

Health Communication Campaigns and Their Impact on Behavior

Leslie B. Snyder, PhD

ABSTRACT

The objective is to review the evidence for the effectiveness of health communication campaigns to inform future nutrition campaigns. The review drew on existing meta-analyses and other literature. The average health campaign affects the intervention community by about 5 percentage points, and nutrition campaigns for fruit and vegetable consumption, fat intake, and breastfeeding, have been slightly more successful on average than for other health topics. The factors affecting success rates are discussed. The conclusion is that nutrition campaigns that pay attention to the specific behavioral goals of the intervention, target populations, communication activities and channels, message content and presentation, and techniques for feedback and evaluation should be able to change nutrition behaviors.

Key Words: campaigns, media, behavior change, target populations, communication channels, message design, evaluation

(*J Nutr Educ Behav.* 2007;39:S32-S40)

INTRODUCTION

One technique to change the dietary behaviors of a large number of people is to conduct communication campaigns. Communication campaigns are an organized communication activity, directed at a particular population for a particular period of time, to achieve a particular goal.^{1,2} The term *campaign* includes organized, communication-based interventions aimed at large groups of people and *social marketing* efforts that include communication activities. Campaigns have promoted a wide variety of health behaviors, including seat belt use, dietary change, medication use, exercise, dental care, social support, substance use prevention and cessation, family planning, use of health services, and testing and screening for diseases. Health communication campaigns have been used to address many of the most common causes of death in the United States—poor diet, physical inactivity, tobacco use, alcohol consumption, microbial agents, and toxic agents.³ Campaigns vary widely in the particular communication activities they use, including posters, handouts, public service announcements, discussion groups, workplace or clinic-based counseling, and in-school presentations. Campaigns that count at least one

form of media among their communication channels are termed “mediated campaigns.”

This narrative review describes some of the most important lessons learned from prior health campaigns that may be applicable to nutrition campaigns. It is intended for people in the field of nutrition education who have limited experience with campaigns beyond more traditional counseling and education. The first question addressed is how well media campaigns work. After reviewing the overall effectiveness of campaigns, the lessons are organized around 3 critical elements of campaign planning: goals, strategy, and research.

The review draws on the conclusions of the meta-analyses and research syntheses that have been conducted to date that examine the effectiveness of communication campaigns, conclusions from evaluations of recent prominent national campaigns (the VERB Campaign on youth physical activity sponsored by the Centers for Disease Control,⁴ the Legacy Foundation’s truth campaign against youth smoking,⁵ and the National Youth Anti-Drug Media Campaign sponsored by the Office of National Drug Control Policy⁶), 2 studies that have collected original data comparing campaigns,^{7,8} and the scientific literature on health campaigns.

Meta-analysis can be particularly helpful in drawing generalizations from a literature that has seemingly conflicting conclusions, such as early assessments of the value of communication campaigns. Meta-analysis provides a way to estimate the average effect of campaigns and to test for contingent conditions that may be responsible for differential results.⁹ It is important to note that the meta-analyses vary in the criteria they use to select which campaigns to analyze, including by health

Department of Communications Sciences, University of Connecticut, Storrs, Connecticut

Author for correspondence: Dr. Leslie B. Snyder, PhD, Professor, Department of Communications Sciences, University of Connecticut, 850 Bolton Road, Unit 1085, Storrs, CT 06269-1085; Tel: (860) 486-2817; Fax (860) 486-5422; E-mail: leslie.snyder@uconn.edu

PUBLISHED BY ELSEVIER INC. ON BEHALF OF THE SOCIETY FOR NUTRITION EDUCATION

doi: 10.1016/j.jneb.2006.09.004

Table The Meta-analyses and Systematic Reviews Used in the Present Review

Author(s)	Studies included	Geographic coverage
Ammerman, Lindquist, Hersey et al. ¹⁰	92 studies on the efficacy of nutrition interventions among adults for fruit and vegetable and dietary fat intake	North America, Europe, and Australia
Bertrand et al. ¹¹	24 HIV prevention campaigns	Developing countries
Derzon and Lipsey ¹²	72 youth substance abuse media campaigns	Mostly in the United States
Grilli et al. ¹³	20 health communication media campaigns on topics such as HIV tests, myocardial infarction admissions, immunizations, and cancer screenings	European
McArthur ¹⁴	12 in-school nutritional campaigns related to heart health aimed at fourth and fifth graders, typically using classroom instruction supplemented by posters, contests, and other promotional activities	United States
Pomerleau et al. ¹⁵	44 interventions designed to increase adult fruit and vegetable intake	Global
Snyder, Badiane, Kalnova, and Diop-Sidibé ¹⁶	58 family planning and reproductive health campaigns	Developing countries
Snyder and colleagues ^{9,17,18}	48 health communication media campaigns across a wide range of topics	United States
Snyder, LaPierre, and Maloney (unpublished data, 2006) ¹⁹	71 nutrition campaigns	Mostly United States (15 international)

topics (such as all inclusive or just nutrition), population addressed by the campaigns (such as adults or youth), and channels and settings used in the campaigns (for example, using at least one mass medium, such as television or billboards, or only examining school-based interventions). The meta-analyses and systematic reviews used in the present review are listed in the accompanying Table.

HOW EFFECTIVE ARE CAMPAIGNS?

Although it may be tempting to answer the simple question, “Are campaigns effective?” it is more valuable to know the magnitude of campaign effects. Knowing the average effect size for campaigns can establish a benchmark against which to compare the effects of specific campaigns, help establish realistic goals for a new campaign, and provide guidance when designing evaluations.⁹

The meta-analytic results are useful in establishing average effect sizes for media campaigns. The effects reported are most often the change in behavior in an intervention community or group from precampaign to postcampaign. Sometimes the campaign effect represents how many more people in an intervention community are performing the behavior as compared to a control community that did not have the intervention.

In the United States, health communication campaigns that include use of the mass media and avoid coercion have an average effect size of about 5 percentage points ($r = .05$).⁹ (Coercion through legal or regulatory enforcement is

not typically applicable to nutrition campaigns, so campaigns that use coercion are excluded here.) Thus, if 60% of people were doing the target behavior before the campaign, about 65% can be predicted to do the health behavior after the campaign. European campaigns using the media are also successful, on average.¹³

The level of effectiveness of health campaigns that include some form of the media depends in part on the specific behavior that is promoted.¹⁷ For example, seatbelt campaigns ($r = .15$), dental care ($r = .13$), and adult alcohol reduction ($r = .11$) have had the greatest success rates, whereas youth drug and marijuana campaigns have had the least success ($r = .01-.02$).^{12,17} Topics that fall in between include family planning ($r = .06$), youth smoking prevention ($r = .06$), heart disease prevention (which include diet and physical activity behaviors [$r = .05$]), sexual risk taking ($r = .04$), mammography screening ($r = .04$), adult smoking prevention ($r = .04$), and youth alcohol prevention and cessation ($r = .04$ to $.07$) and tobacco prevention campaigns ($r = .04$).^{12,16,20}

For new topics, it is possible to anticipate relative success rates by examining characteristics of the behavior. Across health issues, campaigns promoting the adoption of a behavior that is new to the individual or replacement of an old behavior with a new one have a greater success rate than campaigns aiming to cease an unhealthy behavior people are already doing or prevent commencement of a risky behavior.¹⁷ An example of a nutrition campaign promoting the replacement of an old behavior is one in West Virginia that encouraged the switch in consumption from whole or 2% milk to 1% milk.²¹

Vitamin A distribution and breastfeeding campaigns in developing countries have also been more successful than campaigns on many other maternal child health topics² (Hornik R, Contreras-Budge E, McDivitt J, et al. Unpublished data; 1992). Similarly, a trend suggestive in the data is that habits—which would include most dietary matters—can be harder to change than adopting new behaviors that only need to be performed once or twice. A meta-analysis of European campaigns and a review of campaigns in developing countries found that immunization campaigns appear to have greater rates of success than many other topics¹³ (Hornik R, Contreras-Budge E, McDivitt J, et al. Unpublished data; 1992).

Recent national media campaigns aimed at youth are consistent with the meta-analytic record. The VERB campaign promoting physical activity among 9- to 14-year-olds had the largest effect on behavior change,⁴ followed by the truth campaign preventing tobacco use.⁵ The National Youth Anti-Drug Media Campaign was the least effective.⁶

In terms of nutrition campaigns and interventions, the meta-analyses and systematic reviews suggest that they can be as successful as campaigns on some other topics. Preliminary results from a meta-analysis of nutrition campaigns using some form of media found that international breastfeeding campaigns had a very good success rate, with an average campaign effect size of $r = .18$, although they were few—only five—in number.¹⁹ Preliminary analysis of 37 fruit and vegetable media campaigns found an average campaign effect size of $r = .08$.¹⁹ Other systematic reviews of fruit and vegetable interventions found increases in fruit and vegetable servings and decreasing fat per calories consumed.^{10,15} In-school nutritional campaigns aimed at fourth and fifth graders found an average effect of $r = .12$.¹⁴

Less is known about the impact of campaigns and other interventions on knowledge, beliefs, and interpersonal communication, because fewer meta-analyses have reported on outcomes other than behavior. Often specified in a logic, persuasion, or behavior change model for a campaign, knowledge, beliefs, and interpersonal communication are thought of as intermediate outcomes helpful in attaining the goal of behavior change.²² The results for family planning media campaigns suggest that campaigns can influence knowledge ($r = .11$), attitudes ($r = .07$), and communication with a spouse ($r = .05$).¹⁶ HIV programs in developing countries had an impact on knowledge about HIV transmission.¹¹ However, youth substance abuse campaigns had very small effects on attitudes ($r = -.01$ to $.01$) and knowledge ($r = .01$ to $.03$).¹² It is not known how effective nutrition campaigns have been in changing intermediate outcomes. Note that the ability to get movement on attitudes, beliefs, and knowledge depends in part on whether the messages were designed to affect those specific components, and it is often unclear from published accounts whether the messages were so designed.

LESSONS LEARNED FROM PREVIOUS CAMPAIGNS

Campaign Goals

Campaign goals specify what the campaign is designed to accomplish within a period of time. The goals state the desired outcomes, such as the specific behavior that the campaign is promoting. The goals should be clear about the target population. Campaign objectives, which are more detailed versions of goals, should also specify the target level of change, such as: After two years, girls 14-20 years old will have increased their daily calcium consumption by 10 percentage points. The objectives should be measurable and able to be used as criteria for campaign success during evaluation. The meta-analytic results discussed above can provide guidance into setting realistic goals. Some important lessons from the literature on outcomes and population will be discussed in turn.

Outcomes. Campaigns should explicitly state that behavior change is a goal because it will guide development of appropriate messages and campaign strategies.^{23,24} A test of the general principle of stating behavior change goals was conducted in research on HIV/AIDS campaigns in Uganda, which found that campaigns were of higher execution quality when they specified behavior change goals rather than awareness of HIV or a general goal such as reducing AIDS.⁷ Sometimes campaigns use intermediate goals, such as increasing knowledge or awareness of a problem, with an assumption that people will automatically take action when they learn of a problem. However, people do not always act on what they know—a phenomenon known as the knowledge gap or the communication effects gap²⁵—so even when campaigns include knowledge, awareness, or belief change goals, they should also include behavior goals.

Often, nutrition education involves teaching new behavioral skills, such as how to prepare new types of food or cook in a different manner. Campaigns have been able to teach behavioral skills in other contexts, such as how to mix oral rehydration solutions,²⁶ smoking cessation skills,¹⁷ and condom use.²⁷ Nutrition campaigns should carefully consider whether new skills will be needed and test the optimal way to teach them to the population. It may be, for example, that complicated skills require supervised rehearsal to be learned properly and remembered, and the campaign would need to provide for an opportunity to observe people practicing the skill and provide feedback to them on skill attainment. When skills are critical to nutrition campaigns, they should be included in the goals of the campaign.

An important lesson from marketing and social marketing is to select and fine tune the optimal behavior, product, or service to promote through formative research and pretesting,^{28,29,30} by observing or interviewing members of the target population concerning the behavior, product, or service after they have learned about or tried it. It often involves an iterative process of soliciting feedback, altering

the behavior, product, or service, and conducting more tests and revisions as time permits. For example, a nutrition campaign in Indonesia carefully tested which nutritional improvements from a long list of possibilities were “doable” among the target population, given concerns about time constraints for food preparation, the complexity of some of the suggestions, and spotty availability of some foods in the markets.³¹ They enlisted a sample of households to select a few of the behaviors of their own choice, try them for a few weeks, and then provide feedback on the experience. The campaign used the information to successfully promote a focused list with a relatively small number of target behaviors.³¹ Similarly, instructions regarding the behavior need to be pretested to make sure the audience understands them and can carry them out. For example, the instructions for a homemade oral rehydration solution in The Gambia, West Africa was altered after a pretest found that mothers consistently added dangerous levels of salt to their mixtures.³²

Populations. One of the basic tenets of campaigns is to specify fairly homogenous target groups for the campaign and to create messages designed for each group.^{23,28,30,33} The justification for targeting is that messages crafted to be successful with a homogenous group are more likely to have an impact on that group than messages designed for a heterogeneous population with varied concerns, values, and behaviors. Interestingly, community-based organizations have tended to target more precisely than government or educational organizations conducting HIV campaigns in San Francisco,⁸ perhaps because they often define themselves by a population, have more intimate knowledge of it, and stay focused on it when they take on an issue.

Deciding which groups to target depends on what is learned from research with potential groups and the mission and economic realities of the organization conducting the campaign. Campaigns targeted at groups defined by ethnicity and gender are at least as effective as campaigns aimed at a general audience.^{34,35} Although targeting is often based on demographic categories, it can be advantageous to target theoretically meaningful segments of the population.^{36,37} Campaign designers should consider targeting by behavior, actual and perceived risk, misinformation and beliefs, environmental barriers, and communication patterns, because these factors affect the nature of the messages produced for the campaign and the ways to communicate them. If the population has been grouped by how close they are to changing their behavior (eg, unaware of the behavior, contemplating changing it, made a decision to change it, trying it, and maintaining it), then the campaign goal can be to help each group move to the next stage, and messages can be designed accordingly.³⁸ A systematic review of fruit and vegetable campaigns suggests that targeting people diagnosed with a medical condition, rather than the general population, may result in greater behavior change, because they may be more motivated to change.¹⁰

Although in principle it may be optimal to create a unique campaign approach for each target group, the number of target

groups that need to be addressed may be prohibitive. As an alternative, a campaign may economize by delivering the same (or *standardized*) messages to all groups, perhaps acknowledging diversity by showing actors from different demographic groups. However, the broad targeting may result in lower rates of success for some parts of the population. The 5 A Day Campaign, for example, attained greater awareness among women (52%) than men (29%) by 2003.³⁹ It is also possible to start with a standardized campaign, followed by unique campaigns aimed at the groups who did not respond to the standardized campaign. Yet another approach is to adapt some elements of the campaign for different groups—such as channels (the means to reach people), behavior, messages, or executions—to improve chances of impacting those groups.³⁵

Recently, the widespread use of interactive technologies has made it more feasible to *tailor* messages, that is, deliver particular messages to people based on feedback they give about themselves.⁴⁰ Campaign designers can use their theoretical model of change to pick the issues that need to be dealt with in messages, assess the current beliefs, practices, and group identification of each individual at the start of an educational session, and deliver a combination of messages tailored specifically for a person with those answers. People apparently appreciate messages that provide feedback on their current practices, as well as behavioral recommendations that are tailored to their case.⁴⁰ Tailored nutritional interventions have been used to increase fruit and vegetable consumption.¹⁵ It is unknown whether, or under what conditions, tailored interventions are better than nontailored ones.

COMMUNICATION STRATEGIES

Campaigns may use a variety of communication strategies to try to change the behavior of the target populations, including strategies that attempt to change the political and economic context in which people are making decisions, those aimed directly at the populations, and those aimed at people who may have influence with the target population.^{41,42} Selecting which strategy or strategies to use depends on careful analysis of the context surrounding individual decision making, including existing patterns of communication about the behavior and barriers to behavior change. Formative research conducted with the target populations and, if they are different, the decision makers, can provide critical data for the analysis.^{29,30,41} Soliciting the participation of members of the target population and community organizations in campaign design and implementation—through community boards, hiring staff from the target population to be involved in campaign design, and conducting formative research with the target population—may improve the campaign. Establishing ties with community organizations may help institutionalize a program within a community.⁷

A common strategy is to communicate directly with the target population in order to change their behavior, as is done with the VERB campaign,⁴ the truth campaign,⁵ and

National Youth Anti-Drug Media Campaign.⁶ Direct communication assumes that people have the capacity to change their own behavior, which may not be the case with many dietary behaviors, since individual options depend on food availability and socially negotiated choices. It may be necessary to target other people—such as the person or people in the household responsible for food procurement and preparation—in order to change the target population.

If there are environmental barriers hindering behavior change, it may be effective to use the strategy of advocating for policy changes with policy makers, involved professionals, businesses, and the general public.⁴² The target populations for advocacy campaigns typically include decision makers and opinion leaders but may also include members of the public in order to put pressure on the decision makers. For dietary change, advocacy may include the goals of reducing access to food of low nutritional value and increasing access to more healthful food, increasing healthful food options when eating out, encouraging healthful choices through price structures, and providing easy or free distribution of vitamin and mineral supplements. When the environment changes because of advocacy efforts, such as when groceries and restaurants agree to offer or label more healthful food, there is an additional role for campaigns to publicize the new options and attempt to stimulate greater demand for the healthy choices among the public.

When the goals and strategy are in place, the communication activities, message content, and message presentation can be planned. Throughout this stage of planning, it is very beneficial to pretest preliminary versions of messages and presentations with the intended population to see whether activities are appropriate and the messages can be improved. Pretesting is often done in focus groups or individual interviews.²⁹ Communication activities, message content, and message presentation will be discussed in turn.

Communication Activities and Channels

Communication activities need to be chosen for each strategy. For example, a comprehensive worldwide breastfeeding campaign⁴³ addressed contextual barriers to breastfeeding by lobbying to change hospital, national, and international policies and consistently using new language (eg, using the term “breast milk substitute” instead of “baby formula”). It addressed the target population of pregnant and lactating women directly by conducting media campaigns and organizing support groups for that population. It addressed influential others by creating campaigns for fathers and influential older women. To gain the support of medical, political, and key organization leaders, the campaign organized conferences. To support and inform health professionals, the campaign also organized national chapters of an international breastfeeding organization, created reference materials, and conducted training. For future health professionals, the campaign lobbied to change the curriculum in medical and nursing schools, conducted in-service training, and created and distributed reference materials.⁴³

As the breastfeeding campaign example shows, communication channels may include media (such as television and pamphlets) and interpersonal sources of information (such as counselors, friends, and doctors). Although many nutrition interventions have relied predominantly on individual counseling, they have also used small discussion groups, direct mail, newsletters, church bulletins, booklets, CD-ROMs, TV programs, and public service announcements on TV, radio, newspaper, and billboards.¹⁹ Channels that are novel to the target population may garner additional attention. Promotions such as giving away objects like caps or mugs that feature the campaign logo, contests, and tie-ins can help normalize the message and keep it visible.⁴⁴ Interpersonal communication through one-on-one or small group counseling provides an opportunity for outreach staff to tailor messages to the person and answer questions immediately.⁴¹ Brief interpersonal interventions have been effective in changing a number of health behaviors, even when staff is minimally trained in the content area.⁴⁵ Fruit and vegetable consumption increased on average by .6 servings per day based on interventions relying predominantly on counseling.¹⁰ Note that campaigns should make sure the outreach staff members are knowledgeable in the content area and skilled in communication.^{26,44}

Activities and channels should be selected and used in a way to reach a high percentage of the target population multiple times in a given period of time.⁴⁴ Greater reach—or exposure—to a campaign is associated with greater behavior change¹⁸ (see also Hornik, this volume). However, exposure levels often fall short of what is desired. Health campaigns in the United States on average reach 40% of their target populations.¹⁸ International family planning campaigns fare better, at 70% on average, perhaps because family planning campaigns tend to use many different channels (such as television, radio, pamphlets, outreach workers, clinic staff, and special events) to reach the target population, thereby reaching different pockets of people who tend to use different channels.¹⁶ Using multiple channels may increase exposure and lead to greater campaign effects.^{24,26} Media are often more cost effective at reaching people than are interpersonal channels, because they can reach very large numbers after an initial investment to produce the message, whereas interpersonal channels have ongoing salary and other costs.²⁶

The number of times a person is reached by a campaign is called frequency, and greater frequency of exposure may help people remember the campaign messages more accurately.⁴⁴ Using multiple communication channels may also increase frequency of exposure to campaign messages when people see the messages across different channels.^{26,28,30} Note, too, that short, intense campaigns may result in greater short-term effects than campaigns that endure for 2 or more years.¹⁸

Message Content

Campaign planners often establish a theoretical model of how behavior change might take place and use it to guide

development of goals and messages.^{38,46} The theoretical model or logic model often covers the types of information critical to behavior change, the beliefs and attitudes that need to be changed, and barriers to persuasion and action.^{22,24} Commonly used theories include the Theory of Reasoned Action,⁴⁸ Social Cognitive Theory,⁴⁸ and Stages of Change, or the Transtheoretical model.⁴⁹ More recently, the Social Ecological Model provides a framework for integrating psychological and environmental factors affecting behavior change.⁵⁰

Campaigns should emphasize information that is new to the target group and essential for behavior change.¹⁸ If nearly all people are aware of a need for fiber but are unsure how to get it, messages should tell them which food products are high in fiber, and not bother telling them that they need to add fiber. Messages may be needed to deal with “how to” and “when to” knowledge, to support behavior change. It may also be necessary to clear up misconceptions preventing behavior change that were uncovered in research with the target population, and find out about and address other real and perceived barriers to behavior change.²⁴

Planners should analyze which type of beliefs need to be addressed, including perceived severity and likelihood of consequences of the current behavior; perceived benefits of compliance with the recommendations; peer and family behavior and pressure to comply with their norms; degree of identification with people doing the target behavior; and stereotypes of people at risk of the health problem or who follow the recommended behavior.^{23,41,47,48,51,52} For example, a campaign to increase calcium consumption among girls may decide to promote breakfast consumption based on research that found that breakfast consumption correlated positively with calcium consumption and negatively with body mass index.⁵³ If additional research pointed to strong motivations among girls to lose weight but who lack concern about bone health, the campaign may decide to craft messages emphasizing the potential for weight loss more than the importance of increased calcium intake.

Analysis of the communication environment should reveal whether people are receiving strong messages to act in a manner opposite to that of the campaign goals. If the goal is to have people consume food with greater nutritional density, for example, it is important to be aware of the extent and nature of commercial advertising and marketing of food products low in nutrients. The campaign may choose to undermine the credibility of sources of misleading information, as the truth campaign aimed to do for tobacco companies.⁵ Aside from the truth campaign, however, there is little information in the literature at present on the optimal persuasion strategies to effectively countering commercial advertising and marketing.

Message Presentation

Presentation affects how the how the message looks and sounds and can mean the difference between messages that are

accepted and those that are rejected by the target population. Messages need to capture the attention and be easily remembered by each member of the target population.²⁴ This goal can be accomplished by using multiple executions (different versions of the same underlying concept); being creative and novel; refreshing media messages often; depicting people who are clearly members of the target population; keeping messages of high quality; using explicit, intense, emotional, or entertaining messages; and by creating logos, slogans, and jingles.^{44,54} As much as possible, messages should be kept simple, because complicated messages are more likely to be misunderstood and misremembered.²⁴ Campaign designers can think creatively about how to present complicated messages in order to increase the chance of people remembering the correct message, such as employing mnemonics or songs, or by selecting channels like reminder cards or refrigerator magnets.

The emotional tone of the presentation should be carefully considered.^{24,44,55} In many circumstances, messages that evoke positive emotions may have a greater impact with the target group than those evoking negative emotions like fear.⁵⁶

Another aspect of message presentation is the information sources and their credibility and consistency.²³ To increase acceptance of the message, the campaign must select credible spokespeople and organizations that balance trustworthiness and expertise^{22,28} (see Wilson, this volume). All sources of communication with which members of the target population come into contact should share consistent messages. Planners may want to enlist the cooperation of businesses that benefit from the dietary recommendation (eg, cereal companies for fiber messages and restaurants to mark healthful choices on menus), as well as others who communicate about nutrition with the target population (eg, teachers, dietitians, reporters, and health care professionals).

RESEARCH AND EVALUATION

Campaigns use research at different stages in their development and implementation. Formative research, as already mentioned, serves to improve the design of the campaign. Monitoring research is critical to the implementation stage of the campaign. Summative evaluation is critical to assessing campaign effects and disseminating the findings.

It is important to monitor implementation of the campaign to make sure that the plan is being followed and that the campaign has the ability to respond promptly when glitches develop in the field. Monitoring activities can include checking distribution of materials, observing interpersonal outreach, and periodically soliciting feedback from all staff and participants.⁴¹

Summative evaluation is designed to answer the following questions: “Is the campaign having the intended impact?” and “What can we do better next time?” One strong design for summative evaluation is to use both pretest and posttest measurement periods, and include a control group

or community.^{57,58} Evaluations employing this design have a better chance of detecting change than studies that do not have a control group, or studies that do not have a pretest.⁵⁹ The pretest and posttest with control group design enables the researcher to compare the effects of the intervention over time within the intervention community to “naturally occurring” changes over time in the control community.⁵⁸

Another common research design is a time-series design to track responses to a campaign over time using time series data for both monitoring and summative evaluation.⁵⁸ VERB, truth, and the National Youth Anti-Drug Media Campaign used tracking data to supplement their research.^{4,5,6} There are a number of national studies that recur periodically and that could be used to track changes in some nutrition behaviors over time, including the Behavioral Risk Factor Surveillance System, the Youth Risk Behavior Survey and Middle School Youth Behavior Survey, and the National Health and Nutrition Examination Survey.^{60,61,62} Campaigns also sometimes collect original tracking data so that they may ask unique questions, including questions about exposure and reactions to campaign messages.

Evaluations also can measure intermediate steps to behavior change to track progress on those outcomes, refine behavior change models, and improve the campaign.⁵⁸ For example, the evaluation of the 5 A Day campaign found that more women were aware of the campaign than ate the recommended amounts of fruits and vegetables.³⁹ Potential explanations such as a lack of knowledge of serving sizes, motivational issues, resource limitations, and environmental constraints could be tested to provide feedback to the campaign.

IMPLICATIONS FOR RESEARCH AND PRACTICE

In sum, campaigns can successfully change a wide variety of health behaviors, including dietary behaviors. It would be valuable to know average effect sizes for a wider variety of nutritional behaviors than have been reported to date. Given that effect sizes vary across health topics, it is possible that some effect sizes also differ between nutritional behaviors, and preliminary data from one study¹⁹ lend some support for that idea. There may be nutritional behaviors that lend themselves more to campaigns than others, or circumstances under which nutritional campaigns are more likely to succeed.

Although it is not known how successful nutritional campaigns can be at changing intermediate outcomes of knowledge, attitudes, beliefs, and interpersonal communication, evidence from other topics suggests that when campaigns can achieve behavior change they may have knowledge change as well. Evaluations of future nutrition campaigns should aim to measure the aspects of the specific knowledge, beliefs, and communication behaviors that are advocated in campaign messages, to further our understand-

ing of the behavior change process and improve models of nutrition behavior change.

Youth drug abuse prevention campaigns appear to be the least successful at changing both behaviors and intermediate outcomes. Because campaigns targeting youth on some topics have a greater impact than youth drug abuse prevention campaigns, the problem is not the youth orientation, but rather something else about the drug abuse prevention campaign messages, strategies, or social context relevant to that type of campaign. It is not known how successful media-based nutrition campaigns can be with youth since meta-analyses have not yet answered that question, but because school-based nutrition interventions have been relatively effective,¹⁴ media-based campaigns may also work with young people.

The literature on campaigns suggest that it is important for nutrition campaigns to pay attention to the specific behavioral goals of the intervention, target populations, communication strategies, activities, and channels, message content and presentation, and techniques for feedback and evaluation. Campaign planners should carefully select specific behaviors or products to promote that are both efficacious and “doable” for specific populations. The target populations should be based on current dietary behaviors and risks, beliefs, resources, life circumstances, and communication patterns. A comprehensive strategy that addresses policy and environmental constraints, individual factors in behavior change, and social influences on the target population should be considered. A variety of channels should be chosen for their ability to reach the target population multiple times and help people remember the messages. The messages themselves need to be carefully crafted to persuade people to change their behavior. Finally, campaigns need to have built-in methods of garnering feedback about campaign execution and effectiveness. Through careful planning and execution, nutrition campaigns should succeed in changing the nutrition behaviors of some members of their target population.

More fundamental research is needed into the causes and processes of dietary behavior change to inform all facets of campaign planning. For example, when do people need to sample new food or preparation styles before adopting them? What is the best way to help people to eat healthful snacks? How many changes are people in different groups willing to make to their diet at the same time? What life circumstances and environmental conditions are associated with a willingness to change? In order to design more efficient campaigns, we need to better understand how people learn new nutrition information at different points in their lives. People seek and scan for new information because of changes in life status, emergencies, health changes, new breakthroughs, and need for new services, among other reasons.^{2,63,64}

It would be helpful for future research to assess the impact of different communication strategies, channels, and messages as applied specifically to nutrition campaigns for particular populations. Campaigns would benefit greatly

from knowing which combinations of channels are effective at changing what types of nutrition behaviors, when tailored interventions are beneficial, which approaches work best to model sound nutrition practices and teach new skills, and how to use nutrition campaigns to promote and support changes in the nutrition environment.

Another gap in the literature is in understanding the relationship between commercial advertising and marketing for food, diets, and nutrition behaviors. More research is needed into persuasive approaches that would most effectively counter messages for unhealthy choices, and enhance commercial messages promoting healthful food products.

As it stands now, the literature has been more concerned with immediate behavior change than sustainability of effects. Unfortunately, communication campaign effects often decline after a campaign is over.^{2,44} Research is needed into which strategies—such as participation in the campaign by local organizations; selecting goals, messages, and strategies that are sensitive to local cultures and values; and targeting informal socialization agents so that they may teach successive generations the nutrition behavior—lead to sustained campaign effects.²

Finally, nutrition and other campaigns would benefit tremendously from an analysis of the cost-effectiveness of campaign activities. Due to economies of scale, media activities can be much less expensive per person reached than counseling.²⁶ Tailored media⁴⁰ may provide a more efficient approach for some populations, combining some of the advantages of counseling with wider reach.

ACKNOWLEDGMENT

Thanks to Amy Yaroch and Wendy Johnson-Taylor for organizing the workshop and encouraging the article, and to Matt Lapierre for timely preliminary analysis on the nutrition meta-analysis.

REFERENCES

- Rogers EM, Storey JD. Communication campaigns. In: Berger CR, Chaffee SH, eds. *Handbook of Communication Science*. Newbury Park, Calif: Sage; 1987:817-846.
- Snyder LB. Development communication campaigns. In: Gutykunst WB, Mody B, eds. *Handbook of International and Intercultural Communication*. 2nd ed. Thousand Oaks, Calif: Sage; 2001:457-478.
- National Center for Chronic Disease Prevention and Health Promotion. Fact sheet: Actual Causes of Death in the United States, 2000. Available at: http://www.cdc.gov/nccdphp/factsheets/death_causes2000.htm. Accessed March 26, 2004.
- Huhman M, Potter LD, Wong FL, Banspach SW, Duke JC, Heitzler CD. Effects of a mass media campaign to increase physical activity among children: Year 1 results of the VERB Campaign. *Pediatrics*. 2005;116:277-284.
- Farrelly MC, Davis KC, Haviland ML, Messeri P, Heaton CG. Evidence of a dose-response relationship between "truth" antismoking ads and youth smoking prevalence. *Am J Public Health*. 2005;95:425-431.
- Hornik R, Maklan D, Cadell D, et al. *Evaluation of the National Youth Anti-Drug Media Campaign: Fifth Semi-Annual Report of Findings*. Rockville, Md: Westat; 2003.
- Kiwanuka-Tondo J, Snyder LB. The influence of organizational characteristics and campaign design elements on communication campaign quality: Evidence from 91 Ugandan AIDS Campaigns. *J Health Commun*. 2002;7:59-77.
- Dearing JW, Rogers EM, Meyer G, et al. Social marketing and diffusion-based strategies for communication with unique populations: HIV prevention in San Francisco. *J Health Commun*. 1996;1:343-363.
- Snyder LB. How effective are mediated health campaigns? In: Rice R, Atkin C, eds. *Public Information Campaigns*. 3rd ed. Thousand Oaks, Calif: Sage; 2001: 181-190.
- Ammerman A, Lindquist C, Hersey J, et al. Efficacy of interventions to modify dietary behavior related to cancer risk. Rockville, Md: Agency for Healthcare Research and Quality; Research Triangle Institute-University of North Carolina at Chapel Hill Evidence-based Practice Center; February 2001; Evidence Report/Technology Assessment No. 25; Contract No. 290-97-0011; AHRQ Publication No. 01-E029. Available at: <http://www.ncbi.nlm.nih.gov/books/bv.fcgi?rid=hstat1.chapter.35668>. Accessed March 30, 2006.
- Bertrand JT, O'Reilly K, Denison J, Anhang R, Sweat M. Systematic review of the effectiveness of mass communication programs to change HIV/AIDS-related behaviors in developing countries. *Health Educ Res*. 2006;21.
- Derzon JH, Lipsey MW. A meta-analysis of the effectiveness of mass-communication for changing substance-use knowledge, attitudes, and behavior. In: Crano WD, Burgoon M, eds. *Mass Media and Drug Prevention: Classic and Contemporary Theories and Research*. Mahway, NJ: Lawrence Erlbaum Associates; 2002:231-258.
- Grilli R, Ramsay C, Minozzi S. Mass media interventions: effects on health services utilization; Cochrane Database of Systematic Reviews; 2002; Issue 1. Art. No.: CD000389; DOI: 10.1002/14651858.CD000389.
- McArthur DB. Heart healthy eating behaviors of children following a school-based intervention: a meta-analysis. *Issues Compr Pediatr Nurs*. 1998;21(1):35-48.
- Pomerleau J, Lock K, Knai C, McKee M. Interventions designed to increase adult fruit and vegetable intake can be effective: a systematic review of the literature. *J Nutr*. 2005;135:2486-2495.
- Snyder LB, Badiane L, Kalnova S, Diop-Sidibé N. Meta-Analysis of Family Planning Campaigns Advised by the Center for Communication Programs at Johns Hopkins University Compared to Campaigns Conducted and Advised by Other Organizations; Johns Hopkins Bloomberg School of Public Health and U.S. Agency for International Development; 2003.
- Snyder LB, Hamilton MA, Mitchell EW, Kiwanuka-Tondo J, Fleming-Milici F, Proctor D. A meta-analysis of the effect of mediated health communication campaigns on behavior change in the United States. *J Health Commun*. 2004;9 (Supplement 1):71-96.
- Snyder LB, Hamilton MA. Meta-analysis of U.S. health campaign effects on behavior: Emphasize enforcement, exposure, and new information, and beware the secular trend. In: Hornik R, ed. *Public Health Communication: Evidence for Behavior Change*. Hillsdale, NJ: Lawrence Erlbaum Associates; 2002:357-383.
- Snyder LB, Lapierre MA, Maloney EK. Using mass media to improve nutrition: A meta-analytic examination of campaigns and interventions. Paper presented at: 134th Annual Meeting of the American Public Health Association; November 4-8, 2006; Boston, Mass.
- Snyder LB. Meta-analyses of mediated health campaigns. To appear in: Preiss RW, Allen M, et al., eds. *Mass Media Research: Advances through Meta-analysis*. Hillsdale, NJ: Lawrence Erlbaum Associates.
- Regel B, Wootan MG, Booth-Butterfield S. Using mass media to promote healthy eating: A community-based demonstration project. *Prev Med*. 1999;29:414-421.
- McGuire W. The theoretical foundation of campaigns. In: Rice RE, Paisley WJ, eds. *Public Communication Campaigns*. Beverly Hills, Calif: Sage; 1981:41-70.
- Andreasen A. *Marketing Social Change: Changing Behavior to Promote Health, Social Development, and the Environment*. San Francisco, Calif: Jossey-Bass; 1995.

24. Manoff R. *Social Marketing*. New York: Praeger; 1985.
25. Shingi P, Mody B. The communication effects gap: a field experiment in TV and agricultural ignorance in India. In: Rogers EM, ed. *Communication and Development: Critical Perspectives*. Beverly Hills, Calif: Sage; 1976.
26. Hornik RC. *Development Communication: Information, Agriculture, and Nutrition in the Third World*. New York: Longman Publishing Group; 1988.
27. Fisher JD, Fisher WA. The information-motivation-behavioral skills model of AIDS risk behavior change: Empirical support and applications. In: Rice RE, Atkin CK, eds. *Understanding and Preventing HIV Risk Behavior: Safer Sex and Drug Use*. Thousand Oaks, Calif: Sage; 1996:100-127.
28. Kotler P, Roberto N, Lee N. *Social Marketing: Improving the Quality of Life*, 2nd ed. Thousand Oaks, Calif: Sage; 2002.
29. Atkin CK, Freimuth VS. Formative evaluation research in campaign design. In: Rice RE, Atkin CK, eds. *Public Communication Campaigns*. 3rd ed. Thousand Oaks, Calif: Sage; 2001:125-145.
30. Lefebvre RC, Flora JA. Social marketing and public health intervention. *Health Educ Q*. 1981;15:299-315.
31. Griffiths M, Zeitlin M, Manoff RK, Cook TM. *Kader Evaluation: Nutrition Communication and Behavior Change Component, Indonesian Nutrition Development Program*, New York: Manoff International; 1983.
32. Smith WA. *Communications and Social Marketing for Health*; Washington, DC: Academy for Educational Development; 1986; Occasional Paper No. 15.
33. Grunig J. Publics, audiences, and market segments: segmentation principles for campaigns. In: Salmon C, ed. *Information Campaigns: Balancing Social Values and Social Change*. Newbury Park, Calif: Sage; 1989:199-228.
34. Institute of Medicine. *Speaking of Health: Assessing Health Communication Strategies for Diverse Population*. Washington, DC: National Academies Press; 2002.
35. Snyder LB. Evidence of the Effectiveness of Communication Interventions Across Diverse Populations. Report submitted to the Committee on Communication for Behavior Change in the 21st Century: Improving the Health of Diverse Populations, Institute of Medicine, National Academy of Sciences, 2000.
36. Snyder LB, Rouse R. AIDS messages and risk: Targeting the urban audience. *AIDS Education and Prevention: An International Journal*. 1992;4(2):143-159.
37. Slater MD. Choosing audience segmentation strategies and methods for health communication. In: Maibach EW, Parrott RL, eds. *Designing Health Messages: Approaches from Communication Theory and Public Health Practice*. Thousand Oaks, Calif: Sage; 1995:186-198.
38. Slater MD. Integrating application of media effects, persuasion and behavior change theories to communication campaigns: A stages of change framework. *Health Commun*. 1999;11:335-354.
39. National Cancer Institute. Eat 5 to 9 a Day for Better Health Program Evaluation. Available at: <http://5aday.gov/research/program.html>. Accessed July 10, 2005.
40. Kreuter M, Farrell D, Olevich, L, Brennan L, eds. *Tailoring Health Messages: Customizing Communication with Computer Technology*. Mahwah, NJ: Lawrence Erlbaum Associates; 2000:43-51.
41. Weinreich NK. *Hands-On Social Marketing: A Step-by-Step Guide*. Thousand Oaks, Calif: Sage; 1999.
42. Wallack L, Dorfman L, Jernigan D, Themba M. *Media Advocacy and Public Health: Power for Prevention*. Newbury Park, Calif: Sage; 1993.
43. Brown V, Neumann C, Sander-Smith M, Snyder LB. Mid-term Evaluation: Wellstart International's Expanded Promotion of Breastfeeding Program; Washington, DC; US Agency for International Development, Division of Nutrition & Maternal Health, Office of Health & Nutrition; 1994.
44. Shimp T. *Advertising, Promotion, and Supplemental Aspects of Integrated Marketing Communications*, 6th ed. Orlando, FL: Harcourt; 2000.
45. Babor T, Ahmed K, McRee B. Screening, Brief Intervention, and Referral to Treatment (SBIRT): Toward a Public Health Approach to the Management of Substance Abuse. Manuscript.
46. Noar SM. A 10-year retrospective of research in health mass media campaigns: Where do we go from here? *J Health Commun*. 2006;11:21-42.
47. Fishbein M., Ajzen I. *Belief, Attitude, Intention, and Behavior*. Menlo Park, Calif: Addison-Wesley; 1975.
48. Bandura A. *Social Foundations of Thought and Action: A Social Cognitive Theory*. Englewood Cliffs, NJ: Prentice-Hall; 1986.
49. Prochaska JO, DiClemente CC. *The Transtheoretical Approach: Crossing the Traditional Boundaries of Therapy*. 2nd ed. Homewood, Ill: Dow Jones/Irwin; 1986.
50. Stokols D. Translating social ecological theory into guidelines for community health promotion. *Am J Health Promot*. 1996;10(4):282-98.
51. Maiman L, Becker MH. The health belief model: Origins and correlates in psychological theory. *Health Educ Monogr*. 1974;2:387-408.
52. Pechmann C. A comparison of health communication models: risk learning versus stereotype priming. *Media Psychology*. 2001;3:189-210.
53. Affenito SG, Thompson DR, Barton BA, et al. Breakfast consumption by African-American and white adolescent girls correlates positively with calcium and fiber intake and negatively with body mass index. *J Am Diet Assoc*. 2005;105:938-945.
54. Lang A. Involuntary attention and physiological arousal evoked by structural features & emotional content in TV commercials. *Commun Res*. 1990;17:275-299.
55. Batra R, Ray ML. Affective response mediating acceptance of advertising. *J Consum Res*. 1986;13:234-249.
56. Monahan JL. Thinking positively: Using positive affect when designing health messages. In: Maibach EW, Parrott RL, eds. *Designing Health Messages: Approaches from Communication Theory and Public Health Practice*. Thousand Oaks, Calif: Sage; 1995:81-98.
57. Campbell DT, Stanley JC. *Experimental and Quasi-Experimental Designs for Research*. Chicago: Rand McNally and Company; 1963.
58. Valente TW. Evaluating communication campaigns. In: Rice RE, Atkin CK, eds. *Public Communication Campaigns*. 3rd ed. Thousand Oaks, Calif: Sage; 2001:105-124.
59. Snyder LB, Hamilton MA. *When evaluation design affects results: meta-analysis of evaluations of mediated health campaigns*. New Orleans, La: Annual Conference of the Association for Education in Journalism and Mass Communication; 1999.
60. Centers for Disease Control and Prevention (CDC). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Ga: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 1984-2005. Available at: <http://www.cdc.gov/brfss/index.htm>.
61. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention (Atlanta, Ga). Youth Risk Behavior Survey and Middle School Youth Behavior Survey; 1992-2005. Available at: <http://www.cdc.gov/healthyyouth/yrbhs/index.htm>.
62. Centers for Disease Control and Prevention (CDC). National Center for Health Statistics (NCHS). National Health and Nutrition Examination Survey Data. Hyattsville, Md: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 1999-2006. Available at: <http://www.cdc.gov/nchs/nhanes.htm>.
63. Brashers DE, Goldsmith DJ, Hsieh E. Information seeking and avoiding in health contexts. *Hum Commun Res*. 2002;28:258-271.
64. Shim M, Kelly B, Hornik R. Cancer scanning and seeking behavior is associated with knowledge, lifestyle choices, and screening behavior. Presented at the annual meeting of the International Communication Association. New York; May 2005.