners) in four local hospitals in Corwall, United Kingdom. The campaign, delivered from 1994 to 1995, had the objective of increasing glove use. The evaluation used a pre-test, post-test with no comparison group to determine the impact of the campaign on self-reported glove use. Glove use increased following the campaign. No measures of injury or illness were reported. The Royal Cornwall Hospital Trust sponsored the campaign.

Reference(s):
Dyke M. Why not wear gloves? British Journal of Theatre Nursing 1996 Sep;6(6):14-7.

069: Mailed No-Smoking Law Information

This campaign used direct mail to target approximately 500 employers in a Massachusetts city. The campaign, conducted in 1989, had the objective of increasing employers' knowledge of and compliance with a municipal no-smoking bylaw. The evaluation design was a randomized controlled trial. The intervention group of employers reported higher awareness of the law. No differences were found between intervention and control group employers in compliance with the law. The campaign was sponsored by the Brookline Department of Health ($800 (USD) for preparing and distributing the direct mail package).

Reference(s):
Rigotti NA, Bourne D, Rosen A, Locke JA, Schelling TC. Workplace compliance with a no-smoking law: a randomized community intervention trial.[erratum appears in Am J Public Health 1992 May;82(5):684]. American Journal of Public Health 1992 Feb;82(2):229-35.

070: Work Related Eye Injury Educational Intervention

This campaign used the direct distribution of print information and non-paid television and print media, followed by targeted inspection and enforcement to target workers in all 237 metal-ware factories in the district of Imola, Italy. The campaign, conducted over the period 1991-1996, had the objective of reducing the incidence of occupational eye injuries. The evaluation design was a retrospective time series analysis, with two comparison groups (from construction and wood/cermamic sectors). No measures of intermediate outcomes were obtained. Workers in the metal working sector has a substantially greater reduction in the incidence of occupational eye injuries. The campaign was sponsored by the public occupational health service.

Reference(s):

Mancini G, Baldasseroni A, Laffi G, Curti S, Mattioli S, Violante FS. Prevention of work related eye injuries: long term assessment of the effectiveness of a multicomponent intervention among metal workers. Occupational and Environmental Medicine 2005 Dec 31;62(12):830-5.

071: Cotton Weaving and Spinning Mill Safety Campaign

This campaign used posters and direct mail (both in the workplace), a competition with rewards and educational activities to target all workers in multiple sites of a single cotton mill company in Greece. The campaign, delivered in 1980, had the objective of reducing occupational accidents in the company. The evaluation used a pre-test, post-test with no comparison to assess the impact of the campaign on change in knowledge. The analytic methods used by the authors make it difficult to draw conclusions about the effect of campaign on knowledge. No measures of behaviours, injury or illness were reported. The Greek cotton company sponsored the campaign.

Reference(s):

Bazas T, Harrington JM. Evaluation of an accident prevention campaign in a major Greek industry. International Journal of Health Education 1981;24(2):118-21.

072: Defeat Depression Campaign

This campaign used mass media communications to target the adult population in the United Kingdom. The campaign, conducted over the period 1992-1996, had the objective of increasing earlier care seeking for the treatment of depressive disorders. The campaign evaluation used a number of methods, including three surveys of population attitudes concerning depression treatment and monitoring of the annual frequency of sickness and invalidity benefits (of both depressive disorders and other types of mental and physical disorders) provided by the national Department of Social Security. Public attitudes to depression treatment appeared to change in a direction consistent with the campaign objectives. The prevalence of sickness and invalidity benefits for both depressive and musculoskeletal disorders increased steadily in the three year period before the campaign and over the three year period following the initiation of the campaign. No statistical tests were reported to examine whether or not the increase in depressive disorder benefits was different than the increase in musculoskeletal disorder benefits. The campaign was implemented by the UK Royal College of Psychiatrists.

Reference(s):

Moncrieff J. The Defeat Depression Campaign and trends in sickness and invalidity benefits for depressive illness. Journal of Mental Health (UK) 1999 Apr;8(2):195-202.

Priest RG. A new initiative on depression. British Journal of General Practice 1991 Dec;41(353):487.

073: Occupational Safety and Health Council Promotional Activities

The Occupational Safety and Health Council of Hong Kong, established in 1987, conducts worker education programs, workplace consultation and issues regular public service announcements and promotional programs via mass media targeting the working age population in Hong Kong, with an emphasis on health care, manufacturing and transportion sectors. A single evaluation report describes a cross-sectional survey, conducted in 1998, of 668 working-age adults, of whom 50% worked in industries targeted by the Council. Correlations among measures of health and safety attitudes, knowledge, behaviors and injury incidence are reported. There are positive, small

correlations between self-reported exposure to OSHC promotional materials and measures of knowledge and behaviors.

Reference(s):
Cheung CK, Chan CM. Learning to work safely with reference to a social-cognitive model. Social Behavior and Personality 2000;28(3):293-308.

074: Guidelines for Children's Agricultural Tasks

This research study used direct mail to target a representative sample of approximately 500 farm households with children in Canada and the United States. The evaluation, conducted in 1999-2000, had the objective of increasing safe work practices among children performing farm labour in agricultural households. The evaluation design randomly allocated one half of farms to an enhanced dissemination strategy involving repeated mailing of communication materials as well as follow up contact by telephone to confirm receipt of materials; the other half of farms were allocated to a standard dissemination strategy involving a single mailing. The proportion of parents actively using guidelines was higher amongst the farms exposed to the enhanced dissemination strategy compared to the farms exposed to the standard strategy (49% vs 37%, 12% difference, 95% CI 3.4-21.7). However, the between-group comparison only shows the effect of the repeated mailings and telephone contact. To determine the effect of the single mailing, it would be necessary to either (1) compare the safety practices of the group before and after the single mailing or (2) compare the group exposed to the single mailing to a group that does not receive any mailing. Neither one of these types of comparisons was provided in the paper. The evaluation was funded by the Centers for Disease Control (the standard dissemination strategy cost $18.55 (USD) per person and the enhanced dissemination strategy cost $38.75 (USD) per person).

Reference(s):
Marlenga B, Pickett W, Berg RL. Evaluation of an enhanced approach to the dissemination of the North American Guidelines for Children's Agricultural Tasks: A randomized controlled trial. Preventive Medicine: An International Journal Devoted to Practice and Theory 2002 Aug;35(2):150-9.

075: Asbestos Disease Risk Communication

This campaign used direct mail to target all New Jersey hospital patients with asbestosis listed in their discharge diagnosis. The campaign, delivered in 1990, aimed to meet the medical and legal information needs expressed by asbestosis patients. The evaluation used a post-test only with no comparison design to determine the impact of the campaign on behavioural intentions. The New Jersey Department of Health sponsored the campaign.

Reference(s):
Stanbury M, Solice-Sample G, Pescatore J. Asbestos disease risk communication conducted by the New Jersey Department of Health. American Journal of Industrial Medicine Vol 23 1993;23(1):97-104.

077: SunSmart Lifesaver Association Sponsorship Program

This campaign used messages displayed on clothing worn by lifesavers and shade structures as well as training and provision of shade structures and sunscreen to target all lifesavers in Victoria, Australia. The campaign, delivered from 1987 to at least 1996, aimed to improve sun safety attitudes, increase sun safety behaviours, and reduce sunburns amongst lifesavers. The campaign was part of a larger initiative, the

SunSmart campaign, which involved unpaid public service announcements, community coalition activities, policy development and school programs. The evaluation used a post-test only with a comparison group (lifesavers from a nearby state, New South Wales). Compared to New South Wales lifesavers, more Victorian lifesavers practiced sun safety behaviours and fewer experienced sunburns; however, there was no difference between the groups with respect to attitudes. The Victorian Health Promotion Foundation (VicHealth) and the Anti-Cancer Council of Victoria (ACCV) sponsored the campaign.

Reference(s):

Dobbinson, S, Borland, R, Anderson, M. Sponsorship and sun protection practices in lifesavers. Health promotion international Vol 14 1999; 14(2):167-176.

080: Hook That Sling

This campaign used posters in the workplace to target all employees of six steel companies in the United Kingdom. The campaign, delivered some time before 1960, encouraged workers to hook back chain slings on cranes that were not in use. The evaluation consisted of a time series with comparison group (a seventh company that had no posters). Relative to workers in the comparison group, workers in the intervention group increased hook slinging behaviour, particularly amongst companies with low-level ceiling. No measures of injury or illness were reported. The Royal Society for the Prevention of Accidents (ROSPA) sponsored the campaign.

Reference(s):

Laner S, Sell R. An experiment on the effect of specially design safety posters. Occupational Psychology 1960 Jul;34(3):153-69.

101: Safety with Every Step

Over the two year period of the campaign, expenditures on social marketing and information, consulting and education materials totaled approximately 1,000,000 € and personnel costs represented approximately 800,000 €. The reduction in compensated injuries caused by falls was approximately 24%, compared to a reduction in the incidence of all other causes of compensated injury of 15%. The Austria workers' compensation agency estimated the value of the avoided accident compensation cost to represent approximately 10,900,000 €.

Reference(s):

Korpert K. "Safety with Every Step": A national campaign by an Austrian Accident Insurance Institution to prevent falls. In: European Agency for Safety and Health at Work, editor. How to reduce workplace accidents. Accident prevention programmes in the member states of the European Union.Luxembourg: Office for Official Publications of the European Communities; 2001. p. 47-53.

Appendix B: Search Terms

Term Category	Exact Search Terms		
Mass media educational program	*Health Education	Marketing of Health Services	Propaganda
	*Health Promotion	Mass Media	Publications
	Advertising	Motion Pictures	Radio
	Broadsides	Newspapers	Serial Publications
	Communications Media	Pamphlets	Social Marketing
	Government Publications	Periodicals	Television
	Information Dissemination	Persuasive Communication	campaign?.mp
	Marketing		
Occupational health/safety and work disability	Absenteeism	Farmer's Lung	Primary Prevention
	Accident Prevention	Handwashing	Rehabilitation, Vocational
	Accidents, Occupational	Health Benefit Plans, Employee	Sick Building Syndrome
	Accidents, Radiation	Hearing Loss, Noise-Induced	Sick Leave
	Agricultural Workers' Diseases	High Pressure Neurological Syndrome	Siderosis
	Air Pollutants, Occupational	Immunization Programs	Silicosis
	Anthracosilicosis	Inert Gas Narcosis	Silicotuberculosis
	Asbestosis	Infection Control	Silo Filler's Disease
	Berylliosis	Laboratory Infection	Sleep Disorders, Circadian Rhythm
	Bird Fancier's Lung	Mass Immunization	Tennis Elbow
	Burnout, Professional	Maximum Allowable Concentration	Threshold Limit Values
	Byssinosis	Needlestick Injuries	Universal Precautions
	Caplan's Syndrome	Noise, Occupational	Workers' Compensation
	Carpal Tunnel Syndrome	Occupational Diseases	employee efficiency
	Communicable Disease Control	Occupational Exposure	employee productivity
	Cumulative Trauma Disorders	Occupational Health	job performance
	Decompression Sickness	Occupational Health Nursing	work capacity
	Dermatitis, Occupational	Occupational Health Services	presenteeism
	Efficiency, Organizational	Persian Gulf Syndrome	work disabilit$
	Employer Health Costs	Pneumoconiosis	work limitation?
Evaluation	Clinical Trials	Evaluation Studies	Random Allocation
	Cohort Studies	Follow-Up Studies	Randomized Controlled Trials
	Comparative Study	Intervention Studies	Retrospective Studies
	Control Groups	Longitudinal Studies	Single-Blind Method
	Controlled Clinical Trials	Multicenter Studies	evaluat$.mp.
	Cost-Benefit Analysis	Program Evaluation	effect$.mp.
	Costs and Cost Analysis	Prospective Studies	(time adj series).mp.
	Double-Blind Method		
Working population	employ*	nurs*	staff
	farm*	occupation*	work*
	job*		

NOTE: The search terms were combined using the following Boolean logic: terms within a row were combined using "OR" and terms between rows were combined using "AND".
Terms starting with an upper case letter are controlled language terms, while those starting with a lower case letter are uncontrolled language terms.
While the same uncontrolled language terms were used in every database, the controlled language terms presented above were used in MedLine only; these terms were translated for the other databases searched in this review.

#	Question	Guidance	Response Option	Response Consequence
1	Is the reference concerned with an educational program delivered via mass media (in part or whole)?	- "Mass media" includes radio, television, newspapers, magazines, leaflets, posters, pamphlets and direct mail (alone or in conjunction with other interventions) - The following media are ***not*** considered mass media material for the purposes of this review: i. Scientific media such as professional journals, leaflets, and booklets ii. Workplace media meant for use ***during*** employee training sessions iii. Media that must be purchased iv. Material that is ***solely*** concerned with promoting/advertising a training course - If media releases are the only form of mass media used and these releases are ***not*** supported by a description of release uptake (in terms of number of journal/magazine articles and/or television/radio accounts), the answer is "no" - If a mass media campaign is only recommended at the end of the study, the answer is "no"	Yes No Unclear	Include Exclude Include
2	Is the program delivered in more than one work site?	- Programs must be delivered in more than work site, but the evaluation can take place in all, some or just one of the work sites - Programs delivered to multiple worksites of a single employer ***are*** eligible	Yes No Unclear	Include Exclude Include
3	Does the program evaluation involve a work-related outcome?	- The following are considered work-related outcomes for the purposes of this review: i. Occurrence of worker injuries and/or illnesses ii. Costs of worker injuries/illnesses (e.g., employer health insurance costs, lost time (RTW), workers compensation claims, occupational health service use) iii. Worker and organizational performance/productivity iv. Exposure to occupational health risks v. Worker health and safety knowledge, attitudes and/or behaviours NOTE: Evaluations may be in progress or completed; in either case, the evaluation must be described in enough detail to allow reviewers to determine the evaluation design and outcomes examined	Yes No Unclear	Include Exclude Include

Appendix D: Preliminary Data Extraction and Quality Assessment Guidance

#	Item	Guidance
1	Objective	- Please specify the objective of the campaign, including specific targets if a quantitative objective was set
2a	Location (country, province/state)	- Please specify the country and province or state in which the campaign was delivered
2b	Industry (if applicable)	- Please select the industry targeted by the campaign from the North American Industry Classification System (NAICS) list below: o Agriculture, Forestry, Fishing and Hunting o Construction o Health Care and Social Assistance o Transportation and Warehousing o Manufacturing o Mining and Oil and Gas Extraction o Accommodation and Food Services o Administrative Support, Waste Management & Remediation Services o Arts, Entertainment and Recreation o Educational Services o Information and Cultural Industries o Management of Companies and Enterprises o Other Services (except Public Administration) o Professional, Scientific and Technical Services o Public Administration o Real Estate and Rental and Leasing o Retail Trade o Utilities o Wholesale Trade - If the campaign was targeted to the general population, please note this focus
2c	Occupation (if applicable)	- Please specify the occupational group(s) targeted by the campaign - If the campaign was targeted to the general population, please note this focus
2d	Population size	- Please specify the size of the target population
3	Calendar time of campaign delivery	- Please specify when the campaign was delivered (in years and, if available, months)
4	Sponsoring agency(ies)	- Please specify the organization(s) responsible for funding the campaign and evaluation
5	Cost information	- Please specify the cost of the mass media component of the campaign - If the campaign is delivered with co-interventions, please specify the cost of each co-intervention - If the campaign is delivered with co-interventions and the cost is not broken down for the individual components of the campaign, please specify the total cost of the program
6	Type of prevention	- Please specify the type of prevention targeted by the campaign* o Primary prevention (i.e., aims to reduce the incidence of injury/illness) o Secondary prevention (i.e., aims to reduce the duration and/or severity of illness/injury through early detection and corrective interventions) *Classify the type of prevention based on the primary focus of the campaign; only specify “primary AND secondary” if the campaign places equal emphasis on both types of prevention

#	Item	Guidance
7	Target behaviour(s)/practice(s)	- Please specify the type(s) of behaviour(s)/practice(s) targeted by the campaign
8	Type(s) of mass media	- Please select all of the types of mass media used from the list below: o Television advertising o Radio advertising o Print advertising (i.e., newspaper or magazine advertisements) o Posters outside the workplace (including billboards) o Posters inside the workplace o Unpaid news media communication (i.e., publicity caused by campaign public relation activities) o Brochures/pamphlets available in public places o Direct mail o Other (please specify)
9	Type(s) of co-interventions	- Please select all of the types of co-interventions used from the list below: o Consultation (i.e., guidance provided directly to employers by an external organization) o Training/Education (i.e., workers instructed one-on-one or in groups) o Regulatory obligation (i.e., campaign messages reinforce legislation) o Inspection (i.e., regulatory agencies visit workplaces to determine if legislative obligations are met) o Incentive (i.e., provision of monetary or material goods) - If no co-interventions were used, please note this here
10	Outcome(s) examined	- Please select the type(s) of outcome(s) examined from the list below and note a descriptive name for each: o Program awareness o Attitudes or beliefs o Behavioural intentions o Behaviours o Injury or Ill-health o Disability o Other (please specify)
11	Evaluation design(s)	- Select one of the following evaluation designs for each of the outcomes identified in #8 above: o Randomized controlled trial o Time series* with a comparison group o Pre-test, post-test with a comparison group o Time series* with no comparison group o Other (please specify) *To be classified as a “time series”, measures (of the same outcome) had to be taken at (at least) three separate time points
12	Final evaluation results publicly available	- Please specify (yes or no) whether the results were reported in a published paper or a report that could be accessed by the public - If the results were acquired through interview with a program contact, the appropriate response to this item is “no”