Introduction

Millions of dollars are spent every year in Canada on diagnosing and treating cancers associated with smoking. This expenditure is compounded by the economic impact of other smoking-related disorders, such as chronic obstructive pulmonary disease, acute myocardial infarction, stroke and peripheral vascular disease.

Despite recent advances in cancer therapy, the overall survival of patients with advanced lung cancer and other smoking-related malignancies has not changed dramatically for decades. While more targeted cancer therapies hold great promise, we must dedicate more of our resources to prevention.

The primary prevention of smoking-related diseases focuses on encouraging people not to start smoking in the first place and on helping current smokers quit the habit. The approach to successfully getting people to stop smoking involves a combination of strategies including mass-media counter-marketing campaigns, smoke-free laws for public areas and workplaces, tobacco price increases through tax increases.

The Cost to Society of Smoking and Smoking Cessation Products

Costs of Smoking

• Approximately 21 per cent of deaths in Canada are due to smoking.2
• The costs of smoking include direct health care costs, costs incurred by employers, prevention and research costs, the cost of fires caused by smoking, the cost of premature death and the costs specific to secondhand smoke.
• In 2002, it was estimated that the annual direct health care cost (hospitalization, medical care, drugs) resulting from smoking was close to $4 billion.3
• The costs incurred by Canadian employers were also in the range of $4 billion. These costs were due to increased absenteeism, decreased productivity, increased life insurance premiums and the cost for designated smoking areas in the workplace.
• In the same year, the cost of lost income to society and smokers’ families from premature deaths due to smoking was $6.4 billion.
• In total, the costs of smoking for the year 2002 were estimated to be close to $16 billion.
• In 2013, it is likely that these costs are still high despite a decrease in the prevalence of smokers.
• These costs are incurred not just by employers: taxpayers and governments pay approximately 75 per cent of the costs of smoking.

Costs of Smoking Cessation Products

• In 2011, the government of Ontario announced it would fund the use of bupropion and varenicline at an estimated cost of $10 to 15 million per year. It compared this cost to the $1.6 billion it spends each year on tobacco-related illnesses.
• Manitoba has estimated that the $350 per person it will spend through its funding of a 12 week course of varenicline will cost $5 million per annum, which amounts to approximately two per cent of government tobacco revenues in that province.
• In Newfoundland and Labrador (NL), where there is currently no public funding for smoking cessation pharmacotherapy, the government collected an estimated $135 million in tobacco-related taxes in 2011.4
• As demonstrated in Canadian jurisdictions that do fund these cessation aids, the cost to the NL government would be a small fraction of their smoking-related revenues.
• The same story applies to other Atlantic provinces that do not fund or only partially fund smoking cessation products through their prescription drug program.
taxation, quit-lines and counselling, and pharmacotherapies or smoking cessation products (SCPs) such as nicotine replacement therapy (NRT) and prescription smoking cessation drugs (SCDs).1

Unfortunately, while almost all of these smoking cessation modalities are being utilized in every jurisdiction in Canada, the availability of publicly and privately funded NRT and SCDs to assist in smoking cessation varies among Canadian provinces and employers.

**Nicotine Replacement Therapy**

Since their introduction to the market over twenty years ago and subsequent approval for over-the-counter (OTC) use, NRT usage has increased dramatically. Currently available products in Canada include nicotine patches, gum, lozenges and inhalers. The effectiveness of NRT in getting people to quit smoking is controversial and dependent on how outcomes are assessed. The results of clinical trials assessing the efficacy of NRT, with and without behavioural counseling, suggests NRTs are useful cessation adjuvants.5-6 There is some evidence that a combination of short-acting NRT (gum, lozenges, inhalers) and nicotine slow-release patches may be more effective than using only a single route of administration.5,7

Contrary to the results of clinical trials, some population studies have not suggested a benefit for NRT use in smoking cessation success rates.8 A recent large prospective study out of Harvard found that NRT use to quit smoking did not decrease relapse rates.9

**Smoking Cessation Drugs**

The two most widely used prescription SCD treatments are bupropion (Zyban) and varenicline (Champix). Meta-analyses have shown that both bupropion and varenicline are effective cessation aids, with odds ratios (ORs) of 1.69 and 2.31, respectively.10,11 In another pooled analysis study, varenicline was shown to be more effective than bupropion for smoking cessation.12 The results of a recent industry-sponsored study suggest that the delay in funding of

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**TABLE 1  PUBLIC FUNDING FOR SMOKING CESSATION THERAPIES IN CANADIAN PROVINCES AND TERRITORIES**

<table>
<thead>
<tr>
<th>Province/Territory</th>
<th>Approval Date</th>
<th>BUP</th>
<th>VAR</th>
<th>NRT</th>
<th>Provincial Drug Benefit Program(s)</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>2011</td>
<td>GB</td>
<td>GB</td>
<td>GB</td>
<td>BC Pharmcare HealthLink BC (NRT for any resident)</td>
<td>12 weeks of SCDs or NRT per annum (covered at 100%)</td>
</tr>
<tr>
<td>AB</td>
<td>2011</td>
<td>GB</td>
<td>RB or SA</td>
<td>RB or SA</td>
<td>AHWPDP (RB or SA drug coverage varies by plan)</td>
<td>12–24 weeks of SCDs per annum (with counseling) NRT $500 per lifetime</td>
</tr>
<tr>
<td>SK</td>
<td>2011</td>
<td>GB</td>
<td>GB</td>
<td>–</td>
<td>Saskatchewan Health Drug Plan and Extended Benefits Branch</td>
<td>12 weeks of VAR per annum</td>
</tr>
<tr>
<td>MB</td>
<td>2011</td>
<td>–</td>
<td>GB</td>
<td>–</td>
<td>Manitoba Pharmcare</td>
<td>12 weeks of SCDs per annum (with counseling)</td>
</tr>
<tr>
<td>ON</td>
<td>2011</td>
<td>LU</td>
<td>LU</td>
<td>–</td>
<td>ODB Trillium</td>
<td>12 weeks of SCDs per annum NRT available via some community services</td>
</tr>
<tr>
<td>QC</td>
<td>2000</td>
<td>GB</td>
<td>GB</td>
<td>GB</td>
<td>RAMQ</td>
<td>12 weeks of SCDs per annum (24 weeks of VAR may be provided) NRT 12 weeks per annum or 840 units</td>
</tr>
<tr>
<td>NB</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>NS</td>
<td>GB</td>
<td>–</td>
<td>–</td>
<td>NS Pharmcare</td>
<td>Some districts provide subsidised VAR NRT in conjunction with district counseling</td>
<td></td>
</tr>
<tr>
<td>PE</td>
<td>SA</td>
<td>–</td>
<td>RB</td>
<td>PEI Pharmcare Quit Smoke (NRT for enrolled)</td>
<td>Quit Smoke pays first $75 of approved drug per annum</td>
<td></td>
</tr>
<tr>
<td>NL</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>NT</td>
<td>2011</td>
<td>GB</td>
<td>GB</td>
<td>GB</td>
<td>Extended Health Benefits (NIHB)</td>
<td>180 tablets of BUP or 165 tablets of VAR per annum NRT up to 945 doses of gum, lozenges, inhaler or 70-80 patches per annum</td>
</tr>
<tr>
<td>YT</td>
<td>2011</td>
<td>GB</td>
<td>ED</td>
<td>–</td>
<td>Yukon Insured Health Services (excluded from chronic disease plan)</td>
<td>12 weeks of VAR per annum NRT for some Aboriginal and social assistance</td>
</tr>
<tr>
<td>NU</td>
<td>2011</td>
<td>GB</td>
<td>GB</td>
<td>GB</td>
<td>Extended Health Benefits (NIHB)</td>
<td>See NT</td>
</tr>
</tbody>
</table>

BUP = bupropion
VAR = varenicline
NRT = nicotine replacement therapy
GB = general benefit
RB = restricted benefit
SA = special authorization
LU = limited use
ED = exception drug status
– = not covered
AHWPDP = Alberta Health and Welfare Prescription Drug Programs
OB = Ontario Drug Benefit
RAMQ = Régie de l’Assurance Maladie du Québec
NIHB = Non-Insured Health Benefits
varenicline by provincial drug plans even following a positive review by the Common Drug Review (CDR) may have prevented a significant number of smokers from quitting resulting in a marked increase in the projected lifetime cost of tobacco use.13

**Public Funding of NRT and Smoking Cessation Drugs**

Table 1 lists the funding of smoking cessation pharmacotherapy in Canadian provinces and territories as of January 31, 2013. Quebec was the first jurisdiction in Canada to fund the cost of smoking cessation pharmacotherapy. In January 2013, Quebec will increase its annual maximum coverage for smoking cessation products to $725 from the current $665 per person.14

**Private Funding of NRT and Smoking Cessation Drugs**

It is estimated that two to four per cent of Canadians do not have access to any form of prescription drug insurance. Even more alarming is that the majority of the uninsured reside in Atlantic Canada where an estimated 24-30 per cent of the population does not have public or private drug insurance.15

An estimated 53 per cent of Canadians have prescription drug coverage through publicly funded plans.15 Persons who are not eligible for provincial drug plans may rely on group benefits offered by their employer or a family member’s employer, if indeed such a benefit exists and the employee is eligible.

Those without access to public or private insurance may be able to purchase individual drug benefits through an insurance provider but otherwise they pay for their medications out-of-pocket. Even if an individual is covered under an insurance plan, there may be associated costs in the form of deductibles, copays, annual or lifetime caps and exclusions. Providers of group benefits may offer open benefit plans that cover all drugs available by prescription in Canada, formularies that mimic the provincial formulary, or managed formularies. Unfortunately, many insurance companies exclude SCPs as lifestyle drugs. (Personal communication, November 14, 2012).16 Coverage rates for OTC nicotine replacement products are much lower than for prescription drugs, as most private plans are restricted to prescription only medications. Sun Life plans that cover SCPs have a standard lifetime cap of $500 for these products, however employers may select a cap of $300 in any province excluding Quebec, where coverage must match the provincial formulary (Personal communication, December 6, 2012).16

Quebec has been a leader in the coverage of smoking cessation products. Their unique link between public and private insurance17 ensures that all residents have prescription drug coverage providing, at a minimum, the same range of products as the public plan. The public plan does cover smoking cessation products.

The administration and design of private insurance plans and the cost to individual plan members differs significantly across the remaining provinces.

An analysis conducted by Telus Health Analytics, the adjudicator for all Great West Life and Sun Life drug insurance claims, provides some insight into access to smoking cessation pharmacotherapy through private coverage.18 As of December 2011, Telus plans covered more than 10 million Canadians. The Public Service Health Care Plan (PSHCP) offered to federal government employees and their dependents is also adjudicated through Telus; however, data concerning this plan were not included in their analysis. The PSHCP covers 80 per cent of the cost of SCPs up to a lifetime maximum of $1,000. With regards to the remaining Telus plans, Table 2 outlines SCP coverage by province.

To put coverage limits in perspective, a 12-week treatment course of OTC smoking cessation may range from around $140-250 for nicotine gum, $300-360 for nicotine patches and upwards of $550-900 for a nicotine inhaler. Alternatively, a full 12-week treatment course of bupropion will cost approximately $205 compared to $350-360 for varenicline.19 However, even after receiving treatment with bupropion or varenicline, only 20 per cent of patients will remain abstinent from

**TABLE 2 PERCENTAGE OF PLAN SUBSCRIBERS WITH SCP COVERAGE UNDER GREAT WEST LIFE AND SUN LIFE DRUG PLANS**

<table>
<thead>
<tr>
<th>Province</th>
<th>Varenicline (Champix)</th>
<th>Bupropion (Zyban)</th>
<th>Nicotine Patches</th>
<th>Nicotine Gum</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>56%</td>
<td>54%</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>AB</td>
<td>62%</td>
<td>60%</td>
<td>17%</td>
<td>17%</td>
</tr>
<tr>
<td>SK</td>
<td>74%</td>
<td>73%</td>
<td>14%</td>
<td>14%</td>
</tr>
<tr>
<td>MB</td>
<td>66%</td>
<td>52%</td>
<td>27%</td>
<td>27%</td>
</tr>
<tr>
<td>ON</td>
<td>60%</td>
<td>59%</td>
<td>18%</td>
<td>20%</td>
</tr>
<tr>
<td>QC</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
<tr>
<td>NB</td>
<td>65%</td>
<td>62%</td>
<td>40%</td>
<td>40%</td>
</tr>
<tr>
<td>PE</td>
<td>76%</td>
<td>75%</td>
<td>28%</td>
<td>28%</td>
</tr>
<tr>
<td>NS</td>
<td>66%</td>
<td>64%</td>
<td>37%</td>
<td>37%</td>
</tr>
<tr>
<td>NF</td>
<td>61%</td>
<td>58%</td>
<td>29%</td>
<td>30%</td>
</tr>
<tr>
<td>CANADA</td>
<td>68%</td>
<td>66%</td>
<td>34%</td>
<td>35%</td>
</tr>
</tbody>
</table>
smoking at 12 months. Therefore, most patients will require multiple attempts at quitting, all of which may or may not be covered depending on their plan.

Like Sun Life and Great West Life, Medavie Blue Cross administers group and individual drug benefit plans across the country, although their market share is decisively larger in the Atlantic region (Personal communication, January 15, 2013). Medavie Blue Cross offers plans similar in structure to other major insurance companies and employers may or may not opt to include smoking cessation as a benefit depending on the type of plan. If smoking cessation is included on a formulary, employers have the option of including all SCPs (including OTC products) or prescription-only SCDs.

Medavie Blue Cross plans have somewhat lower coverage rates for smoking cessation than those listed for SunLife and Great West Life. However, what is more obvious is the discrepancy between the coverage rates in New Brunswick and Newfoundland compared to other provinces, with only 5.9 per cent and 3.3 per cent of beneficiaries over 18 having access to coverage for smoking cessation, respectively. These are also the only Canadian provinces with no form of public smoking cessation coverage and, as mentioned previously, provincial formulary decisions may influence private plan inclusions. For example, most plans under Manitoba Blue Cross mimic the provincial formulary, which does cover varenicline, but does not cover bupropion (Personal communication, November 19, 2012). This is reflected in the Telus report, where for Manitoba the coverage of bupropion is significantly lower in relation to varenicline when compared to other provinces.

Alternatively, individual plans administered by Ontario Blue Cross do not cover any form of smoking cessation as a general rule (Personal communication, November 19, 2012). In addition to New Brunswick’s limited public and private coverage, NRTs and SCDs are not offered under any private benefit plan offered to employees of the provincial government (Personal communication, December 19, 2012).

Interestingly, the discrepancies noted in Medavie Blue Cross coverage are not reflected in the data from SunLife and Great West Life, which may be an artifact of their relative market shares in various regions of the country. However, because of the intricacies involved in the administration of group benefits and the various opportunities to exclude smoking cessation, any assumptions as to these differences would unfortunately be limited. As this information is of a proprietary nature, most companies are also unable to comment on any differences (Personal communication, December 11, 2012), but what remains clear is that access to smoking cessation through private insurance is inconsistent and depends greatly upon where you live and your employer’s choice of plan.

**Discussion**

The prevalence of smoking in Canada has decreased significantly over the past two decades. However, the cessation rate, or the proportion of smokers who quit, has leveled off over the last five years. A similar trend has also been observed in the United States. The reasons behind this decrease in quit rates are not clear, but is likely multifactorial. In those Canadian jurisdictions where barriers to smoking cessation aids still exist, one would anticipate that improvements in access, such as more inclusive funding for smoking cessation pharmacotherapy, would result in improved quit rates.

The Atlantic provinces are in a particularly dire situation. Compared to the rest of Canada, a significantly larger portion of the population is without any drug insurance whatsoever. Those who are able to subscribe to a public plan have limited or no access to smoking cessation pharmacotherapy. Further, very few of those covered by private insurance are taking advantage of access to smoking cessation, although it is impossible to make any firm assumptions without knowing the actual number of beneficiaries who smoke. Regardless, it is likely that a combination of expanded access and patient and prescriber education is required in order to fully appreciate the benefits of widespread access to pharmacotherapy for smoking cessation.

It is difficult to understand why all provinces and territories in Canada publicly fund medications to treat hypertension and high cholesterol, but have not elected to pay for pharmaceutical interventions to promote smoking cessation. In Canada, smoking is the largest preventable risk factor for ill health. A lifelong smoker has been shown to lose ten years of life, which is an even greater greater deficit than seen in

<table>
<thead>
<tr>
<th>Province</th>
<th>Covered for SCPs</th>
<th>Claims in 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>BC</td>
<td>17.5%</td>
<td>0.31%</td>
</tr>
<tr>
<td>AB</td>
<td>26.0%</td>
<td>0.92%</td>
</tr>
<tr>
<td>SK</td>
<td>21.0%</td>
<td>0%</td>
</tr>
<tr>
<td>MB</td>
<td>17.9%</td>
<td>1.47%</td>
</tr>
<tr>
<td>ON</td>
<td>38.3%</td>
<td>1.10%</td>
</tr>
<tr>
<td>QC</td>
<td>100%</td>
<td>1.98%</td>
</tr>
<tr>
<td>NB</td>
<td>5.9%</td>
<td>2.23%</td>
</tr>
<tr>
<td>PE</td>
<td>25.9%</td>
<td>0.61%</td>
</tr>
<tr>
<td>NS</td>
<td>40.3%</td>
<td>0.93%</td>
</tr>
<tr>
<td>NF</td>
<td>3.3%</td>
<td>0.68%</td>
</tr>
<tr>
<td>YK</td>
<td>83.3%</td>
<td>0%</td>
</tr>
<tr>
<td>NT</td>
<td>25.7%</td>
<td>0%</td>
</tr>
</tbody>
</table>

Table 3 outlines the proportion of individuals 18 years and older insured by Medavie Blue Cross (under group and individual plans) who have access to some form of smoking cessation and also the proportion of all beneficiaries submitting a claim for a smoking cessation benefit. The weighted averages are based on the total subscribers in each province. Data are accurate as of December 31, 2012 (Personal communication, January 14, 2013).
untreated moderate hypertension. Smoking cessation interventions are known to be among the most cost-effective in our healthcare system.

The two provinces (NL and NB) that do not publicly fund either NRT or SCDS have prevalence rates for smoking that are higher than the national average. The cost of funding smoking cessation products in these provinces would be a fraction of the current revenues received every year from the sale of tobacco and would be offset by the projected decrease in the costs of smoking to society.

Employers, through their group benefit plans, could also expand coverage to include smoking cessation treatments. Many Canadians, especially in the Atlantic provinces, have no private drug insurance coverage and even those with private insurance may find that NRTs and SCDS are not covered under their plans. The expenditure needed for coverage of smoking cessation pharmacotherapy is very small compared to the billions of dollars worth of prescription drugs covered by private insurers for the treatment of smoking-related illnesses. While access to pharmacotherapy remains a significant barrier to quitting, no single pharmaceutical agent alone is more effective than a combination of strategies. One must not overlook the importance of behavioural interventions including motivational interviewing, targeted self-help materials and health care provider advice as these have consistently shown to further increase quit rates when used as adjuncts to pharmacotherapy.

**Recommendations**

All provinces and territories must continue to implement and improve upon the multiple smoking cessation strategies currently available to increase the number of Canadians who quit smoking. As well, more comprehensive coverage for both NRTs and SCDS under private drug benefit plans is needed. In the case of the Atlantic Provinces, increased funding of pharmacotherapies for the publicly insured must be provided as well as access for the uninsured. Studying population outcomes of smoking cessation drug utilization at the national and regional levels should be encouraged to monitor the impact of these interventions.

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**References**

16. Personal communications are held in private documentation with the authors; full references are available on request.