Use and Reimbursement Costs of Smoking Cessation Medication Under the Quebec Public Drug Insurance Plan

Michèle Tremblay, MD, Yves Payette, MSc, Annie Montreuil, PhD

ABSTRACT

Objectives: Since October 2000, the nicotine patch, nicotine gum and bupropion have been reimbursed under Quebec's public drug insurance plan. The objective of this study is to describe use of these medications between October 2000 and December 2004 by smokers covered by the public plan, as well as the costs of reimbursing these medications.

Methods: Data from the Régie de l'assurance maladie du Québec were used to analyze prescriptions for smoking cessation medication issued to persons insured under the public drug insurance plan.

Results: Between October 1, 2000, and December 31, 2004, more than 300,000 Quebecers covered by the public drug insurance plan were reimbursed for smoking cessation medications. This corresponds to a yearly average of 14% of all smokers insured under the public plan. The proportion of employment assistance recipients who used these medications was higher than the proportion of seniors or "other" insurance plan participants. Nicotine patches were the treatment of choice for most users. A total of \$55 million was reimbursed by the public drug insurance plan for the nicotine patch, nicotine gum and bupropion over this four-year period.

Conclusion: The reimbursement provisions put in place in Quebec in 2000 were successful in reaching financially disadvantaged smokers, at a cost that was comparable with other effective smoking cessation services.

Key words: Tobacco; cessation; reimbursement; nicotine patch; nicotine gum; bupropion

La traduction du résumé se trouve à la fin de l'article.

Can J Public Health 2009;100(6):417-20.

In order to combat a smoking epidemic that claims more than 37,000 lives in Canada each year,¹ a variety of intervention measures are needed to help current smokers free themselves of their addiction.² Smoking cessation medication, such as the nicotine patch, nicotine gum and bupropion are important tools for smokers who want to stop smoking. Numerous studies have shown that these medications double the rate of quitting success.³⁻⁵

The Framework Convention on Tobacco Control states that countries that ratify the treaty will work to facilitate access to affordable treatment for tobacco dependence, including pharmacotherapy.² Complete reimbursement of smoking cessation medication, as opposed to partial reimbursement or non-reimbursement, is associated with an increased use of smoking cessation medication, a greater number of cessation attempts and higher abstinence rates.⁶

In October 2000, the nicotine patch, nicotine gum and bupropion were added to the general list of medications reimbursed under Quebec's public drug insurance plan, the Régime public d'assurance médicaments du Québec (RPAMQ).⁷ The RPAMQ reimburses the cost of smoking cessation medication for 12 consecutive weeks, once a year, when prescribed by a health professional. In 2000, Quebec was the only province in Canada to offer reimbursement of smoking cessation pharmacotherapy as part of a provincial drug insurance plan.

In Quebec, individuals who have access to a private insurance plan, often available through employers, must subscribe to that plan. Others are covered by the RPAMQ and must pay an annual premium, a monthly deductible and a co-insurance, which varies depending on the class of insured persons to which they belong. In 2004, 43% of the Quebec population aged 15 and over was insured under the RPAMQ, and the classes of persons insured broke down as follows: 15% were employment assistance recipients, 34% were seniors, and 51% were "other" plan participants (who are under the age of 65, are not employment assistance recipients but do not

have access to a private insurance plan, e.g., freelance workers, children under the age of 18). Five percent were in the 15-19 age group, 6% were aged 20-24, 14% were 25-34, 14% were 35-44, 14% were 45-54, 14% were 55-64 and 34% were 65 or older. Fifty-five percent were women. These proportions did not change appreciably between 2000 and 2004.

The present study was undertaken to describe the use of the reimbursement measure in Quebec by people insured under the RPAMQ during the first four years of the program (2000-2004). Costs to the RPAMQ in reimbursing these medications to Quebecers are also described. This article stems from a government report published in 2007.⁸

METHODS

Data source

The database of smoking cessation medications reimbursed to persons 15 and over insured by the RPAMQ between October 1, 2000, and December 31, 2004, was provided to the authors by the Régie de l'assurance maladie du Québec (RAMQ). Medical insurance numbers were encrypted to safeguard anonymity.

Study variables

Medication Characteristics

Characteristics of reimbursed smoking cessation medication included type of medication (nicotine patch, nicotine gum, bupropion) and dose (for nicotine patch 7 mg, 14 mg, 21 mg; for nicotine gum

Authors' Affiliation

Institut national de santé publique du Québec, Montreal, QC

Correspondence and reprint requests: Michèle Tremblay, Institut national de santé publique du Québec, 190 Crémazie East, Montreal, QC H2E 1P2, Tel: 514-864-1600, ext. 3509, Fax: 514-864-5190, E-mail: michele.tremblay@inspq.qc.ca

Acknowledgements: The authors thank the Régie de l'assurance maladie du Québec for the use of their database.

Table 1. Breakdown of Smoking Cessation Medication by Users Insured under the RPAMQ, by Medication and Class of Insured Persons, Quebec, 2000-2004

	2000*	2001	2002	2003	2004	Total 2000-2004
Total number of users	42,906	111,899	111,731	89,289	75,255	306,824†
Number of prescriptions	107,761	406,194	490,038	401,049	342,473	1,747,515
Breakdown of users by medication,‡ %						
Nicotine patch	47.6	72.6	88.5	89.1	89.2	80.4
Nicotine gum	0.2	2.1	3.3	3.3	3.5	2.7
Bupropion	52.2	25.2	8.2	7.6	7.4	16.9
Breakdown of users by class of insured persons,§ %						
Employment assistance recipients	36.0	30.8	31.1	32.2	33.0	29.7
Seniors	15.5	12.9	12.2	12.2	11.4	12.6
"Other" plan participants	48.5	56.3	56.6	55.4	55.3	57.6

Source: RAMQ data

* Last three months of the year, starting on the date the reimbursement provisions came into force.

† The total number of separate users for the 2000-2004 period is different from the sum of all users in each year, since some users repeated the treatment from year to year.

‡ Users who consumed medication from more than one category during the same year are included in the category of the first product used.

§ Fewer than 5% of insured persons changed categories between 2000 and 2004; those who did were still considered part of the first category until the end of the year in which the change occurred, and included in the total for 2000 to 2004.

2 mg, 4 mg; for bupropion 150 mg). A prescription is a quantity of medication sold to a person at a given time. The duration of treatment was estimated using the date when a person requested the medication from a pharmacist and the planned duration of treatment based on the quantity of medication prescribed.

Characteristics of Insured Persons Under the RPAMQ

Characteristics of insured persons were 1) sex, 2) age group and 3) class of insured person (employment assistance recipients, seniors aged 65 and over, "other" plan participants). We estimated the proportion of smokers insured under the RPAMQ on the basis of smoking rates in Quebec from the 2003 Canadian Community Health Survey (CCHS) (Cycle 2.1). The estimated proportion of smokers among employment assistance recipients corresponds to the proportion of smokers in the lowest income category in CCHS. The estimated proportion of smokers aged 65 years and over corresponds to the proportion of smokers in this age group. The estimated proportion of smokers among "other" plan participants corresponds to the proportion of smokers in the general population.

Costs of Reimbursement

Costs to the RPAMQ included medication costs and pharmacists' service costs. They did not include the contributions of insured persons.

Use Threshold

We estimated the proportion of persons who passed a use threshold corresponding to the end-point of a smoking cessation process as set out in manufacturers' instructions⁹ and guidelines published by expert groups.^{3,10} We retained two criteria in our analysis algorithm, based on the premise that users take one patch a day and that treatment is uninterrupted: 1) the last nicotine patch dose must have been 7 mg, and 2) the nicotine patches must have been bought for eight weeks or more.

Analyses

The RAMQ data were analyzed using Visual Foxpro 8 software, and statistical analyses were done with SPSS 12.0.

RESULTS

Use of smoking cessation medication among Quebecers insured under the RPAMQ

Between October 1, 2000 and December 31, 2004, there were 306,824 different Quebecers aged 15 and over insured under the

RPAMQ who were reimbursed, for a total of 1,747,515 prescriptions for smoking cessation medication (Table 1). A reduction of 20% in the number of users was observed between 2002 and 2003, followed by a 16% reduction between 2003 and 2004. Nicotine patches were by far the preferred smoking cessation medication, constituting the choice of 80% of users. There was a significant reduction in the use of bupropion, from 52% in 2000 to 25% in 2001 and 7% in 2004. This reduction may be related to reports released by Health Canada in 2001 of suspected adverse drug reactions associated with bupropion.¹¹

During the 2000-2004 period, employment assistance recipients, who accounted for about 15% of persons insured under the RPAMQ, made up 30% of users, double their proportion within the RPAMQ. On the other hand, seniors accounted for 34% of persons insured under the RPAMQ but only 13% of smoking cessation product users (Table 1).

Use of smoking cessation medication among smokers insured under the RPAMQ

On the basis of our estimates, some 706,800 smokers were insured under the RPAMQ in 2004.⁸ Between 2001 and 2004, a yearly average of 14% of smokers insured under the public plan received reimbursement for smoking cessation medication. The proportion of smokers who were reimbursed was higher among employment assistance recipient smokers (27%) than among seniors (11%) or "other" plan participant smokers (15%). The proportion was also slightly higher among women smokers (16% vs. 13% among men), as well as among smokers aged 35 to 64 (19% vs. 14% or less in other age groups).

Subsequent use of smoking cessation medication

The distribution of users in terms of first-time use or repeat treatment is shown in Table 2. In 2004, 49% of nicotine patch users had been reimbursed for this medication at least once in the previous four years, and past use rates for bupropion and nicotine gum were 34% and 20%, respectively. The average annual number of nicotine patches purchased by users increased with each use episode: from 37 patches in the first episode to 53 patches the fourth time out (data not shown).

Use threshold

The proportion of users who reached a use threshold corresponding to the end-point of a smoking cessation process increased from

Table 2. Breakdown of Smoking Cessation Medication by Users Insured under the RPAMQ According to First Use Episode or Repeat Treatment, Quebec, 2000-2004

	2000*	2001	2002	2003	2004
Nicotine patch users, %					
1 st use episode	100	97	79	61	51
2 nd use episode		3	21	30	31
3 rd use episode			1	8	14
4 th use episode				<0.1	4
Total reuse in 2004					49
No. of patch users	21,616	86,780	102,042	81,777	68,845
Nicotine gum users, %					
1 st use episode	100	99	95	86	80
2 nd use episode		1	5	12	14
3 rd use episode			<0.1	2	5
4 th use episode				<0.1	1
Total reuse in 2004					20
No. of gum users	78	2554	3797	3076	2680
Bupropion users, %					
1 st use episode	100	97	73	68	66
2 nd use episode		3	27	25	23
3 rd use episode			1	7	9
4 th use episode				<0.1	2
Total reuse in 2004					34
No. of bupropion users	23,711	30,118	9399	6976	5696

Source: RAMQ data.

* Last three months of the year, starting on the date the reimbursement provisions came into force.

26% in the first use episode to 42% in the fourth use episode (Table 3). The most important increase, from 29% to 49%, was observed among employment assistance recipients.

Costs

Between 2000 and 2004, reimbursements totalling \$55 million were made by the RPAMQ to 306,824 Quebeckers, representing an average of \$181 per user over the four-year period (Table 4). Two trends emerge. First, from 2001 to 2002, the total cost increased despite a stable number of users. This can be explained by a sharp decrease in the number of bupropion users (from 30,000 to fewer than 10,000, Table 2) coupled with an increase in the number of nicotine patch users (from 87,000 to 102,000), which costs twice as much as bupropion for the RPAMQ (Table 5).

Second, despite a decrease in the total cost and in the number of users between 2002 and 2004 (from \$15 million for 112,000 users to \$11 million for 75,000 users), the yearly average cost per user actually increased, from \$136 to \$142. Given that drug costs did not change appreciably during this period (personal communication: RAMQ, 2007), this increase may be linked to an increase in the proportion of repeat users of the nicotine patch (Table 2), a group that uses more of this medication in a use episode than new users.

Nicotine patches accounted for 90% of all RPAMQ costs for prescription smoking cessation medication between 2000 and 2004 (Table 5). During this period, the average cost per user per year was higher for the nicotine patch (\$138) than for nicotine gum (\$58) or bupropion (\$67). Three reasons may explain this situation: 1) the nicotine

Table 3. Proportion of Users Who Tried the Nicotine Patch for At Least Eight Weeks and Whose Last Dose Was 7 mg, by Use Episode and Class of Persons Insured under the RPAMQ, Quebec, 2000-2004

Nicotine Patch	Employment Assistance Recipients %	Seniors %	"Other" Plan Participants %	Total %
1 st use episode	29.0	32.9	22.4	25.7
2 nd use episode	38.1	34.5	25.7	31.4
3 rd use episode	45.3	38.4	30.7	38.3
4 th use episode	48.7	38.9	30.9	41.5

Source: RAMQ data.

Note: A person who changes categories between two use episodes is included in the first category for the purposes of this table.

patch tends to be used for longer periods of time than nicotine gum; 2) the daily cost of the nicotine patch is generally one and a half times higher than bupropion (personal communication: RAMQ, 2007); and 3) the reuse rate of the nicotine patch was greater during this four-year period than that of nicotine gum or bupropion (Table 2).

Employment assistance recipients and other plan participants accounted for the largest share of smoking cessation medication costs between 2000 and 2004 (just under \$25 million for each category) (Table 5). While employment assistance recipients accounted for 30% of users insured under the RPAMQ, this group generated 42% of all costs. "Other" plan participants generated 44% of costs, even though they accounted for 58% of all users. The average RPAMQ reimbursement cost per user per year was greater for employment assistance recipients (\$167) than for "other" plan participants (\$103), mainly because deductibles, co-insurance costs and maximum contributions paid by insured persons are lower for employment assistance recipients than for "other" plan participants.⁸

DISCUSSION

According to our results, employment assistance recipients (a group more likely to encounter economic barriers to the use of smoking cessation medication) tend to avail themselves of the reimbursement measures in a greater proportion than seniors or "other" plan participants. Close to half of all persons in this group who used the nicotine patch for a fourth try reached a use threshold corresponding to the end-point of a smoking cessation process. Since clinical studies show that the nicotine patch doubles quitting success rates and that several attempts are often needed to successfully stop smoking,^{3,12} it is reasonable to assume that the reimbursement provisions put in place in Quebec in 2000 are responsible for many successful cessations, particularly among employment assistance recipients, a group whose smoking prevalence rate is particularly high.

The nature of tobacco addiction requires measures that are known to be effective, such as professional counselling and pharmaceutical medication.^{3,13,14} The conditions that currently govern the reimbursement of smoking cessation medication in Quebec require

Table 4. Costs to the RPAMQ for the Reimbursement of Smoking Cessation Medication – Nicotine Patch, Nicotine Gum and Bupropion – Quebec, 2000-2004

	2000*	2001	2002	2003	2004	Total 2000-2004
Costs for all users, \$	3,948,424	13,239,160	15,201,330	12,387,887	10,688,588	55,465,387
Number of users	42,906	111,899	111,731	89,289	75,255	306,824†
Cost per user, \$	92	118	136	139	142	181

Source: RAMQ data.

* Last three months of the year, starting on the date the reimbursement provisions came into force.

† The total number of separate users for the 2000-2004 period is different from the sum of all users in each year, since some users repeated the treatment from year to year.

Table 5. Costs to the RPAMQ for the Reimbursement of Smoking Cessation Medication, by Medication and Class of Insured Persons, Quebec, 2000-2004

	Total Costs for All Users from 2000 to 2004 \$	Breakdown of Users %	Proportion of Total Costs %	Average Cost per User per Year \$
Medication				
Nicotine patch	49,700,838	80.4	89.6	138
Nicotine gum	708,806	2.7	1.3	58
Bupropion	5,055,743	16.9	9.1	67
Class of insured persons*				
Employment assistance recipients	23,170,450	29.7	41.8	167
Seniors	7,672,858	12.6	13.8	141
"Other" plan participants	24,482,988	57.6	44.1	103
Total	55,465,387	100	100	129

Source: RAMQ data.

* The sum of costs for the three doses of insured persons (\$55,326,296) is different from the sum of costs for the three classes of medication (\$55,465,387) due to missing information on the class of insured persons.

smokers to consult a doctor or a smoking cessation specialist to obtain a prescription. In so doing, smokers also receive smoking cessation counselling, an intervention that is provided free of charge to Quebecers. The cost of these two interventions combined is comparable to that of other smoking cessation services in Quebec that are considered important¹⁵ and 10 to 12 times lower than the cost of treating other diseases, such as hypercholesterolemia.⁵

The administrative data analyzed in this study cannot be used to evaluate the specific contribution of the reimbursement provisions in reducing the smoking prevalence in Quebec from 30% in 2000-2001 to 25% in 2005.¹⁶ Furthermore, over the past 10 years, Quebec has gradually introduced other measures to help smokers quit, such as annual media campaigns, "Quit and Win" contests, a telephone helpline, quit smoking centres and encouragement to health care professionals to offer counseling to their smoking patients. Future research should evaluate the impact of reimbursing smoking cessation medications on smoking prevalence in a context where complementary services are likely to interact with each other in helping smokers quit.

REFERENCES

1. Rehm J, Baliunas D, Brochu S, Fischer B, Gnam W, Patra J, et al. The Costs of Substance Abuse in Canada 2002. Ottawa, ON: Canadian Centre on Substance Abuse, 2006.
2. Framework Convention on Tobacco Control. Geneva: WHO, 2003. Available at: http://www.who.int/fctc/text_download/en/index.html (Accessed August 11, 2009).
3. Fiore MC, Bailey WC, Cohen SJ, Dorfman SE, Goldstein MG, Gritz ER, et al (Guideline Panel). Clinical Practice Guideline: Treating Tobacco Use and Dependence. Rockville, MD: U.S. Department of Health and Human Services, Public Health Service, 2000.
4. Silagy C, Lancaster T, Stead L, Mant D, Fowler G. Nicotine replacement therapy for smoking cessation. *Cochrane Database Syst Rev* 2005;(1):CD000146.
5. Leane V, de Grosbois S, Guyon L. Programme québécois de remboursement des aides pharmacologiques à l'arrêt tabagique. Phase I : Recension des écrits scientifiques sur l'efficacité et l'efficience des aides pharmacologiques et suivi du fonctionnement du programme depuis sa mise en place. Montréal, QC : Institut national de santé publique du Québec, 2006.
6. Kaper J, Wagena EJ, Severens JL, Van Schayck CP. Healthcare financing systems for increasing the use of tobacco dependence treatment. *Cochrane Database Syst Rev* 2005 Jan 25;(1):CD004305.
7. Martin P. Les médicaments utilisés comme traitement anti-tabagique, période du 1^{er} octobre 2000 au 31 janvier 2002. Service de la recherche et de l'analyse des programmes. Direction de l'analyse et de la gestion de l'information. Régie de l'assurance maladie du Québec, 2002.
8. Tremblay M, Payette Y, Montreuil A. Remboursement des aides pharmacologiques à l'arrêt tabagique au Québec : utilisation par les Québécois assurés par le régime public d'assurance médicaments et coûts associés. Phase II. Montréal, QC : Institut national de santé publique du Québec, 2007.
9. Canadian Pharmacists Association. *Compendium of Pharmaceuticals and Specialties*. Ottawa, ON: CPA, 2006.

10. Department of Health and Ageing, Australian Government. Smoking Cessation Guidelines for Australian General Practice. 2004.
11. Important safety information regarding bupropion. Health Canada, Glaxo-SmithKline, July 3, 2001. Available at: www.hc-sc.gc.ca/hpb-dgpps/therapeut/zfiles/english/advisory/industry/zyban_e.html (Accessed March 16, 2009).
12. Tremblay M, Ben Amar M. Les interventions efficaces pour aider les fumeurs à renoncer au tabac. *Drogues, santé et société* 2007;6(1):241-81.
13. Lancaster T, Stead LE. Physician advice for smoking cessation. *Cochrane Database Syst Rev* 2004;(4):CD000165.
14. Gorin SS, Heck JE. Meta-analysis of the efficacy of tobacco counseling by health care providers. *Cancer Epidemiol Biomarkers Prev* 2004;13(12):2012-22.
15. Tremblay M, Gervais A. Interventions en matière de cessation tabagique : description, efficacité, impact et coûts estimés. Montréal, QC: Institut national de santé publique du Québec, 2001.
16. Statistics Canada. Canadian Community Health Survey (CCHS), 2000-2001. Ottawa, ON: Statistics Canada, 2005.

Received: May 25, 2009

Accepted: August 26, 2009

RÉSUMÉ

Objectif : Depuis octobre 2000, les timbres et les gommes de nicotine de même que le bupropion sont remboursés par le régime public d'assurance médicaments du Québec. Cette étude vise à décrire l'utilisation de ces médicaments entre octobre 2000 et décembre 2004 par les fumeurs assurés par le régime public de même que les coûts des remboursements effectués durant cette période.

Méthodes : Les données de la *Régie de l'assurance maladie du Québec* ont été utilisées pour analyser les prescriptions des médicaments d'aide à l'arrêt tabagique remises aux personnes assurées par le régime public d'assurance médicaments.

Resultats : Du 1^{er} octobre 2000 au 31 décembre 2004, plus de 300 000 Québécois assurés par le régime public d'assurance-médicaments ont été remboursés pour des aides pharmacologiques à l'arrêt tabagique, ce qui représente en moyenne, annuellement, 14 % des fumeurs assurés par le régime public. La proportion de prestataires de l'assistance-emploi ayant utilisé ces aides pharmacologiques est plus élevée que celle des personnes âgées de 65 ans ou plus et que celle des adhérents. Le timbre de nicotine constitue le choix de la majorité des utilisateurs. Durant cette période de quatre ans, 55 millions de dollars ont été remboursés par le régime public d'assurance médicaments pour le timbre de nicotine, la gomme de nicotine et le bupropion.

Conclusion : La mesure de remboursement mise en place au Québec en 2000 a rejoint les fumeurs désavantagés financièrement, à un coût comparable à celui d'autres mesures efficaces en abandon du tabac.

Mots clés : abandon du tabac; remboursement; timbre de nicotine; gomme de nicotine; bupropion