

The Impact of Workplace Smoking Regulations on the Smoking Behavior of Canadian Workers

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Abstract

This paper examines the impact of workplace smoking regulations on the probability that a worker is a current smoker, on the amount working smokers smoke, and examines the relationship between workplace regulations, exposure to second-hand smoke outside the home and at work, and smoking behaviour. Telephone survey data from 40,267 Canadian workers aged 20 or above interviewed in 2003-06 as part of the Canadian Tobacco Use Monitoring Survey is used to conduct the analysis. Smoking regulations are classified as fully restricted, restricted to designated areas, allowed in certain areas, and no restrictions, and are used as exogenous determinants of whether individuals smokes, of exposure to second-hand smoke at work and more generally outside the home, and of how much smokers smoke. Smoking, quantity smoked, and the joint probabilities of smoking and quantity smoked, of smoking and exposure at work or outside the home, and of quantity smoked and exposure at work or outside the home, are estimated using a variety of econometric specifications, including probit, logit, multiple regression, poisson and negative binomial regression, bivariate and instrumental variables probits, simultaneous equation, and hurdle models. All models indicate that workplace smoking regulations have substantial impacts on the probability of smoking, quantity smoked, and exposure. Simultaneous models indicate that smoking affects general exposure to second-hand smoke outside the home, but not exposure at work, that when workplace smoking policies are controlled for, general exposure adds no explanatory value to models that estimate smoking. However, workplace policies effects may be working through an effect on exposure.

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According to a recent report on the health impacts of environmental tobacco smoke (ETS), the Surgeon General concludes that the scientific evidence indicates that ETS causes premature death in non-smokers and increases the risk of variety of diseases or infections in both adult and children (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2006). Policy makers around the world have been taking an interest in regulating or preventing smoking in a variety of public places, including the workplace, schools, public buildings, and even public spaces as a result of concerns over the adverse health impacts of ETS. Additional, less high profile benefits of such regulation include the potential impact that reduced opportunity and exposure have on smoking. Research evidence indicates that for smokers, the urge to smoke is higher when smoking is expected than when it isn't (Dols, van den Hout, Kindt, Willems, & Willems, 2002). The urge to smoke is therefore likely to be higher where opportunity exists, and opportunity is a function of workplace smoking regulations. Permissive workplace smoking regulations or the lack of any workplace smoking regulations can thus reasonably be expected to increase cigarette consumption by smokers and decrease their chances of cessation. Estimating the impact of workplace smoking regulations on smoking prevalence and quantity smoked is therefore an important public health issue.

The purpose of this study is to estimate the impact of workplace smoking regulations on the probability and amount that Canadian workers smoke. The study uses data from the 2003-06 Canadian Tobacco Use Monitoring Survey (CTUMS), a nationally representative survey, and estimates the impact of various levels of workplace smoking restrictions on workers' smoking behavior. Smoking, quantity smoked, and the joint probabilities of smoking and quantity smoked, of smoking and exposure at work or outside the home, and of quantity smoked and

exposure at work or outside the home, are estimated using a variety of econometric specifications, including probit, multiple regression, bivariate probit, tobit, truncated regression, simultaneous equation, and hurdle models. All models indicate that workplace smoking regulations have large impacts on the probability of smoking, quantity smoked, and exposure.

SMOKING AND SMOKING REGULATIONS

A number of studies have looked at the associations with and/or consequences of workplace, bar and restaurant, and/or home smoking bans on smoking (Borland et al., 2006; Evans, Farrelly, & Montgomery, 1999; Farkas, Gilpin, Distefan, & Pierce, 1999; Farkas, Gilpin, White, & Pierce, 2000; Farrelly, Evans, & Sfekas, 1999; Gagné, 2007; Glasgow, Cummings, & Hyland, 1997; Longo, Johnson, Kruse, Brownson, & Hewett, 2001; Moskowitz, Lin, & Hudes, 2000; Pizacani et al., 2004; Siegel, Albers, Cheng, Biener, & Rigotti, 2005). Using data from Canada, the United States, the United Kingdom, and Australia, Borland et al. find that total bar bans are associated with a greater likelihood of uptake of smoke-free homes over an average time span of seven months. Several studies have found evidence that workplace bans predict or are associated with lower smoking prevalence (Evans et al., 1999; Farrelly et al., 1999; Gagné, 2007), lower consumption by smokers (Evans et al., 1999; Farkas et al., 1999; Farrelly et al., 1999; Glasgow et al., 1997), higher cessation rates (Farkas et al., 1999; Glasgow et al., 1997; Longo et al., 2001; Moskowitz et al., 2000). Farkas finds that workplace and household smoking restrictions are associated with lower rates of relapse, while Longo finds that relapse rates are similar between employees with and without smoking bans.

Endogeneity of workplace policies could potentially be an issue if the individual either has a significant impact on the smoking policy or chooses to be in particular locations on the basis of the smoking policy in place at that location. For example, employees could theoretically select

jobs on the basis of the smoking policy in effect at the workplace. Evans et al. (1999) tests this hypothesis but cannot reject the null hypothesis of exogeneity. On the other hand, workers throughout the ages have put up with less than ideal working conditions because of their need for income, and continue to do so, and workplace smoking policies are largely the result of provincial policies rather than employer-specific policies. Nevertheless, the endogeneity hypothesis is tested in this study using provinces and survey year as instruments for workplace smoking policy in models for quantity of cigarettes smoked.² The findings generally indicate that the hypothesis of exogeneity cannot be rejected and the coefficient estimates for policy effects are consistent with those found in single equation models. Therefore, for the purpose of this paper, it is assumed that employees do not determine workplace smoking policies, that career and earnings aspirations trump workplace smoking policies in the choice of employment, and that workplace policies are therefore exogenous to smoking decisions. The focus of this research is therefore on other specification issues, on the magnitude of the effects, and on how workplace policies interact with exposure to smoking at work to determine whether an individual smokes and how much smokers smoke.

DATA SOURCE

The analysis is based on the 2003-2006 Canadian Tobacco Use Monitoring Survey (CTUMS) Public Use Microdata Files (PUMFS). The survey began in 1999 in order to provide Health Canada and its partners with ongoing reliable data on tobacco use and related issues (Microdata user guide: CTUMS cycle 1, February - June 2005), however, data on workplace smoking restrictions only began to be collected in 2003. Persons aged 15 years of age and over who live in Canada are the target population for CTUMS, which excludes residents of the

² Provincial regulation largely determine workplace policies and these regulations have been changing in recent years. These variables are assumed to have no direct effect on outcomes and are therefore suitable instruments.

Yukon, Northwest Territories and Nunavut and full-time residents of institutions. This study focuses on workers aged 20 and over, as most people who ever begin smoking, begin to do so by the time they are 20 years old. The interpretation of findings regarding differential prevalence rates between establishments with various smoking regulations can then be tied to the impact of smoking rules on workers ability to quit smoking or on reducing the amount that they smoke, rather than on workers uptake of smoking.

Data collection for CTUMS is conducted between February and December of each year. Approximately 20,000 observations are collected per year (10,000 per cycle), with the number of observations spread equally among the 10 Canadian provinces, half of the observations collected from individuals aged 15 to 24, and the other half from individuals aged 25 and over. Respondents are selected through a list of working telephone numbers and a systematic sample of numbers drawn within each sampling stratum for the survey (Microdata user guide: CTUMS cycle 1, February - June 2005). The 2003-06 PUMFs include responses about smoking habits of the respondents, exposure to smoking in the home and to second hand smoking outside the home (2005-06 only), limited demographic and labour force information, workplace smoking policies, and various other information. The sample for this study consists of 40,267 workers aged 20 or above in survey years from 2003 to 2006 and is described in Table 1.³ Individuals for whom the variables used in the analysis are missing are excluded.

Table 1 shows the weighted sample means for the dependent and major independent variables used in this paper for the entire sample and for smokers and non-smokers separately.⁴ Columns 1 to 3 are for the entire data and columns 4 to 6 for the data from 2005-6. In 2005, thirteen questions regarding exposure to second hand smoke outside the home were added to the

³ The workplace policy question was first asked in 2003.

⁴ Provincial and year dummies are also included as controls in models, as well as a rural dummy variable for models that use data from '05-06 only.

survey are used for part to the analysis, to determine whether exposure and how much a person smokes affect each other. Twelve of these questions ask respondents whether they have been exposed to second hand smoke in particular locations outside the home in the last month. These questions were used to form a standardized exposure score. One of the twelve questions asked respondent whether they were exposed to second-hand smoke at work.

According to Table 1, 21-22 percent of Canadian workers aged 20 or over were smokers between 2003 and 2006, with reduction in prevalence in the later years. Smokers smoked around 90 cigarettes per week. Smokers were more likely to be exposed to second-hand smoke outside the home, with a score of 0.31 compared to a score of -0.21 for non-smokers.⁵ Sixty-two percent of non-smokers worked in workplaces with complete restrictions, compared to 47 percent for smokers, who were four percentage points more likely to work in workplaces with designated areas than non-smokers. Five percent of non-smokers worked in workplaces with no restrictions compared to 13 percent of non-smokers.

Smokers were twice as likely as non-smokers to not have completed high-school and half as likely as non-smokers to have completed university. They were younger, less likely to be married, more likely to be male, and less likely to not speak English or French at home. They were less likely to be in management or white collar workers, and more likely to be in all other occupations.

These findings regarding the profiles of smokers versus non-smokers are consistent with what has generally been found in the literature. Smokers tend to be younger, as smokers begin to attempt to quit smoking in their mid-twenties and smokers die younger than non-smokers, and they also tend to be from lower socio-economic background. Given that most Canadian are likely well aware of the damage that smoking does to one's health, socioeconomic class

⁵ The score is based on the unweighted sample.

differences in prevalence are probably due to a lower level of toleration for smoking in the higher socioeconomic backgrounds and may equivalently be due to a higher level of exposure to smoking.

METHODOLOGY

The purpose of this research is to determine whether workplace smoking policies have a measurable impact on whether a worker smokes and how much workers smoke. The research design exploits exogenous variation in the policy variable to determine its impact on outcomes. In other words, the policy variable in this study provides the setting for a natural experiment. An intermediate variable of interest in the study is the worker's exposure to second-hand smoke at work and more generally, outside the home. In particular, we are also interested in determining whether and to what extent such exposure increases the risk of smoking and the quantity smoked, whether and to what extent smoking increases the risk of exposure, and whether and to what extent workplace smoking policies act through exposure to affect smoking behaviour.

The first part of the paper focuses on modeling the determinants of whether a person is a smoker and how much such smokers smoke, while the second part focuses on the interaction between smoking outcomes and exposure to second-hand smoke. While estimating the determinants of smoking prevalence can be done using dichotomous variable models such as the probit or the logit, or linear probability models, characterizing smoking more completely by also estimating the determinants of quantity smoked gives rise to certain modeling issues. Modeling choices include whether to assume normality or some other distributional form for the data generating process, whether the determinants of the decision to smoke and the decision of how much to smoke are the same, whether the decision to smoke and the decision of how much to

smoke are dependent, and finally, once a person is classified as a smoker, whether it is possible to observe a corner solution (i.e., zero consumption).⁶

Jones (1989a, 1989b), Blaylock and Blisard (1992), and Garcia and Labeaga (1996) argue that the participation and consumption decision should be viewed as separate choices with separate determinants. The behavioural foundation for this claim is that the decision to smoke or not to smoke relates to factors such as prestige or stigma, which would not affect quantity smoked once one decided to smoke or not (Jones, 1989a).⁷ Although the Tobit model has been used to model smoking, it is inappropriate because it assumes that explanatory variables are the same for the decision to smoke as they are for the smokers decision regarding how much to smoke, and that their effects are of the same sign and magnitude (Blaycock and Blisard, 1992). The Heckman two-step procedure generalizes the Tobit and allows for separate determinants for the decision to smoke and the decision of how much to smoke, but it assumes that once an individual has decided to be a smoker, smoking takes place, and that there are no corner solutions (Garcia and Labeaga, 1996). Jones, Blaycock and Blisard, and Garcia and Labeaga estimate double-hurdle models, where the decision to take-up smoking is seen as separate from the decision to quit.⁸ The double hurdle model states that an individual must pass two hurdles to smoke. In the first hurdle, one decides whether to be a smoker. In the second, one decides whether to smoke (Blaylock and Blisard, 1992). Double-hurdle dependent or independent model can be estimated. With no corner solutions and independence, the smoking and the consumption

⁶ In this data, some people who identified themselves as smokers did not smoke during the reference week. These respondents are likely occasional smokers, and given their existence, this suggest that the consumption decision must be seen as separate from the decision to be a smoker. Further, some respondents admitted to positive consumption during the week but did not classify themselves as smokers. These respondents could be recent or perpetual quitters. For the purpose of the analysis, respondents who stated they smoked during the reference week but classified themselves as non-smokers were reclassified as smokers.

⁷ Reduced-form estimates from the CTUMS data for smoking and quantity smoked lend support to this hypothesis: worker occupation and province of residence are both strong determinants of smoking, but not of quantity smoked.

⁸ The double-hurdle model was developed by Cragg (1971). (Cragg, 1971)

decisions can be estimated separately (Garcia and Labeaga, 1996). Jones, Blaylock and Blisard, and Garcia and Labeaga assume that errors are distributed normally, and components of the likelihood function therefore resemble probits and ordinary-least squares equations.

Alternative assumptions for the distribution of the error term has given rise to the estimation of poisson and negative binomial regressions for smoking and consumption, along with the logit for dichotomous choices. Hilbe (2005a, 2005b) has developed a series of Stata hurdle programs using the exponential distribution, two of which were used here to estimate smoking and quantity smoked: the logit-poisson hurdle model and the logit-negative binomial hurdle model. The results of these two models are compared to the results obtained when smoking and quantity smoked are determined independently using least squares, poisson, and negative binomial regression. Tobit specifications and the Heckman model were also estimated, but are not included in the results section.

To examine the relationship between smoking and exposure to smoking at work or more generally, several specifications were estimated. They include a two-stage probit least squares (Kreshk, 2003) that includes an equation for smoking and an equation for the exposure score, simultaneous equation models for quantity smoked and the exposure score for smokers and non-smokers and for smokers only. They also include a bivariate probit for exposure at work and smoking, and an instrumental variables probit for exposure at work and quantity smoked for smokers and non-smokers and for smokers only.

Instrumental variables equations require exclusion restrictions to identify the system. To determine which of the available variables could be excluded from which equation, reduced-form equations were initially estimated for all of the dependent variables using all of the independent variables. Variables that did not have significant coefficients in these reduced form

equations were excluded from the structural equations. It was found that although all of the available occupations explained smoking, only "trades, transportation, and equipment operators" differed from the others in explaining quantity smoked, only "managers" and "trades, transportation, and equipment operators" differed from the others in explaining exposure at work, and only "processing, manufacturing, and utilities" differed from the others in explaining the exposure score. Education categories explained both smoking and quantity smoked, but not exposure. Gender explained all except the decision to be a smoker. Marital status explained all except exposure at work. Age group explained almost everything, except that the two younger categories did not explain exposure at work (only older workers have different workplace exposure). Rural explained exposure variables only, and provincial dummies were weak at explaining quantity smoked.

FINDINGS

Table 2 shows the marginal effects for single probit, logit, and logit hurdle equations that estimate the probability of being a smoker, for the period of 2003 to 2006, and the period of 2005 to 2006. According to these estimates, the probability of being a smoker was reduced 13 to 14 percentage point in 2003-2006, which is around 60 percent of the average prevalence of 20 to 21 percent, but by 10 percentage points or 45 percent of the average in 2005-06, in workplaces with complete restrictions. The probability of smoking is also reduced in workplaces with designated smoking areas, but less so, with the drops ranging between 6 and 8 percentage points. For workplaces with smoking restricted only to certain areas, the differences from no restrictions are barely significant. Workplace regulations are as or more important in explaining smoking behaviour as individual control variables, and more important than most, except for completion of university and marital status.

Table 3 shows the estimated coefficients for the impact of explanatory variables on quantity smoked using the linear regression, poisson, binomial, poisson hurdle, and binomial hurdle model. The coefficients explain the change in the quantity smoked by smokers with a change in explanatory variables. Complete workplace restrictions account for a decline of 18 to 25 (a 20 to 25 percent decline) cigarettes per week, depending on the model. Restrictions to designated areas account for a decline of 6 to 9 (a 7 to 10 percent decline), and restrictions only in certain areas account for similar declines. Poisson and negative binomial models yield slightly lower impacts than the linear regression models.⁹

Table 4 shows similar coefficients as in Table 3, but for the years 2005 and 2006 only. These separate coefficients are estimated to provide comparison data for the equations in Table 6 that include exposure variables only available in 2005-06. Complete workplace restrictions account for a decline of 21 to 31 (a 23 to 34 percent decline) cigarettes per week, depending on the model. Restrictions to designated areas account for a decline of 11 to 18 (a 12 to 20 percent decline), and restrictions only in certain areas account for similar declines. Again, poisson and negative binomial models yield slightly lower impacts than the linear regression models.

Table 5 shows the results of a two-stage probit least squares (CDSIMEQ) equation for smoking and an exposure to second-hand smoke score, where the exposure score is tested for exogeneity. The results of three stage least squares estimates for quantity smoked and the exposure score equations are also presented for the full sample in 2005-06 and for smokers only in those years. All of the models indicate that the exposure score does not affect quantity smoked when workplaces smoking restrictions are also controlled for. However, the results indicate that quantity smoked (full sample) or whether an individual smokes affect the exposure score. Similar models (not shown here) that exclude the workplace policy variables in the

⁹ The hurdle model effects are based on the reference person rather than evaluated at the means.

smoking equations, but include them in the exposure equations, generate positive effects of the exposure score on smoking outcomes. In particular, an increase of one standard deviation in the exposure score is responsible for an increased probability of smoking of 28 percentage points over a base of 15 percentage points (a 186 percent increase) for the reference person, and for an increase in 12 cigarettes smoked per week on average and 16 cigarettes smoked by smokers per week on average. The exposure score and the workplace policy variables are highly correlated, which suggests that workplace policies may be working through their effect on exposure. Note that the simultaneous equation model results for smokers yield policy impacts that are similar to those reported in Table 4. This is reasonable, considering that in the simultaneous equation model for smokers, consumption does not affect exposure and exposure does not affect consumption.

Table 6 shows the result of a bivariate probit for smoking and workplace exposure, and of instrumental variables probits for workplace exposure, with weekly cigarettes consumption as an endogenous predictor of exposure for the whole 2005-06 sample and the 2005-06 sample of smokers. Although the coefficients for the smoking probit in the bivariate probit have not been transformed into marginal effects, a calculation of the effects for the reference person yields effects similar to those shown in Table 2. The IV probits indicate that weekly cigarette consumption does not affect workplace exposure. Therefore, while smoking positively affects the overall exposure score (shown in Table 5), it does not affect workplace exposure. In other words, the decision to smoke or not to smoke at work does not affect exposure to second-hand smoke in the workplace. On the other hand, the previous results suggests that exposure at work may well affect smoking.

To summarize, findings indicate that workplace smoking policies have statistically significant and large impacts on the probability that a worker smokes and the quantity of cigarettes smoked by smokers, that workplace policies affect overall exposure to second-hand smoke, and that such exposure may have large effects on smoking prevalence and quantity smoked, or in other words, that policies may partly impact smoking through their impact on exposure.

DISCUSSION

Evidence from this study indicates that workplace smoking policies significantly increases the probability that a worker will smoke, and the quantity of cigarettes smoked by smokers. The strictest policy of a complete ban yields the largest impacts. Table 1 indicates that as of 2005-06, 6 percent of workers worked in workplaces with no restrictions, another 6 percent in workplaces where smoking was banned in certain areas only, 38 percent worked in workplaces where smoking was only allowed in designated areas, and 50 percent worked in establishments with a complete ban. As the evidence from this research indicates, moving towards complete bans in the workplace has the potential to reduce both smoking prevalence and quantity smoked by workers. Fully half of Canadian workers worked in establishments where smoking is allowed in 2006, leaving a considerable amount of room for potential policy impacts on smoking in Canada through regulating workplace smoking.

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Table 1 Weighted Means of Main Dependent and Independent Variables

	'03-06			'05-06		
	All	SM	NS	ALL	SM	NS
Smokes	0.22	-	-	0.21	-	-
Average number of cigarettes smoked in a week	19.73	91.14	-	18.79	90.32	-
Exposure to second-hand smoke outside the home (standardized score)				-0.11	0.31	-0.21
Exposed to second-hand smoke at work				0.31	0.41	0.28
Workplace smoking restrictions (ref = no restrictions)						
Restricted completely	0.59	0.47	0.62	0.50	0.40	0.53
Allowed only in designated areas	0.29	0.32	0.28	0.38	0.41	0.38
Restricted only in certain areas	0.05	0.08	0.05	0.06	0.10	0.05
Education (ref = completed high school)						
Did not complete high school	0.09	0.15	0.08	0.09	0.15	0.07
Completed college	0.22	0.22	0.22	0.21	0.22	0.21
Completed university	0.30	0.17	0.34	0.32	0.17	0.36
Occupation (ref = professional, technical, admin. and other)						
Management	0.09	0.07	0.09	0.07	0.06	0.08
Sales or service	0.21	0.25	0.19	0.22	0.26	0.21
Trades, transport, and equipment operators	0.13	0.20	0.11	0.14	0.21	0.12
Primary industries	0.03	0.04	0.03	0.03	0.05	0.02
Processing, manufacturing, and utilities	0.05	0.07	0.05	0.05	0.07	0.05
Speaks neither English nor French at home	0.08	0.05	0.08	0.09	0.06	0.10
Male	0.54	0.60	0.53	0.54	0.60	0.52
Married	0.69	0.59	0.72	0.69	0.61	0.71
Age (ref = less than 25)						
Aged 25 to 34	0.23	0.27	0.22	0.23	0.26	0.23
Aged 35 to 44	0.26	0.27	0.26	0.25	0.26	0.25
Aged 45 plus	0.39	0.32	0.41	0.39	0.33	0.41

Note: Models also include controls for province or residence, rural for '05-06 only models and year of survey.

Table 2 Workplace smoking restrictions and smoking prevalence, single equation models

	Probit		Logit		Hurdle*		Probit		Logit		Hurdle*	
	'03-06		'03-06		'03-06		'05-06		'05-06		'05-06	
Workplace smoking restrictions (ref = no restrictions)												
Restricted completely	-0.14	-9.25	-0.13	-8.98	-0.15	-8.53	-0.10	-4.65	-0.10	-4.55	-0.10	-4.32
Allowed only in designated areas	-0.08	-5.64	-0.08	-6.43	-0.09	-4.87	-0.06	-2.96	-0.06	-2.91	-0.06	-2.59
Restricted only in certain areas	-0.03	-1.61	-0.03	-1.92	-0.03	-1.26	-0.01	-0.19	0.00	-0.13	0.00	0.02
Education (ref = completed high school)												
Did not complete high school	0.07	5.05	0.07	4.81	0.11	5.63	0.07	3.47	0.07	3.26	0.09	3.74
Completed college	-0.03	-2.66	-0.03	-2.74	-0.04	-2.96	-0.02	-1.48	-0.02	-1.57	-0.03	-1.79
Completed university	-0.10	-9.66	-0.10	-10.85	-0.16	-10.67	-0.11	-7.69	-0.11	-8.43	-0.13	-8.31
Occupation (ref = man., prof., technical, admin. and other)												
Sales or service	0.05	5.06	0.05	4.82	0.07	4.88	0.06	4.40	0.06	4.26	0.08	4.22
Trades, transport, and equipment operators	0.08	5.65	0.07	5.14	0.09	4.72	0.10	5.33	0.10	4.81	0.11	4.44
Primary industries	0.01	0.33	0.01	0.31	-0.01	-0.3	0.08	2.59	0.08	2.35	0.09	2.38
Processing, manufacturing, and utilities	0.07	3.44	0.07	3.24	0.09	3.36	0.06	2.18	0.06	2.06	0.07	2.02
Speaks neither English nor French at home	-0.08	-3.92	-0.08	-5.10	-0.13	-4.28	-0.06	-2.35	-0.06	-2.79	-0.08	-2.69
Married	-0.08	-8.49	-0.07	-8.17	-0.10	-8.88	-0.06	-5.17	-0.06	-4.89	-0.07	-5.32
Age (ref = less than 25)												
Aged 25 to 34	0.04	3.31	0.04	3.42	0.07	4.03	0.04	2.48	0.04	2.48	0.06	2.79
Aged 35 to 44	0.02	2.09	0.02	2.27	0.05	3.39	0.04	2.44	0.04	2.40	0.07	3.42
Aged 45 or more	-0.03	-3.35	-0.03	-3.44	-0.03	-2.27	-0.02	-1.29	-0.02	-1.43	-0.01	-0.73
Observed P	0.22		0.22		-5.2		0.21		0.21			
Predicted P at means	0.20		0.20				0.19		0.19			
<i>N</i>	40,267		40,267				21,243		21,243			
<i>Pseudo R-squared</i>	0.068		0.068				0.069		0.068			

*Marginal effects calculated for the reference person; zs from initial estimates.

Note: Models also include controls for province of residence and year of survey.

Table 3 Workplace smoking restrictions and average weekly number of cigarettes smoked ('03-06)

	Linear Regression		Poisson		Neg. Binomial		Poisson Hurdle*		Nbin Hurdle*	
	Coeff	z	Coeff	z	Coeff	z	Coeff	z	Coeff	z
Workplace smoking restrictions										
Restricted completely	-23.27	-5.27	-20.61	-5.69	-21.80	-6.27	-18.96	-6.58	-19.56	-7.26
Allowed only in designated areas	-8.71	-1.89	-6.22	-1.72	-6.19	-1.76	-8.22	-2.59	-8.32	-2.79
Restricted only in certain areas	-10.18	-1.65	-7.20	-1.52	-6.91	-1.38	-7.85	-1.80	-8.18	-1.85
Education and occupation										
Did not complete high school	16.87	4.00	13.75	3.73	14.12	3.99	10.31	3.14	10.31	3.32
Completed college	-11.18	-3.73	-10.69	-3.80	-11.21	-3.98	-9.14	-3.52	-9.41	-3.71
Completed university	-23.77	-6.22	-24.02	-6.45	-25.80	-7.12	-16.34	-4.39	-17.55	-4.88
Trades, transport, and equipment operators	8.90	2.49	7.24	2.30	8.85	2.72	6.50	2.00	8.70	2.63
Demographics										
Speaks neither English nor French at home	-22.16	-2.28	-21.46	-2.26	-21.98	-2.76	-17.82	-1.78	-18.18	-2.17
Male	12.49	4.55	12.60	4.64	11.41	4.08	11.32	4.24	10.01	3.76
Married	-6.05	-2.27	-6.02	-2.35	-5.41	-2.11	-3.57	-1.58	-2.67	-1.20
Age										
Aged 25 to 34	16.45	5.18	18.94	4.72	17.70	4.42	16.07	4.58	15.05	4.35
Aged 35 to 44	33.36	10.83	38.94	9.89	38.84	9.82	34.74	10.12	33.98	10.14
Aged 45 or more	45.16	14.05	50.27	12.58	53.01	12.63	50.84	14.41	53.14	14.59
Constant	81.67	17.29								80.84
<i>N</i>	<i>10,137</i>		<i>10,137</i>		<i>10,137</i>		<i>10,137</i>		<i>10,137</i>	
<i>R-squared</i>	<i>0.154</i>		-		-		-		-	

*Marginal effects calculated for the reference person; zs from initial estimates.

Note: Models also include controls for province of residence and year of survey.

Table 4 Workplace smoking restrictions and average weekly number of cigarettes smoked ('05-06)

	Linear Regression		Poisson		Neg. Binomial		Poisson Hurdle*		Nbin Hurdle*	
	Coeff	z	Coeff	z	Coeff	z	Coeff	z	Coeff	z
Workplace smoking restrictions										
Restricted completely	-30.98	-4.22	-25.78	-4.91	-26.59	-5.44	-18.12	-4.61	-18.21	-5.10
Allowed only in designated areas	-18.26	-2.60	-13.44	-2.70	-13.22	-2.74	-10.49	-2.72	-9.83	-2.72
Restricted only in certain areas	-21.04	-2.26	-14.58	-2.31	-12.74	-1.94	-10.90	-1.98	-9.79	-1.78
Education and occupation										
Did not complete high school	15.97	2.56	13.70	2.55	14.72	2.84	8.69	2.11	8.94	2.26
Completed college	-9.55	-2.36	-9.13	-2.41	-8.41	-2.14	-5.55	-1.84	-4.82	-1.59
Completed university	-19.82	-3.64	-19.79	-3.74	-21.73	-4.18	-10.07	-2.24	-11.14	-2.51
Trades, transport, and equipment operators	9.34	1.84	7.46	1.71	8.60	1.83	9.46	2.32	11.41	2.66
Demographics										
Speaks neither English nor French at home	-32.45	-4.37	-30.42	-4.51	-29.76	-4.52	-21.86	-3.35	-20.07	-3.28
Male	20.43	5.69	20.57	5.93	19.41	5.23	15.16	5.21	13.79	4.49
Married	-4.16	-1.04	-4.55	-1.20	-3.51	-0.96	-2.51	-0.87	-1.41	-0.52
Age										
Aged 25 to 34	13.04	2.85	14.91	2.65	12.23	2.21	11.37	2.67	9.36	2.27
Aged 35 to 44	37.43	7.98	43.45	7.52	43.12	7.65	33.56	7.74	31.70	7.71
Aged 45 or more	41.28	9.37	46.09	8.70	46.89	8.82	39.35	9.54	39.69	9.76
Constant	83.61	11.55						52.55		51.85
<i>N</i>	<i>10,137</i>		<i>10,137</i>		<i>10,137</i>		<i>40,267</i>		<i>40,267</i>	
<i>R-squared</i>	<i>0.154</i>		-		-		-		-	

*Marginal effects calculated for the reference person.

Note: Models also include controls for province of residence and year of survey.

Table 5 Prevalence, quantity smoked, and exposure score ('05-06)

<i>Exposure score equation</i>	CDSIMEQ		Sim Eq. (all)		Sim Eq. (smokes)	
	Coeff	z	Coeff	z	Coeff	z
Smokes	0.13	5.36				
Weekly cigarettes consumption			0.00	2.99	0.00	0.27
Workplace smoking restrictions						
Restricted completely	-0.22	-10.24	-0.23	-9.87	-0.14	-2.94
Allowed only in designated areas	-0.03	-1.53	-0.02	-1.00	0.02	0.40
Primary industries	-0.10	-3.50	-0.11	-3.69	-0.11	-1.95
Demographics						
Neither English nor French at home	-0.18	-5.77	-0.18	-5.73	-0.04	-0.51
Male	0.05	3.64	0.04	3.01	0.07	1.82
Married	-0.15	-10.13	-0.17	-11.51	-0.19	-6.55
Age						
Aged 25 to 34	-0.34	-17.31	-0.35	-17.49	-0.38	-9.29
Aged 35 to 44	-0.51	-27.14	-0.53	-27.03	-0.58	-11.15
Aged 45 or more	-0.70	-40.16	-0.73	-42.71	-0.81	-14.22
Constant	0.70	25.39	0.57	17.83	0.88	8.19
<i>Smoking equation</i>						
		Smokes		Consumption		Consumption
Exposure score	0.19	1.19	1.36	0.60	0.57	0.11
Workplace smoking restrictions						
Restricted completely	-0.28	-4.91	-15.58	-11.11	-23.49	-7.63
Allowed only in designated areas	-0.10	-2.49	-8.79	-6.77	-15.17	-5.29
Restricted only in certain areas	-0.03	-0.65	-4.76	-2.88	-10.84	-2.99
Education						
Did not complete high school	0.39	12.18	19.21	16.92	17.97	7.58
Completed college	-0.06	-2.17	-2.63	-3.04	-1.19	-0.53
Completed university	-0.37	-12.65	-10.91	-13.11	-16.24	-6.15
Occupation						
Sales or service	0.19	7.64				
Trades, transp., and equip. operators	0.21	6.46	6.81	6.59	8.73	3.75
Primary industries	0.05	0.91				
Processing, manufacturing, and utilities	0.23	5.23				
Demographics						
Neither English nor French at home	-0.17	-2.85	-8.46	-5.29	-20.20	-4.31
Male			3.59	5.24	15.41	8.50
Married	-0.17	-4.89	-6.18	-7.45	-2.06	-1.01
Age						
Aged 25 to 34	0.15	2.59	5.17	4.00	8.17	2.53
Aged 35 to 44	0.15	1.83	8.97	5.87	29.05	7.39
Aged 45 or more	-0.02	-0.15	4.40	2.36	35.25	7.33
Constant	-0.58	-6.19	30.35	15.43	78.70	13.15
N	21,243		21,243		5,191	

Note: Models also include controls for province of residence and year of survey.

Table 6 Prevalence, quantity smoked, and workplace exposure ('05-06)

<i>Workplace exposure equation</i>	Biprobit		IVprobit		IVprobit (smoker)	
	Coeff	z	Coeff	z	Coeff	z
Weekly cigarettes consumption			0.00	0.41	0.00	0.47
Workplace smoking restrictions						
Restricted completely	-0.62	-8.04	-0.62	-8.44	-0.59	-4.69
Allowed only in designated areas	0.07	0.94	0.06	0.93	0.07	0.60
Managers	-0.19	-2.38	-0.18	-2.24	-0.49	-2.79
Trades, transp., and equip. operators	0.31	4.92	0.30	4.60	0.18	1.59
Demographics						
Neither English nor French at home	-0.25	-2.99	-0.21	-2.44	-0.02	-0.08
Male	0.13	3.30	0.14	3.30	0.24	2.52
Aged 45 or more	-0.14	-2.82	-0.13	-3.35	-0.13	-1.32
Constant	-0.17	-1.86	-0.27	-2.82	-0.29	-1.19
<i>Smoking equation</i>						
		Smokes	Consumption		Consumption	
Workplace smoking restrictions						
Restricted completely	-0.37	-4.54	-21.99	-5.18	-31.41	-4.21
Allowed only in designated areas	-0.23	-2.84	-16.24	-3.83	-18.14	-2.54
Restricted only in certain areas	-0.02	-0.19	-9.31	-1.73	-20.50	-2.19
Education						
Did not complete high school	0.24	3.46	13.44	3.56	15.80	2.50
Completed college	-0.08	-1.43	-5.52	-3.25	-8.85	-1.91
Completed university	-0.42	-7.69	-12.68	-8.72	-19.87	-3.50
Occupation						
Sales or service	0.22	4.35				
Trades, transp., and equip. operators	0.31	4.56	9.72	3.66	9.31	1.82
Primary industries	0.25	2.28				
Processing, manufacturing, and utilities	0.19	1.94				
Demographics						
Neither English nor French at home	-0.22	-2.38	-9.46	-5.31	-31.80	-4.30
Male	0.06	1.40	5.24	4.33	20.83	5.88
Married	-0.23	-5.21	-6.78	-4.19	-4.01	-1.00
Age						
Aged 25 to 34	0.15	2.52	7.63	4.13	13.13	2.86
Aged 35 to 44	0.14	2.47	12.05	5.97	37.87	7.80
Aged 45 or more	-0.06	-1.24	7.08	4.09	41.03	9.11
Constant	-0.51	-5.31	35.06	8.50	80.59	11.19
N	21,243		21,243		21,243	
<i>rho (p-value)</i>	0.13(0.00)		0.06(0.57)		0.06(0.70)	

Notes: Equations also include controls for province of residence and year of survey, and others controls. Insignificant coefficients are not reported except for primary question.