

Mass Media in Support of Smoking Cessation

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INTRODUCTION Much of what we have learned about the effect of media can be drawn directly from reports on California and Massachusetts cessation trends; the COMMIT experience; Current Population Survey trends; and specific studies on the combined effects of media on pricing, environmental bans, community programs, clinical and self-help interventions. Our objectives are: 1) to summarize key findings in this research regarding media effectiveness, and 2) to discuss the implications of these findings for media practice in support of smoking cessation.

The mass media provide an important means for reaching and influencing smokers on a population-wide basis. Properly designed and implemented, media campaigns can be cost-effective and efficient in disseminating knowledge and information, realigning attitudes and social norms, and advocating for policy changes (Reid, 1996; Burns, 1994; Goldman and Glantz, 1998; Wallack and Dorfman, 1996). These roles tend to support each other and can have broad (“ripple out”) as well as more selective (“targeted”) social and behavioral consequences, depending on the methods and strategies used (mass or segmented; population- or subgroup-focused).

For all their potential, however, media campaigns have caveats. Consumers today are more media-literate and more diverse in their media consumption patterns than in past generations. This means that there is no single most effective way to appeal to smokers using the media. The increased number of television channels, in particular, has led to more fractured and less predictable general audiences. Although this proliferation potentially enables better audience segmentation and targeting, it also entails greater complexity and possibly greater costs in reaching a large group. At the same time, messages within a given media campaign must be sensitive to and differentially targeted to differing segments of smokers if penetration of these special populations and widespread effects are to occur (Goldman and Glantz, 1998). Such segments include members of distinct linguistic, geographic, and cultural communities, as well as high-risk lifestyle groups and heavily addicted smokers.

Evidence suggests that media campaigns are most effective at eliciting smoking cessation when they are part of a comprehensive program of interventions. It has been recognized that “Changes in media have been associated with major changes in smoking behavior, but only when the rest of the social structure actively changed the environment for the smoker. These changes act synergistically with media messages, and cessation or behavior change occurs” (Burns, 1994). Even with these caveats, mass media cam-

paigns can be effective in challenging people's everyday understanding of smoking and at stimulating positive attitudinal and behavioral changes with respect to smoking cessation (Reid, 1996; Flay *et al.*, 1993; Sussman *et al.*, 1994; Wallack and Dorfman, 1996).

Media interventions supporting smoking cessation can be undertaken at three levels: to elicit very specific behavioral changes; to affect the determinants of such behavioral changes; and to advocate for policy changes that, in turn, can affect more complex behavioral changes. In each case, interventions can have predisposing, enabling, and/or reinforcing effects (Green and Kreuter, 1991) with respect to these targeted changes within the context of particular campaign strategies (mass or targeted) and outcome objectives (information, education, motivation, and advocacy). This paper focuses on evaluating media efficacy on the first two of these levels—eliciting smoking cessation behavior and influencing attitudes and opinions. The third level, media advocacy, is briefly discussed at the end as an extension of the process of influencing attitudes and opinions. Two major bodies of evidence are reviewed; the California and Massachusetts campaigns are reviewed as examples of the best campaign practices, and the Stanford Five-City Project and COMMIT study are reviewed as the best examples of controlled community trials that used media.

CALIFORNIA AND MASSACHUSETTS ANTISMOKING ADVERTISING CAMPAIGNS

These well-documented campaigns were undertaken in California in 1990 (Bal *et al.*, 1990) and in Massachusetts in 1994 (Koh, 1996; Begay, 1997) with the dual objectives of discouraging smoking initiation and encouraging smoking cessation. Each campaign was accompanied by a tax increase on the sale of cigarettes—in 1989 and 1993, respectively—amounting to \$0.25 per pack (although, when the tax went into effect in Massachusetts, the tobacco companies reduced point-of-sale prices to 1992 pretax levels).

Goldman and Glantz (1998) have recently analyzed the cost-effectiveness of the two media-led tobacco control campaigns and synthesized findings from the 186 focus groups (involving over 1,500 children and adults) that were conducted by advertising agencies to develop the message strategies for California and Massachusetts and also for a campaign in Michigan. During 1989-1996, per capita cigarette consumption in California fell 1.93 packs per year faster than in the rest of the United States, and during 1993-1996, Massachusetts consumption fell 1.28 packs per year faster. These declines were the result of the combined effects of the tobacco control campaigns in the two states and the increase in the cigarette costs resulting from the tax increase. However, Massachusetts conducted a more media-intensive campaign. The average yearly per-capita cost for the media campaign in California was \$0.50 (1996 U.S. dollars) and the per-capita cost for the Massachusetts campaign was \$2.42 (Goldman and Glantz, 1998).

Based on the focus group results, the most influential advertising messages were those that aggressively addressed tobacco industry duplicity and manipulation and the health consequences of secondhand smoke. Focus group results suggest that these were effective for both adults and youths,

although for different reasons. Adults tended to re-express their guilt at being unable to quit smoking as anger towards the tobacco industry's drive to profit from a deadly product, whereas youths perceived tobacco industry manipulation as being exactly the kind of social control they were rebelling against. Secondhand smoke made adults feel responsible for contaminating the air of children. For youths, it tended to awaken a "sense of injustice for the little guy." The secondhand smoke theme was effective for both groups because it portrayed the child as a "helpless victim" as well as "[making] people aware of the effects of their smoking on others" (Goldman and Glantz, 1998, p. 775).

Recent analyses (Biener, 1998) of findings from adult cohort surveys in the Massachusetts advertising campaign suggest that the perceived emotional intensity of antismoking advertisements correlates positively with the advertisements' perceived effectiveness. A representative sample of adults ($n = 1,566$) was interviewed by telephone before the nine Massachusetts advertisements were aired on television in 1994 and then again 3 years later. In the follow-up survey, cohort recall of the nine advertisements was measured (all were 30-second spots), and each advertisement was then rated on a 10-point effectiveness scale. Correlates of perceived effectiveness were analyzed based on the effectiveness measure, viewer characteristics (from the baseline and follow-up survey), and advertisement characteristics (established independently by a panel of 15 judges). The findings indicate that humorous advertisements are not seen as effective and that spots portraying illness resulting from smoking are likely to be perceived as emotionally intense. Viewer responses were stratified by smoking status (current smoker, quitter, or nonsmoker) for particular advertisements. For example, nonsmokers rated the *Janet Sackman* spot (Tobacco industry is targeting kids) as most effective, whereas quitters and smokers rated the *Picture on Pack* (Quit to stay alive for your kids) as most effective. Nevertheless, all three groups rated the *Circle the date* (Pick a date to quit) and *Ask the doc* (Your doctor can help you) as the two least effective advertisements in the campaign. Smokers on average were found to be more attentive than nonsmokers to anti-tobacco messages. Smokers who were anticipating quitting tended to rate advertisements more highly than those not ready to quit. Smokers who had attempted but failed to quit rated helpful advertisements more highly.

It is likely that the tax increase had an effect on campaign results in California, but not in Massachusetts. Hu *et al.* (1995) conducted an econometric analysis of the relative effects of the California tax increase and the media campaign on per capita cigarette sales and found that the tax increase yielded a higher negative demand elasticity (-0.30) than did the media campaign (-0.05). Goldman and Glantz (1998), however, note that the Hu *et al.* study probably underestimated the demand elasticity of the media campaign, because their model did not account for the additional promotional activities undertaken by the tobacco industry to counter the effects of the media campaign (p. 773). The tobacco industry reduced the price of cigarettes at approximately the same time that the increase in tax occurred in Massachusetts, and therefore the cost effect of the increase in tax was blunted.

Popham *et al.* (1993) surveyed adults who had quit smoking during the first wave of the California campaign (1990-1991) and found that 6.7 percent of smokers, without being cued, identified campaign advertising as a factor in their decision to quit smoking. When directly queried about the campaign, 34.3 percent identified the campaign as having influenced their decision. This translates into 33,000 and 173,000 former adult smokers in California whose decision to quit was influenced to a perceptible degree by the antismoking advertising campaign.

Tables 9-1 and 9-2 present measures of change in smoking behavior for the 1990 and 1996 California Tobacco Surveys (CTS) in relation to self-reported recall of media in the last week (1990) and last month (1996) for television, radio, newspaper, magazine, and billboard spots. The change in smoking behavior measures presented are for those who were current daily smokers 1 year prior to the survey and who were age 25 years or older at the time of the survey. In general, those who reported recall of media spots were more likely to have made a quit attempt in the last 12 months than those who did not. These analyses do not establish whether the quit attempt was a result of the exposure to the media or whether the recall is because of an interest in quitting. Cessation is a process that occurs over time and is measured over the prior 12 months in these analyses. Recall of the media is measured over the last month or week, and it is unlikely that the difference in cessation activity occurred during that period. However, it is also likely that recall of the media is a measure that is generalized over a longer period of time than that specified in the survey question, raising the possibility of a direct effect.

Figure 9-1 presents cessation attempts for the 1990 and 1996 CTS by the number of media channels that the smokers recalled. There is a statistically significant increase in cessation with increasing number of channels recalled for both survey years.

The Massachusetts and California campaigns in many respects represent the “state of the art” in media methodologies, and their results thus far have been quite positive. Several important qualifications need to be made, however, about the findings discussed above. Both campaigns are multidimensional and encompass a number of activities and components in addition to media advertising and taxation. California in particular has integrated a variety of additional services and programs into its campaign, including a statewide proactive telephone helpline, targeted interventions for ethnic and linguistic minorities, and various school- and community-based initiatives. It would be a mistake, therefore, to credit the declines in consumption solely to media advertising. The relative rate comparisons of tobacco consumption reported by Goldman and Glantz (1998) certainly do not rule out other contributing causes, and they do not account for the broader social context of change. Comparing a target state's consumption rate with the rest of the country is useful as a relative indicator of campaign success, but it does not control for ancillary factors that may be contributing to both the national and local state rates. Such factors may include a long-term decline in smoking rates nationally (the “secular trend”) or the status

Table 9-1

Recall of Media in the Last Week* among Current and Former Smokers**

	Current Smokers				Former Smoker		Population Size (N)	Sample Size (n)
	Made Quit Attempt		No Quit Attempt		(Any Quit Length)			
	%	CI	%	CI	%	CI		
Total	35.36	1.71	54.11	1.64	10.53	1.05	3,414,774	7,249
Television Exposure								
Some	38.27	1.99	52.99	2.05	8.74	1.47	1,491,309	3,294
None	33.30	2.30	54.51	2.13	12.20	1.66	1,788,553	3,670
Unknown	30.46	7.28	61.25	8.95	8.28	3.85	134,912	285
Radio Exposure								
Some	41.62	5.18	49.13	4.67	9.25	2.79	501,934	997
None	34.21	1.68	54.95	1.54	10.84	1.06	2,686,266	5,751
Unknown	35.03	6.45	55.27	7.22	9.71	4.42	226,574	501
Newspaper or Magazine Exposure								
Some	36.99	2.56	51.62	2.48	11.39	2.36	701,727	1,683
None	34.93	1.88	54.83	1.83	10.24	1.11	2,564,939	5,308
Unknown	35.08	12.77	53.45	10.16	11.48	7.41	148,108	258
TV, Radio, Newspaper, or Magazine Exposure								
All	41.40	7.06	49.31	10.45	9.29	7.93	92,430	184
Some	37.80	1.91	52.55	2.03	9.64	1.43	1,925,111	4,290
None	31.73	2.48	56.32	2.65	11.95	1.63	1,229,318	2,456
Unknown	30.54	8.84	58.45	9.94	11.01	6.25	167,915	319

*The questions differ between the 1990 survey and the 1996 survey:

1990: Did you see anything in the newspapers or magazines in the last week about the pros or cons of smoking?

1996: In the last month, have you seen a billboard with a message against smoking?

**Current or former smokers, 25+ years of age, who were daily smokers 1 year ago.

Source: 1990 California Tobacco Survey.

of antismoking activities in other state jurisdictions. Without detracting from the success of these two campaigns, it is instructive to compare these very positive findings with the more modest results obtained in community trials that have used experimental control methods to evaluate campaign and intervention performance.

STANFORD FIVE-CITY PROJECT (FCP)

The Stanford Five-City Multi-factor Risk Reduction Project (FCP) was a landmark field trial funded in 1978 to evaluate community-based cardiovascular health education methodologies. The FCP was designed to extend the knowledge and experience gained in the Stanford Three-Community Study and to offer a more rigorous basis of evaluation by using two treatment cities (Monterey and Salinas) and three control cities (Modesto and San Luis Obispo; and Santa Maria for morbidity and mortality data only). Initial funding covered 9 years (6-year intervention with a 3-year follow-up); however, funding was extended to 18 total years in 1987 to allow for 4 additional years of education maintenance (to 1990) and 6 more years of program surveillance (Fortmann *et al.*, 1995). Cardiovascular disease (CVD) risk factors targeted for reduction in the program's multifactorial design included hypertension, elevated plasma cholesterol, smoking, obesity, and sedentary lifestyles (Farquhar *et al.*, 1985 & 1990).

Table 9-2

Recall of Media in the Last Month* among Current and Former Smokers**

	Current Smokers				Former Smoker		Population Size (N)	Sample Size (n)
	Made Quit Attempt		No Quit Attempt		(Any Quit Length)			
	%	CI	%	CI	%	CI		
Total	34.80	1.29	54.97	1.42	10.24	1.00	2,888,238	6,203
Television Exposure								
Some	35.84	1.58	54.68	1.64	9.48	0.97	2,265,114	4,891
None	32.15	3.69	54.10	4.09	13.75	3.24	463,099	957
Unknown	27.71	5.89	61.58	6.85	10.71	3.26	160,027	355
Radio Exposure								
Some	38.35	2.46	51.41	2.31	10.24	1.30	1,329,508	2,882
None	32.64	1.94	56.67	2.51	10.70	1.75	1,187,535	2,516
Unknown	29.01	3.73	62.25	4.81	8.75	2.21	371,198	805
Billboard Exposure								
Some	39.83	1.86	50.61	2.20	9.57	1.30	1,278,612	2,698
None	30.69	1.92	58.57	2.01	10.74	1.30	1,580,481	3,434
Unknown	36.99	11.43	.	.	12.05	8.61	29,151	71
TV, Radio, or Billboard Exposure								
All	42.69	3.34	48.07	3.46	9.24	1.56	678,171	1,416
Some	33.49	1.73	56.63	1.84	9.88	1.11	1,875,742	4,085
None	27.19	4.40	57.11	4.94	15.69	4.32	224,240	465
Unknown	24.00	5.73	64.72	6.85	11.28	4.24	110,092	237

*The questions differ between the 1990 survey and the 1996 survey:

1990: Did you see anything in the newspapers or magazines in the last week about the pros or cons of smoking?

1996: In the last month, have you seen a billboard with a message against smoking?

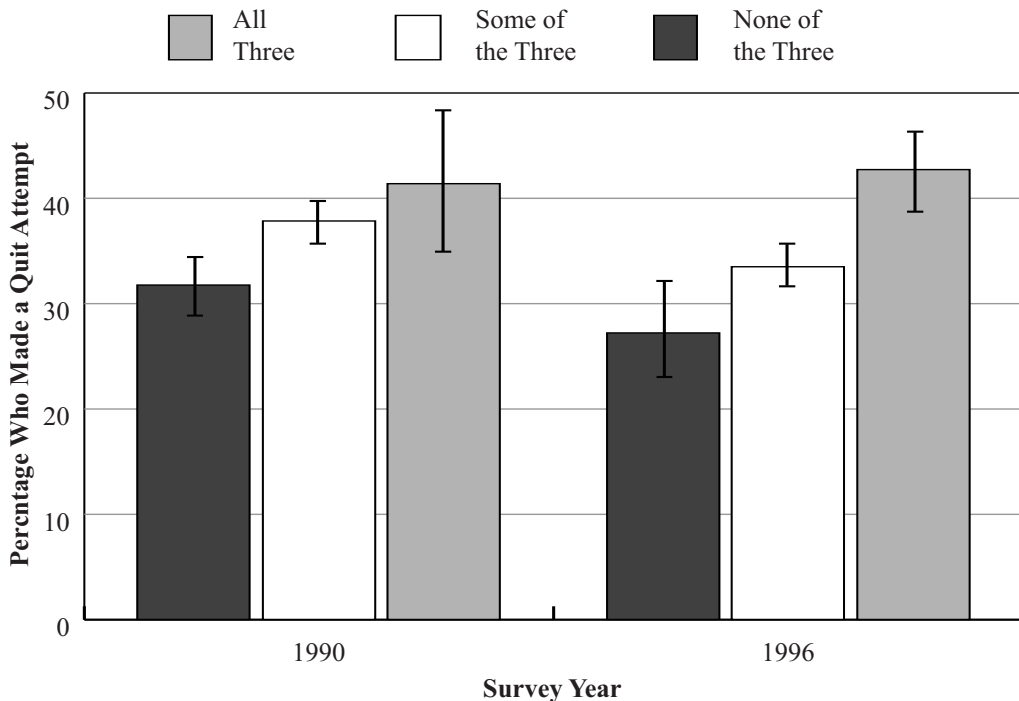
**Current or former smokers, 25+ years of age, who were daily smokers 1 year ago.

Source: 1996 California Tobacco Survey.

The smoking cessation component of FCP was comprehensive, integrated, and multifaceted, and used multiple communications channels and message formats to reach a socially diverse audience of smokers (Fortmann *et al.*, 1993). Media elements differed somewhat from year to year but typically encompassed television, radio, and print campaigns. In the third education year (1982-1983) for example, a television-based smoking cessation program was developed and aired, as were nine 30-second and five 10-second television public service announcements (PSAs) and a radio cessation series targeted at younger, blue-collar smokers. Radio and print programs were also developed for Spanish-speaking audiences. Knowledge, attitude, and behavior goals were set for each year, as were program outcomes. For 1982-1983, the goal was to motivate 2,000 smokers to quit. Predisposing, enabling, and reinforcing factors were emphasized to enhance overall smoking cessation objectives. As noted by the authors, "Attempts were made to increase knowledge about the dangers of smoking and the advantages of quitting, to alter attitudes about smoking, to increase smokers' confidence in their ability to quit, and to encourage smoking prevention, cessation, and maintenance. Multiple programs and products were developed to achieve these aims" (Fortmann *et al.*, 1993). In addition to the media com-

Figure 9-1

Percentage of Current Smokers Making a Quit Attempt by Number of Media Modalities in Which Smoking Messages were Recalled



1990: Television, radio, or newspaper/magazine in the last week

1996: Television, radio, or billboard in the last month

Source: 1990, 1996 California Tobacco Surveys

ponent, core program elements included self-help cessation methods (broadcast cessation programs and quit kits in English and Spanish), group programs, contests and events (Smoker's Challenge, Great American Smoke-Out), school-based smoking prevention initiatives, and health professional interventions (education for health practitioners).

An evaluation of smoking rates by Fortmann *et al.*, (1993) after the fifth education year showed significant treatment effects for the FCP's cohort sample and for the baseline population at follow-up, but showed no significant effects for the independent, cross-sectional samples. The decline in cohort smoking rates (factored as a linear slope coefficient) averaged -1.51 percentage points/year in the two treatment cities, nearly double the -0.78 percentage points/year averaged in the two control cities ($p = 0.007$). By contrast, the findings for the independent samples reflected little treatment effect. The decline in smoking prevalence was similar in treatment and control cities, the changes that occurred were not linear, and cessation rates varied within cities between surveys (Op cit., p. 82). Nevertheless, baseline smokers in both the cohort and independent samples (identified in the initial 1978-1979 survey) were more likely to quit smoking in the treatment

cities than in the control cities (bio-confirmed). In the independent sample, 22 percent in the treatment condition quit smoking, compared with 18 percent in the control, and the resulting treatment versus control survival curves were significantly different (log rank $p = 0.04$). The smoking survival analyses for the cohort sample yielded greater differences with quit rates of 40 percent of baseline smokers in the treatment condition, compared with 23 percent in the control condition, and significant survival curve differences (log rank $p = 0.006$). However, the cohort sample sustained a high dropout rate (nearly 50 percent) and when dropouts were re-coded as smokers as a cautionary measure, significance was lost (log rank $p = 0.075$).

Predictors of smoking cessation for men were baseline cigarette consumption (number per day) and treatment status, whereas for women only baseline cigarette consumption was significant. Education level, intention to quit, and alcohol intake were moderately predictive but did not reach statistical significance. More importantly, media exposure and knowledge of cardiovascular disease both had p values of less than 0.2 and as a result were not included in the final predictive model.

Fortmann *et al.* (1993) also evaluated the effects of socio-demographic characteristics on cessation by cross-tabulating changes in smoking prevalence between the baseline and final cohort surveys with baseline demographic and behavioral characteristics of the sample. These comparisons were post hoc, and Fortmann *et al.* warn that they should be considered exploratory. Because of the small number of comparisons in the data set and the lack of power to detect differences, no statistical tests were reported. Nevertheless, the stratification of changes in smoking rates that resulted is instructive. Treatment effects (measured by net differences in smoking rate changes for treatment and control) were much greater for men (-8.6) than for women (+0.8), and for Anglos (White/non-Hispanic) (-3.8) than for other ethnic groups (approximately half Hispanic) (-2.2), although these subgroups had very dissimilar baseline smoking rates. Treatment cities demonstrated higher smoking rate declines than controls for all age groups and at all education levels, except for the strata with less than a high-school education (+0.8). Lighter smokers (two strata—light ≤ 15 cigarettes/day; moderate = 16-24 cigarettes/day) were more likely to quit than heavy smokers (≥ 25 cigarettes/day) in both the treatment and control conditions. But the change in treatment cities was greater than in control cities at all levels, particularly for moderate-level smokers (light: -7.9; moderate: -21.3; heavy: -8.6).

A subsequent analysis of smoking rates conducted by Winkleby *et al.* (1996), several years after the Fortmann *et al.* study, yielded less positive treatment effects. Using cross-sectional data from the final survey in 1989/1990 (conducted 3 years after the main intervention as the last phase of the original 9-year design), Winkleby *et al.* (1996) found that, “smoking rates leveled out or increased slightly in treatment cities, while declines in the control cities continued” (p. 1,777). Comparing figures for the last year of treatment and the final survey (a 3-year period), the net difference in percentage of smokers in the treatment cities versus the control cities was

+5.8 for men (a change of +3.0 percent in treatment and -2.8 percent in control) and +3.8 for women (a change of -0.2 percent in treatment and -4.0 percent in control). No significant treatment effects were found.

Winkleby *et al.* (1996) attribute the erosion of treatment effects partly to the secular trends in smoking and partly to antismoking activities in one of the control cities, San Luis Obispo, whose smoking trends approximated those in the treatment cities. The number of smokers in the combined control-city data reported by Winkleby *et al.* (1996) fell from 34.3 percent and 30.3 percent of population at baseline for men and women, respectively, to 21.6 percent and 15.2 percent in the final survey, 10 years later.

COMMUNITY INTERVENTION TRIAL FOR SMOKING CESSATION (COMMIT)

COMMIT was funded by the National Cancer Institute (NCI) in 1986 to test the effectiveness of a comprehensive, multiyear, community-based smoking control intervention using randomized control conditions (COMMIT Research Group, 1996). Results from COMMIT are reported elsewhere in this monograph, therefore, only brief mention will be made here of the design and findings of the study as they pertain to mass media and smoking cessation. The COMMIT trial was organized in 11 pairs of communities that were each matched for size, geographic location (state or province), and demographic characteristics. Intervention and comparison communities were randomly assigned from each pair, so treatment/control comparisons would be between like communities. The intervention strategy was standardized across communities and was a comprehensive community activation approach. Fifty-eight activities were mandated, with only limited opportunity for tailoring. Four primary intervention channels were targeted: public education through the media and community events, health care provider interventions, work-site interventions, and cessation resources development and distribution. The public education component required communities to undertake five core activities (COMMIT Research Group, 1995a; Wallack and Sciandra, 1991):

- Provide media advocacy training for community board members
- Implement an initial “kick-off” event
- Publicize smoking control plans
- Design and implement “magnet events” (such as local Quit & Win contests and local extensions of the Great American Smokeout)
- Publicize activities in other areas (such as self-help materials)

COMMIT's main target population was heavy cigarette smokers (>25 cigarettes/day) aged 25 to 64 years; however, the trial's design was cross-sectional and followed a community-based, mass intervention strategy, not a segmented strategy. The primary hypothesis of COMMIT was that, "implementation of a defined intervention protocol [would] result in at least 10 percent higher quit rates among heavy cigarette smokers in the intervention communities than the quit rate observed in the comparison communities (*i.e.*, 25 percent versus 15 percent)" (COMMIT Research Group, 1996; p. 1,621). One of the optional activities permitted under the research protocol was mass media based cessation campaigns. Intermediate trial goals were compatible with media intervention effects and included:

- Increasing the priority of smoking cessation as a public health issue;
- Increasing the community's capacity to modify the smoking behavior of its residents;
- Enhancing the influence of existing political and economic factors that discourage smoking in the community; and
- Increasing societal norms and values that support nonsmoking.

The COMMIT intervention was carried out over 4 years from January 1989 to December 1992. Baseline surveying was done from January to May 1988, followed by annual surveys during the intervention, and a final prevalence survey from August 1993 to January 1994 (COMMIT Research Group, 1995a).

The COMMIT trial achieved significant smoking cessation effects among light-to-moderate smokers in the cohort sample, but not with heavy smokers and not with the independent cross-sectional samples. Average cessation rates (self-reported) for light-to-moderate smokers in the cohort sample were 0.306 for the intervention communities and 0.275 for the comparison communities ($p = 0.004$). By contrast, the rates for heavy smokers were 0.180 for intervention and 0.187 for comparison, a nonsignificant difference ($p = 0.68$). The average quit ratio (an analogous measure to the cohort quit rate, see COMMIT Research Group, 1995b, pp. 194-195) for the independent sample was 0.198 for intervention and 0.185 for comparison, a nonsignificant difference ($p = 0.09$) (COMMIT Research Group, 1995b, p. 196).

Average smoking prevalence rates for the target 25- to 64-year-old age group (independent sample) declined in the intervention communities from 27.6 percent at baseline to 24.1 percent in the final survey (a change of -3.5 percent) and from 28.6 percent to 25.4 percent in the comparison communities (a change of -3.2 percent), a nonsignificant difference ($p = 0.36$). Heavy smoking prevalence fell from 10.2 percent at baseline to 7.3 percent at final for intervention (change of -2.9) and from 11.0 percent to 8.2 percent for comparison (change of -2.9), also a nonsignificant difference ($p = 0.51$).

The COMMIT Research Group evaluated the intervention effects of the mandated smoking control activities by measuring smokers' and recent ex-

smokers' "perception of receipt" of these activities, and by comparing these findings across the intervention and comparison conditions. Only two of the mandated intervention activities achieved significance in the receipt indices, and they were significant for both the cohort and independent samples. These were events and contests (cohort: $p = 0.001$; independent: $p = 0.01$) and programs and materials (cohort: $p = 0.007$; independent: $p = 0.05$). By contrast, media/public relations activities were the least differentiated between the intervention and comparison communities (cohort: $p = 0.29$; independent: $p = 0.68$).

The COMMIT Research Group used pair-wise rank correlations of quit rate differences and receipt-index differences as a way to evaluate the success of the intervention for changing behavior. The correlation findings demonstrate a significant intervention effect for light-to-moderate smokers in the cohort group (rank order correlation = 0.75, $p = 0.01$), but not for the heavy smokers (rank order correlation = 0.13, $p = 0.71$). As noted by the COMMIT Research Group (1995a):

"This suggests that in the light-to-moderate smoker cohort, where the COMMIT intervention did produce a behavioral change, the magnitude of this intervention effect was related to the magnitude of the difference in awareness of (or participation in) smoking control activities."

In the independent sample, pair-wise intervention/comparison differences in the summary receipt index (a standardized composite score of all eight evaluated smoking control activities of which media/public relations was one) were found to correlate significantly with differences in the quit ratio (rank order correlation 0.67, $p = 0.02$), but not with differences in changes of smoking prevalence (rank order correlation 0.02, $p = 0.96$). Interaction tests between quitting and socio-demographic variables yielded one statistically significant finding that demonstrated an inverse relationship to education level and showed that most of the benefits in the light-to-moderate smoker cohort were seen in the lesser educated subgroup (COMMIT Research Group, 1995a, p. 187).

DISCUSSION

The evidence reviewed here supports the observations that a comprehensive program of tobacco control interventions supported by media campaigns can be effective. Although additional factors were undoubtedly at play in the California and Massachusetts experiences, the combined demand elasticities resulting from increased taxes and an effective media-led tobacco control intervention in California (versus Massachusetts where the tobacco industry lowered point of sale prices) help to account at least in part for the higher reported rate of success in smoking cessation in that state. Findings from the Stanford FCP and COMMIT are less conclusive, although they support the efficacy of integrated interventions. Both trials achieved significant treatment effects, using multifaceted, multilevel interventions that combined media campaigns with community-based programs designed to target smoking cessation. Even though the net gains were appreciable, the effects in both trials were mainly restricted to light-to-moderate smokers in the cohort groups and did not extend to the

independent sample or the population of the more addicted heavy smokers. The media awareness findings in the FCP were not significant ($p = 0.2$), and the COMMIT receipt indices for media/public relations activities were the least differentiated between the intervention and comparison communities (cohort: $p = 0.29$; independent: $p = 0.68$).

A number of researchers have attributed the selective success of the Stanford FCP and COMMIT to declining secular trends in smoking and to the increased diffusion of health information about smoking, championed in part by the popular press (Fortmann *et al.*, 1993; Winkleby, 1994; Winkleby *et al.*, 1996; Green, 1997a; COMMIT Research Group, 1995b; Susser, 1995). The COMMIT Research Group (1995b) speculated that the low receipt indices they found for public education and media coverage may reflect the inability of this type of intervention “to affect smoking behavior much beyond national secular trends” (p. 199). In particular, they noted that the increased coverage of tobacco issues in the media observed during the COMMIT trial may have diminished audience receptivity to the trial's own publicity, resulting in “little additional effect of the COMMIT efforts” (*Op cit.*).

The widespread public adoption of healthier lifestyles (including quitting smoking) has followed the classical S-shaped curve of innovation-diffusion theory over the last three decades (Green, 1991; Green, 1997b; Green and Richard, 1993; Rogers, 1983). Declines in smoking rates began in the United States and Canada in the 1960s, soon after the release of the first Surgeon General's report (1964), and the declines have continued to present (Burns, 1994; Cunningham, 1996). The diffusion curve that has resulted helps to explain a number of the apparent inconsistencies and “failures” in the FCP and COMMIT. For example, the diminished success of these trials when compared with earlier trials such as North Karelia, Finland and the Stanford Three-Community Study, can be explained in part by where they have occurred on the diffusion curve. The earliest community trials--North Karelia and the Stanford Three-Community Study--led the diffusion curve and were therefore more successful at producing treatment effects that were ahead of the secular rate of change. Subsequent programs, however, were undertaken after the secular rate of change was already in full swing and had engaged the steeper component of the curve. In such circumstances, when motivation to quit smoking and knowledge about how to quit is widespread, it becomes increasingly difficult to outperform the secular rate of change in a randomized treatment/control context.

The momentum of the secular trend in smoking today is likely partly a result of the power of the media to communicate to a mass public. It also dramatizes the difficulties faced by health promotion initiatives that want to “be heard” over the “noise” of extant health information in the media system. The secular declines in smoking are largely attributable to the success of prior health education initiatives, however, and this attests to the long-term value of education interventions, whether or not they outperform the secular trend.

A second conclusion to draw from these studies, therefore, is that the environmental context of smoking and smoking information is in a state of change that appears to be following classic diffusion patterns. This helps to explain the rather modest media results of FCP and COMMIT, as just noted, and also highlights an emerging need for campaigns to take better account of the media environments in which they operate. The successes in Massachusetts and California indicate that media planners should exploit formative research methods to ensure that campaign messages reinforce (and where necessary, lead or correct) social beliefs portrayed in the popular media context, so as to build on secular trends. Media advocacy strategies as well as social marketing campaigns and community-based interventions can all follow this course of action.

There are also implications for campaign measurement and evaluation. In a period of increased social diffusion of health messages, one can expect to find more respondent confusion over the authorship of particular health messages and more “legitimate” false recognition of campaign messages in control populations, because of the apparent similarity of secular and campaign messages (Brown *et al.*, 1990).

Diffusion theory predicts that at this point on the diffusion curve, motivational appeals are more likely to achieve success with smokers who are contemplating quitting than are cognitively oriented, informational appeals (although these two strategies are not necessarily incommensurate, as we discuss below). This prediction is founded on the premise that a motivational intervention will positively affect the determinants of behavior for a majority of adopters. The usefulness of the diffusion approach and the ability of the media to affect the determinants of smoking behavior are both supported by the results from the reviewed studies. The finding of Popham *et al.* (1993) that 34.3 percent of surveyed California smokers identified campaign advertising as a factor in their decision to quit smoking when prompted, and 6.7 percent spontaneously cited media as a factor, suggests that the campaign was a significant motivating factor for over a third of the smokers in the population. The campaign advertisements were broadly positioned to promote negative attitudes about smoking, and as such they targeted attitudinal determinants of smoking, although help-line numbers and the names of local health organizations were provided. Popham *et al.*'s findings fit well with Biener's (1998) results from Massachusetts—that emotionally tense advertisements were perceived as most effective. As with the California campaign, the strength of the advertising messages in Massachusetts seems to have been in providing the emotional (motivational) grounds for quitting, not in relaying particular techniques and methods. Smokers who had failed at an initial quit attempt, on the other hand, rated helpful advertisements more highly. Smokers generally were found to be more attentive than nonsmokers to anti-tobacco messages. Smokers who were anticipating quitting tended to rate the campaign advertisements more highly than those who were not ready to quit.

Emotive strategies need not necessarily be separate from informational and educational strategies. In some cases, the effectiveness of information penetration, adoption, and use could be enhanced if it were carried on a

message platform that had emotive and motivational appeal. Media messages can serve as a motivational “cue to action” for some smokers, in addition to influencing the context in which the action itself is undertaken. The obvious methodological question that results in this context is whether media campaigns actually enhance smoking cessation rates, or whether the people who quit smoking during a campaign are already motivated to quit and would have quit anyway (Flay *et al.*, 1993). Other types of media campaign evaluations often find that after an initial increase in the uptake of a recommended behavior, a dip in the rate of uptake appears in the following time interval. The number of people not changing in the second time interval is often approximately equal to the number who changed earlier (Green and Lewis, 1986). For example, this is the relationship seen in the 3-year follow-up study of the Stanford FCP noted above. Winkleby *et al.* (1996) found that “smoking rates leveled out or increased slightly in treatment cities, while declines in the control cities continued” (p. 1,777). This “borrowing from the future” response of populations to mass media appeals for behavior change makes the media appear to be successful in part by getting people to do a little earlier what they would have done later anyway.

To suggest that people might be “cued” by mass media to take action, therefore, draws into question both the manner and level of such “cueing.” A study of smoking behavior changes resulting from motivated versus habitual (“de facto”) exposure to a television program (Flay *et al.*, 1993) found that the strongest predictor for attempting to quit smoking was prior motivation to quit. At the same time, however, they also found that people did not actively seek out quit information when given the chance. Rather, their routine viewing patterns were a better predictor of their exposure to televised quit information. Most importantly, however, “de facto” exposure to the televised quit program (*i.e.*, as a result of their regular viewing habits) resulted in increased 24-hour quitting behavior even after controlling for a number of key motivational and demographic factors among the participants. This led Flay *et al.* to speculate that “readiness to change” can perhaps be more passive than previously theorized and that people can be serendipitously cued to action even though they would not have pursued it on their own.

This is a useful way to understand the results seen in the studies reviewed for this paper. That is, media interventions can be used to help build the supportive conditions (“determinants”) for smoking cessation, and to cue specific behavioral changes in individuals who are receptive to these cues and ready to change. Flay *et al.* (1993) conclude that, “particular audiences can be successfully targeted and some change brought about merely by determining which group views a particular television channel most often and knowing that the televised content meets high substantive standards” (p. 331). Other work by Sussman *et al.* (1994) suggests that these same conditions can be extended to other media. In particular, they found that newspapers had a more pronounced effect, in part because they reached the desired demographic group (older smokers) and they had a longer shelf life. One difficulty with television programs is that they have

no follow-up potential once viewed unless people have taped them. Newspaper supplements, by contrast, are long lasting and can be read or browsed at people's leisure, as they will.

In an era of increasing media outlets and modes of communication, the selection of appropriate communication channels for reaching general and target audiences will tend to become more critical. It may be possible to improve campaign efficiency, however, by following a multimodal, multi-channel approach and by using messages that are designed to appeal broadly to several target groups. In the Massachusetts and California campaigns, messages that aggressively focused on tobacco industry duplicity and manipulation and on the health consequences of secondhand smoke were successful with both adults and youths (although for different reasons). This kind of "message efficiency" (of multiple address) can only be achieved through formative research on the targeted populations, as was done (using focus groups) in Massachusetts and California. A second kind of "message efficiency" (of multifunctionality) is also desirable. As noted in the introduction, media messages supporting smoking cessation can be undertaken at three levels: to elicit very specific behavioral changes; to affect the determinants of such behavioral changes; and to advocate for policy changes that, in turn, can affect more complex behavioral changes. Multifunctional messages target change at several of these levels, for example, by using emotive appeals that are designed to alter people's attitudes towards smoking and at the same time cue smoking cessation behavior. Practically speaking, most campaign messages function at several levels, and even functionally distinct campaign strategies can have cross-functional effects. For example, anti-smoking advertising can serve as a stimulus to policy change, and media advocacy programs can result in smoking cessation (as seen in COMMIT).

Events, such as the Great American Smoke-Out and Quit & Win contests, have value in communications plans because they are inherently multi-address and multifunctional. They are also multimodal and attract the interest of a broad segment of the population, although actual participation rates tend to be low. Bains *et al.* (1995) found that contests generally recruit only 1 to 2 percent of the target population. Shipley *et al.* (1995) found that participation rates for stop-smoking contests varied from 0.27 percent to 3.11 percent in the COMMIT trial. Nevertheless, the media attention carried on events typically encompasses both print and broadcast media and is potentially far-reaching. Events and contests were the mandated activity with the most significant receipt indices in COMMIT (cohort: $p = 0.001$; independent: $p = 0.01$), more significant than programs and materials (cohort: $p = 0.007$; independent: $p = 0.05$). This suggests that the events themselves played an important role in distinguishing the COMMIT program in the intervention condition.

As a final observation, maintenance of an antismoking message in the mass media is in itself an important role for media campaigns. For the most part, the media context ("mediascape") continues to be populated with positive images of healthy young people smoking, provided through tobacco

advertising, sponsorship and movie placements. This context is unlikely to change appreciably in the near future. Sparks (1997a,b & c) has shown that the rate of tobacco marketing innovation has stayed ahead of the development of tobacco control legislation internationally, such that the tobacco manufacturers continue to be able to promote their brands effectively, even in countries where tobacco advertising is prohibited. A key point, therefore, is that without clear, targeted antismoking messages in the media, the media context is essentially tobacco-positive for most smokers and starters.

The final and overriding message from research, therefore, is that media support for smoking cessation should be undertaken in such a way as to support long-term goals of correcting social norms as well as short- and medium-term goals of eliciting smoking reduction and quitting in those who are predisposed to do so.

REFERENCES

- Bains, N., Pickett, W., Hoey, J. *Use of incentives to promote smoking cessation: a review*. Ontario Tobacco Research Unit, Literature Reviews Series No. 1, Toronto, 1995.
- Bal, D.G., Kiser, K.W., Felten, P.G., Mozar, H.N., Niemeyer, D. Reducing tobacco consumption in California. *Journal of the American Medical Association* 264:1570-1574, 1990.
- Begay, M. The campaign to raise the tobacco tax in Massachusetts. *American Journal of Public Health* 87:968-973, 1997.
- Biener, L. *Anti-tobacco TV campaigns: Predictors of receptivity*, Presented Paper, Population-Based Smoking Cessation Conference, 1998.
- Brown, J.D., Bauman, K.E., Padgett, C.A. A validity problem in measuring exposure to mass media campaigns. *Health Education Quarterly* 17(3):299-306, 1990.
- Burns, D. M. Use of media in tobacco control programs. *American Journal of Preventive Medicine* 10(3):3-7, 1994.
- COMMIT Research Group. Community intervention trial for smoking cessation (COMMIT): Summary of design and intervention. *Journal of the National Cancer Institute* 83(22):1620-1628, 1996.
- COMMIT Research Group. Community intervention trial for smoking cessation (COMMIT): I. Cohort results from a four-year community intervention. *American Journal of Public Health* 85(2):183-192, 1995a.
- COMMIT Research Group. Community intervention trial for smoking cessation (COMMIT): II. Changes in adult cigarette smoking prevalence. *American Journal of Public Health* 85(2):193-200, 1995b.
- Cunningham, R. *Smoke & Mirrors: The Canadian Tobacco War*. Ottawa, ON: International Development Research Centre, 1996.
- Farquhar, J.W., Fortmann, S.P., Flora, J.A., Taylor C.B., Haskell, W.L., Williams, P.T., Maccoby, N., Wood, P. D. Effects of communitywide education on cardiovascular disease risk factors. *Journal of the American Medical Association* 264(3):359-365, 1990.
- Farquhar, J.W., Fortmann, S.P., Maccoby, N., Haskell, W.L., Williams, P.T., Flora, J.A., Taylor C.B., Brown, B.W., Solomon, D.S., Hulley, S.B. The Stanford five-city project: Design and methods. *American Journal of Epidemiology* 122(2):323-334, 1985.
- Feinleib, M. Editorial: New directions for community intervention studies. *American Journal of Public Health* 86(12):1696-1698, 1996.
- Fisher, E.B. Editorial: The results of the COMMIT trial. *American Journal of Public Health* 85(2):159-160, 1995.
- Flay, B. R. Mass media and smoking cessation: A critical review. *American Journal of Public Health* 77(2):153-160, 1987.
- Flay, B.R., McFall, S., Burton, D., Cook, T.D., Warnecke, R.B. Health behavior changes through television: The roles of de facto and motivated selection processes. *Journal of Health and Social Behavior* 34:322-335, 1993.
- Fortmann, S. P., Flora, J. A., Winkleby, M. A., Schooler, C., Taylor, C. B., Farquhar, J. W. Community intervention trials: Reflections on the Stanford five-city project experience. *American Journal of Epidemiology* 142(6):576-586, 1995.

- Fortmann, S. P., Taylor, C. B., Flora, J. A., Jatulis, D. E. Changes in adult cigarette smoking prevalence after 5 years of community health education: The Stanford five-city project. *American Journal of Epidemiology* 137(1):82-96, 1993.
- Foulds, J. Strategies for smoking cessation. *British Medical Bulletin* 52(1):157-173, 1996.
- Goldman, L. K., Glantz, S. A. Evaluation of anti-smoking advertising campaigns. *Journal of the American Medical Association* 279(10):772-777, 1998.
- Green, L.W. Diffusion theory extended and applied. In Ward, W., Lewis, F. M. (Eds.) *Advances in Health Education and Promotion*, vol. 3, London: Jessica Kingsley Publishers, 1991.
- Green, L. W. Taxes and the tobacco wars. *Canadian Medical Association Journal* 156: 205-206, 1997a.
- Green, L. W. Community health promotion: Applying the science of evaluation to the initial sprint of a marathon. *American Journal of Preventive Medicine* 13(4):225-228, 1997b.
- Green, L. W., Kreuter, M. W. *Health Promotion Planning: An Educational and Environmental Approach*, 2nd ed. Mountain View, CA: Mayfield Publishing Co, 1991.
- Green, L. W., Lewis, F. M. *Measurement and Evaluation in Health Education and Health Promotion*. Palo Alto, CA: Mayfield Publishing Co, 1986.
- Green, L. W., Ottoson, J. M. 1998. *Community and Population Health*, 8th ed. New York, Toronto: WCB McGraw-Hill, 1999.
- Green, L.W., Richard, L. The need to combine health education and health promotion: The case of cardiovascular disease prevention. *Promotion & Education* 11-17, 1993.
- Grunig, J.E. Publics, audiences and market segments: Segmentation principles for campaigns. In Salmon, C. T. (Ed.) *Information Campaigns: Balancing Social Values and Social Change*. Newbury Park, CA: Sage Publications, 1989.
- Haxby, D., Sinclair, A., Eiff, M. P., McQueen, M. H., Toffler, W. L. Characteristics and perceptions of nicotine patch users. *The Journal of Family Practice* 38:459-464, 1994.
- Holman, C.D., Donovan R.J., Corti, B., Jalleh, G., Frizzell, S.K., Carroll, A.M. Banning tobacco sponsorship: Replacing tobacco with health messages and creating health-promoting environments. *Tobacco Control* 6:115-121, 1997.
- Hu, T.W., Sung, H.Y., Keeler, T.E. Reducing cigarette consumption in California: Tobacco taxes vs. an anti-smoking media campaign. *American Journal of Public Health* 85(9):1218-1222, 1995.
- Hughes, J. R. The future of smoking cessation therapy in the United States. *Addiction* 91(12):1797-1802, 1996.
- Jenkins, C.N., McPhee, S. J., Lee A., Pham, G.Q., Ha, N.T., Stewart, S. The effectiveness of a media-led intervention to reduce smoking among Vietnamese-American men. *American Journal of Public Health* 87(6):1031-1034, 1997.
- Koh, H. K. An analysis of the successful 1992 Massachusetts tobacco tax initiative. *Tobacco Control* 5:220-225, 1996.
- MacKenzie, T. D., Bartheccchi, C. E., Schrier, R. W. The human costs of tobacco use. *New England Journal of Medicine* 330:975-80, 1994.
- Marin, B. V., Pérez-Stable, E. J., Marin G., Hauck, W. W. Effects of a community intervention to change smoking behavior among Hispanics. *American Journal of Preventive Medicine* 10(6):340-347, 1994.
- Marin, G., Marin, B.V., Pérez-Stable, E. J., Sabogal, F., Otereo-Sabogal, R. Changes in information as a function of a culturally appropriate smoking cessation community intervention for Hispanics. *American Journal of Community Psychology* 18(6): 847-864, 1990.
- McPhee, S. J., Jenkins, C. N., Wong C., Fordham, D., Lai, K. Q., Bird, J. A., Moskowitz, J.M. Smoking cessation intervention among Vietnamese Americans: A controlled trial. *Tobacco Control* 4(suppl. 1):S16-S24, 1995.
- Millar, W. J. Reaching smokers with lower educational attainment. *Health Reports* 8(2):11-19, 1996.
- Office of Disease Prevention and Health Promotion. Progress review: Tobacco. *Prevention Report* 12(4): 1-2, 1998.
- Pentz, M. A., Sussman, S., Newman, T. The conflict between least harm and no-use tobacco policy for youth: Ethical and policy implications. *Addiction* 92:1165-1173, 1997.
- Popham, W. J., Potter, L. D., Bal, D. G., Johnson, M. D., Duerr, J. M., Quinn, V. Do antismoking media campaigns help smokers quit? *Public Health Reports* 108:510-513, 1993.
- Reid, D. Tobacco control: Overview. *British Medical Bulletin* 52(1):108-120, 1996.
- Rogers, E. M. *Diffusion of Innovations*, 3rd ed. New York: The Free Press, 1983.
- Sandoval, V.A. Smoking and Hispanics: Issues of identity, culture, economics, prevalence, and prevention. *Health Values* 18(1):44-53, 1994.
- Shiple, R.H., Tyler, D.H., Austin, W.D., Clayton, A.C., Stanley, L.C. Community stop-smoking contests in the COMMIT trial: Relationship of participation to costs. *Preventive Medicine* 24:286-289, 1995.
- Slater, M. D., Flora, J. A. Health lifestyles: Audience segmentation analysis for public health interventions. *Health Education Quarterly* 18(2):221-233, 1991.
- Sparks, R. E. Bill C-71 and tobacco sponsorship of sports. *Policy Options* 18(3):22-25, 1997a.
- Sparks, R. E. *Sport Sponsorship, Public Health and the Tobacco Industry's Response to International Tobacco Control Legislation*, Working Paper, The University of British Columbia, p. 33. 1997b.
- Sparks, R.E. Tobacco control legislation, public health and sport sponsorship. *Asia-Australia Journal of Marketing* 5(1):59-70, 1997c.

- Susser, M. Editorial: The tribulations of trials — Intervention in communities. *American Journal of Public Health* 85(2):156-158, 1995.
- Sussman, S., Dent, C., Wang, E., Boley Cruz, N. T., Sanford, D., Johnson, C.A. Participants and non-participants of a mass media self-help smoking cessation program. *Addictive Behaviors* 19:643-654, 1994.
- Thompson, B., Rich L.E., Lynn, W.R., Shields, R., Corle, D.K. A voluntary smokers' registry: Characteristics of joiners and non-joiners in the community intervention trial for smoking cessation (COMMIT). *American Journal of Public Health* 88(1):100-103, 1998.
- Wallack, L. Improving health promotion: Media advocacy and social marketing approaches. In Atkin, C., Wallack, L. (Eds.) *Mass Communication and Public Health* (pp. 147-163). Newbury Park, CA: Sage Publications, 1990.
- Wallack, L., Dorfman, L. Media advocacy: A strategy for advancing policy and promoting health. *Health Education Quarterly* 23(3):293-317, 1996.
- Wallack, L., Sciandra, R. Media advocacy and public education in the community intervention trial for smoking cessation (COMMIT). *International Quarterly of Community Health Education* 11(3):205-222, 1991.
- Williams, J.E., Flora, J.A. Health behavior segmentation and campaign planning to reduce cardiovascular disease risk among Hispanics. *Health Education Quarterly* 22(1):36-48, 1995.
- Winkleby, M.A. The future of community-based cardiovascular disease intervention studies. *American Journal of Public Health* 84(9):1369-1372, 1994.
- Winkleby, M. A., Feldman, H. A., Murray, D.M. Joint analysis of three U.S. community intervention trials for reduction of cardiovascular disease risk. *Journal of Clinical Epidemiology* 50(6):645-658, 1997.
- Winkleby, M.A., Taylor, C.B., Jatulis, D., Fortmann, S.P. The long-term effects of a cardiovascular disease prevention trial: The Stanford five-city project. *American Journal of Public Health* 86(12): 1173-1779, 1996.
- Worden, J. K., Flynn, B. S., Geller, B.M. Development of a smoking prevention mass-media program using diagnostic and formative research. *Preventive Medicine* 17:531-558, 1988.