

# Analysis of Taxable Sales Receipts: Was New York City's Smoke-Free Air Act Bad for Restaurant Business?

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*This article examines the results of a study to determine if the New York City Smoke-Free Air Act has had an adverse economic impact on the taxable sales receipts from the city's restaurant and hotel industries. The study found that real taxable sales from eating and drinking places and hotels in New York City increased by 2.1 percent and 36.9 percent, respectively, compared with levels two years before the smoke-free law took effect. During the same period, real taxable sales for eating and drinking establishments and hotels in the rest of the state experienced a 3.8 percent decrease and a modest 2.4 percent increase in sales, respectively.*

Key words: *economics, environmental tobacco smoke, policy, smoking*

## Introduction

On April 10, 1995, New York City's Smoke-Free Air Act took effect.<sup>1</sup> This legislation restricts smoking in most indoor public places including work sites, sports and recreational facilities, schools, and restaurants in the five boroughs of New York City. Specifically with regard to restaurants, smoking is prohibited in the indoor dining area of restaurants with more than 35 indoor dining seats. Restaurants with 35 or fewer indoor dining area seats and stand-alone bars or taverns whose revenue from the sale of alcoholic beverages is at least 40 percent of their total revenue are exempt from this law. Smoking is permitted in the bar areas of restaurants; however, there must be at least six feet between the bar and the dining areas or a ceiling-to-floor partition or wall be-

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tween the two areas. The bar area cannot exceed 25 percent of the total square footage of the bar and dining areas and no more than 15 percent of the first 100 seats in the entire facility and 10 percent of any seats of more than 100 can be situated in the bar area. Smoking is permitted in the outdoor seating area of a restaurant provided that the section is contiguous and does not exceed 25 percent of the total outdoor seating capacity. Rooms in which smoking is allowed are permitted provided food service is not offered in those areas and it is not the sole indoor patron waiting area. Restaurant owners/managers are responsible for enforcing the law, and the New York City Department of Health performs compliance inspections as part of the routine health department check administered to all licensed restaurants. Penalties for violation of the law range from \$200 (first offense) to \$1,000 (third offense) for restaurant owners/managers and \$100 for smokers.

There have been seven previously published studies that use taxable sales receipts from restaurants to examine the economic effects of smoke-free restaurant laws.<sup>2-8</sup> Each study concludes that variation in sales cannot be attributed to the presence of smoke-free legislation. Of all the methods used to assess the economic impact of smoke-free laws, many researchers believe the use of taxable sales data to be the best approach available.<sup>9</sup> Taxable sales data are an objective and verifiable means of measuring business activity in a large area. These data are easy to obtain from local or state taxation departments, and it is thought that these data are reasonably accurate because it is a crime to report fraudulent information to the Internal Revenue Service. Taxable sales data are superior to survey data in that they permit one to look at macro-level trends in a given area by examining sales from all restaurants in an objective manner. Furthermore, survey data are based on respondents' perceptions of how their business has performed and this may be biased by one's personal attitude about the law.

However, there are a number of drawbacks to the use of taxable sales data. By its nature, the taxable sales approach does not permit the analysis of smaller subsets of the restaurant population and it is impossible to detect migration to areas that may be exempt from the law (for example, shifting restaurant patronage to restaurants with 35 or fewer indoor dining area seats). Additionally, past studies

have included sales figures for establishments not affected by the law. For example, bars and taverns are generally exempt from smoke-free legislation; however, previous studies often combined their taxable sales with restaurants, though recent research has indicated 100 percent smoke-free laws governing bars and taverns do not cause decreases in this type of business.<sup>8</sup> Revenue from bakeries and prepared foods purchased in supermarkets is classified as restaurant revenue even though the establishments from which they were obtained are not restaurants. Meals purchased in restaurants within hotels are categorized with hotel revenue, not restaurant revenue; this can be substantial in localities that cater to tourists like New York City. Due to these multiple sources of bias, it is plausible that this method is not sensitive enough to detect the true effect of a smoke-free ordinance.

Many opponents of the smoke-free law argue that the adverse economic effects will not be restricted to restaurants and that tourism also will suffer. There have been no previous studies that have used taxable sales receipts to examine the effect of smoke-free legislation on the tourist industry. This research is the first to examine factors associated with taxable sales from hotels.

The goal of this study was to determine if the New York City Smoke-Free Air Act had an adverse economic impact on the taxable sales receipts from the city's restaurant or hotel industries, as well as to confirm or contrast the results of recent surveys of New York City consumers and restaurant owners/managers, which also examined the economic impact of the smoke-free law.

## Methods

### Data source

Retrospective longitudinal data on taxable sales from eating and drinking establishments, hotels, and retail trade were obtained semiannually from March 1990 to February 1997 for each county in New York State from the New York State Department of Taxation and Finance.<sup>10</sup> Businesses are categorized from the owner's self-reported classification of their type of business using the Federal Standard Industrial Classification coding system on their income tax returns. The codes for eating and drinking places are

58.10–58.13; the codes for hotels are 70.10–70.41; and the codes for retail trade are 52.00–59.99.

Data for the five counties of New York City were aggregated to obtain figures for the city as a whole. These counties are Bronx, Kings (Brooklyn), New York (Manhattan), Queens, and Richmond (Staten Island). Data for all counties in New York State that did not have a smoke-free restaurant law in place during the study period (1990 to 1997) were combined; this group was the control group for New York City. Specifically, this group contains all 62 counties in New York State except the five counties of New York City, Suffolk County (a smoke-free restaurant law effective January 1, 1995), and Westchester County (law effective September 1, 1996). The term counties outside of New York City refers to the remaining 55 counties in New York State that did not have smoke-free legislation during the study period.

### Outcome Measures

For New York City and counties outside New York City, the following five outcome measures were obtained:

1. total taxable sales from eating and drinking establishments (denoted by T)
2. total taxable sales for hotels (denoted by H)
3. the ratio of sales from eating and drinking places to all noneating and drinking establishment retail trade sales in New York City (denoted by  $R_{NYC}$ )
4. the ratio of sales from eating and drinking places in New York City to sales outside New York City (denoted by  $R_r$ )
5. the ratio of sales from hotels in New York City to sales outside New York City (denoted by  $R_h$ )

All dollar figures are adjusted to March 1990 dollars.<sup>21</sup>

### Independent Variables

The main predictor variable was the presence of the smoke-free ordinance in a given time period in a given region. Six-month time periods from March 1990 to February 1995 were coded with a zero and six-month time periods from March 1995 to February 1997 were coded with a one. The season of a given time period was included in the analysis and was equal to zero for winter months (September to Febru-

ary) and one for summer months (March to August). General economic trends were accounted for by including a time variable equal to the consecutive time rank of a given time period (for example, the first time period included in the analysis is coded as one, the second as two, and so forth) and the unemployment rate in a given location in the final month of a given time period.<sup>12</sup>

### Analysis

In addition to plots of each outcome variable over time, a multivariate linear regression model was constructed using methods similar to those described by Glantz and Smith to model the dependent variables outlined above as a function of the presence of the smoke-free law, time, season, and the unemployment rate.<sup>2</sup> Underlying economic trends that affect the overall business climate in an area, including restaurants, were controlled for by the structure of both the outcome (for example, the ratio measures attempt to control for underlying economic trends) and the predictor variables selected (for example, use of time, seasonal, and unemployment variables).

### Results

#### Overall trends

Trends in taxable sales from eating and drinking places and hotels in New York City and outside New York City over time are presented in Figures 1–5. When adjusted to March 1990 dollars, real raw taxable sales have been increasing in New York City since 1992 and generally decreasing over the same time period in the rest of the state (see Figure 1). A similar but more dramatic trend is observed when real raw revenue from taxable hotel receipts is examined (see Figure 2). The ratio of taxable restaurant sales in New York City to total retail trade sales,  $R_{NYC}$ , has remained nearly constant over time at about 24 percent, though this measure is subject to seasonal variation (see Figure 3). The ratio of taxable restaurant sales in New York City to taxable restaurant sales in the rest of the state has been increasing over time from a low of nearly 80 percent to the current observation of about 110 percent (see Figure 4). Seasonal variation of 5 percent to 10 percent is found in this measure. The ratio of hotel revenue in New York City to hotel revenue in the rest of the state has been in-

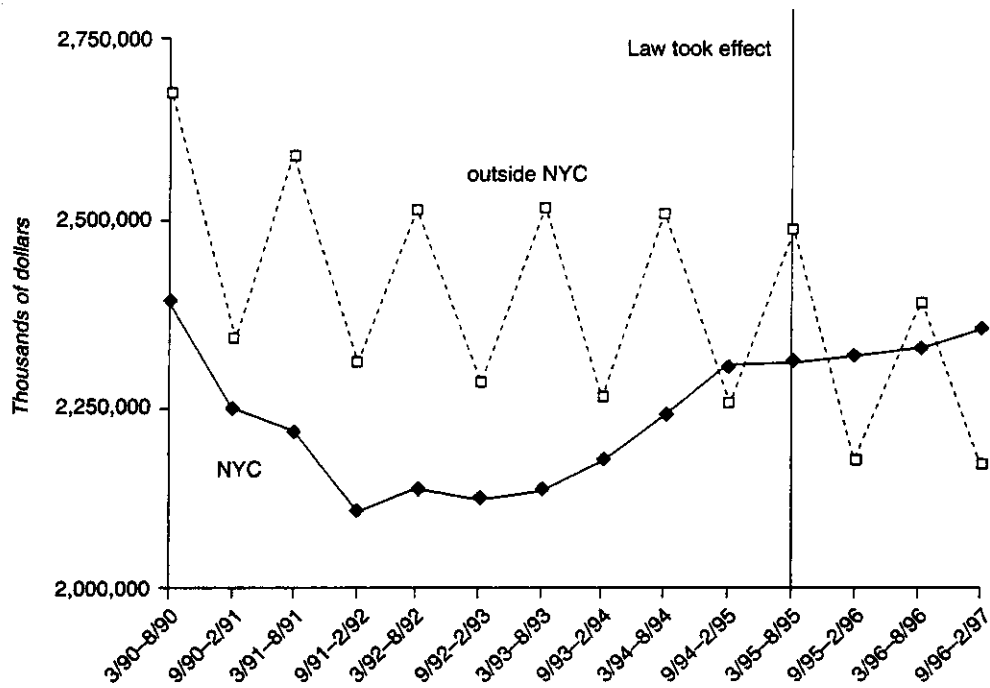


Figure 1. Real taxable sales revenue from eating and drinking establishments in New York City and the rest of New York State excluding Suffolk and Westchester counties, 1990 to 1997.

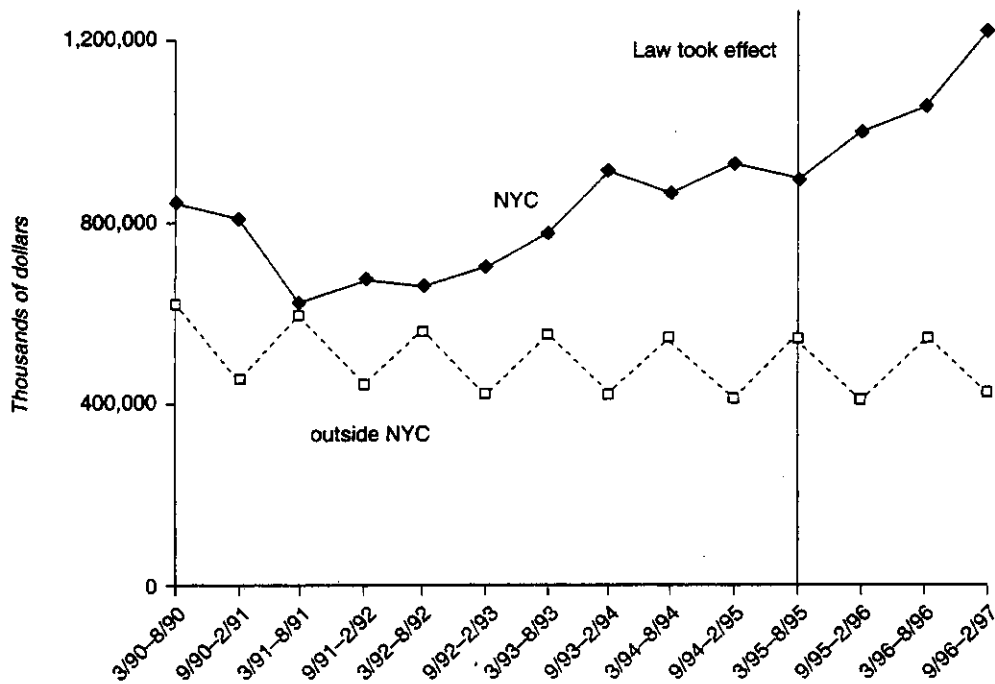
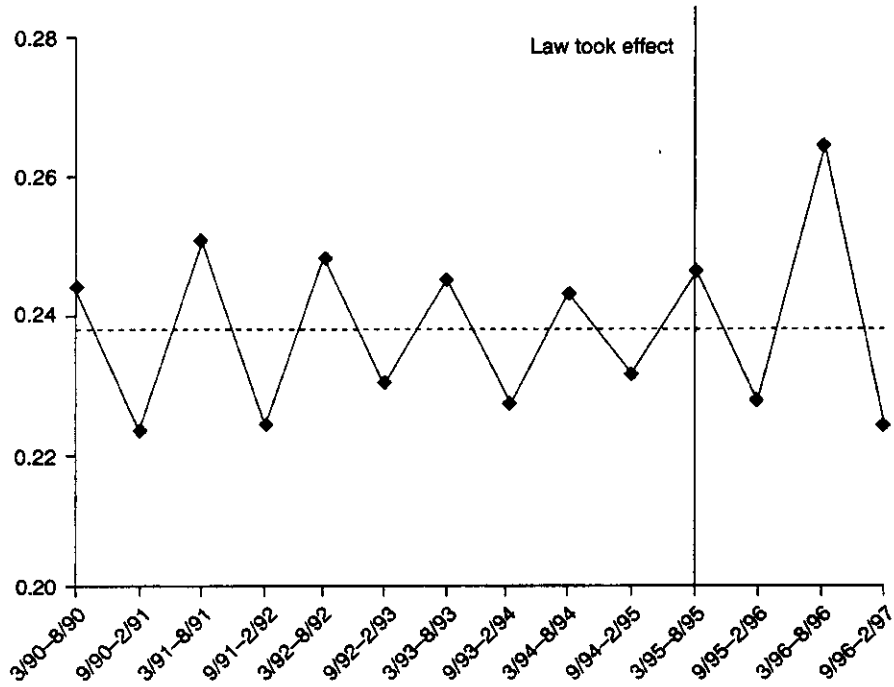
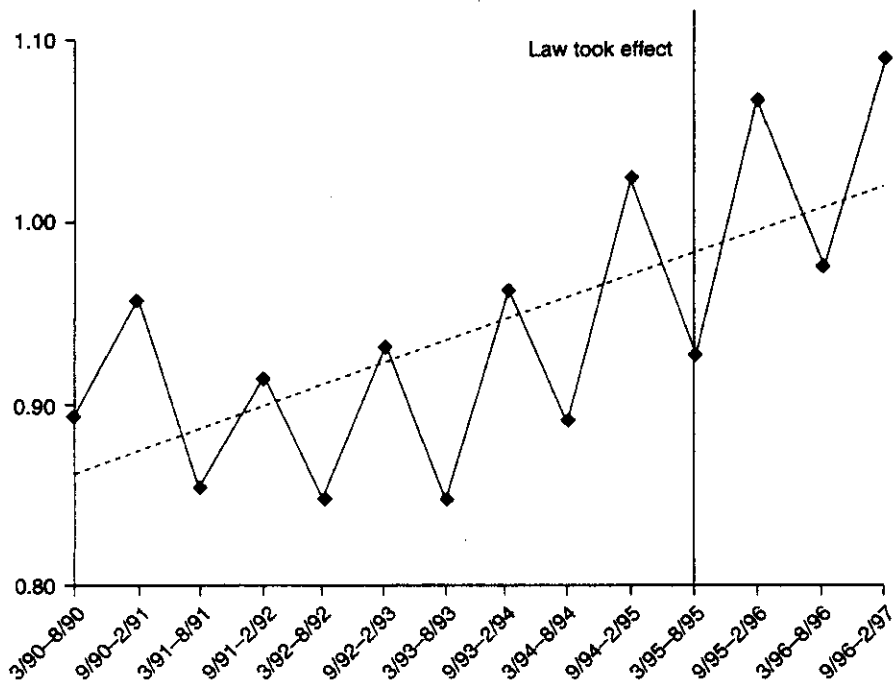


Figure 2. Real taxable sales revenue from hotels in New York City and the rest of New York State excluding Suffolk and Westchester counties, 1990 to 1997.



**Figure 3.** Ratio of sales from eating and drinking establishments to total retail sales minus eating and drinking places in New York City, 1990 to 1997.



**Figure 4.** Ratio of sales from eating and drinking establishments in New York City to eating and drinking establishments in the rest of New York State excluding Suffolk and Westchester counties, 1990 to 1997.

creasing over time from about 100 percent to the current observation of nearly 300 percent (see Figure 5).

**Multivariate analysis**

Results from the multivariate linear regression of each outcome measure are presented in Table 1. Presence of the smoke-free ordinance was not significantly associated with sales for eating and drinking places or hotels, regardless of the outcome measure used.

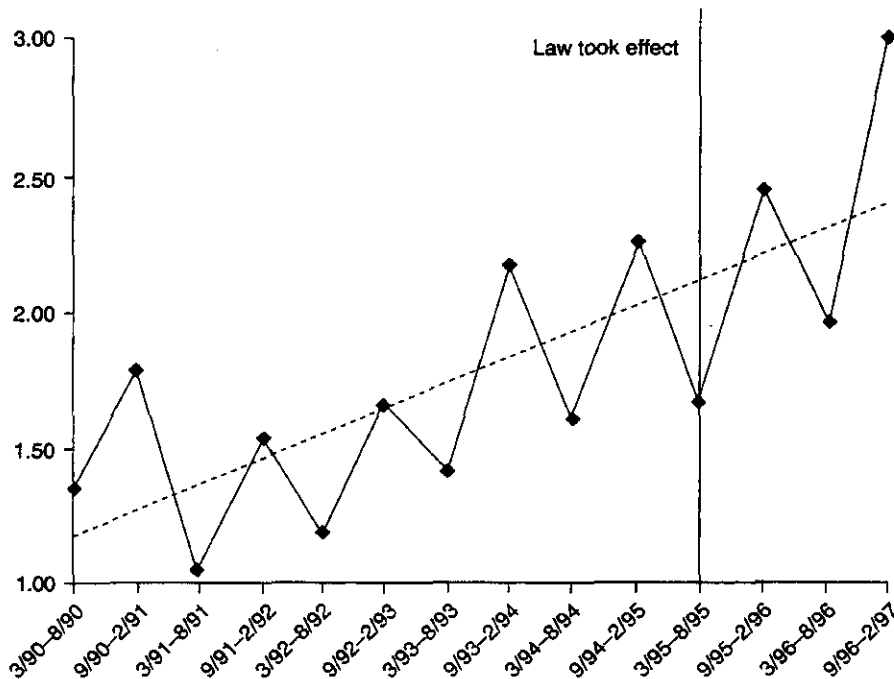
**Discussion**

These data indicate that there is wide variation in the restaurant and hotel industries due to seasonal and other factors. However, this variation cannot be attributed to the presence of the smoke-free law. Raw sales data show that both the restaurant and hotel taxable sales have been increasing recently in New York City while they have been decreasing in the rest of the state. The ratio of taxable sales from eating and drinking places and hotels in New York City to those

places in the rest of the state also has been increasing, confirming the findings from the raw data. Based on these data, it can be concluded that the smoke-free law did not harm the restaurant industry in New York City. Further, no evidence was found that the hotel industry has been adversely affected by the smoke-free legislation.

Use of the taxable sales approach to examine the economic effect of smoke-free legislation is subject to many limitations and these same potential biases are present in the analysis presented herein. The primary area of concern is the fact that data from places not affected by the smoke-free law (bars and restau-

***Based on these data, it can be concluded that the smoke-free law did not harm the restaurant industry in New York City.***



**Figure 5.** Ratio of sales from hotels in New York City to the rest of New York State excluding Suffolk and Westchester counties, 1990 to 1997.

Table 1

Coefficient of the smoke-free law variable for each outcome measure from the multivariate linear regression results\*

Outcome measure	Presence of the smoke-free law	
	Beta	95% Confidence interval
Raw eating and drinking sales (T) <sup>†</sup>	85,779	(-22,898, 194,456)
Raw hotel sales (H) <sup>‡</sup>	67,941	(-147,332, 283,214)
Fraction of eating and drinking sales (R <sub>NYC</sub> ) <sup>§</sup>	0.001	(-0.012, 0.015)
Ratio of eating and drinking sales (R <sub>c</sub> ) <sup>  </sup>	0.029	(-0.017, 0.074)
Ratio of hotel sales (R <sub>h</sub> ) <sup>**</sup>	-0.071	(-0.481, 0.340)

\* Controlled for time, season, and unemployment rates. All dollar amounts are adjusted to March 1990 dollars.

† Real raw sales figures from eating and drinking establishments in New York City (in thousands of dollars).

‡ Real raw sales figures from hotels in New York City (in thousands of dollars).

§ Sales from eating and drinking establishments in New York City to retail places minus eating and drinking establishments in New York City.

|| Sales from eating and drinking establishments in New York City to sales from eating and drinking establishments in the rest of New York State excluding Suffolk and Westchester counties.

\*\* Sales from hotels in New York City to sales from hotels in the rest of New York State excluding Suffolk and Westchester counties.

rants with 35 or fewer indoor dining seats) are included in the taxable sales figures for eating and drinking establishments. Therefore, this method will not be sensitive to detect a migration of dining from larger restaurants to small restaurants or taverns. A power analysis indicates low power to detect an association if one truly exists using the taxable sales data for the regression models. The main problem is that the taxable sales data obtained for this study are subject to too much misclassification and bias to detect small effects. However, the real question of interest to policymakers is whether smoke-free restaurant legislation is associated with large decreases in business. Furthermore, a recent survey of New York City restaurant owners/managers found that those places exempted from the law (such as small restaurants and restaurants with bar areas) reported similar business losses or gains compared with those places that are affected by the law (such as large restaurants without bar areas).<sup>10</sup> Additionally, evidence from Glantz and Smith found that inclusion of taxable sales from bars and taverns with restaurant sales did not appreciably alter their results.<sup>2,8</sup>

A second concern is that there is misclassification of taxable sales revenue. Specifically, meals eaten in

a hotel restaurant are classified as hotel revenue and prepared foods served in bakeries and supermarkets are classified as restaurant revenue. The data examining taxable hotel revenue show that the hotel business is increasing; thus it is reasonable to conclude that restaurants in hotels are also sharing in this increase and thereby the ability of this factor to bias the conclusions is ruled out. The dollars spent on prepared foods served in nonrestaurant establishments are likely to be a small fraction of all dollars spent in restaurants. Furthermore, total retail sales in New York City also experienced similar increases as the restaurant industry as indicated by the R<sub>NYC</sub> measure being constant. Therefore, this bias is also unlikely to alter the conclusions drawn.

It is also possible that declining prices have altered consumer demand and thereby altered taxable revenue. For example, taxable sales receipts can remain constant if prices have dropped and demand has increased. In 1995, city and state hotel taxes were reduced by nearly 30 percent in New York City. However, the mean average room rate actually increased by 39 percent between 1993 and 1997 despite the tax cut. Furthermore, occupancy rates increased from 78.5 percent in 1995 to an estimated 81.0 percent in

1997, and tourism spending in 1997 was expected to be \$500 million more than the previous year.<sup>13</sup> Because the price of hotel services increased (even though taxes were reduced), increases in the demand for hotel services cannot be attributed to the tax cut.<sup>14</sup> With respect to restaurants, data from the ZagatSurvey indicate that real per-meal spending has remained relatively constant from 1995 to 1997.<sup>15</sup> Furthermore, this variable was added to the regression models and the conclusions were unchanged (data not shown). Therefore, it is unlikely that changes in per-meal spending have confounded the association between the presence of the smoke-free law and taxable restaurant sales.

Another possibility is that the smoke-free law has caused many existing restaurants to close and new ones have opened to fill the void, thereby maintaining the observed levels of taxable revenue from eating and drinking establishments. However, restaurant openings have far outpaced restaurant closings in 1995, 1996, and 1997.<sup>15</sup> Data from the New York City Department of Health indicate there has been a large increase in the number of new restaurant permits from 1993 to 1995.<sup>16</sup>

The results from this article are also in agreement with recent survey data collected in New York City. (See p. 28, "Consumer Response to the New York City Smoke-Free Air Act," and p. 37, "Restaurateur Reports of the Economic Impact of the New York City Smoke-Free Air Act," both by Hyland and Cummings, in this issue.) These data indicate that the smoke-free law has had little impact on the dining out patterns of the overwhelming majority of consumers and that restaurants that went smoke-free after the law took effect did not show decreases in business relative to restaurants that still permitted smoking (in the bar area, for example). The results are also consistent with other published studies examining the association between taxable sales receipts and smoke-free restaurant legislation.<sup>2-8</sup> Based on the findings from this study and the weight of evidence from the literature, the authors conclude the smoke-free law was not detrimental to the restaurant or hotel industries in New York City.

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## REFERENCES

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1. New York City Smoke-Free Air Act. Title 17, Chapter 5 of the 1995 Administrative Code of the City of New York.
2. Glantz, S.A., and Smith, L.R.A. The Effect of Ordinances Requiring Smoke-Free Restaurants on Restaurant Sales. *American Journal of Public Health* 84, July (1994): 1081-1085.
3. Huang, P., et al. Assessment of the Impact of a 100 Percent Smoke-Free Ordinance on Restaurant Sales. West Lake Hills, Texas 1992-1994, *Morbidity and Mortality Weekly Report* 44, no. 19 (1995): 370-372.
4. Sciacca, J.P., and Ratliff, R.J. Prohibiting Smoking in Restaurants: Effects on Restaurant Sales. *American Journal of Health Promotion* 12, no. 3 (1998): 176-84.
5. Bartosch, W.J., and Pope, G.C. *Preliminary Analysis of the Economic Impact of Brookline's Smoking Ban*. Waltham, MA: Health Economic Research, Inc., July 1995.
6. Maroney, N., et al. *The Impact of Tobacco Control Ordinances on Restaurant Revenues in California*. Claremont, CA: The Claremont Institute for Economic Policy Studies, the Claremont Graduate School, January 1994.
7. Taylor Consulting Group. *The San Luis Obispo Smoking Ordinance: A Study of the Economic Impacts of San Luis Obispo Restaurants and Bars*. San Luis Obispo, CA: Taylor Consulting Group, January 1993.
8. Glantz, S.A., and Smith, L.R.A. The Effect of Ordinances Requiring Smoke-Free Restaurants and Bars on Revenues: A Follow-Up. *American Journal of Public Health* 87 (1997): 1687-1693.
9. Siegel, M. *Smoking and Restaurants: A Guide for Policy-Makers*. Tobacco Education Clearinghouse of California, September 1994.
10. New York State Department of Taxation and Finance. *Taxable Sales and Purchases Subject to Use Tax by County and Industry*. March 1990 to August 1996 Reports. Albany, N.Y.: New York State Department of Taxation and Finance.
11. Bureau of Labor Statistics. *Consumer Price Index—All Urban Consumers*. Series ID CUSR0000SA0. Washington, D.C.: Bureau of Labor Statistics, 1997.
12. New York State Department of Labor. *Resident Employment Status of the Civilian Labor Force, 1975-1997*. Albany, N.Y.: New York State Department of Labor, 1997.
13. Giuliani, R.W. *Address before the Second Annual Tourism Conference and Expo*. January 27, 1997.
14. Johnson, K. What Saved the Hotels? Not Just Tax Cuts. *New York Times*, July 30, 1997.
15. *ZagatSurvey: 1998 New York City Restaurants—Survey Demographics*. New York, N.Y.: ZagatSurvey, November 1997.
16. New York City Department of Health. *Number of Approved Requests for New Restaurant Permits, 1993-1995*. New York: New York City Department of Health, 1996.