MONASH University

ISCRR
Institute for Safety, Compensation and Recovery Research

Effectiveness of prevention-focused, workplace health and safety campaigns

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Executive Summary

Purpose

The aim of this review was to better understand the effectiveness of mass media health and safety campaigns, nationally and internationally, in shifting health and safety attitudes, knowledge and behaviour. WorkSafe was particularly interested in prevention-focused population-level mass media campaigns and whether they were effective in changing attitudes, improving knowledge and changing target behaviour within the community.

Rationale

WorkSafe are developing a media communications strategy for 2015. Their mass media campaigns aim to raise awareness in the community and change behaviour. The specific focus of the next campaign (ie injury, industry etc) will be determined in early 2015. WorkSafe would like to ensure that they can refer to robust evidence on successful (or otherwise) campaigns from alternative jurisdictions in order to inform their strategy.

Findings

Twelve systematic reviews and four industry/government reports were included in this report. All of the systematic reviews focused on health behaviours and the four reports identified in the grey literature focused on OH&S. Summaries have been provided of the effectiveness of campaign strategies in the review articles and grey literature reports. Interpretation of the results of the review articles and grey literature reports was challenging given the quality of reporting. Given the limitations in the data, we explored the health promotion literature to provide some guidance to the WorkSafe in the development of their media communication strategy for 2015.

Conclusions

The findings from this review along with the evidence from the broader health promotion literature aim to guide WorkSafe in the development of their media communications strategy in 2015. As noted in this report, WorkSafe need to consider a wide range of factors in the development of their communications strategy, ranging from identifying an appropriate target behaviour, population, type of media and campaign to an evaluation framework to measure success. The evidence suggest that consideration of each of these issues is likely to result in a successful media communications strategy.

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1 Background

1.1 Context

A common misconception for public health information programs is that if you present 'the facts', people will change their behaviour accordingly. This assumes a simple, linear relationship between attitudes, knowledge (awareness) and behaviour. In reality, this is far too simplistic. Behaviour is shaped by many factors, and is deeply embedded in social situations, institutional contexts and cultural norms. Thus, in order to achieve behavioural change, a basic understanding of the key determinants of behaviour is required.

1.2 The theory of health behaviour change

In order to understand the process behind changing behaviour, it is important to first consider the theoretical models of behaviour change. These have been discussed extensively in the literature, with the most frequent applications targeting health behaviour, education, and criminology. Core components of many traditional behaviour change models include knowledge, attitudes and workplace practices:

- **Knowledge** encompasses factual or interpretive information to promote understanding about a particular subject or action (1). For example, understanding the risks of back injury in the workplace.
- **Attitudes** are an evaluation of the positive and negative aspects of the proposed behaviour against the likely outcomes of the behaviour (2). For example, perceptions of safe working practices to avoid back injury.
- **Behaviour** captures actions of individuals, groups or organisations (3). For example, workplace practices that reduce the incidence of back injury.

Traditional approaches to health education or behaviour change posited a linear relationship between knowledge, attitudes and behaviour (or practice), known as the KAP model (4). Applying this model, practitioners believed that the provision of information (e.g. mass media campaigns), would lead to a change in attitudes and then adoption of the suggested behaviour (4). This model has been tested in a variety of situations and has repeatedly been found to be inadequate [e.g. (4)].

As a result of these shortcomings, it has been clearly identified that there is no 'one size fits all' approach that can be applied to all behaviours, and a range of approaches to behaviour change have been proposed. While each of these approaches have developed their own specific terminology to identify factors deemed significant to behaviour change, the general consensus involves a recognition of factors such as: individual attitudes, self-efficacy and preparedness to change as well as broader social influences. However, the interaction between, and the overall influence of these factors remains subject to debate. (Note: Appendix A and B provide a brief overview of the most common behaviour change models, their application, and their limitations).

While the **processes** for change appear to be quite similar across a range of different behaviours (5), the **psychological and social processes** that pre-empt behaviour change are dependent on many factors, and are often an artefact of the behaviour itself (some behaviours are more difficult to change than others). For example, smoking cessation is very difficult given the addiction component which provides a strong psychological (and

potentially physical) barrier to change, whereas asking (Australian) people to get 15 minutes of direct sun exposure every day for Vitamin D requirements would be far easier to achieve.

Given these complexities, there is no one, unifying theory of behaviour change that would suit all situations. Further, when exploring the application of the various behaviour change models, it is important to clearly identify both the target audience and the level at which a given intervention aims to target this audience (ie. at the individual or community level). Most of the early behavioural change models aimed to change behaviour at the individual level, however, more recently the importance of influencing behaviour at the community level has been recognised. This is reflected in the various behaviour change models described in Table 1; these well-established theories emphasise different aspects that are likely to trigger and sustain change.

Table 1: Behaviour change theories

Theory	Description
Cognitive theories	Individual level cognitive theories try to influence individual's attitudes about certain behaviours (e.g. Theory of Reasoned Action).
Social cognitive theories	Enhance motivation and opportunities to successfully test a different kind of behaviour.
Health Belief Model	Demonstrates the risks and emphasises the benefits of stopping a given behaviour
Stage/step theories	Guiding the target audience through a learning (or unlearning) process.
Social influence theories	Using the influence of others, such as social influence, social comparison or convergence theories to encourage behaviour change.
Emotional response theories	Appealing to emotions to prompt behaviour change.
Communication theory	Traces processes by which a new idea or practice is communicated in society (diffusion of innovations) and how certain aspects of communications influence behavioural outcomes (input/output persuasion model).

When considering behaviour change, it is critically important to understand the theoretical models. Without a clear understanding of the behaviour that is being targeted and the process by which the change occurs, it is not possible to measure the effects of a given intervention. For example, ensuring that the determinants of a given behaviour are understood at the outset (including the establishment of baseline measurements), it becomes far easier to determine whether an intervention (e.g. mass media campaign) has had the desired effects.

1.3 Measuring success

'Behaviour' is a broad term, and not all behaviours are equal. In order to understand the 'effectiveness' of a media campaign, it is important to identify what the campaign aims to target in the first place. Assuming the target is behaviour (which is often the case), there are a number of different types of behaviour that can be targeted – Table 2 provides some examples.

Table 2: Types of behaviour targeted for change

Behaviour		**Campaign example**
Avoidance	Prevent the behaviour from happening in the first place.	Purchase lifting devices to prevent manual lifting.
Maintenance	Continue with an existing behaviour.	Encourage workers to continue using safe lifting practices to avoid back injury.
Increase	Increase a positive behaviour that is currently being undertaken.	Encourage the frequency of safe lifting practices in the workplace.
Change	Completely changing an existing behaviour.	Stopping unsafe lifting practices in the workplace.
Adoption	Adopt an entirely new behaviour.	Start a safe lifting program using a different approach to lifting (e.g. with a lifting device).

Clearly, the individual, social and cultural contexts underlying these different behaviours, and thus the processes for changing them, would not be the same (which is why there are so many different theoretical models). It is important to know how you might go about achieving each of these different types of changes, and there are a range of factors that need to be considered in this decision. For example, some changes would require the purchase of a product - what are the associated costs and availability, and will these influence campaign success? New (or developed) skills may be necessary; their presence or absence may have an effect on campaign results. In the OHS environment, this may include highly complex skills, such as conflict or anger management, or may even involve the development of an entirely new skill. A fictional example is provided in the box below, and outlines the type of questions that need to be considered.

Table 3: Examples of questions for consideration

Fictional example: OH&S Safe lifting campaign	
What are you asking people to do?	Learn a new skill/strategy/technique for safe lifting.
How do they do that?	Attend a course? Is there a course available? Are you going to provide information on courses? Who pays for it?
What format is the course?	Are the materials written? Has literacy level of your target population been considered?
How do you measure success?	Attendance at courses? Perceived increases in skill level? Reductions in injury rates? Compensation claims?

As described above, it is very important to have clarity around exactly what is being targeted for change and the process for achieving the change. When considering the effectiveness of a campaign, success can be heavily dependent on the type of behaviour being targeted and how it is being measured – selecting the wrong outcome measures can influence the overall picture. For instance, assessing a campaign based on behaviour change when the campaign was actually designed to raise awareness is not helpful – which leads to a key point; behaviour change can only be a meaningful measure of success if the campaign explicitly asks people to perform a specific behaviour (e.g. bend your knees when lifting, or wear a lifting belt).

In summary, some behaviours are more easily addressed than others, some campaigns will aim to raise awareness (not to change behaviour), and some papers may not describe exactly what was being targeted. It is important to keep these aspects in mind when considering the evidence presented in this review.

2 Methods

Due to the large body of research on mass media campaigns, the search was restricted to review articles, supplemented with relevant grey literature. Review articles included Cochrane reviews, systematic reviews and narrative reviews. The review search was performed in the databases, PsychINFO and ProQuest. Search terms included: campaign, mass media, health, review, health and safety, and OH&S that were combined with Boolean operators. The search was restricted to peer-reviewed literature and only included articles published in English. A search of the grey literature relevant to mass media campaigns focused on workplace safety was also conducted. This search was conducted through Google.

2.1 Quality of reporting

The findings presented in the current report should be interpreted with caution, for the following reasons:

1. There was heterogeneity in the reporting of the systematic review articles. Thus, the results were difficult to analyse and interpret.
2. The systematic review articles did not clearly articulate the types of campaigns included in their evaluations. Each review provided a different definition or description of their reported health promotion intervention strategies. For instance, some of the reviews did not define whether the campaigns involved mass media advertising (i.e. communication of health promotion messages to large audiences through television, radio and print over a finite period of time) or entertainment education (i.e., education that uses the entertainment medium, such as film, radio and television, to educate audiences about health issues).
3. Some of the systematic reviews and none of the grey literature evaluated the scientific credibility of the campaign evaluation data, which suggests that some of the results reported may be biased. For example, if the reported campaigns did not involve good baseline data or a control group, it is impossible to definitively make statements regarding the effectiveness of the campaign.
4. The varied findings may reflect poor evaluation design rather than a lack of effect of the intervention. For example, incorrect outcome measures may have been selected, or the study may have stated no evidence of behaviour change when behaviour was not the campaign target. Short timeframes for evaluations may also skew results as behaviour change tends to be a slower process rather than some of the more intermediate outcomes.
5. The results may be artefacts of the type of behaviour being targeted, rather than the quality of the campaign – some behaviours are easier to target than others.

3. Results

Twelve review articles were identified in the peer-reviewed literature and four industry/government reports were sourced from the grey literature. Table 4 provides a description of the peer-reviewed papers and Table 5 describes the grey literature reports

included in this review. Summaries of the effectiveness of the campaign strategies are included for each.

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Table 4: Summary of findings in the peer-reviewed literature presented according to target of campaign.

Authors	Target of campaign	Campaign	Outcomes measured	Summary of the results
Randolf et al. (2014) (6)	Various health-risk behaviours	Mass media	Knowledge (ie., recall, comprehension), attitude, behaviour change	Knowledge changes (ie., recall, comprehension and developing knowledge) • **Recall**: Nine studies found that mass media with entertainment education strategies increased recall of the campaign message. Two studies found no difference between campaign approaches compared to comparison group. • **Comprehension**: One study found that mass media and mass media plus community organising campaigns increased comprehension of campaign message compared to comparison groups. No differences between campaign approaches. • **Knowledge development**: One study found that entertainment strategies increased knowledge development. Four studies found mass media campaigns increased knowledge development. Two studies found no effect for mass media strategies. • **Attitudes**: Two studies found that mass media and community organizing strategies were found to increase positive attitudes toward behaviour change, relative to the media only or comparison groups. • **Behaviour change**: Six studies found that mass media changed target behaviour, while four studies found no effect. One study found that entertainment education strategies improved target behaviour. Four studies found that law enforcement strategies changed target behaviour. • Campaign schedules were not reported.
Niederdeppe et al. (2008) (7)	Smoking cessation	Mass media	Behaviour change	**General population campaigns** • Four of the nine campaigns that were less effective among low socio economic status (SES) populations might be characterized as low-cost, ‘‘self-help’’ campaigns. Each of these programs used minimal resources for promotion or relied entirely on donated and

				earned media coverage. • Six media campaigns were equally effective in promoting smoking cessation among low and high SES smokers. These campaigns used a diverse set of approaches, but were generally large in scale, implemented in the context of other tobacco control programs or activities, and often featured graphic portrayals of the health effects of tobacco (ie., television advertisements with graphic portrayals, televised news segments). • Campaign schedules were not reported. **Targeted campaigns** **Studies establishing effectiveness:** • Smokers (targeting low SES, African American) that were exposed to both the self-help materials and the provider advice achieved greater 16-month quit rates compared to provider advice alone, but smokers who received self-help, provider advice, and telephone counselling did not quit at higher rates compared to provider advice only. • One study compared low income African American smokers living in communities that received a video and a self-help booklet (conducted with larger initiative). This study found no differences in 6-month quit rates between campaign and control communities. However, they did find significant differences in quit rates between low SES, African American smokers that saw the video and read these materials (16%) relative to the control group (8%). • Campaign schedules were not reported. **Studies establishing ineffectiveness:** • One campaign involved a computer campaign guided by ecological perspectives, behaviour change theory and communication theory to develop tailored, direct marketing messages about multiple behaviours to rural, female, blue collar employees.

				• One campaign involved paid (publicity gained through advertising) and earned media (publicity gained through promotional efforts other than advertising), direct marketing, educational workshops, free screening interventions, paid newspaper advertisements and earned media church-based smoking cessation program and received spiritually-guided self-help booklets. • One campaign relied exclusively on direct marketing of self-help materials. • Campaign schedules were not reported.
Durkin et al. (2014) (9)	Smoking cessation	Mass media	Attitudes (ie., intentions), behaviour change	**Intentions**: Four studies found change in either attitudes or intentions. This campaigns involved TV advertisements, posters, radio and print. Intensity levels were recorded as 'Low' for two of the campaigns (average intensity was low, <1200 TRPs/GRPs per quarter; moderate, 1200 up to 2100 TRPs/GRPs per quarter; high, $2100 TRPs/GRPs per quarter). The duration of the campaigns ranged from less than 6 months to more than 18 months. **Behaviour change:** A time series analysis of monthly smoking prevalence over an 11-year period found greater population exposure to televised multi media campaigns (MMCs) was associated with acceleration in the decline in adult smoking prevalence, after adjusting for variation in tobacco prices, smoke-free restaurant laws, tobacco marketing restrictions and availability of smoking cessation products. In a population cohort study, greater population exposure to televised MMCs was associated with a higher likelihood of quitting at a 2-year follow up. The media campaign used TV in addition to billboard, print and media. The intensity level varied over time and the duration of the campaign was longer than 18 months. **Additional findings:** **Channels of delivery**: Despite radio's lower costs its reduced population reach means that it is unlikely to be a good substitute for television in influencing population-wide smoking, and could be considered a reinforcing adjunct.

				Content: Negative health effects messages were most effective at generating increased knowledge, beliefs, positive perceived effectiveness ratings, or quitting behaviour, while there was more mixed evidence for other message types. There was also some evidence that negative health effects messages may be especially effective for low socio-economic status smokers.
Leavy et al. (2011) (8)	Physical activity	Mass media	Knowledge (ie., awareness, recall), attitudes (ie., intentions), behaviour change	Overall, the set of campaigns used a diverse range of media channels including: television commercials (network and/or cable), public service announcements, radio commercials, paid and unpaid print media inserts, bus backs and wraps, billboards, print media, website traffic, public health activities, policy and environmental change. Campaign duration ranged from: as short as 8–13 weeks (n = 6); around 6 months (n = 3), 12 months (n = 2); several phases over 12–24 months (n = 2) and greater than 2 years (n = 5). Detailed information is provided, below. **Awareness**: Campaign awareness levels ranged from 17.4% to 95% prompted post-campaign recall. Media strategies included television advertisements, website and URL. Duration of the campaigns were reported from 8 weeks to 4 years. **Recall**: Two campaigns evaluated campaign awareness by assessing specific brand, trademark or campaign logo recognition and showed an increase in recognition of between 13.5 and 52% from baseline. Media strategies included 6 local newscasts, 20 billboards, 23 workplace kits, 30 loan pedometers, posters/information about pedometers sent to schools (169); GPs (592) dieticians (26), physical therapists (308). **Intention**: One campaign found a significant increase in intention to be more active (the media strategies are the same as noted above in recall), whereas other studies reported smaller non-significant changes in intention to be more active (using media strategies of TV, bus wraps, billboards, newspapers, bus backs, website and free call number). **Behaviour change**: Seven of the campaigns produced significant

				improvements in physical activity. Media strategies included magazine/TV advertisements, press coverage, website, billboards, radio announcements, media coverage, posters/flyers. The duration varied in each of the campaigns.
Brown et al. (2012) (10)	Physical activity	Stand alone mass media	Behaviour change	**Behaviour change:** The authors of this study found that there was insufficient evidence to determine effectiveness for stand-alone mass media campaigns for increasing physical activity. This conclusion was based on multiple factors, including diversity or heterogeneity in methods and outcome measures that limited cross-study comparisons, primary reliance on self-report measures that were not validated, inconsistent patterns of findings, and evidence suggesting only modest behaviour changes. Three of 16 qualifying studies reported decreases rather than increases in physical activity associated with the standalone mass media campaigns, and few studies systematically assessed campaign effects on both the proximal and distal outcomes. The studies varied greatly in terms of their campaign intensity (although intensity was often not reported); duration (i.e., 1 week to 4 years); media dose (ranging from use of two channels to seven channels); and population reach of the various media campaigns.
Heath et al. (2012) (14)	Physical activity	Mass media	Behaviour change	This review found that mass media campaigns can lead to change, especially when they are linked to specific community programmes. One campaign targeted tweens (ie, young people aged 9–13 years) in communities throughout the USA with mass media efforts, internet links, and community events and programmes designed to increase and maintain physical activity. It was characterised by the use of several media, segmented messages, and links to community programming, and effectively increased physical activity of young adolescents. No schedule was reported.
Black et al. (2002) (11)	Cervical cancer screening	Mass media	Behaviour change, attitudes	**Behaviour change**: Of the four studies that used stand alone mass media campaigns, only one was effective and that study targeted a specific sub-population with language specific material. In this campaign, the entire state was exposed to radio, interviews, paid announcements and prizes, over 3 years, for 1.5-2 months yearly. All (n=5) of the studies that combined mass media with other

				strategies were effective at increasing pap smear rates or early cancer detection. The campaign approaches included: 1) Education media campaign television and radio; educational package mailed to GPs. 2) Over 1 month gave educational sessions, television and radio promotions, posters and brochures, workplaces and messages, free screening clinics. 3) Lay health educator or community volunteer using individual or group approach. Two studies found that letters of invitation were effective, but required a centralised registry or survey to identify the women. Of the five studies with no improvement, limitations in the design were identified, including understaffing, low power to detect differences, failure to address system barriers, or failure to report statistical differences. **Attitudes:** Of the studies that found improvement, change was also identified in knowledge, recall of media campaign and behavioural intentions.
Elder et al. (2004) (12)	Driving and driving	Mass media	Behaviour change	**Three studies focused on campaigns with legal deterrence themes.** Three of the evaluated campaigns focused heavily on raising public awareness of enforcement activities and of the legal consequences of drinking and driving. All of these campaigns were evaluated in areas where actual enforcement levels during the campaign were at approximately the same levels as prior to the campaign. The campaign messages were considered credible; however, enforcement levels were already quite high. These campaigns used television, radio, billboards, donated media time, market research. No schedule was reported. **Five studies reviewed evaluated campaigns that highlighted various social and health consequences of alcohol-impaired driving.** One campaign used state-of-the-art marketing methods to influence drinking and driving. Campaign messages depicted relatively mild

				consequences of drinking and driving and modelled desirable behaviour. The campaign reduced crashes likely to involve alcohol. The same campaign messages were also presented as public service announcements in another city where they attained approximately half as much audience exposure as did the paid advertisements. The estimated effect of this study arm was approximately half as strong as that observed for the paid media campaign. The campaigns used television, radio (1 in 6 spots included enforcement messages), newspapers, theatres and billboards. A campaign developed by the Transport Accident Commission (TAC) of Victoria, Australia, used television advertisements depicting realistic and graphic scenes of crashes to highlight the devastating physical and emotional consequences of drinking and driving. Evaluations suggested that this campaign was successful at decreasing alcohol-related crashes. The primary campaign strategy was television (approx. 70%). There was some critique over this campaign in regards to its strong fear-based approach with limited emphasis on modelling desirable behaviours. Similar outcomes were observed in New Zealand, using similar ads and a similar degree of audience exposure.
Tay (2005) (17)	Drinking and driving	Mass media	Behaviour change, attitudes, (ie., acceptance)	Overall, mass media campaigns were likely to have positive indirect effects, including an increase in public awareness and support for other road safety countermeasures. Three studies found that the level of fear arousal is positively correlated with both message acceptance (changing viewers' intentions and self-reported behaviours) and message rejection (defensive avoidance behaviours). In short, highly threatening messages tend to polarise the audience. More importantly, these studies also found that the most important characteristic that determines positive behaviour change in viewers is the response efficacy. Therefore, policy makers should place more emphasis on providing suitable coping strategies to address the underlying threat portrayed in the advertisements instead of relying simply on the emotive appeal.

				Paid advertising campaigns were recommended over public service announcements in order to maintain control over placement and maximise exposure. Furthermore, the benefit in terms of cost savings to society has been shown to outweigh the cost of such campaigns. High production quality will improve the chances of eliciting the intended emotional impact and may maximise the probability that the audience will pay attention to them. This recommendation, however, has to be taken with caution because a big production budget does not necessarily lead to more persuasive advertisements - the impact of high emotional appeal on message acceptance is not unequivocal. The studies found no significant difference in the effectiveness of the campaigns between those that focus on legal deterrence and those that highlight the social and health consequences. It was suggested that some types of messages may be better suited than others for promoting different behaviours. No schedules were reported.
French et al. (2014) (13)	HIV prevention	Mass media	Attitudes (ie., acceptability and intentions)	**Acceptability:** Seven studies reported on acceptability or on the attributes that may affect acceptability. One study, using a multi-media approach reported that men were most likely to agree the campaign had a clear message (around a third of men) but least likely to agree that the campaign was motivating (less than 20% of men). No schedule reported. Six studies were found to increase acceptability of the campaign. These campaigns used imagery such as the use of models representative of the gay community, the benefits of comics for explicit material, and the importance of ensuring imagery and the campaign message complement one another; content such as ensuring messages are not too complex; tone such as not being patronising or blaming; and relevance such as making certain messages are appropriate to the target audience. No schedule reported.

				Intention: Five studies reported on HIV testing or intention to test. Two of these examined campaigns where the primary aim was to encourage HIV testing. One of these campaigns used multimedia and the other used small media, such as leaflets and "knick-knacks" (small branded novelty items such as key-rings, condom packs, and sweets), to complement the mass media campaign. Evaluations of both campaigns reported an increase in the intention to get tested. In the study comparing intervention and control clinics, increases in HIV testing were observed in the campaign clinic, but the greatest increases were observed among Black, southern European and young men, images which featured prominently in the campaign. No similar increases in testing were observed in the two comparison clinics. However, these findings should be interpreted with caution: men in the control clinics were not asked about the reasons for testing; other confounding factors could have affected the observed increases in testing and there may have been contamination across clinics.
Rasura et al. (2014) (15)	Stroke	Mass media	Knowledge, behaviour change	Thirteen campaigns targeted the general public. These campaigns employed several media and study designs but did not allow the contribution of each single medium to be disentangled. One study was an exception. This study evaluated and compared the effectiveness of an 18-month campaign of continuous high level television advertising, intermittent television advertising and newspaper advertising, using a fourth community as a control community. The intermittent television intervention proved the most cost-effective method of raising awareness. That campaign did not promote the need for an emergency response. One campaign was found to have a negative effect. The 4-year campaign was conducted through free media advertising on radio, television, newspapers, posters and websites, but with a low television contribution and a low global intensity. Interestingly, a subgroup analysis showed that the respondents who noticed the campaign (19%) had significantly greater stroke knowledge, suggesting that the messages were well tailored, but low penetration might have been the problem.

				Public health campaigns have also been conducted through the mass media. One campaign implemented a training/information program carried out by emergency health workers, considering they were most suited for identifying effective communication strategies for their territory. A preliminary phase consisted in a training course on cerebrovascular disease for EMS workers, followed by posters placed in pharmacies, shopping malls and on local buses, flyers and bookmarks distributed to local booksellers stressing the need to call the EMS. There was a significant stroke knowledge increase resulting from exposure to the campaign, although it did not have any significant impact on people's behaviour in the case of an acute event.
Stockley & Lund (2008) (16)	Folic acid	Mass media	Behaviour change	A national campaign in the Netherlands included advertisements in newspapers and women's magazines, television and radio commercials, posters in the waiting rooms of general practitioners, midwives and gynaecologists, and information for women wishing to conceive available free from the pharmacist. An additional local campaign was targeted at women in lower socioeconomic groups. Periconceptional folic acid use increased from 16.8% to 48.6%, but socio-economic differences in supplement use remained and persisted in a study carried out 3 years after the campaign. No schedule reported.

Table 3: Summary of findings in the grey literature

Authors	Target of campaign	Campaign	Outcomes measured	Summary of the results
SafeWork Australia (2013) (18)	Occupational health and safety	Campaigns	Knowledge (ie., awareness), behaviour change	This review aimed to identify possible mechanisms that may explain why interventions by regulators influence compliance and work health and safety outcomes, for whom and in what circumstances. Five studies were identified that could contribute to understanding the effect of industry campaigns on business work health and safety practice and outcomes. One study evaluated a UK Health and Safety Executive (HSE) campaign aimed at reducing the risk of musculoskeletal disorders. This study found that the campaign was effective in raising awareness of the issue and showed initial indications of improving outcomes. The campaign strategies used included publicity, inspections, stakeholder engagement and education. The evaluation did not explicitly examine the contribution of different strategies to outcomes. From some of the qualitative material in the report there is some suggestion that education and enforcement were both important. The authors note that this campaign was longer than most previous HSE campaigns, had a higher level of funding, and unlike previous campaigns included seed funding for activities run by other groups. The campaign explicitly targeted workers and businesses and other stakeholders over a long period with the aim of embedding a new understanding and awareness of the issue. The authors argue that the higher level of funding and longer term focus for the campaign contributed to the successful outcome. One study found that a HSE campaign that aimed to raise awareness of slip and trip accidents and encourage business to take action to reduce hazards had very little impact on behaviour. The campaign used communication only and did not include inspections or enforcement. One of the key findings was that those businesses that took action following the campaign were likely to be either already

				taking some action or at least relatively well informed regarding work health and safety issues more generally. One study found that a HSE campaign that aimed to raise awareness of the risk of falling from vehicles and provide information to duty holders about the ways of managing risks resulted in significant levels of recall of key messages and some increase in intention to make changes. The campaign included communications only and did not have an enforcement element. There were relatively minor changes in outcomes at follow-up. Most businesses were taking action on falls from vehicles prior to the campaign and the percentages did not change significantly following the campaign. One study found a small but significant decrease in accidents following an education-only (ie., publicity) safety campaign at a major Danish road construction project. Most workers had worked at the site for less than one year and only ten per cent of workers reported that their working routines had been influenced by the safety campaign. The authors suggest that the observed improvement may be a reasonable outcome for an intervention in construction and note that the accident rate for the site was lower than for a number of other large construction projects in Denmark. The authors also suggested that a primary explanation for the limited impact of the campaign may be the fact that most workers spent only a short time working on the project. One study examined the effectiveness of social marketing in the work health and safety domain. This study aimed to persuade farmers in one state in the US where there was no legal requirement to do so to install rollover protection on their tractors. The study found that the farmers who received a social marketing intervention were significantly more likely to be planning to install rollover protection on their tractors following the campaign. The key aspects of the social marketing intervention included developing campaign messages based on detailed research about the needs, motivations and opinions of the target group.

Oliver et al. (2007) (19)	Height awareness	Campaign	Knowledge (ie., awareness), behaviour change	In 2006, the Health and Safety Executive (HSE) ran a nationally co-ordinated publicity, education and inspection campaign about the risks of working at height. The campaign objectives were to increase awareness of targeted workers and employers of the risks even when working at low height, and to influence attitudes and behaviour to working at height. The HSE 2006 Height Aware campaign had three key components: a media campaign, educational/ promotional events and targeted inspections. **Awareness** There was reasonable recall of the media campaign, where around two in five workers and employers recognised at least one part of the campaign when prompted with images of the press adverts or recordings of the radio adverts. These figures can be extrapolated to the overall population of all employers and workers in Great Britain (though should be interpreted as indicative figures only) and suggests that around 256,000 employers and 10 million workers saw or heard at least one aspect of the Height Aware media campaign. The press adverts demonstrated better recognition than the radio adverts amongst employers (29% compared with 23%), but workers were as likely to recognise a press advert (24%) as a radio advert (22%). Of the four press adverts, 'railings' was the most widely recognised. Of the radio adverts, employers were more likely to recognise the 'awareness' type (20%) than the 'occupation' type (11%); among workers, there were similar levels of recall for both types of radio advert at around one in seven. Extrapolated figures of specific media showed recognition of any press advert at around 165,000 employers and 6.6 million workers, and recognition of any radio advert at around 131,000 employers and 6 million workers.

				Behaviour change Around a fifth of employers and one in ten workers who recognised the media campaign had sought further information about the dangers of working at height (this represents 8% of all employers and 4% of all workers using follow-up stage data). One in ten employers and 6% of workers said they had taken action as a result of the campaign, and more than a third of both respondent types said they planned to take action in the future. The campaign seemed to influence employers and workers in different ways. Among employers, the actions that were taken or planned (combined) were most likely to inform others of the campaign (37%) and to carry out regular risk assessments (28%), although these actions were not the required objective of the media campaign. However, the key message had a greater impact upon workers, where the most frequently mentioned action was to take care or be aware of the dangers even at low height (52%).
Health and community services industry (2004) (20)	Manual handling	Campaign	Behaviour change	The Health, National Manual Handling Campaign 2004 focused on promoting a systematic approach for the management of manual handling risks related to design within the health and community services industry. The campaign model involved workplace audits conducted before (Audit 1) and after (Audit 2) a one-month period of intensive communication about the campaign. The communication strategy was conducted via direct mail and media (the communication activities were different for each State and Territory). In Victoria, the communication strategy included a Media release by the WorkSafe CEO, press release printed in Department of Human Services newsletter, city, regional and suburban newspapers, industry newsletters, union newsletters, two health and safety conference announcements, CD ROM (ie., management of manual handling risk) distributed to 300 workplaces. The campaign audit data and the focus group interviews provided consistent and useful information which has met the aims of the evaluation. Inspectors undertaking the campaign audits universally

				reported dramatic improvements in the standard of manual handling risk management over the last five years, and this was reflected in the claims data from most jurisdictions. The improvements noted were likely to be a consequence of accreditation agency requirements, as well as the activities of the various occupational health and safety agencies in each jurisdiction and the promotion of "no-lift" policies.
Mustard & Bielecky (2008) (21)	Occupational injury and disease	Social marketing campaign	Behaviour change	This report conducted a review of evaluations of social marketing campaigns in occupational injury, disease or disability prevention. 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 behaviours 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 applied 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. We present two case studies that evaluated the effectiveness of social marketing campaigns in occupational injury. The first campaign was referred to as 'On the Right Foot Prevention of injuries caused by slips, trips or falls'. This campaign was promoted to 30,000,000 private sector workers from Hauptverband der Gewerblichen (HVBG) in Germany from 2003-2005. The objective of the campaign was to reduce the incidence of workplace accidents arising from slips, trips, and falls by 15% over two years. The campaign used television and print advertising, posters and pamphlets as well as consultation and inspection activities to target the 30,000,000 workers insured by the Statutory Accident Insurance and Prevention Association in Germany. The evaluation found a 20% reduction in the number of accidents attributed to slips, trips and falls, from 181,000 in 2003 to 144,000 in 2004, 25% reduction in new

				disability pensions attributed to slips, trips and falls, from 4,760 in 2003 to 3,561 in 2004. The evaluation also found evidence to support improved work conditions. The second campaign was referred to as 'Back pain: don't take it lying down' and was population-based media campaign designed to reduce disability associated with back pain. The campaign 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 cause by back pain and corresponding compensation costs. The campaign involved television, radio commercials (involving health care professionals, local celebrities and actors), billboards and posters. The campaign was translated into 16 languages. Management guidelines of compensable back pain were also developed for doctors. The evaluation found a reduction in claims relative to incidence of 8,991 claims in 1996-97 (assuming an average claim of $12k).

4. Summary

4.1 Campaign target

Overall, eleven of the twelve systematic review articles focused on behaviour change, while five studies examined change in attitudes and four in knowledge. All four of the industry/government reports focused on behaviour change, while two focused on change in knowledge and none on change in attitude. One reason for minimal reporting on the intermediate factors may indicate an a-theoretical campaign architecture. Furthermore, the review articles did not provide adequate detail to determine the specific type of behaviour targeted (e.g. avoidance, maintenance etc).

4.2 Type of campaign

Information regarding the campaign strategies and their effects on knowledge, attitudes and behaviour change was extrapolated and are presented in Table 6.

Table 6: Campaign strategies and their effect on outcomes

Mass media campaign approach	Change in outcomes	Number of studies reported
Stand-alone mass media[1]	Knowledge	4
	Behaviour	6
Mass media in combination with entertainment strategies[2]	Knowledge	17
	Attitudes	23
	Behaviour	26
Mass media in combination with community-organising strategies[3]	Knowledge	1
	Attitudes	2
Mass media in combination with law enforcement	Knowledge	2
	Behaviour	8
	Attitudes	3

[1] *No description of mass media strategies, including channel of message distribution.*
[2] *Included communication mediums such as television advertisements, billboards, posters, radio spots, magazine etc.*
[3] *The specific types of community-organising strategies were not frequently reported.*

Notwithstanding the limitations detailed previously, mass media campaigns in combination with entertainment strategies, typically involving large scale distribution of the message through multiple media outlets, have been more frequently reported as being effective in changing knowledge, attitudes and behaviour.

While the types of 'community-organising' strategies were not frequently reported, Randolf and colleagues (6) provided a concise definition of community-organising strategies. The authors defined community-organising strategies as community outreach and community advocacy. Community outreach involves professionals and others reaching out to target populations to disseminate health information. Community advocacy focuses on shaping the public discourse about import health-related topics (eg., tobacco use) in order to promote population-based change. Specific activities may include personal visits to legislators, community rallies or telephone calls and letter writing campaigns.

4.3 Duration of campaign

Only half of the review articles and two campaigns described in the grey literature included information on the duration of the campaign. Campaign durations ranged from as short as 8-13 weeks to 4 years.

4.4 Intensity of campaign

Intensity of the campaign strategy was not reported in any of the studies or reports.

5 Discussion

The aim of this review was to better understand the effectiveness of mass media health and safety campaigns, nationally and internationally, in shifting health and safety attitudes, knowledge and behaviour. Twelve systematic reviews and four industry/government reports were included in this report. All of the systematic reviews focused on health behaviours – there were no reviews in the academic literature that targeted OH&S behaviours. However, the four reports identified in the grey literature focused on OH&S.

What was clear from the current report was that the evidence around mass media campaigns and behaviour change is ambiguous. While the results of this review suggest that mass media campaigns that involve large scale distribution of messages through multiple media outlets may provide an effective approach for changing knowledge, attitudes and behaviour, there was limited information regarding the types of behaviour targeted for change (e.g., avoidance, maintenance, increase etc.), campaign strategy, and duration and intensity of campaign. This information is critical as success of a campaign is heavily dependent on this information, in addition to how it is being measured.

Given the limitations of the articles evaluated in this review, we have explored the health promotion literature to provide some guidance. There are three issues that should be considered. The first issue relates to the campaign strategy. The broader evidence suggests that while health education has a long history in promoting health and the prevention of disease, interventions that rely solely on communication or education have generally failed to achieve substantial or long-term behaviour change (22). This reflects the varied individual, social and

cultural determinants, and the particular behaviour in question. While education is one component of designing a behaviour change intervention, many behaviours require more than just a mass-media campaign. Many successful behaviour change campaigns have involved multi-faceted interventions (e.g. seatbelts, drink driving), and these can include aspects such as:

- Environmental strategies – changes to the environment that promote healthy behaviours (eg., bike paths) or makes unhealthy behaviours difficult (removing junk food from canteens).
- Policies or legislation (eg., healthy catering policies, laws (seatbelt use or over 18 to purchase alcohol), advertising restrictions).
- Economic – pricing policies (junk food more expensive) or tax incentives or penalties for participating in behaviour (eg., speeding tickets).

The second issue relates to the advertising approach. Fear-arousing appeals have gained the most attention in publicity campaigns (23). These types of messages aim to evoke a strong fear response in individuals through presenting individuals with the negative outcomes that they may experience as a result of engaging in an unsafe and/or illegal behaviour. It is expected that the threat will evoke fear at the prospect of experiencing the aversive outcomes, which will in turn motivate the audience to align their attitudes and/or behaviours with those recommended in the message (24, 25). Road safety is particularly renowned for its use of physical threats in which drivers and passengers are often shown to be injured and killed as a result of unsafe and/or illegal behaviour (17, 26, 27). Typically, these advertisements, in a graphically explicit manner, portray the crash scene and victims (28). There has been mixed evidence regarding the effectiveness of fear-arousing appeals. Lewis and colleagues (23) state that the most consistent and definitive conclusions appear to be in relation to the importance, not of fear arousal but, of relevance (ie., vulnerability) and provision of coping strategies and recommendations that an individual can effectively enact to avoid or prevent a threat from occurring (i.e., self-efficacy). This statement has been echoed in the OH&S field. In fact, a Safe Work Australia report (18) identifies efficacy as a critical component in ensuring that individuals can develop self-management capacities in their safe working practices.

The third issue relates to the timeframe of the campaign. Changing behaviour is not a quick fix, with evidence in related fields (for example health and road safety) clearly establishing that behaviour change is a long and complex process, which takes many years to eventuate (in the range of 20-25 years). However, as evidenced in this report, change in behaviour and intermediate variables can be achieved in shorter time frames; although there was no evidence to suggest this change was sustained. Adding to the complexity of interpreting timeframes for behaviour change is the issue of what objectives are being measured; these occur in the short, medium and long term, and are dependent on the specific type of behaviour being measured. Recognition of the imperative to change, the associated benefits and then the motivation to actively engage in change varies across both the communities involved and also the behaviour itself (29). For example, some changes will be readily accepted (e.g. fashion), whereas more fundamental aspects of life (eg., those relating to religious or cultural beliefs) may take several decades to eventuate. Furthermore, research evaluating community change programs

recognise that particular subgroups or members within these communities may be more receptive to new ideas and change than others. For example, younger community members may be more responsive to change compared to older members who are more suspicious to change, and rural communities may take longer to embrace change compared with city communities (29). This same effect is likely to occur in the organisational context.

Looking to successful examples, reductions in drink driving in Australia have been partially attributed to behaviour change campaigns. Figures from TAC indicate that Victoria's road toll has been almost halved, with a marked decrease in the incidence of drink driving (30). Similarly, Victorian statistics show that the number of drivers testing over the legal limit decreased from one in 255 in late 1989 to one in every 668 in 1989 and 1994 respectively (31). However, campaigns to reduce drink driving have been in existence for more than 20 years, and were conducted in conjunction with legislation changes and extensive enforcement campaigns to disincentivise drink driving. This highlights the lengthy process over which behaviour change occurs, and also highlights the complexity in changing behaviours where there are strong incentives not to change. Of course, not all behaviours are as difficult to address, and this highlights the need for understanding the determinants of the behaviour you are attempting to change.

There are also a number of other issues that need to be considered for behaviour change. These include (32):

- Saliency - this reflects the importance of the issue in society. For example, there may be high awareness of an issue, but if it is not perceived as important this makes it difficult to get traction for change (e.g. family violence).
- Counter-messages – the messages that are delivered and the timing of delivery are both important in health promotion campaigns. Campaigns are best suited to segments where there are no competing messages. For example, a competing message for OH&S would be one that focuses on risk taking behaviours, extreme sports etc.
- Difficulty – the amount of effort required for the change is a major factor. Traction is more likely when the target behaviour is easy to adopt, rather than one which is more difficult and requires more effort.
- Addictive properties – even if people want to change behaviour, addictive properties make it difficult. This is not likely to be a factor for OH&S campaigns, unless the target relates to drug, alcohol or smoking during work time for example.
- Social norms and peer pressure – the relative social acceptance (or the converse) of a given behaviour can affect the likelihood of change.
- Selecting the right medium - this is an important issue because whether the target audience can be reached is dependent on the medium. Concurrent availability of required services and products, availability of community-based programs and policies that support behaviour change (33). This issue was supported in the findings of this review.

5.1 Key considerations for developing a behaviour change campaign

From the evidence presented, there are a number of key considerations for the development of a mass media campaign. These include:

- What are you targeting? Knowledge, skills, awareness, behaviour?
- What is your overall outcome? (eg., reduction in the number of claims due to manual handling)
- What is your target behaviour? (avoidance, increase, change – see Table 2)
- Who are you targeting and is the behaviour within their control? (e.g., workers, supervisors)
- Are you targeting sub-groups and how do you plan to segment the population? (eg., high-risk industries)
- What forms of media do you plan to use? (e.g., television, radio, social media)
- What type of campaign are you planning? (e.g., entertainment, enforcement)
- Are you going to supplement with other activities (e.g., training programs)? Does it coincide with changes in policy/practice/legislation? How do you define success?
- How are you going to measure success? If you want to evaluate the campaign properly, you need to define a theoretical model, collect baseline data and measure intermediate outcomes along the way.

6 Conclusion

The findings from the review along with the evidence from the broader health promotion literature aim to guide WorkSafe in the development of their media communications strategy in 2015. As noted in this report, WorkSafe need to consider a wide range of, ranging from identifying an appropriate target behaviour, population, type of media and campaign to an evaluation framework to measure success. The evidence would suggest that consideration of each of these issues is likely to result in a successful media communications strategy.

7 APPENDIX A

Theories of individual behaviour change

Model	Theoretical basis	Application	Limitations
Heath Belief Model (31)	Psychosocial model based on an individual's attitudes and beliefs about the severity and outcome of the health risk, and their self-efficacy to successfully carry out the required health behaviour change actions.	▪ Developed to explain health behaviours ▪ Used in health prevention programs	▪ Only accounts for attitudes and beliefs, may overlook other important factors ▪ The model's four attitudes and beliefs have been shown to have variable effect depending on the health behaviour being targeted
Theory of Reasoned Action (34)	Based on the predicate that behaviour is driven by intention. These intentions are influenced by attitudes, subjective norms (social influences) and personal control (self-efficacy).	▪ Identifies the role of perceived social norms in health behaviour ▪ Provides outline of factors that can be targeted during interventions	▪ Assumption that intention leads directly to behaviour ▪ No distinction between personal and social influences on intentions and behaviour
Transtheoretical Model (35)	Circular model that identifies 5 stages of change: pre-contemplation, contemplation, determination/ preparation, action and maintenance.	▪ Recognises that change is not a static event rather a process ▪ Useful for health practitioners to identify readiness for change ▪ Promotes development of flexible programs ▪ Frequently used in smoking cessation and other addictive behaviours ▪ Can be used in conjunction with other models	▪ Considered as an approach rather than an actual model ▪ More specifically designed to address addictive behaviours
Social Learning Theory (36)	Based on the interaction that exists between an individual and their environment	▪ Considered the most 'complete' theory	▪ Criticised for its narrow focus on the environment as the key influence on behaviour at the expense of other influences ▪ Deterministic (proposes all behaviour is caused by preceding factors and is thus predictable).

8 APPENDIX B

Community behaviour change models are targeted at the community level. Although many of the behaviour change models aimed at individuals also acknowledge the influence of social or environmental factors, the key difference is that community theories aim to change behaviour at the community level (i.e. altering social norms and constructs) which differs to the individual level.

Model	Theory	Application	Limitations
Community Mobilisation Theory (37)	Identifies that community mobilisation is achieved by a focus on one or a combination of, three approaches **Locality (community) development** Focused on community engagement and ownership, this approach facilitates mobilising the community to actively identify and devise solutions for its own issues. **Social planning** Empirically based rational approach. It is task-orientated and predominantly professionally controlled and driven. **Social action** Focussed on community capacity and implementing changes. Encourages a focus on disadvantaged groups within the community.	Aims to engage the community in defining their own issues. Social norms are challenged through community-based education and change is facilitated within communities by improving or providing the necessary services and equity to these services. Community empowerment is both an aim of the model and the driving force behind the implementation and sustainability of changes. Applied to many and varied community health programs (e.g. smoking reform, HIV prevention and substance abuse).	May aim to include the community but commonly key decision making is dominated by the professional bodies organising the programs. Programs often require a substantial investment of resources.
Diffusion of Innovation (38)	The creation of innovative or novel practices (change) and the process through which these innovations are then communicated to the wider community. Proposes that the rate at which change occurs is related to: the adoption classification of members within the community (e.g. early adopters, late adopters) and the degree or level of innovation/change required.	Systematic theory that explores how new ideas are disseminated through communities and analyses the variations in the rate of adoption of these ideas. Identifies that well-developed communication systems within communities support more rapid change.	Labelling of population groups as laggards who will not change is simplistic and discourages exploration other plausible explanations for why groups are resistant to change.

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