

# Effects of a Worksite Nonsmoking Policy: Evidence for Increased Cessation

## ABSTRACT

A random sample of employees was surveyed 20 months after a non-smoking policy was implemented at the New England Telephone Company in 1986. Overall, 21 percent of respondents who were smoking at the time they heard about the policy had quit smoking; 42 percent of quitters said they stopped smoking because of the policy. Cessation was highest among those who reported less smoke in their work area, but was not related to participation in cessation programs. This study suggests that worksite nonsmoking policies may have favorable effects on smoking cessation. (*Am J Public Health* 1991; 81:202-204)

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### Introduction

As evidence of health risks associated with passive smoking has accumulated, more worksites have adopted policies that restrict smoking.<sup>1</sup> Studies evaluating these policies, largely in health care facilities, have reported that non-smoking policies are generally well-received, improve air quality, and reduce cigarette consumption.<sup>2-6</sup> However, there is little evidence that nonsmoking policies stimulate smoking cessation, and the generalizability of these findings to other worksites is not known.

On July 1, 1985, the New England Telephone Company, which employed 27,374 persons at approximately 600 sites, announced a company-wide policy restricting smoking. Beginning September 1, 1985, smoking was banned in conference rooms and classrooms and restricted in cafeterias and lounges. On March 1, 1986, smoking was prohibited in all work areas, including individual offices. Smoking areas were designated in cafeterias, lounges, hallways, and restrooms. A full-time field manager was appointed for 18 months to facilitate the implementation and enforcement of the policy. Free onsite smoking cessation classes were offered. This study examines the effects of this smoking policy on employee smoking behavior and perceived air quality.

### Methods

Employees were surveyed in November 1987. The self-administered anonymous survey was distributed through company mail to a stratified random sample of 1,599 employees, including 892 non-managers (4.3 percent of technicians, operators, and secretarial/clerical staff), 494 (7.7 percent) lower level managers, and 213 (49.9 percent) upper level managers. The overall response rate was 74.5 percent (N = 1,192): 65 percent among non-managers, 86 percent among lower level managers, and 84 percent among upper level managers (three responses to job category were missing). Analysis is limited to

data from the 1,120 (94 percent) respondents employed when the policy was implemented.

Respondents were asked about their current smoking status and smoking status when they first became aware that the company had or would be establishing a policy about smoking. Quitters were defined as those who were smokers when they first became aware of the policy and were not smoking when surveyed. Smokers included those smoking cigarettes, pipes, or cigars. As an indicator of compliance, respondents were asked about air quality in work and nonwork areas.

Relationships among these variables were examined using chi square analysis. The results are reported by job category wherever significant differences by job status are found. Multiple logistic regression was used to identify predictors of smoking status.<sup>7</sup> Analyses were conducted using the software program SYSTAT.<sup>8</sup>

### Results

Characteristics of the sample are presented in Table 1. Overall, 79 (21 percent) of the 375 respondents who were smokers when they first became aware of the policy said they were not smoking by the time of the survey 20 months later, including 15 percent of nonmanagers, 25 percent of lower level managers, and 32 percent of upper level managers (chi square = 8.6,  $p < .01$ ). Omitting short term quitters (N = 13), 18 percent had quit for at least three months. Differences in smoking status by job category are not explained by age or

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**TABLE 1—Characteristics of the Sample**

Demographics	% Nonmanagers	% Lower Level Managers	% Upper Level Managers
Sex	(n = 524)	(n = 407)	(n = 177)
Female	52.5	41.5	16.9
Male	47.5	58.5	83.1
Age (years)	(n = 526)	(n = 410)	(n = 177)
18–29	8.0	4.4	1.1
30–39	36.1	30.0	12.0
40–49	31.2	37.1	39.0
50+	24.7	28.5	42.9
Smoking Status When Respondent First Heard About the Policy	(n = 528)	(n = 411)	(n = 177)
Current Smoker	33.7	34.8	29.9
Former Smoker	30.7	33.8	42.4
Never Smoker	35.6	31.4	27.7
Present Smoking Status	(n = 528)	(n = 411)	(n = 177)
Current Smoker	29.7	27.3	20.9
Former Smoker	35.0	42.1	52.4
Never Smoker	35.2	30.7	27.1

Note: A total of 79 persons who were smoking when they first heard about the policy were not smoking when the survey was administered. Also, eight who reported former smoking and three who reported never smoking when they heard about the policy reported current smoking at the time of the survey.

sex, based on logistic regression analyses. Results of a multiple logistic regression analysis indicate that smoking cessation was more common among those reporting less smoke in work and nonwork areas (Table 2).

The policy was effective in reducing reported exposure to smoke in work areas but not in nonwork areas (Table 3). These results varied significantly by smoking status but not by job category.

Employees classified as smokers were asked: "Which of the following best describes the effect the company's policy about smoking at work has had on your smoking?" Of the 375 smokers, 32 (9 per-

cent) reported that they quit smoking due to the policy, including 20 percent of upper level managers, 9 percent of lower level managers, and 6 percent of nonmanagers. This represents 42 percent of those who quit. In addition, 113 of 375 (32 percent) said that they reduced the number of cigarettes smoked as a result of the policy, including 36 percent of upper level managers, 34 percent of lower level managers, and 29 percent of nonmanagers.

Overall, 38 percent of respondents classified as smokers received some kind of cessation-related assistance. Smokers seeking help were no more likely to quit than those not seeking help (21 percent vs

20 percent). This result did not differ significantly by job category.

## Discussion

A major finding of this study was the overall quit rate of 21 percent over 20 months which is markedly higher than the expected population quit rate of 2 to 5 percent per year.<sup>9,10</sup> In addition, 42 percent of quitters said their cessation was a direct effect of the policy. Cessation was associated with working in areas of good policy compliance, as measured by perceived air quality, but not with participating in cessation classes.

The strengths of this study include data collection from a random sample of employees and retrospective cohort data on cessation. The response rate to the survey was high (75 percent) although it was higher among managers than nonmanagers. Limitations of the study include retrospectively collected data, which risks recall bias. However, a recent study reported 87 percent agreement between recall of smoking status 20 years ago and longitudinal records.<sup>11</sup> Assessment of smoking cessation was based on self-report, but anonymity of responses gave little motive to distort answers. Differing employee turnover rates between smokers and nonsmokers may have inflated cessation rates; however, only 1 percent of managers surveyed knew of any employee who had left the company due to the policy, and the smoking rate of new hires was higher than in established employees. Finally, there was no comparison company to control for secular trends and our results are compared only with reports from population-wide data.

These findings differ from earlier reports from studies in health care settings, which found no relationship between smoking policies and cessation. Findings from health care settings may not apply to other settings; smokers in health care settings may be more aware of the dangers of smoking and consist of a hard core group more resistant to change. These findings suggest that a well implemented worksite smoking policy, which is fully supported by management and accompanied by cessation classes, may be followed by apparent increases in smoking cessation by employees. □

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**TABLE 2—Logistic Regression: Smoking Cessation,<sup>1</sup> with Independent Variables**

Variable	Odds Ratio (95% CI)
Job Status Dummy1 <sup>2</sup> (non-managers)	1.34 (.50, 3.54)
Job Status Dummy2 <sup>2</sup> (managers)	.83 (.32, 2.11)
Number of Cigarettes	.98 (.95, 1.00)
Smoke in Work Areas <sup>3</sup>	1.42 (1.04, 1.94)
Smoke in Non-Working Areas <sup>4</sup>	1.42 (1.03, 1.95)
Age	.82 (.58, 1.16)
Sex	1.13 (.61, 2.09)

Model chi-square 23.89, df = 7 Significant at .01 level

1. Smoking Cessation among those who were smokers when they first heard about the policy.

1 = Current Smoker

2 = Former Smoker

2. Upper level managers serve as the reference category for these dummy variables.

3. "How often do you notice smoky air in your immediate work area?"

4. "How often do you notice smoky air in non-work areas like hallways, rest rooms, etc?"

TABLE 3—Effect of Smoking Policy on Air Quality

	% Current Smoker	% Former Smoker	% Never Smoker	Total
<i>In Work Areas<sup>1</sup> (p = .0001)</i>	(n = 300)	(n = 445)	(n = 350)	(n = 1095)
Improved Air Quality	55.7	71.7	76.0	68.7
Worsened Air Quality	.7	2.0	3.7	2.2
No Effect	43.7	26.3	20.3	29.1
Total	100.0	100.0	100.0	100.0
<i>In Non-work Areas<sup>2</sup> (p = .0001)</i>	(n = 297)	(n = 436)	(n = 340)	(n = 1081)
Improved Air Quality	22.2	23.4	19.0	21.7
Worsened Air Quality	32.7	50.7	55.5	47.3
No Effect	45.1	25.9	25.6	31.1
Total	100.0	100.0	100.0	100.0

1) "What effect do you think the policy about smoking at work has had on the air quality in *your immediate work area?*"  
 2) "What effect do you think the policy about smoking at work has had on the air quality in *non-work areas* like hallways, rest rooms, etc?"

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