A Recommended Population Strategy to Help Canadian Tobacco Users

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1.0 Introduction

The majority of interventions for current tobacco users have focused on the provision of clinical or individual interventions. For example, clinical guidelines for the treatment of nicotine dependency encourage brief counseling and the provision of pharmacotherapy to the vast majority of smokers (Fiore, Cohen, Bailey et al, 2000). However, such an approach has important limitations (McDonald, 2003). An alternative is to approach the problem from a population health perspective. Population strategies seek to reduce the negative effects of tobacco across a population and reduce disparities in the burden of tobacco use borne by sub-groups within populations. These goals are accomplished by addressing broad determinants of tobacco use and increasing overall equitable access to programmatic and policy initiatives.

Like its companion paper, this document is designed to stimulate discussion on the creation of a population strategy to reduce the future health and economic burden of tobacco use among current tobacco users in Canada. The companion paper provided a rationale for such an approach, briefly profiled current tobacco users, critically reviewed existing intervention approaches and discussed why a population strategy must move beyond strictly bio-medical models for the treatment of nicotine dependency (McDonald, 2003). This paper offers a set of potential goals, objectives, actions, and budget estimates, and responsibilities that might form the basis of a comprehensive national strategy to help current tobacco users.

2.0 Recommended Goals and Objectives for National Action Strategy

Consistent with a population approach, and for reasons discussed in the companion document (McDonald, 2003), the recommended goals of a Canadian strategy for helping tobacco users should be to:

(i) Help established tobacco users in a manner which maximally and efficiently reduces the current and future health and economic burden associated with their tobacco use;
(ii) Reduce significant disparities in the health related burden of tobacco use among sub-populations.

The following objectives are proposed as a means of meeting these goals:

(a) Within three years, increase the proportion of established tobacco users who make at least one serious quit attempt each year from approximately 50 per cent to 67 per cent.

(b) Within two years, develop a simple, standardized triage system to assist tobacco users and treatment providers to identify “appropriate” treatment aids. Appropriate is defined as an intervention which is effective, satisfactory to the user, and enables existing resources to be used in a manner that maximally reduces the burden of tobacco use across the population of users.

(c) Within three years, increase the proportion of quitters who use appropriate treatment aids (e.g., self help, telephone helpline, brief professional advice, group counseling, or specialized clinic) from approximately 15 per cent to a *minimum* of 40 per cent.

(d) Within five years, reduce the average age that tobacco users quit from approximately 49 years to 45 years and the average number of years tobacco users consume tobacco products from approximately 36 years to 32 years.

(e) Within three years, improve intervention access, use and effectiveness for important subpopulations of tobacco users including 15 to 24 year olds, aboriginals, persons diagnosed with mental health or substance abuse disorders, and persons living in households from the bottom quartile of income and education.

(f) Within three years decrease the number of tobacco users who are exposed on a weekly basis to social and environmental cues to use tobacco products (e.g., ETS in the home, work and in public places; marketing powerwalls, etc.).

(g) Within three years, increase overall treatment capacity by 350 per cent (relative to current capacity).

(h) Within two years, improve the ability of relevant researchers and decision makers to collect and use data to enhance accountability, quality, effectiveness, cost efficiency, customer satisfaction, and innovation.

2.1 Expected Impact

The objectives were selected with the aim of increasing the number of tobacco users who quit by a minimum of 100 per cent over a three year period (Table 1). Based on the current number of smokers, this would have the effect of reducing the prevalence of smoking by an additional two per cent per year (i.e., 2 per cent more than current declines). In addition to the number of tobacco users who quit, additional benefits are expected to come from the estimated 25 per cent of attempted quitters who significantly reduce their tobacco consumption. Additional reductions in the tobacco burden would come from reducing the average age of quitters or reducing their average length of tobacco use. A three year time frame was selected since it will take time to develop and implement policy, as well as increase system capacity (see section 5.0).

Table 1. Theoretical impact if the proposed objectives are met. The table assumes the number of tobacco users will remain constant at 5.4 million.

Variable	Current	Proposed
Number of tobacco users who try to quit each year	2,700,000	3,618,000
Number of tobacco users who utilize one or more quit aids	405,000	1,447,200
Number who quit using a quit aid (per year)	32,400[1]	144,720[2]
Number who quit on their own (per year)	68,850[3]	65,124[3]
Total number who quit (per year)	101,250	209,844

Notes:

[1]Based on an average quit rate of 8%. The estimate is lower than rates obtained in standard meta-analyses because meta-analyses largely include short term efficacy trials rather than long term effectiveness trials.

[2]Based on an average quit rate of 10%. The effectiveness has been increased from current rates because of the effect of the algorithm for triaging clients.

[3]Based on a quit rate of 3%.

3.0 Recommended Actions

A complementary set of actions will be required to achieve the recommended goals and objectives. Specifically, we will require a combination of *policies* to motivate tobacco users to quit, and quitters to remain abstinent; *communications* to motivate tobacco users to quit and use appropriate services; *programs and products* to improve tobacco users' access to effective and appropriate behavioral, social, and pharmacological support; methods to improve *coordination* across programs and products; interventions to *build capacity* in the treatment system; research, evaluation, monitoring and surveillance to *improve decision making and accountability.*

We desperately require new research to better understand the determinants of quitting, particularly among youth, aboriginals, those with low incomes, persons with psychiatric or substance abuse disorders, and persons who smoke on a less than daily basis or only a few cigarettes per day (see section 4.0). New research must lay the foundation for novel policies, communications, and treatments that are sensitive to the unique experiences and circumstances associated with these groups. Moreover, we must develop a more through understanding of how other broader policies and communications affect the ability of tobacco users to quit. For example, how might social transfer polices (e.g., disability insurance, welfare, employment insurance), housing policies, urban planning, child care, funding for post-secondary education, and access to illness care impact on quitting? Surprisingly little is known about these relationships.

3.1 Implement Policies to Motivate and Support Tobacco Users

Policy is a highly effective instrument with the potential for high exposure at low cost. While the focus should be on federal, provincial and regional/municipal policy, we should not overlook

the importance of policies that are created and adopted by employers, community organizations, and individual citizens. Most of the recommended policies are not new to the field of tobacco control. We need to alter the way we rationalize these policies. In the past, policies such as increased taxes on tobacco products and no-smoking restrictions have been regarded as measures to prevent non-smokers from starting to smoke. They are thought, by many, to be hostile towards smokers. However, closer examination reveals that many policies may actually benefit tobacco users and recent ex-users as much or more than non-users. Therefore, we need to frame policies in a way that highlights the fact that they create supportive environments for current tobacco users by increasing their motivation to quit, reducing confusion about various tobacco and cessation oriented products, as well as reducing social and environmental cues to use tobacco. Moreover, while positive attitudes and behaviours toward quitting may lead to advances in policy, we must not forget that well timed policies can also shape attitudes and behaviours.

A comprehensive policy agenda should include the following:

3.1.1 Legislation for smoke free public places and workplaces

Smoke free places can provide powerful motivation and support to smokers (Farkas, Gilpin, Distefan and Pierce, 1999). Given that the risk of illness is much greater in smokers than non-smokers exposed to environmental tobacco smoke, and given that no-smoking restrictions can significantly help smokers to quit, it is conceivable that no-smoking restrictions in public places may actually have more positive population health impacts on smokers than non-smokers. In any case, greater efforts are needed to promote no-smoking restrictions as effective tools for supporting the majority of smokers who want to quit, former smokers who are trying to remain smoke free, and never smokers. To avoid a patchwork of policies that differ across communities, it is imperative that the tobacco control community advocate for provincial governments to take a lead in adopting and enforcing strong legislation.

3.1.2 Increased Tobacco Taxes

There is increasing evidence that raising the price of tobacco through taxes can motivate tobacco users to quit or reduce, as well as help them remain abstinent. For example, in the 2001 Canadian Tobacco Use Monitoring Survey (CTUMS), eight percent of former smokers over age 24 spontaneously suggested that the increased cost of tobacco was a *major* reason for their decision to quit (Health Canada, 2002). This is nearly three times the proportion who reported quitting because of a doctor's advice.

It is recommended that federal and provincial taxes be raised by a *minimum* of 10 per cent in year two and three of the strategy. The total estimated revenue from such an increase would be approximately $400 million. The greatest provincial increases should occur in Ontario, Quebec, Yukon, Prince Edward Island, New Brunswick and Nova Scotia where the June 2002 cost of a carton of cigarettes were below the provincial and territorial average of $63.72. Concerns about increases in contraband products from the United States are unfounded since prices in jurisdictions such as New York are over $75.00 per carton (Ontario Tobacco Research Unit, 2002).

One potential concern is that raising the price of a potentially addictive product may inadvertently place a greater health burden on lower income groups because they are forced to cut expenditures in areas such as food, housing and medical care. Since tobacco taxes are not tied to income they clearly have the potential to be regressive. However, at least three studies have found that tobacco tax increases are correlated with social class and income, with the lowest classes and incomes more likely to reduce their consumption (Chaloupka, 1991; Farrelly and Bray, 1998; Townsend, Roderick and Cooper, 1994). However, Warner (2000) warns that the evidence of a net benefit for low income groups is still thin. Until more definitive research has been conducted, recommendations for tobacco tax increases should, at the very least, be accompanied by new programs and policies to assist low income tobacco users to quit and address other important determinants of health. Increasing money transfers might offset the effect of the tax increase. Therefore, it may be necessary to invest in programs that directly target important determinants such as child care, housing, and education.

3.1.3 Continue to enhance warning labels on tobacco packaging

Warning labels are a nearly perfect marketing vehicle for reaching smokers. Recent research has demonstrated that well designed warning labels can improve smokers' intentions to quit and may enhance their ability to remain smoke free (Hammond, Fong, McDonald et al, submitted). While Canada has had a history of introducing progressive warning labels, there is still more than can be done, particularly with respect to aiding current tobacco users (Strahan, White, Fong et al., 2002). First, each tobacco package should carry a toll free telephone number that will connect callers to a comprehensive smokers' helpline with information, support and counseling. As shown in Figure 1, the introduction of a toll free counseling number on cigarette packages in the Netherlands produced a massive increase in the number of smokers who called a smokers' helpline (Willemsen, Simons and Zeeman, 2002).

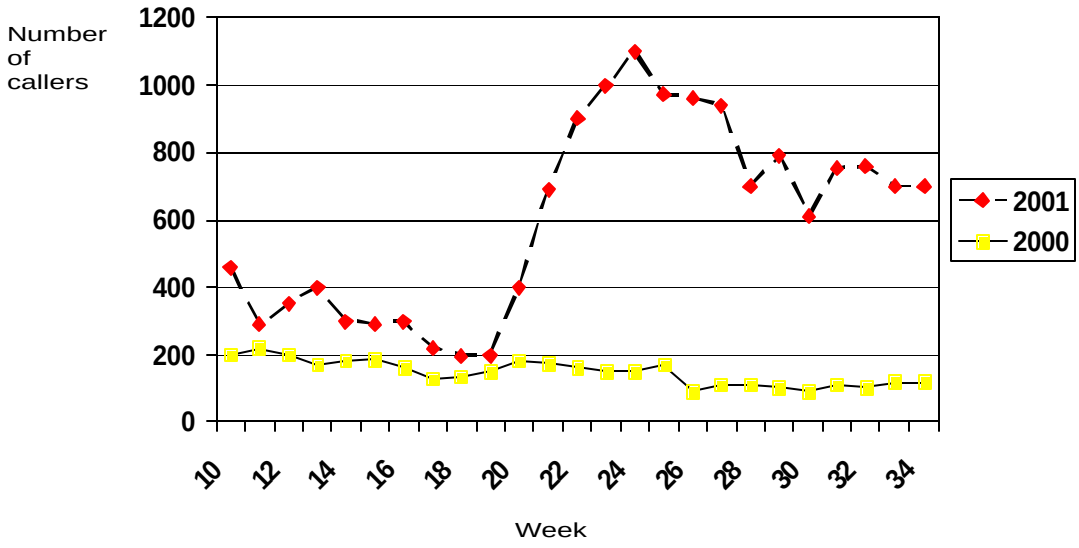

Figure 1. Number of calls per week to the Dutch quitline before and after the introduction of health warnings on cigarette packages with the toll free telephone number of a quitline. From: Willemsen, Simons and Zeeman, 2002.

Current messages should be rotated every couple of years. Novel messages will increase depth of processing which in turn increases intentions to quit (Hammond et al, submitted). Inside messages must be made more salient. They should also be developed in a manner more consistent with prevailing social psychological theory for changing behaviour (Strahan, White, Fong et al., 2002; Witte and Allen, 2000). Exterior messages should be comprehensively tested with current tobacco users to ensure they are not demoralizing. Warning labels should be extended to all forms of tobacco products including smokeless tobacco.

Altering tobacco packaging is the responsibility of the federal government. It is commendable, therefore, that at the writing of this paper, Health Canada was attempting to address some of the issues raised here.

3.1.4 Increase the regulation of tobacco products

Despite its unique status as the only product legally sold in Canada that causes death when used as intended, the design of tobacco products remains almost entirely unregulated. In fact, we have more regulations on how tobacco can be marketed than we do on the actual products themselves. Tobacco manufacturers should be required to reduce components which make tobacco products more harmful. Recent proposals by Health Canada to require manufacturers to produce fire safe cigarettes are another example. Others are to reduce tar and to reduce additives which speed up the rate of nicotine uptake and metabolism (Waller and Froggatt, 1996). Tobacco products must be declared a hazardous product. To continue to let tobacco manufacturers operate outside of the constraints of the Hazardous Products Act or other new legislation is misleading and confusing to consumers. At the very least, tobacco products and non-therapeutic nicotine delivery devices must be subject to *at least* the same regulatory constraints as therapeutic devices such as nicotine replacement therapy. While the ultimate responsibility for these changes rest with the federal government, the entire tobacco control community must advocate for them.

3.1.5 Re-label nicotine replacement products

Unlike tobacco products, treatments and communication campaigns to help smokers are subject to extensive regulation (Sweanor, 1999). One of the most highly regulated is use of nicotine replacement therapies which were approved for use 20 years ago. Since that time a large body of evidence has accumulated which show these products are much safer over a wider range of circumstances than was initially known (Ontario Medical Association, 1999). Warnings and restrictions must be altered to reflect this new reality since a recent study found that these overly cautious warnings may be discouraging tobacco users from using or adhering to treatment protocols (Etter, 2003).

Changing the regulations is ultimately the responsibility of the federal government. However, the entire tobacco control community must advocate for these changes.

3.1.6 Eliminate deceptive labeling practices

Tobacco manufacturers continue to label tobacco products as light and mild. A substantial body of research has shown that consumers mistakenly believe products labeled in this fashion are not as dangerous or addictive (Etter, Kozlowski and Perneger, 2003). Many believe that switching to brands labeled as light and mild is a satisfactory alternative to quitting or reducing their tobacco use (Health Canada, 2002). Once again, responsibility for this policy rests with the federal government, but all members of the tobacco control community must be advocates.

3.1.7 Regulate the placement of tobacco products

Sensory cues can provide a powerful stimulus to use tobacco or relapse from abstinence. The tobacco industry uses this principle as part of its marketing activities. For example, they construct "power walls" of cigarettes and desk top displays at variety and grocery stores. Reducing these cues by passing regulations prohibiting in store ads may make it easier for individuals to maintain abstinence from tobacco.

The province of Saskatchewan has demonstrated leadership in this area. It is now incumbent upon tobacco advocates in other regions to encourage their provinces and territories to follow suit.

3.1.8 Provide *selective* reimbursement for approved pharmacotherapies

The universal reimbursement for nicotine replacement therapy and other pharmacotherapies may not represent the most cost efficient strategy. Adopting a policy which reimburses all tobacco users has the potential to consume a vast proportion of overall resources dedicated to tobacco control. While reimbursement tends to increase the number of tobacco users who make quit attempts using NRT, it does not consistently increase the number of tobacco users who successfully quit (Boyle, Solberg, Magnan et al, 2002; Schauffler, McMenamin, Olson et al, 2001). The reason may be that increases in utilization and quit attempts are greatest among those least likely to benefit (Pierce and Gilpin, 2002). An alternative is to reimburse tobacco users who stand a reasonable chance of benefiting from pharmacotherapy or who have unsuccessfully tried more cost efficient treatments. Rather than attempt to provide a less than optimal duration of treatment for all tobacco users (as the Health Authority has done in the UK), emphasis should be placed on ensuring that qualified tobacco users attempting to quit can obtain up to12 weeks of treatment per year. If we assume that 67 per cent of current tobacco users will try to quit in a given year and that 25 per cent of these individuals would qualify for and seek reimbursement (each year) for an *average* of 3.5 weeks of therapy at $15/wk, then the total estimated cost across Canada will be $47.5 million per year. A premium of five per cent should be added to cover the costs of administering the program bringing the final amount required to $49.9 million per year ($9.24 per smoker). The provision of nicotine replacement products could be done through provincial helplines. Helplines could administer means tests, distribute either vouchers or NRT products and maintain utilization records. Physicians and/or pharmacists would need to be involved in the distribution of vouchers for buproprion. While reimbursement plans might also eventually be extended to nortriptyline and clonidine, they would first have to receive Health Canada approval as recognized treatments for nicotine dependency. Provincial ministries of

health should follow the lead of Quebec and Prince Edward Island in funding selective reimbursement programs.

3.1.9 Initiate litigation against the tobacco industry

The need for and investment in tobacco control was substantially enhanced in the United States as a result of aggressive legal action directed at the tobacco industry. The general public, and especially tobacco users, became much more informed about how they were manipulated by the tobacco industry and how there was blatant disregard for public health. Launching aggressive legal cases to recover costs associated with tobacco use could have the same effect in Canada. However, it is imperative that a considerable portion of the revenue obtained from such actions be directed toward helping tobacco users to quit or reduce their tobacco use.

3.2 Develop and Evaluate a Method to Triage Treatment Users

It is clear that when it comes to treatment for tobacco users one size does NOT fit all. Clinical guidelines generally suggest providing relatively intensive treatments to virtually all tobacco users. However, as discussed in the companion paper (McDonald, 2003), this is cost inefficient and potentially demoralizing to those who do not succeed in the quit attempt. With limited resources this means that we will be able to help fewer tobacco users each year thereby compromising our ability to reduce the population health burden associated with tobacco use. The range of current treatment options for smokers may be confusing.

An alternative approach involves the use of standardized triage tools to match smokers to the most appropriate treatment (Abrams, Orleans, Niaura et al., 1996). The format of one potential algorithm is shown in Figure 2. It is based on two types of evidence. First, the most significant factors which affect the odds of quitting include the presence of certain co-morbid conditions (especially schizophrenia, mood disorders, other types of substance abuse/dependency), intentions to quit, level of nicotine dependency, and various psycho-social factors such as social support, stress, outcome expectancy and self efficacy (Fiore, Bailey, Cohen at et al, 2000; Abrams, Orleans, Niaura et al, 1996). Second, a recent review by McKnight and McDonald (in progress) found that the quit rates for different treatment approaches (e.g., self-help, brief counseling by health professionals, telephone counseling, group counseling, pharmacotherapy) varies according to many of these same factors. For example, Niaura, Goldstein and Abrams (1994) found that smokers with low levels of nicotine dependency actually have *lower* quit rates if they received nicotine replacement (NRT) plus self-help, compared to those who just received self-help. In contrast, smokers with high levels of nicotine dependency did significantly better when they received NRT and counseling compared to self-help alone.

In addition to initially matching smokers to treatment, the algorithm might also serve as the basis of "stepped care" (Abrams, Orleans, Niaura et al., 1996; Niaura and Abrams, 2002). Stepped care is a procedure whereby an individual who has been previously unsuccessful with a lower intensity intervention would be referred to progressively intensive interventions until they remain abstinent from tobacco, or run out of additional treatment options.

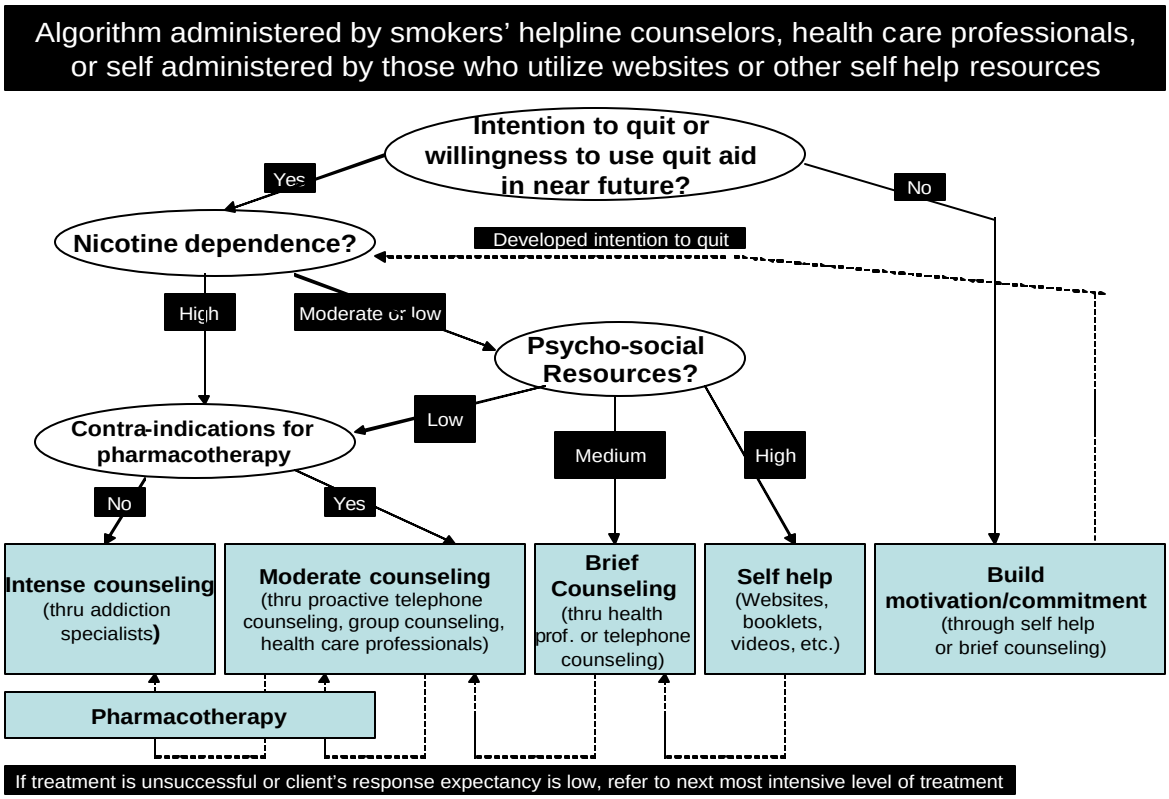

Figure 2. Pictorial representation of the potential decision algorithm.

While matching and stepped care makes sense in theory, relatively few studies have evaluated it (Fiore, Bailey, Cohen et al., 2000). The few studies which exist have found modest support for matching and stepped care (e.g., Reid, Pipe and Dafoe, unpublished; Smith, Jorenby, Fiore et al., 2001). Therefore, additional work is required to design and validate one or more triage systems. Health Canada has recently funded researchers from the University of Waterloo and the University of Prince Edward Island to undertake this important project. Results are expected in mid 2005. Total development and research costs from Health Canada and other sources are expected to be approximately one million dollars over four years, plus approximately $250,000 per year to implement the algorithm.

3.2.1 How the algorithm might work

Once validated, the algorithm would work in the following way. Mass media campaigns would direct tobacco users to call smokers' helplines across Canada. Helpline counselors would then use the algorithm to determine what level or type of treatment is most suitable for the caller and then make a referral (where necessary). Health care professionals who are approached for help or who proactively advise patients to quit using tobacco would also use the algorithm to determine the most suitable type of treatment and make an appropriate referral. Compliance in using the tool is expected to be high because it would be brief and simple to administer. Moreover, it would relieve pressure on health professionals to counsel all patients. The tool

would indicate which patients are suitable for a brief intervention and/or pharmacotherapy. Counseling could be done by either the health professional themselves or they could refer the patient to a smokers' helpline. Finally, the algorithm could be self administered. For example, the algorithm could be incorporated into website assessments, self-help booklets and other self-administered tools.

It is important to note that the algorithm is not intended to replace a thorough clinical assessment. Rather, it is designed solely for ensuring that tobacco users receive the right level of treatment. Once the person begins an appropriate treatment it will still be necessary to ask additional assessment questions such as perceived barriers to quitting, potential resources for quitting, etc.. The algorithm also does not relieve the need for health care professionals to ask patients about tobacco use and advise them to quit. Finally, a significant advantage of the algorithm is that it does not displace existing quit aids in a community. Rather, the algorithm is a device for turning relatively independent providers into a co-ordinated system of care.

3.3 Expand the Implementation of Effective Treatments

For reasons of cost efficiency, provider satisfaction, as well as consumer satisfaction and access, we require an array of treatment approaches that vary in intensity (a few minutes of contact to a few hours of contact), target (biological processes, cognitive processes) and format (self-help, telephone based, person to person) (Owen and Davies, 1990). Given evidence supporting their effectiveness, particular emphasis should be put on *tailored, theory based self-help initiatives* (web based, print, etc.), *brief counseling by health professionals* (especially physicians, dentists/hygienists, nurses, pharmacists), *telephone helplines* (including proactive and reactive counseling) *pharmacotherapy* (especially NRT, buproprion SR, clonidine, and nortriptyline), *group counseling, peer support/mutual aid, and specialized individual counseling* by qualified addiction specialists. Due to insufficient evidence of effectiveness (e.g., Fiore, Cohen, Bailey, et al, 2000), it is recommended that public funds not be used to support treatments such as hypnosis, laser therapy, acupuncture, herbal or clove cigarettes, or pharmacotherapies other than those listed above.

3.3.1 Required treatment capacity

The proportion of tobacco users who will need and seek out each treatment is largely unknown. The distribution of variables such as nicotine dependency and self efficacy suggest that approximately 20 per cent will require intense behavioural interventions (e.g., group and specialized counseling), 25 to 30 per cent will require moderately intense interventions (e.g., proactive telephone counseling), 25 to 30 per cent will require brief interventions while self-help interventions will be indicated for the remaining 20 to 25 per cent (McDonald, 2003). However, these variables do not tell the whole story. Actual utilization rates will be effected because not all services are available in all regions (especially specialized counseling and group programs); smokers with higher levels of dependency and lower self efficacy and social support are more likely to seek out treatment; smokers tend to prefer to use formats that are more flexible and convenient (e.g., self help and brief counseling); many people will already have tried unsuccessfully to use lower intensity interventions (e.g., self help or brief counseling), and

individuals may utilize more than one type of treatment in a given year (because combination therapy is required or they attempt to quit more than once in a 12 month period). Therefore, cost estimates in this paper are based on the assumption that of the 1,447,200 tobacco users we want to seek assistance each year, 10 per cent (144,720) will utilize intensive specialized counseling, 5 per cent (72,360) will utilize group counseling, 20 per cent (289,440) will utilize proactive telephone counseling, 20 per cent (289,440), will utilize reactive telephone counseling, 20 per cent (289,440) will utilize brief professional advice (over and above asking, advising and assessing), and 40 per cent (578,880) will utilize self help resources. Percentage totals exceed 100 because some individuals may utilize more than one service in a given year. Each major component of the treatment system is discussed in more detail below.

3.3.2 Telephone helplines

Because of their low cost and high accessibility, helplines should serve as a primary contact and central coordinating mechanism for the treatment system. A comprehensive helpline should include: answering basic inquires about tobacco use and cessation, assisting callers to identify appropriate treatments (using the algorithm described above), referring callers to appropriate treatments, order fulfillment for approved self-help booklets and other resources, reactive telephone counseling for cessation, "proactive" call backs and counseling, as well as distributing nicotine replacement products or vouchers to appropriate people.

The recommended budget allocation is based on the following assumptions. Helplines would receive 289,440 requests for 20 minutes of reactive counseling at $58/hr.; 289,440 requests for four - 15 minute proactive counseling sessions at $58/hr.; 150,000 four minute calls for information, referral, order fulfillment, NRT, etc. at $58/hr. The figure of $58/hr is based on a staff salary of $45,000/yr, plus 20 per cent of salary for benefits, 20 per cent of staff salary for supervision and administrative support, 30 per cent of salary for indirect costs, evaluation, and materials, and an additional allowance of 30 per cent of salary for idle time (e.g., time between calls) plus $12/hr for telephone charges. These assumptions yield a total required budget allocation of $23 million ($4.26 per smoker). This figure does not include money for marketing helplines since it would be more cost efficient to market them through a single coordinated campaign (see section 2.4) and changes to warning labels (see section 3.1.3).

Ideally, only one single national helpline service is all that is required. However, given that significant investments have already been made to establish helplines in Alberta, British Columbia, Newfoundland, Ontario and Quebec, and given that Health Canada has recently developed partnerships that will allow the other provinces to acquire services from Ontario, it probably makes sense to fund one service for each province (that either resides in the province or is purchased from another province). The federal government should continue to take a lead role in facilitating coordination, evaluation and minimum standards across existing services. While helplines may be operated by voluntary, public or private sector organizations (provided they are able to adhere to recommended practice standards), the primary responsibility for funding helpline services should rest with provincial governments because they have responsibility for providing health care, including disease prevention. They are also primary financial beneficiaries when health care utilization goes down after smokers quit. Moreover, it is difficult to justify why provincial health insurance plans should pay for cessation counseling when it is

delivered through a physician but not pay for it when it is delivered through qualified telephone counselors. The federal government should contribute funds to cover the cost of services for the territories, aboriginals, and armed forces personnel.

Using private sector organizations to provide helpline services would be highly controversial. At the very least, special precautions would need to be taken to ensure that service providers did not have any conflicts of interest (e.g. make money from performing tobacco or cessation related medical services or products) or be subject to any type of influence from the tobacco industry. Given emerging evidence that the privatization of health services may reduce quality of care without saving money (Commission on the Future of Health Care in Canada, 2002), it is recommended that the delivery of helplines be limited to voluntary health agencies (e.g., Canadian Cancer Society, Lung Association, etc.) or suitable public sectors agencies.

A single toll free number should be established for use in all parts of Canada. All communication campaigns (described below), educational material and tobacco warning labels should provide the toll free number of the helpline. Pending an analysis of call volumes, helplines should begin by operating at least five days a week (from early in the morning until late evening) and offer services in French and English. Other languages could be added as demand dictates. Research should be conducted to determine the potential utility of providing telephone counseling to youth, aboriginals, and other groups.

3.3.3 Primary health care providers

A second major entry point into the treatment system should be through primary health care providers including physicians, pharmacists, dentists, nurses (in public health, hospital based and long term care), clinical psychologists and addiction counselors. At present, an insufficient proportion of primary care providers are proactively raising the issue of and responding to tobacco use among their patients. Simple brief interventions based on the concepts of asking, advising, assessing, assisting, and arranging have repeatedly been shown to be effective (Fiore, Bailey, Cohen et al, 2000). However, health professionals face many barriers in consistently implementing this treatment approach, including lack of reimbursement for performing the service, lack of confidence or skills, and insufficient office support systems. Barriers related to knowledge, skills, and confidence can be dealt with through improved training. Additional barriers would be broken if every provincial health insurance plan had a clear means to allow practicing physicians to be fairly compensated for the time they spent counseling their patients to quit using tobacco. Since, brief interventions provided by nurses, dentists and pharmacists are also effective, consideration should be given to allowing these regulated health professionals to bill provincial insurance plans for *at least* 10 minutes of counseling per patient per year. Health professionals with advanced certified training in counseling for dependency disorders, including tobacco, should be permitted to bill provincial insurance plans for more intense counseling for nicotine dependency (see section 3.3.6).

If we paid providers five dollars for each of the 3,620,000 tobacco users (67% of all users in Canada) we would like them to ask, advise, and assess each year and an additional $15 for each of the 289,440 persons they are expected to briefly counsel, this would cost $22,441,600. In addition, up to half of those who receive brief counseling may require one additional 10 minute

follow-up. This would cost an additional $2,170,800. Finally, one million dollars should be designated annually to help primary care providers set up office based systems that ensure patients' tobacco use status is recorded and regularly updated and to prompt providers to periodically ask their patients about interest in quitting. Hence, the total recommended funds to support health care providers are $25.6 million ($4.74 per smoker per year). This should be funded by provincial ministries of health.

3.3.4 Group counseling

There is considerable evidence showing that group programs are effective cessation aids (Fiore, Bailey, Cohen et al, 2000). If we assume that 72,360 people will seek out group counseling, and we further assume that groups will accommodate an average of 8 people and that each group will cost an average of $1,500 for staff, materials, accommodation, etc., then a total of $13.6 million ($2.52 per smoker) would be required annually. Groups should be offered in all regions of the country where there is sufficient demand.

Like helplines, group programs could theoretically be provided through voluntary health agencies, public or private sector organizations. However, for reasons previously discussed, it is recommended that group program providers be limited to voluntary health agencies and public sector organizations (e.g., regional health authorities/public health departments).

For reasons described in the section on helplines, primary responsibility for funding group programs should come from provincial ministries of health with appropriate contributions from the federal government (for aboriginals, the territories, military personnel). Funding should only be provided to support programs which meet the following criteria: (i) those sponsored by organizations that can ensure quality practice; (ii) those with facilitators who have received intensive training in tobacco cessation counseling and are familiar with group oriented treatment; (iii) those who offer services to those who have been referred by helplines, health care professionals, and dependency clinics. The last criteria is to ensure this relatively expensive and intensive form of treatment is not offered to those who are just as likely to succeed with less expensive and intensive forms of treatment. Hence, funding would not be provided to programs that advertise to general populations of smokers. Organizations wishing to offer such programs would have to provide their own funding.

3.3.5 Self-help

Few other types of treatment are duplicated as often as self-help approaches. Literally dozens of books, websites, videos, and other mediums are available in Canada (McDonald, 2003). While some diversity and choice is desirable, too much diversity represents a waste of resources and may confuse smokers about which program is "best". If we assume that 578,880 tobacco users will request a self-help resource and that it costs $6.00 per user (for writing, translation, printing, warehousing, postage, website design and maintenance, etc.) then $3.5 million per year ($0.65/smoker/yr) should be sufficient to develop, distribute, and maintain an appropriate number of self-help resources including websites and self-help booklets. Ideally, potential sponsors and distributors such as federal and provincial governments as well as voluntary agencies would come together to collectively endorse a limited number of options. Since most

self-help material does not have to be region specific, and because costs diminish with additional volume, the federal government should take a leadership role in the creation of a strategic partnership of provincial and territorial governments, voluntary health agencies and others to fund, produce, maintain and disseminate self-help resources. Other than the production of resource books listing local service providers, local agencies, public health departments, or regional health authorities should be funded to distribute self-help resources but not to develop or maintain their own materials or websites.

3.3.6 Specialized nicotine dependency clinics

There is a desperate need to establish clinics to treat those with severe nicotine dependency or those with clinical complications. Where it is not feasible to establish new clinics, videoconferencing and other technology should be explored to link tobacco users from rural areas to clinics in major centres.

If we assume that 10 per cent of tobacco users who seek treatment would benefit from intensive treatment, then we would require sufficient capacity to treat 144,720 tobacco users per year. If we further assume that each person will require an average of 8 hours of assessment and treatment per year (although many clients will require much more than this, many other clients will prematurely drop out of treatment), and that each counselor has 1,600 clinical hours available per year, then we would need approximately 724 counselors across Canada. If each counselor cost an average of $100,000 (for salary, benefits, supplies, office rent, utilities, professional. development, etc.), then $72.4 million ($13.41 per smoker/yr) should be allocated to set up and operate specialized nicotine dependency clinics. Once again, these services should be primarily funded through provincial ministries of health with relevant contributions from the federal government.

3.3.7 Develop and evaluate treatments for high priority populations

Additional resources should be set aside to develop specialized interventions for the priority groups, especially youth, aboriginals, and those with psychiatric comorbidity. In some cases this will mean the development, implementation and testing of “non-conventional” interventions. For example, participatory and community development approaches where community members are given resources to develop their own unique solutions may be more appropriate. Given that half of current tobacco users fall into one or more of the high priority groups, a minimum of $10 million per year should be dedicated to enhance interventions with designated priority groups for the first two years of the strategy and then scaled back to five million dollars per year. Admittedly, the recommended allocation is more guesswork than science. Funding for these special initiatives should come from a variety of sources including Health Canada, the Canadian Tobacco Control Research Initiative, the Social Sciences and Humanities Research Council, the Canadian Institutes of Health, the National Cancer Institute of Canada, the Heart and Stroke Foundation of Canada, the Canadian Lung Association, and provincial and territorial governments.

3.3.8 Create sufficient human resource capacity to support the treatment system

Fully qualified and highly trained personnel are at the foundation of any treatment system. The success of the strategy will depend on our ability to find and train enough people to provide quality interventions. While some training activities are currently taking place (the training of health professionals in various provinces, as well as the Program Training and Consultation Centre in Ontario come to mind as excellent examples), consolidating efforts could reduce costs. It is recommended that a minimum of three million dollars be set aside during each of the first three years of the intervention framework to develop and implement training programs. Once an initial cohort has been trained, the budget can be reduced since the emphasis will switch to providing continuing education.

Funding for training and capacity development might come from a variety of sources including Health Canada, and provincial and territorial ministries of health. Efforts should be made to provide services through existing infrastructures such as clinical tobacco training programs, colleges and universities.

3.4 Implement Mass Communication Campaigns

It is recommended that mass media campaigns be focused on three themes (described below). Additional efforts are needed to eliminate current messages that may be counter-productive.

3.4.1 Implement communication campaigns to motivate tobacco users to quit

Reducing the future health burden associated with tobacco use will require an increasing proportion of users to quit or reduce their tobacco use. Mass communication campaigns are ideally suited for this task. For example, Hammond, Fong, McDonald et al. (submitted) have recently reported Canada's new warning labels are effective in motivating smokers to quit smoking. A large reason for this appears to be related to the negative arousal smokers experience when they process the information contained in the graphic pictures and text on the outside of packages. However, a recent comprehensive review of the literature found that creating arousal alone is insufficient to produce behaviour change. Rather, to be effective messages must also increase the recipient's confidence that *they* can change (self efficacy) and that the change will lead to a resolution of the threat (response efficacy or outcome expectancy) (Witte and Allen, 2000). Based, in part, on figures provided by the CDC's Best Practices guideline, it is suggested that a total of $1.50 *per capita* be spent on communication campaigns ($45 million). One third of this should be spent on motivating tobacco users to quit (i.e. moving precontemplators and contemplators into preparation). Since the need for campaigns will diminish as the number of smokers goes down, it is recommended that funding be tied to the number of smokers rather than the number of people in the country (e.g., $2.80/smoker).

It makes little sense to duplicate development costs in overlapping media markets. Therefore, it is recommended that Health Canada take primary responsibility for funding and coordinating mass media campaigns to motivate smokers. The recent federal ad campaign featuring Bob and Martin is a step in the right direction. Because this type of media can create demands for non-

federal services, it is essential that there be close cooperation and consultation between managers of the media campaign and treatment providers.

3.4.2 Implement communication campaigns to improve the utilization of appropriate treatments

It is clear that an insufficient proportion of tobacco users seek out appropriate quit aids. Less than 15 per cent use any type of aid and many of these receive the wrong type of assistance. Increasing the number of tobacco users who use appropriate support aids is a fast way to reduce the number of current smokers. Studies from around the world conclusively indicate that the utilization of treatments for smokers is highly correlated with the intensity of marketing campaigns to promote them. Tobacco users are so sensitive to marketing campaigns that the number of calls to smokers' helplines can be titrated over periods of minutes. Campaigns have traditionally been so under funded that the point at which additional expenditures produce diminishing returns is unknown. However, as shown in Figure 3, the minimum amount of funds required to produce any positive effect appears to be about $0.32/capita/yr. On the other hand, declines in tobacco consumption continued to rise with expenditures of beyond $0.57/capita) (Victoria Centre for Tobacco Control, 2001).

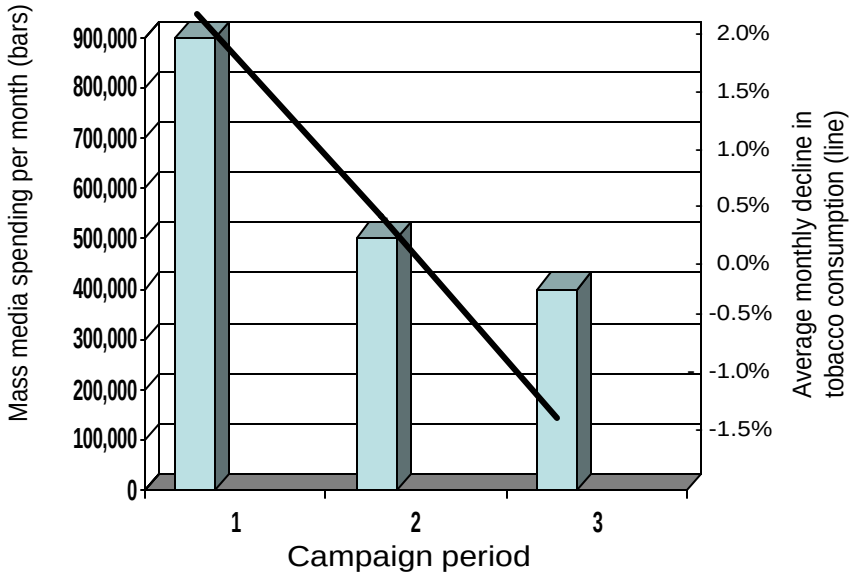

Figure 3 Relationship between monthly media spending (Australian dollars) and average change in tobacco consumption in Australia over 3 campaign periods. From Victoria Centre for Tobacco Control, 2001.

Based on the Australia experience and recommendations by the CDC (1999), it is suggested that the budget of media campaigns that aim to increase the utilization of appropriate quit aids be phased in over a three year period until funding reaches $30 million/yr.

Once again, it makes little sense to duplicate development costs and campaigns. Therefore, Health Canada should take primary responsibility for funding and coordinating mass media campaigns encouraging tobacco users to select and use appropriate treatments. Because this type of media can titrate call volume, it is essential that media developers and managers work very closely with treatment providers to ensure capacity is in place during the periods that promotions will be run.

In order to avoid the potentially confusing situation of promoting multiple types of treatments, a practical focus would be to encourage tobacco users to call the smokers' helpline (and possibly visit a website) to determine what types of treatments are most suitable and where to find them. This requires that helplines and websites be interactive and kept up to date with respect to other treatment options.

3.4.3 Implement campaigns to facilitate the adoption of smoke free homes

Results from California suggest that tobacco users who designate their homes as smoke free are much more likely to make a quit attempt and remain smoke free (Farkas, Gilpin, Distefan and Pierce, 1999). Indeed, the odds of quitting are the in order of magnitude expected from some pharmacotherapies. Because of concerns about "government intrusion" and the potential of the tobacco industry to generate sympathy from this, it may be better if smoke free home campaigns came from local communities (e.g., concerned neighbours). Recent media campaigns that focus on asking a smoker to "take it outside" may invoke defensive reactions among smokers. Further research and focus testing should be completed to ensure a smoke free homes campaign is effective for protecting occupants from second hand smoke *and* makes smokers aware of the personal benefits of establishing smoke free homes and cars. Funds for smoke free homes campaigns should be developed and funded by a partnership that might include Health Canada, provincial and territorial governments, voluntary agencies, and local community agencies/coalitions. A total investment of $5.4 million per year ($1.00 per smoker) for a minimum of two years seems reasonable in light of the potential impact on current tobacco users.

3.4.4 Eliminate the use of potentially demoralizing messages

Many current messages disseminated by the tobacco control community may not only be misleading, but potentially demoralizing to smokers. For example, many current websites and pamphlets suggest that smoking is more addictive than cocaine or heroin. The evidence to support this claim is filled with problems. For example, not all smokers develop nicotine dependency (McDonald, 2003). Most smokers (and non-smokers) know someone who has quit smoking with relative ease. As such, people's personal experience (which is generally more salient) is inconsistent with public health messages and this erodes our credibility. A more appropriate message would be that smoking *can be* as addictive as cocaine or heroin for *some* people. This alerts youth and existing tobacco users to the real possibility that they may become addicted without creating the false impression that it is inevitable. A related message that may be demoralizing is that most smokers will make six or more attempts to quit smoking before remaining abstinent for good. While the average number of quit attempts made by former smokers is above 5, it paints a misleading picture because the mean is skewed by the handful of people who putatively make dozens of attempts to quit. Data from Health Canada (2002) and

Ashley et al (1996) suggest that between 40 and 52 per cent of former smokers quit the first time they make a serious attempt to do so. Well over half quit in less than three attempts. Finally, it is often repeated that quitting smoking is extremely hard and that it may be "the most difficult thing a person will ever do". Once again, while quitting *can be* extremely difficult, other smokers will quit with relative ease.

In sum, many current messages may create negative expectations about quitting. Expectations have a powerful influence on whether an individual will attempt and succeed in quitting.

3.5 Increase Research, Evaluation, Monitoring and Surveillance

In addition to requiring the evaluation of each intervention component, funds should be set aside to fill in knowledge gaps, foster innovation and evaluate the overall effect of the strategy. The CDC Best Practices guideline recommends 10 per cent of the overall framework budget should be set aside for research, monitoring, surveillance and evaluation (CDC, 1999). However, in light of the size of the budget and the nature of many of the big ticket items, approximately five per cent of the final annual allocation should be adequate ($12 million/yr). Additional funds should be built into each treatment program to evaluate individual components of the strategy.

Funds for research, as well as overall monitoring, surveillance and evaluation should come from multiple sources including Health Canada, federal research agencies (CIHR, SSHRC, CTCRI), provincial governments, and voluntary agencies (e.g., NCIC, CCS, HSF, CLA). Existing infrastructures should be used to solicit and review proposals (e.g., CTCRI, CIHR), as well as collect and analyze monitoring data and report results (e.g., the Ontario Tobacco Research Unit; the research unit of the Tobacco Control Program at Health Canada). Increased efforts must be made to engage more scientists across the country to conduct research relevant to the cessation of tobacco use.

3.5.1 Link research to practice and policy

Traditional approaches to research which begin with basic science and progress to efficacy trials and then demonstration projects can take years. Moreover, the generalizability of findings is limited because it is unknown how interventions will work under natural conditions. Finally, policy makers and service providers may not know about or may be resistant to make changes based on the efficacy research. The alternative is to link research and practice. Rather than consider knowledge transfer as a unilateral process that moves from research into practice, policy makers, communication specialists and service providers should be invited to proactively identify the areas that would most improve decision making. They should also work closely with researchers to ensure study participants and conditions will inform practice in the "real world". Closer linkages between research and practice could be achieved in several ways, including inviting program providers and policy makers to work with funding agencies to establish targeted funding initiatives (as CTCRI has done); increasing provider involvement in both grant submissions and the peer review process; placing more emphasis on applied research, requiring program providers and policy makers to work with independent researchers in the thorough evaluation of interventions; convincing academic institutions to place greater value on non-peer

reviewed products; and specifically designing interventions so that they can simultaneously serve as a service and research platform.

Rather than create independent pockets of research and evaluation expertise, a network of provincial research and evaluation units (the research and evaluation unit in the Tobacco Control Program at Health Canada should also be part of the network) should be established. Provincial research units would help ensure they remain connected with regional activities and could link with provincial tobacco control strategies. Creating a network of centres increases cooperation and data sharing. The Ontario Tobacco Research Unit might serve as an example for other provinces.

3.5.2 Adopt new criteria for decision making

Planning and evaluation should be guided by the goals of the cessation strategy. Specifically, population impact (or assessing the relative disparities between sub-populations) must consider three multiplicative factors: intervention utilization or exposure, intervention effectiveness (including compliance), and the expected benefit associated with a successful intervention. Since population impact equals utilization times effectiveness times benefit per success, each of these factors has an equal influence on impact. Consider the following example. Let's suppose that a treatment is annually utilized by five per cent of Canada's 5.4 million tobacco users. Let's also suppose that the treatment helps 15 per cent of its users to quit using tobacco. Finally, let's assume that the average benefit for those who quit is four additional quality life years. Multiplying these together we can calculate that the net impact on the burden on health will be an increase of 165,000 quality adjusted life years. However, our aim is to also use our resources as wisely as possible. Therefore, we must also consider the cost to produce this benefit. If the total annual cost to provide the treatment is three million dollars then the cost efficiency of the intervention is $17.96 per quality adjusted life year gained.

It is recommended that, in future, cost efficiency be used as a primary outcome measure for planning and evaluation. This will facilitate comparisons across types of interventions. It also ensures that all interventions must be at least minimally effective. In some cases it may be necessary to consider combinations of interventions. This will be particularly true of communication campaigns whose immediate purpose is to increase the number of people who utilize a treatment. In this instance it will be necessary to consider the combined cost and effectiveness of the communication campaign and the treatment.

Finally, the impact formula (utilization x effectiveness x benefit) is a useful tool for ensuring interventions are developed and implemented to address each constituent part of the formula. This should help avoid a continuation of the present conditions in which a dis-proportionately large amount of resources are directed at providing under-utilized treatments whose effects are diminished by lack of sufficient environmental support or persuasive communication.

4.0 Priority Groups

Given the proposed goals of the strategy, certain sub-populations should receive special attention, either in terms of the interventions employed and/or the proportion of resources allocated. To justify special consideration, a sub-population should (i) account for a reasonably large share of the overall burden of tobacco use in Canada (e.g., a minimum of 5%), and (ii) currently bear a disproportionately large share of the tobacco related health burden (compared to the reminder of the population). The first criterion is necessary in order to ensure that aiding a particular sub-population will simultaneously contribute to reducing the overall tobacco related health burden in Canada. It prevents the majority of resources being used to help only a handful of people.

4.1 Aboriginals

As detailed in the companion paper (McDonald, 2003), a disproportionately large proportion of the health burden of tobacco use is borne by our aboriginal peoples. Several factors exacerbate the problem. Many aboriginals live in remote areas of Canada that do not offer any consistent type of treatment. Few treatments have been designed or adapted to be culturally sensitive. This is essential given the unique role that tobacco has within aboriginal culture. There are few theoretical models to guide intervention development. Aboriginals are more likely to suffer from depression and co-dependency problems which, in turn, complicate tobacco treatment. Aboriginals are over-represented in lower socio-economic groups. Strategies such as tax increases may actually increase tobacco use as some reserves make tax free cigarettes more broadly available or produce their own independent brands of tobacco products.

It's doubtful that interventions that are effective with non-aboriginal groups will ever have the same utility among aboriginal Canadians. Completely new approaches are immediately required. Other areas of health promotion have found that participatory and community development models seem to be more effective than social planning models. This may represent a promising course of action.

4.2 Persons with Psychiatric and Substance Disorders

A disproportionately large share of tobacco users in Canada have been diagnosed with mental illness or substance abuse problems (including alcohol). Several factors make treatment difficult. A large portion of individuals with mental and dependency disorders will require intensive pharmatherapy and counseling from trained specialists. There are literally only a handful of programs across Canada willing and qualified to deal with tobacco users who suffer from mental health and/or substance abuse problems. Many of these individuals have little or no social support and high levels of stress. Their ability to utilize traditional cognitive treatments may be compromised.

4.3 Persons in Low Socio-economic Groups

Tobacco use is significantly higher among persons with low incomes and/or education (Health Canada, 2002). Transportation, child care issues and other factors may reduce the accessibility of treatments. At least part of the solution may be to advocate for policies which improve higher order determinants of health such as affordable housing and reductions in poverty. Great care must be taken not to engage in "victim blaming". Efforts must be made to inform the broader public that tobacco use, particularly among disadvantaged groups, is inappropriately described as a "lifestyle *choice*". Rather, the ability to abstain is highly influenced by the physical, social and economic environments which are beyond individual control. Available research also suggests that interventions which seek to increase social participation and empower individuals may be effective (e.g., Lindström et al, 2000).

4.4 Youth

A significant number of tobacco users are between the ages of 12 and 24. Indeed, 20 to 24 year olds have the highest prevalence rates of any age cohort. Tobacco users in these age ranges are less likely to be nicotine dependent and more likely to be occasional smokers. However, they are less likely to make a serious quit attempt than other age groups (Health Canada, 2002). This is unfortunate because from a population health perspective, the sooner an individual quits the greater the reduction in the excess lifetime health burden (Fielding, Husten and Eriksen, 1998). It's difficult to know how likely youth tobacco users will be to quit because current measurement may not have sufficient validity. However, the best available data suggests that less than five per cent of adolescent tobacco users will quit in a given year (Driezen, Brown, Cameron and McDonald, submitted). There are at least three reasons why youth may find it more difficult to quit. First, tobacco use may be a covert behaviour. Hence it reduces opportunities for social support. McDonald and his colleagues also found that youth perceive their smoking friends will not support their attempts to quit. A second challenge is that youth have little or no experience changing any aspect of their behaviour. They may also have less perceived and actual control over their lives than adults. Finally, a recent comprehensive review found there are very few effective interventions to help youth quit using tobacco (McDonald, Collwell, Backinger et al., in press). Little is known about what theoretical approaches work best, who the most effective program providers are or which settings are most effective for the delivery of services. There is insufficient evidence to indicate that pharmacotherapy is effective in those under 19. Little is known about the effect of school smoking bans or mass media campaigns on cessation (although there is evidence that overall levels of tobacco use go down in jurisdictions with school smoking policies as part of a comprehensive tobacco strategy).

In sum, additional research is immediately required to meet the demand by health and human service professionals for effective quit aids. Rather than wait several years for the usual research process to unfold, an alternative is to fund teams of researchers and treatment providers to develop theory based interventions and rigorously evaluate them under quasi-controlled conditions (note, a typical trial involving 1000 youth smokers will likely cost a minimum of $500,000 to evaluate properly). In order to avoid institutionalizing ineffective programs, interventions should not be disseminated on a wide scale until they have been adequately

evaluated. Adopting an aggressive research strategy and linking researchers with providers will provide services to at least some youth and expedite the evidentiary foundation for future decision making (Backinger, McDonald, Ossip-Klein et al., in press).

4.5 Light and Medium Smokers

Traditional clinical approaches have emphasized the need to place priority on heavy smokers. The rationale is that the relative risk of developing and dying from a tobacco related disease is much higher in heavy smokers compared to light smokers. However, from a population perspective, relative risk should not be the only consideration. The primary question is what will produce the largest reduction in the health and economic burden associated with tobacco use? As discussed previously, this requires consideration of factors such as how many people are affected, the net benefit per treatment success, and the cost to produce the desired outcomes. The crude analysis shown in Table 2 produces some provocative results. Column one uses the CTUMS (2001) to estimate the number of individuals who may be classified as light, moderate and heavy smokers. These numbers are then multiplied by the excess lifetime health care costs (in 1999 Canadian dollars as calculated by Coleman, 2000) associated with each level (displayed in column 2). Column 3 provides the estimated costs for each type of smoker. It is assumed that the majority of light smokers will succeed through self help and brief counseling through helplines or health professionals. It is assumed that moderate smokers will mostly succeed through brief counseling or by brief counseling plus pharmatherapy. Finally, it is presumed that heavy smokers will require intensive counseling and one or more types of pharmatherapy. Column 4 uses Colman's figures to calculate what the expected savings would be if we were to help 30 per cent of smokers quit at age 40 to 44. Finally, column 5 shows the return ratio (i.e., the amount of money saved for each dollar invested in treatment). Light and moderate smokers clearly produce the greatest net financial returns. Further, it might be argued that excess health costs and health savings are reasonable proxies for morbidity. Hence investing in light and moderate smokers may also have the largest impact on reducing excess morbidity from tobacco use. As a result of the foregoing analysis, it is recommended that heavy smokers not be a priority group per se. They may, however, be indirectly targeted through other priority groups. For example, persons with co-dependencies and mental health disorders are more likely to be heavy smokers.

Table 2. Estimated excess lifetime health costs, saving and return on investment, by heaviness of smoking among Canadian smokers.

Type and number of Smokers	**Total excess lifetime health care costs**	**Estimated cost of treatment**	**Lifetime Reduction in Excess costs if 30% of smokers quit at age 40 to 44.**	**Return for each dollar invested**
1.7 million light smokers	$ 80 billion	$76.5 million	$13 billion	$169.93
3.1 million moderate smokers	$240 billion	$465 million	$42 billion	$ 90.32
0.65 million heavy smokers	$ 86 billion	$292 million	$15 billion	$ 51.37

5.0 Implementation Schedule for Recommended Actions

Proper sequencing of actions is critical. Implementing policies and communication campaigns that increase demand for services without having sufficient capacity to handle the new demand would demoralize and frustrate tobacco users. Trying to expand treatments without making initial investments to train new personnel would be costly and result in the poaching of qualified people from one service to another without actually enhancing capacity. Some initiatives will take much longer to implement than others.

In general, investments should start with developmental and capacity building activities, followed by treatment expansion and then communication. Policies which create supportive environments for tobacco users to quit can be implemented at any time since they are relatively inexpensive and with a couple of exceptions (e.g., tax increases, selected re-imbursement for pharmacotherapy), are unlikely to result in dramatic surges in treatment utilization.

6.0 Summary of Recommended Expenses and Revenues

The total expenses and revenues associated with the strategy are shown in Table 3. When fully implemented, the strategy would actually generate $146.3 million more revenue than it costs to implement. Additional money would come from health care savings, productivity gains, and other indirect benefits. For example, one American study found that on average, each person who quits reduces health care costs for treating heart attacks and stroke by $47 US during their first year of abstinence and a total of $853 during the following seven years (Lightwood and Glantz, 1997). Additional health care savings would likely accrue from a host of other conditions as well, such as the treatment of asthma, bronchitis, accidents, and complications from influenza, pregnancy and low birth weight.

Table 3 also does not account for the fact that several million dollars are currently being invested in tobacco cessation across Canada. Hence, not all of the $253 million required to implement the full strategy is “new” money. It is difficult to estimate how much money is currently being invested in tobacco cessation. However, a conservative estimate would be that the federal and provincial governments are currently investing in excess of $50 million per year (for physician payments, re-imbursement of nicotine replacement products in Quebec and PEI, helplines, self-help websites and books, quit and win contests, advertising campaigns, etc.)

Table 3. Summary of expenses and revenues to implement the recommended actions.

Activity	Cost per smoker[b]	Cost in year 1[a]	Cost in year 2[a]	Cost in subsequent years[a]
Litigation and misc. policy	$ 0.30	1,620,000	1,620,000	1,620,000
Selective reimbursement of pharmacotherapy	$ 9.24	10,000,000	25,000,000	49,900,000
Develop triage and referral system	$ 0.05	250,000	250,000	250,000
Helplines	$ 4.26	6,000,000	12,000,000	23,000,000
Health care providers	$ 4.74	5,000,000	13,000,000	25,600,000
Group counseling	$ 2.52	2,000,000	7,000,000	13,600,000
Self help	$ 0.65	2,000,000	3,000,000	3,500,000
Dependence clinics	$13.41	10,000,000	36,000,000	72,400,000
Treatment for high priority groups	$ 0.93	10,000,000	10,000,000	5,000,000
Create human resource capacity	$ 0.28	3,000,000	3,000,000	1,500,000
Communication to motivate quitting	$ 2.80	2,000,000	7,500,000	15,000,000
Communication to increase service utilization	$ 5.56	2,000,000	15,000,000	30,000,000
Communication for smoke free places	$ 0.00	5,400,000	5,400,000	
Eliminate demoralizing messages				
Research, evaluation, surveillance, and monitoring	$ 2.23	3,000,000	7,000,000	12,000,000
Total costs	$46.92	63,270,000	145,770,000	253,370,000
Total revenue from new tobacco taxes			400,000,000	400,000,000
Total funds available for re-allocation (does not include savings from treating tobacco related illness and other indirect benefits)		(63,270,000)	254,230,000	146,630,000

Notes:
[a] Budgets are based on estimated number of smokes in 2002. Actual amounts may go down as the number of smokers is reduced.
[b] Per smoker costs are based on annual costs for full implementation.

7.0 Final Thoughts

As was evidenced at the Third National Conference on Tobacco or Health held in Ottawa in December 2002, Canadian partners in tobacco control are united in their commitment to improve our performance by building on what we know, what we're currently doing and considering new ideas. The suggestions in this paper are meant to stimulate discussion. They are *not* meant to be prescriptive. This paper represents only one step towards achieving an innovative, effective, affordable and pragmatic strategy for helping to reduce the present and future burden on health among tobacco users.

Some people will look at the estimated cost of the proposed strategy and say a quarter of a billion dollars is unrealistic. There is no way that governments and other stakeholders will agree to such a plan. However, it is incumbent on the tobacco control community to convince them that a comprehensive strategy such as the one proposed in this paper will actually generate revenue while significantly improving the quality of lives of more than 100,000 Canadians a year. We need to put the estimated investment into perspective. How many other investments will produce such substantial returns? Recent polls consistently find that Canadians place a priority

on investments that will improve out health, particularly when it involves disease prevention.

The next step in the process must involve rapid discussion around the ideas presented in this paper. This discussion must lead to consensus building and ultimately collaborative action. To paraphrase Andrew Pipe from the 1996 National Tobacco Conference, the time has come for stakeholders to "stop the dithering". We must recognize that tobacco cessation is a substantial social challenge, not merely an individual lifestyle issue or bio-medical problem. Our actions must be bold and commensurate with the scope of this challenge. Anything less and we will have failed millions of tobacco users in Canada whose lives will depend on our progress.

References

Abrams DB, Orleans CT, Niaura RS, Goldstein MG, Prochaska JO and Velicer W (1996). Integrating individual and public health perspectives for treatment of tobacco dependence under managed health care: A combined stepped-care and matching model. *Annals of Behavioral Medicine*, 18, 290-304.

Ashley MJ, Cohen J, Bull S, Poland B, Gao J, Stockton L, Pederson L, Ferrence R (1997). Smoking in Ontario: Analysis of Data from the "Q&Q" Study. Report submitted to Health Canada and the Ontario Ministry of Health. NHRDP Project Number 6606-6006-801, March 31, 1997.

Backinger, C, McDonald P, Ossip-Klein D, Colby S, Maule C, Fagan P, Husten C, and Colwell B (in press). Improving the future of youth smoking cessation: Building the research foundation. *American Journal of Health Behavior*.

Boyle RG, Solberg LI, Magnan S, Davidson G and Alesci NL (2002). Does insurance coverage for drug therapy affect smoking cessation? *Health Affairs*, 21, 162-168.

Centers for Disease Control and Prevention (1999). *Best Practices for Comprehensive Tobacco Control Programs.* Atlanta GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.

Chaloupka FJ (1991). Rational addictive behavior and cigarette smoking. Journal of Political Economy, 99, 722-742.

Colman R (2000). *The Cost of Tobacco in Nova Scotia*. Halifax: GPI Atlantic.

Commission on the Future of Health Care in Canada (2002). *Building on Values: The Future of Health Care in Canada. Final Report.*

Driezen P, Brown KS, Cameron R, and McDonald PW (submitted). Youth smoking patterns from an Ontario cohort: Seven-year longitudinal data. *Tobacco Control*.

Etter JF, Kozlowski LT, Perneger TV (2003). What smokers believe about light and ultra-light cigarettes. *Preventive Medicine*, 36, 92-98.

Farkas AJ, Gilpin EA, Distefan JM and Pierce JP (1999). The effects of household and workplace smoking restrictions on quitting behaviours. *Tobacco Control*, 8, 261-265.

Farrelly MC and Bray JW (1998). Office on Smoking and Health. Responses to increases in cigarette prices by race/ethnicity, income and age groups – United States, 1976-1993. *Morbidity Mortality Weekly Report*, 47, 605-609.

Fielding JE, Husten CG and Eriksen MP (1998). Tobacco: health effects and control. In RB Wallace (ed.), *Public Health & Preventive Medicine, 14th Edition*. Stamford CT: Appleton and Lange.

Fiore, MC, Bailey, WC, Cohen, SJ, Dorfman, SF, Goldstein, M, Gritz, E et al. (2000). *Treating tobacco use and dependence. Clinical practice guideline*. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service.

Hammond D, Fong G, McDonald PW, Borland R (submitted). Do smokers know how to quit? Knowledge and perceived effectiveness of cessation assistance as predictors of cessation behaviour in a longitudinal sample of smokers. *Tobacco Control*.

Hammond D, Fong GT, McDonald PW, Cameron, R, Brown KS (submitted). The impact of the graphic Canadian warning labels on adult smoking behaviour. *Tobacco Control*.

Health Canada (2002). *Canadian Tobacco Use Monitoring Survey, 2001*. Ottawa: Health Canada.

Lightwood JM and Glantz SA (1997). Short term economic and health benefits of smoking cessation: Myocardial infarction and stroke. *Circulation, 96*, 1089-1096.

Lindström M, Hanson BS, Östergren PO and Berglund G (2000). Socio-economic differences in smoking cessation: The role of social participation. *Scandinavian Journal of Public Health*, 28, 200-208.

McDonald, PW, Collwell, B, Backinger C, Maule, C (in press). Better practices for youth tobacco cessation: Recommendations from an evidence review panel. *American Journal of Health Behavior*.

McDonald PW (2003). *Considerations and Rationale for a National Action Plan to Help Canadian Tobacco Users*. Toronto, ON: Ontario Tobacco Research Unit, Special Report Series, May 2003

Niaura R and Abrams DB (2002). Smoking cessation: Progress, Priorities and prospectus. *Journal of Consulting and Clinical Psychology*, 70, 494-509.

Niaura R, Goldstein MG, Abrams DB (1994). Matching high and low-dependent smokers to self-help treatment with or without nicotine replacement. *Preventive Medicine, 23*, 70-77.

Ontario Medical Association (1999). Rethinking Stop-smoking Medications: Myths and Facts. Http:www.oma.org/phealth/stopsmoke.htm

Ontario Tobacco Research Unit (2002, November). Indicators of Progress. Special Reports: Monitoring the Ontario tobacco Strategy, 2001/2002 (Volume 8, Part 3). Toronto, ON: Ontario Tobacco Research Unit.

Owen N and Davies MJ (1990). Smokers preferences for assistance with cessation. *Preventive Medicine*, 19, 424-431.

Pierce JP and Gilpin EA (2002). Impact of over-the counter sales on effectiveness of pharmaceutical aids for smoking cessation. JAMA, 288, 1260-1264.

Reid RD, Pipe AL and Dafoe WA (unpublished). Randomized trial of telephone counseling in association with nicotine replacement and brief physician advice in smoking cessation.

Schauffler HH, McMenamin S, Olson K, Boyce-Smith G, Rideout JA and Kami J (2001). Variations in treatment benefits influence smoking cessation: Results of a randomized controlled trial. *Tobacco Control*, 10, 175-180.

Smith SS, Jorenby DE, Fiore MC, Anderson JE, Mielke MM, Beach KE, Piasecki TM and Baker TB (2001). Strike while the iron is hot: Can stepped care treatments resurrect relapsing smokers? *Journal of Consulting and Clinical Psychology*, 69, 429-439.

Strahan E, White K, Fong G, Fabrigar L, Zanna M, Cameron R (2002). Enhancing the effectiveness of tobacco package warning labels: A social psychological perspective. *Tobacco Control*, 11, 183-190.

Sweanor DT (1999). Policy options to reduce tobacco caused mortality. *Journal of Addictive Diseases*, 18, 1-11.

Townsend JL, Roderick P and Cooper J (1994). Cigarette smoking by socio-economic group, sex, and age: Effects of price, income and health publicity. *British Medical Journal*, 309, 923-926.

Victoria Centre for Tobacco Control (2001). *Tobacco Control: A Blue Chip Investment in Public Health.* Melbourne, AU: Victoria Centre for Tobacco Control.

Waller RE and Froggatt P (1996). Product modification. *British Medical Bulletin*, 52, 193-205.

Warner KE (2000). The economics of tobacco: Myths and realities. *Tobacco Control*, 9, 78-89.

Willemsen MC, Simons C, Zeeman G (2002). Impact of the new EU health warnings on the Dutch Quit line. *Tobacco Control, 11*, 381-382.

Witte K and Allen M (2000). A meta-analysis of fear appeals: Implications for effective public health campaigns. *Health Education and Behavior*, 27, 591-615.