

ARTICLES

Promoting Smoking Cessation in the United States: Effect of Public Service Announcements on the Cancer Information Service Telephone Line

John P. Pierce,* D. Michael Anderson, Rose Mary Romano, Helen I. Meissner, JoAnne C. Odenkirchen

Background: Although many smokers report making attempts to quit, few seek help or are successful in their attempts. Some of the barriers to seeking help can be overcome by a telephone counseling and information service like that offered by the Cancer Information Service of the National Cancer Institute. This service has been promoted by antismoking public service announcements produced by the Office on Smoking and Health, Centers for Disease Control, Public Health Service, U.S. Department of Health and Human Services. **Purpose:** We determined whether such nationally televised public service announcements were associated with increased use of the Cancer Information Service. We assessed the importance of specifically promoting the telephone line and identified the characteristics of the individuals who responded to such promotion. **Methods:** We combined the frequency-of-call data from the Cancer Information Service with the data on the frequency and reach of the television spots. **Results:** During this 5-year study (1983-1987), the Cancer Information Service received a notably disproportionate number of calls in 3 specific months (August 1983, January 1985, and January 1987). In each case, more than 20% of all calls in that year were received in that month (expected percentage = 8% if the calls had been evenly distributed). These peak periods were associated with the showing of the three public service announcements that mentioned the telephone number of the Cancer Information Service. These promotions were particularly effective in increasing the percentage of callers who were male, who were under the age of 40 years, or who had received a high school education or less. **Conclusions:** Television is an effective medium for supporting antismoking goals by motivating more smokers to seek help to quit. **Implications:** It is important to identify whether the aid offered by the Cancer Information Service hotline is effective in helping the caller to quit. Future work must concentrate

on the most effective strategies for using this initial contact to provide aid to prevent relapse, thus maximizing the potential impact of the public service announcement campaigns. [J Natl Cancer Inst 84:677-683, 1992]

Reducing the prevalence of cigarette smoking has been a high public health priority for many years (1-3). At the current rates of change, smoking prevalence in the adult population will decrease to 22% (40 million people) by the year 2000 (4-6). These rates must double to meet the Public Health Service's aim to reduce smoking prevalence to 15% by that time.

A major barrier to reducing smoking prevalence is the high proportion of persons who quit smoking for only a short time. Although an estimated 17 million smokers quit for at least 1 day in 1986 (7), only 1.3 million smokers in any year succeed in quitting (4). The estimated success rate—about 8%—is even lower among smokers who have a high school education or less (8). Meeting the year 2000 goal will require a targeted program to help all smokers who want to quit.

Most people who try to quit smoking do not seek help. Of those who quit for at least 1 day in the early 1980s, only 10% sought help to make that attempt successful (9). Yet smoking-

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J. P. Pierce, University of California (San Diego) Cancer Center.

D. M. Anderson, H. I. Meissner, J. C. Odenkirchen, Division of Cancer Prevention and Control, National Cancer Institute, Bethesda, Md.

R. M. Romano, Office on Smoking and Health, Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control, Atlanta, Ga.

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*Correspondence to: John P. Pierce, Ph.D., UCSD Cancer Prevention Program, 0901, 2251 San Diego Ave., Ste. B-111, San Diego, CA 92110.

cessation programs typically have a 1-year success rate of between 20% and 45% (10). Participants in these programs would appear to be more addicted to cigarettes (9), but the barriers to program access may work to ensure that those who do attend are more motivated to succeed. One of the barriers to seeking help may be that most programs require participants to schedule one or more face-to-face visits with a counselor (11).

Personal telephone counseling and the provision of self-help materials are other ways of offering help to smokers who want to quit; these two methods do not have this scheduling barrier to access (12,13). Since 1983, the Cancer Information Service of the National Cancer Institute has provided a telephone counseling service for all areas of cancer concern, including smoking (14). This service has a network of 22 regional offices and one national office linked through a single telephone number (1-800-4-CANCER). This service has been promoted to the public using a number of means, including television public service announcements. As a result, more than 400 000 people each year are counseled or given information through this service.

Television commercials have been shown to be a potent means for motivating people to change their smoking habits (15-19). In the Sydney, Australia, "Quit. For Life" program, paid television and radio commercials were used to motivate smokers to either call the telephone helpline or attend a special low-cost cessation program. Such television advertising was associated with a sixfold increase in both the number of people who called the helpline and the number who attended cessation programs (15). This campaign was also associated with an almost immediate drop of 2.6% in community smoking prevalence in both men and women.

In the United States, television commercials in the form of public service announcements have been used to promote non-smoking. Both the Office on Smoking and Health (Centers for Disease Control, Public Health Service, U.S. Department of Health and Human Services) and, to a lesser extent, voluntary health organizations have used public service announcements to promote nonsmoking. Generally, nationally sponsored public service announcements have not been used to promote attendance at cessation programs; however, three such announcements were produced by the Office on Smoking and Health to promote calls to the Cancer Information Service telephone line.

This article seeks to determine whether the nationally televised public service announcements prepared by the Office on Smoking and Health since 1983 were associated with increased usage of the Cancer Information Service. We discuss the importance of specifically promoting the telephone service and identify the characteristics of the individuals who responded to such promotion.

Methods

The Cancer Information Service provides an information, counseling, and referral service to anyone who calls seeking help to quit smoking. It records the number of smoking-related calls each month and collects basic demographic information about a random subsample of callers and the type of service being sought. All counselors are trained to categorize smokers into groups based on the various stages of the quitting process

(14,20), but such information is not currently recorded in the Cancer Information Service database. Accordingly, this study is limited to information about the number of people who called between 1983 and 1987 and the demographic characteristics available only on the random subsample of callers.

The Office on Smoking and Health releases an average of three public service announcements in any given year. Some of these announcements are targeted at preventing young people from taking up the habit; others encourage smokers to quit. These public service announcements are presented to the public service directors of television stations and the networks, who then make decisions about placing them on the air. Television stations receive many other public service announcements that compete for the limited allocation of community service time. Television stations do not keep logs of the day or time at which these announcements are used. To gauge usage of the public service announcements that the Office on Smoking and Health releases, standard monitoring reports were purchased from the Broadcast Advertiser's Report, a company that monitors use of commercials in the top 75 of the 212 media markets of the country. These 75 markets cover 351 television stations and account for 80% of advertising expenditures in the United States. The Broadcast Advertiser's Report monitors 17 of these top 75 markets daily; together, these 17 are estimated to have access to greater than 50% of U.S. television households. The remaining 58 markets are monitored for a randomly selected week every month.

The commercial monitoring service records on videotape the daily programming from each television station and places electronic markers in periods of silence that mark the beginning and end of a public service announcement. Reviewers have a number of aids to enhance accuracy in recording. One of these is a list of all public service announcements that the Broadcast Advertiser's Report has been asked to monitor for that month. The Broadcast Advertiser's Report states that advertising agency auditing of its system has verified that the logs for paid commercials are 99.85% accurate. Using Arbitron television rating data for the shows during which the public service announcement was shown, the Broadcast Advertiser's Report estimates both the proportion of viewers who saw the announcement on at least one occasion and the undiscounted recommended dollar value of the particular television slot that was used. The target or undiscounted dollar value for a commercial is set by the television station for each specific commercial slot. However, discounting is widely practiced. Thus, the undiscounted dollar value does not truly reflect the actual cost that would have been needed to pay for these commercial slots.

The price of a standard report from the Broadcast Advertiser's Report is related to the number of spots monitored and to the duration of monitoring. Because of budget constraints, the Office on Smoking and Health has not been able to purchase monitoring for the entire time a given public service announcement runs on television. This particular bias will cause estimates of exposure to any public service announcement to be conservative.

In this study, we looked for evidence that particular public service announcements (those containing a specific message to call the Cancer Information Service telephone number) led to

increased calls to the Cancer Information Service. We superimposed by calendar time the Cancer Information Service frequency-of-call data and the Broadcast Advertiser's Report data for the timing and duration of the spots. In addition, we investigated the differences in the demographic characteristics of callers during periods when stations aired public service announcements specifically mentioning the Cancer Information Service hotline and those of callers during periods in which there was no television promotion of this hotline.

Results

Smoking-Related Calls to the Cancer Information Service

From 1983 through 1987, the Cancer Information Service telephone line received 279 681 smoking-related calls. Averaging 55 806 per year, these calls accounted for 15.9% of all calls to the Cancer Information Service over that time period (Fig. 1); 1985, the year in which the most calls were received (79 031), was flanked by the 2 years (1984 and 1986) with the fewest calls. During three periods in the 5-year study, however, the Cancer Information Service received a notably disproportionate number of calls for that given year. The peaks for these periods were 1) August 1983 (12 812 calls), 2) January 1985 (19 045 calls), and 3) January 1987 (12 710 calls). In each of these instances, more than 20% of all the calls in that particular year were received in that month (the expected percentage would be 8% if the calls had been evenly distributed). As we show later, these peak periods are associated with the showing of three particular public service announcements.

Use of Antismoking Public Service Announcements

The distribution of the showing of all 12 antismoking television public service announcements for this 5-year period does not follow the pattern of peaks and troughs seen in the calls for advice and information on smoking. According to the Broadcast Advertiser's Report estimates (Fig. 2), a maximum of 64% of the U.S. population in the 75 top markets viewed the antismoking public service announcements in any month of a given year. Only three of the 12 announcements showed television exposure patterns that reflected the three peaks in smoking-related calls to the Cancer Information Service. These three public service announcements were 1) "Surgeon General," in which Dr. C. Everett Koop urged viewers not to smoke; 2) "Chained Smoker," which featured a man in a striped prison suit chained to a giant cigarette; and 3) "Reaching Smokers," which featured situations in which a telephone gave smokers a "hand" when they felt the urge to smoke. Each of these public service announcements explicitly encouraged smokers to call the Cancer Information Service telephone number (1-800-4-CANCER) to seek additional information and help. Although other announcements targeted similar audiences during the same period, none promoted the Cancer Information Service telephone number. One such public service announcement was "Smoking Off Your Back," which featured a smoker with a monkey on his back; the monkey left when the smoker quit.

The "Surgeon General" public service announcement and calls to the Cancer Information Service. The Office on Smoking and Health released the "Surgeon General" public service

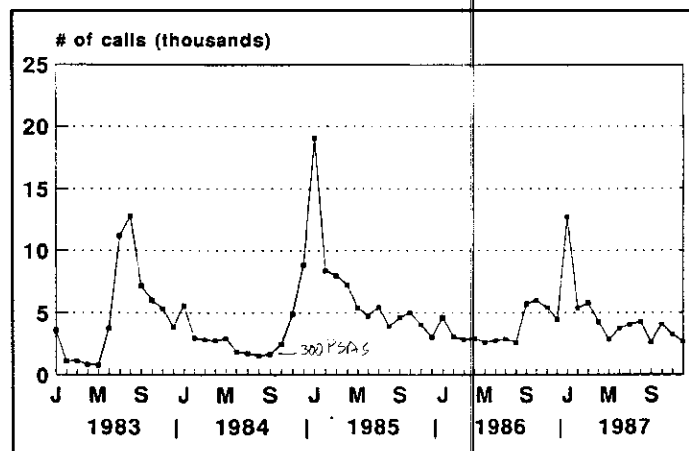


Fig. 1. Monthly frequency of smoking-related calls to the Cancer Information Service: 1983-1987.

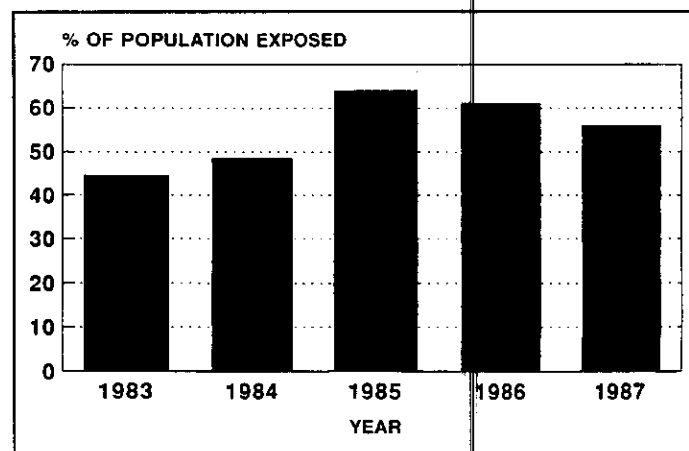


Fig. 2. Estimated maximum percentage of population in the 75 top U.S. media markets who were exposed to antismoking public service announcements by year. Source: Broadcast Advertiser's Report.

announcement in May 1983 and purchased the Broadcast Advertiser's Report monitoring for June through September of that year. The public service announcement exposure peaked at 600 showings in July; in September, the last month the Broadcast Advertiser's Report monitored, the announcement was shown 300 times. Considering this rate of decline in usage, we can assume that the announcement continued to be used beyond the monitoring period. The undiscounted dollar value of the 1452 spots shown during these 4 months was \$205 345.

Smoking-related telephone calls to the Cancer Information Service were fairly evenly distributed over the 4 months of February through May, at an average of almost 1000 calls per month (Fig. 3). The number of calls increased rapidly after that, peaked at 12 812 calls in August, and then rapidly declined. During December, the last month reported for this study, the Cancer Information Service received 3865 calls. The total number of calls to the Cancer Information Service during the 4-month, Broadcast Advertiser's Report-monitored period was 34 900—almost nine times the number of calls during the preceding 4 months.

The "Chained Smoker" public service announcement and calls to the Cancer Information Service. The Office on Smoking and Health released the "Chained Smoker" public service

ing and Health released the "Chained Smoker" public service announcement in October 1984 and purchased the Broadcast Advertiser's Report monitoring for November 1984 through June 1985. The announcement was heavily used in December and January (just under 800 spots each month) (Fig. 4). Use of the announcement decreased to fewer than 200 spots per month in March and then rose slightly and remained at about 250 spots per month. The undiscounted dollar value of these 3033 spots was \$454 560.

The rates of smoking-related calls to the Cancer Information Service were fairly stable between June and October 1984, at an average of 1872 telephone calls per month (range, 1553-2483). The number of calls increased rapidly after that, peaked at 19 045 calls in January, and then declined fairly steadily to 3051 calls in December. In total, the Cancer Information Service received 71 613 smoking-related calls during the 8-month, Broadcast Advertiser's Report-monitored period—almost five times the number of calls expected from the rate for the preceding 5 months.

The "Reaching Smokers" public service announcement and calls to the Cancer Information Service. The Office on Smoking and Health released the "Reaching Smokers" public service announcement in August 1986 and purchased the Broadcast Advertiser's Report monitoring for September 1986 through March 1987. The announcement was shown more than 300 times in September, more than 600 times in October, 450 times in November, 550 times each in December and January, and 280 times each in February and March (Fig. 5). The undiscounted dollar value of these 3119 spots was \$778 000.

The Cancer Information Service had received an average of 2785 smoking-related telephone calls per month (range, 2606-2964) between March and August 1986. The number of calls ranged from 4468 to 6033 for September through December, rose rapidly in January (12 710 calls), and ranged from 2857 to 5816 for February through May. In total, the Cancer Information Service received 45 631 calls during the 7-month, Broadcast Advertiser's Report-monitored period—2.3 times the number of calls expected from the rate for the preceding 6 months.

The "Smoking Off Your Back" public service announcement and calls to the Cancer Information Service. In August 1985, the Office on Smoking and Health issued a public service announcement titled "Smoking Off Your Back," in which a man shown with a monkey on his back was urged to rid himself of his addiction to smoking. This public service announcement did not specifically promote or even mention the Cancer Information Service telephone line. Broadcast Advertiser's Report monitoring was purchased for August 1985 through July 1986. More than 150 spots were shown in September, approximately 450 each for October and November, approximately 550 each for December and January, 380 in February, about 300 in March and April, and just over 200 each for May, June, and July (Fig. 6). The commercial, undiscounted dollar value of these 3833 spots was \$695 781.

From May through August 1985, the Cancer Information Service received an average of 4893 smoking-related telephone calls per month (range, 3905-5475). During the 3-month period of heaviest use of the public service announcement, the Cancer Information Service received an average of 3539 calls per

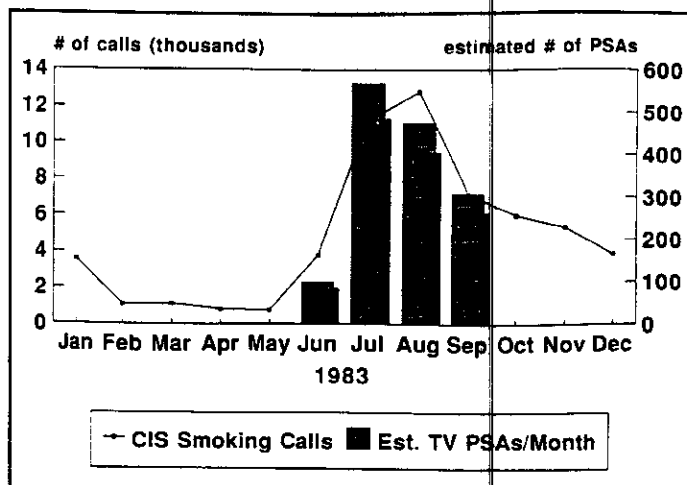


Fig. 3. Relationship between smoking-related calls to the Cancer Information Service (CIS) and the estimated number of showings of "Surgeon General," a public service announcement (PSA) tagged with the Cancer Information Service telephone number.

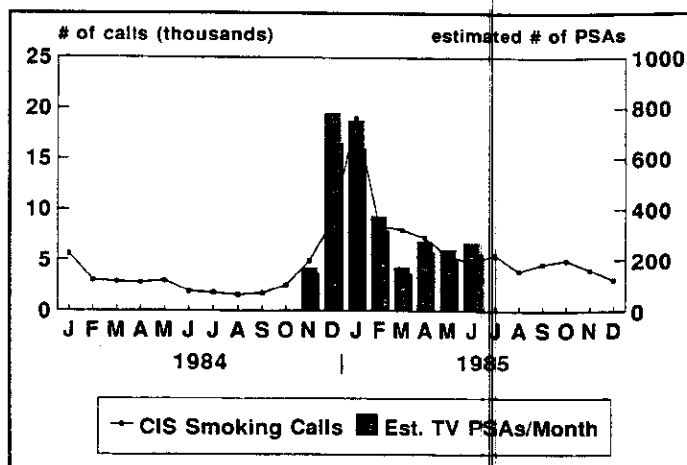


Fig. 4. Relationship between smoking-related calls to the Cancer Information Service (CIS) and the estimated number of showings of "Chained Smoker," a public service announcement (PSA) tagged with the Cancer Information Service telephone number.

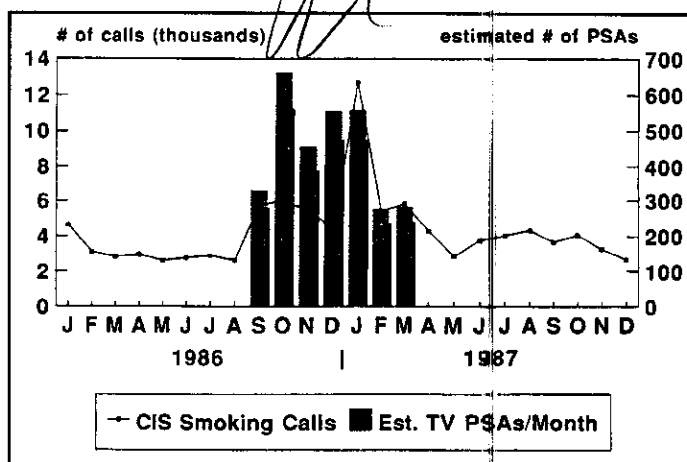


Fig. 5. Relationship between smoking-related calls to the Cancer Information Service (CIS) and the estimated number of showings of "Reaching Smokers," a public service announcement (PSA) tagged with the Cancer Information Service telephone number.

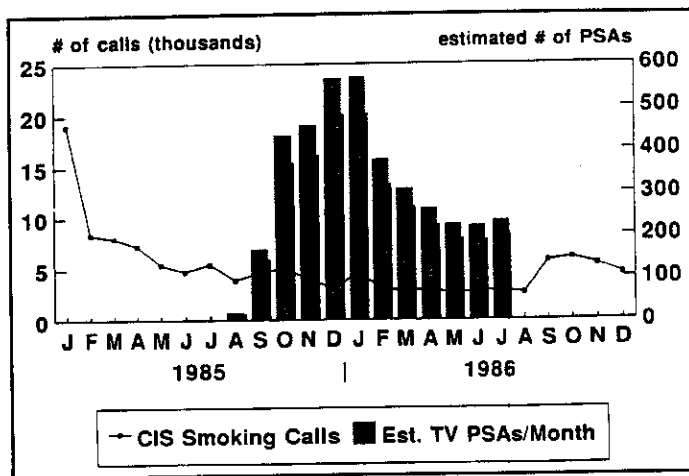


Fig. 6. Relationship between smoking-related calls to the Cancer Information Service (CIS) and the estimated number of showings of "Smoking Off Your Back," a public service announcement (PSA) not tagged with the Cancer Information Service telephone number.

month—a rate 2.5 times lower than the average monthly rate received during the peak period for "Surgeon General," 1.8 times lower than that for "Reaching Smokers," and 2.5 times lower than that for "Chained Smoker."

Comparison of Cancer Information Service Callers During Periods of Television or No Television Promotion

The Cancer Information Service counselors obtained demographic data from a random subsample of smoking-related callers; we compared data from this population with those from a reference group derived from the 1985 U.S. population distribution (Table 1). The Cancer Information Service data have been categorized according to whether the telephone call occurred during a period of television promotion, on the basis of the particular months identified above. If we assume that men and women had an equal opportunity to call the Cancer Information Service, women were 20% more likely to call during periods of no television promotion. Television promotion reduced this factor to 13%. Whites were slightly more likely than Blacks to be callers, with or without television promotion. During times without television promotion, people with more than a high school education were 52% more likely to call the Cancer Information Service than were less educated smokers; with television promotion, this factor was reduced to 35%. On the other hand, television promotion increased the difference in the use of the Cancer Information Service telephone line by younger and older smokers. In the absence of television public service announcements, people less than 40 years old were 20%-28% more likely to call the Cancer Information Service than were older people; with promotion, people under the age of 40 were 36%-40% more likely to call the Cancer Information Service than were older smokers.

Discussion

Between 1983 and 1987, the Office on Smoking and Health produced 12 different television antismoking public service announcements that apparently reached a large proportion of the U.S. population. These announcements were shown an es-

Table 1. Effect of television promotion on calls to the Cancer Information Service smoking helpline

Demographic group	Percentage who called during periods of TV promotion*	Percentage who called during periods of no TV promotion*	1985 population distribution, %
Sex			
Men	41.1 (0.86)	37.3 (0.18)	47.7
Women	58.9 (1.13)	62.7 (1.20)	52.3
Race			
White	87.4 (1.01)	87.4 (1.01)	86.2
Black/other	12.6 (0.91)	12.6 (0.91)	13.8
Age, y			
15-19	13.6 (1.36)	12.0 (1.20)	10.0
20-39	60.3 (1.40)	55.1 (1.28)	43.1
40-59	20.8 (0.79)	25.6 (0.97)	26.3
≥60	5.4 (0.26)	7.4 (0.36)	20.6
Education level†			
≤12 y	54.9 (0.81)	49.5 (0.73)	67.7
>12 y	45.0 (1.35)	50.5 (1.52)	33.3

*Parentheses indicate the difference in this proportion from what would be expected from the population distribution in 1985.

†≤12 years = a high school education or less; >12 years = some college.

estimated 48 900 times—about 30% of them during the prime television viewing hours. This antismoking campaign would have cost the Office on Smoking and Health more than \$9 million (or \$1.8 million per year) in purchased network airtime. During this time, more than 63% of the U.S. television-viewing audience is estimated to have seen these messages.

While this is considered an excellent showing for a public service announcement campaign, this performance only translates to an average of two showings per month per television station. This is a 25-fold lower level of intensity of exposure than was reported in the successful Australian paid media campaign (15). Accordingly, it is unreasonable to expect that this public service announcement campaign should be associated with as precipitous a drop in prevalence as was associated with the more intense campaign (18). Indeed, no evidence suggests any sudden change in smoking prevalence in the United States that could be attributed to the public service announcement campaign (3,21).

This study nonetheless replicates the finding that, even when only public service announcements are used, televised messages can be a powerful method for encouraging people to seek help to stop smoking (19). The careful choice of television antismoking messages has been previously shown to be effective in getting people to think about quitting (15). Promoting a telephone service in conjunction with such commercials may help convert this mental momentum into an immediate action. From 1983 through 1987, the Cancer Information Service telephone line served more than 279 000 Americans who wanted to quit smoking. While a single contact seldom suffices to help a smoker quit, the Cancer Information Service performs a useful function in referring smokers to other available quitting services.

The number of smoking-related calls to the Cancer Information Service telephone line was strongly related to the extent of media promotion. The data presented here indicate that the estimated peak month for television exposure frequently preceded the peak month for calls for help. There are a number of pos-

sible explanations for this. First, the likelihood of persons responding to a television spot may increase with the number of exposures they have had. Thus, there would be more calls per spot in later months than in earlier months, at least to a certain threshold level. Second, persons who have been exposed may store up the information and use it when they plan to quit, such as on the Great American Smokeout or on New Year's Day. Third, there may be a systematic bias in how public service announcements are allocated to popular television programs by the television station's public service director. For instance, these announcements may not be placed on popular programs until they have been shown to be noncontroversial on less popular programs. During the public service announcement campaigns that promoted the Cancer Information Service telephone number, the caller profile changed. The percentages of calls increased from subgroups with smoking prevalence rates that are higher than the national average, such as men, persons under the age of 40 years, and persons with a high school education or less.

However, these three public service announcements were not equally effective in motivating smokers to seek help. For example, although the "Surgeon General" public service announcement was shown much less often than the other two announcements, its associated ninefold increase in the number of smoking-related calls far surpassed the effectiveness of either "Chained Smoker" (fivefold associated increase in calls) or "Reaching Smokers" (twofold associated increase). The "Surgeon General" public service announcement (4), the most effective of the four discussed here, was the one least used by the television stations; this situation illustrates a major problem in relying on public service announcements to communicate public health messages. The propensity of television stations to air such announcements at times of high viewership of the target audience may not correlate with the quality of potential effectiveness of these announcements. This challenge to get media exposure for public service announcements ultimately falls on the message producers.

The health communicator must follow the tenets (22) of effective communication and produce high-quality messages that fit the preferred formats of the stations, offer an easy action step (e.g., provide a telephone number to call for materials), and then actively pursue placement through local stations.

The current rate of reduction in smoking prevalence must be doubled to meet Public Health Service goals. Television can be an effective medium for supporting this goal by motivating more smokers to seek help to quit and by encouraging telephone contact to help redress the current imbalance of younger and less educated smokers seeking help. If televised public service announcements cause more smokers to call such helplines as the Cancer Information Service line, the ultimate results will probably be both an increase in quit attempts and a higher quitting success rate overall.

Because of their dependence on the voluntary compliance of television stations and networks, public service announcement campaigns are unlikely to achieve the penetration levels needed to effect a major change in smoking behavior in the population. Whether the expense of paid media campaigns will be cost effective in obtaining change in the United States is at present an unanswered question. This question may be resolved by the

results of the paid-media antismoking campaign in California that is funded by a 25-cent-per-pack increase in the state tobacco excise tax (23). However, the counseling telephone line offers several important opportunities for improving the quitting success rate. This initial contact can provide a way to overcome some of the barriers that currently impede many smokers from seeking help to quit. Further contacts can offer an easy and affordable source of ongoing encouragement and support for smokers who want to quit and for former smokers who do not want to relapse.

Smoking is without doubt the single most preventable cause of premature death in this nation (24). More than 30% of smokers report that they try to quit each year (7), most of them without seeking any kind of assistance (9). The vast majority of these attempts to quit fail in the 1st month (7). If these relapses could be prevented by access to earlier and appropriate services, the prevalence of smoking in the United States would decline much more rapidly than it currently is. Therefore, any technique that effectively gets smokers to seek help in their attempt to quit is very important to the public health goal of a smoke-free society. This study shows that the use of antismoking messages on television tagged with a helpline telephone number can dramatically increase the number of smokers seeking help to quit. Thus, the use of television offers the possibility of overcoming the problem of how to find smokers who are ready to quit. There is an urgent need to develop effective strategies for using this initial contact to provide the necessary assistance to prevent relapse.

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