ABSTRACT

Objectives: This study explored and measured the presence, content and growth of municipal no-smoking by-laws and examined factors related to differences in by-law breadth and comprehensiveness.

Methods: By-laws from each jurisdiction across Ontario were collected and scored relative to their breadth and restrictiveness using the Asbridge-O'Grady Index. Kruskal-Wallis analysis of variance was used to compare the distributions of municipal characteristics among the regulatory level of municipal smoking legislation.

Results: Twenty-three percent of Ontario municipalities (215/951) had enacted smoking by-laws by the end of 1998 compared to 18% (169/951) in 1994. Larger municipalities tend to be significantly more restrictive than smaller municipalities.

Conclusion: No-smoking legislation has become more extensive and restrictive in Ontario since the passage of the 1994 Tobacco Control Act. There was little legislative variability among the regions that contained tobacco-producing municipalities and those that did not.

ABRÉGÉ

Objectifs : nous voulions étudier et mesurer l'existence, la teneur et l'évolution des règlements municipaux contre le tabagisme et examiner les facteurs pouvant expliquer les écarts dans la portée et l'intégralité de ces règlements.

Méthode : nous avons consulté les règlements de chaque municipalité ontarienne en leur attribuant un score, à l'aide de l'indice Asbridge-O'Grady, pour en établir la portée et les restrictions. Par analyse de variance Kruskal-Wallis, nous avons comparé la répartition des caractéristiques des municipalités selon le niveau de restriction de la réglementation anti-tabac.

Résultats : 23 % des municipalités ontariennes (215/951) avaient des règlements anti-tabac à la fin de 1998, contre 18 % (169/951) en 1994. Les grandes municipalités ont eu tendance à adopter des règlements beaucoup plus restrictifs que les petites.

Conclusion : la portée et la sévérité des règlements anti-tabac ont augmenté en Ontario depuis la promulgation, en 1994, de la Loi réglementant les produits du tabac. Nous avons constaté peu d'écarts sur le plan de la réglementation entre les régions comportant des municipalités productrices de tabac et les régions qui n'en comportent pas.

Analysis of Factors Related to Development, Regulatory Level and Change in Municipal No-smoking By-laws in Ontario

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Despite the 30 years of warnings from Health Canada and the U.S. Surgeon General about tobacco smoke, tobacco use continues to be the leading cause of preventable disease, disability and death in Canada and a major contributor to health care costs and lost productivity.^{1,2}

In recent years, there has been increased recognition that health policies and environmental changes tend to have a greater impact on the health of the whole community than do individually oriented approaches.³ Among these approaches is the enactment of legislation to limit exposure to environmental tobacco smoke by banning smoking in public places. One such piece of legislation is the 1994 Ontario *Tobacco Control Act*⁴ (TCA), which features a provision enabling municipalities to enact even more stringent local by-laws.

As part of an ongoing evaluation of the Tobacco Control Act,⁵ the purpose of this study is to describe the existence, content and growth of municipal no-smoking by-laws in the province of Ontario in 1998 and to explore both:

1. how no-smoking by-laws have changed since passage of the TCA, and,
2. factors related to differences in the breadth and comprehensiveness of no-smoking by-laws in Ontario.

METHODS

In 1994 and again in 1998, Tobacco Control Officers at each of the 37 Ontario health units were contacted and asked for copies of any existing municipal or local regional no-smoking by-laws enacted as of December 31 of that year under their jurisdiction. It is believed that this process resulted in a complete collection of all existing or enacted by-laws in the province.

The Asbridge-O'Grady Index,⁶ a construct for understanding municipal no-smoking by-laws, was used to evaluate the collection of by-laws and completely measure their regulatory strength. The Index takes into account both the comprehensiveness and restrictiveness of a by-law. Potentially there are 11 different public places in which smoking could be controlled within a municipality, and the comprehensiveness of the by-law is based on the number of these places in which some form of smoking control is outlined in the by-law. The level of restrictiveness of the by-law ranges from a complete ban on smoking, to partial regulation, designated areas or no restrictions. Each of the 11 public places is assigned a score from 0 = no restrictions to 3 = completely restricted. The addition of scores under each of the 11 categories yields an Index Score. An Abernathy-Lacchetti modification of the Index recommends scores be standardized to compensate for differences in municipalities based on population size. This involves surveying municipalities to determine which public places are present in communities of differing sizes. Combined with the municipal smoking by-laws themselves, one would know which public places were actually present within a given municipality, and what public places were regulated within that same municipality. The percentage of pub-

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TABLE I
1994 and 1998 Level of Regulation by Geographic Region

Level of Regulation (N)	Geographic Region											
	South West		Central West		Central East		Eastern		North East		North West	
	1994	1998	1994	1998	1994	1998	1994	1998	1994	1998	1994	1998
None to Minimal	22	38	19	6	23	23	23	23	9	10	14	14
Weak	3	4	6	9	11	10	6	9	2	3	0	0
Medium	4	4	7	6	6	9	1	1	2	4	0	0
Strong	2	1	1	3	2	8	3	1	0	0	0	0
Very Strong	0	1	0	0	1	1	0	0	1	0	0	0
Total (N)	31	48	33	24	43	51	33	34	14	17	14	14

lic places that *could* be regulated and which *are* regulated is then calculated. The standardized rating, referred to as the *Level of Regulation*, is calculated by multiplying the Index score by the percentage of available places covered. The dependent variable, Level of Regulation for each municipal by-law, ranges from 0 (nonexistent law) to 27+ (very comprehensive and restrictive law). Raw scores are recoded into five separate categories of roughly equivalent size and used in cross-tabulations: 0 = none to minimal regulation (0-5.5), 1 = weak regulation (5.6-12.5), 2 = medium regulation (12.6-19.5), 3 = strong regulation (19.6-26.5), 4 = very strong to complete regulation (26.6+).

All statistical analyses were conducted using the SPSS statistical package.⁷ To examine the relationship between the five municipal characteristics and regulation level, bivariate cross-tabulations were used on categorical data.

Categorical data were obtained when health units within Ontario were divided into 6 geographic regions (South West, Central West, Central East, Eastern, North East, and North West), based on the Ontario Ministry of Health's administrative/planning boundaries in place at the time of the study, and represent 951 municipalities. Since municipal-specific smoking prevalence data are not available for a provincial sample, 1996 Ontario Health Survey (OHS) data,⁸ broken down at the health unit level, were used as a proxy. Health unit prevalence rates were divided into three categories by subdividing the variance in smoking prevalence into thirds: low (21.6-30.7), medium (30.8-32.6), and high (32.7-40.1). Population statistics were obtained from Statistics Canada's 1996 census⁹ and categorized into five outcomes: 0-999, 1000-

Figure 1. Number of new and existing by-laws: 1973-1998

Figure 2. Percentage of population covered by level of by-law: Ontario, 1994 vs. 1998

4999, 5000-9999, 10,000-99,999, and $\geq 100,000$. The date of enactment of a municipal by-law and whether the particular by-law was an amendment to a previous by-law or was the original by-law were

combined to yield the variable date and status, which was categorized into four outcomes: original prior to 1988, amendment prior to 1988, original from 1989 on, and amendment from 1989 on.

Since the Index did not meet the criteria of interval data, the nonparametric Kruskal-Wallis analysis of variance was used to compare the distributions of the ordinal variables (population size, geographic region, smoking prevalence, by-law date and status, and median total income) among the Level of Regulation. A significance level of $p < 0.05$ was used for decision-making in the statistical analyses.

RESULTS

Twenty-three percent of Ontario municipalities (215/951) had enacted smoking by-laws by the end of 1998 compared to 18%

(169/951) in 1994. Although the development of such by-laws has been incremental, the cumulative proportion of by-laws has increased substantially over time (Figure 1). Considerably more residents were unprotected by absent or minimal level smoking by-laws in 1994 than in 1998 and the percentage of the population covered by strong and very strong level by-laws increased substantially from 1994 to 1998 (Figure 2). Furthermore, during this four-year period, the trend in by-law development was towards an increase in the Level of Regulation, such that municipalities with no by-laws began to enact smoking legislation, and those with existing legislation developed stronger laws (Table I, Figure 3).

There was an increase in the percentage of public place covered in the 1998 collection of by-laws. In particular, municipal offices/buildings were not only the most regulated public place (83% of municipalities), but also tended to be the first public place for which a municipality develops regulations. Another area demonstrating important increases in by-law development is the licensed establishment – the only public place without any governing smoking legislation in 1994. Four percent of Ontario municipalities had enacted smoking by-laws in such establishments by the end of 1998.

Municipalities with greater populations showed a shift towards more restrictive legislation during the four-year period, with the most highly populated areas revealing the most dramatic changes in by-law restrictiveness.

Five of the six geographic regions showed improvements in the regulatory strength of their by-laws from 1994 to 1998 (Figure 4). The North West region, however, retained its collection of minimal level by-laws during the four-year period. Municipalities within the South West, Central East and North East regions appear to have introduced the strongest by-laws in 1998, while the Central East region was the only one with such restrictive legislation in 1994.

The regulatory level of smoking by-laws showed some increases from 1994 to 1998, regardless of the existing level of smoking

prevalence; however, more restrictive by-laws were enacted during this period in municipalities with a lower smoking prevalence rate. Municipalities with a high smoking prevalence rate also established a small percentage of very strong level by-laws which were non-existent in 1994 within such communities.

It has been hypothesized that the later the date of enactment, the stronger the legislation, and that amended laws are stronger than the original legislation. In general, by-laws enacted in 1989 and later were stronger than those enacted in 1988 or earlier, regardless of whether the by-law was an amendment or an original.

Tests indicated that no significant difference existed in both the 1994 and 1998 Level of Regulation according to geographic region or date and status of the by-law. However, the analysis did reveal that the Level of Regulation in 1994 was significantly related to municipal smoking prevalence ($p < 0.05$) and median total income ($p < 0.05$). Furthermore, both the 1994 and 1998 Level of Regulation were found to vary significantly with municipal population ($p < 0.001$).

DISCUSSION

Results reveal considerable variation in the regulatory level of municipal smoking legislation in Ontario. It appears as though the evolution of tobacco control legislation occurs in an incremental fashion, where the first important step is to get a by-law passed – most often in an area under government control – regardless of strength. Within time, the by-laws evolve into more comprehensive, broader-reaching pieces of legislation.

The finding that municipalities with large populations compared to those with small populations were more likely to have enacted a by-law with a strong level of regulation, is consistent with previous by-law research in Canada and the United States.^{10,11} In fact, municipal population size demonstrated the strongest relationship to the level of regulation for a municipal by-law. While this relationship seems intuitive, it remains undetermined whether this results from less public and political support in the smaller communities, the

absence of nonsmokers' rights activism, or whether smaller communities just move forward more cautiously with smoking legislation.⁶

Earlier work has demonstrated a discrepancy in by-law regulatory level according to the regional location of the municipality.⁶ While no statistically significant relationship was detected between the geographic region and the Level of Regulation, municipalities within the Central East and Central West had not only enacted more smoking by-laws in general, but also by-laws of greater regulatory strength. In part, this may stem from the predominance of urban communities within these two geographical regions, including Toronto and Hamilton, respectively. The remaining four regions are characterized by a great deal of rural territory. In the development of policy, a distinct urban-rural effect may exist wherein the rural communities get less input from the public and have less opportunity to conduct public education and awareness campaigns, or wherein public readiness may be lacking and there is a preference to just control behaviour through "understood", "unwritten" policies.⁶ Enforcement of formal, enacted legislation can also become more difficult in these vast communities.⁶

In addition to the urban-rural distinctions among the six geographic regions in Ontario, the existence of tobacco production in some areas is also noteworthy. An extensive tobacco-producing industry exists in Ontario, with tobacco farms concentrated within the South West region in the counties of Elgin, Essex, Kent, and Oxford. The Central West region of the province is also home to the tobacco-producing municipalities of Haldimand-Norfolk and Brant. However, the failure to detect any statistically significant relationship between Level of Regulation and geographic area suggests little legislative variability among the regions that contained tobacco-producing municipalities and those that did not.

The significant relationship between the 1994 Level of Regulation and smoking prevalence is evidence that, in 1994, a municipality's likelihood of having a strong regulatory smoking by-law was associated with a high prevalence of smoking.

While the causal ordering of this relationship has not been determined in this study, it seems plausible that high municipal smoking prevalence rates in 1994 acted as an impetus to the development of restrictive local legislation.

Median total income of a municipality was included in the analysis because it was thought to offer a crude measure of the social environment and capacity of the municipality. The relationship detected between the 1994 Level of Regulation and median total income suggests that, in 1994, municipalities with higher incomes were more likely to have strong level smoking legislation. This may be explained, in part, by the greater capacity with which high income municipalities could act and bring about change and, as such, develop stronger smoking by-laws.

The results of this study are noteworthy given that this is the first investigation to evaluate Ontario no-smoking by-laws over a four-year period. Furthermore, all by-laws in Ontario were included in the analysis. While the study did not account for all factors that might explain differences, the analysis did make use of a wide range of variables. Such information can assist policy-makers in developing more restrictive by-laws in areas where they are most needed. Yet, further research is necessary to extend these findings. In particular, determining the independent effects of the factors studied would be an important next step. Furthermore, whether these laws achieve their intent of reducing sales to minors and ETS exposure, and whether they alter behaviour and social norms is not yet known and merits examination. Continued evaluation is necessary to assist in the long-term development of municipal smoking legislation and to facilitate the movement towards stronger levels of regulation. Such action is vital and will ultimately offer greater protection to the health of our public.

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elle renverse la notion de pression des camarades. Les concours de renoncement au tabac, très populaires chez les adultes, fonctionnent bien. (Qui n'aime pas recevoir des prix?) Mais les jeunes peuvent-ils continuer à s'abstenir une fois les prix distribués?

À Ottawa, les organismes de santé publique ont misé sur la protection contre le tabac en créant des milieux de travail et des lieux publics (restaurants, bars, salles de quilles) entièrement sans fumée. Mais la protection n'est que le troisième aspect de la lutte contre le tabagisme, qui comprend aussi le renoncement et la prévention. Il devient de plus en plus évident qu'une victoire sur un aspect facilite les choses sur les deux autres. Une nouvelle étude finlandaise a constaté que les interdictions de fumer au travail réduisaient considérablement le nombre de fumeurs dans la population adulte, et que ceux qui persistaient fumaient un moins grand nombre de cigarettes.³ Un récent sondage a permis de constater qu'à Ottawa, 69 % des anciens fumeurs appuient les nouveaux règlements antitabac dans les lieux publics, contre 27 % des fumeurs actuels. Les efforts de renoncement semblent donc renforcer les campagnes de protection.⁴ Puisque les jeunes considèrent que le tabagisme est une activité légitime qui les initie au monde adulte, la création d'espaces pour adultes sans fumée, comme les bars, favorise sans nul doute les efforts de prévention. La baisse récente du taux d'initiation au tabac chez les jeunes des États-Unis (en recul du tiers en deux ans)⁵ s'expliquerait par la hausse du prix des cigarettes et par un changement culturel dû à des campagnes

publicitaires choc contre le tabac et à l'avènement des restaurants sans fumée. Au Canada également, le tabagisme chez les 15 à 19 ans a baissé, passant de 28 % en 1999 à 25 % en 2000.⁶

Les coûts du tabagisme sont vraiment trop importants pour qu'on les néglige. Comme l'affirme l'article de Murray Finkelstein dans le présent numéro,⁷ le tabagisme (et l'obésité) coûte très cher en services médicaux aux contribuables : environ 275 millions par année en tout en Ontario.

En vérité, le tabac entraîne des coûts humains beaucoup plus sinistres que toute considération financière. Le délai de 30 ans entre l'initiation au tabac et l'apparition des symptômes signifie que les gens qui commencent à fumer à l'adolescence risquent de mourir d'un cancer du poumon beaucoup trop jeunes – avant la fin des études secondaires de leurs propres enfants.

Le fait même que nous ayons à prôner le renoncement au tabac chez les adolescents est le signe d'un problème réel qu'il faut résoudre rapidement. Il faudrait faire du renoncement une quête passionnante pour les adolescents et mettre tous les outils nécessaires à leur disposition. Fumer, par contre, devrait être compliqué, et tout aussi mal vu que de se piquer à l'héroïne. Les adolescents peuvent se procurer des cigarettes avec une facilité alarmante. La vente de tabac aux jeunes a beau être interdite au Canada, les taux de conformité sont loin d'être parfaits.⁸ Le roulement élevé du personnel dans les magasins de quartier et l'intimidation des jeunes employés sont deux obstacles entre mille, sans parler de l'accord tacite des parents. Si les collectivités considéraient la vente ou l'offre de

cigarettes aux enfants comme les crimes qu'ils sont réellement, les taux de tabagisme chuteraient probablement.

Le tabagisme est une épidémie chez les enfants. Rares sont les fumeurs qui commencent à fumer après 18 ans, et le niveau d'accoutumance (le nombre de cigarettes fumées par jour) et le tabagisme précoce sont liés.⁹ Nous devons collectivement prendre les mesures qui s'imposent pour contrer les forces sociales et économiques qui alimentent l'épidémie, pour protéger nos enfants des ravages de l'accoutumance à vie et pour empêcher la banqueroute imminente de notre régime de soins de santé.

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