



OFFICE OF THE CITY CLERK

CITY OF CAMBRIDGE

CITY HALL, CAMBRIDGE, MASSACHUSETTS 02139

(617) 498-9017

JOSEPH E. CONNARTON
CITY CLERK

JOHN E. FLYNN
DEPUTY CITY CLERK

January 4, 1989

Dr. Nancy Rigotti
Associate Director
Institute for the Study of Smoking Behavior and Policy
Kennedy School of Government
Harvard University
79 John F. Kennedy Street
Cambridge, MA 02138

Dear Dr. Rigotti:

Please be advised that the City Council has rescheduled its public hearing to discuss the Institute's recent study and findings and questions raised concerning the enforcement of some portions of the City's smoking ordinance to be held on Monday, January 23, 1989 beginning at 6:00 p.m. in the Sullivan Chamber, City Hall. Said hearing, as you will recall, was previously scheduled to be held on December 19th, but was postponed at that time.

Your presence, or that of your appropriate designee(s) is requested at this time.

Thank you for your cooperation in this matter.

Sincerely yours,

Joseph E. Connarton
City Clerk.

JEC/mh



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January 4, 1989

TO: Robert W. Healy, City Manager
Dr. Melvin Chalfen, Commissioner of Health & Hospitals
Joseph Cellucci, Commissioner of Inspectional Services
Russell B. Higley, City Solicitor

FROM: Joseph E. Connarton, ^{JEC} City Clerk

SUBJECT: Rescheduling of City Council Hearing
regarding enforcement of the Smoking Ordinance

Please be advised that the City Council will has rescheduled its public hearing concerning the recent study and findings by Harvard University's Institute for the Study of Smoking Behavior and Policy and questions raised concerning the enforcement of some portions of the City's Smoking Ordinance to be held on Monday, January 23, 1989 at 6:00 p.m. in the Sullivan Chamber.

Said hearing, as you will recall, was previously scheduled for December 19th, but was postponed at that meeting. Your presence is requested at this time.

Your anticipated cooperation in this matter will be greatly appreciated.

JEC/mh

HARVARD UNIVERSITY
INSTITUTE FOR THE STUDY OF SMOKING BEHAVIOR AND POLICY
JOHN F. KENNEDY SCHOOL OF GOVERNMENT

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1988 DEC 15 AM 9:14

CAMBRIDGE MA.

79 John F. Kennedy Street
Cambridge, Massachusetts 02138

617-495-0806

December 14, 1988

Mr. Joseph E. Connarton
City Clerk
City Hall
Cambridge, MA 02139

Dear Mr. Connarton:

I will be speaking at a public hearing of the Cambridge City Council on Monday, December 19. Enclosed are 10 copies of background material for my testimony about our study of the implementation and impact of the city's 1986 ordinance restricting smoking in public places and the workplace. I would be grateful if you could distribute copies to the City Councillors in preparation for that meeting.

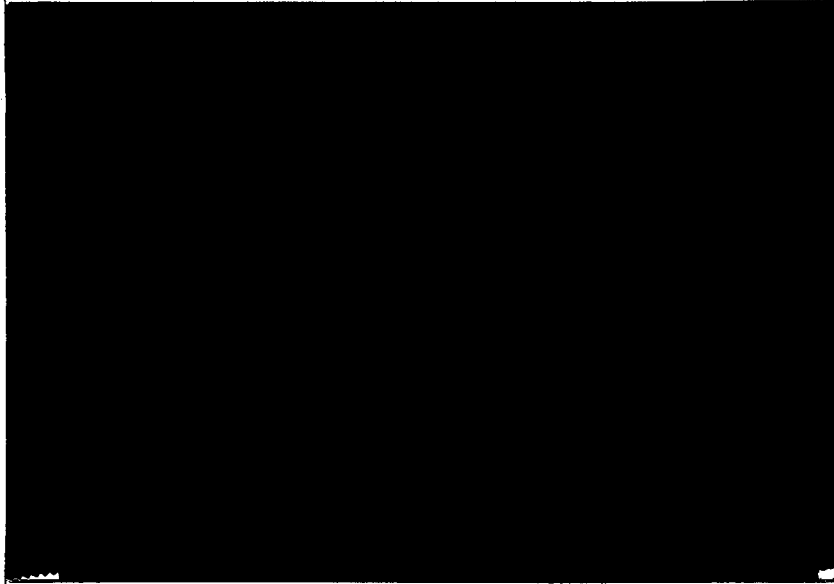
Thank you very much.

Sincerely,



Nancy A. Rigotti, M.D.
Associate Director

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1988 DEC 15 AM 9:14
CAMBRIDGE MA.



NOT FOR QUOTATION OR
CITATION WITHOUT
PERMISSION OF THE
AUTHOR

IMPLEMENTATION AND IMPACT OF A CITY'S REGULATION
OF SMOKING IN PUBLIC PLACES AND THE WORKPLACE:
THE EXPERIENCE OF CAMBRIDGE, MASSACHUSETTS

Nancy A. Rigotti, M.D.
Michael A. Stoto, Ph.D.
Mark Kleiman, Ph.D.
Thomas C. Schelling, Ph.D.

Presented at the 6th World Conference on Smoking and Health
Tokyo, Japan
November 11, 1987

Institute for the Study of Smoking
Behavior and Policy
John F. Kennedy School of Government
Harvard University
79 John F. Kennedy Street
Cambridge, MA 02138
(617) 495-0806

January 1988
S-88-17

DISCUSSION PAPERS are reports of work in progress in the fields of smoking behavior, policy, and disease epidemiology. The papers have not been published and have received limited review. The goal of the Discussion Paper Series is to provide investigators with an avenue for discussion of work prior to publication.

TO PROTECT THE AUTHORS' FUTURE PUBLICATION INTERESTS, REPRODUCTION, QUOTATION, OR CITATION OF THIS DISCUSSION PAPER IS NOT PERMITTED WITHOUT PERMISSION OF THE AUTHOR.

The views expressed in this paper are those of the authors and do not necessarily reflect those of the Institute for the Study of Smoking Behavior and Policy or Harvard University.

Requests or inquiries should be directed to:

Dr. Nancy A. Rigotti
Institute for the Study of Smoking
Behavior and Policy
John F. Kennedy School of Government
Harvard University
79 John F. Kennedy Street
Cambridge, MA 02138
(617) 495-0806

© Rigotti

To protect nonsmokers from passive smoke exposure, a growing number of U.S. states and communities are enacting laws restricting smoking in public places and the workplace. There has been little formal assessment of the political or public health impact of these laws. Methods for their implementation and enforcement have neither been described nor evaluated. The public's opinion of and degree of compliance with these laws has not been systematically measured. Their resultant effects on air quality or the behavior of smokers and nonsmokers is not known. It is expected that these laws will achieve their primary goal of reducing individuals' exposure to passive smoke, and it is hypothesized that by reducing opportunities to smoke, they will contribute to reductions in tobacco consumption and smoking prevalence. (1) Such information would be useful to the increasing number of groups considering these laws and to public health officials concerned with reducing the health and economic burdens of tobacco smoking.

We are studying the city of Cambridge, Massachusetts, a city of 95,000 residents, to examine the effect of a new no-smoking ordinance. In December 1986, the City Council passed an ordinance broadly restricting smoking in all indoor areas to which the public was admitted and in all worksites except the smallest. (Appendix I) The law went into effect on March 9, 1987. The regulations cover government buildings, auditoriums, lecture halls, meeting rooms, waiting rooms, theaters and movie houses, classrooms, health care facilities, retail stores, and restrooms. Specifically excluded are private residences, private parties, and fraternal or veterans' organizations. Smoking in restaurants had previously been addressed by a 1984 city ordinance requiring nonsmoking sections, and this was not altered by the new law. Employers were required to establish a smoking policy and provide a

smoke-free work area to all employees desiring one. The City's Commissioner of Health and Hospitals was given responsibility for the law's implementation and enforcement, but no additional funds were set aside for this purpose. Individuals or employers who violated the law could be fined. Managers who permitted smoking in their public areas could have their city licenses suspended.

We are conducting a formal evaluation of this no-smoking ordinance in order to answer the following questions:

1. How did the city choose to implement and enforce the law?
2. How well are businesses and the public informed about the law?
3. Do residents and businesses support the law?
4. How well do residents and businesses comply with the law?
5. What effect has the law had on individuals' perceptions of passive smoke exposure?
6. What effect has the law had on the behavior of smokers? It has been hypothesized that smoking control laws will reduce the prevalence of smoking by inducing current smokers to quit and discouraging the young from starting to smoke. (1) Although it is unlikely to see major changes in a short time, we hypothesized that the law may increase individual's interest in quitting smoking and increase the number of quit attempts they make.

METHODS

Our evaluation focused on the initial effects of the new Cambridge ordinance. Baseline information was collected during February 1987, the month before the policy took effect, and follow-up data 3 months later (June 1987).

The study had 5 components:

1. A telephone survey of Cambridge residents measured awareness and approval of the law, compliance, and smoking behavior. Independent random samples of 400 residents (200 smokers and 200 nonsmokers) were interviewed at baseline and at 3 months.
2. Direct observations of a cluster sample of 201 retail stores and 88 restaurants at baseline and at 3-month follow-up assessed the level of institutional compliance with the law. Compliance was defined as the presence of signs prohibiting smoking and the absence of visible smoking or cigarette-related debris on the premises.
3. A telephone survey of a random sample of 300 Cambridge businesses 3 months after the law took effect assessed their awareness, opinion, level of compliance, and perceptions of the effect of the ordinance on their business.
4. All Cambridge city officials involved in the passage, implementation, and enforcement of the law were interviewed to determine how decisions were made. To track the flow of information, city officials kept a running log of phone calls received about the ordinance.
5. Detailed interviews of 5 Cambridge facilities were conducted to observe how complex institutions coped with the requirements of the new law. We studied a corporation, a hospital, a hotel, a university, and the offices of city government.

RESULTS

We are presenting preliminary results from ongoing analyses of the first 4 components of our study.

IMPLEMENTATION AND ENFORCEMENT

The implementation of laws regulating smoking in public places and worksites has generally been put into the hands of public health departments rather than police departments. These laws are often said to be "self-enforcing." The assumption is that the majority of smokers, being law-abiding, will obey smoking restrictions and that nonsmokers will enforce any noncompliance, freeing government from the need to actively police the laws. (1) The few available anecdotal reports indicate that compliance is measured passively rather than actively; the lack of complaints is equated with adequate compliance. (2) To be successful, this strategy requires that the public have a high level of awareness of the law's provisions.

The Cambridge ordinance followed this established pattern, assigning implementation and enforcement to the Health Department. The Health Commissioner assigned one employee to spend a portion of his time to coordinate plans. The City Manager was given responsibility for insuring that the offices and employees of city government complied with the law.

To inform the public about the law, the Health Commissioner relied on the local news media. The ordinance attracted considerable attention both locally and nationally. News stories appeared the major Boston newspaper (Boston Globe) at the time of the law's passage and for 3 days preceding March 9, the date it took effect. The smaller weekly Cambridge newspapers also carried several stories from December through May. The local television

stations mentioned the story on their news programs on the day the law took effect. Stories also appeared in newspapers outside the region, such as the New York Times and Washington Post. This ordinance attracted this unusual level of national attention presumably because Cambridge is the home of well-known universities such as Harvard and the Massachusetts Institute of Technology. Other local laws would probably not attract this level of attention. However, this national attention is more likely to have informed individuals outside than inside the city about the ordinance.

To inform city businesses about the no-smoking law, the Health Commissioner collaborated with the local Chamber of Commerce to prepare and mail a two-page information sheet which summarized the provisions of the law and specified whom individuals should contact for further information about the law's provisions or adopting a smoking policy. (Appendix II) This information was mailed by the Chamber of Commerce to its members, which is about half of city businesses. Although intended to be mailed in January, it was mailed in late February, leaving businesses with only a couple of weeks to come into compliance.

The Health Commissioner chose to enforce the law by responding to complaints rather than by active surveillance. One employee in his office was designated to respond to telephone and written questions and complaints. However, some calls to city government about the law were directed to another individual. The telephone call logs demonstrate a peak of calls in the few weeks after the law took effect, followed by a rapid decline. (Figure 1) Nearly half of calls were requests for information. One third were complaints and one-fifth were requests for information by outsiders, primarily the media. (Fig.2) The nature of calls changed over time. (Fig.3) Initially most calls

were to request information on compliance; as time passed, a larger proportion of calls were to report violations. No standardized method of response to complaints was established. In a few cases, city officials made visits to establishments to investigate complaints, followed by telephone calls to managers. Over the first 3 months, there was no formal action to penalize violators. No individual or business was fined, no city license was suspended, and no judicial action taken.

This approach appeared to reflect both the political and financial climate in which the law was implemented. The city authorized no additional personnel or funds to cover implementation costs. Although the law had passed the City Council with a strong 8-1 majority, several city councillors subsequently indicated that they intended it to be a self-enforcing public statement and felt that active enforcement by city government was neither necessary nor appropriate. An attempt to strengthen the enforcement by an amendment which would have allowed police to issue violators the equivalent of a parking ticket for smoking was defeated. Shortly after the law took effect, further exemptions were approved by the Council in response to constituent pressures and one threatened lawsuit. The amendment exempted smoking in psychiatric meetings such as Alcoholics Anonymous, in the city's only bowling alley, and in religious services.

There did not appear to be strong public pressure for more active enforcement. Three months after the policy took effect, the majority of city residents (54%) felt that enforcement was adequate, although a substantial number (36%) felt that it was not strict enough. Half of residents thought that the city should leave enforcement at worksites to employees, 28% felt

that the city should respond to complaints, and only 19% favored active surveillance of worksites.

AWARENESS AND APPROVAL OF THE ORDINANCE

Public awareness of the law was high.(Table 1) Most residents (57%) were aware of the ordinance at baseline and this proportion increased to 80% at 3 months. At baseline, smokers were more likely than nonsmokers to be aware of the ordinance, but this difference was insignificant at follow-up. Over the 3 month period the proportion of residents who thought that smoking was not permitted at work, on public transportation, in restaurants, and in government buildings increased. Support for the ordinance was also strong. Over three-quarters (77%) favored the law at baseline; there was no change at 3 months. More nonsmokers than smokers were in favor of the law, but 41% of smokers approved.

Awareness and approval were also high when Cambridge businessmen were surveyed 3 months after the ordinance took effect. Nearly all (93%) managers of businesses were aware of the law. Most (73%) knew the law's provisions, although over half incorrectly believed that they were required to provide a smoking working area for employees requesting one. Businesses appeared to have learned of the law through the news media rather than the city mailings. Only 27% had received the city's information sheet. Forty percent felt that they were not well informed about their responsibilities under the law. Nearly two-thirds (64%) of managers supported the law, 20% opposed it, and 16% were neutral.

COMPLIANCE

Compliance was measured by direct observation in public places, by managers' reports in worksites, and by city residents' reports.

Public Places

We directly observed retail stores and restaurants. At baseline, smoking was not commonly observed in stores, although few had posted signs prohibiting smoking. (Table 2) There was other indirect evidence of management's permissive attitude toward smoking. Ashtrays were present in one-third of stores and cigarette butts observed in 27%. Three months after the law went into effect, we observed no increase in the prevalence of signs. Only 3% of stores had posted a sign referring to the city ordinance, as the ordinance recommended. Nonetheless, smokers were observed in fewer stores, and there was less indirect evidence of smoking (fewer cigarette butts and ashtrays).

Smoking in restaurants was not affected by the law we studied. It had already been addressed by a 1984 city ordinance mandating a nonsmoking section in restaurants with 25 or more seats and bars seating 75 or more. Consequently, our baseline observations served as an evaluation of compliance 3 years after passage. There was a high level of compliance. Of the 69 restaurants subject to the ordinance (25 or more seats), 87% had a nonsmoking section and 65% had a nonsmoking section that was of the prescribed size (25% or more seats designated nonsmoking). (Table 3) Most restaurants posted signs to identify nonsmoking sections, but did not mark smoking sections. In most cases there was no physical barrier separating smoking and nonsmoking sections.

At 3 months, 32% of residents surveyed had recently noticed smoking in public where it was not allowed. Most noticed it in public transport,

government buildings, restaurants, and stores. Residents' most common response to violations of the law was to do nothing (82% of smokers and 53% of nonsmokers). No respondent envisioned calling the police or a city official in response to a violation.

Worksites

Self-reported compliance is high by Cambridge businesses. A large majority of managers who know of the no-smoking law report that they are in compliance with it (85%) or planning to comply (2%). A similar large majority of managers reported having no problems coming into compliance with the law. Overall, 82% of city businesses have a smoking policy, but only 33% of these are written policies. An additional 2% plan to adopt a policy in the next year. About one third of policies appear to have been adopted in response to the law: 31% of companies with policies had adopted them in the 6 months since the ordinance was enacted. One third of companies with policies also said that the city ordinance was one reason for adopting their policy. Most company policies (70%) ban smoking in shared work areas, 12% restrict smoking to designated areas, and 15% permit smoking in shared workspace.

AIR QUALITY

We made no direct measurements of air quality. We relied on individuals' perceptions of the degree of smoke in the air. Overall, there is no major change in perceived air quality, using our measures. One-third of residents report at follow-up noticing less smoke in the air in public places. However, there is no difference between baseline and follow-up in the proportion of residents who report being bothered by smoke in work or public places.

SMOKING BEHAVIOR

At baseline, the proportion of Cambridge residents who smoke is 23.5%, less than the U.S. prevalence of 26.5% (3). There was no change in smoking prevalence over the three months of the study. Residents demonstrate substantial interest in quitting at baseline; this number decreased rather than increased at follow-up. Similarly, the proportion of smokers who said they had tried to quit in the previous 3 months was higher before the policy took effect (47%) than after (23%). The larger number of quit attempts occurred during the period of December-February, after some publicity about the law. Another explanation for this difference is the increase in quit attempts associated with New Year's Day.

CONCLUSIONS

The Cambridge no-smoking ordinance appears to have been a successful, if imperfect, effort to reduce the amount of smoking in public places and the worksite. Support for the policy by the public and the business community was high. Although the health department's efforts to implement and enforce the no-smoking law were limited by the political climate and budgetary constraints, they successfully informed a large majority of individuals and businesses about the law. The news media appears to be an inexpensive and effective way for city government to communicate a smoking policy to the public and business communities. Direct mailings to businesses need to be done early; the existence of a list of community businesses would facilitate this effort.

Compliance was high, especially given the low-key approach to enforcement. Most individuals appear to abide by the restrictions, even in the absence of a high level of signage in retail stores, and most businesses have adopted a smoking policy that is close to what the ordinance specifies.

However, the self-reported disinclination of individuals to confront violators calls into question the assumption that it is sufficient to rely on "self-enforcement" by citizens.

We observed little effect on air quality, but our measures were subjective and imperfect. We also observed no change in increase in smoking cessation in the first 3 months after the policy was adopted. Any such changes may require more time to occur.

REFERENCES

1. Rigotti, NA. "Policies Restricting Smoking in Public Places and the Workplace" in The Health Consequences of Involuntary Smoking: A Report of the Surgeon General. U.S. Department of Health and Human Services, Public Health Service, 1986, pp 261-332.
2. Martin, MJ. The San Francisco experience with regulation of smoking in the workplace: the first twelve months. Amer. J. Public Health 76:585-6, 1986.
3. Cigarette smoking in the United States, 1986. Morbidity and Mortality Weekly Report 36:581-5, 1986.

TABLE 1
 AWARENESS AND APPROVAL

	SMOKERS	NONSMOKERS	ALL
Know of law ¹			
Baseline	64%	54%	57%
Follow-up	81%	80%	80%
Approve of law ²			
Baseline			
Favor	39%	88%	76%
Neutral	11%	3%	5%
Disapprove	50%	9%	19%
Follow-Up			
Favor	41%	90%	78%
Neutral	17%	2%	6%
Disapprove	42%	8%	16%

¹ p<.05 for difference between baseline and follow-up.

² p<.05 for smoker-nonsmoker difference.

TABLE 2

COMPLIANCE WITH NO-SMOKING LAW

	RETAIL STORES N=201	
	<u>Baseline</u>	<u>3 mo</u>
No Smoking Sign		
N	43	41
%	21%	20%
Recommended Sign ¹		
N	--	6
%	--	3%
Smoking Customer		
N	28	8
%	14%	* 4%
Ashtrays Present		
N	66	40
%	33%	* 20%
Cigarette Butts Present Inside		
N	55	34
%	27%	* 17%

¹Sign which refers to smoking prohibited by city ordinance.

* p<.01

TABLE 3

RESTAURANT COMPLIANCE WITH 1984 NO-SMOKING LAW

3 YEAR FOLLOW-UP

Restaurants observed	88
Restaurants subject to ordinance	69
Have no-smoking section	60 (87%)
Have adequate-sized no-smoking section	45 (65%)

FIGURE 1

Weekly # of Calls about Ordinance

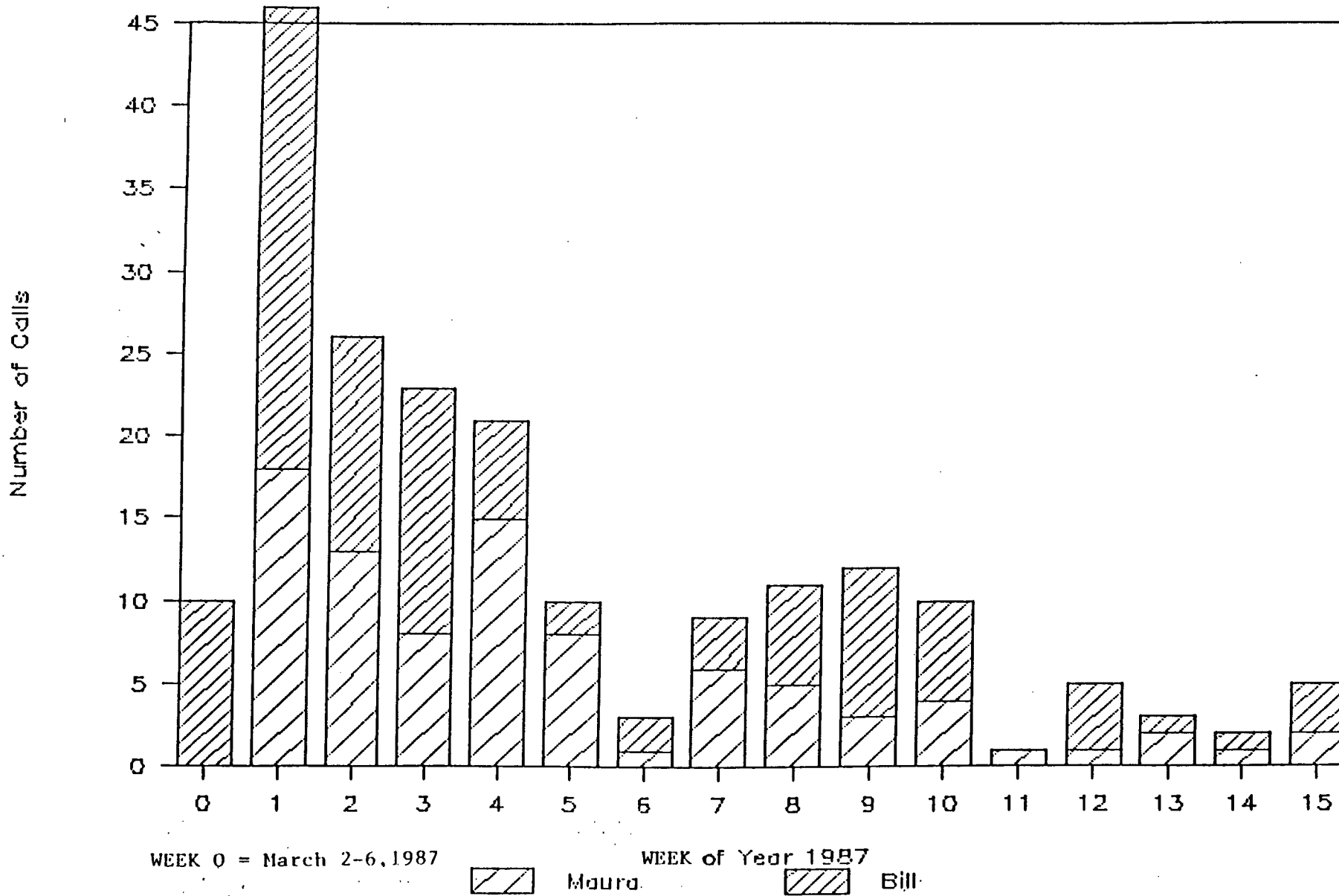


FIGURE 2

Types of Calls About Ordinance Combined

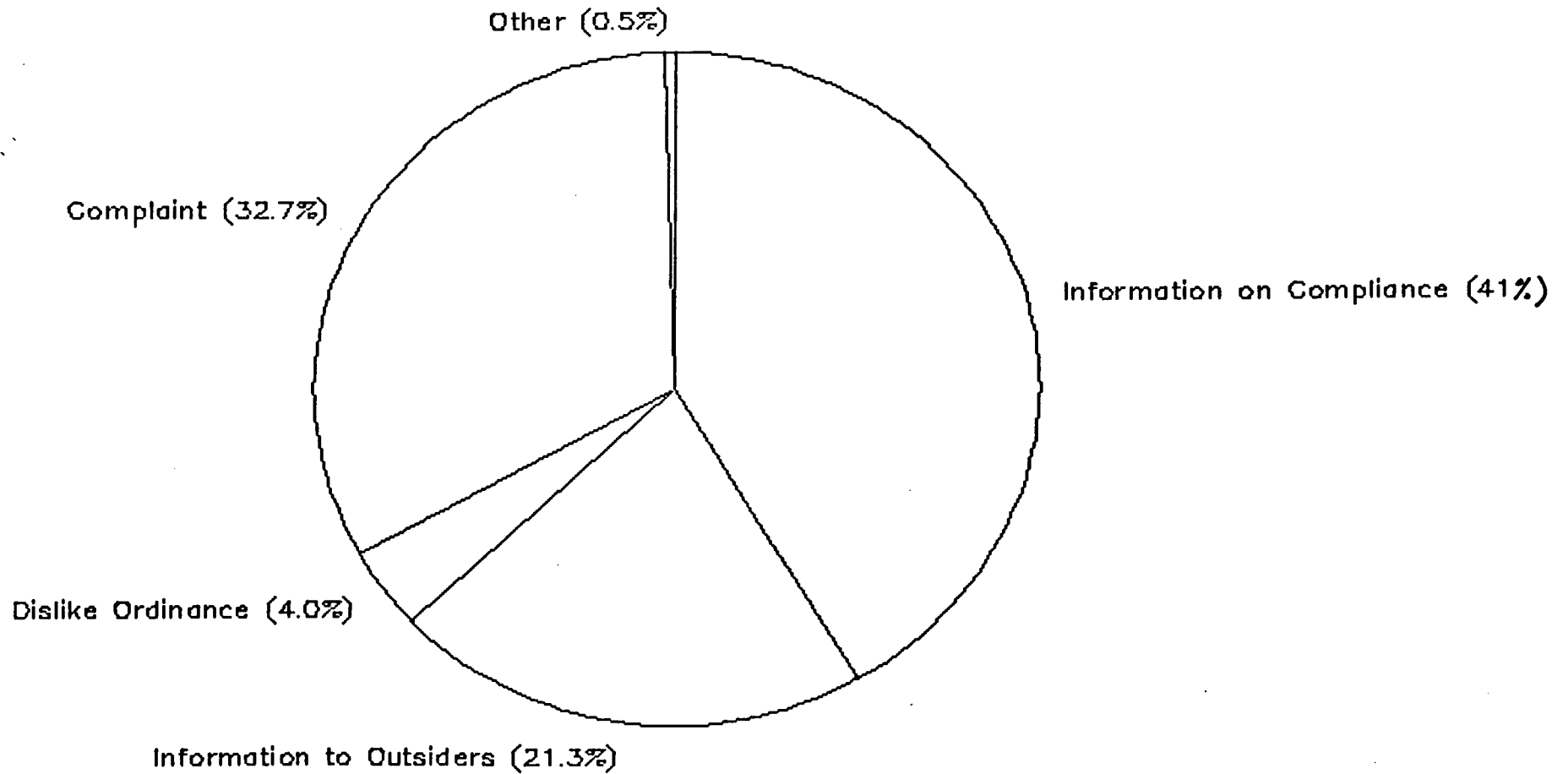
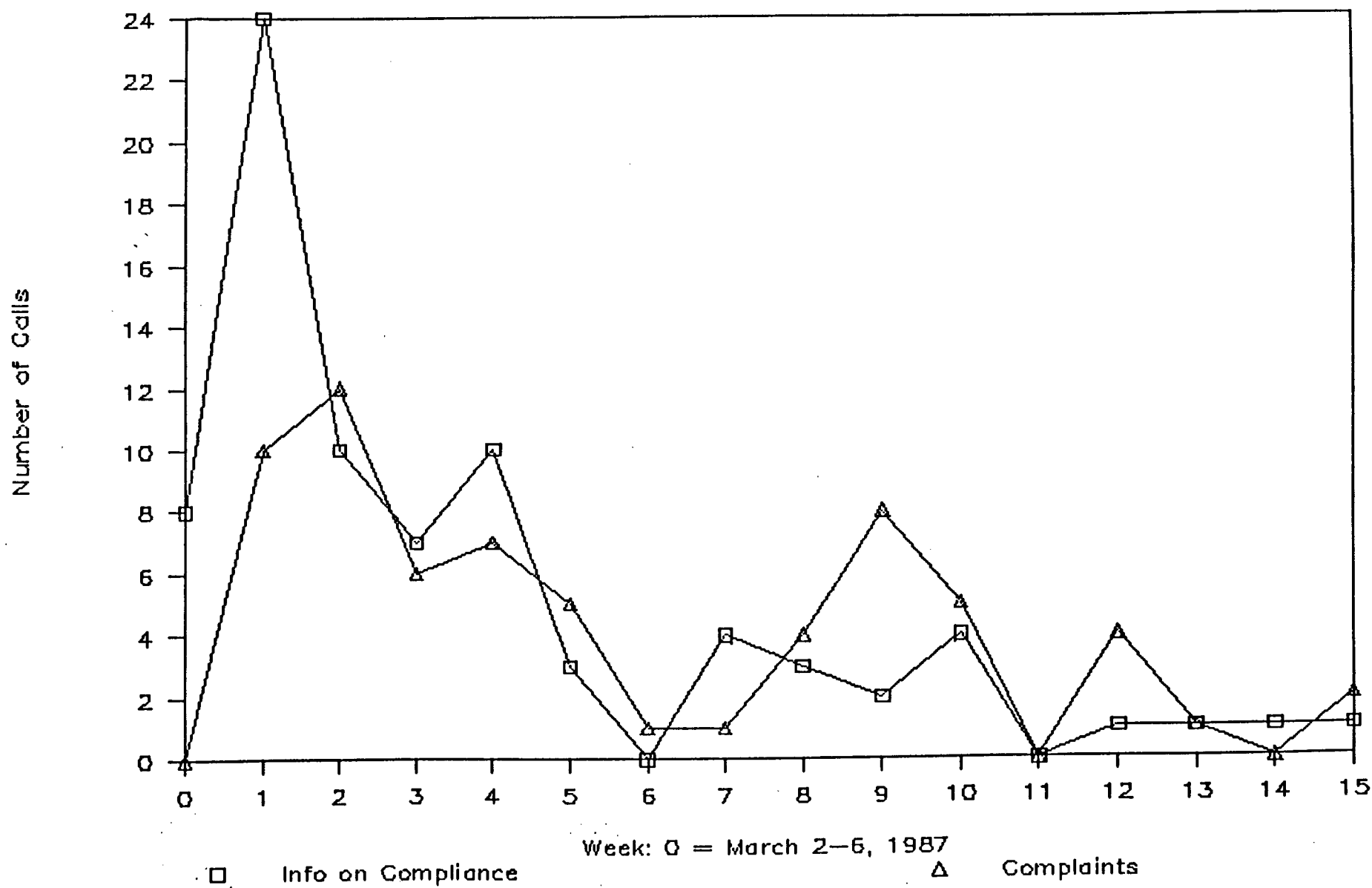


FIGURE 3

Nature of Calls over Time Combined



APPENDIX I

ORDINANCE NO. 1046

Final Publication No. 2339. First publication in the Chronicle on Nov. 20, 1



City of Cambridge

In the Year One Thousand, Nine Hundred Eighty-Six

AN ORDINANCE

In amendment to an ordinance formerly entitled: "The General Ordinances of the City of Cambridge" as revised in 1972 and now designated as "The Code of the City of Cambridge".

Be it ordained by the City Council of the City of Cambridge as follows:

Chapter Thirteen entitled: "Offenses", Article II entitled: "Offenses Against Public Health" is hereby amended by striking out the present Article II and inserting in place thereof a new Article II entitled: "Offenses Against Public Health", Section 13-4 entitled: "Smoking Prohibited" which reads as follows:

ARTICLE II. OFFENSES AGAINST PUBLIC HEALTH

Section 13-4. Smoking Prohibited.

(a) It is hereby declared that smoking in public places is a public nuisance, dangerous and hazardous to the public health, and violative of the right of non-smokers to breathe air which is free to smoke contamination.

(b) As used herein, "Smoking" shall include carrying a lighted cigarette, cigar, pipe or other tobacco product.

(c) No person shall smoke in any elevator accessible to the public.

(d) No person shall smoke in any room to which the public is invited or in which the public is permitted, including but not limited to, any health care facility, classroom, lecture hall, theater, motion picture theater, opera house, concert hall, library, auditorium, school, retail store, reception area, restroom or lavatory, waiting room, or public area of a bank, but not including any private residence, nor any restaurant or other place mentioned in subsection (e) nor any party, board game, social reception, or fraternal or veteran's organizations.

(e) This subsection shall not apply to any restaurant with a seating capacity of fewer than twenty-five (25) persons. Nor shall this sub-section apply to any area with a seating capacity of fewer than seventy-five (75) persons, which is used primarily for selling alcoholic beverages for consumption on the premises and in which any sale of food or presentation of entertainment is incidental to the sale of such beverages.

No person shall smoke in any restaurant except in specifically designated smoking areas. This prohibition does not apply in cases in which an entire room or hall is used for a private social function and not by the proprietor or person in charge of the restaurant.

Smoking areas may be designated by the proprietor or other person in charge of a restaurant, except in places in which smoking is prohibited by the fire marshal or by other law or regulation. Smoking areas designated so shall comprise no more than seventy-five (75) percent of the seating capacity of the restaurant. Where smoking areas are designated, existing physical barriers and ventilation systems shall be used to minimize the toxic effect of smoke on persons in adjacent no-smoking areas. In the case of restaurants consisting of a single room, the provisions of this subsection shall be considered met if one side of the room is reserved and posted as a no-smoking area, provided that the no smoking area comprises no less than twenty-five (25) percent of the seating capacity of the restaurant.

However, to the extent that the shape of the room allows maximum separation, the proprietor will be required to utilize those natural barriers to satisfy the provisions of this ordinance. Furthermore, if such natural barriers do not exist, the proprietor will make every effort to set up the space to inhibit the transfer of smoke to non-smoking areas.

The proprietor or other person in charge of a restaurant shall make reasonable efforts to prevent smoking in the no-smoking areas of the restaurant by:

- (1) posting appropriate signs;
- (2) arranging seating to provide a smoke free area;
- (3) asking smokers to refrain from smoking upon request of a client, patron or employee suffering discomfort from the smoke; or
- (4) any other means which may be appropriate

In addition to the remedies provided by subsections (h) and (i), the Inspectional Services Department or any person aggrieved by the willful failure of the proprietor or other person in charge of a restaurant to comply with any provision of this subsection may apply for injunctive relief to enforce the provisions of this subsection in any court of competent jurisdiction.

Nothing in this subsection shall make lawful smoking in any area in which smoking is or may hereafter be prohibited by law.

(f) (1) Except as provided in paragraph (2), no person shall smoke in any room under the control of a public or private employer which employees normally frequent during the course of employment, including, but no limited to, work areas, employee lounges and restrooms, conference rooms, and hallways, but not including any private residence unless it is used as a child care or health care facility, nor any dining area of a restaurant or other place mentioned in subsection (e).

(f) (2) At the written request of one or more employees, an employer may (but is not required to) designate the area in the immediate vicinity of the employee's usual work station as a smoking area, if the employer finds that such a smoking area will not allow non-smoking employees or the public to breathe any significant amount of smoke. Upon the same request and finding, an employer may also make other reasonable accommodation to smoking employees, including provision of a separate employee lounge for smoking, no larger in floor area or seating capacity than the employee lounge for non-smokers. Upon request in writing, an employer shall provide a copy in writing of its smoking policy under this paragraph, including any designated smoking areas or other accommodation for smoking employees, to any employee, prospective employee, and the Commissioner of Health and Hospitals. Any employee aggrieved by an employer's smoking policy or any portion thereof may appeal in writing to the Commissioner, who may modify it in any manner to carry out the purposes of this section. In any dispute arising from such a smoking policy, the health concerns of non-smokers shall be given precedence.

(3) The Commissioner of Health and Hospitals shall enforce this subsection and subsection (d), and for this purpose shall have the assistance of the City Manager and the Police, Law, and Inspectional Services Departments. In addition to the remedies provided by subsections (h) and (i), the Commissioner or any person aggrieved by any violation of this subsection or subsection (d) may apply for injunctive relief to enforce said provisions in any court with jurisdiction. This does not apply to small businesses which occupy only 1500 square feet of office space and where 100% of the employees have no objection.

(g) Every person having control of premises upon which smoking is prohibited by this ordinance, or his or her agent or designee, shall conspicuously display upon the premises a sign reading "Smoking Prohibited by Law".

(h) It shall be unlawful for any person having control of any premises or place in which smoking is prohibited by this ordinance to knowingly permit a violation of this ordinance. A person shall be held to have knowingly permitted a violation of this ordinance if a visitor to his or her premises observes one or more people smoking (other than in properly designated smoking areas) on three successive visits. Any licenses issued by this city to such person shall be subject to suspension for up to fifteen (15) days for a single violation of this subsection, and shall be subject to suspension for up to one year, or to revocation, for any successive violation.

(i) Any person who knowingly violates any provision of the ordinance, or who smokes in an area in which a "Smoking Prohibited by Law" notice is conspicuously posted as required by subsection (h) of this ordinance, shall be fined in an amount of not less than twenty-five (\$25.00) nor more than one hundred (\$100.00) dollars.

(j) If any section, subsection, sentence, clause, phrase, or portion of this ordinance is for any reason held invalid or unconstitutional by any court of competent jurisdiction, such portion shall be deemed a separate, distinct and independent provision and such holding shall not affect the validity of the remaining portions thereof.

This ordinance shall take effect ninety days after its final passage.

In City Council December 8, 1986.

Passed to be ordained as amended by a yea and nay vote:- Yeas 8;
Nays 1; Absent 0.

Robert W. Healy, City Manager.

ATTEST:- Joseph E. Connerton
City Clerk

This text includes all of the following amendments:

Ordinance #849
Ordinance #1006
Ordinance #1046

APPENDIX II

CAMBRIDGE SMOKING RESTRICTIONS FACT SHEET

The City of Cambridge has revised its city smoking ordinance with the intent of protecting and promoting public health by reducing involuntary exposure to tobacco smoke. This law is effective as of March 7, 1987.

No smoking has been established as the norm in public places under the new ordinance. Smoking is defined as carrying a lighted cigarette, cigar or pipe. This will affect both public and private Cambridge employers, restaurants, government facilities and other public places.

Following is an outline of the Cambridge Smoking Restrictions:

Public Places: NO SMOKING ALLOWED, no exceptions. Includes any room in which the public is invited or permitted, such as elevators, health care facilities, classrooms, lecture halls, theaters, libraries, auditoriums, schools, retail stores and reception areas of banks.

Excludes private homes, parties, beano games, social receptions, and fraternal and veterans' organizations.

Work Places: NO SMOKING ALLOWED, (see exceptions). Any area in either a public or private business that employees frequent during the course of a business day. Includes, but is not limited to, non-designated work areas, employee lounges and restrooms, conference rooms and hallways. Excludes private residences, unless they are used as child care or health care facilities; public areas of restaurants or bars; or small businesses of less than 1500 square feet (unless any employee objects).

Exceptions: Only if non-smoking employees and the public are not bothered by any significant smoke. Employees may request (but not require) an employer to designate their work station as a smoking area. Employers may make other reasonable accommodations, such as a smokers' lounge that should be no larger than the non-smoking lounge.

Restaurants and Bars: NO SMOKING ALLOWED in designated no-smoking areas, which must include at least 25 percent of seats. "No smoking" areas must be separated from smoking areas either by shape of room, natural and/or existing barriers, or space.

Excludes: Restaurants with less than 25 seats and bars with less than 75 seats. Private social functions are also excluded in the ordinance.

Individuals owning or controlling places where smoking is prohibited under this ordinance must post "No Smoking" signs and must not knowingly allow violations.

SMOKING ORDINANCE FACT SHEET - PAGE 2

Signs should be displayed in public lobbies and other prominent places indicating that smoking is prohibited by City Ordinance. Suggested wording for signs include:

"City Ordinance No. 1046 prohibits smoking except in designated areas"

International no smoking signs should also be posted at elevators and in other no smoking designated areas.

It is the intent of the City of Cambridge to assist area employers in making a smooth transition to implementation of the nonsmoking ordinance. The ordinance is intended to be self-enforcing. Employers are encouraged to develop and implement their own smoking policies internally.

For more information contact:

Restaurants and Bars: Cambridge Inspectional Services
City Hall, Third Floor
795 Massachusetts Avenue
498-9013

Public Places and Work Places: Cambridge Department of Health
and Hospitals
1493 Cambridge Street
498-1486

Developing Smoking Policies: The American Cancer Society
Public Education Department
Attn: Candy Pierce-Lavin
247 Commonwealth Avenue
Boston, MA 02116
267-2650, ext. 327

The American Lung Association
of Middlesex County
Attn: David Ales or Terry Clancy
P.O. Box 265
Burlington, MA 01803
272-2866

Smoking Cessation Programs: The Cambridge Hospital
Department of Behavioral Medicine
1493 Cambridge Street
498-1183

See also: American Lung
Association and American Cancer
Society above.

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COMPLIANCE WITH A COMMUNITY NO-SMOKING LAW:

RETAIL STORES IN CAMBRIDGE, MASSACHUSETTS

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ABSTRACT

To protect the public from the health effects of involuntary smoke exposure, many states and cities have adopted laws restricting smoking in public places. The benefits of these laws cannot be achieved without good compliance. Levels of compliance have not been measured directly. To assess compliance with a March, 1987, no-smoking ordinance in Cambridge, Massachusetts, we conducted systematic field observations in a cohort of 174 retail stores 1 month before and 3 and 11 months after the law went into effect. Compliance with the letter of the law was poor; only 3% of stores had posted a sign with the required wording, and fewer than half had posted any no-smoking sign. The number of stores displaying a no-smoking sign increased after the law took effect, from 22% at baseline to 41% at 11 months ($p < .001$), but this occurred only after a delay of 3 months. Despite the sparsity of signs, few people smoked in stores: 12% of stores contained a smoker and 1% of store occupants were smoking at 1 year. If a smoker was seen, it was more often an employee than a customer ($p < .001$). We conclude that the low level of compliance with this ordinance calls into question assumptions about the self-enforcing nature of these laws and indicates a need for further efforts to insure good compliance.

INTRODUCTION

Cigarette smoking is a major public health problem. In addition to the well-known hazards to the smoker, there is increasing evidence about adverse health consequences to individuals who are involuntarily exposed to tobacco smoke in the environment.^{1,2} This evidence has led to a variety of actions whose goal is to protect individuals from exposure to environmental tobacco smoke by limiting the circumstances in which smoking is permitted. In the private sector, businesses, schools, and health care facilities have adopted smoking restrictions.^{3,4} In the public sector, a growing number of states and communities have enacted legislation which restricts or bans smoking in public places and workplaces. By 1985, 40 states had laws which restricted smoking in at least one public place, and a dozen had so-called Clean Indoor Air Acts, which broadly restricted smoking in indoor public places.³ Similar smoking restrictions have been enacted by a rapidly growing number of cities and towns since the early 1980s.

Consequently, laws restricting smoking affect the daily lives of a large and increasing number of Americans. These laws will be regarded as successful if they achieve their stated aim of reducing involuntary tobacco smoke exposure. They have the potential for far greater health impact if, as many have hypothesized, they contribute to reductions in the prevalence of smoking by encouraging current smokers to quit and by discouraging young people from starting to smoke.³ Whether no-smoking laws will have this impact is not known because these laws have not been formally evaluated.

These laws will have little impact if individuals and businesses do not comply with them. At present, the level of compliance with these laws is not known. Public health departments, which have usually been given the

responsibility of implementing and enforcing no-smoking laws, have had little guidance about how to do so. The laws have generally been regarded as self-enforcing, implying that most smokers will comply with restrictions and that individual citizens will assume responsibility for enforcement. Consequently, most health departments have adopted the enforcement strategy of responding to complaints rather than doing active surveillance.³ In the one published report of implementation, a lack of complaints was equated with a high level of compliance.⁵ However, the level of compliance was not measured directly. In the absence of this information, the potential health benefits of these laws cannot be assessed.

In 1986, the passage of a new city ordinance limiting smoking in public places and workplaces in Cambridge, Massachusetts, provided the opportunity to evaluate systematically the impact of a no-smoking law. As part of this evaluation, we made direct observations of the level of compliance in public places. We report here the results of our surveillance of retail stores, chosen because they constituted the largest single group of public places for observation. To assess the impact of the law, we observed a cohort of retail stores 1 month before and 3 and 11 months after the law went into effect.

METHODS

The Cambridge No-Smoking Ordinance

A no-smoking ordinance was enacted by the City Council of Cambridge, Massachusetts, a city of 95,000 residents, in December 1986.⁶ The law broadly bans smoking in all indoor areas "to which the public is invited or in which the public is permitted."⁷ It directs that "Every person having control of premises upon which smoking is prohibited by this ordinance shall conspic-

uously display upon the premises a sign reading 'Smoking Prohibited by Law'" (Section 13-4 [g]).⁷ Furthermore, "it shall be unlawful for any person having control of any premises or place in which smoking is prohibited by this ordinance to have knowingly permitted a violation." (Section 13-4 [h])⁷ Individuals who permit smoking on the premises can be fined or have their city license suspended.

The ordinance gave the city's Commissioner of Health and Hospitals responsibility for implementing and enforcing the law. He used the local news media to inform the public about the law. A two-page information sheet summarizing the provisions of the law was sent to members of the Chamber of Commerce (about half of city businesses) shortly before the law went into effect on March 9, 1987. Enforcement consisted of responding to complaints.

The Sample

Because there was no complete list of the city's retail stores from which to draw a probability sample, we developed a cluster sample of Cambridge retail stores. To define our clusters, we drew a sample of every fiftieth store in the Cambridge Yellow Pages and plotted its location on a city map. This plot demonstrated that businesses were clustered in 6 geographic areas (Harvard Square, Central Square, Inman Square, Porter Square, East Cambridge, and Alewife Parkway), and it permitted a rough calculation of the proportion of city stores in each cluster.

In order to observe a sample of all retail stores, including those without telephones and those opened since the telephone directory was printed, we used a different method to select the stores actually observed. Each cluster was assigned a number of observations that was proportional to its representation in the Yellow Pages-derived sample. We developed a sampling rule for each cluster; observers were to begin at a pre-set central location

and observe all retail stores in a predetermined pattern of streets until they had reached the total for that cluster. The allocation of the total sample of 174 stores according to clusters is shown in Table 1.

Observation Method

The retail stores were initially observed in February 1987, one month before the law took effect. The same stores were revisited in June 1987 and February 1988, 3 and 11 months after the law went into effect; this was 4 and 12 months, respectively, after the baseline observations. At follow-up, stores were revisited in similar fashion and at the same time of day and day of week as in the original observation.

We developed a one-page data form to be completed on-site in each store and trained M.A.-level students as observers. At each store, they recorded the size, location, and type of store; the number of employees and customers; the presence and wording of any signs referring to smoking; the presence of anyone smoking in the store (direct evidence of smoking); the smell of smoke in the store (indirect evidence of smoking); the presence of ashtrays or cigarette butts in the store (regarded as evidence of a permissive attitude toward smoking); and the time spent making the observation. On no occasion was an observer refused permission to survey a store. Observers did not identify themselves unless asked; this was required only one-third of the time. If no sign was seen at final follow-up, the observer identified himself and asked about the store's smoking policy and whether signs were present. Inter-rater reliability was assessed by having a random 15% of stores observed simultaneously by two different observers.

Definition of Compliance

We defined full compliance with the law as (1) the presence of a no-smoking sign with the required wording, (2) the absence of a smoker on the

premises (i.e., direct evidence that smoking was permitted), and (3) the lack of a smoky odor in the store (i.e., indirect evidence that smoking had occurred). Stores that achieved some but not all of the above criteria fell into one of our categories of partial compliance, as defined in Table 3. We considered a store to have a permissive attitude toward smoking if ashtrays or cigarette butts were observed on the premises, but did not consider that their presence was evidence of noncompliance.

Data Analysis

Inter-rater reliability was assessed with Cohen's kappa statistic.⁸ Comparisons among variables within the same time period were made with contingency tables and the chi square statistic. McNemar's test was used to measure the significance of changes in categorical variables over time in the cohort of retail stores observed.⁹

RESULTS

We observed 174 Cambridge retail stores, distributed among 6 clusters, in February 1987. (Table 1) At 4-month follow-up, one store had temporarily closed. At one-year follow-up, 20 stores had closed or moved; 154 stores were observed, representing 88% of the original sample. At baseline, stores were visited for a mean (± 1 SD) of 5.3 ± 2.3 minutes and contained a mean (± 1 SD) of 3.7 ± 3.9 employees and 7.6 ± 12.4 customers. The observation time and number of store occupants were similar at the follow-up visits (Table 1).

Inter-rater reliability was high for the 3 major variables observed: a no-smoking sign, a smoker, or the odor of smoke. The two observers agreed 96% of the time in the assessment of each variable. Reliability was slightly lower for the scoring of cigarette butts, ashtrays, and store size; for these

variables, there was 87% agreement. To determine what proportion of these agreements occurred in excess of chance, we calculated Cohen's kappa statistic.⁸ The kappa statistic (\pm S.E.) was $.86 \pm .13$ (no-smoking signs); $.78 \pm .21$ (see a smoker and smell smoke); $.77 \pm .13$ (size); and $.50 \pm .25$ (butts and ashtrays). This indicates a high degree of agreement between observers.

Compliance: Posting of Signs

Before the law went into effect, a no-smoking sign was posted in 39 stores (22%). The proportion of stores with signs was no different 3 months after the law took effect, but it nearly doubled, to 41%, by the final follow-up. (Table 2) This increase in signs was highly significant ($p < .001$, McNemar's). Although the language of the city ordinance clearly stipulated the wording of no-smoking signs, virtually no store posted a sign with the required wording. Only 4 stores (3% of all stores and 6% of stores posting a sign) had done so by the final follow-up.

Eleven months after the law went into effect, 91 stores (59%) had failed to post any sign regarding smoking. Employees in these stores were asked about the store's smoking policy. Smoking was not permitted in 41 of these stores (45%), but employees reported that customers were permitted to smoke in 36 stores (40%). Of the remaining, 2 had separate smoking and nonsmoking areas and 12 had no policy of which the employee was aware. Thus, nearly one year after the city ordinance took effect, smoking was permitted by employee report in 23% of retail stores.

Compliance: Smoking in Stores

Despite the small number of no-smoking signs, there was relatively little direct evidence of noncompliance by individual smokers. Smokers were observed in only a few retail stores, either before or after the ordinance

took effect. (Table 2) At baseline, one or more smokers was observed in 18 stores (10%); this proportion did not change significantly over the year of follow-up. At baseline, 20 of 1851 store occupants observed (1.1%) were smoking. This proportion also did not change significantly at follow-up; 3 and 11 months after the law took effect, 1.7% and 1.0% of store occupants were smoking, respectively. Interestingly, when a smoker was observed, it was more likely to be an employee than a customer. Three months after the ordinance took effect, 3.4% of employees were smoking, compared to 0.9% of customers ($p < .01$); at 11 months the difference was even more marked (2.4% of employees vs. 0.5% of customers, $p < .001$).

Smoky air was noted about as often as smokers were seen, and there was no significant change over time. At baseline, smoky air was noted in 23 stores (13% of those visited). Four and 12 months later, the proportion of stores with smoky air was 20% and 13%, respectively. (Table 2)

We interpreted the presence of ashtrays or cigarette butts in retail stores as evidence of a permissive attitude toward smoking by store management. Ashtrays and cigarette butts were observed in nearly one-third of stores at baseline. (Table 2) There was a transient decrease in both variables 3 months after the law went into effect. The proportion of stores with ashtrays dropped from 29% to 20% ($p = .04$, McNemar's); for cigarette butts, the decrease was 32% to 22% ($p = .02$, McNemar's). However, one year after the law was adopted, the proportion of stores with ashtrays and cigarette butts had returned to the baseline level. Cigarette butts increased outside stores at the same time that they temporarily decreased inside stores ($p < .01$, McNemar's). (Table 2)

Compliance: Summary Measures

Virtually no store was in full compliance with the no-smoking ordinance during the year after the law went into effect. Only 4 stores (3 percent) met the criteria for full compliance: they had posted a sign with the required wording and had neither a smoker on the premises nor the odor of smoke when visited. The level of compliance increased if we relaxed our criteria to reflect the spirit, if not the letter, of the law. (Table 3) However, fewer than half of the retail stores visited were in even partial compliance with the no-smoking ordinance one year after it went into effect. More than half of stores were in partial compliance at one year only if an employee's report that smoking was prohibited was accepted as valid in the absence of a posted sign. Despite the low level of compliance, we did detect change over the course of our one year follow-up. Our measures of partial compliance approximately doubled between 3 and 11 months ($p < .001$, McNemar's) after the law went into effect.

Correlates of Compliance

We compared stores with and without no-smoking signs posted, expecting that stores with signs would contain less evidence of smoking. (Table 4) At one year, there was a nonsignificant association between signs and the lack of smokers; a smoker was seen in 6% of 63 stores with signs, compared to 15% of 91 stores without signs ($p = .09$). Stores posting signs consistently had fewer ashtrays ($p = .005$) and fewer cigarette butts ($p = .003$), but were no less likely to have smoky air. When we compared stores where smoking was banned (by sign or employee report) with those where smoking was permitted, we found that stores prohibiting smoking had fewer smokers, less smoky air, fewer ashtrays, and fewer cigarette butts (all p values $< .01$; data not shown).

We also examined the effect of store size, store type, and geographic location on the level of compliance with the law. No-smoking signs were more often posted in large stores than in small or medium stores, but the difference was not statistically significant (57% vs. 38%, $p=.10$). Other compliance measures did not correlate with store size. There were variations in compliance by location. In general, there were fewer smokers and less smoke in stores in Harvard Square than in other clusters, while stores in East Cambridge and Inman Square had the most. The variability in compliance roughly mirrors the socioeconomic variations within Cambridge; residents in the Harvard Square area have the highest per capita incomes while those in East Cambridge and Inman Square the lowest.⁶ The posting of signs varied widely among types of retail stores ($p=.004$). (Table 5) No signs were posted in liquor stores, sporting goods, or toy stores, while signs were very common in stationery and book stores (83% had signs), pharmacies (60%), and computer/electronics stores (50%).

DISCUSSION

To our knowledge, this is the first systematic assessment of compliance with a state or city law restricting smoking in public places. In contrast to prior reports of good compliance based on a lack of complaints,^{3,5} we found that active surveillance uncovered a remarkably low level of compliance with a city no-smoking ordinance. Even one year after the well-publicized law took effect, fewer than half of the city's retail stores had posted a no-smoking sign and almost none had posted a sign whose wording complied with the letter of the law. Even more surprising was our observation that nonsmoking cannot be the assumed policy of stores without signs; employees in 40% of them stated

that smoking was allowed. Overall, nearly one quarter of retail stores permitted smoking (by employee report) one year after the city ordinance had gone into effect.

Although overall compliance was low, we did observe an increase in the number of stores posting no-smoking signs during the year after the law took effect. While this change probably reflected the impact of the new law, the lack of control group makes it impossible to attribute the change uniquely and unequivocally to the law. It is likely that some of the change we observed reflects concurrent society-wide changes in public attitudes about smoking. Our study period followed the release of a Surgeon General's Report on the health hazards of involuntary smoking¹ and coincided with an increase in the rate at which no-smoking policies were adopted in the private and public sectors.^{10,11}

We also considered potential internal threats to the validity of our finding that no-smoking signs and compliance increased over time. Only at the final follow-up did observers ask employees to point out a no-smoking sign if none was observed. It is possible that more signs were seen at one year because more care was taken in finding them. However, employees pointed out a sign not previously seen in fewer than 10 of 154 stores. If we reduce the number of stores with signs by 10, the proportion of stores with signs becomes 34% (53/154), which remains a significant increase from baseline. Another potential problem is the possibility of variability between observers' assessment of outcomes, particularly in recording more subjective data such as the odor of smoke. To address this, we tested the inter-rater reliability of our major variables between 2 observers and found it to be quite high. While we did not test reliability among all observers, who numbered 10 and differed across time, we assume it would be similarly high. Consequently, we conclude

that the increase in signs was real and that in all likelihood, much of the increase was a result of the new no-smoking ordinance.

In contrast to the low level of institutional compliance with the no-smoking law, we observed relatively little actual smoking in retail stores, suggesting that compliance by individuals exceeds that of store managers. Because there was little smoking in stores either before or after the policy took effect, we cannot conclude that the law was responsible. Low levels of smoking may reflect pre-existing social norms proscribing smoking in retail stores based on its being a fire hazard.³ The indirect evidence of smoking that we used--the presence of ashtrays or cigarette butts--suggests a higher level of smoking than we observed directly. The correctness of our inference that ashtrays and cigarette butts reflect a permissive attitude toward smoking is supported by the finding that they were less common in stores where smoking was prohibited and no-smoking signs were posted.

No-smoking laws are frequently regarded as self-enforcing.³ While this concept implies little need for enforcement by government, it does not imply that all government efforts are unnecessary. For high compliance to be achieved with a self-enforcing law, individuals and institutions must be aware of the rules about smoking and be willing to confront violators. In the case of retail stores, we expected that the posting of no-smoking signs and the actions of employees would be key elements in attaining good compliance. No-smoking signs are vehicles for communicating the law to the public, while employees bear much of the burden of enforcing the law at the individual level. Based on this analysis, we expected to find less smoking in stores with signs. While we did find this relationship, it was not statistically significant, in part because the small number of smokers observed in all stores reduced the statistical power of our calculations. We did find fewer

ashtrays and cigarette butts in stores with signs, providing some support for our hypothesis. The fact that when smokers were observed, they were more likely to be employees than customers was of particular concern. If employees are unaware of or ignore those laws, it is unlikely that enforcement, and ultimately compliance, will be good.

We conclude that the Cambridge no-smoking law did increase the number of signs in retail stores, but only after a delay of several months. Any reduction on smoking in stores is difficult to assess because so little smoking was noted at baseline. Although compliance by retail stores was not high, measurable improvements occurred over the course of the year following rather modest implementation efforts by the city. Since we studied only one community, we do not know that laws in other communities have not achieved higher levels of compliance due to differences in the wording of statutes or in the efforts of government agencies which implement them. Further studies are needed to determine the generalizability of our findings.

Nonetheless, the low level of institutional compliance we observed raises questions about how to achieve good compliance with no-smoking laws. Our findings indicate that passing a law alone is not sufficient to insure good compliance and thereby achieve reductions in involuntary smoke exposure. Good implementation efforts are necessary, although they may be limited, as in Cambridge, by economic or political constraints. It is our opinion that activist enforcement mechanisms are likely to be both expensive and unpopular. The potential of self-enforcement might be maximized if health departments given the responsibility of implementing these laws focused on informing rather than enforcing.

Our findings suggest several simple and inexpensive approaches to increase compliance with no-smoking laws. The virtual absence of properly-

worded signs in Cambridge retail stores indicates the need for clear communication to merchants about specific requirements under a new no-smoking law. The considerable number of employees who were unaware of the smoking law and were themselves smoking in stores suggests that educational efforts target employees as well as employers. Individuals and institutions should be informed promptly about their responsibilities under a new law in order to avoid a delay in compliance such as we observed. This could be done by a comprehensive direct mailing, as well as by using local news media. Health departments could facilitate compliance by supplying (or arranging for local businesses to supply) properly-worded signs. Enforcement might be accomplished by checking compliance in the course of existing surveillance efforts, such as restaurant or fire inspections. Efforts such as these may increase the level of compliance with no-smoking laws and thereby maximize their potential to reduce the health consequences of environmental tobacco smoke exposure.

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REFERENCES

1. The Health Consequences of Involuntary Smoking: A Report of the Surgeon General. U.S. Department of Health and Human Services, Public Health Service, 1986.
2. National Academy of Sciences. Environmental Tobacco Smoke: Measuring Exposures and Assessing Health Effects. National Research Council, National Academy Press, Washington, D.C., 1986.
3. Rigotti, N.A. "Policies restricting smoking in public places and the workplace." In The Health Consequences of Involuntary Smoking: A Report of the Surgeon General. U.S. Department of Health and Human Services, Public Health Service, 1986, pp. 261-232.
4. Walsh DC, Gordon NP. Legal approaches to smoking deterrence. Ann. Rev. Public Health 1986; 7:127-149.
5. Martin MJ. The San Francisco experience with regulation of smoking in the workplace: the first twelve months. Am. J. Public Health 1986; 76:585-586.
6. U.S. Census of Population and Housing, 1980. (Information on Cambridge obtained from the Community Development Department, City of Cambridge).

7. Code of the City of Cambridge. Ordinance No. 1046. Article II (Offenses against Public Health), Section 13-4. Enacted by City Council, Dec. 8, 1986.
8. Cohen J. A coefficient of agreement for nominal scales. Educational and Psychological Measurement 1960; 20:37-46.
9. Siegel S. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill, 1956, pp 63-67.
10. Bureau of National Affairs, Where There's Smoke: Problems and Policies Concerning Smoking in the Workplace (2nd ed.) Washington, D.C.: Bureau of National Affairs, 1987.
11. Rigotti NA, Pashos C. Government actions to restrict smoking in public places and workplaces. 1988 (Unpublished manuscript).

TABLE 1: CHARACTERISTICS OF CAMBRIDGE RETAIL STORES OBSERVED

RETAIL STORES

	<u>BASELINE¹</u> <u>(FEB 1987)</u> N = 174	<u>4 MO FOLLOW-UP²</u> <u>(JUNE 1987)</u> N = 173	<u>12 MO FOLLOW-UP³</u> <u>(FEB 1988)</u> N = 154
LOCATION (CLUSTER)			
Central Square	55 (32%)	54 (31%)	47 (31%)
Harvard Square	40 (23%)	40 (23%)	36 (23%)
Inman Square	16 (9%)	16 (9%)	16 (10%)
East Cambridge	11 (6%)	11 (6%)	8 (5%)
West/Alewife	23 (13%)	23 (13%)	21 (14%)
Porter Square	29 (17%)	29 (17%)	26 (17%)
SIZE OF STORE			
Small	102 (59%)	101 (58%)	86 (56%)
Medium	49 (28%)	49 (28%)	47 (30%)
Large	23 (13%)	23 (14%)	21 (14%)
STORE OCCUPANTS			
Employees			
Mean \pm 1 SD	3.7 \pm 3.9	2.8 \pm 3.0	3.5 \pm 4.0
Median	3	2	3
Range	(0 - 25)	(0 - 30)	(1 - 36)
Customers			
Mean \pm 1 SD	7.6 \pm 12.4	5.5 \pm 12.6	10.9 \pm 20.3
Median	4	3	5
Range	(0 - 99)	(0 - 120)	(0 - 140)
TIME SPENT ONSITE (min.)			
Mean \pm 1 SD	5.3 \pm 2.3	---*	4.0 \pm 2.5
Range	(2 - 15)		(1 - 17)

¹ 1 month before Cambridge No-Smoking Ordinance went into effect

² 3 months after the law went into effect

³ 11 months after the law went into effect

* Observations not timed

TABLE 2: RETAIL STORES' COMPLIANCE WITH CAMBRIDGE NO-SMOKING ORDINANCE

	BASELINE (FEB 1987) N = 174	4 MO FOLLOW-UP (JUNE 1987) N = 173	12 MO FOLLOW-UP (FEB 1988) N = 154
<u>POSTING OF NO-SMOKING SIGNS</u>			
Any No-Smoking Sign	39 (22%)	39 (23%)	63 (41%)
Sign in Store Window	20 (12%)	27 (16%)	35 (23%)
Sign Inside Store	25 (14%)	16 (10%)	40 (26%)
Sign Refers to Law	--	4 (2% of stores) (10% of signs)	4 (3% of stores) (6% of signs)
<u>SMOKING IN STORES</u>			
<u>DIRECT MEASURES</u>			
Stores With Smoker Present	18 (10%)	14/163 (9%)	18 (12%)
Store Occupants Smoking			
All Store Occupants	20/1851 (1.1%)	25/1391 (1.7%)	21/2213 (1.0%)
Employees Only	--	16/468 (3.4%)	13/532 (2.4%)
Customers Only	--	9/923 (0.9%)	8/1681 (0.5%)
		(Employee vs Customer, p < .01)	(Employee vs Customer, p < .001)
<u>INDIRECT MEASURES</u>			
Smoky Air in Store	23 (13%)	35 (20%)	20 (13%)
Ashtray in Store	50 (29%)	33 (20%)	46 (30%)
Cigarette Butts in Store	54 (32%)	37 (22%)	42 (27%)
Cigarette Butts Outside Store	134 (80%)	159 (93%)	139 (91%)

TABLE 3: SUMMARY MEASURES OF COMPLIANCE BY CAMBRIDGE RETAIL STORES

	<u>JUNE 1987</u> <u>(3 Months After Law)</u>	<u>FEB. 1988</u> <u>(11 Months After Law)</u>
FULL COMPLIANCE	2 (1%)	4 (3%)
- Sign With Required Wording		
- No Smoker On Premises		
- No Smoke Odor		
PARTIAL COMPLIANCE		
- Any No-Smoking Sign	31 (18%)	55 (36%)*
- No Smoker on Premises		
- No Smoke Odor		
- Any No-Smoking Sign	34 (20%)	59 (38%)*
- No Smoker on Premises		
- Any No-Smoking Sign	39 (23%)	63 (41%)*
- No-Smoking Sign OR Employee Report of No Smoking		104 (68%)

*p<.001 (McNemar's) for comparison to prior time period.

TABLE 4: COMPARISON OF RETAIL STORES WITH AND WITHOUT NO-SMOKING SIGNS

	FEB 1987			JUNE 1987			FEB 1988		
	Baseline		p	4 Mo. Follow-Up		p	12 Mo. Follow-Up		p
	<u>SIGN</u> N=39	<u>NO SIGN</u> N=133		<u>SIGN</u> N=38	<u>NO SIGN</u> N=132		<u>SIGN</u> N=63	<u>NO SIGN</u> N=91	
Store Occupant Smoking	2 (5)	16 (12)	NS	2 (6)	12 (9)	NS	4 (6)	14 (15)	.09
Smoky Air in Store	2 (5)	21 (16)	.09	5 (13)	30 (23)	NS	7 (11)	13 (14)	NS
Ashtray in Store	3 (8)	47 (35)	.001	2 (5)	31 (24)	.01	11 (17)	35 (38)	.005
Cigarette Butts In Store	7 (18)	7 (37)	.03	10 (26)	27 (21)	NS	9 (14)	33 (36)	.003
Cigarette Butts Outside Store	34 (87)	101 (78)	NS	36 (95)	123 (93)	NS	57 (90)	82 (91)	NS

TABLE 5: VARIATION IN COMPLIANCE BY TYPE OF STORE
(February 1988)

<u>TYPE OF RETAIL STORE</u>	<u>NUMBER OBSERVED</u>	<u>NO-SMOKING SIGN POSTED*</u>
Videotape Sales/Rental	4	4 (100%)
Sewing Supplies	4	4 (100%)
Books/Stationary/Records	12	10 (83%)
Pharmacy	10	6 (60%)
Computer/Electronics	8	4 (50%)
Hardware	8	4 (50%)
Food	13	6 (46%)
Furniture	14	6 (43%)
Clothing/Shoes	35	12 (34%)
Convenience Store	10	3 (30%)
Florist	5	1 (20%)
Service**	10	2 (20%)
Department/Variety/Discount	6	1 (17%)
Liquor	6	0 (0%)
Sporting Goods/Toys	<u>9</u>	<u>0</u> (0%)
TOTAL	154	63 (41%)

* Difference among signs by store type: $p=.004$

** Laundry, Cleaners, Salons, Barbers, Photocopiers

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Comm. from Dr. Nancy Rigotti, Assoc. Dir.,
Harvard University Institute For the Study
of Smoking Behavior and Policy, transmitting
in connection with this evening's hearing
the Discussion Paper Series entitled "Imple-
mentation and Impact of a City's Regulation
of Smoking in Public Places and the Workplace:
The Experience of Cambridge, Massachusetts".

In City Council,

December 19, 1988

*Referred to Hearing,
Hearing postponed
to Jan. 23, 1989 at 6:01 P.M.
Re-notification for January 23'89
hearing sent to Dr. Rigotti, the City Manager,
Commissioner of Health + Hospitals, Commissioner of
Inspectional Services + the City Solicitor - 1/7/89 wk
copy within.*