

Mass Media Health Communication Campaigns Combined with Health-Related Product Distribution

A Community Guide Systematic Review

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Context: Health communication campaigns including mass media and health-related product distribution have been used to reduce mortality and morbidity through behavior change. The intervention is defined as having two core components reflecting two social marketing principles: (1) promoting behavior change through multiple communication channels, one being mass media, and (2) distributing a free or reduced-price product that facilitates adoption and maintenance of healthy behavior change, sustains cessation of harmful behaviors, or protects against behavior-related disease or injury.

Evidence acquisition: Using methods previously developed for the Community Guide, a systematic review (search period, January 1980–December 2009) was conducted to evaluate the effectiveness of health communication campaigns that use multiple channels, including mass media, and distribute health-related products. The primary outcome of interest was use of distributed health-related products.

Evidence synthesis: Twenty-two studies that met Community Guide quality criteria were analyzed in 2010. Most studies showed favorable behavior change effects on health-related product use (a median increase of 8.4 percentage points). By product category, median increases in desired behaviors ranged from 4.0 percentage points for condom promotion and distribution campaigns to 10.0 percentage points for smoking-cessation campaigns.

Conclusions: Health communication campaigns that combine mass media and other communication channels with distribution of free or reduced-price health-related products are effective in improving healthy behaviors. This intervention is expected to be applicable across U.S. demographic groups, with appropriate population targeting. The ability to draw more specific conclusions about other important social marketing practices is constrained by limited reporting of intervention components and characteristics.

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Context

Preventable hazardous behaviors contribute to injuries, illnesses, and deaths each year in the U.S., from engagement in wheeled sports without proper protective gear (e.g., helmets) to making poor dietary choices that heighten cardiovascular disease risk.¹ Over the last several decades, health communication campaigns and social marketing concepts^{2,3} have been used widely in the field of public health to disseminate health promotion messages designed to change behaviors and reduce morbidity and mortality.

Health communication campaigns that incorporate social marketing concepts were first used in family planning to promote use of contraceptives.^{4–7} In the late 1960s, such campaigns were used in intensive national tobacco counter-marketing campaigns. Since then, health communication campaigns have been used in many other public health domains. These campaigns can transmit messages that influence knowledge, awareness, and social norms, and help to change many health-related behaviors.

Commercial marketing principles of combining mass media with product distribution were well established long before their adoption into the public health domain.⁸ Over time, refinement of communication theories and campaign strategies and their application to an extensive range of health behaviors have led to more sophisticated campaigns.⁹ Evidence demonstrates that health communication campaigns, when combined with other strategies (e.g., community events), compared to those that use only a single strategy (e.g., poster campaign), have a greater impact on improving health behaviors.¹⁰

A meta-analysis¹¹ of the effectiveness of mediated health communication campaigns on a broad range of topics (which delivered messages through at least one form of media but no product distribution) found that such campaigns generally improve health behaviors, with a mean relative increase of approximately 10% in the targeted behaviors. Mass media approaches, although sometimes cost prohibitive, have both a broad reach and awareness-building potential among consumers.

This Community Guide review aimed to extend this body of research by assessing the effectiveness of health communication campaigns that include both mass media and health-related product distribution to increase healthy behavior change. The criterion requiring campaigns to use a mass media channel was developed to decrease the challenge of distinguishing campaigns from health education interventions, resulting in a more homogenous body of evidence, and allowing for a well-defined scope for a systematic review.

Overview of Health Communication Campaigns

Health communication campaigns apply integrated strategies to deliver messages designed—directly or indirectly—to inform, influence, and persuade target audiences' attitudes about changing or maintaining healthful behaviors.¹² Messages can be transmitted through a variety of channels, such as traditional mass media (e.g., TV, radio, newspapers); the Internet and social media (e.g., websites, Facebook, Twitter); small media¹³ (e.g., brochures, posters, fliers); group interactions (e.g., workshops, community forums); and one-on-one interactions (e.g., hotline counseling).¹⁴

In particular, use of traditional mass media in health communication campaigns has the potential to transmit a behavior change message faster and farther than most other communication approaches.¹⁵ A variety of such mass media campaigns have been found to be effective. The internationally recognized SunSmart campaign, whose slogan was “slip on a shirt, slop on sunscreen, slap on a hat, seek shade, and slide on some sunnies,”¹⁶ used both broadcast and print media to communicate skin cancer prevention messages, substantially increasing the sun-protection behaviors recommended by the campaign.¹⁷

Similarly, over the last several decades, tobacco counter-marketing campaigns have led to reductions in tobacco use in the U.S. and internationally.^{18,19} The Florida “Truth” campaign used paid TV and radio advertisements, along with billboard and other print media, to expose youth to the tactics of the tobacco industry, the truth about addiction, and the health and social consequences of smoking.²⁰

Overview of Social Marketing Campaigns

Social marketing is the adoption of strategic marketing practices to promote social change.^{3,14}

According to the National Social Marketing Centre, eight benchmark criteria should be considered in designing a successful campaign: consumer orientation, behavior, theory, insight, exchange, competition, segmentation, and methods mix.^{21,22} The most notable criterion of a social marketing campaign is “the marketing mix,” often referred to as the four P's (product, price, place, and promotion).^{14,16,17} Additional P's have been suggested in the marketing literature, including factors pertinent to behavior change (e.g., people, process, purse strings, and physical evidence).^{14,21}

One common public health application of social marketing is to combine a health communication campaign (i.e., promotion) with the distribution of free or reduced-price products (i.e., product and price). Accompanying a product with a campaign “enables the target to manifest its motivation and ability” to see the benefits of engaging in that behavior without force.⁸

For example, the National Safe Kids campaign,²³ which used both mass media and small media and distributed free and reduced-price helmets, increased awareness among parents about the importance of wearing helmets to prevent injury and deaths related to wheeled sports, thus increasing children's helmet use.^{23–26} "Hombres Sanos," an HIV-prevention campaign targeting Spanish-speaking men who have sex with men, markedly increased safe sex practices by simultaneously distributing free condoms and promoting condom use via broadcast media, print materials, transit ads, and activities at local venues.²⁷

The goals of this review were to (1) assess and evaluate high-priority public health outcomes; (2) evaluate the potential utility of social marketing concepts in improving effectiveness of health-promotion campaigns; (3) provide specific recommendations to enhance current strategic and operational approaches; (4) answer questions about the value of using health communication and social marketing principles in the field; and (5) determine whether these principles are broadly applicable.

Intervention Definition

The specific interventions evaluated in the systematic review combine health communication campaigns promoting behavior change through multiple communication channels, including mass media, with the distribution of free or reduced-price products that

- facilitate the adoption or maintenance of health-promoting behaviors (i.e., increased physical activity through pedometer distribution combined with walking campaigns);
- facilitate or help to sustain the cessation of harmful behaviors (i.e., smoking cessation through free or reduced-cost over-the-counter nicotine replacement therapy [NRT]); and
- protect against behavior-related disease or injury (i.e., condoms, child safety seats, recreational safety helmets, and sun-protection products).

In this review, mass media health communication campaigns combined with health-related product distribution are defined as campaigns that

1. use messages designed to increase awareness of, demand for, and appropriate use of a product. (To provide multiple opportunities for exposure, messages had to be delivered through multiple channels, one of which had to be mass media.); and
2. distribute a product to facilitate adoption or maintenance of health-promoting behaviors, sustain cessation of harmful behaviors, or protect against behavior-related disease or injury. (To reduce cost-related barriers to use, distributed products were free or discounted.)

This review considered only those health-related products that were

1. previously demonstrated through an evidence-based process (such as a peer-reviewed systematic review or multiple rigorous studies) to improve health-related outcomes (e.g., increased physical activity; smoking cessation; and reductions in disease, injury, or death);
2. tangible;
3. not a service (e.g., mammogram);
4. not exclusively available through prescription or administration by a health professional (e.g., vaccination or prescribed medication);
5. used repeatedly or continually for desired health behavior change and disease and injury prevention effects (e.g., using condoms, wearing helmets) rather than a one-time behavior (e.g., installing smoke alarms); and
6. not a food marketed as being "healthful" (e.g., oatmeal).

Evidence Acquisition

Methods for Conducting the Review

General methods to conduct systematic reviews for the Community Guide and to develop evidence-based recommendations are described in detail elsewhere.^{28,29} The conceptual approach and methods specific to this review, including intervention selection and outcome determinations, are described here.

Systematic Review Development Team

The systematic review development team (the team) consisted of scientists and research fellows from CDC's Community Guide branch collaborating with subject matter experts and consultants, including members of CDC's former National Center for Health Marketing; members of the Community Preventive Services Task Force (Task Force); and liaisons to the Task Force. Subject matter experts from Harvard University, Agency for Healthcare Research and Quality, and Fielding School of Public Health contributed perspectives from research, practice, and policy related to marketing, social marketing, health communication, health education, and health literacy.

Conceptual Approach

The analytic framework (Figure 1), which helped guide the systematic review process, illustrates the conceptual pathways by which health communication campaigns combined with product distribution can increase the adoption or performance of health-related behaviors to improve population health and ultimately decrease morbidity and mortality. It was developed through team discussions and an in-depth literature search of health communication and social marketing intervention studies and reviews.

The intervention may affect ultimate health outcomes through changes across varied levels of the social ecologic model (e.g., individual, organizational, community), leading to use of products with direct protective effects (e.g., bicycle helmets) or that facilitate adoption of healthy behaviors (e.g., physical activity with use of a

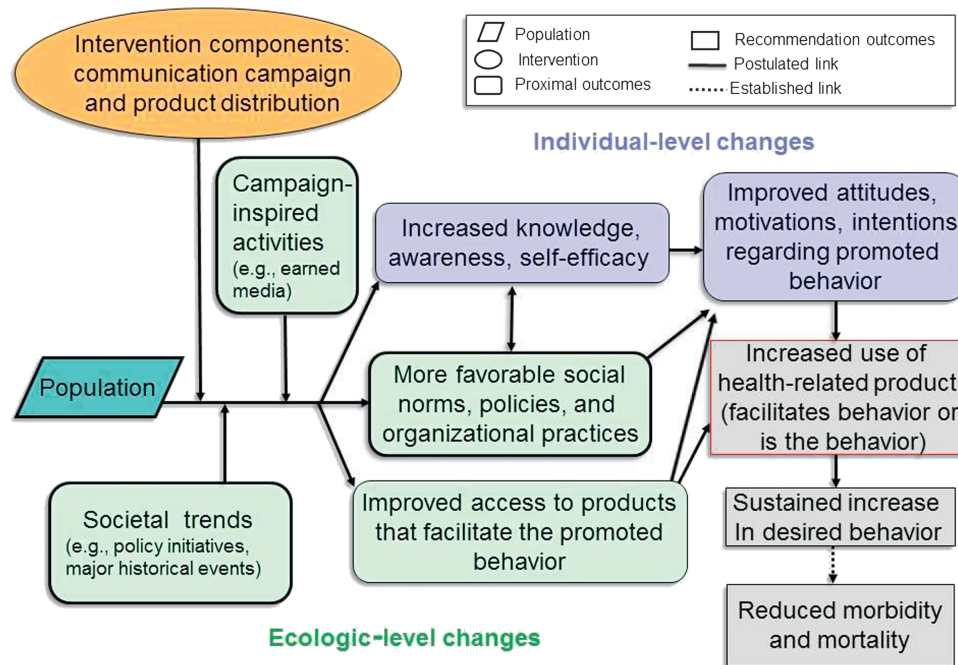


Figure 1. Conceptual model of effects of health communication campaigns that include mass media and health-related product distribution

pedometer). Incorporating a product distribution component to the intervention improves access by providing products free of charge or at a reduced price. Products can be distributed at various events³⁰ or through partnerships with local businesses.

Media campaigns can support a variety of strategies to promote healthy behaviors. In a physical activity study,³¹ campaign implementers collaborated with city council members to promote walking by installing permanent motivational signs throughout the community. Policy initiatives can occur early in a campaign or after assessment of a campaign's effectiveness. Such campaigns may benefit from increased awareness of the health issue generated by earned media,³² which involve reporting by local media, often prompted by a news release generated from state or local health departments about campaign efforts and outcomes.

The intervention may generate more favorable social norms about the promoted behavior, which, in turn, may enhance self-efficacy and intentions to engage in the behavior. Over time, campaigns may also garner community support, as persistent campaign messages create shifts in attitudes about the promoted behavior.³³

Ecologic-level changes have enormous potential to influence individual-level behaviors. The principles of health promotion^{34,35} plant a strong foundation to capitalize on the interaction between changes at the individual and ecologic levels. A well-designed campaign uses formative research to create messages that effectively influence the knowledge, attitudes, and behaviors of the target audience.³⁶

Audience exposure to the messages influences engagement in the desired behavior. As messages are reinforced through repeated exposure, the campaign's message reach and target audience expand, as does the likelihood of, at least, short-term effects on

behavior.⁶ Further, the enhanced "availability, accessibility, and affordability" of a health-related product may increase adoption and maintenance of the healthful behavior, resulting in a decline in morbidity and mortality.⁶

Economic Evaluation

Evaluations of economic efficiency are conducted if the Community Preventive Services Task Force recommends an intervention. The methods and findings of the economic evaluation of mass media health communication campaigns combined with health-related product distribution interventions are described in an accompanying article.³⁷

Search for Evidence and Criteria for Inclusion

Electronic searches were conducted for literature published between January 1980 and December 2009. References listed in all retrieved articles were examined and information from subject matter experts on the team were incorporated. The full search details are available at www.thecommunityguide.org/healthcommunication/supportingmaterials/SScampaigns.html.

The inclusion criteria for this review required that studies evaluated an intervention that met the definition specified above; were published in English; were conducted in a high-income economy (data.worldbank.org/about/country-and-lending-groups); were a primary study rather than, for example, a guideline or review; and applied a study design that compared an exposed group to an unexposed group (i.e., no intervention), measured a group's exposure pre-intervention and post-intervention, or compared a post-only design with a concurrent comparison group.

Abstraction and Evaluation of Studies

Each study that met the inclusion criteria was abstracted independently by two reviewers, using the standardized Community Guide abstraction form.²⁸ Discrepancies between reviewers were reconciled by consensus among team members. Design suitability was rated as greatest, moderate, or least, depending on the degree to which the design protected against threats to validity.²⁹

The intervention and study quality of execution was rated as good, fair, or limited, based on population and intervention description, sampling, measurement of exposure, reliability and validity, how the data were analyzed, and how the results were interpreted.²⁹ Only studies with good or fair quality of execution were included in the review. From the data in those included studies, the team calculated effect estimates for study outcomes whenever sufficient information was available to do so.

Effect Estimate Calculations

Health-related behavior change was calculated from use of the product that directly protected the user or facilitated change. Using data from the last available time point in each study, the absolute percentage point (pct pt) change in the proportion of people engaging in a health-related behavior change (e.g., booster seat use) was calculated for people exposed to the intervention, and compared to changes among people unexposed to the intervention:

Absolute pct pt change = (Intervention Prop_{post} – Intervention Prop_{pre}) – (Comparison Prop_{post} – Comparison Prop_{pre}),
where Prop. = proportion of people.

For continuous variables (e.g., number of steps per day), a similar difference in differences approach was used to calculate effect estimates for changes in group means:

Difference in differences of the mean = (Intervention Mean_{post} – Intervention Mean_{pre}) – (Comparison Mean_{post} – Comparison Mean_{pre}).

For pre–post studies, simple differences were used.

Results were summarized using descriptive statistics (medians and interquartile intervals [IQIs]) for the entire body of evidence and for subgroups of studies stratified by key methodologic and substantive variables. For subgroups consisting of five or more studies, an IQI was presented as an index of variability; otherwise, a simple range of values was reported. Studies that did not report data in these metrics were summarized separately.^{31,38–41}

When outcomes were assessed at multiple time points, effect estimates were calculated using the earliest available measurement pre-intervention and the last available follow-up. For studies that reported different measures of a given outcome, consistently applied rules were used to select the “best” measure with respect to validity and precision (e.g., when different helmet use measures were reported, observed helmet use was selected over self-reported measures). Results adjusted for effects of potential confounders were used in preference to crude effect measures, when both were reported.

In addition to assessing outcomes related to the intervention’s effectiveness in changing the health behaviors of interest, the team assessed issues related to intervention applicability across contexts and populations. The team also considered other benefits and potential harms from the intervention, as well as considerations for implementation, including barriers.

Evidence Synthesis

Intervention Effectiveness

Initially, 15,941 studies were identified in the search. Of these, 958 were obtained for full-text review. Following the review, 936 articles were excluded after full-text review for not meeting the inclusion criteria.

A total of 23 studies (with 26 study arms)^{24–27,30,31,33,38–53} evaluating the effectiveness of health communication campaigns that use multiple channels, include mass media, and distribute free or discounted health-related products were ultimately considered for inclusion. One study, with limited quality of execution, was excluded from all analyses (Figure 2).⁴⁷ Of the remaining study arms, three^{38,42,43} had good and 19^{24,30,39–41,44–53} had fair quality of execution. Specific details on the 22 studies included in analyses (25 study arms)^{24–27,30,31,33,38–46,48–53} are provided at www.thecommunityguide.org/healthcommunication/supportingmaterials/SETcampaigns.pdf. Analyses were conducted in 2010.

Of all the health-related products that were eligible for this review, six (i.e., child safety seats, condoms, recreational helmets, NRT, pedometers, and sunscreen) were represented in the included studies. The studies in this review reported outcomes using a variety of effect measures for each product or behavior outcome (Table 1). Although a search was performed for studies of additional health-related products that assessed effectiveness or measured the outcome of interest, none were found.

In the 17 studies (20 study arms)^{24–27,30,33,42–46,48–53} shown in Figure 3, data on intervention effects on the proportion of people engaging in a healthy behavior are shown as pct pt changes. Data points to the right of the zero line are in the favorable direction. The median increase in these studies was 8.4 pct pts (IQI=2.7, 14.5). Although the magnitude of intervention effects varied, favorable results were found for at least one intervention promoting each of the six distributed health-related products.

Overall, results were consistently favorable across products and a wide range of baseline usage rates (median baseline usage rate of 9.7 pct pts, IQI=5.1, 18.2). Health behavior change for five included studies could not be expressed as pct pt changes,^{31,38–41} but the results were consistent with the rest of the body of evidence. Three study arms^{33,45,51} did not show favorable results, which the authors attributed to intervention staffing issues, lack of proper investment in each implemented outreach event, and intervention exposure.

Key intervention characteristics and stratified effect estimates are described in Table 2. The most commonly evaluated interventions were those promoting use of condoms and recreational safety helmets. Results were

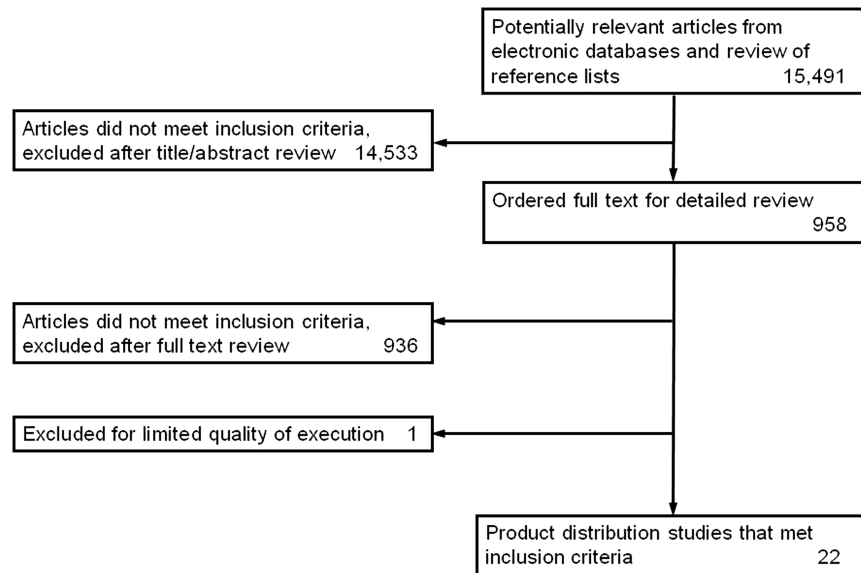


Figure 2. Flow diagram showing number of studies identified, reviewed in full text, reasons for exclusion, and total number of included studies

consistently favorable, without any clear differences in estimated effect magnitude across strata.

Smoking-cessation campaigns and product distribution can affect overall smoking rates in two complementary ways. First, the intervention can increase the total number of smokers who called quitlines, which has been demonstrated to increase smoking cessation (www.thecommunityguide.org/tobacco/quitlines.html). The intervention resulted in large increases in calls to quitlines, ranging from 57% to 2,500%. Second, the proportion of quitline callers who actually quit smoking increased by a median of 10 pct pts in the intervention group (Table 2), likely as a result of distribution of free NRT. In one of the studies, 89% of NRT recipients continued purchasing it after free supplies ran out, showing that initial free distribution increased longer-term demand for use of NRT.⁴⁸

Incremental effects of combining product distribution with health communication campaigns. To examine the incremental effects of adding distribution of health-related products to health communication campaigns, three additional analyses were carried out for (1) a broad range of health behaviors; (2) use of a specific product (i.e., condoms); and (3) a specific health communication message with and without product distribution.

To assess a broad range of health behaviors, results from studies in this review were compared to those from a meta-analysis of comparable, but not identical, health communication campaigns.¹¹ Those studies addressed a similar range of behaviors and also included a mass media channel but did not include product distribution. The meta-analysis review found that different types of

campaign messages resulted in a relative increase of approximately 10% from baseline in the targeted behaviors. When results from the current review were expressed using the same metric, the median absolute increase (8.4 pct pts) in target behaviors translated to a median relative increase of 77.8%, substantially larger than the relative increase without product distribution.

Among studies that assessed effectiveness of health communication campaigns promoting use of a specific product (condoms), with^{27,33,44,49} and without^{54–58} product distribution, studies with product distribution increased condom use by a median of 4.0 pct pts (four studies, IQI= –4.0, 10.8) and studies without product distribution increased condom use by a median of 1.5 pct pts (four studies, IQI= –16.1, 7.3). Taken together, the weight of this evidence indicates that integrating product distribution with a health communication campaign can increase effectiveness.

A direct comparison of a specific health promotion message with and without product distribution was performed using supplementary evidence from a smoking-cessation campaign already included in the review.⁴⁸ This study directly compared a smoking-cessation promotion message alone with one combining the message with offer of a free product: a cigarette substitute. After the promotion-only message, quitline calls increased by about 50%, compared with an increase of about 100% after promotion with product distribution. Although the cigarette substitute did not meet criteria for an NRT health-related product, the conceptualization of the campaign and product promotion and distribution intervention process provide some evidence that adding product distribution does increase healthier behavior.

Table 1. Health-related products and measurements of use

| Product or target behavior | Outcome measures | Instrument |
|---|--|---------------------------------|
| Child safety seats | Use of booster seat | Observation of use |
| Condoms | Condoms at last intercourse | Questionnaire |
| | Any unprotected anal intercourse in the past 2 months | Questionnaire |
| | Condom use with main partner at last intercourse | Questionnaire |
| | Unprotected vaginal or anal sex with a female partner during the last 60 days | Questionnaire |
| | Proportion of times used condoms in the last 4 weeks among those reporting sexual activity | Questionnaire |
| Recreational safety helmets | Use of helmet | Observation of use |
| | Wore helmet at last ride | Questionnaire |
| | Parent report of child wearing a bicycle helmet at least 50% of the time | Questionnaire |
| Smoking cessation (over-the-counter nicotine replacement therapy) | Quit rates | Questionnaire |
| | 6 months since abstinence | Questionnaire |
| | Quitline calls | Call volume |
| Physical activity (pedometers) | Time spent walking, moderate and vigorous activity during the last week | Questionnaire |
| | Steps per day | Pedometer data |
| Sun-protection products | Sunscreen (SPF 15) use (days) | Sunscreen use recorded in diary |

SPF, sun-protection factor

Applicability

The reviewed studies evaluated intervention effectiveness in a wide range of urban, rural, and suburban settings in the U.S. and Australia,^{31,40} Canada,²⁴ Belgium,³⁸ and Israel.²⁵ Many papers did not report details on population demographics, such as race, age, and education. Nonetheless, favorable results were found for interventions targeting a variety of specific demographic groups. Populations addressed included African Americans,⁴¹ people of Hispanic origin,^{27,43,45} low-income groups,⁴⁵ and men who have sex with men.^{24,27,44} Owing to the consistency of these favorable effects and the lack of any strong a priori reason to expect different effects across populations for appropriately targeted campaigns, the evidence from this review is likely to be broadly applicable.

Potential Harms and Additional Benefits

No significant harms of health communication campaigns with product distribution were reported in the

reviewed studies or postulated by the review team. However, additional benefits to implementing this intervention were identified through information gathered from reviewing the literature and expert consultation. One benefit, reported in an included study,³³ was that targeting condom usage fostered an environment that encouraged dialogue between adults and teenagers, and among teenagers themselves, about risky sex behaviors. Other potential benefits, conceptualized by the review team, included reaching populations beyond the scope of those originally targeted and encouraging community involvement and partnership (e.g., retailers responded to the campaign by moving products to accessible areas because they saw increased demand for products).

Considerations for Implementation

Although no common barriers to implementation were reported in the included studies, some unique challenges were mentioned. In one case, retailers sold products that

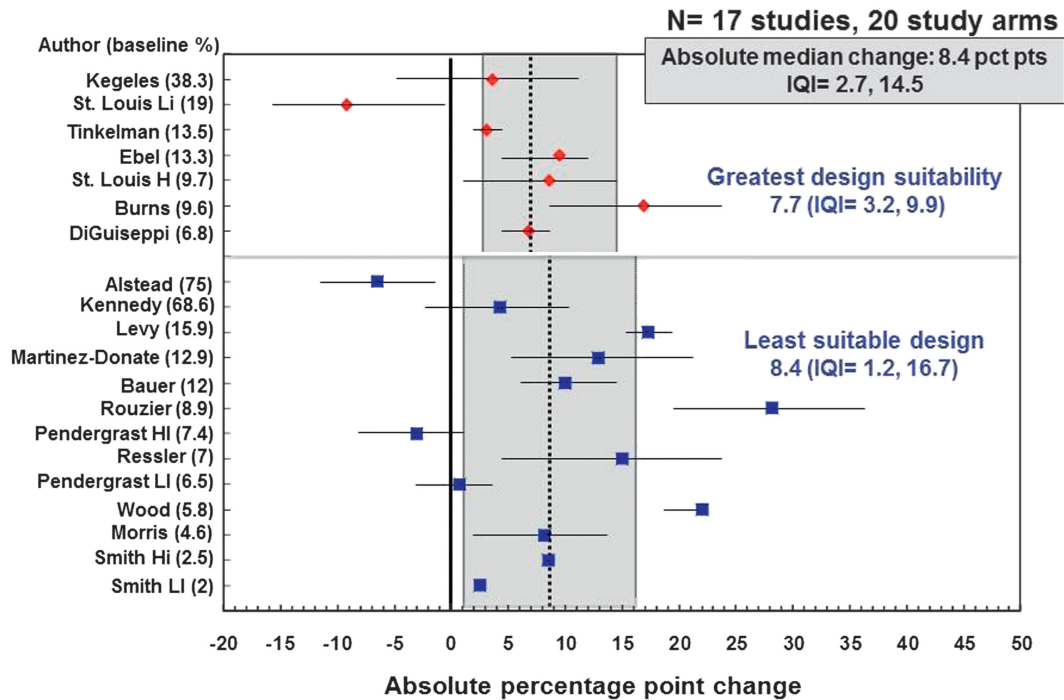


Figure 3. Change in health behavior related to product use
 IQI, interquartile interval

were intended to be free, and in another case there was a lack of community buy-in to the campaign approach.⁵¹ For condom promotion and distribution campaigns, community resistance to condom distribution, particularly when targeted to youth, can be a problem.⁴¹

Conclusion

Summary of Findings

According to Community Guide rules of evidence,²⁹ there is strong evidence that health communication campaigns that use multiple channels, including at least one mass media channel, combined with promotion and distribution of free or reduced-price health-related products, are effective. The types of behaviors promoted in reviewed studies were use of products that (1) directly protect against behavior-related disease or injury (i.e., condoms, child safety seats, recreational safety helmets, and sun-protection products); (2) facilitate adoption or maintenance of health-promoting behaviors (i.e., increased physical activity through pedometer distribution combined with walking campaigns); and (3) facilitate or help sustain cessation of harmful behaviors (i.e., smoking cessation through free or reduced-cost over-the-counter NRT).

Although the magnitude of intervention effects varied across evaluated behaviors, results were positive for all six behaviors. Thus, it is reasonable to expect that findings will apply to similar interventions that promote use of a

broader range of health-related products that meet the review's product eligibility criteria as described in the Intervention Definition section. The effectiveness of an intervention promoting use of health-related products other than those distributed in the reviewed studies, however, should be further assessed by public health practitioners to ensure that the intervention meets this review's definition and criteria.

Evidence Gaps

This review identified two major ways that future research can help address remaining questions: (1) through improved reporting in the intervention research literature and (2) by conducting studies to fill specific gaps in the evidence.

Need for improved reporting. Generally, reviewed studies provided sparse information on several potentially important aspects of the intervention, such as intensity of the health communication campaigns (e.g., measures of audience reach and exposure to mass media campaigns) and the degree to which formative research or other social marketing practices were used to develop the communication campaign and product distribution strategies. Additionally, limited data were available to evaluate differential effects of an intervention across demographic groups. Reporting such details increases understanding of the conditions under which this

Table 2. Intervention characteristics

| Description | Number of study arms | | Median percentage point change in desired health behavior |
|--|--|--|--|
| | Body of evidence | Analysis ^a | |
| Design suitability | | | |
| Greatest | 12 ^{30,31,38–46} | 7 ^{30,42–46} | 7.7 (IQR=3.2, 9.9) |
| Least | 13 ^{24–27,33,48–53} | 13 ^{24–27,33,48–53} | 8.4 (IQR=1.2, 16.7) |
| Targeted health behavior | | | |
| Use of child safety seats | 3 ^{30,45} | 3 ^{30,45} | 8.6 (range= -9.2, 9.6) |
| Use of condoms | 6 ^{27,33,39,41,44,49} | 4 ^{27,33,44,49} | 4.0 (IQR= -4.0, 10.8) |
| Use of recreational safety helmets | 10 ^{24–26,42,50–53} | 10 ^{20–22,37,50–53} | 8.4 (IQR=2.1, 18.5) |
| Smoking cessation | 3 ^{43,46,48} | 3 ^{43,46,48} | 10.0 (range=3.1, 16.9) |
| Physical activity | 2 ^{31,38} | N/A ^b | N/A ^b |
| Use of sun-protection products | 1 ⁴⁰ | N/A ^b | N/A ^b |
| Categories of channels | | | |
| Mass media | 25 ^{24–27,30,31,33,38–46,48–53} | N/A ^c | N/A ^c |
| Small media | 22 ^{20–23,30,31,33,38–42,44,45,49–53} | N/A ^c | N/A ^c |
| Interpersonal communication | 23 ^{24–27,30,31,33,38–46,48–53} | N/A ^c | N/A ^c |
| Community events | 11 ^{24–27,30,38,39,42,44,45,53} | N/A ^c | N/A ^c |
| Social media | 2 ^{30,38} | N/A ^c | N/A ^c |
| Number of categories of channels | | | |
| 1–2 | 4 ^{43,46,48,51} | 4 ^{43,46,48,51} | 6.6 (IQR=1.3, 15.2) |
| 3–4 | 20 ^{24–27,31,33,38–42,44,45,49,51,53} | 15 ^{24–27,33,42,44,45,49–51,53} | 8.2 (IQR=2.5, 15.0) |
| 5 | 1 ³⁰ | 1 ³⁰ | 9.6 |
| Use of social marketing | | | |
| Self-identified as a social marketing campaign | 8 ^{24,25,27,30,31,33,49,50} | 7 ^{24,25,27,30,31,33,49,50} | 9.6 (IQR=4.3, 15.0) |
| Did not self-identify as a social marketing campaign | 17 ^{26,38–46,48,51–53} | 13 ^{26,42–46,48,51–53} | 6.8 (IQR=1.6, 13.5) |
| Duration of campaign | | | |
| 0–6 months | 5 ^{27,43,48,52} | 5 ^{23,38,48,52} | 10.0 (IQR=5.5, 14.9) |
| 7–13 months | 5 ^{33,44,46,51} | 5 ^{40,45,47,51} | 0.7 (IQR= -4.8, 3.4) |
| 14–20 months | 7 ^{20,21,37–39,44} | 6 ^{24,25,30,42,45} | 8.4 (IQR=2.8, 11.0) |
| ≥21 months | 6 ^{22,31,41,49,50,53} | 4 ^{26,49,50,53} | 19.7 (IQR=7.6, 26.7) |
| Not reported | 2 ^{39,40} | N/A ^b | N/A ^b |
| Location | | | |
| U.S. | 20 ^{22,23,30,39–46,47–53} | 17 ^{26,27,30,33,42–46,48–53} | 6.8 (IQR=1.6, 11.5) |

(continued on next page)

Table 2. Intervention characteristics (continued)

| Description | Number of study arms | | Median percentage point change in desired health behavior |
|---------------------|--|--------------------------------|---|
| | Body of evidence | Analysis ^a | |
| Outside U.S. | 5 ^{20,22,31,38,53} | 3 ^{24,26,53} | 15.0 (range=8.2, 15.2) |
| Price | | | |
| Free | 12 ^{27,31,38-41,43,44,46,48-50} | 7 ^{27,43,44,46,48-50} | 10.0 (IQI=3.6, 16.9) |
| Discounted | 8 ^{24-26,30,51-53} | 8 ^{20-22,39,51-53} | 8.9 (IQI=1.2, 15.2) |
| Free and discounted | 5 ^{33,42,45,52} | 5 ^{33,42,45,52} | 6.8 (IQI= -7.9, 8.6) |

^aAn absolute percentage point change in health behavior could be calculated.

^bResults could not be calculated as an absolute percentage point change.

^cThe variable is not mutually exclusive; therefore, an analysis is not applicable. IQI, interquartile interval; N/A, not applicable

intervention may be most or least effective, and can guide implementers in adopting and adapting such an intervention for use in their communities.

More consistent use of terminology describing social marketing concepts such as segmentation, formative research, and insight would be desirable to allow more clarity and more systematic analyses related to such concepts in future systematic reviews. Additional information on demographic groups and the differential effects of the intervention by age, gender, SES, and race/ethnicity should also be collected, studied, and reported.

Finally, journal editors should recognize the importance of these additional types of information and provide adequate space for authors to include descriptions in published journals or on linked web pages.

Filling specific evidence gaps. Most campaigns in the review only provided short-term follow-up data; data from longer follow-up periods could provide important additional information. Furthermore, although the available evidence allowed an assessment of the effectiveness of the intervention in general, questions remain about why some programs are more effective than others. For example, factors such as intensity of communication campaigns, or whether products are offered for free versus at reduced price, may influence how many people exhibit healthier behaviors or the extent of their behavior change.

However, more evidence will be needed to clarify whether such hypothesized relationships hold. Ideally, that evidence would come from studies in which the variables of interest are directly manipulated, to eliminate confounding of across-study comparisons by factors such as selective publication bias or secular trends in media usage that may lead to differences in the effectiveness of mass media interventions over time.

With today's rapidly changing media environment, the Internet and social media are gaining prominence in health promotion given their strong potential for conveying targeted messages in a cost-effective manner. The availability of these options has the potential to make health communication campaigns with product distribution feasible for many organizations that would have difficulty funding an intervention centered on traditional mass media channels. Given the very limited use of such strategies in the interventions reviewed in this paper, the assessment of effectiveness of product promotion and distribution interventions that use social media as a primary communication channel will be an important area for future research.

Discussion

Ample evidence shows that health communication campaigns by themselves increase awareness and knowledge and, thereby, contribute to changes in attitudes and behavioral intentions of target audiences.^{11,59} A 2004 meta-analysis¹¹ further supports this evidence; its results indicate that public health communication campaigns that promote adoption of health behaviors (e.g., seatbelt use) or discourage harmful behaviors (e.g., tobacco use) are associated with small, but significant, behavior changes.

Further, a recent narrative review⁶⁰ found that health communication campaigns implemented in conjunction with other strategies (e.g., screening services, community programs, and policy support) are more likely to produce positive changes or prevent negative changes in health-related behaviors than health communication campaigns alone. The current review supports and extends these previous findings by improving understanding of how campaign effectiveness can increase when health communication campaigns are combined with product

distribution. Applying the results of this review to development of new health communication and social marketing campaigns and programs could play an important role in improving population health, as it relates to a wide variety of risk and protective factors.

Points of view are those of the authors and do not necessarily reflect those of the CDC.

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