

# The Potential Effectiveness of Warning Labels on Cigarette Packages

## The Perceptions of Young Adult Canadians

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### ABSTRACT

**Background:** Since 1989 when health warning labels appeared on Canadian cigarette packages, the labels have changed from text only covering less than one quarter of the package to text and graphics covering over half the package. This study examines how Canadians in their 20s feel about the current graphic warning labels and their potential to prevent smoking and encourage quitting.

**Methods:** Participants between 20 and 24 years of age were part of a 10-year cohort study begun when the group was in Grade 6, with the purpose of examining factors that may affect smoking. Five questions about warning labels were added to the 2002 questionnaire requesting information on perceptions of the labels and their potential impact on smoking behaviours of young adults. One item had been included in previous questionnaires.

**Results:** 32.8% (n=1267) of the respondents were smokers, with males (35.6%) being more likely to smoke than females (30.4%). Current smokers were less likely than experimental/ex-smokers to believe that warning labels with stronger messages would make people their age less likely to smoke. Female current smokers were more likely to think about quitting.

**Conclusion:** Despite the efforts taken in developing the labels, some young adults are skeptical about their effects. Warning labels may have to be modified to target issues that are relevant to young adults; gender differences are important in this modification. Warning labels can offer an additional component to a comprehensive tobacco control program, in that they provide health information.

**MeSH terms:** Smoking; product labelling; statistics

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

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**Acknowledgements and sources of funding:** We thank Janna Stam for her assistance with the introduction and the literature search. We also thank the young adults for their continued participation and support of this study over the past 10 years. This is an analysis of a follow-up study funded by the National Cancer Institute of Canada, Grants #011279 and #015046, awarded to Dr. J. Koval.

In Canada, overall smoking prevalence has dropped substantially since the mid-1990s, (32% in 1994 to 20% in 2003).<sup>1</sup> From 1998 to 2003, there has been a reduction in the prevalence of current smoking among young adults aged 20-24, from 38% to 30%. However, this age group is still smoking at a considerably higher rate than the general Canadian population.<sup>1,2</sup> In the US, smoking levels among 18 to 24 year olds surpass youth (ages 12-17) smoking rates, and they are not declining, compared to declines in other age groups;<sup>3</sup> prevalence was 28.5% in 2002, 26.9% in 2001.<sup>4,5</sup> Several tobacco control measures have been instituted to help reduce prevalence, including increasing the price of tobacco products through taxation, restrictions on tobacco advertising, restrictions on vending machine cigarette distribution, restrictions on smoking-allowed environments,<sup>6-9</sup> increasing public awareness of the dangers of smoking and second-hand smoke through education programs.<sup>10,11</sup> More prominent warning labels on cigarette packs can contribute to tobacco control efforts through the provision of information about health effects and tobacco ingredients.<sup>12</sup> In Canada, warning labels have evolved from text-only labels covering 20% of the pack in 1989 to graphics and text covering over 50% of the pack in 2000.<sup>13</sup>

In this report, we present findings from a group of young adults who have participated in a 10-year longitudinal study.<sup>14-16</sup> The original purpose of the study was to examine the influence of specific psychosocial factors on the smoking behaviour of adolescents from the Greater Toronto area.<sup>15</sup> The cohort, who in 2002 were in their early 20s, were asked how they perceived the warning labels that had been on cigarette packages for two years, and the potential effectiveness of these labels in preventing young people from starting to smoke and in encouraging current smokers to quit.

### METHODS

Ethics approval was obtained from the University of Western Ontario; 1,409 questionnaires were sent out and 1,270 (90.1%) were returned.\* Methods for this

\* In 1992, 107 (87%) principals in the 123 elementary schools in Scarborough (Ontario) School Board agreed to participate in the original study. Baseline data for this study were collected

TABLE I

## Statement/Questions About the Warning Labels on Cigarette Packages Implemented in Canada as of June, 2000

|  | Possible Responses/Level of Agreement |
|--|---------------------------------------|
| People might quit smoking if the warning labels on the packages had a stronger message.        | Not at all, A little bit, A lot       |
| Have you seen the new warning labels which include pictures?                                   | Yes, No, Don't Know                   |
| Do you think the new warning labels might make some young people less likely to start smoking? | Yes, No, Don't Know                   |
| Do you think the new warnings might make some young people more likely to start smoking?       | Yes, No, Don't Know                   |
| <b>Current Smokers Only</b>  |                                       |
| Do the new warnings make you think about trying to quit?                                       | Yes, No, Don't Know                   |
| In the past month, has noticing the new warnings led you to decide not to have a cigarette?    | Yes, No, Don't Know                   |

cohort study have been described elsewhere.<sup>14-16</sup> In the 88-item questionnaire, respondents were asked about their demographics, current education status, work status, social involvement, illegal drug and alcohol use, parental education and occupation, attitudes and psychosocial factors, smoking environment and smoking status. One item from the original questionnaire requested level of agreement with a statement about warning labels helping people quit smoking. Five new questions were added that asked specifically about existing warning labels (see Table I), resulting in six items focussing on warning labels. Two of the five items were only asked of current smokers.

The definition of smoking status was based on self-reported responses to two smoking questions. Never-smokers were defined as young adults who had never smoked cigarettes. Experimental/ex-smokers were defined as those who had ever smoked, but had not used cigarettes in the past 30 days. Current smokers were those who had ever smoked and had used cigarettes in the past 30 days.

Chi-square tests were used to examine the association between self-reported attitude toward, or knowledge of, cigarette package warning labels and both smoking status and gender. Logistic regression models were used to examine possible interaction between gender and smoking status and the relationship to responses to cigarette package warning labels. All analyses were done in SAS version 8.2.

## RESULTS

Of the 1,270 returned questionnaires, 3 (0.2%) were excluded from the current analysis because smoking status was missing. The remainder consisted of

from a convenience sample of 1,614 grade 6 students; subjects were subsequently tested three times over the next 10 years. Each test surveyed the individuals' evolving behaviour, attitudes, and lifestyle related to smoking and health.

TABLE II

## Attitude Toward or Knowledge of Cigarette Package Warning Labels by Smoking Status

|                              | Smoking Status, n (%) |                 |             | p-value           |
|------------------------------|-----------------------|-----------------|-------------|-------------------|
|                              | Current               | Ex/Experimenter | Never       |                   |
| Had a stronger message       |                       |                 |             |                   |
| Not at all                   | 297 (72.44)           | 250 (55.80)     | 204 (51.65) | <0.0001<br>n=1253 |
| A little bit/a lot           | 113 (27.56)           | 198 (44.20)     | 191 (48.35) |                   |
| Seen new warning labels      |                       |                 |             |                   |
| Yes                          | 406 (98.54)           | 400 (88.89)     | 268 (67.51) | <0.0001<br>n=1259 |
| No/don't know                | 6 (1.46)              | 50 (11.11)      | 129 (32.49) |                   |
| Less likely to start smoking |                       |                 |             |                   |
| Yes                          | 129 (31.31)           | 191 (42.44)     | 119 (29.97) | 0.0001<br>n=1259  |
| No/don't know                | 283 (68.69)           | 259 (57.56)     | 278 (70.03) |                   |
| More likely to start smoking |                       |                 |             |                   |
| Yes                          | 31 (7.54)             | 20 (4.45)       | 12 (3.04)   | 0.0109<br>n=1255  |
| No/don't know                | 380 (92.46)           | 429 (95.55)     | 383 (96.96) |                   |

TABLE III

## Attitude Toward or Knowledge of Cigarette Package Warning Labels by Gender

|  | Males       | Females     | p-value          |
|--|-------------|-------------|------------------|
|  | n (%)       | n (%)       |                  |
| Had a stronger message   |             |             |                  |
| Not at all   | 370 (63.03) | 382 (57.10) | 0.0324<br>n=1256 |
| A little bit/a lot   | 217 (36.97) | 287 (42.90) |                  |
| Seen new warning labels  |             |             |                  |
| Yes  | 519 (88.27) | 558 (82.79) | 0.0061<br>n=1262 |
| No/don't know  | 69 (11.73)  | 116 (17.21) |                  |
| Less likely to start smoking   |             |             |                  |
| Yes  | 214 (36.39) | 226 (33.53) | 0.2870<br>n=1262 |
| No/don't know  | 374 (63.61) | 448 (66.47) |                  |
| More likely to start smoking   |             |             |                  |
| Yes  | 39 (6.67)   | 26 (3.86)   | 0.0251<br>n=1258 |
| No/don't know  | 546 (93.33) | 647 (96.14) |                  |
| <b>Only current smokers were asked to complete the following two questions</b> |             |             |                  |
| Think about trying to quit   |             |             |                  |
| Yes  | 70 (37.04)  | 93 (48.44)  | 0.0245<br>n=381  |
| No/don't know  | 119 (62.96) | 99 (51.56)  |                  |
| Decided not to have a cigarette  |             |             |                  |
| Yes  | 43 (22.63)  | 51 (26.56)  | 0.3725<br>n=382  |
| No/can't say   | 147 (77.37) | 141 (73.44) |                  |

592 (46.7%) males and 675 (53.3%) females. The prevalence of current smoking was 32.8%, being higher for males (35.6%) than females (30.4%). For males, 172 (29.1%) were classified as never-smokers, 209 (35.3%) experimental/ex-smokers and 211 (35.6%) current smokers. For females, 226 (33.4%) were never-smokers, 244 (36.2%) experimental/ex-smokers and 205 (30.4%) current smokers.

When examining the relationship between attitude toward, or knowledge of, cigarette package warning labels and smoking status, statistically significant associations were found (Table II). Current smokers were less likely to believe a stronger message on the warning labels

would make people their age less likely to smoke as compared to experimental/ex-smokers. Current smokers and experimental/ex-smokers were more likely to have seen the new pictorial warning labels than never-smokers. Experimental/ex-smokers were more likely to endorse the belief that the new warnings might make young people less likely to start smoking than were never- or current smokers. Interestingly, although the actual percent was small (7.54%), current smokers were more likely to support the statement that the new warnings might make young people more likely to start smoking.

Findings from the comparison of male and female responses to the questions on

attitude toward, or knowledge of, cigarette package warning labels revealed gender differences (Table III). Females were significantly less likely to have seen the labels. On the other hand, a small percentage of males were significantly more likely to respond that the new warnings might make some people more likely to start smoking. Female current smokers were significantly more likely to think about trying to quit after viewing the labels than male current smokers. However, no difference was noted among current smokers when asked about whether they decided not to have a cigarette after noticing the warning label. Results from the four logistic regression models revealed that there were no significant interactions of gender with smoking status.

## DISCUSSION

While there is a role for communicating health information to smokers through the use of warning labels, their potential impact may be weakened by the fact that the information is sometimes not attended to and/or believed by consumers<sup>17,18</sup> and the information may not be personally relevant.<sup>17,19</sup> Fischer et al., using eye tracking, found that half of the adolescents they tested did not even look at the warning labels.<sup>20</sup> Other studies have found that many adolescents do not understand what is written on the warning labels in part because the language was too technical.<sup>21,22</sup> Several focus groups were conducted with adolescents and adults in Canada, examining reactions to warning labels.<sup>23</sup> In one set of focus groups with Canadian adolescents and young adults who smoked (ages 16-21), many participants said they did not even read the warning messages on the cigarette package, but were aware of their presence.<sup>23,24</sup> Almost all of the participants said the labels did not motivate them to quit.<sup>23,24</sup> While non-smokers have demonstrated higher levels of agreement than smokers with the information found on warning labels,<sup>12</sup> it is believed that communicating the potential harm from smoking is an important process for creating informed consumers.<sup>25,26</sup>

Canadian cigarette manufacturers voluntarily labelled cigarette packages with health warnings and tar concentrations prior to 1989. The 1989 Tobacco Product

Control Act<sup>13</sup> allowed the Canadian government to regulate the health information printed on tobacco product packages. Initially the manufacturers were required to display one of four warning messages, on a rotating basis, that covered 20% of the pack and with contrasting colours. Tar concentration and other chemical levels had to be listed on the side panels. Over the following decade, more changes were made to the size, colour and look of the labels.<sup>27</sup>

In 1999, when new labels were being developed, focus groups were conducted with adolescents and young adult smokers in order to determine what warning label information might be relevant for them.<sup>23</sup> While the adolescents in these groups were dismissive about the long-term risks of smoking for their age group, they were concerned about immediate health problems like impaired athletic performance.<sup>23</sup> When participants were asked how the warning labels could be improved, many stated the message should include more information on the toxic ingredients in cigarettes and less information on the health risks of smoking, and that such information should be based on research findings.<sup>28</sup>

The latest Canadian tobacco warnings, implemented in June 2000,<sup>2</sup> cover over 50% of the faces of the packs, contain graphic illustrations targeting specific groups, cover a range of health conditions and information, and include supporting statistics. A Canadian study by Liefeld found that Canadian warning messages on cigarette packages encourage more smokers to stop smoking and deter more non-smokers from starting to smoke.<sup>29</sup> However, despite the care taken to develop the labels, some young adults in this study were skeptical that stronger warnings would encourage others their age to quit. One cannot expect marked reductions in prevalence among young adults from cigarette warning labels. However, warning labels can offer an additional component to a comprehensive tobacco control program targeting young adults in that they provide health information. When given the opportunity to provide comments with regard to the warning labels, many participants wrote that the labels would not deter them or any teenager from smoking. "Teenagers are not going to stop smok-

ing...just because they are bombarded with info, ads, etc. on how smoking can kill them. It's pointless because they are going to smoke anyway." "As smokers we already know that smoking is bad for us. If it didn't stop us then, why do you think that new warning labels with old information will change that? Do you know anyone that didn't know the hazards of smoking before they started?" Some participants felt that the new warning labels were "funny" and were being "collected and traded like baseball or hockey cards".

While the young adult smokers in this study were reluctant to acknowledge the influence of warning labels, other data with Canadian adults have documented the potential impact of the labels. Hammond et al. evaluated the impact of the new Canadian labels on adult current smokers.<sup>30</sup> Nine months after introduction of the new labels, 616 smokers completed a baseline telephone survey, with a follow-up survey three months later. At baseline, smokers who read, thought about, and discussed the warnings in greater depth were more likely to intend to quit in the subsequent 6 months. At follow-up, smokers who read, thought about, and discussed the warnings in greater depth at baseline were significantly more likely to report having quit, having attempted to quit, or having reduced their smoking during the study period. O'Hegarty et al. also evaluated the perceptions and reactions of young adults in the US to Canadian and US warning labels to determine their perceptions of the potential impact of these labels on smoking cessation, and to elicit suggestions for modifying the labels for US use.<sup>31</sup> Similar to the findings in the current study, females expressed less skepticism about warning labels than did males.

There are some limitations that should be considered in interpreting the findings from this study. First, the perceptions and attitudes of the individuals in this study may not necessarily be generalizable to all individuals within this age group; compared to 2001 census data for 20-24 year olds, the participants in this study had more unemployed, more attending school, with more males and more never-married individuals. Second, participants were in a restricted age group; therefore the findings may not be applicable to other age groups. Third, smoking may be viewed as socially

acceptable behaviour among this age group. Young adults may be reluctant to support the use of warning labels or agree that these labels influence them.

Perhaps warning labels should be modified so that they are more relevant to young adults. For this age group, addressing athletic performance, attractiveness to the opposite sex, taking control of addiction and cost may generate greater interest than health conditions that are in the distant future; moreover, any modification should consider gender differences in response to warning labels. Furthermore, warning labels can be incorporated into comprehensive tobacco control efforts and can be a part of anti-smoking campaigns targeting young adults. Possible venues for these campaigns might include bars and nightclubs where young adults frequent and where the tobacco industry readily promotes particular brands of cigarettes and seeks potential consumers.<sup>32</sup>

## REFERENCES

1. Health Canada. Canadian Tobacco Use Monitoring Survey (CTUMS) summary results for 2003. Ottawa, ON: Author. Available on-line at: <http://www.hc-sc.gc.ca/hecs-sesc/tobacco/research/ctums/2003> (Accessed August 2004).
2. Health Canada. The National Strategy: Moving Forward. The 2002 Progress Report on Tobacco Control. Health Canada. 2002;1-17.
3. CDC. Cigarette Smoking Among Adults—United States, 2002. *MMWR* 2004;53(20):427-31.
4. CDC. Cigarette Smoking Among Adults—United States, 2001. *MMWR* 2003;52(40):953-56.
5. CDC. Cigarette Smoking Among Adults—United States, 2000. *MMWR* 2002;51(29):642-45.
6. Meier KJ, Licari MJ. The effect of cigarette taxes on cigarette consumption, 1955 through 1994. *Am J Public Health* 1997;87(7):1126-30.
7. Scollo M, Sweanor D. Cigarette taxes. *Tob Control* 2000;8(1):110-11.
8. Sweanor D. Killing taxes and Canadians. *Can J Public Health* 1994;85(2):78-79.
9. Laugesen M, Scollo M, Sweanor D, Shiffman S, Gitchell J, Barnsley K, et al. World's best practice in tobacco control. *Tob Control* 2000;9(2):228-36.
10. USDHHS. Reducing Tobacco Use: A report of the Surgeon General. Atlanta, Georgia, 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. 2000;1-4.
11. Liang L, Chaloupka F, Nichter M, Clayton R. Prices, policies and youth smoking, May 2001. *Addiction* 2003;98(Suppl 1):105-22.
12. Crane FG, MacLean VA. A consumer evaluation of health warning labels on cigarette packages in Canada. *Health Market Q* 1996;13(3):47.

13. Health Canada. *The Tobacco Act: History of Labelling*. Health Canada, 2000.
14. Koval JJ, Pederson LL. Stress-coping and other psychosocial risk factors: A model for smoking in grade 6 students. *Addict Behav* 1999;24(2):207-18.
15. Pederson LL, Koval JJ, O'Connor K. Are psychosocial factors related to smoking in grade-6 students? *Addict Behav* 1997;22(2):169-81.
16. Pederson LL, McGrady GA, Koval JJ, Mills CA, Carvajal SC. The role of stress, depression and other psychosocial factors in initiation to smoking: A comparison of models for a cohort of Grade 6 students who begin smoking by Grade 8 and by Grade 11. In: Columbus F (Ed.), *Advances in Psychology Research: Volume IV*. Huntington, NY: Nova Science Publishers, 2001;175-98.
17. Beltramini RF. Perceived believability of warning label information presented in cigarette advertising. *J Advertising* 1988;17(2):26-32.
18. Crawford MA, Balch GI, Mermelstein R. Responses to tobacco control policies among youth. *Tob Control* 2002;11:14-19.
19. Tandemar Research Inc. Cigarette Packaging Study: The Evaluation of New Health Warning Messages. Health Canada. 1996;TR#663022:1-80.
20. Fischer PM, Richards Jr JW, Berman EJ, Krugman DM. Recall and eye tracking study of adolescents viewing tobacco advertisements. *JAMA* 1989;261(1):84-89.
21. Mahood G. Warnings that tell the truth: Breaking new ground in Canada. *Tob Control* 1999;8(4):356-61.
22. Malouff J, Gabrilowitz D, Schutte N. Readability of health warnings on alcohol and tobacco products. *Am J Public Health* 1992;82(3):464.
23. Environics Research Group Limited. Health Canada - Office for Tobacco Control Focus Group Report Regarding Messages on Cigarette Package Sides and Flip-Tops. Health Canada. 1999;PN 4385.
24. Environics Research Group Limited. Health Warning Messages on the Flip/Side and Inserts of Cigarette Packaging-A survey of smokers. Health Canada. 2000;4617:1-14.
25. Aftab M, Kolben D, Lurie P. International cigarette labeling practices. *Tob Control* 1999;8(4):368-72.
26. Borland R, Hill D. Initial impact of the new Australian tobacco health warnings on knowledge and beliefs. *Tob Control* 1997;6(4):317-25.
27. Government of Canada. Tobacco Products Information Regulations-Tobacco Act. Government of Canada. 2000.
28. Environics Research Group Limited. Canadian Adult and Youth Opinions of the Sizing of Health Warning Messages. Health Canada. 1999;PN4501.
29. Liefeld JP. The relative importance of the size, content & pictures on cigarette package warning messages. Health Canada - Office for Tobacco Control [On-line]. 1999. Available on-line at: [www.hc-sc.gc.ca/hecs-sesc/tobacco/pdf/liefeld-eng.pdf](http://www.hc-sc.gc.ca/hecs-sesc/tobacco/pdf/liefeld-eng.pdf) (Accessed May 2004).
30. Hammond D, Fong GT, McDonald PW, Cameron R, Brown KS. Impact of the graphic Canadian warning labels on adult smoking behaviour. *Tob Control* 2003;12(4):391-95.
31. O'Hegarty M, Yenokyan G, Pederson LL, Wortley P. Young adults perceptions of warning labels. 2005, unpublished manuscript.
32. Sepe E, Ling PM, Glantz SA. Smooth moves: Bar and nightclub tobacco promotions that target young adults. *Am J Public Health* 2002;92(3):414-19.

Received: September 24, 2004  
 Accepted: March 30, 2005

## RÉSUMÉ

**Contexte :** C'est en 1989 qu'est entrée en vigueur l'affichage obligatoire des étiquettes d'avertissement de dangers pour la santé sur les paquets de cigarettes vendus au Canada. Des étiquettes d'avertissement qui ne couvraient au départ que moins du quart de la surface du paquet de cigarettes, occupent maintenant plus de la moitié du paquet et sont assorties d'éléments textuels et graphiques. Cette étude vise à déterminer la perception des Canadiens dans la vingtaine à l'égard des éléments graphiques présents sur les étiquettes d'avertissement actuels et de leur efficacité comme mesure préventive du tabagisme et d'incitation à cesser de fumer.

**Méthodes :** Des personnes de 20 à 24 ans participaient à une étude de cohortes d'une durée de dix ans (qui a débuté alors que le groupe était en sixième année) qui portait sur les facteurs influant sur le tabagisme. On a ajouté au questionnaire de 2002 cinq questions liées aux étiquettes d'avertissement au sujet de la perception des étiquettes et leur effet éventuel sur les habitudes des mineurs au chapitre du tabagisme. Dans le passé, l'un de ces points avait été intégré aux questionnaires.

**Résultats :** Les fumeurs représentaient 32,8 % (n=1267) des répondants; les hommes (35,6 %) étaient davantage susceptibles de s'adonner au tabagisme que les femmes (30,4 %). Les fumeurs réguliers étaient moins susceptibles que les personnes qui tentaient l'expérience et celles qui ont cessé de fumer de croire que les étiquettes d'avertissement qui présentaient des messages plus convaincants auraient un effet éventuel sur les habitudes de consommation du tabac des gens de leur âge. Les fumeuses régulières étaient plus susceptibles d'envisager de cesser de fumer.

**Conclusion :** Malgré les efforts investis dans la conception d'étiquettes, certains jeunes adultes émettent des doutes quant à l'efficacité d'une telle méthode. On faudrait probablement modifier les étiquettes d'avertissement pour mieux cibler les préoccupations des jeunes adultes; au moment de cette modification, on accorderait une place importante aux différences entre la perception des hommes et des femmes. Les étiquettes d'avertissement peuvent constituer un complément à un programme global de lutte contre le tabagisme dans la mesure où elles présentent des renseignements sur la santé.