ENHANCING THE DISSEMINATION OF POPULATION BASED SMOKING CESSATION PROGRAMS: A STUDY OF SELECTED COMMUNICATION VARIABLES

by

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ENHANCING THE DISSEMINATION OF POPULATION BASED SMOKING CESSATION PROGRAMS: A STUDY OF SELECTED COMMUNICATION VARIABLES

Attempts to reduce the prevalence of smoking through quit smoking programs have, to date, been largely unsuccessful. A major reason for this may be that quit smoking programs designed for broad populations have not attracted large numbers of smokers to participate in them.

A systematic review of the literature was conducted to identify potential communication variables that might enhance recruitment for population based quit smoking programs. Thirty-three publications reporting the results of 40 recruitment campaigns were located. The median recruitment rate across all campaigns was 2.0 per cent of smokers. Logistic regression was used to examine the effect of six variables on recruitment rate: the type of program sponsor, the type of program offered, the cost of the program, presence or absence of an incentive, whether messages were segmented by stage of change, and the type of channel used to send messages. The only significant predictor of recruitment rate was channel type. Studies that used pro-active recruitment channels (telephone and interpersonal communication) were 66.5 times more effective than those using passive recruitment strategies (mass media, direct mail). An attempt to examine whether segmenting messages by stage of change enhanced recruitment was inconclusive.

In a follow-up study, 14,369 smokers and ex-smokers aged 18 and over from Windsor, Canada were randomly assigned to one of seven recruitment conditions to test the effects of using different channel types (mass media, direct mail, telephone) and messages (segmented by stage or change or not) on recruitment rate (% of target population who

enrolled in the quit smoking program offered), recruitment efficiency (% of target population who received the message and enrolled) , and cost efficiency (mean cost per enrollee).

Messages segmented by stage of change and delivered by telemarketing produced the highest recruitment rate (8.8 % of smokers; 7.2 % of smokers plus ex-smokers). Messages segmented by stage of change improved the odds of recruitment relative to generic messages for smokers (OR = 1.40; 95% CI: 1.02 - 1.92) and smokers plus ex-smokers (OR = 1.53; 95% CI: 1.16-2.01). Using two channels to deliver messages to smokers (OR = 1.30; 95% CI: 0.99 - 1.72) or smokers plus ex-smokers (OR = 1.15; 95% CI:.90 - 1.46) did not improve recruitment relative to the use of a single channel. The effect of channel was highly significant. For smokers, staged messages delivered by telephone were more successful than those using mass media (OR = 4.72; 95% CI: 2.90 - 7.67) or mail (OR = 4.49; 95% CI: 2.83 - 7.11). A similar pattern of results emerged with smokers plus ex-smokers. The greatest increase in recruitment rates and recruitment efficiency occurred among smokers in precontemplation and former smokers in the action and maintenance stages. Staged messages by telephone also produced the highest recruitment efficiency rate (26.9 %), and were also the most cost efficient recruitment strategy ($32.57 CDN per enrollee).

The present results suggest that researchers and practitioners interested in population wide tobacco control should pay more attention to recruitment. Relative to the most common recruitment strategies (i.e., mass media or direct mail), using telemarketing to send messages specifically designed to appeal to smokers across the continuum of change has the potential to increase participation in population based quit smoking programs by more than 400 per cent. Future studies are required to replicate and extend these findings.

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Dedication

To Linda, Nathan and Aaron: because to love and be loved is all that really matters. Thank you for patiently sharing my journey for life through learning.

"Free at last, free at last, thank God Almighty, free at last."
Dr. Martin Luther King

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CHAPTER 1

INTRODUCTION TO THE PROBLEM

The global impact of smoking on population health is staggering. In a three year study completed on behalf of the World Bank, Murray and Lopez (1996) reported that tobacco use annually accounts for more than three million deaths world wide and nearly three per cent of all disability adjusted life years. Equally alarming is that the health burden associated with tobacco is expected to increase dramatically for at least the next 20 years until it accounts for nine percent of quality adjusted life years lost, earning it the dubious distinction as being the leading cause of disability and death on the planet.

While most of the global burden is due to the rapid uptake of smoking in developing countries such as China, tobacco use remains a significant threat to population health in developed countries as well. For example, Kaiserman (1997) recently estimated that smoking cost Canadians about 15 billion dollars in 1991. Moreover, the 1989 death toll from smoking in Canada was 27 per cent of all premature deaths (Wigle, Semenciw, et al. 1990), and this is expected to increase over the next few years (Ellison, Mao and Gibbons 1995). Given this impact on population health, the need to develop comprehensive tobacco control strategies is apparent (Reid 1996; Reid, Killoran, et al. 1994; U.S. Department of Health and Human Services 1991). Moreover, a cornerstone of these population based control strategies is to help smokers quit smoking and remain smoke free. The inclusion of smoking cessation

control strategies is to help smokers quit smoking and remain smoke free. The inclusion of smoking cessation in population health strategies is generally based on four important sets of evidence. First, despite tobacco's highly addictive nature (U.S. Department of Health and Human Services 1988), it is possible for people to quit smoking and remain smoke free. For example, the 1990 Health Promotion Survey by Health Canada (1992) indicated that more than half of all Canadian adults who had ever smoked and were still alive, had already quit smoking. Second, carefully designed smoking cessation interventions can increase the likelihood that a smoker will quit and remain smoke free (Fiore, Novotny, et al. 1990; Law and Tang 1995). Third, the inclusion of smoking cessation in a population health initiative finds support from data showing that those who quit smoking, even for relatively brief periods, reduce their chances of developing a wide range of serious health risks relative to those who continue to smoke (Ockene, Kuller, et al. 1990; Rosenberg, Kaufman, et al. 1985). After 10 years of abstinence, former smokers have about half the risk of dying from lung cancer as continuing smokers. The excess risk of dying from coronary heart disease due to smoking is cut in half after only one year of abstinence and it continues to decline until it equals the risk of a non-smoker (Centres for Disease Control 1990; Novello 1990). Within six months of quitting, former smokers report better psychological well-being and cognitive functioning as well as higher energy levels and self esteem than those that continue to smoke (Stewart, King, et al. 1995). The final argument for including cessation programs as a public health measure is that a reduction in the population prevalence of smoking is associated with improvements in population health (e.g., Vartiainen, Puska, et al. 1993).

While this evidence is necessary to justify the inclusion of smoking cessation programs in a comprehensive population based tobacco control strategy, it is insufficient for doing so. Specifically, it is not yet clear what impact smoking cessation programs can have on the population prevalence of tobacco use. Some have argued that the population impact of quit smoking programs is negligible and should therefore be dropped as a population health strategy (Chapman 1985). Indeed there is increasing evidence suggesting that the potential for tobacco cessation programs to reduce population smoking rates and improve health has not been realized. For example, the Minnesota Heart Health Project spent 40 million dollars over five years in four communities with a total of 400,000 people and failed to significantly reduce the population prevalence of smoking in the intervention communities relative to the controls (Lando, Pechacek, et al. 1995; Luepker, Murray, et al. 1994). In a four year intervention involving 11 matched community pairs in the United States and Canada, the Community Intervention Trial for Smoking Cessation was unable to demonstrate a reduction in smoking prevalence for heavy smokers and only a modest effect with light smokers (COMMIT Research Group 1995). Overall, the net reduction in the quit rate for intervention communities was 1.8 per cent. Finally, two of the largest worksite trials in history involving thousands of employees in dozens of worksites across the United States were also unable to significantly reduce population smoking rates by offering smoking cessation programs (Glasgow, Terborg, et al, 1995; Sorenson, Thompson, et al. 1996).

Despite these discouraging results, it is premature to join with Chapman (1985) and conclude that smoking cessation programs are not a viable means for reducing tobacco use and improving population health. Specifically, the population impact (sometimes referred to

as public health impact) of smoking cessation programs depends on both the long term effectiveness of the programs being offered as well as the number of people who participate in them (Flay 1986; Ockene 1992; Prochaska 1996). While the efficacy and effectiveness of programs to help adults quit smoking has been well studied, little is known about the factors that enhance participation in smoking cessation programs, particularly those aimed at general adult populations (Curry 1993; Ockene 1992; Parcel, Perry, and Taylor 1990). In the words of one researcher, "recruitment has generally been a rather haphazard, catch as catch can enterprise (Hooks, Tsong, et al. 1988, p. 49)".

Low participation rates in smoking cessation programs can account for the relatively poor results seen in projects such as the Minnesota Heart Health Project (Luepker Murray, et al. 1994), the Working Well Trial (Sorenson, Thompson, et al. 1996), and others. For example, in the Minnesota project, although 90 per cent of smokers in the treatment communities recalled seeing messages about smoking in the previous year, only about three per cent of smokers actually participated in a formal smoking cessation program (Lando, Pechacek, et al. 1995). Hence, even if the interventions offered were 100 per cent effective they would have produced a maximum of a three per cent drop in smoking prevalence. However, given that long term effectiveness of most smoking cessation interventions in general population is less than 15 per cent (Law and Tang 1995), it should not come as a surprise that population based interventions to date have produced reductions in prevalence rates of less than one half of one per cent.

These results have prompted a number of recent reviewers to suggest that increased efforts should be directed toward enhancing the dissemination of smoking cessation

programs (e.g., Curry 1993; Ockene 1992; Orleans 1995; Prochaska 1996; Shiffman 1993). One of the six recommendations made by an Expert Advisory Panel convened by the National Cancer Institute of the United States to improve interventions for smoking cessation was that research efforts should be redirected from the development of new smoking cessation interventions towards enhancing the number of smokers who participate in quit smoking programs (Glynn, Boyd, and Gruman 1990).

The purpose of the present study was to systematically examine selected factors that affected participation in smoking cessation programs suitable for a general population of adult smokers. Adolescents were excluded from the study because little is known about whether it is even possible to develop effective cessation programs for this distinctive group (U.S. Department of Health and Human Services 1991). Moreover, 92 per cent of all smokers in Canada are over age 17 (Health Canada 1995). Hence, the largest population health gains will likely occur through interventions aimed at adults.

Using a combination of models from dissemination and communications theory, it will be argued that enhancing the recruitment of smokers and ex-smokers at risk of relapse into tobacco cessation programs represents a promising approach for reducing the prevalence of tobacco use. Specifically, it will be argued that improving the design and delivery of campaign messages has the potential to enhance recruitment. Prior to presenting the results of a literature review, the term recruitment will be defined and a framework for evaluating communication campaigns will be outlined. Finally, results from a meta-analysis of the literature will be used to develop a series of hypotheses to be tested in the present study.

1.1 The Dissemination of Smoking Cessation Innovations

Ferrence (1996) has suggested that a useful framework for understanding how and why people use smoking cessation programs is Rogers' (1995) work on diffusion of innovations. Diffusion is the process by which an innovation spreads through members of a population. When diffusion occurs as the result of deliberate and planned actions it is known as dissemination.

Dissemination models largely based on Roger's theory have been described by Parcel, Perry and Taylor (1990) and Orlandi, Landers, Weston, and Haley (1990). The first stage in these models is to design and test an innovation, such as a smoking cessation program, to ensure that it works as intended. In order to maximally disseminate this innovation, the second challenge is to communicate with the intended adopters. The goal of this stage is to make potential users aware of the program, provide information about it and increase the motivation of potential users to adopt it. The goal of the third stage, called adoption, is to obtain commitment from potential users to try the innovation. The decision to adopt is positively influenced by the extent to which the potential adopters perceive that the innovation is (a) advantageous relative to the alternatives, (b) compatible with the adopter's lifestyles, values, and social norms, (c) easy to try and to use, either in whole or in part, (d) low in risk and (e) easily adapted (Rogers, 1995; Zaltman and Duncan 1977). Once the decision to adopt the innovation has been made, the challenge is to assist adopters to implement the innovation in a suitable way. This is the implementation stage and generally involves providing adopters with the necessary information, skills, and resources to use the innovation to maximize benefits and minimize costs. The decision to continue or

discontinue using the innovation occurs in the final stage, maintenance. Generally, a combination of feedback and incentives are used to reinforce the innovation in a manner that leads to its continued use.

Various reviews of the literature (e.g., Curry 1993; Glynn, Boyd, and Gruman 1990; Litchenstein and Glasgow 1992; Schwartz 1987; Shiffman 1993) suggest that the vast majority of studies on smoking cessation programs are aimed at the development of innovations (i.e., new programs). However, the ability to improve dissemination through further innovation may be limited. For example, a review by Shiffman (1993) suggested that despite a host of treatment innovations, the efficacy of quit smoking programs has shown little progress over the past three decades. After examining 244 studies reported between 1965 and 1990, Shiffman found that the mean long term efficacy rates for smoking cessation programs peaked between the years 1970 and 1974 and have remained relatively stable since that time (although it should be noted that recent advances in nicotine replacement were not included in the review). While this apparent stagnation may be due to factors such as the increased use of valid outcome measures, and a population of smokers that has become increasingly retractable, the results suggest that it is unlikely that we will see dramatic increases in the efficacy of smoking cessation programs in the near future.

The relatively modest long term effectiveness of programs have led a number of researchers to study issues in the implementation and maintenance phases (c.f., Cummings, Emont, Jaen, and Sciandra 1988; Curry 1993; Curry and McBride 1994). More recently, researchers and practitioners have also begun to focus on adoption variables. Specifically, calls are being made to design programs that address the special needs, values, skills, and

lifestyles of various groups in the population including women, minorities, seniors, and persons with low incomes and/or low literacy skills (c.f., Davis, Cummings, et al. 1992; Glynn, Boyd, and Gruman 1990; Gritz, Neilson, and Brooks 1996; Meade and Byrd 1989; O'Hara and Portser 1994; Rimer and Orleans 1994; Spoth 1991). On the other hand, despite rapid progress in the use of communication theory to promote other types of behaviour change (e.g., Maibach and Holtgrave 1995) very little work has examined how to enhance the dissemination of tobacco cessation programs through improved communication strategies. Hence, this represents a promising means of improving the dissemination of tobacco cessation programs.

The potential impact of enhancing recruitment through improved communication is illustrated by the following example. If two per cent of smokers in a population participate in a given cessation program that is effective in helping 25 per cent of smokers to quit smoking, then the program will help one half of one per cent of smokers in the population to quit. Without a change in the effectiveness of our recruitment efforts, an increase in program effectiveness from 25 to 35 per cent would increase population impact by only two tenths of one per cent. On the other hand, increasing the proportion of smokers recruited into a program with a stable success rate from two to four percent would double the population impact.

Most of the work examining the role of communication in the dissemination of tobacco cessation programs has focused on the direct delivery of programs through mass media (e.g., Warnecke, Langenberg, et al. 1992). While such interventions have demonstrated modestly acceptable quit rates, like other cessation methods they tend to

recruit relatively few participants and therefore have a negligible impact on population smoking rates (for a review see Flay, 1987). Hence, these studies offer little insight into how to maximize dissemination through improved communication.

1.2 Enhancing Communication for Smoking Cessation Programs

A framework that may help to identify key variables within the communication stage of the dissemination process is the communication-persuasion model developed by McGuire (1984; 1989). According to McGuire, there are five sets of "input" or independent variables that may be manipulated in the design of a public communication campaign to promote health related behaviours and services (such as smoking cessation programs): source, destination, message, receiver, and channel. Source variables refer to the characteristics of the perceived communicator to whom the message is attributed. Issues such as the credibility, attractiveness, power, and homophily of the perceived source determine how persuasive a communication is (McGuire 1985; Petty and Cacioppo 1986). For example, Bandura (1986) suggests that messages delivered by models that are similar to the intended audience will have the greatest effect. Destination factors include variables having to do with the type of target behaviour that the communication is aimed at (e.g., short term versus long term change, change of behaviour versus change in attitude, change in eating habits versus change in tobacco use, etc.). Message factors include the issues such as how the message is delivered and organized, its length, pace, and degree of repetition. Channel factors are the methods by which messages are transmitted. McGuire's final set of input variables, receiver factors, concern the extent to which the communication is consistent with the characteristics of the intended audience. This is related to the notion of audience

segmentation, the most widely used tool in social and commercial marketing (*c.f.*, Albrecht and Bryant 1996). The idea is that more persuasive messages can be created for audience segments than can be created for diffuse populations (Bandura 1986; Maibach and Cotton 1995; McGuire 1984).

The variables with the greatest impact on persuasiveness are channel and receiver factors (McGuire 1985; Rogers 1995); hence, a logical place to begin searching for ways to enhance the communication of smoking cessation programs is to examine each of these variables in more detail. In general, two types of channels have been identified, interpersonal and mass media. "Mass media are all those means of transmitting messages that involve a mass media, such as radio, television, newspapers and so on..." (Rogers 1995, p. 18). They typically involve messages being broadcast to large groups of people in a manner that precludes interaction. Interpersonal communication generally involves the direct and real time exchange of information between two people or between members of a small group. Most often this is done in a face to face manner although it can also be mediated through devices that allow for real time exchanges such as the telephone or computer (Aronson 1971; Cathcart and Gumpert 1983; Ratzan, Payne, and Bishop 1996). The essential difference between mass media and interpersonal communication is that mass media messages cannot immediately be modified to the individual needs and responses of the receiver (Flora and Cassady 1990), and the receiver of mass media communications cannot ask for and receive immediate clarification, selective repetition, and so forth.

A variety of commentators have suggested that mass media channels are most effective for reaching large audiences quickly. They also have the advantage of being able to

deliver a message in a consistent manner to all intended receivers. In contrast, interpersonal channels are relatively slow, but they are also inexpensive and tend to be more persuasive (Rogers 1995; Kotler and Roberto 1989). As a result, Rogers has hypothesized that mass media are particularly effective in enhancing adoption among early adopters and opinion leaders, while interpersonal communication is more effective for the majority of members of a given target audience.

Bandura (1986), Bass (1969), and Sultan, Farley and Lehmann (1990) further posit that the most effective dissemination strategy is to combine mass media and interpersonal channels. This proposition has become known as the dual link hypothesis (Bandura 1986). According to this hypothesis, influential persons learn about innovations from the media and persuade others to adopt it through interpersonal contact.

A variation of mass media that can also reach large numbers of people over brief periods of time with more detailed information than traditional broadcast and print media are selective communication strategies (Kotler and Roberto 1989; Stone 1989). The principal technique of selective communication is direct mail (Kotler and Roberto 1989). Direct mail has several advantages over mass media in the promotion of a social product: (a) it can more easily segment the target group into identifiable clusters than can mass media; (b) messages can be semi-personalized (e.g., address recipients by name; mention one or more attributes relevant to the recipient); (c) it can provide information or materials such as order forms that facilitate recruitment; and, (d) it is easy to adjust the size and scope of the reach and/or message. The merits of direct mail as a population recruitment strategy compared with more traditional media and interpersonal strategies was discussed by the Lung Health Research

Group. Their comparison of methods across 11 North American recruitment sites for a study attempting to recruit smokers for a study of chronic obstructive pulmonary disease (COPD) indicated that the most effective strategy for recruiting large numbers of participants was direct mail, followed by media, and interpersonal techniques (Connet, Bjornson-Benson, and Daniels 1993; Durkin, Kjelsberg, et al. 1993; Rudick, Anthonisen and Manfreda 1993). In summary, direct mail represents a viable alternative that has some of the potential benefits of both mass media and interpersonal communication.

One segmentation variable stage of change, has recently generated considerable attention among researchers and providers of smoking cessation programs. Several reviewers (e.g., Andreasen 1995; Curry 1993; Glynn, Boyd, and Gruman 1990; Holtgrave, Tinsely, and Kay 1995; Kviz, Crittenden, and Warnecke 1992; Maibach and Cotton 1995; Rogers 1995; Winnett 1995) have suggested that the application of the transtheoretical model of change developed by Prochaska and his colleagues (Prochaska, DiClemente, and Norcross 1992) has the potential to significantly enhance the dissemination of smoking cessation programs. Indeed, Orleans (1995) recently called the transtheoretical model of change the "greatest single theoretical advance" since the early 1980's.

1.3 Transtheoretical Model of Change.

The transtheoretical model of change, or more commonly referred to as the stages of change model, was originally developed in the early 1980s by James Prochaska and Carlo DiClemente at the University of Rhode Island. A basic premise of the model is that human change undergoes a natural history and is a dynamic process. Although the model has been applied to a range of health related behaviours such as the reduction of dietary fat, physical

activity, and condom use, the majority of work has been in relation to smoking cessation among adults (Prochaska, Norcross, and DiClemente 1995).

Four inter-related ideas are central to the model. First, change is not a discrete event; rather, it is possible to identify five distinctive stages of change (Prochaska and DiClemente 1982, 1992). Second, movement through the stages occurs as people use a universal set of processes of change. Individuals who are successful at changing typically apply these processes in a very specific order (Ahijevych and Wewers 1992; Prochaska, Velicer, DiClemente, and Fava 1988). Third, progress through the model, especially the early stages, depends on a shift in the relative salience of the benefits (pros) and challenges (cons) of adopting a target behaviour (Prochaska 1994; Prochaska, Velicer, Rossi, et al. 1994). Finally, initiating and maintaining a new behaviour requires an increase in self efficacy; that is, confidence in one's ability to perform the new behaviour and the prerequisites required to maintain it (DiClemente, Prochaska, and Gibertini 1985; Velicer, DiClemente, Rossi, and Prochaska 1990).

The central organizing feature of the model are the five stages of change. The model posits that change involves progressing through the five stages by addressing stage specific issues and tasks. The first stage is precontemplation and is characterized by a lack of interest in changing. Indeed, people in this stage may be quite hostile toward attempts to change their behaviour. Precontemplators typically manifest low levels of self efficacy with respect to changing their behaviour. They are also able to generate a litany of reasons why they should not change (cons). On the other hand, precontemplators often have difficulty generating a list of benefits (pros) associated with change.

The second stage, contemplation, involves thinking about change in the foreseeable future, typically within the next six months. Contemplators typically have higher levels of self-efficacy than precontemplators, although they still lack confidence that they will succeed in changing. Contemplators are also distinguished from precontemplators by their ability to spontaneously generate and/or acknowledge more pros for changing their behaviour.

In the preparation stage people are either seriously thinking about changing, typically within the next 30 days, or have made a serious but unsuccessful attempt to change within the past year. Generally, persons in preparation have developed sufficient self-efficacy to at least try making a change although their outcome expectancies may still be low. Their motivation for change is also relatively high in so far as their pros for change now outnumber the cons for change.

The fourth stage, action, is characterized by an active attempt to change. The risk of relapse is greatest at this stage and emphasis is placed on the development and use of acute coping skills.

Finally, maintenance is defined by being able to persist in the desired behaviour for at least six months. The largest issue is the avoidance of temptations and relapse. Gradually, the individual's self-concept moves from that of being a smoker to that of being a non-smoker. An individual is said to move out of the stages of change when they feel completely confident that they can cope with any circumstance without relapse. It is not uncommon for this transition to take five years or more (Prochaska, DiClemente, and Norcross 1992).

1.4 Stage of Change as a Segmentation Variable.

The notion that segmenting audiences by stage of change and then tailoring messages to specifically address their needs to enhance recruitment for smoking cessation programs gains support from several sources. First, by matching interventions to stage of change, Prochaska and his colleagues have shown that it is possible to significantly enhance the long term effectiveness of smoking cessation interventions. For example, in a study that compared the self reported point prevalence rates of 756 smokers assigned to one of four treatments, Prochaska, DiClemente, Velicer, and Rossi (1993) reported that staged based interventions were not only superior to standard treatment, but that the improvements were continuing to increase when that study ended after 18 months.

Additional support for propositions that segmenting smokers and former smokers by stage of change may enhance recruitment comes from data showing that, to date, quit smoking programs have principally been aimed at smokers in the preparation and action stages, despite the fact that the majority of smokers are in precontemplation and contemplation. For example, aggregate data from three large American samples, including two surveys employing random digit dialling techniques, indicated that approximately 40 per cent of smokers were in precontemplation, another 40 per cent were in contemplation, while only 20 per cent were in the preparation stage (Velicer, Fava, et al. 1995). A recent random telephone survey of 12,800 Canadians aged 15 and over by Health Canada (1995) indicated that 25 per cent of people who had ever smoked were in precontemplation, 16 per cent were in contemplation, 5 per cent were in the preparation stage, 6 per cent were in the action stage and 47 per cent had been smoke free for at least 6 months (maintenance and termination).

Among current smokers, 54 per cent were in precontemplation, 34 per cent were in contemplation and only 12 per cent were in preparation. The largest percentage of persons in precontemplation were female (59 per cent) and over 20 years of age (56 per cent). Although the largest proportion of smokers are in precontemplation and contemplation, virtually all recruitment campaigns are currently aimed at and successful in enlisting persons in the preparation and action stages (Prochaska 1996; Prochaska, DiClemente, and Norcross 1992). For example, only 2 per cent of participants in a large community based trial in the Netherlands recruited through mass media and physician referrals were in precontemplation. In comparison, the authors estimated that 68 percent of the smoking population was in precontemplation. Thirty percent of recruits were in the preparation and action stages compared to a population proportion among current smokers of 7 per cent (Muddle, de Vries, and Strecher 1996). In a study comparing the characteristics of smokers who participated versus those who did not participate in a quit smoking program delivered over the television in Chicago, Kviz, Crittenden, and Warnecke (1992) found that non-participants were significantly more likely to be in the earlier stages of change. Hence, there is great potential for improving the dissemination of quit smoking programs by attempting to recruit smokers and ex-smokers at risk of relapse from all stages of change.

One of the arguments against using stage of change as a segmentation variable comes from those who suggest that reaching out to hostile audiences, such as those in precontemplation, are unlikely to be successful. However, evidence from research in commercial advertising indicates that it is feasible to advertise successfully to hostile audiences. For example, Winters (1988) found that it is possible to construct messages that

not only change the beliefs and attitudes of hostile audiences, but also their brand-purchasing behaviour. By attempting to convey concern for the audience, concern about how the audience perceived the sponsor (i.e., a large oil company) and using concrete examples of how they were solving problems of concern to the audience, campaign designers were able to produce sustained, positive effects such as increasing the likelihood that members of the hostile audience purchased the sponsor's products.

Further support for the feasibility of improving message persuasiveness through audience segmentation by stage of change comes from the field of social cognition. According to this literature, theoretical cognitive structures called schema act as templates that guide the perception, interpretation, transformation, organization and recall of information. Schema enable the perceiver to identify stimuli quickly, chunk information, fill in missing information, and select a strategy for obtaining further information, solving some problem or taking an action (Taylor and Croker 1981). Research has shown that schemas that hold information about oneself are especially powerful (Markus 1977). These self-schemas function as selective mechanisms that determine which information is attended to, how it is structured, what importance is attached to it, and what happens to it. Thus, when a persuasive message is written to reflect a perspective that is consistent with, rather than irrelevant to the intended recipient's self-schema, the activation of the self-schema may guide, fill-in or strengthen the arguments presented, thereby leading to the perception of the message being more persuasive. Indeed, Cacioppo, Petty, and Sidera (1982) were able to demonstrate that messages consistent with a subject's self-schema are more persuasive than messages inconsistent with a subject's self- schema. Moreover, messages that activated a

subject's self-schema also increased the probability that subjects would rate the messenger as more credible. Shadel, Mermelstein and Borrelli (1996) have shown that a smoker's self concept changes over time with movement through the stages of change. Therefore, the type of cessation message likely to activate an individual's self-schema may be dependent upon the message being congruent with the receiver's stage of change. Once activated, it may result in the message being viewed more persuasively and positively. For example, a message aimed at precontemplators may be more effective if it does not ask the person to quit smoking and instead invites reflection on reasons for smoking. Conversely, messages aimed at former smokers who have begun to develop a self concept that excludes smoking may be more successful if it focuses on the continued abstinence of smoking rather than on the process of trying to quit.

Hotgrave, Tinsely, and Kay (1995) have argued that several lines of evidence from the behavioural decision making literature also support the notion that messages segmented by stage of change will be more effective. For example, the relative influence of pros and cons at different stages document that an individual's perception of risk is related to stage of change. A consensus panel suggested that only risks with similar dimension profiles should be compared in communication campaigns (National Research Council 1989). When an audience's perception of risk differs from the level of risk depicted in a communication campaign, the audience is more likely to feel manipulated and less persuaded by the message. This suggests that the level of risk that precontemplators will tolerate (very low) is considerably different than the risks that smokers in preparation will tolerate.

Finally, several authors have speculated that tailoring messages by stage using a social cognitive framework might be helpful. For example, Andreasen (1995) as well as Maibach and Cotton (1995) have advocated that the focus of efforts with precontemplators should be on building outcome expectation. Efforts aimed at persons in contemplation should focus on raising self efficacy with respect to adopting a new behaviour and lowering negative outcome expectancies. These approaches should be continued through the preparation stage with the addition of an attempt to build skills and set personal goals. Finally, for persons in action and maintenance the focus is on building positive outcome expectancies for the new behaviour through reinforcement, building self-efficacy in the face of temporary setbacks, setting goals for alternative behaviours, and the development of coping skills.

Interestingly, the primary developer of social cognitive theory has recently rejected attempts to integrate the theory with the transtheoretical model (Bandura 1995). Bandura has argued that the addition of a stage based paradigm, such as the transtheoretical model, reduces the parsimonious nature of social cognitive theory without adding any additional explanatory power. The evidence with respect to smoking cessation, however, does not support this view. For example, quit smoking programs based on stage of change have significantly outperformed those based on social cognitive theory (Prochaska, DiClemente, Velicer, and Rossi 1993). Moreover, scores on indices of decisional balance (pros and cons of quitting) and the use of processes of change continue to help predict who will make a quit attempt even after adjusting for variance due to self-efficacy and outcome expectancies (DiClemente, Prochaska, et al. 1991).

1.5 Evaluation of Communication Campaigns

A significant challenge facing researchers studying communication campaigns is how to evaluate them. Several authors (e.g., Flay, 1987, Flay and Cook, 1989; McGuire, 1989) describe three possible phases and various types of evaluation that are relevant to communication campaigns. In the pre-production phase, planning, concept testing and message pretesting are used to develop and refine rough messages and draft ideas. Such methods are collectively referred to as formative evaluation. In the post production but pre-dissemination phase the final messages undergo testing with the potential audience to ensure that the final product is acceptable and efficacious under ideal circumstances (i.e., produces the desired effect such as knowledge acquisition, attitude change, etc.).

While formative evaluation was employed in the present study to ensure that all messages in each recruitment condition were of at least a minimally acceptable quality, the major challenge was to design an evaluation strategy that assessed the outcomes associated with the intervention, and why they occurred (Patton, 1997). According to McGuire (1989), one reason that a campaign may fail to bring about its intended effect is because the messages did not reach the intended audience. For example, a campaign may appear to have been ineffective when in fact the messages produced the desired effect but they seldom reached the intended audience. In the case of the present study, it will be useful to know what channels reached the greatest number of people, and whether reach varied as a function of the target audience's stage of change. For example, various studies have reported that precontemplators are less likely to participate in smoking cessation programs (e.g., Muddle, de Vries, and Strecher 1996). What is unknown is whether this is due to the fact that

messages have not been as persuasive with this group, or whether is it because different lifestyle characteristics and/or attitudes limit their exposure to messages. In the case of mass media, a simple way to assess reach is to consult various Broadcast Advertisers Reports (Flay and Cook 1989). However, different methods would have to be employed to estimate the reach of messages delivered through other channels. Therefore, it would not be valid to compare estimates derived in different ways. An alternative method is to conduct a random sample of the intended audience to determine what proportion recall seeing and/or hearing the message over the various channels employed (Flay and Cook 1989).

There are several reasons why a message that was received by the intended audience may not have achieved its intended effect. For example, Unger (1996) has recently shown that a person's stage of change may be related to variables such as education and ethnicity. Therefore, it is conceivable that the under-recruitment of persons in the early stages of change is at least partially due to differences in message comprehension. Other major reasons messages fail are that the intended audience does not find them interesting or credible (McGuire 1984; 1989). Hence, assessing the extent to which the intended audience was able to comprehend a message, enjoy it and find it credible may help determine why a communication was or was not effective with the audience or particular segments of the audience. Although it is possible to use a variety of methods to assess audience response to messages (e.g., Patton, 1997), random survey methods conducted with large samples are considered a highly valid and reliable method (Flay and Cook 1989; Rossi and Freeman, 1993).

A third central question is, did the communication intervention achieve its desired effect (e.g, increase in knowledge or familiarity, attitude change, behaviour change, etc.). In the present study, the primary outcome of interest is behavioural. Namely, do the messages enhance the recruitment of smokers and ex-smokers into a smoking cessation program? Recruitment is defined as the systematic process of contacting individuals or organized groups in a manner that results in their voluntary participation in an identified activity. Recruitment is minimally a two stage process that involves the systematic contact of members within a defined population, followed by the enrollment of the contacts into a program or service according to predefined criteria (Agras and Bradford 1982). Green and his colleagues have argued that a distinguishing feature of health programs, such as smoking cessation, is that they rely on the voluntary adoption of behaviour (Green, Kreuter, et al. 1980). Hence, improving recruitment strategies for community based smoking cessation programs implies developing means of contacting individuals or groups for the purpose of facilitating voluntary enrollment in a program or service.

Most studies simply report the total number of participants enrolled in a quit smoking program. However, the number of persons recruited is at least partially a function of the size of the population of interest. Therefore, in order to adequately compare recruitment strategies, it is minimally necessary to report recruitment rates, defined as the number of participants enrolled in the program over a standard period of time, divided by the total population of persons eligible to participate in the program.

Enrolment is at least partially a function of how the program is delivered. For example, a cessation program delivered through organized classes may define enrolment as

either those who declare their intent to participate by registering in advance of the program (the least conservative estimate), those who attend the first class, those who attend more than one class, or those who attend all of the classes (the most conservative estimate). A manual-based self-help program may operationally define enrolment as a request for material (least conservative) or use of some or all the material (most conservative). Enrolment estimates for programs delivered via television or radio pose more difficulties. Common methods for defining enrolment include estimating requests for supplementary program materials or persons who report hearing at least one or more of the sessions that were broadcast. Although defining enrolment in terms of attendance at a session or use of program materials represents a far more conservative estimate of enrollment, from the perspective of dissemination theory, it would confound communication challenges with issues of adoption, implementation and/or maintenance (Orlandi, Landers, Weston, and Haley 1990). For example, an effort to recruit a smoker through a communication campaign may have been successful in so far as the person expressed a desire to at least try the program. However, the smoker's decision not to continue in the program may be due to other factors such as a change in their work schedule, illness, or conflict with other participants, all of which are unrelated to the recruitment effort. Hence, to fully illuminate the communication process, enrollment should not include a commitment from the subject beyond making first contact and an expression of intention to participate.

Not all persons eligible to participate in a program may actually receive an invitation to participate. Therefore, another valuable statistic for assessing the effectiveness of recruitment methods is the recruitment efficiency rate, defined by Agras and Bradford (1982)

as the number of persons who enrol in a program divided by the number of people who have received a message inviting them to participate. A comparison of efficiency rates helps determine how persuasive a given message was. It addresses the following question: of those people who received the message, how many performed the desired behaviour? In this case the desired outcome is enrolment in a smoking cessation program.

Another important consideration in the evaluation of a recruitment campaign is cost efficiency. For example, a particular recruitment method may be twice as effective as an alternative. However, if the more effective method costs three times as much, a recruiter with a fixed budget will get a greater return on investment by using an inferior method. Perhaps the most useful and direct method of comparing recruitment strategies is calculating the cost per capita (i.e., the mean cost for each person successfully recruited). This is simply the total of all costs for a particular recruitment strategy divided by the number of people who enrolled in a program as a result of the recruitment method under study. Costs to develop and administer the program should be excluded, but costs to develop, produce and implement any recruitment materials as well as register participants should be included (Detsky and Naglie 1990).

CHAPTER 2

REVIEW OF THE LITERATURE

The purpose of this analytic review was to determine what the average recruitment rate has been in published studies, to ascertain which communication variables are potentially most effective for enhancing the recruitment of smokers into population based quit smoking programs, and to suggest hypotheses for further study. Determining the average recruitment rate of smokers into population based smoking cessation programs would serve two primary purposes. First, it would be useful for estimating the required sample sizes in future recruitment studies involving population based quit smoking programs. Secondly, an examination of the variance associated with the mean may provide an initial indication as to the feasibility of improving recruitment rates. For example, if a systematic review reveals that recruitment success has been consistently low with little variance despite the application of a wide variety of strategies, it would provide evidence in support of Chapman's (1985) proposition that we should abandon attempts to improve population health through community based quit smoking programs in favour of other more effective and cost efficient interventions. On the other hand, if recruitment rates vary substantially between trials employing different strategies, a systematic review of the literature may help us generate specific testable hypotheses regarding how population based recruitment for smoking cessation may be improved. Since large variations may also be the

result of random error, it is important to employ careful, pre-planned methods to limit error and bias in the synthesis of results. The present review was based on the methods suggested by Light and Pillemer (1984), as well as Cook, Mulrow and Haynes (1997), for conducting systematic reviews of the scientific literature.

2.1 Method

2.1.0 Search Strategy. Potential studies were identified by searching three electronic databases: MEDLINE, compiled by the National Library of Medicine in the United States for the period January, 1983 to January 30, 1997; Psychlit (including journal articles, books and chapters) complied by the American Psychological Association for the period of January 1, 1990 to December 31, 1996; and CINAHL a cumulative index of the nursing and health literature for the period January 1, 1982 and January 30, 1997. MEDLINE accesses the worldwide biomedical literature. Psychlit records the world wide literature in psychology. CINAHL references English-language journals in nursing, allied and consumer health.

Combinations of the following keywords were employed during the search of titles, abstracts and keywords: smoking cessation, participation, promotion, and recruitment. Non-English language abstracts were excluded from the search. Potential studies prior to 1986 were also identified by reviewing Schwartz's (1987) compilation of smoking cessation programs in the United States and Canada published between 1978 and 1985. Finally, studies were identified by searching the reference lists of key articles. With two exceptions, only published papers were included in the analysis.

Using the above techniques a total of 236 studies included the terms smoking cessation and participation (170) or smoking cessation and recruitment (66). The abstracts,

and full texts where necessary, were then reviewed to determine if they were appropriate for inclusion in the analysis. Appropriate studies were defined as published trials in which (i) a group of adult smokers from a general population were offered a smoking cessation intervention, and (ii) the percentage of adult smokers in the target population that enrolled in the program was reported (i.e., the recruitment rate) or sufficient data were reported in the study or a companion study to permit the calculation of recruitment rate. Studies principally aimed at adolescents, worksites, schools, universities, clinical, or other highly specialized populations were excluded from further review. Studies conducted with large, managed care populations that draw clients from general populations were included. Finally, care was taken to eliminate multiple reports of a single recruitment campaign conducted with a single population. Since the primary unit of interest is the recruitment campaign rather than the population, per se, the analysis may include several independent campaigns that target a single community. To be considered independent, a campaign had to use either different promotional methods and/or substantially different messages. In cases where a similar recruitment strategy was aimed at a common population over multiple time periods, only the mean recruitment rate was reported.

2.1.1 Results of the Search. A total of 33 studies were identified that reported sufficient data to determine recruitment rates from 40 independent recruitment campaigns (Table 2.1). Thirty of the campaigns were conducted in the United States (75%), four were implemented in Canada (10%), two in Finland (5%), and one each in Australia, Sweden, and the Netherlands. One study reported the collective results of campaigns conducted in 11 American and Canadian cities that occurred as part of the COMMIT trials (Shipley,

Hartwell, et al. 1995). Thirty-three campaigns attempted to recruit smokers from geographically defined areas such as cities or counties. Seven attempted to recruit subjects from large managed health care agencies (HMOs). Two of the recruitment samples were restricted to female adult smokers; all others targeted both men and women. One study included persons aged 16 and over; the minimum age in all other studies was 18.

2.1.2 Variables and Coding. The dependent measure of interest was recruitment rate, defined as the number of persons who enrolled in a program divided by the estimated total number of smokers in the target population. Care was taken to ensure that the denominator included all eligible smokers in the target population. Since the number of smokers was inferred from surveys it would have been instructive to report confidence intervals for the recruitment estimate. However, none of the studies reported confidence bands. Where studies reported some other denominator, such as the number of smokers reached by an intervention (i.e., recruitment efficiency), or the number of homes containing a smoker, an attempt was made to adjust the data to estimate all smokers in the target population. Where a shortage of necessary information prevented this adjustment, the study was excluded from the analysis. An individual was considered to have enrolled upon returning a registration card or consenting to receive program materials or participate in the program. In cases where the program itself was delivered through the media, individuals were considered to have enrolled only if they requested supplemental material. Since the present review focussed on communication variables rather than adoption or implementation variables (*c.f.*, Rogers 1995) attendance at a class, the actual use of material, or a quit attempt were not considered as measures of enrolment.

Independent variables in the analysis were selected to relate to McGuire's (1984) five communication input factors: source (the organization or person sponsoring the smoking cessation program being offered); destination (the type of program; the cost of the program and/or whether an incentive was offered to participate); message (the length of the campaign); receiver (whether the recruitment campaign was segmented by stage of change), and channel (the principle method or methods used to deliver the campaign message). The size of the target population of smokers was also noted. The relative paucity of detail routinely reported in study results prevented the inclusion of additional variables.

The program sponsor was categorized as a health care provider, a researcher/academic, or a non-government agency (NGO)/other. Where there were multiple sponsors from different categories, an attempt was made to ascertain who the principal sponsor was and who the intended audience would most likely perceive the sponsor to be. Researchers included persons with academic affiliations or where subjects were explicitly told that the project was part of a research trial. Providers included physicians, health departments, managed health care agencies, and the National Cancer Institute. The NGO/other category included volunteer foundations such as the Lung Association, the Heart Foundation, the Cancer Society, newspapers, and civic groups.

Program type was entered as a categorical variable and included group programs or classes, self-help program materials, quit and win contests and lotteries, and other programs (e.g., individual counselling, telephone support lines, etc.). Where more than one program type was offered, only the principal strategy was recorded. Incentive was entered into the analysis as a dichotomous variable, with zero representing a recruitment campaign that did

not offer an enrollment incentive and one representing a campaign that did (e.g., a draw for a trip, cash prizes, merchandise, etc., or payment for participation in a program or research study). Program cost was also entered as a dichotomous variable with zero representing programs that were offered at no cost and one representing programs that charged either a flat fee or required a refundable deposit.

Segmentation was entered as a dichotomous variable where one represented a campaign with messages designed to appeal to smokers in more than one stage of change, and zero represented a campaign that did not attempt to segment its audience by stage of change and adjust messages accordingly. Studies that failed to explicitly mention stage of change or level of readiness as a variable of interest were coded as a zero.

Recruitment channel was coded categorically as mass media, including television, radio, newspaper and magazine advertisements and public service announcements, feature news stories and educational pieces, the distribution of flyers, presentations with limited interaction, and posters; mail packages that were specifically addressed to a household or an individual; telephone contact including requests to complete RDD surveys and telemarketing inquiries; interpersonal contacts including individual messages delivered by physicians and other health care providers, and/or small interactive group presentations and display booths staffed by an individual recruiter; a combination of media plus interpersonal channels; or a combination of media, mail and/or telephone. Where authors specifically suggest that one strategy was abandoned because of lack of effect in favour of another, only the latter strategy was recorded.

TABLE 2.1

List of studies included in the analysis.

Author, Year	Population description	No. of smokers	Prog. sponsor	Prog. descr.	Incentive	Prog. cost	Recruit. channel	Segment by stage?	Campaign length (months)	Recruit. rate (% of smokers)
Chapman, Smith, et al. 1993	Newcastle, Australia	101,277	Provider	Quit & win	Yes	None	Media	No	1	1.2
Cummings, Kelly, et al. 1990	Buffalo, N.Y.	256,000	Provider/ civic grp	Quit & win	Yes	None	Media	No	1.5	1.0
Cummings, Sciandra, et al. 1989	7 cities in NY and Pennsylvania		Provider	Telephone help line	No	None	Media	No	6.5	mean =0.08
Cummings, Sciandra and Markello 1987	Buffalo, NY	239,252	Provider	Manual (kit)	No	None	Media	No	0.25	0.8
Curry, Wagner and Grothaus 1991	HMO in Puget Sound, Washington	67,900	Provider	Manual	No	None	Media	No	4	1.8
Elder, Campbell, et al. 1991	San Diego, CA	500,000	NGO	Manual (kit)	Yes	None	Media	No	2	0.2
Elder, McGraw, et al. 1987	Pawtucket, RI	23,000	Provider	Group	Yes	None	Media	No	1	0.5
Elder, McGraw, et al. 1987	Pawtucket, RI	18,000 age 18-64	Provider	Quit & win	Yes	None	Interpersonal + media	No	2	1.9
Fava, Velicer and Prochaska 1995	Rhode Island	11,360	Research	Manual	Yes	None	Telephone	Yes	8	36.5
Fortmann and Killen 1994, 1995	Fremont & Newark, CA	7,135 age 18-65	Research	Quit & win	Yes	None	Telephone	No	24	26.4
Glasgow, Lando, Hollis, et al. 1993	HMO in Portland, OR	2,148	Provider	Telephone help line	Yes	None	Media + mail	No	33	14.2

Author, Year	Population description	No. of smokers	Prog. sponsor	Prog. descr.	Incentive	Prog. cost	Recruit. channel	Segment by stage?	Campaign length (months)	Recruit. rate (% of smokers)
Gritz, Berman, et al. 1992	HMO in Los Angles Females age 18-60	7,176	Provider	Manual	Yes	None	Telephone	No		19.5
King, Flora, et al. 1987	2 cities in Northern California	25,000	Research	Quit & win	Yes	None	Media	No	1	2.0
Korhonen, Niemensivu, et al. 1992	North Karelia, Finland	31,000	NGO	Quit & win	Yes	None	Media + interpersonal	No		3.2
Korhonen, Niemensivu, et al. 1992	Turku, Finland	53,000	NGO	Quit & win	Yes	None	Media	No		1.6
Lando 1982	Des Moines & Ames, Iowa	65,250	Provider	Group	No	None	Media	No	2	0.4[1]
Lando, Hellerstedt et al. 1991	Bloomington, MN (1988)	13,500[2]	Provider	Quit & win	Yes	None	Media + mail	No	8	7.0
Lando, Loken, et al. 1990	Bloomington, MN	13,500[2]	NGO	Quit & win	Yes	None	Media + mail	No	3	1.1
Leinweber, Macdonald and Campbell 1994	Medicine Hat, AB	8,500	NGO	Quit & win	Yes	None	Media	No	1	0.9
Litchtenstein and Hollis 1992	HMO in Portland OR age 19-70	1,387	Provider	Manual	No	None	Interpersonal	No		11.0
Millar and Naegele 1987	Winnipeg, MB age 25-44	54,825	Provider	Manual	No	None		No	6	39.0
Muddle, de Vric, and Strecher 1996	Den Bosh, Netherlands age 25-64	16,800	Provider	Manual or group	No	None	Media + interpersonal	No	12	2.5
Ossip-Klein, Giovino, et al. 1991	10 counties in western NY state	137,300	NGO	Manual + telephone help	No	$5 deposit	Media	No	24	1.3

Author, Year	Population description	No. of smokers	Prog. sponsor	Prog. descr.	Incentive	Prog. cost	Recruit. channel	Segment by stage?	Campaign length (months)	Recruit. rate (% of smokers)
Pechacek,, Lando, et al. 1994	Mankato, MN (1983 - 1986)	6,393	Provider	Quit & win	Yes	None	Media	No	1	3.2[5]
Pechacek,, Lando, et al. 1994	Fargo-Moorehead (1984 - 1986)	15,532	Provider	Quit & win	Yes	None	Media + interpersonal	No	1	4.7[5]
Pechacek,, Lando, et al. 1994	Bloomington, MN (1985 - 1988)	8,714	Provider	Quit & win	Yes	None	Media	No	1	3.9[5]
Pickett, Bains, et al. 1996	Kingston & Frontenac, ON	28,900	Provider	Quit & win + kit	Yes	None	Media	No	1	0.8
Pickett, Bains, et al. 1996	Hastings & Prince Edward County, ON	27,200	Provider	Quit & win	Yes	None	Media	No	1	0.8
Pirie, McBride, et al. 1992	Bloomington, MN women age 20-64	2,631	NGO	Group	No	$100 deposit	Telephone	No		10.0
Prochaska, Velicer, Fava and Laforge, Unpublished			Research	Manuals			Telephone	Yes		82.0
Prochaska, Velicer, Fava and Rossi, Unpublished			Research	Manuals			Telephone	Yes		85.0
Schmid, Jeffery, and Hellerstedt, 1989	Mankato, MN	2,592[3]	Research	Manual/ newsletter	No	$5 fee or $60 deposit	Mail	No	.5	1.1
Schmid, Jeffery, and Hellerstedt, 1989	Fargo-Moorehead, NM/ND	17,064[3]	Research	Manual/ newsletter	No	$5 fee or $60 deposit	Mail + media	No	.5	0.7
Schmid, Jeffery, and Hellerstedt, 1989	Bloomington, MN	13,565[3]	Research	Manual/ newsletter	No	$5 fee or $60 deposit	Mail	No	.5	1.1

Author, Year	Population description	No. of smokers	Prog. sponsor	Prog. descr.	Incentive	Prog. cost	Recruit. channel	Segment by stage?	Campaign length (months)	Recruit. rate (% of smokers)
Shipley, Hartwell, et al. 1995	11 North American intervention cities in COMMIT trial	232,914	Provider/ NGO/ Research	Quit & win	Yes	None	Media	No	1 (average campaign)	mean= 1.3 Range: 0.3-3.1
Sussman, Dent, et al. 1994	5 cities in California	5,184[3]	Research	TV Program	No	None	Telephone	No	1	38.3
Thompson, Michnich, et al. 1988	HMO in Pugent Sound, Washington	369	NGO	Group	No	$30 fee	Interpersonal	No	12	14.0
Tillgren, Haglund, et al. 1992	Sweden age 16+	2,167,000	Provider	Quit & win	Yes	None	Media	No	12	0.6
Wagner, Schoenbach, et al. 1990	HMO in Puget Sound, Washington	49,500	Provider	Manuals	No	None	Media	No	3	4.1
Warnecke, Flay, et al. 1991	Chicago, IL	1,440,000	Provider	Manuals + TV prog.	No	None	Media	No	1	5.2[4]

Notes:

1. Assumes a smoking prevalence rate of 20 per cent of adult population.
2. Estimated from data given in Schmid, Jeffery & Hellersted, 1989. Also see note 3.
3. Recruitment was originally given by household. To convert rate based on individual smokers it was assumed that each household had an average of 1.6 adults and that smoking prevalence was 27 per cent of the adult population.
4. Per cent of smokers that received a self help manual.
5. In order to maintain independent samples in the analysis, the recruitment rate shown is the mean for that population obtained over multiple contests using similar methodology.

Finally, campaign length, entered into the analysis as a continuous variable, represented the number of months that subjects were actively recruited. Population size was entered as a continuous variable based on the authors' reports. In some cases the population of smokers was estimated by utilizing the known number of participants and the reported recruitment rate.

2.2 Results

2.2.0 Coding reliability. All studies on which the present analysis is based were coded by the author of the current overview. To check the reliability of the reported variables, half of the studies were randomly selected and coded by a second rater blind with respect to the purpose of the study. Kappas, an estimate of inter-rater reliability that adjusts for chance agreement, ranged from .69 to .84 which is considered moderately high (Hollenbeck 1978).

2.2.1 Statistical analysis. The mean percentage of smokers recruited across the 40 studies examined was 10.8 (SD = 19.9) with a range of .08 to 85.0. The median recruitment rate was 2.0 per cent. The distribution of recruitment rates is shown in Figure 2.1.

Campaigns were aimed at an average of 153,264 smokers (SD = 420,959) and had a mean length of 5.4 months (SD = 7.9; range of one week to 33 months). Fifty-eight per cent of the campaigns were sponsored principally by health care providers, 20 per cent were offered by NGOs, and 22.6 per cent were offered by researchers. Although one study (describing the COMMIT trials) collectively reported on multiple campaigns that had been sponsored by a combination of providers, NGOs and researchers, for purposes of the analysis it was classified as provider sponsored.

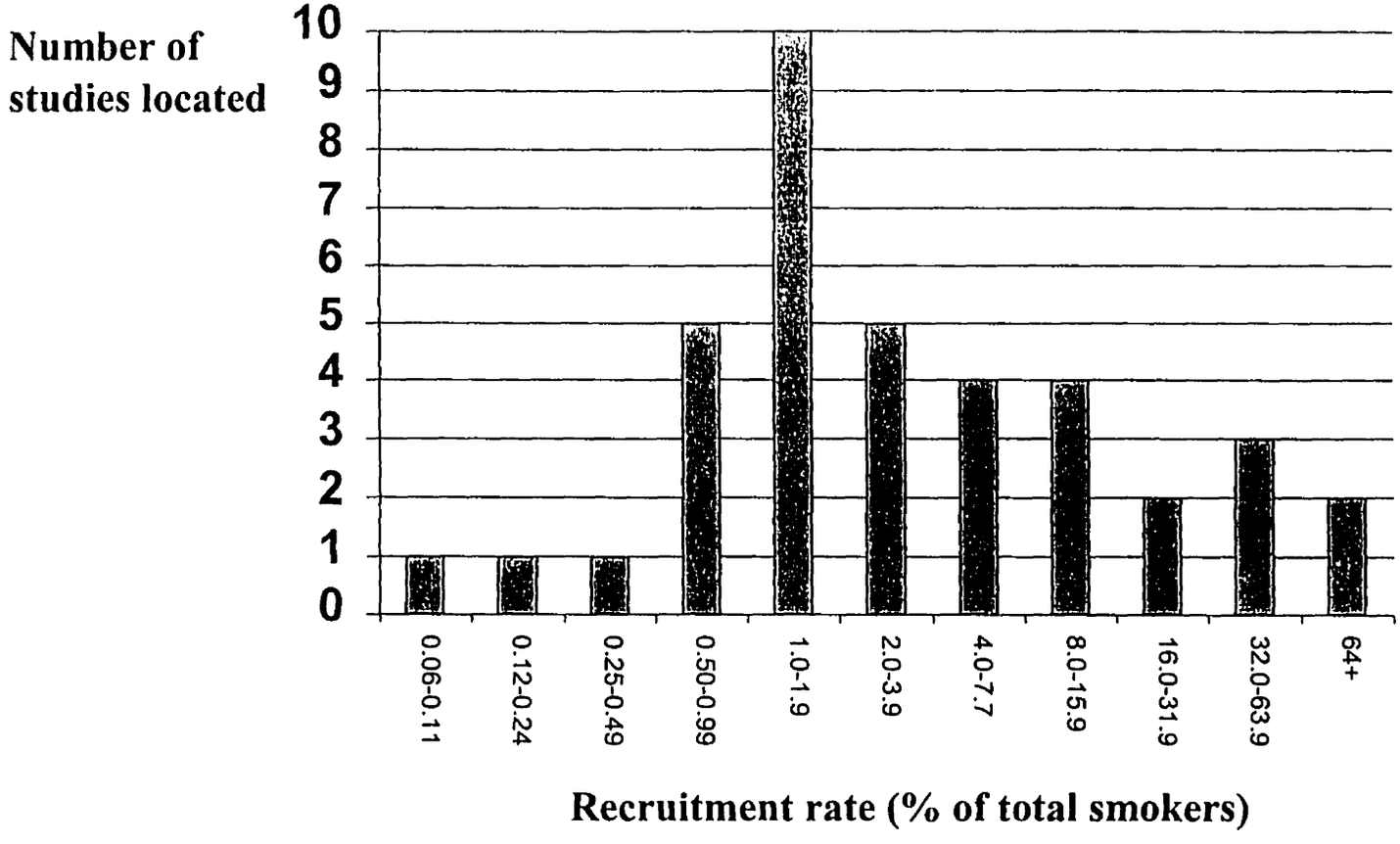


Figure 2.1 Distribution of recruitment rates across the 40 campaigns reviewed.

Several types of programs were represented in the studies. Forty per cent of the studies were promoting a self-help manual or quit kit while another 42.5 per cent of the studies were based at least in part on a quit and win contest. None of the programs being offered could be described as individual counselling. Only 12.5 per cent offered group programs either alone or in combination with self-help programs. A telephone help line was a principal object of recruitment in three of the 40 campaigns, while two others advertised programs that were delivered via television. In addition to the 17 quit and win campaigns identified, there were five other reports of campaigns offering enrollment incentives to smokers. Two studies asked participants to make a refundable deposit in order to participate in the program. Another three gave participants a choice of a refundable deposit or paying a flat fee. Interestingly, 95 per cent of participants in the latter study opted for the flat fee (Schmid, Jeffery, and Hellerstedt 1989). Only one study required participants to pay a fee. In all cases where fees or deposits were levied, with one exception, the amount was less than $60.

The most frequent channel employed to deliver messages was media, either alone (51% of campaigns) or in combination with at least one other strategy (18 % of campaigns). Seven of the 39 campaigns that reported details about channel relied primarily on the telephone. Only two studies reported using interpersonal recruitment methods alone, but another four reported that interpersonal methods were systematically used in combination with media. Two studies used direct mail as their primary recruitment strategy. However, four other studies used mail in combination with media. Finally, despite considerable recent speculation about the potential value of segmenting audiences and gearing messages based

on stage of change, only three of the 40 campaigns made explicit reference to such a practice.

Logistic regression was used to examine the relationship between recruitment and the predictor variables. Since data on campaign length was not available on 17.5 per cent of the campaigns they were not included in the regression analysis. Data on the number of smokers targeted by campaigns was also either missing or crudely estimated in a number of studies; hence, in an effort to keep the ratio of the number of predictor variables to the number of cases as high as possible, this variable was also excluded from the regression analysis. To create the proportion type response required for a logistic analysis, a dichotomous dependent variable, called success, was created. A second variable, called caseweight was also created to express the number of persons per thousand population that were either recruited or failed to be recruited in each campaign. Hence, it was necessary to enter each campaign into the data base twice and weight each case by the caseweight variable. For each pair of cases related to a specific recruitment campaign, one case was assigned a success value of 1 to denote recruitment success while the other case was assigned a success value of 0 to denote recruitment failure. Caseweight was assigned the following values:

(4.1) If success = 1, then caseweight = $\frac{S_i}{S_i + F_i}$ X 10000

(4.2) If success = 0, then caseweight = $\frac{F_i}{S_i + F_i}$ X 10000

where: S_i = estimated number of smokers successfully recruited in campaign i;
F_i = est. no. of smokers that were targeted by campaign i but not recruited .

Caseweight was expressed as a rate per ten thousand in order to avoid having to round off any recruitment estimates. For example, Cummings, Sciandra et al. (1989) reported the lowest recruitment rate of any study reviewed, 0.08 per cent of smokers. Therefore, in this study when success was equal to 1, caseweight was set at 8. When success was equal to 0, caseweight was equal to 9992. Except for success and caseweight, all other variables for each pair of cases related to a specific recruitment campaign were identical. In essence, this procedure is equivalent to creating 10,000 individual cases for each campaign with each case differentiated only by whether the smoker was successfully recruited or not.

Normally in systematic reviews, the weighting of studies depends on their relative sample size with the largest samples carrying the most weight in the overall analysis. This is done because increasing a sample size reduces variance and results in a more stable estimate. However, in the present analysis each campaign was re-scaled to a common weight for three principle reasons. First, there is no compelling reason to believe that recruitment campaigns conducted in large metropolitan areas are any more valid than those conducted with more modest populations. Indeed, it may be argued that implementation and data collection can be done more accurately with smaller studies. Second, sample size is potentially confounded with channel type. Campaigns targeted at the largest populations relied almost exclusively on mass media while campaigns using telephone, interpersonal contact, or mail were conducted with relatively small target populations. Hence, without re-scaling, the analysis would have been overwhelmingly dominated by campaigns that sent messages by mass media while results using other channels would have been largely

obscured. Finally, although it was possible to calculate recruitment rates for all campaigns, not all studies reported enough information to estimate the size of their population of smokers.

It should be noted, however, that a substantial disadvantage of re-scaling studies down in size is that the precision of the estimates obtained from them may be significantly reduced thereby increasing the likelihood of a type II error. For example, instead of an aggregate population of more than 5,670,868 smokers, the present analysis was based on an effective sample of 10,000 x 36 studies = 360,000. Moreover, the loss of precision would be greatest for the largest studies. Therefore, the effects associated with large trials that used media to deliver messages have the greatest probability of being overlooked.

Following the suggestions of Hosmer and Lemeshow (1989), the first step in analyses began with a univariate examination of the potential effect of each predictor variable (campaign sponsorship, program type, the use of campaign incentives, program costs, campaign channels and segmented messages based on stage of change) on the probability of being successfully recruited into a smoking cessation program. For each variable, Table 2.2 presents the (a) estimated slope of the coefficient(s) for the univariate logistic regression model containing only the variable shown in the left hand column of the table, (b) the estimated standard error of the estimated slope coefficient, (c) the estimated odds ratio, which was obtained by exponentiating the estimated β coefficient, the 95 per cent confidence interval for the odds ratio, (d) the Wald statistic for the hypothesis that the slope of the coefficient is zero, and (e) the associated probability associated with obtaining the Wald statistic. An examination of the confidence interval estimates for the odds ratios

TABLE 2.2

Results of the univariate logistic regression models predicting the probability of recruitment success.

Predictor Variable	n	β	SE(β)	Wald (df = 1)	*p*	Odds Ratio	95% CI for OR
Channel (media)	78	-1.2127	0.6345	3.653	.056	0.30	0.09, 1.03
Channel (mail)	78	-1.6214	1.8026	0.809	.368	0.20	0.01, 6.76
Channel (telephone)	78	2.5762	0.4742	29.511	.000	13.15	5.19,33.30
Channel (interpersonal)	78	0.9314	0.7005	1.768	.184	2.54	0.64,10.02
Channel (media+interp.)	78	-0.7540	0.8464	0.794	.373	0.47	0.02, 1.07
Sponsor (researcher)	76	0.8301	0.3173	6.843	.009	2.29	1.23, 4.27
Sponsor (hlth. provider)	76	-0.3468	0.3010	1.327	.249	0.71	0.39, 1.28
Program type (quit/win)	80	-1.1597	0.3658	10.037	.002	0.32	0.15, 0.64
Program type (group)	80	-0.7395	0.5278	1.963	.161	0.48	0.17, 1.34
Program type (self help)	80	0.4022	0.2917	1.901	.168	1.50	0.84, 2.65
Segmentation	80	-1.7356	0.2234	60.372	.000	0.18	0.11, 3.66
Cost	76	0.2392	0.3232	0.548	.459	1.27	0.67, 2.39
Incentive	76	0.1146	0.2018	0.323	.570	1.12	0.75, 1.67

revealed that only two variables have at least one level with values that exceed one (channel, and sponsor). These two variables also have one or more levels with statistically significant Wald tests indicating coefficients that differ significantly from zero. Moreover, univariate analyses using channel (χ^2 (5) = 80.03, $p < .001$), or sponsor (χ^2 (2) = 62.91, $p < .025$) significantly improved the goodness of fit relative to a model containing the constant only.

Two variables had at least one level where the lower bound of the confidence level approached one (program type and segmentation). The Wald test for segmentation is significant ($p < .001$) while one of the three levels of program type had a coefficient that differed significantly from zero. An examination of the goodness of fit for univariate models using segmentation (χ^2 with 1 df = 64.76, $p < .001$) or program type (χ^2 with 3 df = 22.84, $p < .001$) revealed that both resulted in significant improvements relative to a model containing a constant only.

In contrast to the other variables, univariate analyses with cost (χ^2 with 1 df = 0.61, $p = .433$) or incentive (χ^2 with 1 df = 0.32, $p = .569$) did not significantly improve the goodness of fit. Moreover, the lower bound of the confidence interval for the odds ratios associated with cost and the presence of an incentive did not approach one. Finally, neither cost or incentive had coefficients that differed significantly from zero.

These results suggest that cost or the use of incentives were likely not associated with the probability of successfully recruiting smokers into smoking cessation programs. On the other hand, channel type, program sponsor, program type and message segmentation may influence the probability of recruitment success. To further test this possibility, an attempt

was made to build a multivariate model.

The first step in building a multivariate model was to check for the presence of significant interactions among channel, sponsor, program type and segmentation. Since the variables being considered had between two and five levels each, the decision was made to limit the number of interactions to those with the greatest plausibility. Moreover, missing data in some cells prevented the inclusion of some interactions (e.g., segmentation and channel). Since researchers tended to rely on telephone recruitment in order to conduct random surveys and providers tend to rely on media, an interaction between sponsor and channel was a possibility. Moreover, quit and win programs tend to rely heavily on the media so an interaction between program type and channel also seemed plausible. Finally, a three way interaction between channel, sponsor and program type was also checked.

In addition to the aforementioned interactions, channel, program type, sponsor and segmentation were entered as categorical predictors of recruitment success. Once again, each campaign was entered into the model twice with each pair weighted by the proportion of successes and failures respectively. Results indicated that none of the interactions appeared to significantly improve the model. For example, none of the β coefficients for the interaction terms were significant (p's $> .578$). Moreover, none of the odds ratios for the interaction terms were significant.

The next step in building a multivariate model consisted of entering the variables channel, program type, sponsor, and segmentation into a stepwise logistic regression procedure using forward selection. Rather than selecting variables based on the Wald statistic, a likelihood-ratio test was employed whereby the change in log likelihood for the

model is examined after the systematic entry of each variable. As suggested by Mickey and Greenland (1989), in order to ensure that the model is as stable as possible, the selected screening criteria was set at $p < .15$.

Using 74 cases, the stepwise procedure included only one variable in the model, channel. Overall, the model correctly classified 93.9 per cent of cases and produced -2 log likelihood estimate of 136.425. The model chi square, which tests the null hypothesis that the coefficients for all of the terms of the model except the constant are equal to zero, was also highly significant (χ^2 with 5 df = 33.22, $p < .001$).

Table 2.3 provides the odds ratios and associated confidence intervals for recruitment success using each combination of channels in the analysis. Detailed inspection shows use of the telephone significantly improves the odds of successfully recruiting smokers for smoking cessation programs relative to any other channel. Indeed, the odds of success are 5.17 (95% C.I. = 3.31 to 8.07) times greater than the next most effective strategy, interpersonal channels, and nearly 45 (95% C.I. = 30.58 to 65.07) times more effective than media. Interpersonal channels appear to increase the odds of recruitment success relative to media and mail, whether used independently or in combination. However, the effectiveness of interpersonal recruitment appears to be improved when it is used in combination with media (OR = 4.50; 95% C.I. = 2.22 to 9.11). The odds of recruitment success also appear to improve when mail and media are used in combination with each other rather than on their own (see Table 2.3). The odds of successfully recruiting smokers appears to be approximately equal for media relative to mail based strategies (OR = 1.49; 95% C.I. = 0.38 to 5.92).

TABLE 2.3

Odds ratios for successfully recruiting smokers into smoking cessation programs using various communication channels. 95 per cent confidence intervals are shown in parentheses.

	Media	Mail	Telephone	Interpers	Media+. Interpers.	Media+ Mail
Media vs.	-	1.49 (0.38, 5.92)	0.02 (0.01, 0.03)	0.12 (0.07, 0.21)	0.52 (0.27, 1.01)	0.27 (0.16, 0.47)
Mail vs.	0.67 (0.17, 2.66)	-	0.02 (0.01, 0.08)	0.08 (0.02, 0.32)	0.35 (0.08, 1.48)	0.18 (0.04, 0.73)
Telephone vs.	44.61 (30.58, 65.07)	66.45 (17.45, 253.08)	-	5.17 (3.31, 8.07)	23.30 (12.95, 41.92)	12.12 (7.75, 18.95)
Interpersonal vs.	8.62 (5.01, 14.84)	12.84 (3.19, 51.72)	0.19 (0.12, 0.30)	-	0.22 (0.11, 0.45)	2.34 (1.29, 4.24)
Media + Interpers. vs.	1.91 (0.98, 3.71)	2.85 (0.67, 12.09)	0.04 (0.02, 0.07)	4.50 (2.22, 9.11)	-	1.93 (0.95, 3.91)
Media + Mail vs.	3.68 (2.13, 6.35)	5.49 (1.36, 22.12)	0.08 (0.05, 0.13)	0.43 (0.12, 0.78)	0.52 (0.26, 1.05)	-

Since campaign length and the size of the population of smokers associated with each campaign were not included in the logistic regression analysis, a simple correlational analysis was performed. Correlations between the percentage of smokers recruited and campaign length ($r = .294$; $p = .090$), as well as between the percentage of smokers recruited and the number of smokers in the target population ($r = -.159$; $p = .348$) were both non-significant. Since the impact of campaigns delivered through the media and interpersonal channels are more likely to be sensitive to campaign length than mail and telephone based strategies (Kottler and Roberto 1989), the relationship between recruitment and campaign length was examined only for those delivered through the media or interpersonal channels. Once again, however, no relationship was found ($r = .291, p = .130$).

2.3 Discussion of the Review Results

Overall, the results suggest that recruitment efforts to date have been modestly successful at best. The typical campaign recruited less than two per cent of available smokers into population based quit smoking programs. However, the rather dramatic range of results also suggests that it may be possible to improve on this outcome.

Other reviews have suggested that the use of incentives can improve recruitment rates (e.g., Bains, Pickett, and Hoey 1995; Matson, Lee, and Hopp 1993). In contrast, the present results did not show an advantage to those studies that used incentives to improve recruitment rate. However, it should be noted that incentives may also impact on other outcomes of interest as well. For example, in some campaigns smokers had to remain smoke free for some period of time in order to remain eligible to receive the incentive. Therefore, although incentives may not improve recruitment rates, they may impact on program

compliance, and/or improve program efficacy.

Although the present review failed to find that program cost significantly altered recruitment rates, given the relatively few studies that were examined it would be premature to generalize these findings. For example, the marketing literature has a plethora of data demonstrating that, in general, cost plays a significant role in whether or not an innovation will be adopted (c.f., Andreasen 1995; Kotler and Roberto 1989). The failure to find a relationship between cost and recruitment in the present study may, however, reflect the fact that the few studies that attempted to levy a cost did so in a very modest way. For example, three studies charged a fee of only five dollars, equivalent to less than two packages of cigarettes.

The finding that the length of campaigns were unrelated to recruitment rates is, at first blush, counter-intuitive. However, there are at least two plausible explanations for this finding. First, the impact of recruitment campaigns is likely the result of both the length of the campaign and its intensity (Bovee and Arens 1992; Kotler and Roberto 1989). Therefore, the lack of an observed relationship between campaign length may have been due to confounding differences in campaign intensity. A second plausible explanation is that the marginal utility of continuing a campaign diminishes over time. Several studies that tracked enrolment over time noted this trend. For example, in a quit and win contest that was run over a period of eight months, Landon, Hellerstedt, et al. (1991) reported that nearly 30 per cent of the total number of participants sent in their registration within the first month of the campaign. Glasgow and his colleagues (1991) reported that over 60 per cent of participants in a year long smoking cessation program conducted in nine worksites collectively

employing over 700 smokers registered in the first month of the campaign.

The present review suggests that the recruitment variable with the most potential to improve population based communication campaigns for smoking cessation programs is the channel used to deliver campaign messages. Specifically, the results indicate that telephone based recruitment has a significant advantage over all other channels. An examination of the mean ranks for each channel type given in Figure 2.2, as well as the individual rankings, suggest that overall, telephone and interpersonal recruitment strategies consistently produced results superior to media or mail, whether used independently or in combination with one another. For example, telephone based recruitment produced the six of the top seven recruitment rates and seven of the top 11. Campaigns that employed interpersonal methods produced two of the best 11 recruitment rates. Moreover, campaigns that combined interpersonal strategies with media were also consistently more effective than either media alone or media in combination with mail.

Not only did telephone and interpersonal recruitment strategies produce consistently higher recruitment rates, but the size of their superiority is also quite notable. For example, the mean recruitment rate obtained in campaigns involving telephone recruitment was 42.5 per cent. No telephone based campaign produced a recruitment rate of less than 10 per cent of smokers. Campaigns that employed interpersonal methods either alone or in combination with other strategies produced a mean recruitment rate of 6.2 per cent. The worst performance for a campaign involving interpersonal methods was a recruitment rate of 1.9 per cent. In comparison, campaigns that relied on mass media or direct mail had a mean recruitment rate of 2.2 per cent. Hence, telephone based recruitment was 19 times more

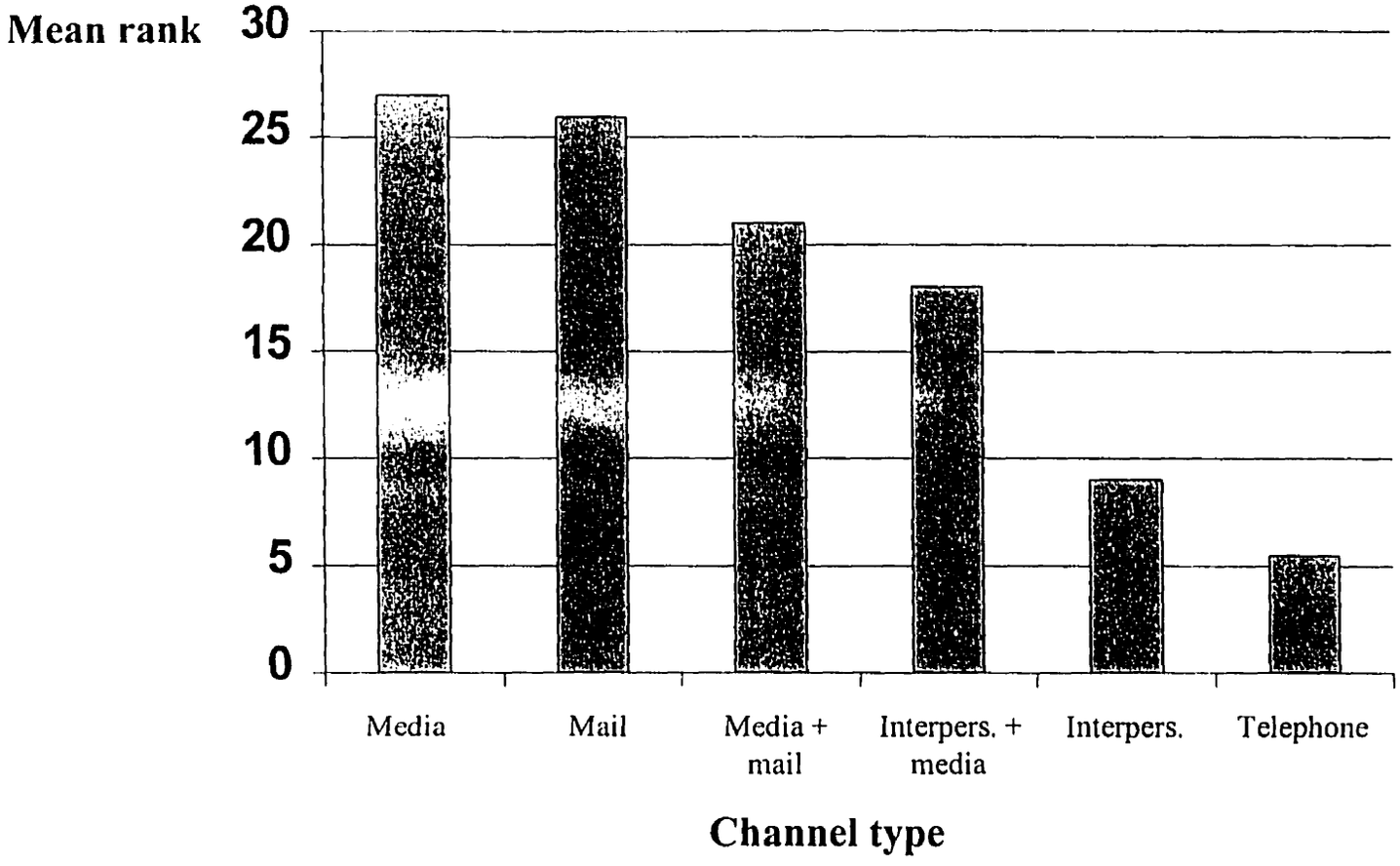


Figure 2.2 Mean rank of recruitment rates for each channel type across the 40 studies reviewed

effective on average than mass media and direct mail, while the average advantage for interpersonal methods was more than 280 per cent as great as media and mail.

The fact that telephone and interpersonal methods produced superior recruitment results is consistent with the result of studies in schools and worksites that attempted to compare pro-active and passive recruitment strategies for smoking cessation. Peltier, Telch and Coates (1982) attempted to recruit teen smokers in two California high schools whose students had similar characteristics. The school that utilized interpersonal recruitment reported a participation rate six times higher than a similar school that relied on posters and public announcements. Similarly, in a 1987 study Lowe, Windsor and Post randomly assigned employees in a single large worksite in Birmingham, Alabama into two treatments. One group received a personal letter inviting smokers to participate in an onsite smoking cessation clinic. The other group received their invitation to the same program through a telephone call from a health educator employed by the company. None of the smokers receiving the letter registered for the program, but 19.8 per cent of smokers receiving the telephone call did so. When the number of smokers who were unable to be contacted are dropped from the recruitment formula, a total of 51.4% of those who received the message enrolled. In sum, it would appear that recruitment campaigns that pro-actively contact smokers either by telephone or in person consistently produce superior results to those relying on media and mail that require smokers to passively respond to messages.

The results of the present analysis are incomplete with respect to the idea that segmenting messages by stage of change may produce significantly higher recruitment rates. An inspection of the studies reveal that only three reported segmenting their messages by

stage of change. Moreover, two of the three were removed from the logistic regression analysis because of missing data. An examination of the three campaigns that segmented messages also reveals another potential confound. Specifically, whenever messages were staged, they were delivered either by telephone or by telephone in combination with mail. Since these channels tend to be the most effective, it is difficult to determine what the independent effect of segmentation was in the campaigns that employed it. Thus, while there has been considerable discussion on the potential benefits of segmenting recruitment messages on the basis of stage of change, the present review contained insufficient data to adequately test the hypothesis.

While results of the present review are suggestive, they must be interpreted with extreme caution. For example, although every attempt was made to identify the primary intended recruitment channel used by the sponsors, we should not assume that these were the only channels employed. Rogers (1995), for instance, suggests that early adopters recruited by media are likely to personally convince others to enrol with them. Therefore, interpersonal communication is likely to have played a role in virtually every campaign.

Another potential source of error is the inclusion of program participants in the numerator of the recruitment fraction who are not included in the denominator. This occurs, for example, when smokers enrol in the program from outside the geographic area used for estimating the number of smokers in the target population. This may result in an overestimation of the recruitment rate. For example, Shipley et al. (1995) reported the results of one quit and win contest in which 30 per cent of participants were from outside the target geographic region. A related concern is that the methods used to estimate the number

of smokers also varied. While all of the reported studies used some form of random sampling to estimate their smoking populations, they varied substantially in their methodology. For example, some included both daily and occasional smokers, while others included more rigorous criteria such as a minimum consumption level. Likewise, the programs being offered also tended to have slightly different inclusion criteria.

Another limitation of the review is that it was not possible to assess the intensity of campaigns. Hence, while pro-active campaigns appear to be superior to passive strategies, this is true only insofar as the attempt is fairly intensive. For example, Elder, McGraw, Rodgrigues et al. (1987) reported that they had to abandon attempts to recruit participants into a quit and win contest in Pawtucket after an insufficient number of volunteers could be located.

Finally, the present review did not examine cost efficiency. This may be an important consideration for potential sponsors with fixed budgets. Presumably, instead of attempting to recruit the greatest number of smokers into a program, under such conditions the goal should be to recruit as many smokers as possible for the budget available. That is, the goal is to utilize the most cost efficient recruitment strategy. The strategy that produces the most recruits may not be the most cost efficient.

2.4 The Present Study

There is little doubt that tobacco control represents a potential means of significantly improving population health. What is in doubt, however, is whether population based quit smoking programs can make a significant contribution towards the control and reduction of tobacco use. Before accepting tobacco cessation as an integral part of community wide

tobacco control initiatives it must be demonstrated that a significant proportion of smokers can consistently be recruited into effective programs. A review of the literature suggested that this has not happened to date, but that it may be possible.

Consistent with the theories of McGuire (1989) and Rogers (1995), the selection of the channel used to send messages appears to be particularly critical. However, the post hoc nature of the review precludes the attribution of causality between recruitment rate and variables such as channel. There are simply too many uncontrolled variables that could account for the observed relationships to draw valid conclusions. In order to have a more precise understanding of the factors and conditions that consistently lead to improvements recruitment rates, it is necessary to conduct a controlled study that systematically manipulates a limited number of independent variables while holding other factors as constant as possible. Only one study could be located that reported the effects of systematically manipulating channel type on population based recruitment rates for smoking cessation (Schmid, Jeffery and Hellerstedt 1989).

It is noteworthy that the most common channel used to deliver recruitment messages is mass media, either alone or in combination with another strategy. However, Schmid and his colleagues found that combining media with direct mail offered little additional benefit relative to the use of mail alone. These results may be explained by the fact that both media and direct mail are passive recruitment strategies. On the other hand, Bandura's (1986) dual link hypothesis suggests that dissemination of an innovation will be enhanced when mass media is used to reach early adopters and is then followed by a pro-active strategy to engage middle and late adopters. Given the cost of media as a recruitment strategy, it is essential

that program providers have clearer understanding of its benefits relative to other channels. Based on the results of the systematic review, the use of pro-active channels such as telemarketing appear to be extremely promising. There is also a need to determine whether media is more effective when used in advance of other communication channels such as telemarketing and direct mail.

Given that the vast majority of smokers are not interested in quitting (Health Canada 1995), and the high relapse rates associated with smoking (Curry and McBride 1994; Fiore, et al. 1990; Prochaska et al 1992), it stands to reason smoking cessation programs will not have a population level effect until smokers who are unmotivated to quit and recent ex-smokers at risk of relapse receive the appropriate assistance. It is noteworthy, therefore, that despite considerable speculation about the potential benefits that segmenting messages by stage of change might have on population recruitment (e.g., Prochaska 1996), no study to date has systematically examined this hypothesis. The only studies that have segmented messages did not include a suitable comparison condition (e.g., Fava et al, 1995; Prochaska et al., unpublished). Therefore, there is a need to conduct a study that directly compares the effect of segmenting messages by stage of change on population recruitment rates relative to standard, unsegmented messages.

The first purpose of the present study was to systematically examine the effect of varying the most popular types (media, telephone, mail) and combinations of communication channels on recruitment. A second purpose was to study whether segmenting messages by stage of change enhanced recruitment for quit smoking programs relative to the use of uniform messages.

In an effort to begin developing a more complete understanding of the recruitment process, the study attempted to go beyond a strict comparison of recruitment rates for general populations of smokers. For example, recruitment is a function of two variables: the number of people contacted by a given communication strategy and the persuasiveness of the message(s). Therefore, an attempt was made to design the study in a manner that would permit a preliminary examination of the effect of channel type, number of channels, and message segmentation on campaign reach and persuasiveness. The study was also designed to permit a preliminary examination of whether the variables of interest had a differential effect on smokers and ex-smokers in each of the stages of change.

Finally, a review of the literature reveals there is very little information on the relative cost efficiencies of various recruitment methods. For example, most recruitment campaigns simply report the total cost of implementing their initiative. Determining cost efficiency across campaigns is extremely difficult because costs for media, labour, printing, and so forth vary enormously across locations and over time. Hence, a final purpose of the present study was to directly compare the cost efficiency of various types of popular recruitment methods.

2.5 Hypotheses to be Tested

Based on the results of the literature review, the present study sought to test a number of hypotheses by systematically varying three factors: channel type, the number of channels employed, and message segmentation. The outcomes of interest included recruitment rate, message reach (as measured by recall), and message persuasiveness (as measured by recruitment efficiency). Each of these variables is described in more detail in the next

chapter.

2.5.1 Segmentation of messages. Based on the recruitment results reported by Prochaska and his colleagues (e.g., unpublished; Fava, et al, 1995) as well as the arguments of Hotgrave et al (1995), Maibach and Cotton (1995), and others, it was hypothesized that treatments (smoker and ex-smokers) receiving messages that had been segmented by stage of change would result in significantly higher recruitment rates, recruitment efficiency rates and message recall than treatments that received generic messages. It was further hypothesized that segmented messages would have their greatest relative effect on smokers in precontemplation and contemplation as well as ex-smokers in the maintenance stage. It was predicted that message segmentation would have no effect on smokers in the preparation stage and ex-smokers in the action stage.

Because of the extra costs associated with producing and implementing multiple messages instead of one message, it was hypothesized that segmented messages sent through media, mail, or any combination involving media or mail would be less cost efficient than generic messages. However, because the extra costs of segmenting telephone messages was expected to be minimal, it was hypothesized that this would be the most cost efficient recruitment strategy of all.

2.5.2 Channel Types Based on the results of the literature review it was hypothesized that treatment groups that received pro-active messages by telephone would result in higher recruitment rates than messages delivered by mail or media. It was further predicted that the recruitment rate of the treatment receiving messages by mail would not vary significantly from the treatment receiving messages by media. Given evidence that

response rates to telephone surveys with two call backs are typically less than 50 per cent (Lavrakas 1993), the imprecise methods used to locate smokers (e.g., voters lists), and the fact that the message is being delivered at a single brief contact, it is predicted that recall rates for telephone messages will be lower than messages delivered by media or mail. Recall rates and recruitment efficiency for treatments receiving messages by mail or media were expected to be equal. However, since recruitment rates were expected to be highest for messages delivered by telephone despite relatively low recall rates, it was hypothesized that this would be the most highly efficient form of communication. Based on the arguments of Maibach and Cotton (1995), it was hypothesized that telephone recruitment would be particularly effective with smokers in precontemplation and contemplation as well as ex-smokers in maintenance. However, channel type was not expected to have a differential effect on smokers in the preparation stage or ex-smokers in action.

A variety of studies attempting to promote smoking cessation programs have reported that the cost per recruit using media ranges from US $32 to $80 (e.g., Muddle, de Vries, and Strecher 1996; Shipley, et al. 1995; Tillegren, et al. 1993). In one of the few controlled studies that has used direct mail to recruit subjects for smoking cessation and a weight loss program, Schmid, Jeffery and Hellerstedt (1989) reported that the cost to enrol each participant ranged from $14 to $27 (1987 US dollars). Little data is available on the cost efficiency of recruitment for smoking cessation programs through telemarketing. However, based on the hypothesized superiority of telemarketing as a recruitment channel, it is predicted that telemarketing will be the most cost efficient strategy followed by mail and media respectively.

2.5.3 Channel Combinations. Since more members of the target group were expected to be exposed to messages delivered through two channels rather than one, it was hypothesized that utilizing a combination of two channels (i.e., media plus mail or media plus telephone) would increase the likelihood that the target audience would be able to recall the message, and in overall recruitment rates. According to Bandura's (1986) dual link hypothesis, sending messages by mass media followed by an interpersonal strategy such as telephone should produce the highest recruitment rates of all treatments. Because the increased message exposure came through a relatively unpersuasive form of communication (media), recruitment efficiency for treatments receiving a combination of strategies was expected to be inferior to the use of telephone, media, or mail channels alone.

Finally, because the cost of sending messages via two channels significantly increases the cost, it was expected that treatments that sent messages over two channels would be less cost efficient than treatments that utilized a single communication channel.

CHAPTER 3

METHODS

3.1 Subjects

Subjects were adults aged 18 and over selected from the voters lists supplied by the Returning Officers of three provincial ridings located within and immediately adjacent to the City of Windsor, Ontario, Canada: Windsor-Walkerville, Windsor-Sandwich, and Windsor-Riverside.

3.2 Procedure

One name from every third household on the voters lists was entered to create a computerized database. Where more than one person was listed in a household, a single name was randomly selected with the aid of a random number generator. Due to their residential transience, voters who resided in nursing homes, an inpatient substance abuse treatment centre, a chronic care hospital, and a psychiatric residence located within the target area were excluded from the study.

Voters lists were utilized as the original source of potential study participants for several reasons. First, the lists were compiled in May of 1995, approximately 9 months before the start of the present study, making them one of the most up to date catalogues of adults in the target community. Second, since the lists were developed by door to door canvassing, validation cards mailed to all persons on the list, and lists posted for public

inspection, they are considered to be a reliable listing of adults eligible to vote. Third, the lists are in the public domain and were obtained for no cost. Not only is this an advantage for the present study but it represents an important consideration for other program providers in Canada who might wish to replicate all or part of the present study design. While commercial lists that may include a higher proportion of smokers and ex-smokers were available, they tend to be very expensive. Fourth, the lists included only persons who have celebrated their 18th birthday on or before June 6, 1995. Obtaining a list of adult residents only was useful since the smoking cessation program that was provided to respondents is appropriate only for persons aged 18 years and older. Fifth, the voters lists excluded landed immigrants and other persons from outside the British Commonwealth, a large portion of whom do not have proficiency in English. This is relevant in-so-far-as the present recruitment campaign was only conducted in English. Finally, the voters lists did not include persons without a mailing address. Once again, this was an advantage for the present campaign since the program that was offered is mail based and therefore cannot be used reliably with such persons.

The names extracted from the voters lists were assigned randomly to one of seven recruitment conditions and entered into a computerized database. Due to a file transfer error, an estimated 300 names were lost from each of groups five and six. At the time of the error the names had not been sorted or entered in a particular order so there was no reason to believe that the randomization procedure had been compromised. The final distribution of target participants by recruitment condition is shown in Table 3.1. By using

TABLE 3.1

Estimated Distribution of Smokers and Smokers Plus Ex-smokers, By Recruitment Condition and Sex.

Recruitment Condition	Number Adults Assigned[9]	Estimated Number of Smokers			Estimated Number of Smokers + Ex-smokers		
		Male[2]	Female[3]	Total[4,8]	Male[5]	Female[6]	Total[7,8]
1. Generic mail	3979	710	683	1393	1133	962	2093
2. Staged mail	4048	723	695	1417	1152	979	2129
3. Generic telephone	3813	680	654	1335	1085	922	2006
4. Staged telephone	4099	732	703	1435	1167	991	2156
5. Staged Media	3699	660	635	1295	1053	894	1946
6. Post media staged mail	3751	670	644	1313	1068	907	1973
7. Post media staged tele.	3928	700	674	1375	1118	950	2066

Notes:

1 Estimates assume that 52% of adults aged 18+ in the Windsor Census Metropolitan area are female (Statistics Canada, 1991).

2. Estimated smoking rate for males aged 20+ in Windsor-Essex County is 37.2% (95% CI = 31.2 - 43.2). Source: Ontario Ministry of Health, 1991.

3. Estimated smoking rate for females aged 20+ in Windsor-Essex County is 33.0% (95% CI = 28.0 - 38.0). Source: Ontario Ministry of Health, 1991.

4. Estimated smoking rate for adults aged 20+ in Windsor-Essex County is 35% (95% CI = 31.0 - 39.0). Source: Ontario Ministry of Health, 1991.

5. Estimated rate of former plus current smoking males aged 20+ in Windsor-Essex County is 59.3% (95% CI = 65.3 - 53.6). Source: Ontario Ministry of Health, 1991.

6. Estimated rate of former plus current smoking females aged 20+ in Windsor-Essex County is 46.5% (95% CI = 41.5 - 51.5). Source: Ontario Ministry of Health, 1991.

7. Estimated rate of former plus current smokers for adults aged 20+ in Windsor-Essex County of 52.6% (95% CI = 48.6 - 56.6). Source: Ontario Ministry of Health, 1991.

8. Some totals may not equal the stated values for males plus females due to rounding.

9 Number in each condition are unequal because subjects were randomly assigned and because of the loss of approximately 300 names from each of groups five and six due to a computer error.

smoking prevalence data from the 1990 Ontario Health survey, it was possible to estimate the expected number of current smokers (daily plus occasional smokers) as well as the estimated number of persons who have ever smoked (current plus former smokers) by sex. These estimates are also shown in Table 3.1.

3.3 Design

The overarching theoretical paradigm used for the design of the study was based on McGuire's (1989) Communication/Persuasion model. The design sought to isolate and systematically manipulate channel as a factor by comparing combinations of mediated interpersonal communication (telemarketing) with mass media and a highly popular form of selective communication (direct mail). The study also attempted to systematically examine one receiver variable: stage of change.

An incomplete three way factorial design was used to study the effects of three independent variables: message segmentation by stage of change (yes or no), channel type (telemarketing, direct mail, or mass media), and the number of channels used to send messages (one or two). A complete factorial design could not be used because all the subjects resided within a single media market. The decision to broadcast and publish only media messages that had been segmented by stage of change resulted in a total of seven recruitment conditions: (1) non-segmented (generic) messages delivered by mail; (2) segmented (staged based) messages delivered by mail; (3) generic messages delivered by telephone; (4) staged based messages delivered by telephone; (5) stage based messages delivered by mass media; (6) staged based messages delivered by media followed by mail; and (7) stage based messages delivered by media followed by telephone.

Subjects were randomly assigned to the seven treatment conditions to control all other receiver variables. To isolate the impact of channel and stage of change it was necessary to hold the other communication input factors as constant as possible. For example, throughout the study, the source of the messages and the program being offered was the Windsor-Essex County Health Unit. Message variables were also held as constant as possible across the treatment groups. For example, the purpose of all messages was to persuade contacts to enroll in a smoking cessation program. Destination variables were held constant by virtue of the fact that only a smoking cessation program was offered. As part of another research project, once subjects were recruited they were assigned randomly to receive one of four types of smoking cessation interventions: a six month waiting list control; the American Lung Association's *Freedom From Smoking in 20 Days* program; a new self-help smoking cessation program based on the Stages of Change model called *One Step at a Time*; or a modified version of *One Step at a Time* that enabled participants to correspond interactively with the program sponsor through the mail. The evaluation of the stop smoking programs being provided was not part of the present study. However, in order to keep the destination variables constant, recruitment messages in the present study emphasized common attributes of the four programs (e.g., programs are easy to use, delivered through the mail, etc.). The fact that there were four program conditions was concealed from subjects during the recruitment study.

Persons that received the American Lung Association manual were billed $5.00 for each of the booklets they received. For persons that were assigned one of the *One Step at a Time* treatments, the booklets for the precontemplation and contemplation stages were

provided free, while registrants in preparation, action or maintenance were billed $5.00 for each booklet. A strategy for examining whether a confound was created by this differential pricing strategy will be discussed in the sections on study measures.

Since all subjects resided in the same media market it was necessary to stagger the implementation of the recruitment campaigns. As shown in Table 3.2 subjects assigned to the direct mail campaign with the generic message (group 1) and the stage based mail campaign (group 2) were mailed their materials on February 12, 1996. They began receiving the packages on February 13 and registration cards were accepted up to and including March 14, 1996 (31 days after mailing). Calls were placed to participants assigned to the telemarketing groups 3 and 4 starting on February 14 and were completed on March 2. The media campaign began on March 18 and ended on March 30. Registrations were accepted from persons assigned to the media condition (group 5) between March 18 and April 14, 1996 inclusive (30 days). Telephone calls to persons assigned to group 6, the post media - staged telemarketing group, were completed between April 2 and April 18, 1996. Packages directed at persons assigned to group 7 were mailed on April 1. Registrations were accepted from persons assigned to group 7 up to and including May 1, 1996 (31 days after mailing). Hence, the registration period for groups one through four was completed before the start of the media campaign, while groups six and seven were implemented immediately following the media blitz in order to assess the impact of combining media messages with messages delivered by either mail or telephone. The timing and length of each campaign was based on three important considerations. First, a number of organizations in the recruitment area

TABLE 3.2

Sequence of Implementation, Registration, and Post Campaign Surveying for Each Recruitment Group

Task	Recruitment Group	Dates (week beginning, 1996)												
		February			March				April				May	
		12	19	26	4	11	18	25	1	8	15	22	29	6
Implementation	1 - Gen Mail	*												(Feb. 12)
	2 - Stg Mail	*												(Feb. 12)
	3 - Gen Tele	********												(Feb. 12-Mar. 2)
	4 - Stg Tele	********												(Feb. 12-Mar. 2)
	5 - Media					******								(Mar. 18-30)
	6 - Stg. Mail							******						(Apr. 1)
	7 - Stg. Tele							******						(Apr. 2-18)
Registration														
	1 - Gen Mail	**********												(Feb. 13-Mar. 14)
	2 - Stg Mail	**********												(Feb. 13-Mar. 14)
	3 - Gen Tele	**********												(Feb. 14-Mar. 15)
	4 - Stg Tele	**********												(Feb. 14-Mar. 15)
	5 - Media					**********								(Mar. 18-Apr. 14)
	6 - Stg. Mail							**********						(Apr. 2-May 1)
	7 - Stg. Tele							**********						(Apr. 2-May1)
Post campaign survey														
	1 - Gen Mail		***											(Feb. 23-27)
	2 - Stg Mail		***											(Feb.23-27)
	3 - Gen Tele			***										(Feb. 26-Mar. 5)
	4 - Stg Tele			***										(Feb. 26-Mar. 5)
	5 - Media										***			(Apr. 10-15)
	6 - Stg. Mail											***		(Apr. 15-18)
	7 - Stg. Tele												***	(Apr. 22-27)

were known to conduct special smoking related promotions in early to mid January. Hence to reduce the likelihood of a confounding promotional campaign, the decision was made to wait until mid February before starting any of the campaigns. The need to complete all campaigns before late spring was based on evidence showing that attempts to quit smoking are seasonally related (D'Mello and Flanagan 1996; Glassman, Helzer et al. 1990). Quit attempts are relatively stable between February and mid April, after which they tend to drop off. Hence, completing all campaigns before the end of April would reduce the chances of seasonally related confounds in motivation to quit smoking.

3.4 Materials

Message Development. Message development is one of the most critical elements of a successful dissemination plan (Lefebvre 1990). Therefore, great care was taken in the development of the messages for the present study. In order to maximize their impact, all messages were drafted to emphasize that the smoking cessation programs being offered were simple, quick, and easy to use, inexpensive, low risk, reversible, and easily adapted (Montazeri and Mewen 1997; Rogers 1997; Zaltman and Duncan 1977).

In addition to emphasising the benefits of the innovation, messages also attempted to incorporate the suggestions made by MacLachlan (1984) for increasing persuasiveness. For example, benefit statements and points of potential agreement were placed near the beginning of the message; terminology was kept as concrete as possible; and key points were repeated. At least one recent study has shown that the reading level of smokers tends to be lower than the general population and that the majority of current messages aimed at smokers are too sophisticated for large proportions to comprehend (Meade and Byrd 1989).

Therefore, all messages were constructed using the principles of clear language (Ontario Ministry of Education 1993). Written material was prepared at a grade eight reading level or less, and utilized large fonts, simple diagrams, and plenty of white space.

Since one of the primary variables of interest was related to better defining the value system of potential adopters using the stages of change model (Prochaska, DiClemente, and Norcross 1992) five of the seven treatment groups emphasized values about quitting that are thought to be related to a smoker or former smoker's level of readiness to quit smoking. By including two "generic" conditions that do not emphasize these differentiated value systems, it was possible to compare the impact that segmentation by stage of change has on the recruitment process.

The decision to develop three basic messages instead of one for each of the five stages of change outlined in the transtheoretical model (Prochaska, DiClemente, and Norcross 1992) was based on two primary considerations. First, during the formative evaluation of a pilot study attempting to recruit smokers into a smoking cessation program using classified advertising, participants suggested that the distinction between five messages was too subtle to be of significant benefit (McDonald and Lawrance in press). While precontemplators had very distinctive preferences, smokers in contemplation and preparation appeared to be equally predisposed to messages designed for persons in contemplation or preparation. Likewise, ex-smokers in action and maintenance showed affinity for each other's ads. Hence, the pilot study utilized three messages: one aimed at smokers in precontemplation, one aimed at smokers in contemplation or preparation, and one aimed at ex-smokers in action or maintenance. Results using the three messages were highly

successful in recruiting smokers with all levels of readiness to quit. As hypothesized, the specific advertisement that participants responded to was highly correlated with their stage ($r = .91; p<.01$). The second reason for restricting the number of stage based messages to three was cost. Increasing the number of distinct messages would have dramatically increased the cost of each of the stage based recruitment strategies, especially for mass media. As discussed above, an important goal of the present research was to make it feasible for local communities with limited budgets to replicate.

After the initial scripts and layouts were drafted, they were reviewed collectively by three Health Promotion Specialists at the Windsor-Essex County Health Unit with expertise in social marketing and tobacco cessation. After expert review, the scripts and message layouts were reviewed by separate focus groups of male and female smokers/ex-smokers in each stage of change. Focus group participants were asked to provide suggestions to improve the clarity, acceptability, and appeal of each of the message formats. A significant change in the scripts involved the decision to restrict the use of humour to electronic messages aimed at precontemplators. Although the members of the precontemplation focus group strongly endorsed our original decision to incorporate humour into our radio and television scripts, the other focus groups felt that it was inappropriate. The decision to restrict the use of humour to electronic mass media was based on the results of a review by Weinberger, Spotts, Campbell and Parsons (1995) that suggested humour increases audience recall and execution for products such as smoking cessation when broadcast through radio and television, but not for print. They speculate that this is because electronic media are more passively received by an audience that has higher expectations to be entertained.

After incorporating the comments of the experts and focus group participants, the scripts and layouts were used to produce the television, radio, newspaper advertisements, the direct mail package and the telemarketing scripts. Finally, each medium was subjected to a final round of focus testing with a single group of smokers and ex-smokers.

Treatment 1 - Generic Direct Mail. Persons assigned to treatment one received a personally addressed direct mail package. According to Stone (1989) and Cohen (1984), obtaining the best results with direct mail is highly dependent on the nature of the product and the characteristics of the target group. Since few studies promoting community based smoking cessation programs have used direct mail and even fewer describe the content or format of their packages, it was unknown what combination of materials would work optimally. However, in general, most direct marketing packages have found that the inclusion of a cover letter, brochures that describe the product or service being offered, and postage paid order forms work well (Cohen 1984; Stone 1989). Although it is possible to include a variety of other material, in an effort to keep the cost as modest as possible it was decided to start with a basic package. While it may be demonstrated that additional materials produce higher recruitment rates and may even be more cost effective, most community groups or organizations work with limited budgets for printing and postage. Therefore, the weight of the total package was kept below the limit for a first class letter and kept the printing costs below $1.00 per package.

The purpose of the cover letter was to: (a) invite smokers and ex-smokers to order a stop smoking program from the Windsor-Essex County Health Unit, (b) briefly describe the contents and benefits of the program in accordance to the methods suggested by Rogers

(1995) to enhance diffusion, (c) provide instructions for the recipient to order the program by sending in an enclosed postage paid order card, (d) encourage the reader to provide a second enclosed order card to a friend and, (e) call the Health Unit if they require further information on the program. The cover letter was printed on white letterhead from the Windsor-Essex County Health Unit and signed by the local Medical Officer of Health. The cover letter was printed on a single sheet of 70 pound white bond paper, 8.5 inches by 11 inches in size, with a medium dark green Windsor-Essex County Health Unit logo approximately 1.5 inches square on the top centre of each page and the Health Unit's address, telephone number and facsimile printed in 10 point test and running approximately 0.5 inches across the bottom of the sheet. The green ink used on the cover letter and envelope was chosen to match the Health Unit's standard colours which are well known to members of the local community. Text was printed in black ink using a 12 point Times Roman font and single spacing.

A single brochure briefly describing a stop smoking program was included. Brochures were printed on 8.5 inch by 7.3 inch 90 pound coated white paper and folded once down the vertical midline. The front panel contained the words "A Stop Smoking Program for Smokers Just Like You" in 30 point white Helvetica lettering inside a red box on a blue background. The inside panels contained an opening line announcing a stop smoking program for adults followed by a short paragraph describing the contents of the program being offered. The descriptive paragraph was followed by five bullets that emphasize the benefits of the program in accordance with the adoption variables suggested by Rogers (1995). Two diagrams with a red and blue stylized background and white lettering depicting

a generic program booklet, a survey and postage paid response cards appeared on the left side of the panels. The back panel provided instructions for the recipient to mail back the postage paid order form, identified the Windsor-Essex County Health Unit as the sponsor and provided a telephone number to call for more information. A stylized star with a drop shadow containing the words "easy to use" also appeared on the upper left hand corner of the final panel.

Each package also included two 3.875 inch by 5.75 inch order cards printed in black ink on a white card 18 mm thick to conform to Canada Post specifications. On one side of the card was the return postage indicia from Canada Post in the upper right corner, a postal bar code and registration number in the centre, and four light straight black lines in the upper left corner for the respondent to place their return postal address. In the centre was the Health Unit's address. The other side of the order form contained a place for the respondent to write his or her name, address, telephone number, and birthdate. Using a five point Likert scale from 1 (not sure at all) to 5 (totally sure), all respondents were asked to answer two questions: (1) "How sure are you that quitting smoking will help your life (e.g., health, relationships, etc)?" and, (2) "How sure are you that you can stay smoke free?" In addition, current smokers were asked, "How sure are you that you could quit smoking if you wanted to?" These were included to provide an estimate of respondent's outcome expectancy and self efficacy with respect to their cessation of smoking (Bandura 1986). A series of boxes were also provided so respondents could check off if they worked at Chrysler Canada, if they had smoked in the last 7 days, and an algorithm designed to determine the person's stage of change (Prochaska, DiClemente, and Norcross 1992). Information regarding employment at

Chrysler was obtained since this employer offered to pilot test the *One Step at a Time* quit smoking program on behalf of the Health Unit. Finally, an open ended question asked those who have already quit, how many months it has been since they stopped smoking. Order cards included in the package for treatment group one were identifiable by the inclusion of a small letter "g" appearing in the upper corner of the card. Cards included in the staged based direct mail packages did not contain the "g" identifier.

All package contents were distributed via first class mail in a standard number 10 white envelope. A number 10 envelope was selected for several reasons. First, its relative popularity made it the most inexpensive envelope to purchase. Second, the size of the envelope reduced the cost of mailing. Third, by avoiding a special sized envelope, the package was less likely to be characterized as "junk mail" by recipients and therefore had a better chance of being opened (Stone 1989). Printed on the front upper left hand corner of each envelope was a Windsor-Essex County Health Unit logo approximately 1 inch square. Immediately to the right of the logo, running horizontally approximately 0.375 inches from the top edge of the envelope was the Health Unit's return mailing address in nine point Helvetica font. In an effort to encourage recipients to open the mail pack, the words, "An important message from the Medical Officer of Health" was printed horizontally approximately one and one quarter inches from the top edge and starting two inches from the left edge of the envelope in a 15 point bold, underlined Times Roman font. All printing on the envelope was in a medium dark green ink. Letters were individually addressed by placing a white, one and one half inch by three and one half inch mailing label containing the intended recipient's first and last name, and address. Mailing labels were produced from the

computerized database of names extracted from the voters lists using a Hewlett Packard Laserjet 4 postscript printer. Postage was applied in the upper right-hand corner using a commercial postage machine that imprints a red indicia.

The contents and wording of all material for treatment group one is given in Appendix A.

Treatment 2 - Staged Based Direct Mail Only. Persons assigned to treatment two received a personally addressed direct mail package in the same manner and format as treatment group one with the following changes. The cover letter for treatment two was specifically written to appeal to smokers who like smoking, smokers who are thinking about quitting and ex-smokers who want to stay smoke free for good. A second important difference was that the inclusion of three different brochures. The front panels of the brochures provided the following messages: "For Smokers Who Like Smoking"; "For Smokers Who Are Thinking About Quitting Smoking"; and "For Ex-smokers Who Want to Stay Smoke Free For Good". In each case the two inside panels opened with a header and a descriptive paragraph that reflected the theme on the front panel. Each also contained bullet statements about the benefits of the program in accordance with the suggestions of Rogers (1995) for maximizing diffusion of an innovation. The back panel was similar to the brochure described in treatment one except that it emphasized that the program contains five booklets and briefly described them. The order cards and the envelope were identical to those described in treatment one except the order cards did not include the small "g" identifier in the top corner. Program materials are provided in Appendix B.

Treatment 3 - Generic Telemarketing Only. Telephone numbers for persons assigned to treatment three were added to the computerized data base by checking local telephone directories, commercial street directories, the Health Unit's client database, and information provided by local political parties. A professional telemarketing firm, DCI Canada, was contracted to begin telephoning people on the supplied lists, scripts and protocols. All DCI employees involved in the project received four hours of training by the principal investigator.

The database containing the names and telephone numbers of persons assigned to treatment three was transferred to an automated outbound dialling system at the DCI headquarters in Toronto. Calls were placed by a control computer. Once a connection was made it was directed to one of several outbound operators. The operator read from a prepared script that appeared on a computer monitor located immediately in front them. All results were recorded in a database entered directly from an operator computer terminal.

First calls to each person in the database were concentrated on evenings and Saturdays. If there was no answer a second call was placed to all households. A maximum of two attempts were made to contact each person on the list.

Persons assigned to treatment one were asked if they would complete a short survey "on smoking" being conducted by the Windsor-Essex County Health Unit. Only smokers and former smokers at least 18 years old were eligible for inclusion. The primary purpose of the script was to ask smokers and ex-smokers if they would like to receive a copy of new quit smoking program designed for smokers "just like you" being offered through the Windsor-Essex County Health Unit. No reference was made to the program being suitable

for smokers at different levels of readiness to quit smoking. Rather it emphasized generic attributes such as helping the user to weigh the costs and benefits of quitting, preparing mentally and physically to stop smoking and dealing with urges to start smoking again. The description provided was similar to the brochure included in treatment group one. Data pertaining to the respondent's stage of change was collected but was not used to differentiate the message delivered to the respondent. Smokers were asked how confident they were that they could quit smoking while former smokers were asked how confident they were that they could remain smoke free. Persons that registered for a quit smoking program were asked to indicate their gender and age. The full script and the response algorithm is provided in Appendix C. If the designated person from the contact list had never smoked, or if they could not be contacted after a call back, the operator asked to speak to another adult smoker or former smoker in the household; however, only persons designated on the recruitment list that registered in the program were included in the analysis.

Treatment 4 - Stage Based Telemarketing Only. Residents assigned to treatment four underwent a protocol identical to that described for treatment three, except that the information on the respondent's stage of change was used to select one of three final questions inviting them to enrol in a quit smoking program. Each script only emphasized a message pertinent to the respondent's stage of change. For example, instead of inviting respondents to enrol in a short, easy to read program designed for persons "just like you", the operator invited precontemplators to enrol in a short easy to read program that understands that "its your choice whether or not you smoke" and provided help on how to deal with people who nag you to quit. The message aimed at smokers in contemplation or preparation

identified the program as being for people like you who are thinking about quitting. It emphasized building confidence and the development of a plan for quitting. Finally, former smokers in action or maintenance were invited to enrol in a program that was designed for people who wanted to "stay smoke free for good". Emphasis was placed on the development of coping skills and how to deal with slips and temptations.

Treatment 5 - Mass Media Only. Residents assigned to treatment group five were not sent anything by mail and did not receive a telephone call. Rather, their only means of receiving a campaign message was through a mass media campaign.

The media campaign consisted of three related components: television and radio spots as well as newspaper print ads. Each medium simultaneously ran three independent messages aimed at three groups: smokers who like smoking and do not want to quit; smokers who are thinking about quitting; and ex-smokers who want to remain smoke free.

Print ads were placed in the *Windsor Star*, the only local daily newspaper in the region with an estimated daily circulation of 86,048 (Nadbank 1993). It has been estimated that over 80 per cent of households in the provincial ridings targeted receive the *Star* daily while another 5 per cent receive it only on Saturday. One 6 column by 30 line advertisement (approximately 7 inches wide by 4.25 inches long) corresponding to each of the three themes was inserted in the front section of the newspaper on Mondays, Wednesdays and Fridays between March 18 and March 29, 1996. Hence each of the three advertisements appeared twice. In addition, one 6 column by 76 line advertisement for each of the three themes appeared in each edition on Saturday March 23 and Saturday, March 30, 1996. All insertions were in black and white and placed at the discretion of the editor. The first

section of the newspaper carries prime local, national and international news stories. This section was selected because it receives the highest readership (Nadbank 1996).

One 60 second radio spot was produced to correspond to each of the three message themes (smokers who like smoking; smokers who are thinking about quitting, ex-smokers who want to remain smoke free). Each of the three spots alternated each weekday between 6 am and 10 am and again between 3 pm to 7 pm on four local radio stations. The four radio stations selected included FM-CIMX, an alternative music station geared toward adults between ages 18 and 34 with an estimated market share of 6.4 per cent. A total of 39 spots were broadcast on CIMX. A total of 81 spots were broadcast on CKLW, an AM all talk and news station geared towards adults aged 25 to 54. It had an estimated market share of 8.8 per cent. With 6.9 per cent of the market, AM-CKWW plays music hits of the 1940, 1950s and 1960s and is geared toward adults over age 50. Eighty-one spots were broadcast on CKWW. Finally, 81 spots were broadcast on CIDR, an FM station that plays contemporary music geared to adults aged 30 to 45. It had an estimated market share of 6.5 per cent. Based on a two week survey of cumulative market reach conducted by the Bureau of Broadcast Management (BBM) between March 25 and April 7, 1996 it was estimated that 48.9 per cent of residents aged 12 and over in the Windsor-Essex broadcast area were tuned in to one of the radio stations during the period the advertisements were scheduled to run. It was further estimated that listeners heard the advertisements an average of 11.8 times over the two week period they were scheduled to run.

A total of 69 sixty-second spots were also broadcast between March 18 and March 30, 1996 on CBET television, an affiliate of the Canadian Broadcasting Corporation. Once

again, three different spots were produced corresponding to each of the themes previously identified. Each of the spots was alternated throughout the prime time viewing schedule between 5:30 pm and 11:44 pm.. The BBM estimated that the market share for the broadcast period ranged from 3 to 32 per cent with an average audience share of 10.6 per cent.

Treatment 6 - Mass Media + Staged Based Direct Mail. Immediately following the completion of the media campaign described for treatment group five, persons assigned to treatment six were mailed a stage based direct mail package identical to that described for treatment group two.

Treatment 7 - Mass Media + Staged Based Telemarketing. Immediately following the completion of the media campaign, the telemarketers began making calls to persons assigned to treatment seven using the protocol described for group four.

3.5 Program Sponsor

The decision to use the Windsor-Essex County Health Unit as the program and campaign sponsor (for all conditions) was based on evidence that diffusion can be enhanced through the use of sources that are credible and well known to the target audience (Bandura 1986; Cohen 1984; Schiffman and Kanuk 1991; Stone 1989). An August, 1993 survey of 1100 Windsor-Essex County adults indicated that 89 per cent of respondents had previously heard of the Health Unit and 82 per cent were able to identify it as a community health agency accountable to the provincial and/or municipal government. Perhaps most significantly, 77 percent saw the Health Unit as a credible or highly credible source of information on smoking. Relative to the other options provided, including non-government

agencies and worksites, only physicians received a higher credibility rating than the Health Unit (McDonald unpublished).

3.6 Outcome and Process Measures

There were three major outcomes of interest in the present study: recruitment rate, recruitment efficiency rate and cost effectiveness. Since most studies to date have not attempted to discriminate between smokers and ex-smokers, to facilitate comparison with the broader literature each of the outcomes were separately calculated for smokers only, as well as smokers plus ex-smokers. As shown in equations 3.1 to 3.4, the numerator for recruitment rate and efficiency rate calculations was simply the number of smokers or the number of smokers plus ex-smokers who are named in each treatment group and who order smoking cessation materials either by mail (order card), outbound telemarketing, or inbound telephone request. For the direct mail conditions, only orders received within 31 days of the recruitment packages being put in the mail were counted. For the persons contacted through telemarketing, only requests received within 30 days of the beginning of the telemarketing campaign were included in the analysis. For the media only treatment group, orders received within 30 days of the start of the media campaign were included in the analysis.

For recruitment rates involving smokers only, the denominator for each treatment group was calculated by multiplying the number of names on the database for each treatment by the estimated prevalence of smokers for Essex County as reported in the 1990 Ontario Health Survey (Ontario Ministry of Health 1991). To estimate the denominator involving smokers plus ex-smokers, the number of names in the treatment group multiplied

by the estimated number of ex-smokers reported in the 1990 Ontario Health Survey (Ontario

$$(3.1)\ \text{Recruitment rate for smokers}_{(\text{treatment } i)} = \frac{es_i}{(n_i)(ps)}$$

$$(3.2)\ \text{Recruitment rate for smokers plus ex-smokers}_{(\text{treatment } i)} = \frac{es_i + ef_i}{n_i\,(ps + pf)}$$

$$(3.3)\ \text{Recruitment efficiency rate for smokers}_{(\text{treatment } i)} = \frac{es_i}{(n_i)\,(pr_i)\,(ps)}$$

$$(3.4)\ \text{Recruitment efficiency rate for smokers plus ex-smokers}_{(\text{treatment } i)} = \frac{es_i + ef_i}{(n_i)(pr_i)(ps + pf)}$$

Where: es_i = number of current smokers assigned to group i that enrolled to receive a smoking cessation program;

ef_i = number of former smokers assigned to group i that enrolled to receive a smoking cessation program;

n_i = number of persons assigned to treatment group i;

ps = estimated proportion of adults who currently smoke;

pf = estimated proportion of adults who are former smokers

pr_i = estimated proportion of adults who received the message targeted at group i.

Ministry of Health 1991) were added to the estimated number of smokers. The estimated number of smokers and smokers plus ex-smokers assigned to each group is given in Table 3.1.

In order to estimate recruitment efficiency it was necessary to divide the number of smokers and smokers plus ex-smokers who registered from each treatment group by an

estimate of the number of smokers and smokers plus ex-smokers in each treatment condition who received the intended message. While it is relatively simple to determine the number of persons who received telemarketing messages, it is more problematic for conditions involving mass media and direct mail. For example, mere delivery of the material to the target address did not guarantee that the intended recipient actually received or read the mail package. For mass media recipients, there was no direct way to determine how many actually read the newspaper advertisements or heard the electronic spots. While a market analysis is available for each type of media, it is not possible to estimate the accumulated exposure to the recruitment messages across the various media channels (e.g., radio, television and newspaper).

Flay and Cook (1989) have suggested that one way to assess whether individuals have received a campaign message is to conduct a survey of the target audience and ask whether respondents can recall the message. However, in order to permit equivalent comparisons it was necessary to estimate recall using a similar method for all treatment groups, including those involving telemarketing . Therefore, a random sample of adults assigned to each of the seven treatment groups was surveyed by telephone using the scripts in Appendix F. Persons assigned to one of the direct mail conditions (groups 1, 2, or 6) were surveyed within 10 to 14 days after the estimated delivery date of the packages. Persons assigned to treatment group 5 (media only), were surveyed 10 to 15 days after the end of the media campaign. Persons assigned to treatments involving telemarketing (groups 3,4, or 7) were surveyed 12 to 20 days after the estimated midpoint of the telemarketing campaign. Since the post media telephone survey may have inadvertently acted as a kind of supplemental promotional

intervention prompting some persons to register that may not otherwise have done so, individuals who completed the survey and who registered in the program after the onset of the survey were excluded from the analysis.

Respondents assigned to treatment groups 1 (generic direct mail), and 2 (staged based direct mail), were asked:

> Over the past month, the Windsor-Essex County Health Unit sent you a package in the mail describing a new program for smokers and ex-smokers. It contained a letter from the Medical Officer of Health, a couple of small postage paid cards and one or more blue, red and white pamphlets that described the program. Do you remember receiving or reading at least some of this mail package, yes or no?

Respondents assigned to treatment groups 3 and 4 received the following question:

> Over the past month the Windsor-Essex County Health Unit conducted a telephone survey of Windsor smokers and ex-smokers. It consisted of between five and 10 questions. Part of the survey described a new program for smokers and ex-smokers that is available through the mail from the Health Unit. Do you recall whether you participated in this survey, yes or no?

Respondents assigned to treatment group 5 received the following question:

> Over the past month the Windsor-Essex County Health Unit ran a series of television, radio, and newspaper ads about a new program called One Step at a Time. The advertisements were directed at three types of smokers: those who enjoy smoking and don't want to quit; smokers who are thinking about quitting, and former smokers who want to stay smoke free. In some of the radio and TV ads a researcher asks a group of smokers what kind of quit smoking program they would like. In a second ad, two smokers outside in the cold talk about quitting smoking. The third ad is about a woman at work who is struggling to stay smoke free. Do you remember seeing or hearing one or more of these advertisements on radio, television or in the Windsor Star within the past month, yes or no?

Respondents in treatment 6 (mass media plus direct mail) were asked both of the questions assigned to groups 2 and 5 while respondents in treatment group 7 (media plus telemarketing) were asked both of the recall questions assigned to groups 4 and 5.

Respondents in treatments 6 and 7 were deemed to have received the message if they answered yes to at least one of the recall questions. In all cases respondents who were unsure whether they received a mail package or were exposed to the media campaign were coded negatively.

Since this represents an estimate of aided recall it is possible that some respondents may have answered affirmatively even when they had not actually received the intended message. To gauge the percentage of individuals who may have falsely recalled the intended message, the survey described a non-existent campaign about no-smoking by-laws. To estimate the true recall rate for each treatment group, the percentage of people answering that they recalled the false package/campaign was subtracted from the percentage of people who recalled the real package/campaigns.

By using the adjusted recall rate as an estimate of the number of persons in a treatment group who received the intended message it was possible to calculate recruitment efficiency rates. The recruitment efficiency rate for smokers was estimated by dividing the number of smokers from each respective treatment group who registered for a smoking cessation program divided by the estimated number of smokers in the treatment multiplied by the adjusted recall rate from the appropriate post treatment survey. Efficiency rates for smokers plus ex-smokers was calculated in a similar way.

To examine the relationship between treatment condition and stage of change, stage and treatment specific recruitment rates were calculated as follows:

(3.5) Recruitment rate for smokers in stage $_i$ and treatment $_j$ = $\frac{e_{ij}}{(P_i)(n_j)}$

Where: e_{ij} = the number of recruits in stage i that received treatment j;

P_i = the proportion of smokers in the target population (i.e., collapsed across treatment) in stage i as estimated by the post campaign survey;

n_j = the estimated number of smokers assigned to treatment j (from Table 3.1)

(3.6) Recruitment rate for ex-smokers in stage $_i$ and treatment $_j$ = $\frac{e_{ij}}{(P_i)(n_j)}$

Where: e_{ij} = the number of recruits in stage i that received treatment j;

P_i = the proportion of ex-smokers in the target population (i.e., collapsed across treatment) in stage i as estimated by the post campaign survey;

n_j = estimated number of ex-smokers assigned to treatment j (from Table 3.1)

Cost effectiveness was calculated by dividing the total number of smokers as well as smokers plus ex-smokers by the total estimated recruitment costs including materials, printing, postage and staff time to receive the program orders. Supplier invoices were used to verify material, printing, and postage costs while time-tracking records from the host agency, the Windsor-Essex County Health Unit, were used to estimate the number of hours spent on the project. Costs for staff time were calculated by multiplying the number of hours times the average job class wage. Benefit costs were calculated by multiplying the total wages by 18 per cent which represented the mean benefit cost per annual wage for the entire sponsoring organization in 1996. Costs associated with research and evaluation, such as the

post media survey, were not included. The costs of developing and providing the smoking cessation programs that were distributed to enrollees were also not included in the present cost effectiveness analysis.

While a comparison of recruitment rates and efficiency can tell us whether the treatments differed in their effectiveness and efficiency, they offer little insight into why these differences might exist. For example, the audience may not have responded to certain messages because they did not understand them or view them as credible. It is therefore useful to measure whether the intended audience understood the message and their attitudes towards it (Flay and Cook, 1989; Patton, 1997). Hence the post media survey of treatment groups included questions to determine if respondents could identify the main point of the messages. Two further questions asked respondents to rate how interesting and well done they thought the campaign was compared to other campaigns they had seen. In order to evaluate the message attributes among treatment groups six and seven it would have been necessary to assess the impact of both the media messages as well as the complementary channel. Therefore, in an effort to reduce the length of the survey and stay within budget, questions on understanding and message attributes were not included.

As previously mentioned, a potential confound in the study design is the fact that some individuals were offered the materials at no cost while others were required to pay a program fee of five dollars. In order to determine the extent to which this differential pricing structure may have impacted on recruitment rates, the post treatment survey asked respondents in each treatment group to indicate the extent to which the cost of the program influenced their decision to enrol or not to enrol in the program. In addition, using a five

point Likert scale ranging from highly unlikely to highly likely, persons who requested the materials at no cost were asked to indicate how likely it is that they would have ordered the materials if they had cost five dollars.

3.7 Analysis

Since the design is an incomplete (unbalanced) factorial, it was necessary to develop a slightly unorthodox approach to the analysis of the data. Unless otherwise noted, all analyses concerning recruitment rates and recruitment efficiency were calculated in the following ways. To test for a main effect due to the segmentation of messages by stage of change, results from treatment groups two (staged messages by mail) and four (staged messages by telephone) were combined and compared to a combination of groups one (generic messages by mail) and three (generic messages by telephone). Including groups five through seven (all involving staged based media) in this analysis would have introduced a confound since the research design did not include equivalent generic treatment conditions (e.g., generic messages sent by media). For the same reason, statistical tests for interactions between segmentation and channel were limited to groups one through four (inclusive).

To analyse for main effects due to the number of channels used (single or double), a combination of groups two (staged mail), four (staged telephone) and five (staged media) were compared to a combination of groups six (staged media plus mail) and seven (staged messages by media plus telephone). Persons assigned to groups one (generic messages by mail) and three (generic messages by telephone) were excluded because of the lack of suitable treatments that sent generic messages by a combination of two channels.

Since the media treatment utilized staged messages only, all treatments that used generic messages were excluded from any analyses involving a main effect for channel. To avoid a confound with the number of channels employed in a given treatment, analysis searching for main effects due to channel type also excluded treatment groups six and seven. Therefore, an examination of main effects due to channel included groups two (staged mail), four (staged telephone) and five (staged media) only.

To compare the effect of sending messages by mail versus telephone, groups one (generic mail) and two (staged mail) were combined and compared to a combination of groups three (generic telephone) and four (staged telephone). To test the effect of sending messages by mail relative to media, group two (staged mail) was compared to group five (staged media). To examine the effect of sending messages by telephone relative to media messages, treatment group four (staged telephone) was compared to treatment group five (staged media).

Finally, groups two (staged mail), four (staged telephone), five (staged media), six (staged media plus mail) and seven (staged media plus telephone) were used to test for potential interactions between channel type and channel number. Unfortunately, the research design did not permit the examination of a three-way interaction between message segmentation, channel type and the number of channels used.

CHAPTER FOUR

RESULTS

4.1 Characteristics of the Recruits

A total of 27,317 adults from the three Windsor area provincial voters lists were randomly assigned to the seven recruitment conditions. Figures 4.1 to 4.3 show the outcomes for persons assigned to recruitment conditions one, two and six. Figures 4.4 to 4.6 provide details for persons assigned to recruitment conditions three, four and seven.

An examination of Figures 4.1 to 4.3 indicates that an average of 5.6 per cent of the envelopes addressed to persons in one of the three mail treatments (groups 1,2, and 6) were returned to the sender, a proportion that did not differ significantly across the mail treatments, $\chi^2(2) = 3.97,\ p > .100$.

Figures 4.4 to 4.6 show that, on average, the telemarketers were able to contact 40.5 per cent of persons assigned to receive messages by telephone (groups 3, 4, and 7). The proportion of assigned persons who were successfully contacted did not differ across the telemarketing treatments, $\chi^2(2) = 3.59, p > .100$. Moreover, the proportion of smokers and ex-smokers who had quit smoking within the previous five year period and who were willing to listen to the message was also similar across all telemarketing treatments, $\chi^2(2) = 2.22,\ p > .250$.

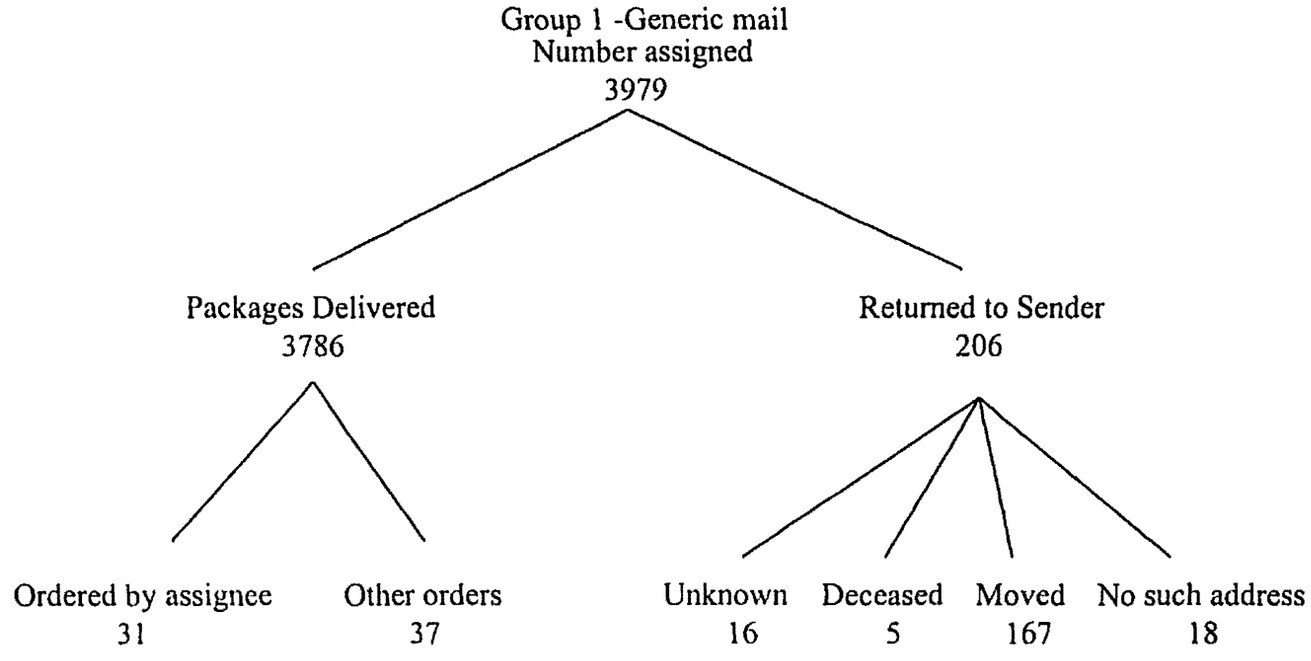


Figure 4.1 Results of attempts to contact and recruit smokers and former smokers assigned to receive generic messages delivered through the mail.

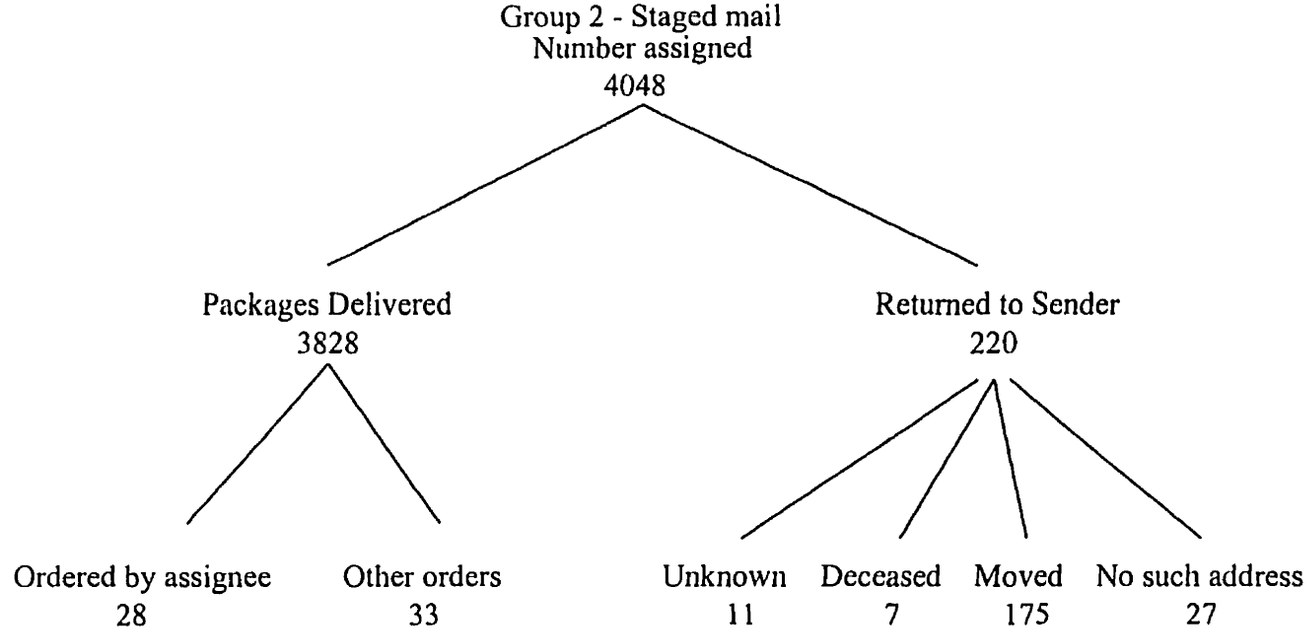


Figure 4.2 Results of attempts to contact and recruit smokers and former smokers assigned to receive staged based messages delivered through the mail.

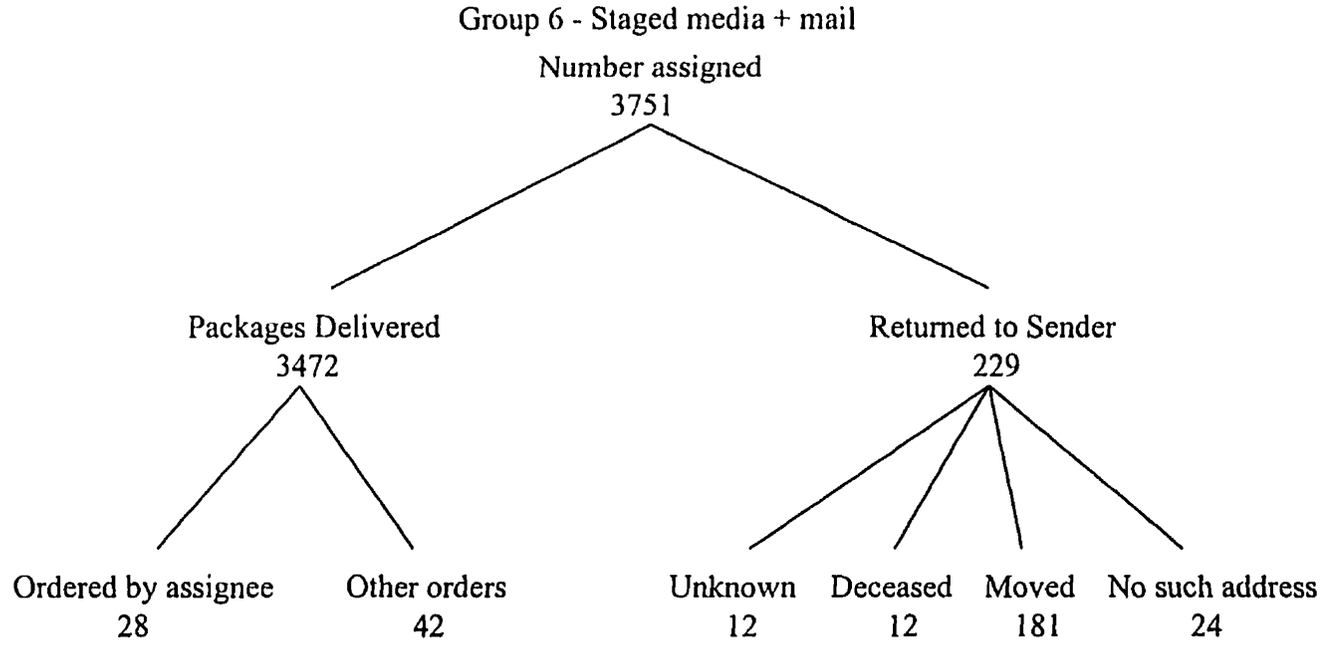


Figure 4.3 Results of attempts to contact and recruit smokers and former smokers assigned to receive staged based messages delivered through the mail and the media.

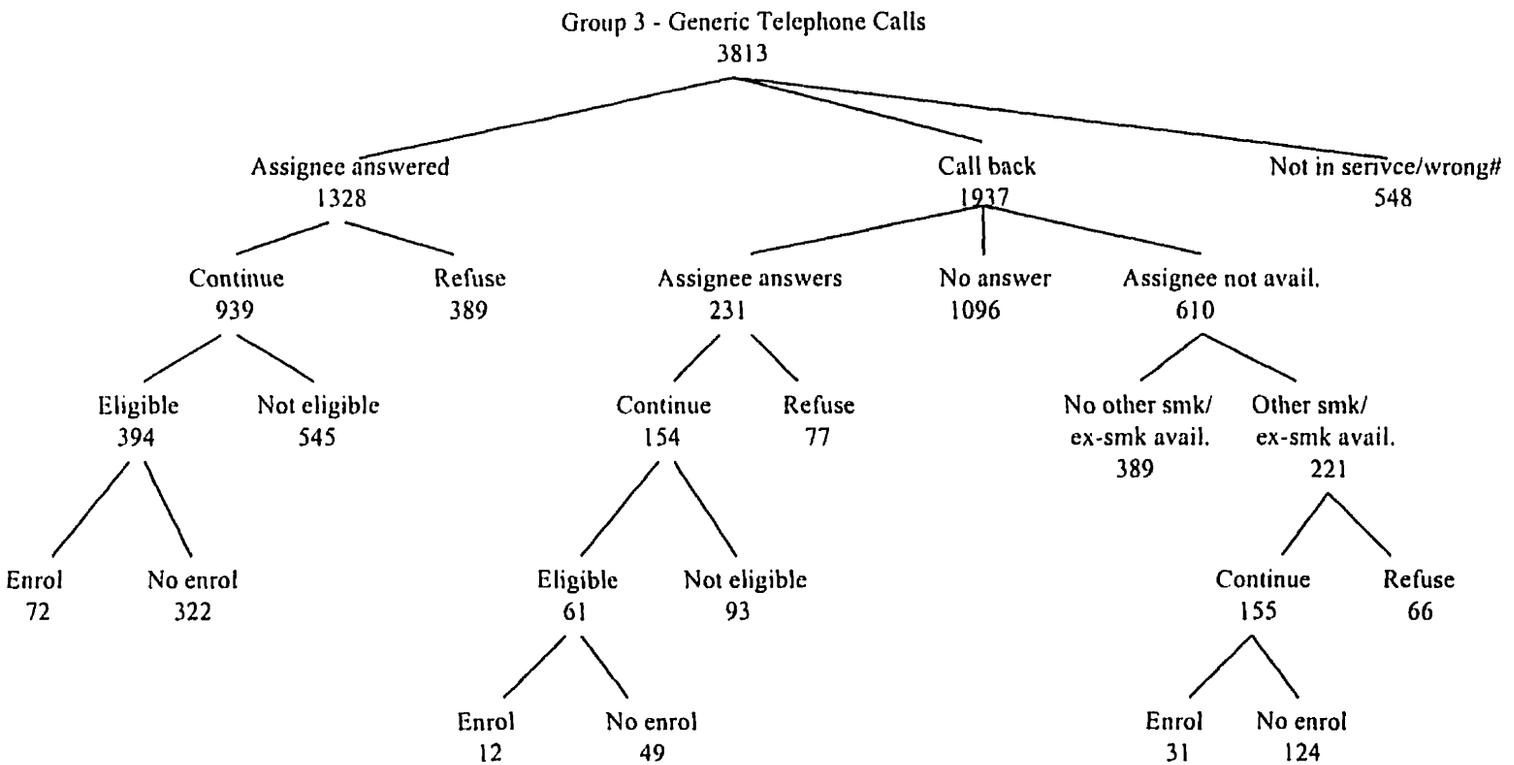


Figure 4.4 Results of attempts to contact and recruit smokers and ex-smokers assigned to receive generic telephone messages. To be "eligible" respondents had to be 18 years old or over and either be a current smoker or had quit smoking within the previous five year period. "Assignee" refers to adults who were assigned to the treatment condition from voters lists.

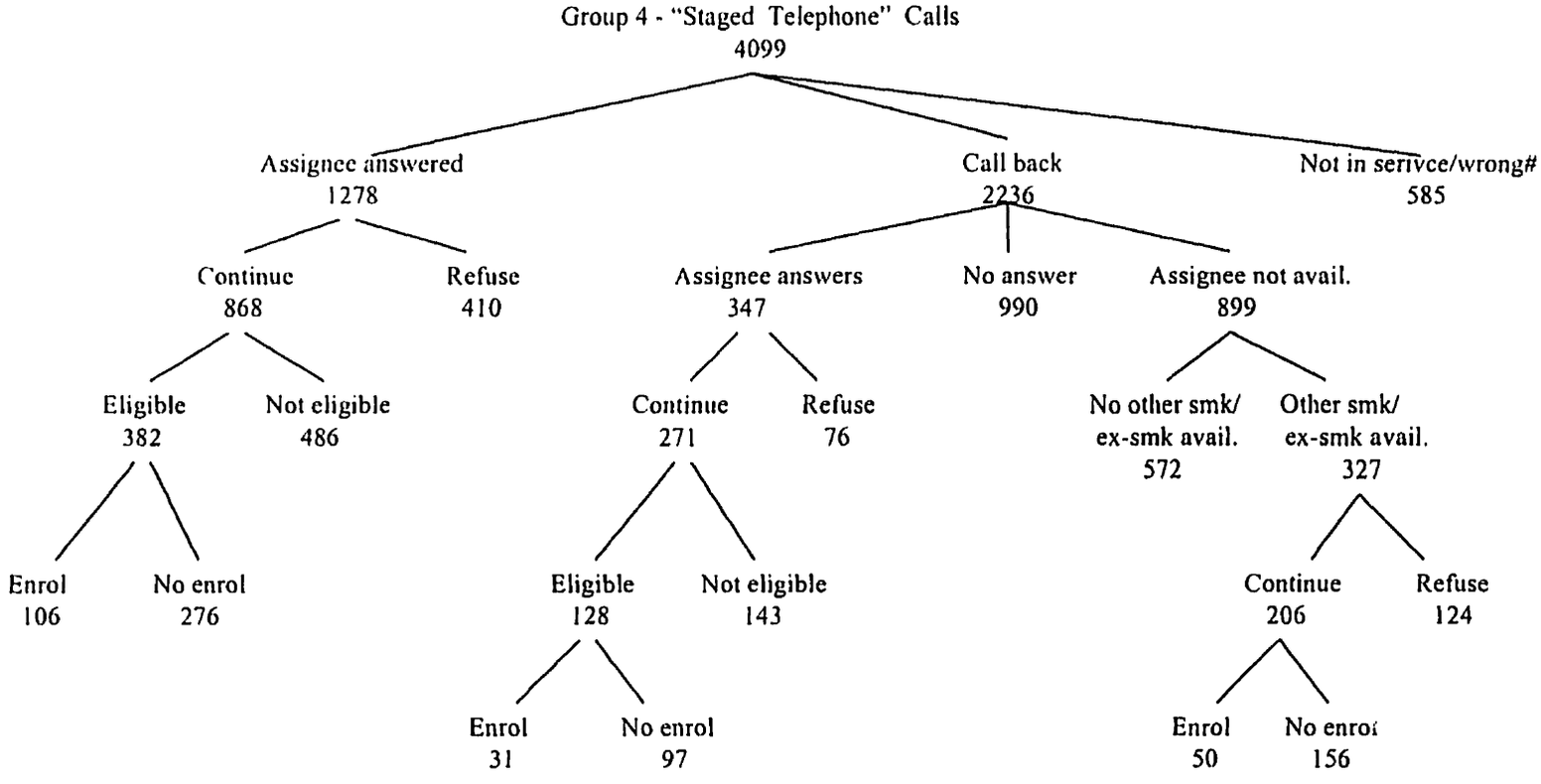


Figure 4.5 Results of attempts to contact and recruit smokers and ex-smokers assigned to receive messages segmented by stage of change and delivered by telephone. To be "eligible" respondents had to be 18 years old or over and either be a current smoker or had quit smoking within the previous five year period. "Assignee" refers to adults who were assigned to the treatment condition from voters lists.

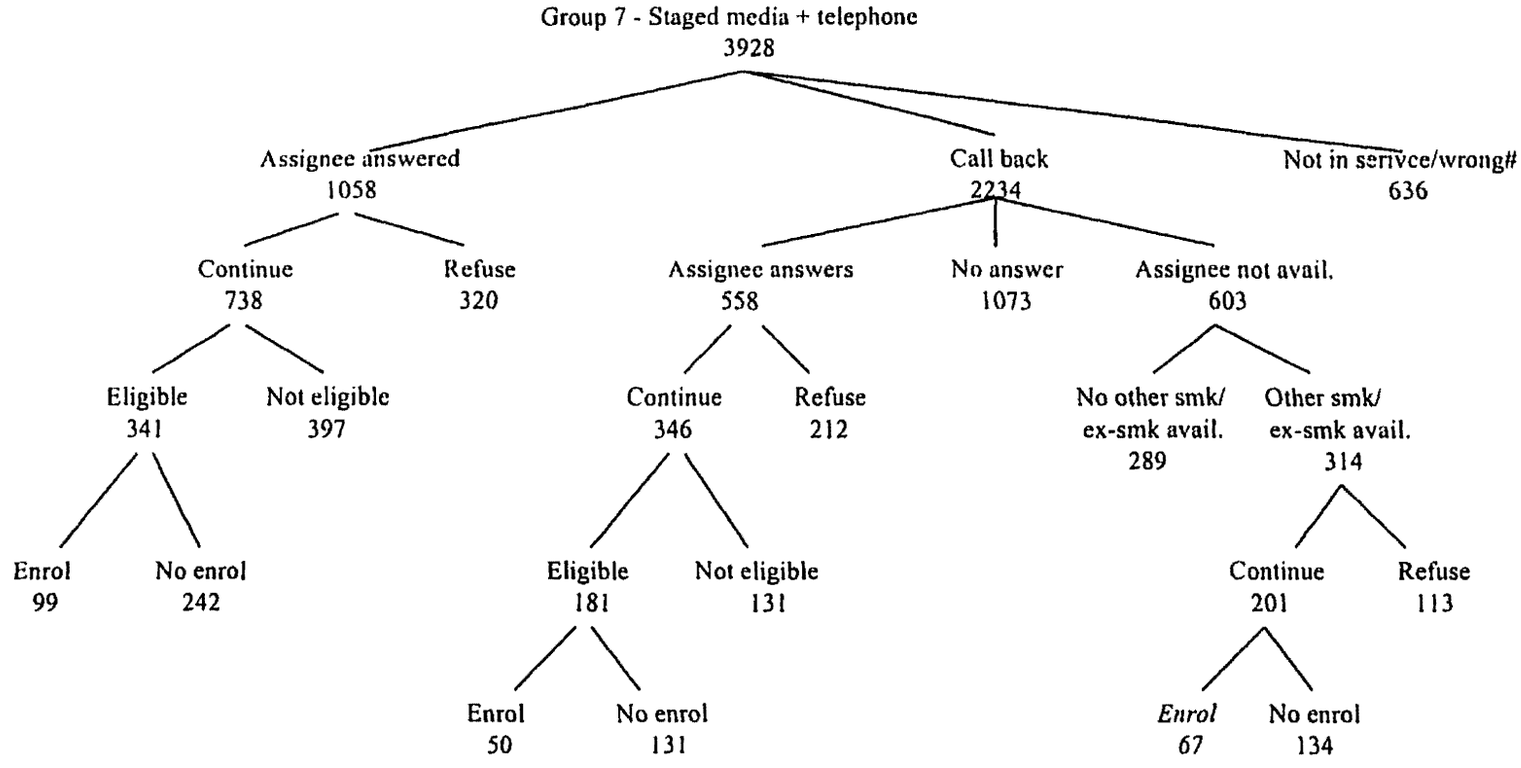


Figure 4.6 Results of attempts to contact and recruit smokers and ex-smokers assigned to receive messages segmented by stage of change through the telephone plus media. To be "eligible" respondents had to be 18 years old or over and either be a current smoker or have quit smoking within the previous five year period. "Assignee" refers to adults who were assigned to the treatment condition from voters lists.

Based on a survey of two week cumulative market reach conducted by the Bureau of Broadcast Management (BBM) between March 25 and April 7, 1996 it was estimated that 48.9 per cent of residents aged 12 and over in the Windsor-Essex broadcast area were tuned in to one of the radio stations during the period the advertisements were scheduled to run. BBM estimated that 26.3 per cent of Windsor areas residents aged 12 and over tuned in, at least once, to the television station broadcasting the ads during the dates and times the ads were aired. Commercial estimates of newspaper reach were not available during the period the advertisements appeared. Moreover, it was not possible to use the BBM data to determine what proportion of residents were exposed to at least one of the media channels or if these exposures differed across the recruitment groups.

A total of 379 smokers and 105 ex-smokers assigned to one of the seven treatment conditions registered to participate in a smoking cessation program. In addition to persons assigned to one of the seven recruitment conditions, another 692 smokers and 205 ex-smokers from the target community were eligible and asked to register in the program. Unless otherwise noted, all analyses concerning recruitment rates and recruitment efficiency were limited to persons assigned to one of the recruitment conditions.

4.1.1 Demographic Characteristics of the Treatment Groups. Recruits (including smokers and ex-smokers) ranged in age from 19 to 84 with a mean of 44.6 years (SD = 13.87). The mean age of registrants did not differ across recruitment conditions ($F_{6,361}$ = 1.74, p = .110). Moreover, recruits' mean age did not differ from the mean age of smokers and former smokers over age 19 for the population of Windsor-Essex County (z = 1.52, p = .063) as estimated in the 1990 Ontario Health Survey (Ontario Ministry of Health, 1991).

Overall, 43.8 per cent of smokers recruited were male, a proportion that did not differ significantly across treatment groups, χ^2 (6) = 3.47, p = .748. However, the proportion of male smokers recruited was significantly less than the estimated 51 per cent of smokers who were male in the target population, z = -2.80, p = .003 (Ontario Ministry of Health, 1991). Overall, 45 per cent of registrants (smokers plus ex-smokers) were male, a proportion that did not differ significantly across treatment groups, χ^2 (6) = 4.16, p = .656. The proportion of male smokers and ex-smokers recruited was significantly less than the estimated 54.1 per cent of smokers and ex-smokers in the target population, z = 10.73 , p= .001.

4.1.2 Efficacy and Outcomes Expectations. A series of three Likert scales with response options that ranged from 1 (not sure at all) to 5 (totally sure) were used to assess (a) smokers' confidence in their ability to quit smoking, (b) ex-smokers' confidence that they would remain smoke free, and (c) the confidence of smokers and former smokers that quitting smoking would improve their life. The mean level of confidence among smokers that they could quit smoking differed significantly across treatment groups, $F_{6,380}$ = 2.15, p =.047. A series of preplanned comparisons indicated that the mean confidence of smokers recruited through generic messages was significantly higher than those recruited through segmented messages, $F_{1,213}$ = 4.00, p = .040. The mean confidence ratings of smokers recruited by mail did not differ from those recruited by mass media, $F_{1,41}$ = 1.68, p = .100. However, the mean confidence rating of smokers recruited by telephone was significantly less than those recruited by either mail, $F_{1,213}$ = 4.62, p < .050, or mass media $F_{1,117}$ = , p < 4.24, p < .050. Finally, the mean confidence ratings of smokers assigned to treatments that utilized a single channel did not differ from those that utilized two channels, $F_{1,261}$ = 1.10, p

= .300.

The mean level of confidence among ex-smokers that they would remain smoke free was 1.03 (SD = .17). The small number of respondents who provided a rating other than 1 (not confident at all) made the use of an asymptotic test inappropriate. However, by treating the responses as a categorical variable and using a non-asymptotic exact test as described by Agresti (1990) results suggested that ex-smokers' confidence scores were not associated with treatment condition, $p < .05$.

The mean confidence rating that "quitting smoking will improve your life" obtained from smokers and ex-smokers was 4.41 (SD = 1.04). However, ratings were not normally distributed; therefore, confidence ratings were treated as a categorical rather than a continuous variable. Since using the original five levels of confidence would have resulted in 60 per cent of cells with expected counts of less than five, confidence ratings were re-coded into three levels by collapsing an original value of one, two or three into a new value of low to moderate confidence, an original rating of four into a level called high confidence, and an original rating of five into a new rating called very high confidence. Results with the re-coded variable suggested that confidence ratings of smokers plus ex-smokers for improvements in their life after quitting were dependent upon recruitment group, $\chi^2(12) = 27.54$, $p = .006$. An inspection of the cross-tabulation cell proportions was used to identify potential recruitment groups that might vary from one another. The inspection and subsequent analysis revealed that recruits' confidence that quitting would help their life did not differ across registrants from treatments involving telephone recruitment (i.e., generic

messages by telephone, staged messages by telephone, staged messages by telephone and media), χ^2 (4) = 4.57, p = .335. Similarly, expectations that quitting would improve recruits' lives did not differ across non-telephone treatments (i.e., generic messages by mail, staged messages by mail, staged messages by media), χ^2 (6) = 6.56, p = .364. However, recruits' confidence that quitting would improve their life differed significantly depending upon whether they were recruited by telephone or not, χ^2 (4) = 18.49, p < .001. For example, among registrants recruited through one of the conditions involving telephone, 24 per cent had low to moderate levels of confidence that quitting would help their life whereas only 6 per cent of registrants recruited through a condition that did not involve telemarketing had low to moderate levels of confidence.

A chi square test of independence was used to examine whether respondents who received a stage based message (e.g., staged telephone and staged mail) might be different from those who received generic messages (generic telephone and generic mail). Results indicated that confidence ratings did not appear to depend upon whether registrants received staged messages or generic messages, χ^2 (2) = 0.20, p = .090.

Finally, a test of independence was used to determine if confidence that life would improve was related to whether recruits were in a condition that used a combination of channels or a single channel to send messages. Confidence ratings were independent of the number of channels used to recruit registrants. The mean age of registrants also did not differ across recruitment conditions, χ^2 (2) = 2.74, p = .110.

A variety of studies have shown that the self efficacy of smokers and ex-smokers is related to their stage of change (DiClemente, 1986; DiClemente, Prochaska & Gibertini,

1985; Prochaska, Crimi, Lapsanski, Martel & Reid, 1982). Therefore, the relationship between recruits' confidence ratings and their stage of change was examined through a series of correlations. Results indicated that the level of confidence of smokers that they could remain smoke free was associated with stage of change, $r = .159, p = .003$. On the other hand, the confidence of ex-smokers that they would remain smoke free was uncorrelated with their stage of change, $r = .082, p = .423$. The level of confidence among all recruits that smoking would improve their life was also uncorrelated to their stage of change, $r = .042, p = .451$.

4.2 Post Campaign Survey

A total of 1250 names from each recruitment condition were randomly selected for the post campaign survey. Overall, 13.9 per cent of telephone numbers of persons designated for contact were either wrong, unavailable, or not in service. There was no answer at a further 26.6 per cent of the numbers. Connections were made at an additional 12.8 per cent of the numbers but the designated contacts were not home on either of the two attempts to reach them. Of the 4087 designated persons who were contacted, 865 (21.2 per cent) declined to complete the survey . Of the 3222 people who agreed to complete the survey, 32.3 per cent were current smokers and 15.1 per cent were former smokers who had quit within the previous five years. Neither the percentage of smokers, $\chi^2 (6) = 5.41, p > .250$, or ex-smokers, $\chi^2 (6) = 10.68, p > .100$ differed significantly across treatment groups.

The proportion of post survey respondents who were current smokers was not significantly different from the adult smoking prevalence rate in the target community as estimated by the Ontario Health Survey, $z = 1.57, p = .058$ (Ontario Ministry of Health,

1991). The proportion of former smokers in the post campaign survey was 2.6 per cent lower than the prevalence estimated by the Ontario Health Survey. Although this difference was statistically significant, $z = 2.03$, $p = .022$, caution should be used in drawing conclusions since, unlike the post campaign survey that was limited to former smokers who had quit in the previous five years, the Ontario Health Survey included all former smokers.

Fifty-four per cent of survey respondents were female, a significantly greater proportion than was estimated to be in the target population of smokers and ex-smokers, $z = 6.353$, $p < .001$ (Ontario Ministry of Health, 1991).

The proportion of survey respondents in each stage of change is shown in Table 4.1. Compared with one of the few recent Canadian telephone surveys to assess stage of change in a general adult population (Health Canada, 1995), a greater proportion of post campaign respondents were in contemplation while significantly fewer were in preparation. The proportion of former smokers in action and maintenance appear to be similar across surveys. However, it should be noted that the Health Canada survey included all former smokers while the post campaign survey in the present study was limited to adults who had quit smoking within the previous five year period. Therefore, it is possible that the post campaign survey has a slightly greater proportion of former smokers in the action stage than would be expected.

The proportion of smokers and ex-smokers from the post campaign survey who were in each stage of change did not depend on the gender of the respondent, $\chi^2(6) = 11.66$, $p > .050$ or what treatment group they were assigned to, $\chi^2(24) = 36.22$, $p > .050$.

TABLE 4.1

Proportion of post campaign survey respondents in each stage of change compared to results from a Health Canada (1995) random telephone survey conducted with 8170 Canadian smokers and former smokers aged 15 and over.

Stage of Change	Per cent of Respondents Post Campaign[1]	Health Canada[1]	z	p
Smokers	*(n = 1041)*	*(n = 3840)*		
Precontemplation	51.6	54.0	1.38	.083
Contemplation	39.4	34.0	3.23	.001
Preparation	9.0	12.0	2.70	.004
Ex-smokers	*(n = 485)*	*(n = 4330)*		
Action	11.8	11.3	0.33	.374
Maintenance[2]	88.2	88.7	0.33	.374

Notes:

1. The post campaign survey was conducted with smokers and ex-smokers 18 years of age and older while the Health Canada survey included smokers and ex-smokers 19 years of age and over.
2. The Health Canada survey included all former smokers while the post campaign survey was limited to former smokers that had quit smoking within the previous five year period.

Overall, 45.4 per cent of survey respondents reported being able to recall receiving the intended message. However, since 2.4 per cent also reported being able to recall a bogus message, the overall adjusted message recall rate was 43.0 out of 100. As shown in Figure 4.7, the percentage of respondents who recalled the messages after adjusting for bogus recall differed significantly across recruitment treatment groups, $\chi^2(6) = 58.99, p < .001$. The odds that a participant was able to recall the message were higher when the message was delivered by mail alone relative to telephone alone (OR = 1.54; 95% CI: 1.19 to 1.99). However, recall rates for staged mail messages did not differ from staged media messages (OR = 1.04; 95% CI: 0.74 to 1.46). Although the recall of staged media messages was slightly higher than staged telephone messages, this difference was not statistically significant (OR = 1.27; 95% CI: 0.88 to 1.85). The recall of staged based messages was also similar to generic messages (OR = 1.13; 95% CI: 0.90 to 1.41). The odds of recall were significantly higher when staged messages were sent through a combination of media and either mail or telephone than through a single strategy alone (OR = 1.46; 95% CI: 1.18 to 1.81).

Respondents in groups one through five who reported being able to recall the intended message were asked to use a five point Likert scale that ranged from 1 (very boring) to 5 (very interesting) to rate how interesting the message was compared to other messages delivered by the same channel. The mean rating of 3.3 varied significantly across treatment groups ($F_{4,425} = 13.53, p = .010$). Post hoc comparisons using Tukey's test of honestly significantly differences indicated that mean interest in staged telephone messages and generic telephone messages did not differ ($p = .561$) but that both had significantly higher

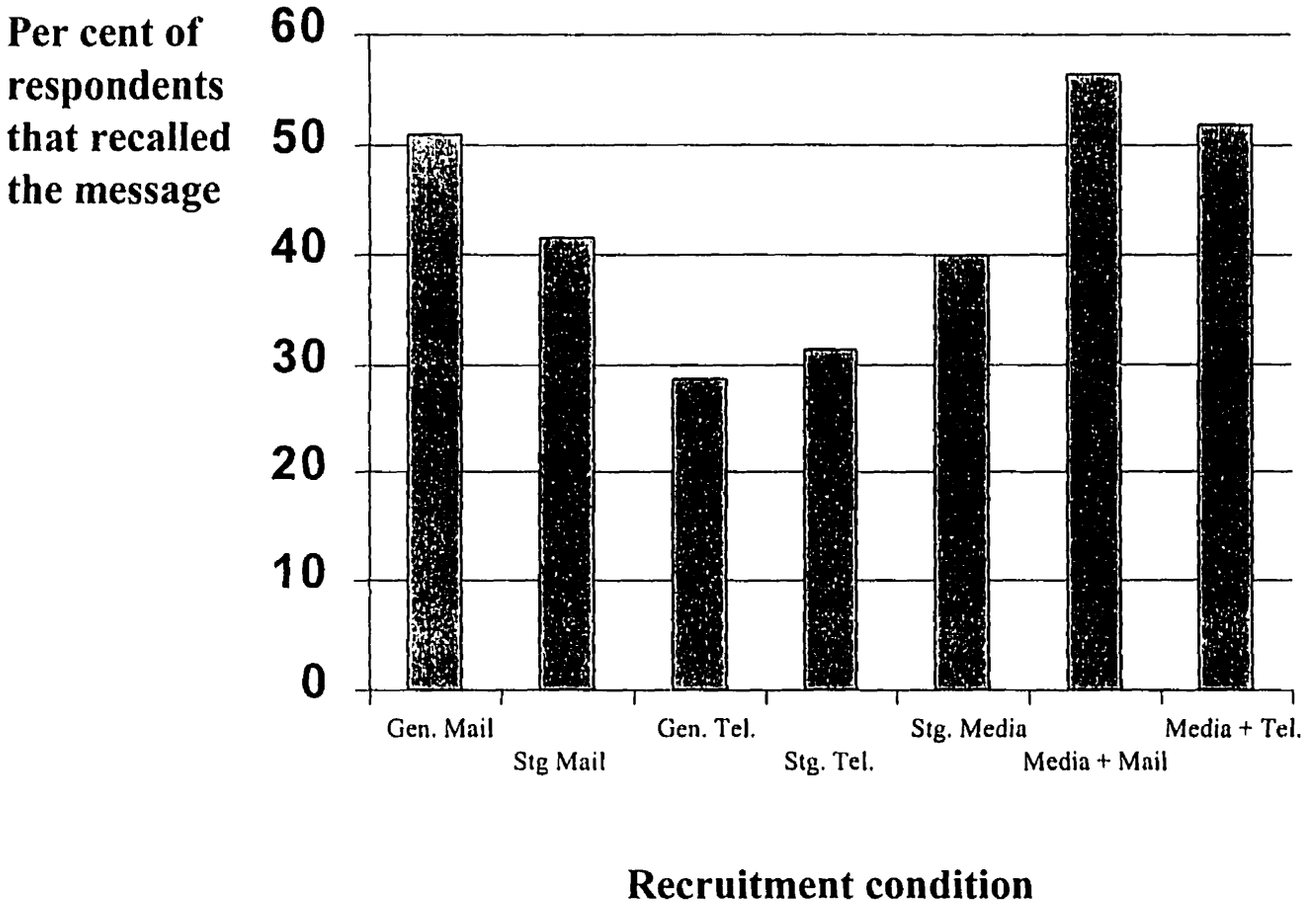


Figure 4.7 Per cent of post campaign survey respondents in each treament group that reported being able to recall the intended message, after adjusting for the recall of bogus messages.

mean interest ratings than media messages or messages delivered by mail (p = .009). Mean interest ratings for media and mail messages did not differ (p =.891).

Using a five point scale that ranged from 1 (very poorly done) to 5 (very well done), respondents from recruitment groups one to five who could recall the intended message were asked to compare the message to other similar campaigns they had heard or seen. The mean rating of 3.08 did not differ significantly across recruitment groups, $F_{4,422} = 3.786$, p = .101.

Of the 696 respondents who recalled the intended messages, 108 reported registering in the quit smoking program. When these registrants were asked, "to what extent did the cost of the program influence your decision to register in it", 51.9 per cent said "not at all", 18.5 per cent said "somewhat", 27.8 per cent said "quite a bit", and 1.9 per cent responded "completely". Because more than 20 per cent of the cells had expected values of less than five, all responses other than "not at all" were recoded into a single response labeled "at least somewhat influenced". Results using this re-coded format suggested that responses were un-related to treatment group, χ^2 (6) = 2.93, p > .250.

Registrants who were in the precontemplation or contemplation stages of change were asked, "how likely is it that you would have registered in the program if the material had cost five dollars instead of being free?" Two of the 57 registrants (3.5 per cent) answering this question said it was very unlikely, 5.3 per cent responded "somewhat unlikely", 15.8 per cent said "somewhat likely", 45.6 per cent responded "very likely", and 28.1 per cent said they "didn't know". Hence, among those with an opinion, 63.8 per cent said that they would very likely have ordered the cessation programs even if it had cost five dollars. 12.2 percent reported they were at least somewhat unlikely to have ordered the

materials if there was a five dollar cost. The distribution of the scores prevented the use of an asymptotic test to examine whether responses were the same for all treatment groups. However, a non-asymptotic exact test suggested that the self reported likelihood of registering in the program was the same across treatment groups, $p > .05$.

The 588 survey respondents who could recall the message but did not register for a quit smoking program were asked "To what extent did the cost of the program influence your decision not to register in it?". Ninety per cent said "not at all", 7.7 per cent responded "somewhat", 1.9 per cent said "quite a bit", and 0.5 per cent said "completely". After combining respondents who answered "quite a bit" and "completely" into a single category, a chi square test of independence revealed that influence ratings were not associated with recruitment group, $\chi^2\,(18) = 18.7584, p > .250$.

4.3 Effect of Treatment on Recruitment Rate

Figure 4.8 shows the estimated proportion of smokers who registered in a smoking cessation program by recruitment condition and sex. Figure 4.9 shows the estimated proportion of smokers plus ex-smokers who registered in a smoking cessation program by recruitment condition and sex. As hypothesized, the recruitment rate for smokers, $\chi^2\,(6) = 191.42, p = .001$, and smokers plus ex-smokers, $\chi^2\,(6) = 255.14, p = .001$, differed significantly across recruitment conditions.

To test the possibility that recruitment rates depended upon both treatment and gender, a multinomial logit analysis was performed using a saturated model (i.e., all interactions and main effects were included in the initial model). Terms in the model included the proportion of estimated smokers targeted who were unsuccessfully recruited,

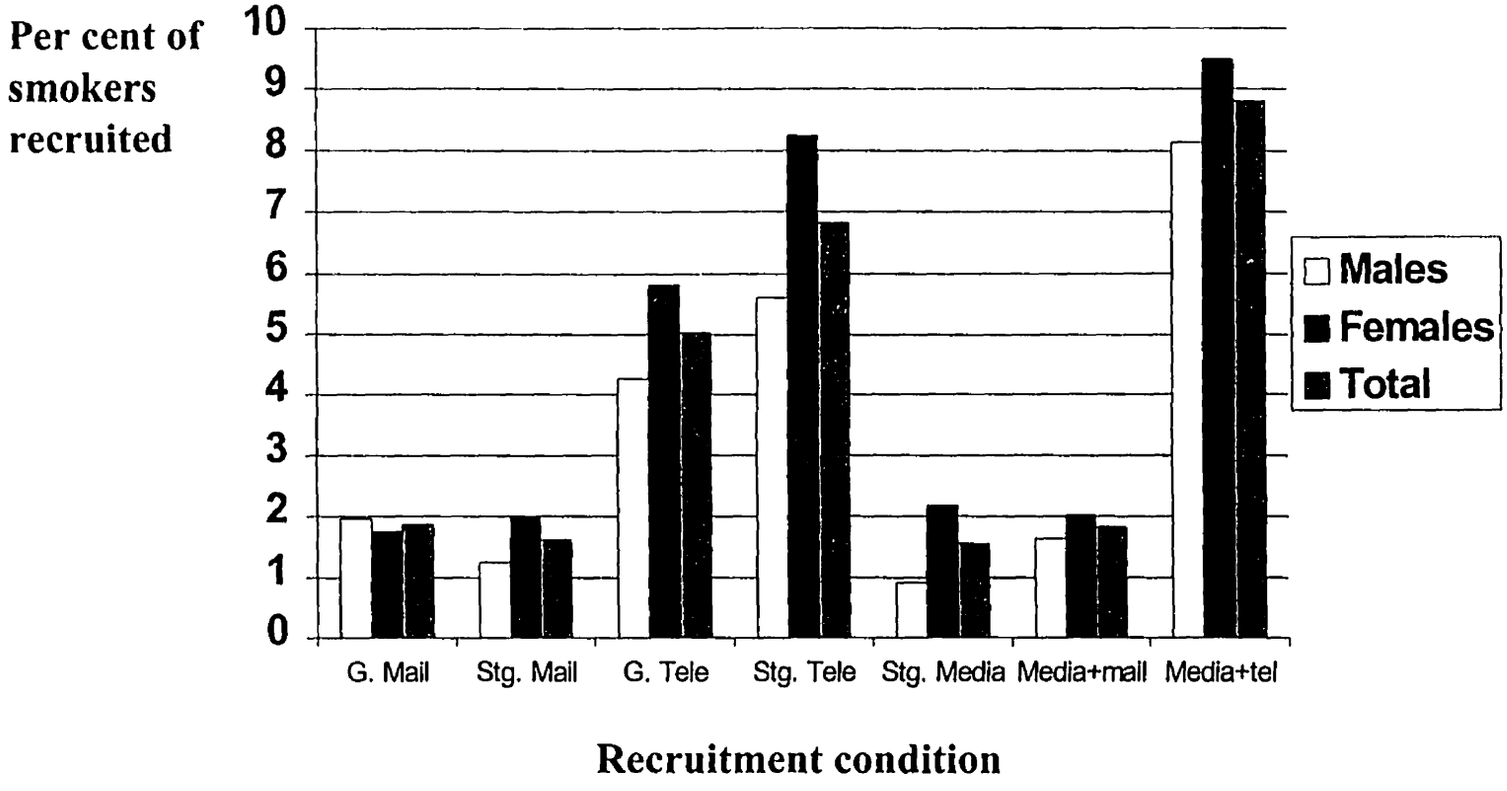


Figure 4.8 Percentage of smokers that registered in a smoking cessation program by recruitment condition and sex.

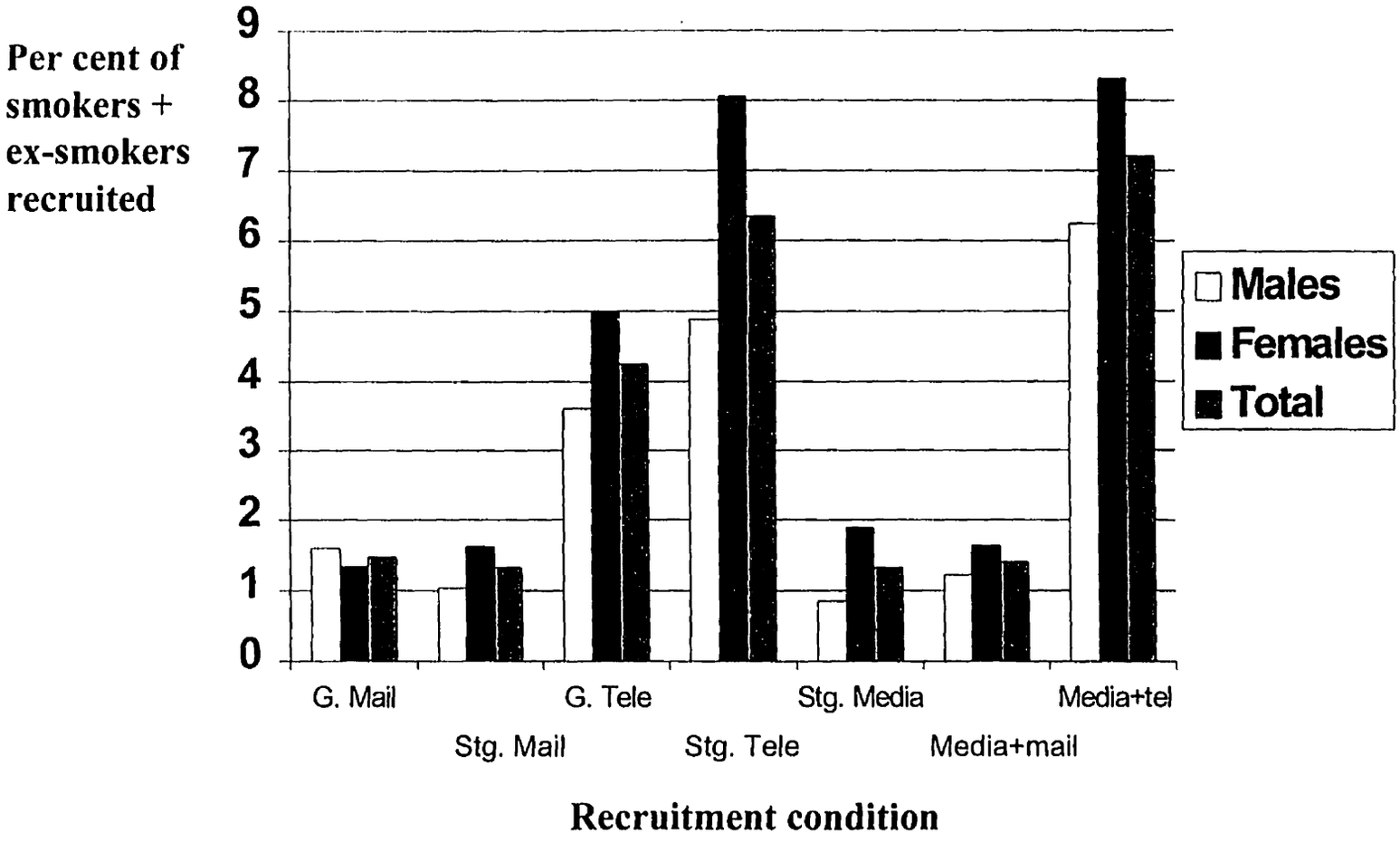


Figure 4.9 Percentage of smokers plus ex-smokers that registered in a smoking cessation program by recruitment condition and sex.

the sex of the target group, and the treatment group. Recruitment failure was entered as the dependent variable. Results, shown in Tables 4.2 and 4.3, suggested that the recruitment of smokers or smokers plus ex-smokers was related to treatment but not gender or a combination of gender and recruitment group.

Table 4.4 shows the odds that smokers were recruited in any treatment group relative to all other treatment conditions. Table 4.5 shows the odds that smokers plus ex-smokers were recruited in a treatment group relative to all other recruitment conditions.

A multinomial logit model was used to examine the effect of channel type (mail or telephone), message segmentation (yes or no) and a potential interaction between channel and segmentation on recruitment. Since only staged based messages were delivered by media, groups five through seven were excluded from the analysis. Results with smokers indicated the presence of main effects for both segmentation (OR = 1.40; 95% CI: 1.02 to 1.92) and channel (OR = 4.42; 95% CI: 2.80 to 6.96). However, the interaction between channel type and message segmentation was not significant (OR = 0.62; 95% CI: 0.33 to 1.19). A similar pattern emerged with attempts to recruit smokers plus ex-smokers. The main effects for segmentation (OR = 1.53; 95% CI: 1.16 to 2.01) and channel type (OR = 5.02; 95% CI: 3.35 to 7.54) were significant but the interaction was not (OR = 0.58; 95% CI = 0.33 to 1.04).

A more detailed review of the odds ratios, however, reveals that, for smokers, segmenting messages by stage of change improved the odds of recruitment when the message was delivered by telephone (OR = 1.40; 95% CI: 1.02 to 1.93), but not by mail (OR = 0.87; 95% CI: 0.57 to 1.76). Similarly, segmentation improved the odds of recruiting

TABLE 4.2

Results of the multinomial logit analysis examining the relationship between recruitment success with smokers, sex of the registrants, and the recruitment treatment group.

Parameter	Odds ratio	Asymptotic 95% CI for the odds ratio	
		Lower	Upper
Recruitment (failure)	11.19	8.58	14.59
Recruit x sex (female)	0.85	0.58	1.22
Recruit x treatment (1)	4.29	2.39	7.69
Recruit x treatment (2)	6.72	3.35	13.46
Recruit x treatment (3)	1.97	1.25	3.13
Recruit x treatment (4)	1.49	0.98	2.24
Recruit x treatment (5)	9.00	3.97	20.49
Recruit x treatment (6)	5.12	2.69	9.78
Recruit x sex x treat. (1)	1.32	0.57	3.10
Recruit x sex x treat. (2)	0.74	0.30	1.82
Recruit x sex x treat. (3)	0.86	0.46	1.58
Recruit x sex x treat. (4)	0.78	0.45	1.36
Recruit x sex x treat. (5)	0.50	0.18	1.38
Recruit x sex x treat. (6)	0.96	0.40	2.32

Note:

Numbers in parentheses refer to the treatment group number.

TABLE 4.3

Results of the multinomial logit analysis examining the relationship between recruitment success with smokers plus ex-smokers, sex of the registrants, and the recruitment treatment group.

Parameter	Odds ratio	Asymptotic 95% CI for the odds ratio	
		Lower	Upper
Recruitment (failure)	14.9	11.70	18.92
Recruit x sex (female)	0.74	0.53	1.03
Recruit x treatment (1)	4.05	2.41	6.82
Recruit x treatment (2)	6.13	3.35	11.25
Recruit x treatment (3)	1.78	1.20	2.66
Recruit x treatment (4)	1.30	0.90	1.86
Recruit x treatment (5)	7.39	3.74	14.59
Recruit x treatment (6)	5.26	2.92	9.49
Recruit x sex x treat. (1)	1.58	0.73	3.46
Recruit x sex x treat. (2)	0.87	0.39	1.95
Recruit x sex x treat. (3)	0.97	0.56	1.67
Recruit x sex x treat. (4)	0.80	0.49	1.28
Recruit x sex x treat. (5)	0.62	0.26	1.46
Recruit x sex x treat. (6)	1.00	0.44	2.25

Note:

Numbers in parentheses refer to the treatment group number.

TABLE 4.4

The odds that smokers were recruited in a given recruitment condition relative to all other recruitment conditions.

	Comparison Treatment						
	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele.
Generic messages by mail vs.	-	1.15 (0.57, 2.31)	0.36* (0.23, 0.57)	0.26* (0.17, 0.40)	1.21 (0.67, 2.18)	1.02 (0.58, 1.79)	0.20* (0.13, 0.31)
Staged messages by mail vs.	0.87 (0.57, 1.76)	-	0.31* (0.19, 0.50)	0.22* (0.14, 0.35)	1.05 (0.57, 1.92)	0.89 (0.50, 1.59)	0.17* (0.11, 0.27)
Generic messages by telephone vs.	2.78* (1.76, 4.39)	3.20* (1.98, 5.17)	-	0.71* (0.52, 0.98)	3.37* (2.03, 5.58)	2.84* (1.77, 4.55)	0.55* (0.41, 0.75)
Staged messages by telephone vs.	3.90* (2.52, 6.05)	4.49* (2.83, 7.11)	1.40* (1.02, 1.93)	-	4.72* (2.90, 7.67)	2.81* (1.79, 4.42)	0.77 (0.58, 1.02)
Staged messages by media vs.	0.82 (0.46, 1.48)	0.71 (0.28, 1.30)	0.30* (0.18, 0.50)	0.21* (0.13, 0.34)	-	0.84 (0.46, 1.53)	0.16* (0.10, 0.26)
Stg. messages by mail + media vs.	0.98 (0.56, 1.72)	1.13 (0.63, 2.01)	0.35* (0.22, 0.56)	0.36* (0.23, 0.57)	1.19 (0.65, 2.17)	-	0.19* (0.12, 0.30)
Stg. messages by tele. + media vs.	5.07* (3.30, 7.80)	5.85* (3.72, 9.20)	1.83* (1.35, 2.48)	1.30 (0.99, 1.71)	6.15* (3.81, 9.94)	5.18* (3.32, 8.08)	-

Figures in parentheses denote the 95 per cent confidence interval.
* denotes odds ratios that are significantly different from 1.00.

TABLE 4.5

The odds that smokers plus ex-smokers were recruited in a given recruitment condition relative to all other recruitment conditions.

	Comparison Treatment						
	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele.
Generic messages by mail vs.	-	1.13 (0.68, 1.89)	0.34* (0.22, 0.52)	0.76 (0.51, 1.13)	1.11 (0.66, 1.88)	1.04 (0.62, 1.74)	0.19* (0.13, 0.28)
Staged messaged by mail vs.	0.89 (0.53, 1.49)	-	0.30* (0.19, 0.46)	0.20* (0.13, 0.30)	0.98 (0.57, 1.68)	0.93 (0.55, 1.58)	0.17* (0.11, 0.26)
Generic messages by telephone vs.	2.94* (1.94, 4.46)	3.32* (2.16, 5.11)	-	0.65* (0.49, 0.86)	3.27* (2.10, 5.10)	3.07* (1.99, 4.73)	0.57* (0.43, 0.75)
Staged messages by telephone vs.	4.51* (3.04, 6.69)	5.09* (3.37, 7.68)	1.53* (1.16, 2.02)	-	5.01* (3.28, 7.66)	4.71* (3.12, 7.10)	0.87 (0.68, 1.11)
Staged messages by media vs.	0.90 (0.53, 1.52)	1.02 (0.60, 1.75)	0.31* (0.20, 0.48)	0.20* (0.13, 0.31)	-	0.94 (0.55, 1.61)	0.17* (0.11, 0.26)
Stg. messages by mail + media vs.	0.96 (0.57, 1.61)	1.08 (0.64, 1.83)	0.33* (0.21, 0.51)	0.21* (0.14, 0.32)	1.06 (0.62, 1.81)	-	0.19* (0.13, 0.29)
Stg. messages by tele. + media vs.	5.17* (3.49, 7.65)	5.83* (3.88, 8.77)	1.76* (1.34, 2.31)	1.15 (0.91, 1.46)	5.74* (3.77, 8.75)	5.40* (3.59, 8.12)	-

Figures in parentheses denote the 95 per cent confidence interval.
* denotes odds ratios that differ significantly from 1.00.

smokers plus ex-smokers when messages were delivered by telephone (OR = 1.53; 95% CI: 1.16 to 2.02) but not by mail (OR = 0.89; 95% CI: 0.53 to 1.49). Moreover, the odds of being recruited through stage based messages delivered by mail did not differ from staged messages delivered by media for smokers (OR = 1.05; 95% CI: 0.57 to 1.92) or smokers plus ex-smokers (OR = 0.98; 95% CI: 0.57 to 1.68). However, the odds of smokers being recruited through staged based telephone messages were 4.49 times higher (95% CI: 2.83 to 7.11) than staged based mail messages and 4.72 times higher (95% CI: 2.90 to 7.67) than staged based messages delivered through mass media. Generic messages delivered by telephone were also superior for recruiting smokers relative to generic mail messages (OR 3.2; 95% CI: 1.98 to 5.17). When smokers and ex-smokers are combined, the odds of being recruited through staged based telephone messages are 5.09 times higher (95% CI: 3.37 to 7.68) than staged mail messages and 5.01 times higher (95% CI: 3.28 to 7.66) than staged messages delivered through mass media. Generic messages delivered by telephone are also more effective for recruiting smokers plus ex-smokers than generic mail messages (OR 3.32; 95% CI: 2.16 to 5.11).

A saturated multinomial logit model was used with groups 2, 4, 6 and 7 to examine the relationship between the number of channels and the type of channel. For smokers, the main effect for channel type was significant (OR = 5.10; 95% CI: 3.29 to 7.92) while the main effect for the number of channels approached significance (OR = 1.30; 95% CI: 0.99 to 1.72). The interaction between channel type and the number of channels used was not significant (OR = 0.65; 95% CI: 0.46 to 1.63). For smokers plus ex-smokers, only the main effect for channel type was significant (OR = 5.32; 3.56 to 8.00). Neither the main effect for

the number of strategies (OR = 1.15; 95% CI: 0.90 to 1.46) nor the interaction between channel type and the number of channels employed (OR = 0.94; 95% CI: 0.53 to 1.68) was significant.

Once again, a detailed examination of the odds ratios between treatment provides further enlightenment. For smokers, the odds of being recruited when staged messages were delivered through media followed by mail were not significantly different than staged based messages sent via media (OR = 1.19; 95% CI: 0.65 to 2.17) or mail alone (OR = 1.13; 95% CI: 0.63 to 2.01). The odds of recruiting smokers plus ex-smokers through staged messages delivered through a combination of media and mail was also similar to treatments that utilized staged based media (OR = 1.06; 95% CI: 0.62 to 1.81) or mail (OR = 1.08; 95% CI: 0.64 to 1.83) only. Conversely, the odds of smokers being recruited by staged based messages delivered through a combination of media and telephone were significantly greater than staged messages by media alone (OR = 6.15; 95% CI: 3.81 to 9.94), but not staged messages by telephone alone (OR = 1.30; 95% CI: 0.99 to 1.71). For smokers plus ex-smokers, staged based messages delivered through media plus telephone were advantageous to staged media messages alone (OR = 5.74; 95% CI: 3.77 to 8.75) but not stage messages delivered through telephone alone (OR = 1.15; 95% CI: 0.91 to 1.46).

One of the purposes of segmenting messages and using proactive channels (e.g., telephone) was to increase the likelihood of recruiting smokers who were not already motivated to quit as well as former smokers who were at risk of relapse. Table 4.6 provides the proportion of recruits in each stage of change relative to the proportion of respondents in the post campaign survey. Overall, results collapsed across treatment conditions suggest that

persons in precontemplation and maintenance were under-recruited relative to their distribution in the target population, while a disproportionate number of recruits were in preparation and action. However, a chi square test of independence indicates that the proportion of smokers and ex-smokers in each stage of change depended upon treatment condition $\chi^2(24) = 42.25, p = .012$.

To examine the relationship between treatment condition and stage of change, stage and treatment specific recruitment rates were calculated. Since two treatment conditions (media; media plus mail) were unsuccessful in recruiting any ex-smokers in the maintenance stage, the action and maintenance stages in all treatments were collapsed into a single category.

Table 4.7 shows the recruitment rates obtained for each treatment by stage of change. Results suggest that recruitment rates differed across treatments for each stage of change. To examine the effect of segmenting messages, different channel types, and the number of channel types on recruitment for smokers and ex-smokers in each stage of change, a series of multinomial logit analyses were performed. The results suggested that relative to mail, telephone based recruitment produced that greatest improvement among smokers in precontemplation (OR = 11.11; 95% CI: 3.70 to 25.00) and contemplation (OR = 4.17; 95% CI: 1.92 to 9.09) as well as ex-smokers in action/maintenance (OR = 7.14; 95% CI: 2.78 to 16.67). Conversely, the effect of channel type on smokers in preparation was not statistically significant (OR = 2.00; 95%CI: 0.96 to 4.16). Relative to media, recruitment by telephone was significantly more effective for smokers in precontemplation (OR = 7.13; 95% CI: 2.58 to 19.69), contemplation (OR = 3.33; 95% CI: 1.58 to 7.04) and preparation (OR = 2.79;

TABLE 4.6

Proportion of recruits in each stage of change collapsed across recruitment conditions and compared to the proportion of recruits in the target population as estimated by the post campaign survey.

	Per cent of Recruits	Per cent in Target Population	z	p
Precontemplation	21.3	35.2	5.630	.001
Contemplation	33.0	26.9	2.523	.006
Preparation	24.4	6.2	11.219	.001
Action	18.0	4.5	9.551	.001
Maintenance	3.3	28.0	16.265	.001

TABLE 4.7

Estimated per cent of target group recruited by recruitment treatment and stage of change.

	Treatment Group								
Stage of Change	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele.	χ^2 (d.f.=6)	p
Precontemplation	0.3	0.4	3.5	5.7	0.6	0.8	4.5	83.17	.001
Contemplation	2.0	1.6	4.5	6.7	1.7	2.9	12.2	101.46	.001
Preparation	12.2	10.3	20.7	21.0	7.5	4.6	28.0	38.00	.001
Action/Maint.	0.8	0.8	3.1	6.1	1.1	0.7	4.7	49.10	.001

95% CI: 1.28 to 6.10) as well as ex-smokers in action/maintenance (OR = 4.37; 95% CI: 1.87 to 10.20). The recruitment rates produced by media messages were similar to those produced by messages sent through the mail for smokers in precontemplation (OR = 1.73; 95% CI: 0.46 to 6.46), contemplation (OR = 1.09; 95% CI: 0.41 to 2.93) and preparation (OR = 0.73; 95% CI: 0.29 to 1.85, as well as ex-smokers in action/maintenance (OR = 1.31; 0.40 to 4.32).

Results suggested that segmenting messages by stage of change was only advantageous for smokers in the precontemplation stage (OR = 1.67; 95% CI: 1.01 to 2.77) and ex-smokers in action/maintenance (OR = 1.97; 95% CI: 1.11 to 3.45). Segmenting messages did not produce a statistically significant advantage for recruiting smokers in contemplation (OR = 1.47; 95% CI: 0.85 to 2.50) or preparation (OR = 0.99; 95% CI: 0.55 to 1.89). The interaction between channel type and segmentation was not significant for recruits in any of the stages of change.

Sending messages through a combination of two channels rather than a single channel had a positive effect on the recruitment of smokers in contemplation (OR = 1.81; 95% CI: 1.17 to 2.78) but did not produce an advantage with smokers in precontemplation (OR = 0.75; 95% CI: 0.46 to 1.23), smokers in preparation (OR = 1.33; 95% CI: 0.75 to 2.38) or ex-smokers in action/maintenance (OR = 0.78; 95% CI: 0.46 to 1.27). None of the interactions between the number of channels and channel type was significant for recruits in any of the stages of change.

4.4 Effect of Treatment on Recruitment Efficiency

The proportion of individuals in a target population who were recruited into a given

program is the product of two variables: the proportion of the target group that received the intended message, and how persuasive the message was. The post campaign survey provided one indicator of message receipt: message recall. An indicator of persuasiveness is recruitment efficiency, the percentage of persons in the target audience who received the intended message who were persuaded to register in the quit smoking program being offered.

The numerator to calculate recruitment efficiency in the present study was the number of smokers or smokers plus ex-smokers in a given recruitment condition who enrolled in the quit smoking program. The denominator was calculated by multiplying the proportion of smokers and ex-smokers who reported being able to recall the message for that recruitment condition (after adjusting for recall of the bogus message), times the estimated number of smokers or smokers plus ex-smokers in a given treatment group (c.f., Table 3.1). Results for each recruitment group are shown in Figure 4.10.

To test the possibility that recruitment efficiency depended upon both treatment and gender, a multinomial logit analysis was performed using a saturated model. Terms in the model included the proportion of estimated smokers targeted that were unsuccessfully recruited, the sex of the target group, and the treatment group. Recruitment was entered as the dependent variable. Results suggested that the recruitment of smokers or smokers plus ex-smokers was related to treatment but not gender or a combination of gender and recruitment group.

As expected, a chi square test of proportions from independent samples revealed that recruitment efficiency differed significantly across recruitment conditions for both smokers, $\chi^2(6) = 265.66$, $p < .001$, and ex-smokers plus smokers, $\chi^2(6) = 366.16$, $p < .001$. To

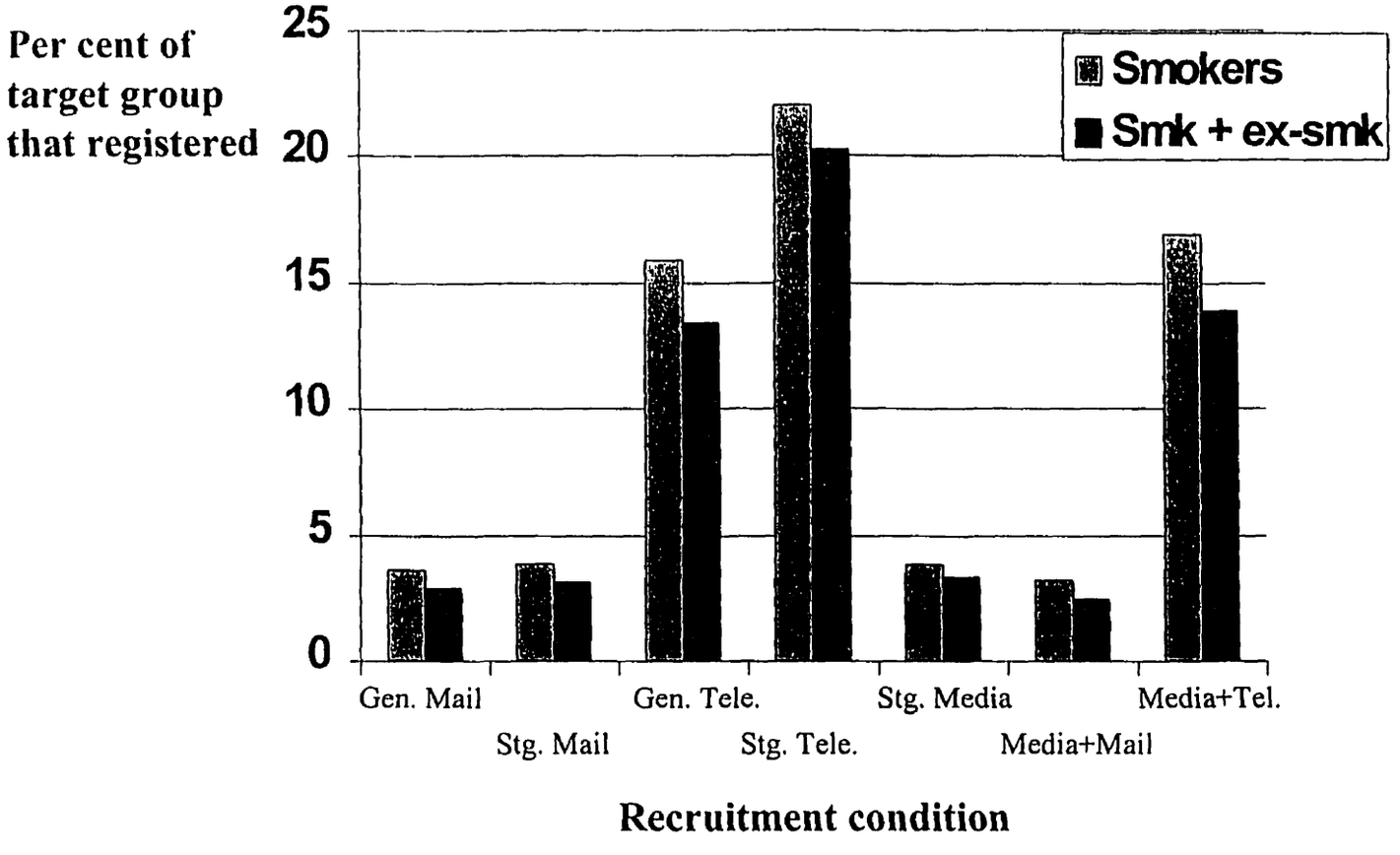


Figure 4.10 Per cent of smokers and smokers plus ex-smokers who received the intended message and registered in a quit smoking program, by recruitment condition.

examine the results in more detail, a series of odds ratios between each combination of treatments was calculated. Results are shown in Tables 4.8 and 4.9.

The hypothesis that segmenting messages based on stage of change would improve recruitment efficiency was only partially supported. Segmented messages based on stage of change and delivered by mail were no more likely to persuade smokers (OR = 1.07; 95% CI: 0.60 to 1.89) or ex-smokers plus smokers (OR = 1.09; 95% CI: 0.65 to 1.83) to enrol in a quit smoking program than generic messages delivered by mail. However, messages segmented by stage of change and delivered by telephone were 1.38 times (95% CI: 1.01 to 1.93) more likely to recruit smokers who could recall the message than generic telephone messages. Similarly, ex-smokers plus smokers who could recall the segmented telephone message were 1.50 times (95% CI: 1.12 to 2.01) more likely to enrol as those who received generic messages by telephone.

Recruitment efficiency varied with the type of channel used to send the message. Staged based messages delivered by telephone were 5.64 times (95% CI: 3.53 to 9.02) more efficient in recruiting smokers and 6.42 times (95% CI: 4.22 to 9.76) more efficient in recruiting smokers plus ex-smokers than staged based mail messages. Similarly, generic messages by telephone were 4.37 times (95% CI: 2.74 to 6.98) more efficient in recruiting smokers and 4.66 times (95% CI: 3.05 to 7.11) more efficient in the recruitment of smokers plus ex-smokers than generic messages delivered by mail. Staged based telephone messages were significantly more efficient in recruiting smokers (OR = 5.69; 95% CI: 3.46 to 9.35) and ex-smokers plus smokers (OR = 6.06; 95% CI: 3.93 to 9.33) than staged based media. However, staged based messages by mail and staged based messages by media did not differ

TABLE 4.8

The estimated odds ratios for all combinations of treatments that a smoker who recalled the intended message would enrol in a smoking cessation program. The 95 per cent confidence intervals are shown in parenthesis below the estimate.

	Comparison treatment						
	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele.
Generic messages by mail vs.	-	0.94 (0.53, 1.66)	0.23* (0.14, 0.39)	0.17* (0.11, 0.27)	0.95 (0.52, 1.72)	1.13 (0.64, 1.99)	0.22* (0.14,0.34)
Staged messages by mail vs.	1.07 (0.60, 1.89)	-	0.24* (0.15, 0.39)	0.18* (0.11, 0.29)	1.01 (0.55, 1.86)	1.20 (0.67, 2.15)	0.23* (0.15, 0.36)
Generic messages by telephone vs.	4.37* (2.74, 6.98)	4.11* (2.52, 6.72)	-	0.71* (0.51, 0.99)	4.14* (2.47, 6.94)	4.94* (3.05, 8.00)	0.94 (0.68, 1.32)
Staged messages by telephone vs.	6.01* (3.84, 9.41)	5.64* (3.52, 9.02)	1.38* (1.01, 1.93)	-	5.69* (3.46, 9.35)	6.79* (4.28,10.77)	1.30 (0.97, 1.74)
Staged messages by media vs.	1.06 (0.58, 1.92)	0.99 (0.54, 1.82)	0.24* (0.14, 0.40)	0.18* (0.11, 0.30)	-	1.19 (0.65, 2.18)	0.23* (0.14, 0.37)
Staged messages by mail+media vs.	0.89 (0.51, 1.56)	0.83 (0.46, 1.49)	0.20* (0.12, 0.32)	0.15* (0.09, 0.24)	0.84 (0.46, 1.54)	-	0.19* (0.12, 0.30)
Staged messages by tele.+media vs.	4.64* (3.00, 7.18)	4.35* (2.75, 6.89)	1.06 (0.77, 1.46)	0.77 (0.58, 1.03)	4.39* (2.70, 7.14)	5.24* (3.34, 8.22)	-

TABLE 4.9

The estimated odds ratios for all combinations of treatments that a smoker or ex-smoker who recalled the intended message would enrol in a smoking cessation program. The 95 per cent confidence intervals are shown in parenthesis below the estimate.

	Comparison treatment						
	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele
Generic messages by mail vs.	-	0.92 (0.55, 1.55)	0.21 (0.14, 0.32)	0.14 (0.09, 0.21)	0.87 (0.51, 1.48)	1.15 (0.67, 1.98)	0.21* (0.14, 0.31)
Staged messages by mail vs.	1.09 (0.65, 1.83)	-	0.23* (0.15, 0.36)	0.16* (0.11, 0.24)	0.94 (0.55, 1.62)	1.26 (0.72, 2.20)	0.23* (0.15, 0.35)
Generic messages by telephone vs.	4.66* (3.05, 7.11)	4.28* (2.76, 6.64)	-	0.67* (0.50, 0.90)	4.40* (2.57, 6.35)	5.37* (3.35, 8.60)	0.97 (0.73, 1.29)
Staged messages by telephone vs.	6.98* (4.67,10.43)	6.42* (4.22, 9.76)	1.50* (1.12, 2.01)	-	6.06* (3.93, 9.33)	8.06* (5.13,12.67)	1.46* (1.14, 1.88)
Staged messages by media vs.	1.15 (0.68, 1.95)	1.06 (0.62, 1.82)	0.25* (0.16, 0.39)	0.17* (0.11, 0.26)	-	1.33 (0.75, 2.35)	0.24* (0.16, 0.37)
Staged messages by mail+media vs.	0.87 (0.50, 1.50)	0.80 (0.46, 1.40)	0.19* (0.12, 0.30)	0.12* (0.08, 0.19)	0.75 (0.42, 1.32)	-	0.18* (0.12, 0.28)
Staged messages by tele.+media vs.	4.80* (3.23, 7.13)	4.41* (2.92, 6.66)	1.03 (0.78, 1.37)	0.69* (0.54, 0.89)	4.16* (2.72, 6.37)	5.53* (3.54, 8.65)	-

in their efficiency for recruiting either smokers (OR = 1.01; .55 to 1.86) or smokers plus ex-smokers (OR = 0.94; 95% CI: 0.55 to 1.62).

Recruitment efficiency was generally unaffected by sending messages through a combination of channels rather than a single channel. Recruitment efficiency with smokers receiving staged based messages by media and mail was the same as those receiving staged messages by mail (OR = 0.83; 95% CI: 0.46 to 1.49) or media (OR = 0.84; 95% CI: 0.46 to 1.53) alone. For smokers plus ex-smokers who could recall receiving the message, the odds of being recruited by a combination of media and mail were similar to mail only (OR = 0.80; 95% CI: 0.46 to 1.40) or media only (OR = 0.75; 95% CI: 0.42 to 1.32). Recruitment efficiency for staged messages sent by both media and telephone were superior to the use of media alone for both smokers (OR = 4.39; 95% CI: 2.70 to 7.14) and ex-smokers plus smokers (OR = 4.16; 95% CI: 2.72 to 6.37). However, the combination of staged based media and mail messages was no more efficient at recruiting smokers than staged based telephone messages alone (OR = .77; 95% CI: 0.58 to 1.03). Moreover, staged based messages sent by media and mail were significantly less efficient in the recruitment of ex-smokers plus smokers (OR = 0.69; 95% CI: 0.54 to 0.89).

The data from the post campaign survey was used to estimate the percentage of smokers and ex-smokers in each treatment from each stage of change who could recall receiving the intended message. Each percentage was then multiplied by the estimated number of smokers and ex-smokers assigned to each treatment (c.f., Table 3.1) to approximate the number of smokers and former smokers in each stage of change in each treatment who could recall the message. The actual number of recruits in each stage of

change from each treatment was then divided by the appropriate estimate to obtain a treatment and stage specific recruitment efficiency rate. The results are shown in Table 4.10. A chi square test for multiple independent samples was used to determine if stage specific recruitment efficiency rates varied across treatment conditions. Recruitment efficiency for smokers and ex-smokers varied as a function of the treatment group they were assigned to (Table 4.10).

For smokers in the precontemplation stage, recruitment efficiency was significantly higher when messages were segmented by stage relative to generic messages (OR = 1.84; 95% CI: 1.10 to 3.08). Similarly, recruitment efficiency was enhanced when messages were sent by telephone relative to media (OR = 9.99; 95% CI: 3.52 to 28.37) or mail (17.19; 95% CI: 6.86 to 43.09). Messages sent by media did not differ significantly from those sent by mail (OR = 1.65; 95% CI: 0.37 to 7.44). Sending messages through a combination of two channels relative to the use of a single channel also did not have a significant effect on the recruitment efficiency rate with precontemplators (OR = 1.38; 95% CI: 0.87 to 2.18).

For smokers in the contemplation stage, there was a slight, but non-significant improvement in recruitment efficiency when messages were segmented by stage relative to generic messages (OR = 1.56; 95% CI: 0.97 to 2.51). Recruitment efficiency among contemplators, however, was enhanced significantly when messages were sent by telephone relative to media (OR = 5.42; 95% CI: 2.46 to 11.96) or mail (4.46; 95% CI: 2.58 to 7.70). Messages sent by media were equally as efficient as those sent by mail (OR = 0.95; 95% CI: 0.35 to 2.57). Sending messages through a combination of two channels relative to the use of a single channel did result in a slight improvement in the recruitment efficiency rate with

TABLE 4.10

Estimated per cent of target group who could recall the message and who enrolled in the quit smoking program, by treatment condition and stage of change

	Treatment Group								
Stage of Change	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele.	χ^2 (d.f.=6)	p
Precontemplation	0.6	1.0	9.5	15.7	1.5	1.3	6.8	124.68	.001
Contemplation	3.4	3.6	12.2	18.6	3.4	5.5	22.3	107.28	.001
Preparation	23.3	25.0	53.4	55.6	15.7	7.4	47.1	56.73	.001
Action/Maint.	1.4	1.7	10.2	16.1	2.7	1.1	8.8	107.61	<.001

contemplators (OR = 1.80; 95% CI: 1.24 to 2.62).

For smokers in the preparation stage, recruitment efficiency was not significantly higher when messages were segmented by stage relative to generic messages (OR = 1.11; 95% CI: 0.65 to 1.90). However, recruitment efficiency was enhanced when messages were sent by telephone relative to media (OR = 3.54; 95% CI: 1.45 to 8.63) or mail (2.26; 95% CI: 1.30 to 3,93). The efficiency of messages sent by media was not significantly different from those sent by mail (OR = 0.63; 95% CI: 0.24 to 1.67). Sending messages through a combination of two channels relative to the use of a single channel also did not have any significant effect on the recruitment efficiency rate with smokers in preparation (OR = 0.87; 95% CI: 0.53 to 1.43).

Among ex-smokers in the precontemplation action/maintenance stage, recruitment efficiency was significantly higher when messages were segmented by stage relative to generic messages (OR = 1.83; 95% CI: 1.29 to 2.59). Similarly, recruitment efficiency was enhanced when messages were sent by telephone relative to media (OR = 5.90 95% CI: 2.45 to 14.23) or mail (8.58; 95% CI: 4.32 to 17.04). As with smokers in all other stages, the recruitment efficiency of messages sent by media did not differ significantly from those sent by mail (OR = 1.65; 95% CI: 0.49 to 5.48). Sending messages through a combination of two channels relative to the use of a single channel also did not have any significant effect on the recruitment efficiency rate with ex-smokers (OR = 0.71; 95% CI: 0.45 to 1.12).

4.5 Cost Efficiency of the Treatments

The cost efficiency of each treatment condition was calculated using two principal methods. First, the total estimated costs to design and deliver the recruitment intervention as

well as register participants was divided by either the number of smokers or smokers plus ex-smokers assigned to a given condition that were recruited. While this method provides an estimate of the average cost of recruiting smokers and ex-smokers assigned to each recruitment condition, it fails to acknowledge that each treatment was capable of recruiting more smokers and ex-smokers than those specifically assigned to the treatment list. For example, although only 26 smokers and ex-smokers assigned to the media condition registered in a smoking cessation program, a total of 680 smokers and ex-smokers registered in a smoking cessation program during the media campaign. Although 26 smokers assigned to the generic mail treatment registered in the program, an additional 30 smokers returned one of the registration cards that was included in the generic mail package. Hence, to understand the true cost efficiency of a recruitment strategy it is necessary to divide the total costs for a given strategy by the total number of adult smokers or smokers plus ex-smokers who registered in the cessation program as a consequence of being directly or indirectly exposed to the strategy.

Tables 4.11 and 4.12 provide the total costs associated with each treatment condition for smokers as well as smokers plus ex-smokers. The total cost to print the brochures, cover letters, registration cards and envelopes used in the treatments that delivered messages by mail was $9,951 (1996 Canadian dollars), including applicable provincial and federal taxes. The costs were distributed across conditions according to the relative number of persons assigned to that condition. For example, a total of 11,778 mail packages were distributed. Therefore, since group one contained 3979 names, 33.8 per cent of the costs to print the envelopes, registration cards and cover letter were charged to group one. Costs to print the

TABLE 4.11

Distribution of costs to recruit smokers, by recruitment group.

Item	Recruitment group						
	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele.
Printing	2271.34	3148.39				2917.39	
Outbound postage	1915.89	1949.11				1806.11	
Inbound postage	12.48	11.04				11.52	
Media					18960.00	18960.00	18960.00
Telemarketing			5370.96	5771.28			5537.76
Personnel							
Receive orders					7929.60	7929.60	7929.60
Graphic design & test	319.02	361.56				361.56	
Media design & test					778.19	778.17	778.17
Tele. script & train			265.85	292.44			292.44
Stuff envelopes	781.77	795.65				735.51	
Total cost	$5300.50	$6265.75	$5636.81	$6063.72	$27,661.77	$32764.35	$33497.97
# Assigned smk. recruited	26	23	67	98	20	24	121
Cost per targeted recruit	$203.86	$272.42	$ 84.13	$ 61.87	$1383.09	$1365.18	$267.84

All amounts are in 1996 Canadian dollars.

TABLE 4.12

Distribution of costs to recruit smokers and ex-smokers, by recruitment group.

Item	Recruitment group						
	Gen. Mail	Stg. Mail	Gen. Tele.	Stg. Tele.	Stg. Media	Media +Mail	Media +Tele.
Printing	2271.34	3986.06				3693.60	
Outbound postage	1915.89	1949.11				1806.11	
Inbound postage	14.93	13.48				13.48	
Media					28440.00	28440.00	28440.00
Telemarketing			5370.96	5771.28			5537.76
Personnel							
Receive orders					7929.60	7929.60	7929.60
Graphic design & test	319.02	425.36				425.36	
Media design & test					1037.56	1037.56	1037.56
Tele. script & train			265.85	319.02			319.02
Stuff envelopes	781.77	795.65				735.51	
Total cost	$5302.95	$7169.66	$5636.81	$6090.30	$37407.16	$44081.22	$43263.94
# Assigned smk. recruited	31	28	85	137	26	28	149
Cost per targeted recruit	$171.06	$256.06	$ 66.37	$ 44.45	$1438.74	$1574.33	$290.36

All amounts are in 1996 Canadian dollars.

brochures were further adjusted to account for the fact that generic mail packages contained a single brochure rather than the three brochures that were included in the staged based packages.

Costs for outbound postage were calculated by multiplying the number of persons assigned to each condition times the price to send a first class letter (e.g., $0.45 plus applicable federal taxes). Inbound postage was calculated by multiplying the number of postage paid registration cards received from a person in a particular treatment condition times the cost of a first class letter.

The total cost of producing and broadcasting or publishing all mass media advertising was $28,440, including applicable federal and provincial taxes. Since it costs the same to reach one group as it does to reach three treatment groups, the analysis of cost efficiency across treatment groups was based on the full cost of the media charged to each group. Since smokers required only two advertisements (aimed at persons in precontemplation and contemplation/preparation), when calculating costs for smokers two thirds of the total media cost was assigned to each media condition.

The total cost to hire the telemarketing firm was $16,680. Similar to the printing costs, telephone costs were apportioned to treatment groups based on the relative number of people assigned to a particular condition. For example, since treatment group three contained 3813 of the 11840 people assigned to receive a telephone call, 32.2 per cent of all telemarketing costs were charged to group three.

One of the disadvantages of using electronic media to broadcast messages was that prospective registrants had to call the sponsor to provide enrollment information. This

necessitated having telephone operators on standby throughout the recruitment period. Costs to register participants responding to media advertisements were based on having three telephone operators on standby at an average wage of $16 per hour plus 18 per cent benefits. Each operator worked an average of 7 hours per day over the four week enrollment period.

Other personnel costs included time to design and formatively test all print materials, media advertisements and telephone scripts. Time was also required to train telemarketers, and stuff materials into the mail packages. The average wage of personnel assigned to these tasks was $22.53 per hour plus 18 per cent benefits. Time sheets were used to determine how long each task took. Costs reflect the fact that treatments using segmented messages required the preparation of three separate messages instead of one.

As shown in Table 4.12, the average costs to recruit targeted smokers plus ex-smokers ranged from a low of $44.45 for staged messages delivered by telephone to a high of $1,574.33 for staged messages delivered by a combination of media and mail. The average cost for recruiting a targeted smoker ranged from $61.87 for staged based messages delivered by telephone to $1,383.09 staged messages delivered by media alone. In general, messages delivered by telephone, whether staged or generic, were considerably more cost efficient for recruiting either smokers or ex-smokers. In contrast, strategies using media were most expensive for recruiting targeted smokers and ex-smokers.

A cost efficiency analysis based on the total number of smokers and ex-smokers recruited, whether or not they were part of a pre-assigned recruitment list, provides a slightly different picture. The total number of people recruited in groups one and two (generic and staged messages delivered through the mail), was determined by including all persons who

returned one of the registration cards sent out as part of each respective campaign, whether or not they had been formally assigned to the condition. Similarly, groups three and four included not only smokers and ex-smokers that were assigned to these conditions, but other smokers and ex-smokers who registered in the program after responding to telephone calls initially directed at members assigned to the condition.

The numerator for the media condition included the total costs to design, focus test, produce, publish and broadcast the messages. The numerator also included the costs of having three telephone operators on standby to receive registration requests. The denominator for the media condition included persons assigned to the condition, as well as all other eligible smokers and non-smokers who responded to the media campaign. This included persons assigned to groups six and seven who responded after the media campaign began but before the follow-up mail or telemarketing campaign began. The number of recruits did not include persons originally assigned to groups one through four who called after the onset of the media campaign since it could be argued that they may not have responded to the media campaign had they not first been exposed to the message delivered through another channel. Since only six people fell into this category, the overall effect of including or excluding them in the analysis is relatively small. Also excluded from the denominator of the treatments involving media were persons under the age of 18 and persons who resided outside the target population of Windsor and Essex County (e.g., Michigan and other Canadian counties).

Since the purpose of groups six and seven was to examine the effect of combining media with either mail or telemarketing, the total number of recruits included assignees and

non-assignees who responded to the principal strategy (i.e., the mail or telephone message) plus persons assigned to the respective condition who enrolled after hearing the media campaign but before the follow-up mail or telephone campaign.

As shown in Figure 4.11, the average cost of recruiting smokers plus ex-smokers using the total number of recruits in the denominator range from a low of $32.57 to a high of $117.54. For smokers, the average recruitment costs range from a low of $43.62 for staged messages delivered by telephone to a high of $125.32 for staged messages delivered by mail.

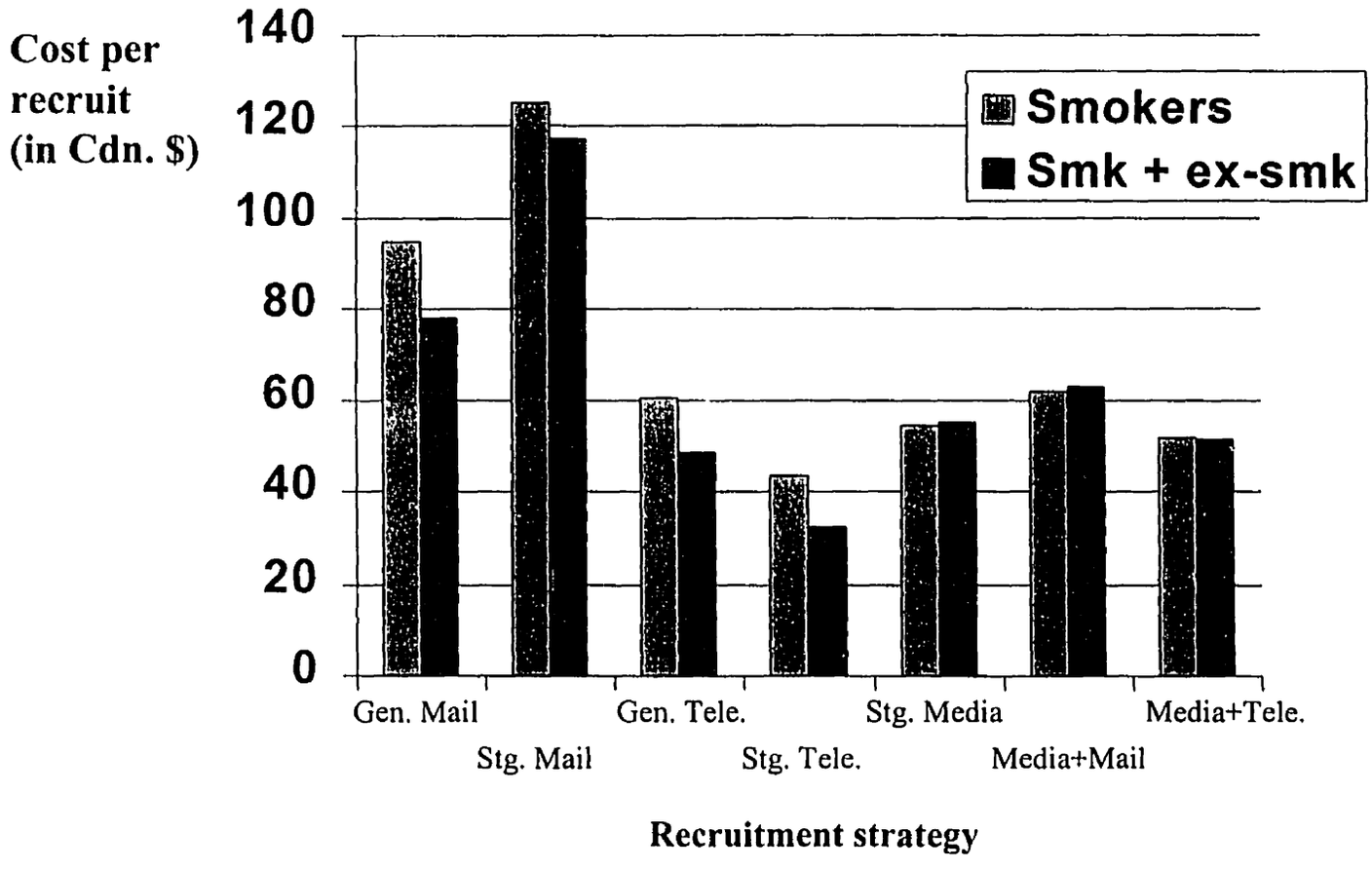


Figure 4.11 Cost efficiency of the strategies employed to recruit smokers as well as smokers plus ex-smokers.

CHAPTER 5

DISCUSSION

5.1 Summary and Interpretation of the Findings

The purpose of this study was to examine whether it is possible to enhance population based recruitment for smoking cessation programs through the segmentation of messages and the selection of channels used to deliver them. Overall, segmented messages delivered by a combination of mass media and telephone produced the highest recruitment rates (8.8 per cent of smokers; 7.21 per cent of smokers plus ex-smokers). Indeed, this condition was 500 per cent more effective than the methods most traditionally employed (e.g., generic mail messages) to recruit smokers into smoking cessation programs. However, the highest recruitment efficiency rate and best cost efficiency were obtained by sending segmented messages through telephone alone. More than one out of every five smokers or recent ex-smokers who could recall receiving a staged telephone message agreed to enrol in the program being offered, at an average recruitment cost of $32.57 each. If the records of the telemarketing firm are used instead of recall data to assess recruitment efficiency (Table 4.5), staged messages delivered by telephone recruited 137 out of the 510 who received the message for a recruitment efficiency rate of 26.9 per cent.

Results from the community trial suggest that, as hypothesized, recruitment rates and recruitment efficiency can be improved by delivering messages designed to appeal to

smokers and former smokers at different stages of change. Overall, segmented messages increased the odds that smokers would be recruited by 40 per cent. For smokers and ex-smokers combined, the relative advantage of segmenting messages was 53 per cent.

The hypothesis that recall would be greater for messages segmented by stage of change was not supported. Adjusted recall rates did not differ according to whether messages were staged or generic. Therefore, if it is assumed that adjusted recall is a valid indicator of reach and comprehension (McGuire, 1989), the results suggest messages segmented by stage of change improved population recruitment for smoking cessation by being more persuasive with the target audience. However, caution should be used in drawing explicit conclusions in this regard since, message recall may be confounded with persuasiveness. For example, a variety of studies have shown that recall may improve as messages become more persuasive (O'Keefe 1990; Perloff 1993).

The largest increases in recruitment from segmenting messages by stage occurred, as hypothesized, among smokers in precontemplation and ex-smokers in action/maintenance. A scan of tobacco cessation programs available in the target community prior to and during the present study suggested that these programs were exclusively aimed at current smokers already motivated and reasonably confident that they could quit. Therefore, treatments that segmented their messages by stage of change appear to have been successful in recruiting a previously neglected group of smokers (Kviz, Crittenden and Warnecke 1992). Although the study did not attempt to collect data to elucidate the reasons why, it is possible that segmented messages were successful with precontemplators because they did not ask smokers to do something they felt they could not do and/or did not want to do (i.e., quit

smoking). Kviz and his associates (1992) found that relative to persons who participate in traditional quit smoking programs, nonparticipants, and especially precontemplators, not only have lower levels of self efficacy about quitting, but also have a much lower desire to quit smoking. On the other hand, formative testing of the messages suggested that providing assistance on how to deal with people who bug you to quit smoking was an extremely attractive feature in the programs being offered. Emphasizing this program attribute in the messages aimed at precontemplators made it more compatible with their perceived needs, a characteristic of successful innovations (Rogers 1995; Zaltman and Duncan 1977).

Segmented messages also had greater appeal to ex-smokers in action or maintenance with low levels of confidence in their ability to remain smoke free. Once again, results of the present study provide no direct data that might help us understand why this might be the case. However, feedback from the formative testing of messages suggested that ex-smokers were put off by programs that contained redundant information such as how to quit smoking. Rather, they valued information specifically related to the significant challenges of how to overcome withdrawal symptoms and resist the temptation to start smoking again. Therefore, by emphasizing these program attributes the messages made it clear that the program being offered was more compatible with their needs (Rogers 1995; Zaltman and Duncan 1977).

Recruitment rates among smokers in preparation are closely related to beliefs that a formal quit smoking program will improve their chances of quitting (Spoth 1992). It must also meet their lifestyle needs (e.g., work schedule, child care, transportation, etc.)(McDonald unpublished; Spoth, 1991). Since the segmented messages aimed at smokers in preparation highlighted the same program attributes as the generic messages

(designed for smokers thinking about quitting, ease of use, inexpensive, delivered through the mail, etc.), the failure to find an advantage for segmented messages with smokers in preparation was predictable.

The finding that message segmentation by stage of change did not improve the recruitment of persons in contemplation was unexpected and the data offers few clues about why this was the case. It should be noted, however, that the small number of contemplators recruited in most of the treatment conditions made the results vulnerable to type II errors. Indeed, with an alpha level of .05, the probability of a type II error exceeded 40 per cent. The results estimate that contemplators were actually 47 per cent more likely to be recruited when messages were segmented relative to generic messages; however, the small proportion of recruits and the small number of contemplators in each treatment result in large confidence intervals.

A close inspection of the results also revealed that segmentation by stage of change was effective for messages sent by telephone, but offered no advantage when messages were sent by mail. This pattern emerged for both recruitment rate and recruitment efficiency among smokers as well as smokers plus ex-smokers.

There are several possible explanations why message segmentation was effective by telephone but not through the mail. The interactive nature of telephone meant that it was possible to assess a respondent's stage of change prior to message delivery. Respondents received only the message appropriate for their stage of change. Conversely, no attempt was made to make an *a priori* assessment of stage of change in members of non-telephone treatments. As a result, it was necessary to simultaneously expose intended adopters to

messages designed for persons at all stages of change. It is possible that the multiple messages created confusion about who the program was for and limited its persuasiveness.

Social judgement theory (Kiesler, Collins and Miller 1969; Sherif, Sherif and Nebergall 1965) may also shed light on why segmented messages did not improve recruitment when messages were delivered by mail, or why they failed to significantly improve the recruitment of persons in the contemplation stage of change. The theory holds that a receiver's reaction to a given persuasive communication will depend on how he or she assesses the point of view it is advocating. This implies that, in reacting to a persuasive message, the receiver must initially come to decide just what position the message is forwarding. Social judgment theory suggests that, in reaching this judgement, the receiver may be subject to perceptual distortions termed "contrast effects." A contrast effect is said to occur when the receiver perceives the message as advocating a position further away (i.e., more discrepant) from his or her own position than it actually does. In the mail campaign, where recipients received messages aimed at smokers across all stages of change, the receiver may have been more likely to infer that the goal of the communication was to get the person to quit smoking. This would have been incompatible with the views of smokers in the precontemplation and contemplation stage. It may also have suggested that the program being offered would be directed toward the process of quitting rather than staying smoke free. Therefore, a contrast may have also occurred with persons in action and/or maintenance.

Since messages delivered by telemarketing were distinct (recipients received only one message instead of three), receivers would have been much less vulnerable to contrast

effects. The exception to this would be among person in contemplation and preparation who received a message designed to appeal to both.

A related explanation for why staged messages did not improve recruitment when delivered by mail is that recipients in this condition may have felt more manipulated than those who received messages by telephone. For example, a consensus panel conducted by the National Research Council (1989) suggested that when an audience's perception differs substantially from that depicted in a communication campaign, the audience is more likely to feel manipulated and therefore, less persuaded by the message. As such, attempting to deliver staged messages by mail without prior knowledge of the recipient's stage of change may not be a valid test of message segmentation by stage of change.

A third explanation for the failure of segmented messages by mail may have related to the fact that the brochures for each stage of change were identical in shape, colour and layout. Recipients may have assumed that they received multiple copies of a single brochure. Therefore, if the brochure they read first did not meet their needs, they may have discarded the entire package without reading the brochure that related to their stage of change.

The finding that recruitment success for staged messages depended upon the channel employed also affected the relative cost efficiencies of the conditions. Since it is more expensive to produce and implement segmented messages, the failure of the staged mail treatment to significantly improve recruitment rates relative to generic mail messages or staged media messages meant that it was also the least cost efficient. Conversely, for messages delivered by telephone, the significant improvement in recruitment rates more than

offset the minor additional costs of segmentation. Therefore, staged messages by telephone were the most cost efficient means of recruiting the intended audience.

Perhaps the most important results in the study were the findings related to channel selection. Both the systematic review and the community study strongly supported the hypothesis that relative to passive communication channels such as direct mail and mass media, pro-active recruitment channels such as telemarketing can significantly improve recruitment rates for both smokers and ex-smokers. Indeed, relative to mail, messages delivered by telephone were more than 4.4 times as likely to recruit smokers and five times more likely to recruit smokers plus ex-smokers. Telemarketing was even more effective than mass media. However, as predicted, both passive recruitment strategies, mass media and direct mail, did not differ in their ability to recruit smokers or ex-smokers.

As expected, the effect of channel on recruitment was related to stage of change, with the largest improvement coming among those at each end of the change process. For example, relative to sending messages by mass media, telemarketing was 2.8 times more effective in recruiting smokers in the preparation stage, 3.3 times more effective for smokers in contemplation and 7.1 times more effective for smokers in precontemplation. Results also confirmed predictions that telemarketing would be significantly more effective than media with ex-smokers (OR = 4.37). Unfortunately, the sample size was insufficient to differentiate between persons in the action and maintenance stages of change.

Results of the present review and community study are consistent with results from other types of programs. For example, in a study conducted more than thirty years ago, Epstein and his associates (1965) found that using the telephone to recruit participants for a

large clinical trial on cardiovascular disease was five times more effective than when invitations to participate were delivered by mail. More than twenty years ago Stahl, Lawrie, Neil and Kelly (1977) reported on the effects of mass mailings, incentives, and face to face contact to encourage community residents to have their blood pressure checked at a local clinic. Results indicated that sending a single letter produced a recruitment rate of 1.7 per cent while sending a follow-up letter to non-responders or offering a gift incentive improved the response rates to 2.3 and 2.7 per cent respectively. In contrast, when a health technician visited households to personally invite community members to have their blood pressure taken recruitment rates jumped to more than 17 per cent. In a more recent study, Selby-Harrington and colleagues (1995) compared the effectiveness of inviting Medicade recipients in rural North Carolina to attend child health screenings. Compared to a no treatment control, sending a pamphlet by mail did not significantly increase the odds that the recipient would attend the screening clinic. However, invitations by telephone increased the odds of attendance by 300 per cent while a home visit increased the likelihood by 417 per cent.

The high recruitment efficiency rates generated by telemarketing made this a relatively cost efficient strategy, particularly for staged based messages. However, it should be noted that it costs more to segment messages by stage of change when they are delivered by media than when they are delivered by telephone. For example, in the present study the additional cost to segment messages sent by telephone, relative to generic messages by telephone was approximately 50 dollars. On the other hand, it cost a minimum of $1600 more to design, formatively test and produce three segmented media messages instead of

one. Therefore, if we assume that segmented messages would have recruited the same number of people as generic messages (as was the case with the messages by mail), then generic messages by media would have been more cost effective than generic messages by telephone. On the other hand, if message segmentation effects recruitment by media the same way that it does by telephone, then generic messages by telephone would be more cost efficient than generic messages by media.

Some of the results from comparing single with double channels to deliver messages were unexpected. As predicted, the combination of mass media and telemarketing to send stage based messages produced the highest overall recruitment rates of any treatment condition (8.8 per cent of smokers and 7.21 per cent of smokers plus ex-smokers). However, the combination of the two passive channels, media and mail, to send staged based messages was no more successful in recruiting smokers or ex-smokers than the use of stage based media or mail messages alone. These latter results are particularly striking when they are compared to the post survey results on message recall and the cost efficiency data. The combination of media and mail produced the highest recall rates of any condition. Moreover, the combination of media and mail was considerably less cost efficient than the use of media alone. Collectively, then, the results suggest that using multiple channels to increase the number of potential adopters that are reached does not necessarily improve recruitment. Indeed, for the same relative expenditure, a program provider would actually be able to recruit more participants using media alone than by using a combination of media and mail. On the other hand, while a combination of media and telemarketing will improve recruitment rates, it is slightly less cost efficient than using telemarketing alone.

At first blush the results appear to be consistent with the notions of both Bandura (1986) and Rogers (1995) who have argued that, in general, the diffusion of an innovation can be maximized by using a combination of mass media and interpersonal communication channels. Specifically, they have suggested that mass media is more effective in engaging early adopters who require relatively little persuasion. On the other hand, the majority of the population require more intensive and persuasive forms of communication in order to adopt an innovation. Therefore, media plus the interpersonal testimonies of the early adopters will lead to uptake by the early majority, who in turn will collectively influence the late majority.

A 1984 study provides some empirical support that diffusion theory is applicable to participation in smoking cessation programs. Using an ABAB design, Ossip-Klein and her colleagues used either interpersonal contact alone or interpersonal contact plus media to promote a telephone support line for smokers and ex-smokers in Rochester, New York. Results showed that interpersonal contact alone initially had little effect. However, when media was added, the number of calls increased significantly. Moreover, when the media was discontinued, the number of calls received during the second interpersonal phase was significantly higher than the first interpersonal phase.

Diffusion theory proposes that early adopters act as the initial interpersonal conduit. However, in the present study, there is little evidence that early adopters were responsible for the increase in recruitment. For example, interpersonal diffusion is generally a slow process that can take months or even years (Roberto and Kelly 1989). The limited recruitment period in the present study (two months between the start of the media campaign and the end of the recruitment period for the media plus telephone condition) make it unlikely that early

adopters had enough time to be a significant factor. Moreover, the S-shaped curve that is so common to the diffusion processes suggests that media and interpersonal communication eventually work in a synergistic fashion. However, the present results appear to be more additive in nature. For example, if the 1.54 (95% CI: 1.53 to 1.55) per cent of smokers recruited in media only treatment (group 5) is added to the 6.83 (95% CI: 5.53 to 8.14) per cent obtained from the staged telemarketing group (group 4) it is not significantly different from the 8.80 (95% CI: 7.30 to 10.30) per cent recruitment rate obtained from the treatment that delivered staged messages by a combination of media and telemarketing (group seven). This suggests that media and telemarketing may have appealed to different types of smokers, but that these two groups did not have a great deal of impact on each other. It also suggests that the success of treatment group seven, like treatment groups three and four, was primarily due to the persuasive nature of telemarketing as a communication tool and that media played a relatively minor role.

Further support for the notion that most of benefits observed in the media plus telemarketing condition were additive rather than synergistic comes from an examination of the recruitment results with smokers in each stage of change. With perhaps one exception, the percentage of smokers and ex-smokers that treatment group seven recruited by stage was similar to the rate obtained by adding groups four and five together. The one possible exception may have been among smokers in the contemplation stage. For these smokers, hearing the messages through media followed by telephone almost doubled the odds of recruitment relative to hearing them by telemarketing alone, a difference that cannot be accounted for by the simple addition of media. Rather, it appears that for smokers who

realize they should quit but still have some doubts about their ability to do so, hearing the message of multiple channels may "tip the scale".

The finding that recruitment rates did not differ by gender was also somewhat of a pleasant surprise. Although this was not identified as a specific hypothesis, a variety of previous studies have shown that, in general, a greater proportion of women than men will enrol in community based quit smoking programs (Britt et al 1994; Kviz, Crittenden, Belzer and Warnecke 1991; Kviz, Crittenden and Warnecke 1992; Muddle, de Vries and Strecher 1996; Wagner et al. 1990). From a population health perspective this is important because a greater number of adult smokers are male, although the difference has been declining for several years (Health and Welfare Canada 1993; Pan American Health Organziation 1992). The results are, therefore, welcome in-so-far as they suggest that pro-active, staged messages may be effective with men, an important public health group that has been more difficult to engage with traditional strategies.

Prior to accepting the above results, it is necessary to rule out the possibility that observed treatment differences might be due to systematic differences in the persons assigned to the conditions, or due to some unintended differences in the messages themselves. Neither of these scenarios appears likely. For example, the proportion of mail packages returned, or persons willing to accept a telephone call did not differ across conditions. Results of the post campaign survey suggested that the proportion of smokers and ex-smokers assigned to each treatment did not differ. Moreover, the proportion of smokers who completed the survey appears to be consistent with the results of the Ontario Health Survey (Ontario Ministry of Health, 1991). Due to differences in the way the data

were collected, it was more difficult to compare the post survey results with those of the Ontario Health Survey. However, the size and direction of the differences between the two samples makes it unlikely that they differ from one another. Establishing the validity of the Ontario Health Survey data was important since it was used to estimate the number of smokers and ex-smokers in each condition.

Although a higher proportion of post survey respondents were female than was expected, this is consistent with other telephone surveys that show women are generally more likely to respond to telephone surveys than men (Lavrakas 1993). Moreover, the proportion of women responding did not differ across treatment conditions.

Results of the post campaign survey also suggested that all treatments were viewed as at least moderately interesting, and reasonably well done relative to other promotional campaigns. More importantly, credibility did not differ significantly across treatments. Therefore, the results can not be attributed to differences in messages credibility. There were, however, slight differences in message interest across treatments. Interest in messages delivered by telephone was slightly greater than messages delivered by media or mail. This may be due to the novelty of telemarketing as a recruitment tool. Interest did not differ as a function of whether messages were staged or generic.

5.2 Limitations of the Study

As with most quasi-experimental designs, the present research is not without limitations (Cook and Campbell 1979). Caution must be exercised during the interpretation of results and in using them to inform actions in other settings.

There are several factors that might undermine the present study's internal validity; that is, the ability to make correct inferences about the relationship between the independent variables (channel type, channel combination, message type) and the outcomes of interest (recruitment rate, recruitment efficiency, recall rate, and cost efficiency). Although it is possible to examine issues related to statistical and construct validity as special forms of internal validity (e.g., Cook and Campbell, 1979), the present study will make no attempt to distinguish them.

Perhaps the most serious limitation was the exclusive reliance on survey data to estimate the denominators for calculating recruitment rates and recruitment efficiency. For example, the denominator to calculate recruitment rate in treatment group one was obtained by multiplying the number of persons assigned to the condition (3979) times the estimated adult smoking prevalence rate of 35 per cent. While this represents the best estimate of smoking prevalence in the treatment group, as noted in Table 3.1, there is a 95 per cent chance that actual adult smoking prevalence rate was between 31 and 39 per cent. Therefore, the number of smokers assigned to this treatment could have been as high as 1552 and as low as 1233. Although the estimated recruitment rate for treatment group one was shown as 26/1393 = 1.87 per cent, in fact there is a 95 per cent chance that the real rate was between 1.68 per cent and 2.11 per cent. Similar variations may be expected in all of the other treatment conditions as well. Therefore, caution should be exercised when citing a specific recruitment rate.

It is important to note that the same prevalence estimates were used for all treatment conditions. Therefore, while the absolute value of each recruitment rate is subject to the

smoking prevalence estimate used, the relative value of recruitment rates across treatment was largely unaffected. For example, if we assume that the prevalence rate does not differ across treatment groups (an assumption that is consistent with results of the post campaign survey), then the odds that a smoker would be recruited by generic messages delivered over the telephone (group three) relative to generic messages delivered by mail (group one) would be 2.79 (95% CI: 1.76 to 4.41) using a smoking prevalence rate of 31 per cent, 2.78 (95 % CI: 1.76 to 4.39) if the smoking prevalence rate was 35 per cent, and 2.77 (95% CI: 1.75 to 4.38) if the smoking prevalence rate was 39 per cent.

Estimates of recruitment efficiency are somewhat more complicated since the denominator was calculated by multiplying the estimated number of smokers (or smoker plus ex-smokers) in each respective treatment times the estimated number of eligible respondents in the post campaign survey who could recall the message *for that given treatment*. Since recall rates differed from one treatment to the next, so too will the accuracy of each denominator. For example, recruitment efficiency for treatment group one (3.65 per cent) was estimated by dividing the number of recruits in group one (26) by the estimated number of smokers assigned to treatment one (1393) times the percentage of post campaign survey respondents assigned to group one who could recall receiving the message (51.1 per cent after adjusting for bogus recall). However, as discussed above there is a 95 per cent probability that the real number of smokers assigned to group one was between 1233 and 1552. Moreover, the 95 per cent confidence interval for the recall rate is 44.7 to 57.5 per cent. Therefore, there is a 90 per cent chance that the real recruitment efficiency rate for group one is between 2.91 and 4.72 per cent. If this method were repeated for the other

treatments, they would also yield large confidence intervals.

Of particular concern is the fact that, unlike the odds ratios for recruitment rate, the odds ratios for recruitment efficiency may vary substantially, even if we use the same smoking prevalence rate to estimate the number of smokers assigned to each treatment. For example, assuming a smoking prevalence rate of 35 per cent to compare the recruitment efficiency of generic messages by telephone with generic messages by mail, using the upper bound of the estimate for recall rate from group one and the lower bound from group three results in an odds ratio of 6.86 (95 % CI: 4.29 to 11.00). On the other hand, it we use the lower bound of the estimate for message recall from group one and the upper bound from group three it produces an odds ratio of 2.82 (95% CI: 1.76 to 4.51). It is only because the effect size is so large that all estimates lead to the same conclusion: that generic telephone is more efficient than generic mail. However, the precise magnitude of the advantage can change rather dramatically, depending upon the recall rate used from each treatment.

The validity of conclusions about recruitment rates for smokers in a particular stage of change should also be interpreted with extreme caution. As previously discussed, the small sample sizes dramatically increased the probability of making a type II error. Moreover, like estimates for recruitment efficiency, the denominator used to calculate stage specific recruitment rates or stage specific recruitment efficiency is dependent upon estimates from the post campaign survey. In order to reduce the variability associated with small sample sizes, the proportion of persons in each stage of change was based on the results collapsed across treatment condition (i.e., n = 1526). However, despite this precaution, stage specific recruitment rates and recruitment efficiency rates are subject to

wide confidence intervals and should be interpreted with caution.

Another relatively small, but potentially systematic source of error in the present study results from the fact that individuals were the unit of analysis despite the fact that the unit of randomization was a household (Donner and Klar 1994). This is of concern because there is considerable evidence that an individual is much more likely to smoke if others in their household smoke (Abrams, Orleans, Niaura, et al 1993; Lennox 1992; Morgan, Asheberg and Fisher 1988). Therefore, in order to reduce inter-cluster correlation, a maximum of one person from each household was assigned to a treatment. Despite this precaution, no attempt was made to verify that recruits included in the analysis actually resided at different addresses.

Given that smoking rates are significantly higher among low income groups (Ontario Ministry of Health, 1991), and recent data showing that at least some health behaviours may be regulated by price (French, Jeffery, Story, Hannan, and Snyder, 1997; Paine-Andrews, Francisco, Fawcett, Johnston and Coen, 1996; Scammon, Smith and Beard 1995), it is possible that the differential pricing strategy used in the present study created a confound in the results. Specifically, smokers in the precontemplation and contemplation stages of change were offered a smoking cessation program at no cost while smokers in the preparation stage and ex-smokers in action or maintenance were asked to pay a five dollar fee. Since the differential pricing strategy did not vary as a function of the channel used or whether the message was segmented or not, it is unlikely to substantially influence the interpretation of the overall results. However, it is possible that recruitment results obtained across persons in different stages of change were due, at least in part, to price. The five

dollar fee may have discouraged persons in preparation, action and maintenance from enrolling in the program thereby reducing their recruitment rates relative to smokers in precontemplation and contemplation.

To test this possibility the post campaign survey included a series of price related questions. Results suggested that the decision to enrol or not to enrol by the majority of respondents was unrelated to the cost of the program. Among smokers in the precontemplation and contemplation stages of change who registered, nearly two thirds of those with an opinion indicated that they would likely have enrolled even if the program had cost five dollars. Among respondents in all stages of change who did not enrol, 90 per cent said that price was not a factor in their decision. It would appear, therefore, that relative to precontemplators and contemplators, the five dollar fee did not prevent a significant number of persons in preparation, action and maintenance from enrolling in the program.

A closer inspection of the data, however, reveals another possibility. Approximately half of the respondents who said price influenced them were registrants in preparation, action and maintenance. A review of anecdotal comments recorded by the interviewers suggested that these people were influenced because they perceived the price to be so low. In other words, they viewed the five dollar price as a kind of incentive rather than a barrier. Because the survey failed to ask persons in preparation, action and maintenance how they would have responded if there was no program cost, the possibility that a free program may have resulted in higher recruitment rates among persons in these stages cannot be ruled out. However, it seems relatively unlikely that the price differential significantly influenced the present results. A variety of other studies have shown that small changes in price have a

negligible impact on the selection and consumption of health services (e.g., Crane, 1991, 1996; Dasgupta and Ghose, 1994; Spoth 1992).

Another potential threat to the internal validity of the present results is related to the fact that not all treatments were implemented at the same point in time. An attempt was made by the investigator to monitor factors external to the study that might systematically influence recruitment (e.g., tobacco related changes in public policies or policies at major worksites in the target community, concurrent recruitment or social marketing campaigns, events that may call the credibility of the program sponsor into question, etc.). Fortunately, no such instances were detected. However, as mentioned previously, even factors as subtle as the time of the year may have influenced recruitment results (D'Mello and Flanagan 1996; Glassman, Helzer et al. 1990). Therefore, the possibility that recruitment rates differed systematically as a function of when they were implemented cannot be entirely ruled out.

Although relatively unlikely, it is possible that subjects were inadvertently exposed to more than one treatment. For example, it is possible that through various social exchanges subjects conversed with each other about the program and the type of message they received. This was a particular concern in the mail condition since each package contained two registration cards with instructions in the covering letter to share the materials with a family member or friend. Assuming that conditions were subject to greater cross contamination than others, it would have the effect of increasing the recruitment rates in conditions that did involve the delivery of messages by mail. For example, persons receiving telemarketing messages may have been pre-exposed to the mail package. To reduce possible effects from

cross contamination, the analysis was conducted after attempting to exclude persons from a non-mail condition who returned a registration card. However this does not rule out the possibility that persons receiving telephone messages or media messages enrolled primarily after learning about the program from a friend who shared their mail package.

One factor that may undermine both the internal and external validity of the results is the period of time over which recruitment was measured. Recruits were accepted in each treatment for a period of approximately 30 days after the onset of the intervention. However, it is important to note that this restriction may have affected the treatments in different ways. In the case of telemarketing, the respondent was asked to make a decision to enrol at virtually the same time that the message was delivered. However, in the mail and media conditions, recipients could take several days or even weeks to make a decision about enrolment. Moreover, mail packages were sent only once while media messages were repeated over a two week period. A review of the registration patterns by treatment condition revealed that 91 per cent of persons that received a mail package enrolled within two weeks of receiving the package and only three per cent were received 21 to 28 days after implementation. On the other hand, 79 per cent of persons in the media only treatment registered during the two week period that the advertisements were run, while 8 per cent were received 21 to 28 days after the start of the campaign. It is possible, therefore, that a longer recruitment period would have slightly increased the recruitment rate of the media only treatment but had no effect on telemarketing or mail conditions.

Another possible consequence of limiting the recruitment period is that it may have severely restricted adoption through interpersonal diffusion. Rogers (1995) has shown that

the majority of persons that eventually adopt an innovation learn about it from innovators and early adopters rather than from mass media. In other words, mass media (and direct mail) serves as a kind of stimulus whose direct effects are somewhat limited, but whose indirect effects can be substantial. While interpersonal diffusion in the present study was treated as a potential confound that needed to be controlled, it could be argued that interpersonal diffusion is a normal expected outcome of effective media or direct mail campaigns. From this perspective, limiting the period over which registrations were accepted may have prevented the media and mail treatments from reaching their full recruitment potential. Not only would this result in an underestimate of the recruitment rate for these conditions, but it may alter conclusions about the relative benefits of the three channel types used in the present study.

A potentially significant limitation of the present study is that it does not consider what happens to recruits after they have been enrolled. To achieve a population health benefit, large numbers of smokers must not only enrol in a program, but they must be able to quit smoking. This is a particular concern because, as noted previously, the increases in the overall recruitment rates occurred among smokers in precontemplation and contemplation. The low outcome expectancies and self efficacy levels characteristic of smokers in these stages not only reduces their chances of quitting, but increases their chances of dropping out of a program (Prochaska 1996). For example, Litchtenstein and Hollis (1992) used a combination of recruitment techniques to pro-actively recruit smokers into a quit smoking program. While 35 per cent of smokers in precontemplation enrolled in the program, only 3 per cent showed up, 2 per cent completed the program and none quit smoking. Therefore,

drawing conclusions about the population health benefits associated with recruiting smokers through pro-active channels and segmented messages based on stage of change must be reserved until it can be shown that these additional recruits can quit smoking.

Another factor that limits the generalizability of results from the present study is related to the use of voters lists as a starting point for the recruitment process. No attempt was made to maximize the chances that only smokers or ex-smokers would be targeted. For example, the use of commercial contact lists that include persons with certain characteristics correlated with smoking (e.g., lower income, lower levels of education, various consumer preferences such as beer drinkers) would have increased the probability of contacting a smoker or former smoker. Although this would have little effect on the mass media treatment, these targeted lists may have significantly improved the cost efficiency of treatments involving direct mail or telephone.

The failure to include a treatment condition that involved sending generic messages by mass media also restricts the conclusions that may be drawn from the present results. This is significant because, as shown in the systematic review, generic messages delivered by mass media may be the most common method currently used to recruit smokers in to community based quit smoking programs. Presumably, segmenting the media messages would have either enhanced the recruitment of smokers and ex-smokers or had no effect. If this assumption is correct then, the present study may underestimate the advantages of telemarketing relative to a "usual care" condition. However, given that the recruitment rate associated with staged mail messages was actually lower (although the difference was not statistically significant) than generic mail messages, it is at least conceivable that the present

study may over-estimate the recruitment advantage of telemarketing.

As discussed previously, another limitation of the present study is that only three messages were developed to appeal to persons in five stages of change. It should be noted, however, that using four or five messages to correspond more directly to each stages of change may improve recruitment rates and efficiency, but unless these increases are significant, the extra costs involved may make them less cost efficient. This will be of particular concern for program sponsors who have fixed recruitment budgets.

Finally, it should be noted that the present campaign promoted a "new" smoking cessation program to the target community. It is therefore unknown if these results can be generalized to campaigns that involve the promotion of pre-existing programs or even other types of programs such as group counselling. Since messages in all conditions used similar wording, it is unlikely to have differentially affected the treatments. However, it may have resulted in an overall increase in the recruitment rate. Conversely, given research showing people tend to prefer items that are more familiar to them (Zajonc 1980, 1984), it is conceivable that the overall recruitment rates may go up when pre-existing programs are promoted.

5.3 Implications of the Results

Although the present results must be replicated and extended, they clearly suggest that improvements in recruitment have the potential to significantly improve the population level impact of smoking cessation programs. Calls to abandon population based quit smoking programs as part of an overall tobacco control strategy (e.g., Chapman 1985) are premature at best, and misguided at worst.

From the perspective of program providers concerned with improving public health, three things are particularly noteworthy about the results of the present study: (1) the size of the effects, especially for channel selection; (2) the ability to increase recruitment among persons in precontemplation who, despite making up the vast majority of smokers (Health Canada, 1995; Velicer, Fava Prochaska, et al 1995), have been the most difficult to engage (Kiviz, Crittenden & Warnecke 1992; Muddle, de Vrie & Strecher 1996), and (3) the finding that the most effective recruitment channels are also the most cost efficient.

To put the results in context, it is necessary to consider the effects of recruitment in conjunction with the other factors that determine the population impact of smoking cessation programs. Using traditional recruitment methods, such as mass media, about 1.5 per cent of smokers were recruited. However, of those that are recruited, we could expect that at least 50 per cent of registrants will drop out prior to completing the program (e.g., Curry, Wagner and Grothaus 1991). If we assume that 30 per cent of the people who complete the quit smoking program offered in the present study will be smoke free at a 12 month follow up, then with all other factors being equal, the traditional recruitment method can expect to reduce the population smoking prevalence rate by a maximum of 0.225 per cent. In contrast, the use of telemarketing to deliver stage based messages in the same population recruited 6.8 per cent of smokers. Even if the drop out rate for persons recruited through this method turns out to be 50 per cent greater than those recruited through media (i.e., only 25 per cent of registrants complete the program), the net reduction in the smoking prevalence rate would be 0.51 percent, two and one quarter times as high as the traditional approach. To achieve this same effect by enhancing the design of a smoking cessation program, the one year point

prevalence success rate would need to go from 30 per cent to over 67 per cent with a general population of smokers.

Most population based recruitment campaigns select the channel for sending messages based on the needs of the source rather than those of the intended receivers. From this perspective, emphasis has been placed on finding the way to reach as many members of the target audience as possible (e.g., Flay 1987; Flay and Cook 1989). The assumption is, if they receive it, they will come. However, as McGuire (1989) has pointed out, this is only one of many challenges that must be met in order for a communication to result in a response from receivers. Indeed, the present results suggest that maximizing reach does not necessarily lead to the highest recruitment rates. Despite having the highest recall rates, messages sent by mail had the lowest recruitment rates. Conversely, telephone had the lowest recall rates but the highest recruitment rates.

Chaffee (1986) has speculated that the reason communication by telephone is more persuasive is because it allows more emphasis to be placed on the needs of the receiver relative to the needs of the source. The present results seem to confirm the importance of meeting the needs of the intended receiver. For example, the perceived need to quit smoking increases from precontemplation to contemplation to preparation (Prochaska et al 1992). An examination of Table 4.7 shows that regardless of what type of treatment they were exposed to, smokers in preparation were far more likely to register in a quit smoking program than contemplators. Smokers in contemplation, were, in turn, more likely to enrol in a quit smoking program than smokers in precontemplation. Thus, when the perceived need for information is high, the receiver pays little regard to the type of channel (Bauer 1964). On

the other hand, when the perceived need for change is low, there is little likelihood that a person will seek out information on their own. Moreover, telemarketing channels not only provided information, but it also made the process of registering easier. For example, once the persons contacted by telephone had answered the interviewers questions, they were effectively registered in the program. On the other hand, persons contacted by mail or media had to take an additional step and initiate contact with the program sponsor either by making a telephone call or completing an enrolment card and mailing it back.

One potential concern of program providers may be that telemarketing will be viewed by recipients as offensive or an invasion of their privacy. However, data from programs using the telephone to support smokers does not support this view. Lando and his colleagues (1991) surveyed 875 Minnesota smokers who were not part of a community smoking program. Their results suggested that more than half of respondents indicated a desire to be contacted by telephone to receive information on materials, classes, etc. related to smoking cessation. They concluded that the pro-active contact of smokers by telephone was not only feasible, but would be welcomed by smokers. In a similar study, Britt and his associates (1994) contacted nearly 1,137 smokers enrolled in a large HMO in Washington State and asked if they would be willing to participate in a study on smoking cessation. They were told that participants would be sent written health care materials and receive three additional telephone calls from a health educator. Eighty-four per cent of subjects completed at least one telephone call with the health educator. Although acceptance rates were slightly higher for smokers in preparation and contemplation than precontemplation, these differences were not statistically significant. Indeed, 58 per cent of all persons in

precontemplation accepted all three calls. Given the effectiveness of pro-active recruitment methods such as telemarketing, and the willingness of smokers in all stages of readiness to receive messages delivered in this way, it is unfortunate that providers of smoking cessation programs continue to rely on passive recruitment strategies to promote their programs.

Virtually all quit smoking programs to date have focused on smokers who are already highly motivated to quit smoking, despite the fact that this group makes up less than 12 per cent of the smoking population (Health Canada, 1995; Velicer, Fava Prochaska, et al 1995). Moreover, despite the introduction of a series of smoking cessation innovations over the past three decades, progress in improving the effectiveness of programs has been modest at best (Fiore, Novotny, Pierce et al. 1990; Law and Tang 1995; Lichtenstein and Glasgow 1992; Shiffman 1993). It has therefore been argued that future progress depends largely on our ability to design programs for smokers all across the continuum of change (e.g., Orleans 1995; Prochaska 1996). However, while effective programs have been developed to assist smokers in all stages of change (e.g., Prochaska, DiClemente, Velicer and Rossi 1993) they will have no impact on population smoking rates unless smokers and ex-smokers can be persuaded to use them (Prochaska, 1996). The present results suggest that this is not only possible, but advisable.

Given recent concerns about the cost of health care and budget cuts to health care providers, it is surprising that few studies to date have bothered to consider the cost of recruitment. This may, of course, reflect the fact that most program related research fails to take the needs of the provider into account (Patton 1997).

The paucity of information on the cost efficiency of recruiting participants for public health programs may contribute to the mistaken notion that tools such as telemarketing are expensive and/or impractical (James Pasternak, President of DCI Canada, personal communication). The results show that not only was telemarketing more cost effective than other recruitment treatment conditions in the present study, but that it compares favourably with the results obtained in other studies as well. For example, Muddle and his colleagues (1996) relied on free public service announcements, posters and pamphlets to recruit 417 smokers in a Dutch community of 100,000 residents. They reported that the total cost for recruitment was US$16,363, the majority of which (US$12,750) was related to the need to staff a telephone registration line. The cost efficiency of their strategy in Canadian dollars was approximately $53.75 per recruit, 23 per cent more than staged based telemarketing in the present study. It is interesting to note that Muddle et al's (1996) cost efficiency using "free" public service announcements were virtually identical to the $54.57 per recruit obtained in the present study using paid advertising. This suggests that programmers who use public service announcements as a means of cutting their costs may not actually be any further ahead than if they had used paid advertising.

Shipley and his associates (1995) reported results from 26 community based quit smoking contests that were offered in 11 communities as part of the COMMIT trials. Relying principally on mass media to deliver messages, the average cost across the 26 contests was estimated at US$78.57 per recruit with a range of $27.68 to $154.21. Hence, after converting to Canadian dollars and adding 3 per cent for inflation (the COMMIT contests were implemented approximately one and one half years prior to the present study),

staged based telemarketing messages were more than two and one half times more cost efficient than the average COMMIT campaign..

Schmid, Jeffery and Hellerstedt (1989) used a combination of direct mail and mass media to recruit smokers in three communities in Minnesota with populations between 37,800 and 101,000 people. They reported that the average costs per recruit in 1987 ranged from US$61.70 to $1,505.60. Once again, after adjusting for inflation and the currency exchange rate, even their most cost efficient method was 2.6 times more costly than staged telephone messages in the present study.

These studies demonstrate that one of the major advantages of using telemarketing is that it eliminates the need to have staff on standby to receive registration requests. Unfortunately, by failing to consider this in their cost analysis most program providers do not get a true assessment of recruitment efficiency. However, the cost effectiveness of alternative strategies can be improved if volunteers are used to receive orders. For example, Nelson, Lasater, Niknian and Carelton (1989) used volunteers to directly recruit smokers attending a festival in Pawtucket, Rhode Island. After adjusting for inflation and the currency exchange, face to face recruitment cost an average of $27.32 per recruit, 37 per cent less than staged based telemarketing in the present study.

In summary, based on the results of the present studies and previous literature, providers of quit smoking programs aimed at broad populations should: (1) ensure that the program content is designed to meet the specific needs of smokers in each stage of change as well as ex-smokers at risk of relapse; (2) develop promotional campaigns that implement messages aimed at smokers all across the continuum of change, including ex-smokers; (3)

use pro-active channels to send their messages when budgets are fixed or, a combination of mass media followed by pro-active contact where budgets are more flexible; (4) consider the cost efficiency of the entire recruitment process rather than making a decision solely on the costs to purchase required goods or services to conduct the campaign; and (5) measure outcomes based on the percentage of smokers and ex-smokers enrolled in the program and who subsequently quit, rather than assessing success based on either the percentage of registrants that quit smoking, or the estimated per cent of the target population reached by a recruitment campaign.

The present results also have several implications for researchers interested in population based smoking cessation. Obviously the present results will need to be replicated. However, perhaps the most important implication is that evaluators and researchers must stop treating recruitment as an outcome of secondary interest. For example, most of the data on recruitment continues to come from studies that are primarily interested in testing a new smoking cessation program. While it will be important to continue researching innovative methods to help smokers quit and remain smoke free, the present results show that far more resources should be directed toward the study of recruitment as a topic in its own right (Curry 1993; Glynn, Boyd, and Gruman 1990; Ockene 1992; Orleans 1995; Prochaska 1996).

Orlandi et al.'s (1990) model of dissemination offers an ideal framework in which it will be necessary to study how to overcome each of the five potential failure points. The present research is relevant to issues of communication and adoption. However, the study was limited in-so-far-as it did not attempt to determine if success rates for quitting are

related to how participants were recruited. If, for example, drop out rates are higher for persons recruited through pro-active channels, then we need to understand whether this can be overcome. Hence, far more work needs to be done in order to understand the potential relationship between innovation, communication, adoption, implementation and maintenance issues.

With respect to communication and adoption issues, more attention must be paid to how recruitment is defined and the scientific methods employed to study it. For example, large studies that reduce the probability of type II errors must be conducted. Recruitment must also be defined in terms of the total target population of smokers rather than expressing it purely as a function of those who are contacted. Future studies should include a control condition that sends generic messages by mass media since this is presently the most common type of recruitment strategy used. Researchers must also recognize that most program providers have limited budgets. Data on cost efficiency must be routinely collected and reported. As was the case in the present study, the most effective recruitment strategy may not be the most cost efficient strategy. Therefore, the issue of interest should not be what is the most effective way to recruit smokers and ex-smokers; rather it ought to be, what is the best way to recruit the most smokers in a manner that will enhance their chances of quitting for a fixed budget.

While the present study showed that it may be possible to dramatically increase recruitment, it provided relatively little information on what factors were crucial to these improvements. For example, it would be important to know precisely what message elements are necessary to appeal to smokers at each stage of change. It would be extremely

useful to know the pros and cons of segmenting messages to correspond to various combinations of stages. The present study used three separate messages but would two work just as well or would one for each stage of change be optimal? Moreover, would other segmentation variables be of additional value? For example, Gritz and her colleagues (1996) have noted the many differences between male and female smokers. Therefore, it is conceivable that separate messages aimed at men and women may be more effective and/or efficient. Moreover, Kviz and his associates (1994) have suggested that messages should be tailored based on a smoker's age. The present study excluded adolescents. However, the rapid recent increase in smoking among this population (Health Canada, 1995) has increased the urgency for finding methods to help them quit. As with adults, our impact will depend upon finding effective programs as well as the ability to recruit participants into these programs.

Another area that must be examined is the long term effects of recruitment. For example, when interpersonal diffusion is considered, do pro-active recruitment channels and segmented messages merely speed up the natural diffusion process or does it increase the number of people that are recruited into formal programs? Both have merits. For example, given that quitting smoking results in both long and short term benefits to health, speeding the natural diffusion process would result in a public health benefit by reducing the years of illness burden across the population of smokers and ex-smokers.

Results suggest that regardless of the method employed to recruit smokers and former smokers, they tend to have high expectations that quitting will benefit them but little confidence that they will succeed. This is consistent with the findings of Wagner et al.

(1990), and Brod and Hall (1984). Andreasen (1995), Maibach and Cotton (1995) and others, have suggested that promotional efforts aimed at persons in contemplation through action should focus on raising self efficacy. Future research may need to examine how to approach smokers with low outcome expectancies, as well as those who are at risk for relapse in-spite of high levels of self efficacy such as persons with certain co-morbidities and environmental risks (Abrams 1993).

Clearly, there is much more that needs to be done. The above discussion represents only a partial list of future directions. However, the present research shows that greater concern over the recruitment process by both program providers and researchers represents a potentially fruitful means of improving population health through community based smoking cessation programs.

Appendix A
Contents of generic based direct mail package
(Recruitment group 1)

6

★ *One Step At A Time* **ORDER FORM** ★

NAME _____ SEX ☐ M ☐ F

ADDRESS _____ AGE: _____

FOR CURRENT SMOKERS ONLY

Do you plan to quit in the next 6 months?
☐ no ☐ yes

Do you plan to quit in the next 30 days?
☐ no ☐ yes

Are you going to quit in the next 10 days?
☐ no ☐ yes

In the past year, did you go for *more than* 30 days without smoking? ☐ no ☐ yes

How sure are you that you could successfully quit smoking if you wanted to?

not at all sure				totally sure
1	2	3	4	5

FOR EVERYONE

How sure are you that quitting smoking will help your life (eg, health, relationships, etc.)?

not at all sure				totally sure
1	2	3	4	5

How sure are you that you can *stay* smoke free?

not at all sure				totally sure
1	2	3	4	5

Have you had a cigarette, even a puff, in the last 7 days? ☐ no ☐ yes

IF YOU HAVE QUIT smoking, how many months ago did you quit? _____

Do you work at Chrysler? ☐ no ☐ yes

MAIL POSTE
Canada Post Corporation
Société canadienne des postes
Postage paid / Port payé
if mailed in Canada / si posté au Canada
Business Reply / Réponse d'affaires
0027322899 01

0027322899-N9A4J8-BR01

One Step At A Time
Windsor-Essex County Health Unit
1005 Ouellette Avenue
Windsor, Ontario
N9A 4J8

Photocopy of the front and back of the registration card.

WINDSOR - ESSEX COUNTY
HEALTH UNIT

Unité sanitaire
de Windsor • comté d'Essex

February, 1996

Dear Friend:

Are you a smoker or an ex-smoker? If so, I would like to invite you to try a new **stop smoking program** from the Windsor-Essex County Health Unit for people just like you.

Designed with the help of smokers and ex-smokers, the program consists of **easy–to–read booklets.** The material will help you **weigh the pros and cons of quitting,** develop a realistic plan to prepare yourself mentally and physically to stop smoking for good, **build your self confidence, cope with withdrawal** and ongoing urges to smoke, as well as provide suggestions on how to remain smoke free for good.

Each booklet takes only a few minutes to complete and can be done at your own pace. All material is delivered through the mail so there are **no meetings to attend and no hassles.** We even pay the postage! There are no lectures and no gimmicks. The best news of all is the special introductory price. Depending on the material that you receive, **booklets are either free or just $5.00 each** – about the cost of two packages of cigarettes. The cost includes ongoing support from professionals specially trained to help smokers stop smoking.

Please read the enclosed materials then **return the enclosed postage paid** ORDER FORM. Give the extra ORDER FORM to a friend. I encourage you to take advantage of this introductory offer. If you have any questions about the Windsor-Essex County Health Unit stop smoking program, please call us during normal business hours at 258-2146, extension 260.

Sincerely,

G. Allen Heimann, MD , MHSc.
Medical Officer of Health

1005 Ouellette Avenue, Windsor, Ontario N9A 4J8 / Telephone (519) 258-2146 Fax (519) 258-6003
1005, avenue Ouellette (Windsor) Ontario N9A 4J8 / Télephone (519) 258-2146 Telécopieur (519) 258-6003

Black and white photocopy of the cover letter shown at 80 per cent of actual size.

A Stop Smoking
Program for
Smokers Just
Like You

A Stop Smoking
Program for
Smokers Just
Like You

To order
Your Stop Smoking Program
send in the enclosed order form

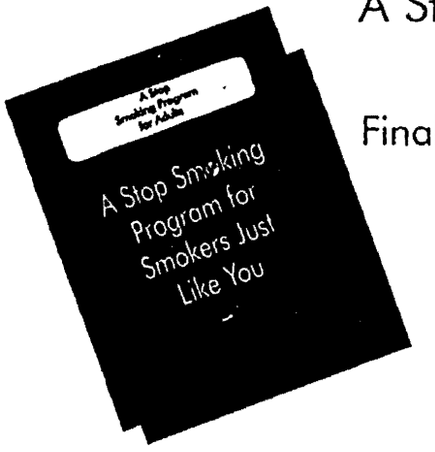
Windsor-Essex County Health Unit, 1005 Ouellette Ave., Windsor ON. N9A 4J8

For more information please call the Windsor-Essex County Health Unit at (519) 258-2146 ext. 260

Black and white photocopy of the front of the brochure.

Black and white photocopy of the back of the brochure.

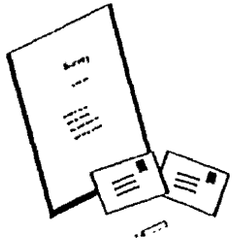
A Stop Smoking Program for adults



Finally, a quit smoking program just for you.

We have a quit smoking program for all types of smokers It will help you weigh the costs and benefits of quitting, prepare you mentally and physically to quit, help you cope with urges to smoke and help you remain smoke free forever. The program is easy to read and can be completed in no time at all.

55 easy to use booklet



pre-paid postage

Get the program that's right for you.
You can stop at any time.

no meetings to attend

go at your own pace

complete the program by mail

no preaching

no gimmicks

Appendix B
Contents of stage based direct mail package
(Recruitment group 2)

WINDSOR - ESSEX COUNTY HEALTH UNIT

Unité sanitaire
de Windsor • comté d'Essex

February, 1996

Dear Friend:

Are you a smoker who likes smoking and doesn't want to quit? Are you a smoker who is thinking about quitting? Are you an ex-smoker who wants to stay smoke free for good? If you answered yes to any of these questions, I invite you to try ***One Step at a Time.*** Its a series of **new programs** from the Windsor-Essex County Health Unit **for all types of smokers.**

Designed with the help of smokers and ex-smokers, ***One Step at a Time*** is actually five different programs – each one developed for a different type of smoker. There are even separate materials for men and women. Each program consists of an **easy–to–read booklet.**

Booklet 1, helps smokers **deal with people who nag you to quit** and invites you to consider why you smoke. There are no lectures on quitting - in fact, it doesn't even ask you to stop smoking! Booklet 2 helps you **weigh the pros and cons of quitting** and **build self confidence.** Booklet 3 helps you to develop a realistic plan to prepare physically and mentally for the day you quit smoking. Booklet 4 guides you through the quitting process and **helps** you cope with withdrawal. Finally, Booklet 5 helps ex-smokers deal with the ongoing temptations to smoke.

We help you choose the booklet that's right for you. Each booklet takes only a few minutes to complete. When you are finished, order the next booklet or stop the program. It's your choice. Do it all at your own pace. Everything is delivered through the mail so there are **no meetings** to **attend and no hassles.** We even pay the postage! There are no lectures and no gimmicks. The best news of all is the special introductory price. **Booklets 1 and 2 are free. Booklets 3, 4, and 5 are just $5.00 each** – about the cost of two packages of cigarettes. The cost includes ongoing support from professionals specially trained to help all types of smokers.

Please read the enclosed materials then **return the enclosed postage paid** ORDER FORM. Give the extra ORDER FORM to a friend. I encourage you to take advantage of this introductory offer. If you have any questions about ***One Step at a Time***, please call the Windsor-Essex County Health Unit during normal business hours at 258-2146, extension 260.

Sincerely,

G. Allen Heimann, MD , MHSc.
Medical Officer of Health

1005 Ouellette Avenue, Windsor, Ontario N9A 4J8 / Telephone (519) 258-2146 Fax (519) 258-6003
1005, avenue Ouellette (Windsor) Ontario N9A 4J8 / Téléphone (519) 258-2146 Telecopieur (519) 258 6003

Black and white photocopy of the cover letter shown at 80 per cent of actual size.

★ *One Step At A Time* **ORDER FORM** ★

NAME _____ SEX ☐ M ☐ F

ADDRESS _____ AGE: _____

FOR CURRENT SMOKERS ONLY

Do you plan to quit in the next 6 months?
☐ no ☐ yes

Do you plan to quit in the next 30 days?
☐ no ☐ yes

Are you going to quit in the next 10 days?
☐ no ☐ yes

In the past year, did you go for *more than* 30 days without smoking? ☐ no ☐ yes

How sure are you that you could successfully quit smoking if you wanted to?

not at all sure				totally sure
1	2	3	4	5

FOR EVERYONE

How sure are you that quitting smoking will help your life (eg, health, relationships, etc.)?

not at all sure				totally sure
1	2	3	4	5

How sure are you that you can *stay* smoke free?

not at all sure				totally sure
1	2	3	4	5

Have you had a cigarette, even a puff, in the last 7 days? ☐ no ☐ yes

IF YOU HAVE QUIT smoking, how many months ago did you quit? _____

Do you work at Chrysler? ☐ no ☐ yes

_____
_____
_____
_____

MAIL POSTE
Canada Post Corporation
Société canadienne des postes
Postage paid / Port payé
if mailed in Canada / si posté au Canada
Business Reply / Réponse d'affaires
0027322899 01

0027322899-N9A4J8-BR01

One Step At A Time
Windsor-Essex County Health Unit
1005 Ouellette Avenue
Windsor, Ontario
N9A 4J8

Photocopy of the front and back of the registration card.

Black and white photocopy of the front of the brochure aimed at smokers in precontemplation.

One Step At A Time for adults

Finally, a program that understands. It's your choice to smoke.

booklets for each step are available for both men and women

no meetings to attend

go at your own pace

complete the program by mail

separate programs for men and women

no lectures on quitting

no preaching

no gimmicks

free booklet special bonus gift for those who complete two booklets

pay with postage

Start the program with the booklet that's right for you and stop at any time.

One Step At A Time is five programs in one. The first booklet lets you think about smoking and the reasons why you smoke. It helps you weigh the costs and benefits of smoking and decide if smoking is right for you. It tells you how to deal with people who nag you to quit.

The booklets are easy to read and can be finished in no time at all.

Black and white photocopy of the back of the brochure aimed at smokers in precontemplation.

Black and white photocopy of the front of the brochure aimed at smokers in contemplation and preparation.

Black and white photocopy of the back of the brochure aimed at smokers in contemplation and preparation.

One Step At A Time for adults

Finally, a program that understands.

Making the decision to quit smoking is very a important and personal step in the quitting process. Everyone has their own reasons for quitting. And many smokers are at different stages of readiness to quit. That's why we have booklets for each stage.

These booklets will help you see smoking in a different way and will help you look at the pro's and con's of smoking. They will help you deal with the urge to smoke and the things that make you smoke. They're easy to read and can be finished in no time at all.

free binder
special bonus gift
for those who
complete two booklets

pre-paid postage

Start the program with the booklet that's right for you and stop at any time.

no meetings to attend

go at your own pace

complete the program by mail

separate programs for men and women

no preaching

no gimmicks

booklets for each step are available for both men and women

It's five different programs in one.
Separate easy-to-use booklets for:

- free smokers who don't want to quit
- free smokers who might want to quit
- smokers who are preparing to quit
- smokers who are trying to quit
- ex-smokers who recently quit

ONE STEP AT A TIME

To order One Step At A Time
send in the enclosed order form

Windsor-Essex County Health Unit, 1005 Ouellette Ave., Windsor ON N9A 4J8

For more information please call the Windsor-Essex County Health Unit at (519) 258-2146 ext. 260

Black and white photocopy of the front of the brochure aimed at ex-smokers in action and maintenance.

One Step At A Time for adults

Finally, a program that offers real help for smokers who want to quit once and for all.

This program helps ex-smokers develop the coping skills and confidence they need to stay smoke free. Booklets 4 and 5 guide you through the moment of quitting. They will help you cope with withdrawal and help you overcome urges to smoke. The booklets discuss how to deal with "slips" and stay smoke free forever. The booklets are easy to read and can be finished in no time at all.

free booklet special bonus gift for those who complete two booklets

no postage

Start the program with the booklet that's right for you and stop at any time.

no meetings to attend

go at your own pace

complete the program by mail

separate programs for men and women

no preaching

no gimmicks

booklets for each step are available for both men and women

Black and white photocopy of the back of the brochure aimed at ex-smokers in action and maintenance.



1005 Ouellette Avenue, Windsor, Ontario N9A 4J8
1005, avenue Ouellette (Windsor) Ontario N9A 4J8

An important message from the Medical Officer of Health

Black and white photocopy of the envelope.

Appendix C

Layout of newspaper print ads
and scripts for television and radio advertising spots
(Recruitment groups 5, 6 & 7)

Newspaper advertisement number one targeted at smokers in precontemplation.

Are You Thinking About Quitting Smoking?

One Step at a Time **is a series of new programs that will help you quit smoking for good. One program is designed specifically for people who aren't sure if they're ready to quit. Another program helps you develop a realistic plan and prepare for quit day. A third program guides you through the moment of quitting and helps you cope with withdrawal and urges to smoke.**

costs $5!

no meetings

no gimmicks

complete the program by mail

stop the program at any time

quick and easy to use

ONE STEP AT A TIME

To order One Step At A Time
call the Windsor-Essex County Health Unit
at (519) 258-2146 ext. 260 during business hours.

00222651

Newspaper advertisement number two targeted at smokers in contemplation and preparation.

Real Help for Smokers Who Want to Quit For Good

costs $5!
no meetings

no lectures
no gimmicks

complete the program by mail
stop the program at any time

The One Step at a Time **Program is a new program to help ex-smokers develop the coping skills and confidence they need to stay smoke free. It will guide you through the moment of quitting, help you cope with withdrawal, and help you overcome urges to smoke. The booklets discuss how to deal with "slips" and stay smoke free forever. The booklets are easy to read and can be finished in no time at all.**

quick and easy to use

ONE STEP AT A TIME

To order One Step At A Time call the Windsor-Essex County Health Unit at (519) 258-2146 ext. 260 during business hours.

00222850

Newspaper advertisement number three targeted at ex-smokers in action and maintenance.

Television Script for Smokers in Precontemplation and Contemplation
"I Love to Smoke"

Scene opens by a Facilitator entering a room and joining a group of several people sitting around a table who are smoking feverishly. They look annoyed, and are boisterous. There is a strange-looking person who is facilitating this group (wearing a white Health Unit lab coat), standing beside a chalkboard or large notepad. The group is joined in progress.

FACILITATOR: So, what kind of program would get you guys to think about quitting smoking?

MAN 1: One that doesn't ask me to quit! (All laugh)

Group all nods in approval (says yah, right on, etc.) while facilitator is writing these points down very quickly.

MAN 2: I'd like a program that helps me deal with people who bug me to quit.

WOMAN 2: (interjects and adds..) One that doesn't lecture me.

MAN 1: And quick and easy.

WOMAN 2: And free of course.

FACILITATOR: OK, I'll get back to you.

Facilitator leaves the room and quickly shuts the door. The group looks at each other and shrug, wondering what's going on.

SFX: productive sounds, typing, a printer going etc..
(A title appears at the bottom of the screen that reads: Actual elapsed time = 12 months)

Facilitator enters the room carrying a OSAAT book.

FACILITATOR: Ok, here it is. A support program for smokers who like to smoke!

MAN 2: You're kidding right?

WOMAN 1: He's not kidding, check it out. It's a new program from the Windsor-Essex Health Unit.

MAN 1: Here's a section on dealing with people who nag you to quit.

MAN 2: Hmmm (looking at book)..doesn't ask me to quit, flexible,....

FACILITATOR: It's part of a new program called One Step at a Time. It's a short booklet you get it through the mail, and it's free! .

Cut to faces of others who look like they're pleasantly surprised.

NARRATOR: To receive your copy of One Step at Time, call the Windsor-Essex County Health Unit during normal business hours.

Television Script Targeted at Smokers in Contemplation and Preparation
"I Really Should Quit Smoking"

SCENE ONE EXTERIOR OF BUILDING. WEATHER APPEARS TO BE FRIGID. Open to some workers (blue collar) smoking on their break. They are bundled up and shivering.

MAN: Oh man it's cold out here. I really should quit smoking (stamps feet).

WOMEN: Easier said then done. I've been getting ready to quit and next week is it for me.

MAN: Ya, I've gotta get serious about it too but I'm just not sure... (voice trails off).

WOMAN: I just got this new program that's really helped me. It's called ONE STEP AT TIME (reaches into coat pocket for the brochure). It's from the Windsor-Essex County Health Unit.

MAN: So what's so good about it? (takes the booklet and starts scanning it)

WOMAN: It was designed with the help of ex-smokers. They've got 10 different booklets. You get the one that's right for you. I'm finishing the booklet for women who are serious about quitting. You'll need the book that helps you build self confidence.

MAN: I like the fact that they send all the material through the mail. No lectures, no hocus pocus.

WOMAN: Each booklet is easy to read.

WOMAN: And the book for people thinking of quitting is free and the others are just five bucks!

Fade into logo of a OSAAT (WECHU logo also somewhere on screen).

NARRATOR: To request your copy of the One Step at a Time booklet that's right for you, call the Windsor-Essex County Health Unit during normal business hours.

Television Script Targeted at Ex-smokers in Action and Maintenance
"Trying to Stay Smoke Free"

SCENE ONE INTERIOR OF A WORKPLACE. A WOMAN IS ON THE TELEPHONE. HER DESK IS PILED HIGH WITH PAPERS AND FILES.

Open to a woman who hangs up the phone in disgust, picks up a pen or pencil and starts to fidget with it in her hand, eventually holding it like a cigarette.

WOMAN: It's times like this that I really feel like a smoke.

A male co-worker comes in to the woman's office.

MAN: You're not going to start again are you?

WOMAN: Well, it's not easy!

MAN: I know. You made that perfectly clear that last time you quit. Why don't you get some help now, before you start smoking again?

WOMAN: Yah, like hypnosis or those group programs? Give me a break!

MAN: What about that new program from the Windsor-Essex Health Unit.

The man hands her a copy of the newspaper with the ad for One Step at a Time.

WOMAN: One Step at a Time .. a program for ex-smokers. It has information on how to deal with urges to smoke and reduce stress. That sounds like something I could use.

MAN: Look, they send everything through the mail so there's no meetings and it costs only five bucks!

Focus on woman picking up phone and starting to dial.

WOMAN: Hello? Windsor-Essex County Health Unit? ...

Fade into OSAAT logo with WECHU logo somewhere on screen.

NARRATOR: To receive your copy of One Step at a Time, phone the Windsor-Essex County Health Unit during normal business hours.

Radio Script for Smokers in Precontemplation and Contemplation
"I Love to Smoke"

SFX: GROUP OF ANNOYED PEOPLE TALKING IN BACKGROUND NARRATOR. WHEN DOCTOR TALKS, SILENCE.

NARRATOR: (Almost a whisper) We're about to listen in on a clinical study group of heavy smokers. They're talking about a new program for smokers. Let's listen.

DOCTOR: (female) So, what kind of program would get you guys to think about quitting smoking?

MAN 1: One that doesn't ask me to quit!

ALL LAUGH

MAN 2: I'd like a program that helps me to deal with people who bug me to quit.

WOMAN: ... One that doesn't lecture me.

MAN 1: And quick and easy.

WOMAN: And free of course.

DOCTOR: Ok, I'll get back to you!

SFX: 5 SECONDS OF TYPING, HAMMERING, SAWING, ETC.

DOCTOR: Ok, here it is. A support program for smokers who like to smoke!

MAN 1: You're kidding right? A book?

WOMAN: She's not kidding, check it out. It's a new program from the Windsor-Essex County Health Unit.

MAN 2: Here's a section on dealing with people who nag you to quit!

MAN 1: Hmmm...doesn't ask me to quit, flexible...

DOCTOR: It's part of a new program called One Step at a Time. It's a short booklet you get through the mail and its free!

NARRATOR: And there you have it. If you're still sceptical, don't be. To receive your free copy of One Step at a Time for smokers who enjoy smoking, call the Windsor-Essex County Health Unit during normal business hours at 258-2146.

Radio Script Targeted at Smokers in Contemplation and Preparation
"I Really Should Quit Smoking"

SFX: BIG COLD WIND, TRAFFIC AMBIENCE.

MAN: Oh man this sucks, its so cold out here either they should let us smoke inside or I'll have to quit.

WOMAN: Easier said than done. I've been getting ready to quit and next week is it for me.

MAN: Ya, I've got to get serious about it too but I'm just not sure...

WOMAN: Well, I just got this new program that's really helped me. It's called One Step at a Time. It's from the Windsor-Essex County Health Unit.

MAN: So what's so good about it?

WOMAN: It was designed with the help of smokers and ex-smokers. They've got 10 different booklets so you get the one that's right for you. I'm finishing the booklet for women who are serious about quitting. It sounds like you'll need the booklet that helps you build self confidence.

MAN: I like the fact that they send all the material through the mail. No lectures, no hocus pocus!

WOMAN: Each booklet is easy to read and the one for people thinking of quitting is free. The booklets are just five bucks.

MAN Sounds great! How do I get started?

NARRATOR: To request your copy of One Step at a Time for People thinking about quitting smoking, call the Windsor-Essex County Health Unit during normal business hours at 258-2146.

Radio Script Targeted at Ex-smokers in Action and Maintenance
"Trying to Stay Smoke Free"

SFX: OFFICE AMBIENCE, PHONE RINGING, TYPEWRITERS, ETC.
WOMAN: What do you mean my car won't be ready? But I need it toda..no, no you don't, just make sure its ready at 5!!!

SFX: PHONE BEING HUNG UP HARD.

WOMAN: Man, its times like this that I really feel like having a smoke!

MAN: You're not going to start smoking again are you?

WOMAN: Jerks like that sure don't make it easy!

MAN: I know. You made that clear the last time you quit. Why don't you get some help NOW before you start smoking again?

WOMAN: Yah, like hypnosis or one of those group programs? Give me a break.

MAN: What about that new program from the Windsor-Essex County Health Unit? Here.

WOMAN: One Step at a Time, a program for ex-smokers... information on how to deal with urges to smoke and reduce stress...sounds like something I could use!! Where did you get this?

MAN: Like I said, the Windsor-Essex County Health Unit. They send everything through the mail. There's no meetings and it only costs five bucks. All you have to do is call.

SFX: SOUND OF PHONE BEING DIALED

WOMAN: Hello, Windsor-Essex County Health Unit? I need One Step at a Time.

NARRATOR: To receive your copy of One Step at a Time for people who are trying to quit and want to remain smoke free, phone the Windsor-Essex County Health Unit during normal business hours at 258-2146.

Appendix D
Generic telemarketing script (Recruitment group 3)
Stage based telemarketing script (Recruitment group 4 and 7)

Telemarketing Script for Generic Group (recruitment group 3)

1. Hello, may I please speak to _____ .

   0. No - (go to question 2)
   1. Yes - (go to question 3)

2. I'm calling on behalf of the Windsor-Essex County Health Unit. We are conducting a short survey on smoking in Essex County.

   Is there anyone over 18 years of age currently home that is a smoker or ex-smoker that could answer a few short questions?

   No (Thank you - end call)
   Yes - may I speak to them please? (go to question 3)

3. I'm calling on behalf of the Windsor-Essex County Health Unit. We are conducting a short survey on smoking in Essex County. May I ask you a few short questions? Your answers are confidential and it will take less than 2 minutes of your time.

   No - (go to question 2 part II)
   Yes - (go to question 4)

4. Our survey today is for people who are at least 18 years old, and who currently smoke or who have quit smoking within the last five years. Are you at least 18 and do you currently smoke or did you quit smoking within the last five years?

   No (go to question 2 part II)
   Yes (go to question 5)

5. On a five point scale where one means you are not sure at all and five means you are totally sure, how sure are you that quitting smoking will help your life, such as your health, better relationships, etc. ___ (enter number; then go to question 6).

6. Have you smoked a cigarette, even a puff, in the last 7 days?

   0. No (go to question 12)
   1. Yes (go to question 7)

7. Using a five point scale where one means that you are not sure at all and five means that you are totally sure, how sure are you that you could successfully quit smoking if you wanted to? ___ (enter variable, then go to question 9).

8. Do you plan to quit smoking in the next 6 months?
No (enter stage = 1; then go to question 14)
Yes (go to question 9)

9. Do you plan to quit smoking in the next 30 days?

No (go to question 11)
Yes (go to question 10)

10. Do you plan to quit smoking in the next 10 days?

No (enter stage = 3; then go to question 14)
Yes (enter stage = 4; then go to question 14)

11. In the past year, did you go for more than 30 days straight without smoking?

No (enter stage = 2; then go to question 14)
Yes (enter stage = 3; then go to question 14)

12. On a five point scale where one means that you are not sure at all and five means that you are totally sure, how sure are you that you could stay smoke free if you wanted to? ___ (enter number; then go to question 13)

13. Have you been smoke free for at least 3 months?

No (enter stage = 4; then go to question 14)
Yes (enter stage = 5; then go to question 14)

14. The Windsor-Essex County Health Unit is offering a new quit smoking program for people just like you. It was developed with the help of smokers and ex-smokers. The program comes in an easy to read booklet. All material is delivered through the mail so there are no meetings to attend and no hassles. You can complete it at your own pace and can stop the program at any time. It contains information to help you weigh the costs and benefits of quitting, prepare mentally and physically to stop smoking, and help you cope with urges to smoke. The program costs just 5 dollars. May I send you a copy of our booklet?

0. No - that's all the questions that I have. I'd like to thank you for completing our survey. (end)
1. Yes - (go to question 15)

15. May I have your name so we can send you our material?

    Name _____ ____

16. May I have your street address?

    _____ (incl. apartment)

17. May I have the name of the city or town that you live in?

    _____

18. May I have your postal code?

    _____

19. Are you:
    0. male
    1. female

20. What is your present age __ __ (enter age; max. 99)

    Your material will be mailed to you within two weeks and you will be billed when you receive the material. Thank you for completing the survey and best wishes with the program. (end)

Telemarketing Script for Stage Based Groups (recruitment groups 4 & 7)

1. Hello, may I please speak to _____ .

   0. No - (go to question 2)
   1. Yes - (go to question 3)

2. I'm calling on behalf of the Windsor-Essex County Health Unit. We are conducting a short survey on smoking in Essex County.

   Is there anyone over 18 years of age currently home that is a smoker or ex-smoker that could answer a few short questions?

   No (Thank you - end call)
   Yes - may I speak to them please? (go to question 3)

3. I'm calling on behalf of the Windsor-Essex County Health Unit. We are conducting a short survey on smoking in Essex County. May I ask you a few short questions? Your answers are confidential and it will take less than 2 minutes of your time.

   No - (go to question 2, part II)
   Yes - (go to question 4)

4. Our survey today is for people who are at least 18 years old, and who currently smoke or who have quit smoking within the last five years. Are you at least 18 and do you currently smoke or did you quit smoking within the last five years?

   No (go to question 2 part II.)
   Yes (go to question 5)

5. On a five point scale where one means you are not sure at all and five means you are totally sure, how sure are you that quitting smoking will help your life, such as your health, better relationships, etc. ___ (enter number; then go to question 6).

6. Have you smoked a cigarette, even a puff, in the last 7 days?
   0. No (go to question 12)
   1. Yes (go to question 7)

7. Using a five point scale where one means that you are not sure at all and five means that you are totally sure, how sure are you that you could successfully quit smoking if you wanted to? ___ (enter variable, then go to question 9).

8. Do you plan to quit smoking in the next 6 months?

No (enter stage = 1; then go to question 14a)
Yes (go to question 9)

9. Do you plan to quit smoking in the next 30 days?

No (go to question 11)
Yes (go to question 10)

10. Do you plan to quit smoking in the next 10 days?

No (enter stage = 3; then go to question 14c)
Yes (enter stage = 4; then go to question 14d)

11. In the past year, did you go for more than 30 days straight without smoking?

No (enter stage = 2; then go to question 14b)
Yes (enter stage = 3; then go to question 14c)

12. On a five point scale where one means that you are not sure at all and five means that you are totally sure, how sure are you that you could stay smoke free if you wanted to? ___ (enter number; then go to question 13)

13. Have you been smoke free for at least 3 months?

No (enter stage = 4; then go to question 14d)
Yes (enter stage = 5; then go to question 14d)

14a. The Windsor-Essex County Health Unit is offering a support program for smokers who like smoking. Our new program, called One Step at a Time, was developed with the help of smokers that understand its your choice whether you smoke. It consists of a short, easy to read booklet. All materials are delivered through the mail so there are no meetings to attend and no hassles. You read it at your own pace and can stop the program at any time. It contains information to help you deal with people who nag you to quit smoking. It helps you weigh the costs and benefits of smoking. It does <u>not</u> ask you quit smoking or provide information on how to quit. The booklet is free. May I send you a copy of our booklet?

0. No - that's all the questions that I have. I'd like to thank you for completing our survey.
1. Yes - (go to question 15).

14b. The Windsor-Essex County Health Unit is offering a program just for people like you who are thinking about quitting smoking. Our new program, called One Step at a Time, was developed with the help of people who successfully quit smoking. It consists of a short, easy to read booklet. All program material is delivered through the mail so there are no meetings to attend and no hassles. You read it at your own pace and can stop the program at any time. Our program will help weigh the pros and cons of quitting, show you how to get ready to quit, build your confidence, and help you develop a realistic plan so that you will be able to stop smoking once and for all. There is no cost for the program. May I send you a copy of our new booklet?

0 No - that's all the questions that I have. Thank you for completing our survey. (end call)
1. Yes - (go to question 15)

14c. The Windsor-Essex County Health Unit is offering a program just for people like you who are thinking about quitting smoking. Our new program, called One Step at a Time, was developed with the help of people who successfully quit smoking. It consists of a short, easy to read booklet. All program material is delivered through the mail so there are no meetings to attend and no hassles. You read it at your own pace and can stop the program at any time. Our program will help weigh the pros and cons of quitting, show you how to get ready to quit, build your confidence, and help you develop a realistic plan so that you will be able to stop smoking once and for all. The cost is just five dollars. May I send you a copy of our new booklet?

0. No - that's all the questions that I have. Thank you for completing our survey. (end call)
1. Yes - (go to question 15)

14d. The Windsor-Essex County Health Unit is offering a new program for people like you who want to stay smoke free for good. Our new program, called One Step at a Time, was developed with the help of people who have successfully quit smoking. It consists of a short, easy to read booklet. All materials are delivered through the mail so there are no meetings to attend and no hassles. You read it at your own pace and can stop the program at any time. Our new booklet will help you develop the coping skills and confidence that you will need to stay smoke free for ever. It provides information on how to deal with slips and ongoing temptations to smoke. The cost is just five dollars. May I send you a copy of our new booklet?

0. No - that's all the questions that I have. Thank you for completing our survey. (end call)
1. Yes - (go to question 15)

15. May I have your name so we can send you our material?

_____

16. May I have your street address?

_____ (incl. apartment)

17. May I have the name of the city or town that you live in?

_____

18. May I have your postal code?

_____

19. Are you:
0. male
1. female

20. What is your present age __ __ (enter age; max. 99)

Your material will be mailed to you within two weeks and you will be billed when you receive the material. Thank you for completing the survey and best wishes with the program. (end)

Appendix E
Intake questions for telephone orders

Telephone Intake Form

I'd like to begin by asking you a few questions. Your answers will help make sure that we send you the right materials and help us improve our program.

1. On a five point scale where one means you are not sure at all and five means you are totally sure, how sure are you that quitting smoking will help your life, such as your health, better relationships, etc.

   1 2 3 4 5

2. Have you smoked a cigarette, even a puff, in the last 7 days?

   0. No (go to question 8)
   1. Yes (go to question 3)

3. Using a five point scale where one means that you are not sure at all and five means that you are totally sure, how sure are you that you could successfully quit smoking if you wanted to?

   1 2 3 4 5

4. Do you plan to quit smoking in the next 6 months?

   No (enter stage = 1)
   Yes (go to question 5)

5. Do you plan to quit smoking in the next 30 days?

   No (go to question 7)
   Yes (go to question 6)

6. Do you plan to quit smoking in the next 10 days?

   No (enter stage = 3)
   Yes (enter stage = 4)

7. In the past year, did you go for more than 30 days straight without smoking?

   No (enter stage = 2)
   Yes (enter stage = 3)

8. On a five point scale where one means that you are not sure at all and five means that you are totally sure, how sure are you that you could stay smoke free if you wanted to?

   1 2 3 4 5

9. Have you been smoke free for at least 3 months?

   No (enter stage = 4)
   Yes (enter stage = 5)

10. Do you work at Chrysler?
    0 No
    1 Yes

11. As you may know from our promotional material and advertisements, some of the booklets are free and some cost five dollars each. To what extent did the cost of the program influence your decision to register in the program?
    0 Not at all
    1 Somewhat
    2 Quite a bit
    3 Completely
    4 Don't know

12. For persons in precontemplation and contemplation only.
    Your materials will be sent to you at no cost. However, how likely is it that you would have registered in the program if the materials had cost five dollars instead of being free?
    0 Very unlikely
    1 Somewhat unlikely
    2 Somewhat likely
    3 Very likely
    4 Don't know

13. What is your present age __ __ (enter age; max. 99)

14. May I have your name so we can send you our material?

    _____

15. What is your home address?

    Street _____ (incl. apartment)
    City/town _____

Postal code _____

16. Enter respondent's gender.
    0. male
    1. female

Your material will be mailed to you within two weeks (and you will be billed five dollars when you receive the material). Thank you for answering our questions. Best wishes with the program.

Appendix F
Post Campaign Survey Scripts

Post Survey Script for Mail Campaign (Groups 1 and 2)

1. Hello, may I please speak to _____.
   - 0 Not home/no answer (thank you and terminate call - max. 1 call back)
   - 1. Yes

2. Hello, I'm calling on behalf of a student researcher from the University of Waterloo. We are conducting a short survey on smoking in Windsor and Essex County. We are not selling anything or asking for donations. Rather, the information we are collecting will be used to improve the effectiveness of health programs. May I ask you a few short questions? Your answers will remain confidential and it will take less than 4 minutes of your time to complete.
   - 0 No (thanks and terminate call)
   - 1 Yes

3. Our survey today is for people who currently smoke or who have quit smoking within the last five years. Do you currently smoke or did you quit smoking within the past five years?
   - 0 No (thanks and terminate call)
   - 1 Yes

4. Have you smoked a cigarette, even a puff, in the last 7 days?
   - 0 No (go to question 8)
   - 1 Yes

5. Do you plan to quit smoking in the next 6 months?
   - 0 No (Stage = 1; Go to question 9)
   - 1 Yes

6. Do you plan to quit smoking within the next 30 days?
   - 0 No
   - 1 Yes (Stage = 3; Go to question 9)

7. Over the past year, did you go for more than 30 straight days without smoking?
   - 0 No (Stage = 2; Go to question 9)
   - 1 Yes (Stage = 3; Go to question 9)

8. Have you been smoke free for at least 3 months?
   - 0 No (Stage = 4)
   - 1 Yes (Stage = 5)

Over the past month, the Windsor Essex County Health Unit sent you a package in the mail describing a program for smokers and ex-smokers. It contained a letter from the Medical Officer of Health, a couple of small postage paid cards and one or more blue, red and white pamphlets that described the program. Do you remember receiving or reading at least some of this mail package, yes or no?

0 No (Go to question 17)
1 Yes

10. Can you tell me what you think the main point of the mail package was?
    0 No
    1 Yes (get smokers and/or former smokers to join/register in program)

11. Compared to other mail based advertising you receive , would you say the Health Unit's package was:
    0. Very boring
    1. Somewhat boring
    2. Neither boring or interesting
    3. Somewhat interesting
    4. Very interesting

12. Compared to other mail based advertising you receive, would you say the Health Unit's package was:
    0. Very poorly done
    1. Poorly done
    2. About the same
    3. Well done
    4. Very well done

13. As a result of seeing the mail package did you register in the program?
    0 No
    1 Yes (go to question 15)

14. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision not to register in it?
    0 Not at all
    1 Somewhat
    2 Quite a bit
    3 Completely

Go to question 17

15. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision to register in it?
    - 0 Not at all
    - 1 Somewhat
    - 2 Quite a bit
    - 3 Completely

16. For persons in precontemplation and contemplation only.
    Your materials have been sent to you at no cost. However, how likely is it that you would have registered in the program if the materials had cost five dollars instead of being free?
    - 0 Very unlikely
    - 1 Somewhat unlikely
    - 2 Somewhat likely
    - 3 Very likely
    - 4 Don't know

17. Over the last month, do you recall receiving some information in the mail on changes to Windsor's no-smoking policies? It contained a letter from the Chair of the Interagency Council on Smoking and Health, as well as a red and yellow brochure describing the program. Do you remember seeing or reading at least some of this mail package within the past month?
    - 0 No
    - 1 Yes

18. Record the gender of the caller
    - 0 Male
    - 1 Female

That's all the questions I have for you today. Thank you for your help.

Post Survey Script for the Telemarketing Campaign (Groups 3 and 4)

1. Hello, may I please speak to _____.
   - 0 Not home/no answer (thank you and terminate call - max. 1 call back)
   - 1. Yes

2. Hello, I'm calling on behalf of a student researcher from the University of Waterloo. A few days ago the Windsor-Essex County Health Unit conducted a telephone survey on tobacco use. We are randomly calling a few individuals to determine if they participated in this survey. We would like to ask you a few questions to evaluate how successful this survey was. We are not selling anything and we are not raising money. Rather, the information we are collecting will be used to improve the effectiveness of health programs. May we ask you a few short questions? Your answers will remain confidential and it will take less than 2 minutes of your time to complete.
   - 0 No (thanks and terminate call)
   - 1 Yes

   Since we are trying to determine the overall accuracy of our previous survey, it may be necessary to repeat some of the questions. We are not trying to test the accuracy of your responses. So, please be patient if you have already answered some of these questions

3. Our survey today is for people who currently smoke or who have quit smoking within the last five years. Do you currently smoke or did you quit smoking within the past five years?
   - 0 No (thanks and terminate call)
   - 1 Yes

4. Have you smoked a cigarette, even a puff, in the last 7 days?
   - 0 No (go to question 8)
   - 1 Yes

5. Do you plan to quit smoking in the next 6 months?
   - 0 No (Stage = 1; Go to question 9)
   - 1 Yes

6. Do you plan to quit smoking within the next 30 days?
   - 0 No
   - 1 Yes (Stage = 3; Go to question 9)

7. Over the past year, did you go for more than 30 straight days without smoking?
   0 No (Stage = 2; Go to question 9)
   1 Yes (Stage = 3; Go to question 9)

8. Have you been smoke free for at least 3 months?
   0 No (Stage = 4)
   1 Yes (Stage = 5)

9. Over the past month the Windsor-Essex County Health Unit conducted a telephone survey of Windsor-smokers and ex-smokers. It consisted of between five and ten questions. Part of the survey described a new program for smokers and ex-smokers that is available through the mail from the Health Unit. Do you recall whether you participated in this survey, yes or no?
   0 No (Go to question 17)
   1 Yes

10. Can you tell me what do you think the main purpose of the telephone survey was?
   0 No
   1 Yes - Collect information on smokers/former smokers
   2 Yes - Get smokers and/or former smokers to join/register in program

11. Compared to other telemarketing calls you receive , would you say the Health Unit survey was:
   0. Very boring
   1. Somewhat boring
   2. Neither boring or interesting
   3. Somewhat interesting
   4. Very interesting

12. Compared to other telemarketing calls you receive, would you say the Health Unit's package was:
   0. Very poorly done
   1. Poorly done
   2. About the same
   3. Well done
   4. Very well done

13. As a result of participating in the survey, did you register in the Health Unit's program for smokers or former smokers?
   0 No
   1 Yes (go to question 15)

14. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision not to register in it?

    0 Not at all
    1 Somewhat
    3 Quite a bit
    4 Completely

Go to question 17

15. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision to register in it?

    0 Not at all
    1 Somewhat
    3 Quite a bit
    4 Completely

16. For persons in precontemplation and contemplation only.
    Your materials have been sent to you at no cost. However, how likely is it that you would have registered in the program if the materials had cost five dollars instead of being free?

    0 Very unlikely
    1 Somewhat unlikely
    2 Somewhat likely
    3 Very likely
    4 Don't know

17. Over the past month the Windsor-Essex County Health Unit also conducted a telephone survey of Windsor and Essex County residents on their attitudes toward public policies on tobacco. It consisted of approximately ten questions asking people whether they wanted more or less smoking restrictions, their thoughts about tobacco taxes and so on. Do you recall whether you participated in this survey, yes or no?

    0 No
    1 Yes

18. Record the gender of the caller

    0 Male
    1 Female

That's all the questions I have for you today. Thank you for your help.

Post Survey Script for Media Campaign (Group 5)

1. Hello, may I please speak to _____.
   - 0 Not home/no answer (thank you and terminate call - max. 1 call back)
   - 1. Yes

2. Hello, I'm calling on behalf of a student researcher from the University of Waterloo. We are conducting a short survey on smoking in Windsor and Essex County. We are not selling anything and we are not asking for a donation. Rather, the information we are collecting will be used to improve the effectiveness of health programs. May I ask you a few short questions? Your answers will remain confidential and it will take less than 4 minutes of your time to complete.
   - 0 No (thanks and terminate call)
   - 1 Yes

3. Our survey today is for people who currently smoke or who have quit smoking within the last five years. Do you currently smoke or did you quit smoking within the past five years?
   - 0 No (thanks and terminate call)
   - 1 Yes

4. Have you smoked a cigarette, even a puff, in the last 7 days?
   - 0 No (go to question 8)
   - 1 Yes

5. Do you plan to quit smoking in the next 6 months?
   - 0 No (Stage = 1; Go to question 9)
   - 1 Yes

6. Do you plan to quit smoking within the next 30 days?
   - 0 No
   - 1 Yes (Stage = 3; Go to question 9)

7. Over the past year, did you go for more than 30 straight days without smoking?
   - 0 No (Stage = 2; Go to question 9)
   - 1 Yes (Stage = 3; Go to question 9)

8. Have you been smoke free for at least 3 months?
   - 0 No (Stage = 4)
   - 1 Yes (Stage = 5)

9. Over the past month, the Windsor Essex County Health Unit ran a series of television, radio and newspaper ads about a program called One Step at a Time. The advertisements were directed at three types of smokers: those who enjoy smoking and don't want to quit, smokers who are thinking about quitting, and former smokers who want to stay smoke free. In some of the radio and TV ads a researcher asks a group of smokers about what kind of quit smoking program they would like. In a second ad, two smokers outside in the cold talk about quitting. The third ad is about a woman at work who is struggling to stay smoke free. Do you remember seeing or hearing one or more of these advertisements within the past month, yes or no?

    0 No (go to question 17)
    1 Yes

10. Can you tell me what you think the main point of the ads were?

    0 No
    1 Yes (get smokers and/or former smokers to join/register in program)

11. Compared to other media advertisements, would you say the Health Unit's campaign was:

    0. Very boring
    1. Somewhat boring
    2. Neither boring or interesting
    3. Somewhat interesting
    4. Very interesting

12. Compared to other media advertisements, would you say the Health Unit's campaign was:

    0. Very poorly done
    1. Poorly done
    2. About the same
    3. Well done
    4. Very well done

13. As a result of seeing the advertisement, did you register in the program?

    0 No
    1 Yes (go to question 15)

14. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision not to register in it?

    0 Not at all
    1 Somewhat
    2 Quite a bit
    3 Completely

Go to question 17

15. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision to register in it?

    0 Not at all
    1 Somewhat
    2 Quite a bit
    3 Completely

16. For persons in precontemplation and contemplation only.
    Your materials have been sent to you at no cost. However, how likely is it that you would have registered in the program if the materials had cost five dollars instead of being free?

    0 Very unlikely
    1 Somewhat unlikely
    2 Somewhat likely
    3 Very likely
    4 Don't know

17. Over the last month, do you recall seeing a series of radio, television and newspaper advertisements about recent changes to the City of Windsor's no-smoking policies. One ad featured a man sitting on a bench at a mall while a second advertisement depicted a child changing from a frown to a smile as the air around him cleared. Do you remember seeing or hearing one or more of these advertisements on radio, television, or in the Windsor Star within the past month?

    0 No
    1 Yes

18. Record the gender of the caller

    0 Male
    1 Female

That's all the questions I have for you today. Thank you for your help.

Post Survey Script for Combined Mail and Media Campaign (Group 6)

1. Hello, may I please speak to _____.
   - 0 Not home/no answer (thank you and terminate call - max. 1 call back)
   - 1. Yes

2. Hello, I'm calling on behalf of a student researcher from the University of Waterloo. We are conducting a short survey on smoking in Windsor and Essex County. We are not selling anything or asking for donations. Rather, the information we are collecting will be used to help us improve the effectiveness of health programs. May I ask you a few short questions? Your answers will remain confidential and it will take less than 4 minutes of your time to complete.
   - 0 No (thanks and terminate call)
   - 1 Yes

3. Our survey today is for people who currently smoke or who have quit smoking within the last five years. Do you currently smoke or did you quit smoking within the past five years?
   - 0 No (thanks and terminate call)
   - 1 Yes

4. Have you smoked a cigarette, even a puff, in the last 7 days?
   - 0 No (go to question 8)
   - 1 Yes

5. Do you plan to quit smoking in the next 6 months?
   - 0 No (Stage = 1; Go to question 9)
   - 1 Yes

6. Do you plan to quit smoking within the next 30 days?
   - 0 No
   - 1 Yes (Stage = 3; Go to question 9)

7. Over the past year, did you go for more than 30 straight days without smoking?
   - 0 No (Stage = 2; Go to question 9)
   - 1 Yes (Stage = 3; Go to question 9)

8. Have you been smoke free for at least 3 months?
   - 0 No (Stage = 4)
   - 1 Yes (Stage = 5)

9. Over the past month, the Windsor Essex County Health Unit sent you a package in the mail describing a program for smokers and ex-smokers. It contained a letter from the Medical Officer of Health, a couple of small postage paid cards and one or more blue, red and white pamphlets that described the program. Do you remember receiving or reading at least some of this mail package, yes or no?

    0 No
    1 Yes

10. Over the past month, the Windsor Essex County Health Unit ran a series of television, radio and newspaper ads about a program called One Step at a Time. The advertisements were directed at three types of smokers: those who enjoy smoking and don't want to quit, smokers who are thinking about quitting, and former smokers who want to stay smoke free. In some of the radio and TV ads a researcher asks a group of smokers about what kind of quit smoking program they would like. In a second ad, two smokers outside in the cold talk about quitting. The third ad is about a woman at work who is struggling to stay smoke free. Do you remember seeing or hearing one or more of these advertisements on radio, television, or in the Windsor Star within the past month, yes or no?

    0 No (go to question 15)
    1 Yes

11. As a result of seeing the mail package or the media advertisements did you register in the program?

    0 No
    1 Yes (go to question 13)

12. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision not to register in it?

    0 Not at all
    1 Somewhat
    2 Quite a bit
    3 Completely

Go to question 15

13. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision to register in it?

    0 Not at all
    1 Somewhat
    2 Quite a bit
    3 Completely

14. For persons in precontemplation and contemplation only.
Your materials have been sent to you at no cost. However, how likely is it that you would have registered in the program if the materials had cost five dollars instead of being free?

    0 Very unlikely
    1 Somewhat unlikely
    2 Somewhat likely
    3 Very likely
    4 Don't know

15. Over the last month, do you recall receiving some information in the mail on changes to Windsor's no-smoking policies? It contained a letter from the Chair of the Interagency Council on Smoking and Health, as well as a red and yellow brochure describing the program. Do you remember seeing or reading at least some of this mail package within the past month?

    0 No
    1 Yes

16. Over the last month, do you recall seeing a series of radio, television and newspaper advertisements about recent changes to the City of Windsor's no-smoking policies. One ad featured a man sitting on a bench at a mall while a second advertisement depicted a child changing from a frown to a smile as the air around him cleared. Do you remember seeing or hearing one or more of these advertisements on radio, television, or in the Windsor Star within the past month?

    0 No
    1 Yes

17. Record the gender of the caller

    0 Male
    1 Female

That's all the questions I have for you today. Thank you for your help.

Post Survey Script for the Combined Telephone and Media Campaign (Group 7)

1. Hello, may I please speak to _____.
   0 Not home/no answer (thank you and terminate call - max. 1 call back)
   1. Yes

2. Hello, I'm calling on behalf of a student researcher from the University of Waterloo. A few days ago the Windsor-Essex County Health Unit conducted a telephone survey on tobacco use and conducted a media campaign on a smoking program. We are randomly calling a few individuals to determine if they participated in this survey or are familiar with the media campaign. We would like to ask you a few questions to evaluate how successful our efforts were. We are not selling anything and we are not raising money. Rather, the information we are collecting will be used to improve the effectiveness of health programs. May we ask you a few short questions? Your answers will remain confidential and it will take less than 2 minutes of your time..
   0 No (thanks and terminate call)
   1 Yes

   Since we are trying to determine the overall accuracy of our previous survey, it may be necessary to repeat some of the questions. We are not trying to test the accuracy of your responses. So, please be patient if you have already answered some of these questions

3. Our survey today is for people who currently smoke or who have quit smoking within the last five years. Do you currently smoke or did you quit smoking within the past five years?
   0 No (thanks and terminate call)
   1 Yes

4. Have you smoked a cigarette, even a puff, in the last 7 days?
   0 No (go to question 8)
   1 Yes

5. Do you plan to quit smoking in the next 6 months?
   0 No (Stage = 1; Go to question 9)
   1 Yes

6. Do you plan to quit smoking within the next 30 days?
   0 No
   1 Yes (Stage = 3; Go to question 9)

7. Over the past year, did you go for more than 30 straight days without smoking?
   0 No (Stage = 2; Go to question 9)
   1 Yes (Stage = 3; Go to question 9)

8. Have you been smoke free for at least 3 months?
   0 No (Stage = 4)
   1 Yes (Stage = 5)

9. As I mentioned earlier, over the past month the Windsor-Essex County Health Unit conducted a telephone survey of Windsor-smokers and ex-smokers. It consisted of between five and ten questions. Part of the survey described a new program for smokers and ex-smokers that is available through the mail from the Health Unit. Do you recall whether you participated in this survey, yes or no?
   0 No
   1 Yes

10. Over the past month, the Windsor Essex County Health Unit ran a series of television, radio and newspaper ads about a new program called One Step at a Time. The advertisements were directed at three types of smokers: those who enjoy smoking and don't want to quit, smokers who are thinking about quitting, and former smokers who want to stay smoke free. In some of the radio and TV ads a researcher asks a group of smokers about what kind of quit smoking program they would like. In a second ad, two smokers outside in the cold talk about quitting. The third ad is about a woman at work who is struggling to stay smoke free. Do you remember seeing or hearing one or more of these advertisements on radio, television, or in the Windsor Star within the past month, yes or no?
   0 No (go to question 15)
   1 Yes

11. As a result of seeing the advertisements or participating in the telephone survey, did you register in the program?
   0 No
   1 Yes (go to question 13)

12. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision not to register in it?
   0 Not at all
   1 Somewhat
   3 Quite a bit
   4 Completely

Go to question 15

13. As you may recall, some of the booklets being offered were free and some cost five dollars. To what extent did the cost of the program influence your decision to register in it?
    - 0 Not at all
    - 1 Somewhat
    - 3 Quite a bit
    - 4 Completely

14. For persons in precontemplation and contemplation only.
    Your materials have been sent to you at no cost. However, how likely is it that you would have registered in the program if the materials had cost five dollars instead of being free?
    - 0 Very unlikely
    - 1 Somewhat unlikely
    - 2 Somewhat likely
    - 3 Very likely
    - 4 Don't know

15. Over the last month, do you recall seeing a series of radio, television and newspaper advertisements about recent changes to the City of Windsor's no-smoking policies. One ad featured a man sitting on a bench at a mall while a second advertisement depicted a child changing from a frown to a smile as the air around him cleared. Do you remember seeing or hearing one or more of these advertisements on radio, television, or in the Windsor Star within the past month?
    - 0 No
    - 1 Yes

16. Over the past month the Windsor-Essex County Health Unit also conducted a telephone survey of Windsor and Essex County residents on their attitudes toward public policies on tobacco. It consisted of approximately ten questions asking people whether they wanted more or less smoking restrictions, their thoughts about tobacco taxes and so on. Do you recall whether you participated in this survey, yes or no?
    - 0 No
    - 1 Yes

17. Record the gender of the caller
    - 0 Male
    - 1 Female

That's all the questions I have for you today. Thank you for your help.

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