

## A B S T R A C T

Using data from a 1996 random-digit-dialling computer-assisted telephone survey of Ontario adults, 424 smokers and 1,340 nonsmokers were compared regarding knowledge about the health effects of tobacco use, attitudes toward restrictions on smoking and other tobacco control measures, and predictions of compliance with more restrictions. The response rate was 65%. Smokers were less knowledgeable than nonsmokers. Smokers were also less likely to support bans on smoking in specific locations, but majorities of both groups supported some restriction in most settings. Smokers were more likely than nonsmokers to predict that most smokers would comply with more restrictions, and more than three quarters indicated that they, themselves, would comply. Sizable proportions of both groups, especially smokers, failed to appreciate the effectiveness of taxation in reducing smoking. Support for other control measures also differed by smoking status. Both knowledge and smoking status were independently associated with support for more restrictions and other tobacco control policy measures.

## A B R É G É

À partir de données recueillies en 1996 lors d'un sondage téléphonique à numéros aléatoires assisté par ordinateur et mené auprès d'adultes de l'Ontario, nous avons comparé les réponses de 424 fumeurs et de 1 340 non-fumeurs concernant les effets du tabagisme sur la santé, les attitudes à l'égard de restrictions et d'autres mesures de contrôle de l'usage du tabac et les prédictions quant au respect de restrictions plus nombreuses. Le taux de réponse au sondage a été de 65 %. Les fumeurs avaient moins de connaissances que les non-fumeurs. Les fumeurs étaient également moins portés à appuyer l'interdiction de fumer à certains endroits précis, mais la majorité des répondants des deux groupes appuyaient l'idée d'imposer certaines restrictions dans la plupart des endroits. Les fumeurs étaient plus portés que les non-fumeurs à prédire que la plupart des fumeurs se conformeraient à un plus grand nombre de restrictions; plus des trois-quarts d'entre eux ont indiqué qu'eux-mêmes s'y conformeraient. Une grande proportion des deux groupes, surtout parmi les fumeurs, ne croyait pas que les taxes étaient un moyen efficace de réduire l'usage du tabac. Les deux groupes ne donnaient pas le même appui à d'autres mesures de contrôle du tabagisme. La connaissance et le statut de fumeur ou de non-fumeur étaient associés de façon indépendante à l'appui donné à des restrictions plus nombreuses et à d'autres mesures de contrôle de l'usage du tabac.

# Knowledge About Tobacco and Attitudes Toward Tobacco Control: How Different are Smokers and Nonsmokers?

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The public health impact of tobacco use in Canadian society is well documented. Recent estimates indicate that each year tobacco accounts for 33,500 to 41,500 deaths, almost half a million years of lost life, more than 200,000 hospital separations, 3 million hospital days and \$15 billion in economic costs.<sup>1-4</sup> Despite this enormous toll, smoking remains prevalent; in 1996-97 almost 7 million Canadians were smokers.<sup>5</sup> Public policies and programs aimed at reducing smoking and exposure to environmental tobacco smoke (ETS) are key components in a comprehensive approach to eliminating the use of tobacco products in Canada.<sup>6</sup> Although progress has been made, including the enactment of restrictions on smoking in some locations,<sup>7,8</sup> much remains to be done.

Current information about knowledge of the health impacts of tobacco use and attitudes toward control measures in smokers and nonsmokers can be valuable in informing the public education and policy development processes. In previous work,<sup>9,10,11-13</sup>

differences between smokers and nonsmokers were found. Informational strategies specifically targeted to smokers may be needed. Further, explicit data on the attitudes of smokers to restrictions on smoking and their predictions of compliance with more restrictions may help counteract activities promoted by the tobacco industry regarding "smokers' rights" and "smokers' revolts",<sup>14,15</sup> and allay anxieties that policy makers may have about noncompliance. We present comparative information on smokers and nonsmokers in Ontario and discuss the implications of the findings for policy and program development.

## METHODS

A telephone survey of a representative sample of adult Ontarians was conducted in 1996.<sup>16,17</sup> A two-stage probability process was used to select respondents 18 years of age and older. First, households were selected using random digit dialling. A respondent within each household was then selected based on most recent birthday.<sup>18</sup> To maximize the chances of getting a completed interview from each sample number, at least 12 call attempts were made during the day and evening, both during the week and on the weekend. Because Metropolitan Toronto was over-sampled to allow for comparison with previous surveys, both household weights and regional weights were computed for each respondent.

A computer-assisted telephone interview, lasting about 20 minutes on average, addressed the respondent's sociodemographic characteristics; smoking history; knowledge of the health effects of smoking and exposure to ETS and of the public

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health impact of tobacco in Canada; attitudes towards restrictions on smoking in specific settings and predicted compliance with more restrictions; and attitudes toward other tobacco-control measures, including packaging and sales, prohibition of advertising, restrictions on sales to minors, and informational package inserts. Perceptions of the effectiveness of taxation measures in reducing smoking were also assessed (a copy of the questionnaire can be obtained from the first author).

Interviews were completed with 1,764 respondents, yielding a response rate of 65%, based on the estimated number of eligible households. By comparing the sociodemographic characteristics of the sample with the adult population (1991 census), it was determined that the sample was representative with respect to age, sex, and marital status, but under-represented those with low levels of education, a common finding in telephone surveys.<sup>19</sup> The proportions of never smokers (51.2%), former smokers (24.7%) and current smokers (24.7%) were in keeping with those found in other recent provincial surveys.<sup>20</sup>

Based on findings from an earlier survey showing similar knowledge and attitudes among never and former smokers,<sup>9</sup> these groups were combined, yielding 424 smokers for comparison with 1,340 nonsmokers. These sample sizes were sufficient to detect differences of eight percentage points. Observations were weighted according to the probability of being selected into the sample. Responses were tabulated as weighted percentages, and corresponding 95% confidence intervals (CIs) were calculated using standard errors estimated according to the survey design.<sup>21-23</sup> A statistically significant difference at the  $p = 0.05$  level was declared when the 95% CI for the difference in responses between smokers and nonsmokers excluded zero (denoted by \* in the tables). Non-overlapping 95% CIs for smokers versus nonsmokers is approximately equivalent to statistically significant differences at the  $p = 0.005$  level. Multiple logistic regression was used to examine the independent relationships of knowledge about the health effects of smoking and ETS exposure, as well as smoking status, to attitudes, controlling for sociodemographic characteristics.<sup>24</sup>

**TABLE I**  
**Knowledge of Health Effects of Smoking and Environmental Tobacco Smoke (ETS)**

	Nonsmokers (n=1340)		Smokers (n=424)	
	Percent	95% CI	Percent	95% CI
Smoking is a cause of:				
Lung cancer*	87.0	84.5, 89.4	67.4	61.3, 73.6
Chronic bronchitis*	75.4	72.2, 78.7	65.7	59.4, 72.0
Pregnancy complications*	67.3	63.8, 70.8	51.1	44.5, 57.8
Heart attacks*	60.2	56.5, 63.9	45.1	38.4, 51.8
ETS is a cause of:				
Chest problems in children*	58.0	54.3, 61.8	35.8	29.5, 42.2
Lung cancer*	54.1	50.3, 57.8	32.6	26.2, 39.1
Heart attacks*	30.4	26.9, 33.8	17.7	12.5, 22.9
Ear problems in children	14.3	11.7, 16.8	11.4	7.2, 15.6
Daily smokers addicted: <i>All/most</i>	87.6	85.4, 89.9	82.6	77.5, 87.8
Quitting smoking can improve health even after having smoked a lot for a long time: <i>Strongly agree</i>	73.1	69.5, 76.6	66.7	60.2, 73.2
Number of cigarettes that can be smoked daily without increasing the risk of a serious health problem: <i>None*</i>	49.7	46.2, 53.3	33.8	28.0, 39.6
Tobacco causes <i>a lot more</i> deaths than:				
Alcohol	23.3	20.0, 26.6	17.3	11.6, 22.9
AIDS*	34.6	30.8, 38.4	25.2	18.9, 31.4

\* indicates that the difference between nonsmokers and smokers is statistically significant at the  $p < 0.05$  level.

Summaries of knowledge regarding the health effects of both smoking and ETS exposure, each ranging between 0 and 4, were obtained by summing each correct answer to the conditions reported in Table I. We defined support as "majority" if the lower CI of the percentage in question exceeded 50%; "clear majority" support required that the lower CI be at least 60%, while "substantial minority" support required the lower CI to be at least 40%.

## RESULTS

### Sociodemographic characteristics

The male/female ratio was less than one in nonsmokers and greater than one in smokers. In both sexes smokers tended to be younger than nonsmokers. Although the majority of both groups were married or living with partners, smokers were more likely to be divorced or separated. They also tended to report lower levels of formal education.

### Knowledge of health effects and impact of smoking in Canada

Respondents were asked whether smoking or exposure to ETS is a cause, may be a cause, or is not a cause of specific health

problems. Overall, smokers were much less likely than nonsmokers to indicate that smoking is a cause of lung cancer, chronic bronchitis, complications in pregnancy, and heart attacks (Table I). Both groups were most knowledgeable about the causal role of smoking in lung cancer and least aware about smoking and heart attacks. While majorities of nonsmokers recognized the causal role of smoking in all four conditions, among smokers this was the case only for lung cancer and chronic bronchitis. Although both nonsmokers and smokers knew less about the health effects of ETS, majorities of nonsmokers acknowledged the causal role of ETS in chest problems in children and in lung cancer. Both groups were less aware of the causal role of ETS in heart attacks and ear problems in children. This is not surprising because strong evidence of the causal role of ETS in these conditions has emerged only recently.<sup>25</sup> More than three quarters of each group thought that all or most daily smokers are addicted, and clear majorities also strongly agreed that quitting smoking can improve health even after smoking a lot for a long time. However, knowledge that any amount of smoking represents a serious risk was lower, espe-

**TABLE II**  
**Attitudes Toward Restrictions on Smoking in Specific Settings†**

	Nonsmokers (n=1340)		Smokers (n=424)	
	Percent	95% CI	Percent	95% CI
<i>Smoking should not be permitted at all in</i>				
Family fast food restaurants*	71.0	67.5, 74.5	47.0	40.3, 53.7
Indoor public gatherings*	62.4	58.7, 66.1	39.9	33.4, 46.4
Food courts in malls*	58.6	54.8, 62.3	31.6	25.4, 37.8
Hockey arenas*	58.4	54.6, 62.1	41.5	34.9, 48.1
Workplaces*	45.5	41.8, 49.3	22.9	17.4, 28.5
Restaurants*	44.5	40.8, 48.3	13.6	8.7, 18.4
Bingo halls*	36.1	32.6, 39.7	16.7	11.7, 21.7
Bars and taverns*	17.9	15.1, 20.7	3.0	1.0, 5.0

† listed in descending order of support among nonsmokers for not permitting smoking at all  
\* indicates that the difference between nonsmokers and smokers is statistically significant at the  $p < 0.05$  level.

**TABLE III**  
**Predicted Compliance with More Restrictions**

	Nonsmokers (n=1340)		Smokers (n=424)	
	Percent	95% CI	Percent	95% CI
<i>"If there were more restrictions on smoking MOST SMOKERS WOULD"</i>				
Go along with the rules*	36.8	33.2, 40.4	50.0	43.2, 56.7
Go along only if there is a big fine	31.7	28.1, 35.2	26.7	20.6, 32.9
Ignore restrictions*	26.9	23.6, 30.3	19.4	13.9, 25.0
Don't know/refused to answer	4.6	3.1, 6.1	3.9	1.5, 6.3
<i>"If there were more restrictions on smoking, I WOULD" (smokers only)</i>				
Go along with the rules			77.8	71.9, 83.7
Go along only if there is a big fine			10.6	6.3, 15.0
Ignore restrictions			9.4	5.3, 13.6
Don't know/refused to answer			2.1	0.0, 4.4

\* indicates that the difference between nonsmokers and smokers is statistically significant at the  $p < 0.05$  level.

cially among smokers. Most respondents in both groups were not aware that tobacco causes a lot more deaths than alcohol or AIDS.

### Attitudes toward restrictions on smoking in specific settings

For each of eight settings, respondents were asked whether smoking should not be permitted at all, smoking should be permitted in restricted areas, or smoking should not be restricted at all. For all settings, nonsmokers were significantly more likely than smokers to support bans on smoking (Table II); a clear majority supported a ban in family fast food restaurants, while majorities supported bans at indoor public gatherings, in food courts in malls, and in hockey arenas, and substantial minorities supported bans in workplaces and restaurants. In contrast, bans on smoking were not supported by a majority of smokers for any setting. The largest minorities of smokers favoured bans in family fast food restaurants, hockey arenas,

and indoor public gatherings. Both groups were least supportive of bans in bars and taverns.

When nonsmokers and smokers were compared regarding support for at least some restriction on smoking (either a complete ban or restriction to certain areas) in the eight settings, most of the intergroup differences disappeared. Clear majorities of both groups favoured at least some degree of restriction on smoking in seven of the eight locations. Only for bars and taverns did nonsmokers and smokers differ substantially, with 73% and 45%, respectively, supporting some degree of restriction.

### Predicted compliance with more restrictions

Respondents were asked to predict what most smokers would do if there were more restrictions on smoking (Table III). Smokers were more likely than nonsmokers to predict that most smokers would go along with rules (50% versus 37%, respectively), and less likely to predict that smok-

ers would ignore the rules. When smokers were asked to predict *their own* compliance with more restrictions on smoking, a large majority (78%) predicted that they, themselves, would go along with the rules.

### Perceptions of the effectiveness of taxes on tobacco and attitudes toward tobacco policy measures

Sizable proportions of both groups, but especially smokers, failed to recognize the effectiveness of tax measures in reducing smoking among both children and adults (Table IV). Smokers also differed from nonsmokers in their support for restrictions on the sale of tobacco products. In both groups, support was strongest for banning sales in drug stores. A majority of nonsmokers and about one in four smokers favoured restricting the sale of cigarettes to special stores, as is done with alcohol.

Although nonsmokers were also more likely than smokers to support other tobacco policy measures, clear majorities of both groups agreed that stores convicted of selling tobacco to minors should be prohibited from selling tobacco, and majorities agreed that cigarette packages should include an insert fully describing the health hazards of smoking and tips on how to quit. Clear majorities of nonsmokers also supported the plain packaging of cigarettes and bans on advertising. Even among smokers, there was substantial minority support for bans on advertising. However, consistent with these findings, smokers were more likely than nonsmokers to agree that tobacco companies should be allowed to sponsor sporting and cultural events.

### Relationships of smoking status and knowledge to attitudes

Multiple logistic regression analysis that controlled for age, sex, marital status and educational attainment showed that both smoking status and knowledge were independently associated with support for restrictions and other tobacco control policy measures. Nonsmokers were more supportive of these measures, as were respondents who were more informed about either the health risks of smoking or exposure to ETS. However, the strength of the relationship between knowledge and support was similar in smokers and in nonsmokers.

## DISCUSSION

These findings have implications for tobacco control programs and policy. First, deficits in knowledge, particularly with regard to ETS, risks of smoking even small amounts, and public health impact, were found in both groups, but especially in smokers. Explanations for previous findings of accentuated knowledge deficits in smokers have been offered.<sup>26</sup> The findings imply that while effective educational programs aimed at the entire population are needed, specific efforts must be directed at smokers. Appropriately designed health warnings on cigarette packages<sup>27,28</sup> and package inserts are potential vehicles. The latter measure was supported by a majority of smokers in this survey. In designing educational strategies, the lower educational attainment of smokers compared to nonsmokers must be taken into account. Using data from the 1994-95 National Population Health Survey, Miller<sup>29</sup> showed that while all smokers cited the mass media as their major source of information about smoking, those with lower education reported the mass media less often than did smokers with higher education. Furthermore, they were less likely to obtain information from books, pamphlets or magazines and less likely to recall printed warnings about heart disease on cigarette packages. These findings must be considered in selecting channels for education and designing materials. The fact that knowledge was found to be independently associated with supportive attitudes toward tobacco control suggests that educational interventions will not only help to inform the public, they may increase support for other interventions.

Second, clear majorities of both groups supported some degree of restriction on smoking in specific settings; they differed, however, in their support for complete bans. In a 1991 survey, it had been found that 50% or more of both smokers and nonsmokers supported complete bans in city buses, doctors' offices, day-care centres, stores, schools, banks, movie theatres, airplanes, and hospitals.<sup>10</sup> Therefore, these locations were not reassessed. Only restaurants, workplaces and indoor public gatherings were re-examined. Between 1991

	Nonsmokers (n=1340)		Smokers (n=424)	
	Percent	95% CI	Percent	95% CI
<i>Strongly agree/agree</i>				
Higher taxes on tobacco will help prevent children from becoming smokers*	54.9	51.3, 58.4	40.5	34.3, 46.8
Higher taxes on tobacco would help people quit smoking*	51.6	48.0, 55.1	27.2	21.6, 32.9
Tobacco products should not be sold in:				
Drug stores*	73.8	70.8, 76.8	56.0	49.7, 62.2
Grocery stores*	50.0	46.4, 53.5	22.9	17.5, 28.2
Variety stores*	23.7	20.7, 26.6	4.6	2.2, 7.0
Cigarettes should be sold only in special stores, like alcohol:*	54.3	50.8, 57.8	24.1	18.9, 29.4
<i>Strongly agree/agree</i>				
Stores convicted of selling tobacco to young people < 19 should lose licence to sell tobacco*	90.3	88.2, 92.4	74.6	69.2, 80.1
Cigarette packages should include insert describing health hazards and tips on quitting*	83.7	81.2, 86.3	59.5	53.3, 65.7
Cigarettes should be sold in plain white packages to discourage smoking by children*	71.5	68.4, 74.6	44.5	38.2, 50.7
All advertising about tobacco products should be forbidden by law*	68.4	65.0, 71.7	46.9	40.6, 53.2
Tobacco companies should be allowed to sponsor sporting and cultural events*	51.1	47.6, 54.7	72.8	67.2, 78.5
* indicates that the difference between nonsmokers and smokers is statistically significant at the p < 0.05 level.				

and 1996, there was some increase in support for bans on smoking in workplaces and restaurants, however in 1996, such support still fell short of majorities among both groups for both settings. The recent findings do suggest that family fast food restaurants and hockey arenas should be priority settings for the implementation of complete bans. They further suggest that for settings where there is only weak support for complete bans, a requirement for appropriate restrictions, in the form of enclosed, separately ventilated areas,<sup>30</sup> should be considered as an interim step. It is most encouraging that almost 80% of smokers indicated that they would go along with more restrictions on smoking, even without the threat of a fine.

It is also encouraging that majorities of both groups supported banning cigarette sales in drug stores, a prohibition that came into effect in Ontario some months before the survey.<sup>31</sup> The widespread support for punishing stores that sell tobacco

to minors is likewise encouraging. However, the relative failure of both groups to recognize the effectiveness of tax measures in reducing smoking among both children and adults is consistent with the findings of earlier studies in Ontario.<sup>9,10</sup> This should be a matter of concern. Many studies have demonstrated the effectiveness of tax policies as part of a comprehensive tobacco control strategy (e.g. refs. 32-35). Specific interventions to increase understanding about the effectiveness of tobacco taxes and support for tax measures are needed.

Certain limitations are inherent in these findings. The growing social unacceptability of smoking may have biased respondents, particularly smokers, to indicate stronger support for various control measures than was really the case, thus diminishing the actual extent of differences between smokers and nonsmokers. Regarding knowledge, however, it is reassuring that only 6% and 5% of nonsmokers

ers and smokers indicated a causal relationship between smoking and arthritis. Such a relationship has not been established. As well, the comprehensiveness of the topics addressed prohibited in-depth probing in the telephone interview of perceptions and experiences that may underpin attitudes toward tobacco control. Nonetheless, the findings provide guidance for the tobacco control agenda.

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