

Prevalence of Cigar Use in 22 North American Communities: 1989 and 1993

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ABSTRACT

Objectives. This study examined the prevalence rate of and characteristics associated with cigar use.

Methods. Data were derived from population-based telephone surveys of adults conducted in 22 North American communities in 1989 and 1993 as part of the National Cancer Institute's Community Intervention Trial for Smoking Cessation.

Results. Averaged across the 22 communities, the prevalence rate of regular cigar use increased 133% from 1989 to 1993. Regular cigar use increased in every gender, age, race, income, education, and smoking status category.

Conclusion. These results confirm other data indicating that cigar use is increasing. (*Am J Public Health.* 1998; 88:1086-1089)

Introduction

After a sharp decline in the prevalence of cigar smoking from 1964 to 1991,^{1,2} there has recently been a resurgence of the popularity of the cigar. The US Department of Agriculture estimates that nearly 4.5 billion cigars were consumed in the United States in 1996.³ This represents an increase of more than 30%, or 1 billion cigars, from the number consumed just 3 years earlier. It is also the first reported increase in total cigar consumption in 25 years.

Cigars vary in their size and nicotine content more than do regular cigarettes; however, they generally contain more nicotine per unit of weight.⁴ Furthermore, the pH level of cigar smoke is higher than that of cigarettes, thus allowing more complete delivery of nicotine into the bloodstream.^{4,5} Studies have shown cigar smoking to be associated with oral cancers, as well as cancers of the larynx, pharynx, esophagus, and lung,⁶⁻⁸ and exposure to secondhand cigar smoke is believed to carry at least the same risk as exposure to secondhand cigarette smoke.⁹

Using data from the National Cancer Institute's Community Intervention Trial for Smoking Cessation (COMMIT), conducted in 22 North American communities between 1989 and 1993, we examined the following 2 questions: (1) What was the prevalence rate of cigar use in each COMMIT community in 1989 and 1993? and (2) What characteristics of respondents were associated with cigar use?

Methods

The COMMIT Study

The COMMIT study was a randomized controlled trial, conducted at the community level, testing the effectiveness of a multifaceted intervention designed to help adult cigarette smokers achieve and maintain cessation.¹⁰ The study involved 11 matched pairs of communities, 10 in the United States and 1 in Canada. The design and primary outcomes of the COMMIT study have been described elsewhere.¹¹⁻¹³

Data Collection

The data described here were derived from a population-based cross-sectional tele-

phone survey conducted in 1993 and from a telephone survey used to track a cohort of smokers and nonsmokers followed between 1989 and 1993.

Cross-sectional survey. From August 1993 to January 1994, a random-digit-dialing telephone survey was conducted to identify approximately 2300 households in each COMMIT community. A disproportionate sample of smokers, ex-smokers, and never smokers 25 to 64 years of age was selected to participate in an extended interview designed to gather information on current and past smoking status, other tobacco use patterns, and demographic variables. Details on the survey methodology have been described elsewhere.^{11,13} Data used in this analysis were obtained from the sample of 26 378 respondents with known age, gender, and cigar smoking status.

Cohort survey. From January to May 1988, cohorts of approximately 110 heavy smokers (more than 25 cigarettes per day), light to moderate smokers (25 cigarettes per day or less), ex-smokers, and never smokers in each community were randomly selected, and these individuals were interviewed in depth in 1989 to assess their tobacco use history. Details on the survey methodology have been described elsewhere.^{11,13} This group was subsequently followed until 1993 and re-interviewed via an instrument comparable to the baseline survey. Results by community and demographic variables are reported for the 8315 individuals with known age, gender, and cigar smoking status.

Outcome Measures

Regular cigar users (in both 1989 and 1993) were defined as those persons who responded affirmatively to the following question: "Do you smoke cigars (excluding

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TABLE 1—Cigar Use in the Community Intervention Trial for Smoking Cessation: 1989 Cohort Survey (n = 8 315) and 1993 Cross-Sectional Survey (n = 26 378)

Community	1989		1993		
	Sample Size	Use Regularly, %	Sample Size	Use Regularly, %	Use Occasionally, %
Hayward, Calif	350	1.2	1 153	1.0	3.3
Vallejo, Calif	370	1.2	1 047	1.5	2.8
Peterboro, Ontario	393	0.8	1 351	2.5	4.3
Brantford, Ontario	424	0.2	1 467	1.9	6.0
Cedar Rapids, Iowa	407	0.3	1 300	2.4	5.4
Davenport, Iowa	412	1.1	1 366	1.7	5.2
Lowell, Mass	395	1.0	1 255	2.1	4.1
Fitchburg/Leominster, Mass	382	1.3	1 289	1.5	5.1
Paterson, NJ	314	0.9	1 128	3.5	6.5
Trenton, NJ	367	1.2	1 287	1.8	4.0
Las Cruces, NM	370	0.5	1 097	3.2	4.9
Santa Fe, NM	358	0.2	1 090	2.5	5.0
Yonkers, NY	373	1.0	1 144	2.1	4.5
New Rochelle, NY	376	1.4	1 081	2.3	3.7
Utica, NY	384	0.8	1 298	2.2	6.0
Binghamton/Johnson City, NY	377	1.5	1 253	1.9	5.2
Greensboro, NC	382	0.5	1 205	3.8	6.3
Raleigh, NC	392	1.3	1 104	1.4	3.0
Medford/Ashland, Ore	376	0.4	1 102	2.5	5.0
Albany/Corvallis, Ore	375	1.1	1 022	1.1	3.0
Bellingham, Wash	376	0.4	1 080	1.3	4.1
Longview/Kelso, Wash	362	0.9	1 259	1.5	3.9
Average across communities	8 315	0.9	26 378	2.1	4.6

Note. Data were weighted to account for variation in smoking status and nonresponse and standardized to the age-gender distribution within each community from the 1990 census (1991 for Canadian sites).

cigarillos) on a regular basis?" If necessary, the interviewer clarified the meaning of the word "regular" as at least 3 or 4 times per week. Occasional cigar users (occasional use was measured in 1993 only) were defined as those respondents who reported that they had smoked any cigars in the 6 months prior to the interview.

Analysis

For both the 1989 and 1993 surveys, we identified the percentage of adults who reported using cigars on a regular basis by community and by the gender, age, race/ethnicity, gross annual household income, education, and smoking status of the respondent. We also present data on the percentage of adults who reported smoking cigars occasionally in 1993 by each of the independent variables just described. Community-specific results were weighted to yield population-based estimates of cigar use by accounting for variation in smoking status, nonresponse, and the probability of inclusion in the sample.¹³ These data were also directly standardized to the 1990 age-gender census distribution (1991 for the Canadian communities) within a given community (written communication, Donald K. Corle, Adjustment and Standardization Procedures for COMMIT Prevalence Surveys, June 8, 1994). Factors associated with cigar use were analyzed via

the raw data from the 1989 cohort survey and the 1993 cross-sectional survey. A similar analysis was conducted to confirm the associations found in the cross-sectional data using the set of cohort members who were successfully followed from 1989 to 1993. Chi-square tests of independence and linear trend were used to determine statistically significant differences (at the .05 level) within each characteristic for a given survey year.

Results

Table 1 shows the prevalence of regular cigar use among adults 25 to 64 years of age from the 1989 cohort data and the 1993 cross-sectional data. Also shown is the prevalence of occasional cigar use in 1993. Averaged across all 22 communities, the prevalence rate of regular cigar use increased from 0.9% in 1989 (range: 0.2% to 1.5%) to 2.1% 4 years later in 1993 (range: 1.0% to 3.8%). The rate of occasional cigar use was more than 2 times higher than the rate of regular cigar use in 1993 (average across communities: 4.6%; range: 2.8% to 6.5%).

Table 2 outlines characteristics associated with regular cigar use in 1989 and 1993, as well as occasional use in 1993. For each characteristic examined, the rate of regular cigar use was higher in 1993 than it was in 1989. Male respondents were more

than 10 times more likely to report regular cigar use than female respondents. There was no evidence that age was related to regular cigar use in 1989; however, the 1993 data suggest that younger respondents were more likely to be regularly and occasionally smoking cigars. There were no clear patterns observed between income or education and cigar use. In 1993, heavy cigarette smokers were more than 3 times more likely to report regular or occasional cigar smoking than those who had never smoked cigarettes; however, this association was not apparent in the 1989 data. To confirm the associations found in the cross-sectional data presented in Table 2, we conducted the same analysis for those cohort members who responded to questions pertaining to cigar use in both the 1989 and 1993 cohort surveys. (Data from only the cross-sectional survey are presented, because it allowed for population estimates of cigar smoking prevalence within each community.) This analysis yielded similar findings (data not shown; results are available upon request).

Discussion

It appears that the decline in cigar smoking in the United States has stopped, and the trend has reversed. Rates of cigar use had been tumbling from 1964 until around

TABLE 2—Characteristics Associated with Cigar Use in the Community Intervention Trial for Smoking Cessation: 1989 Cohort Survey (n = 8 315) and 1993 Cross-Sectional Survey (n = 26 378)

	1989		1993		
	Sample Size	Use Regularly, %	Sample Size	Use Regularly, %	Use Occasionally, %
Gender					
Male	4 013	1.6 ^a	12 775	4.5 ^a	10.8 ^a
Female	4 302	<0.1	13 603	0.4	0.9
Age, y					
25–34	2 786	0.7	8 323	2.7 ^a	7.3 ^a
35–44	2 578	0.8	8 223	2.4	5.8
45–54	1 645	1.0	6 009	2.0	4.7
55–64	1 306	0.8	3 823	2.2	3.4
Race/ethnicity					
White	5 975	0.9	15 143	2.3	5.9
Black	601	0.5	1 994	2.3	5.7
Hispanic	574	0.7	1 988	3.0	5.3
Asian	129	1.6	469	2.3	4.9
American Indian	65	0.0	314	3.5	8.0
Canadian	817	0.7	2 818	2.3	5.7
Other	22	0.0	45	6.7	8.9
Income, \$					
<10 000	558	0.7	1 798	2.9	6.5
10 000–25 000	2 146	0.7	5 144	2.4	5.5
25 001–40 000	2 391	0.5	6 219	2.4	6.3
>40 000	2 481	1.1	7 883	2.2	5.6
Education, y					
<12	1 237	1.1	3 229	3.0 ^b	6.7 ^b
12	1 743	0.6	4 245	1.7	4.7
13–15	3 210	0.6	9 724	2.4	5.9
>16	1 973	1.2	5 255	2.4	6.0
Smoking status					
Heavy smoker	1 518	1.1	4 168	3.5 ^a	10.5 ^a
Light to moderate smoker	2 188	0.6	9 183	2.4	6.3
Ex-smoker	2 247	0.8	9 798	2.3	4.0
Never smoker	2 362	0.9	3 187	1.1	2.7

Note. Sample sizes may not sum to total sample size as a result of missing data on the predictor variables.

^aChi-square test of independence and linear trend: $P < .05$.

^bChi-square test of independence: $P < .05$.

1991; however, our results indicate that there has been a turnaround, particularly among younger adults, where the recent growth of the cigar market in the United States appears to be strong. Younger adults provide the greatest potential for long-term profit and promulgation of the acceptability of cigar use, which may explain why cigar advertising appears to target this group. However, these young adults are also most vulnerable to the harmful effects of cigars through a potentially longer period of use.

This study has several limitations that need to be considered in interpreting the results. It is difficult to make comparisons over time because of the way in which cigar use is measured. For example, there is not a clear definition of "regular" cigar use, and we do not know what type of cigars respondents reported smoking, particularly in light of the recent disproportionate increase in premium cigar use. Our data are not nationally representative; rather, they are indicative of prevalence rates in 22 communities. However, similar trends in cigar use between

1989 and 1993 were observed with 2 independent sources of data, leading one to speculate that the trends observed generalize the national trend as a whole. Finally, this study is limited as a result of its descriptive nature.

Despite these limitations, our data indicate that cigar use is increasing in the United States. This is a matter of public health importance, since risks of many types of cancer are comparable for cigar and cigarette smokers. Also, if our prevalence estimates are applied to national population figures, the number of regular cigar smokers in the United States was about 3 million in 1993 and will have increased sharply if the observed trend has continued to the present. To curb this trend, policies need to be implemented. Currently, warning labels stating the known health dangers associated with use are not required for cigars as they are for cigarettes and smokeless tobacco²; the excise tax on cigars is well below that of cigarettes¹⁴; there are no limits on advertising of large cigars, although federal law does prohibit broadcast advertising of

"little" cigars (defined by a weight of less than 3 lb [1.4 kg] per 1000 cigars)²; and the Food and Drug Administration regulations that limit the sale and marketing of cigarettes and smokeless tobacco products do not apply to cigars.¹⁵ □

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References

- Giovino GA, Schooley MW, Zhu B, et al. Surveillance for selected tobacco-use behaviors—United States, 1900–1994. *MMWR Morb Mortal Wkly Rep.* 1994;43:1–43.
- Reducing the Health Consequences of Smoking: 25 Years of Progress. A Report of the Sur-*

geon General. Washington, DC: US Dept of Health and Human Services; 1989. DHHS publication CDC 89-8411.

3. *Tobacco Situation and Outlook Report*. Washington, DC: US Dept of Agriculture; 1997.

4. Henningfield JE, Hariharan M, Kozlowski LT. Nicotine content and health risks of cigars. *JAMA*. 1996;276:1857-1858.

5. Brunnemann KD, Hoffman D. The pH of tobacco smoke. *Food Cosmet Toxicol*. 1974; 12:115-124.

6. Kahn HA. *The Dorn Study of Smoking Mortality Among U.S. Veterans: Report on Eight and One-Half Years of Observation*. Washington, DC: US Dept of Health, Education, and Welfare; 1966:1-125. National Cancer Institute monograph 19.

7. Abelin T, Gsell OP. Relative risk of pulmonary cancer in cigar and pipe smokers. *Cancer*. 1967;20:1288-1296.

8. Carstensen JM, Pershagen G, Eklund G. Mortality in relation to cigarette and pipe smoking: 16 years' observation of 25 000 Swedish men. *J Epidemiol Community Health*. 1987;41: 166-172.

9. Higgins ITT, Mahan CM, Wydner EL. Lung cancer among cigar and pipe smokers. *Prev Med*. 1988;17:116-128.

10. COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT): summary of design and intervention. *J Natl Cancer Inst*. 1991;83:1620-1628.

11. COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT), I: cohort results from a four-year com-

munity intervention. *Am J Public Health*. 1995;85:183-192.

12. Matteson ME, Cummings KM, Lynn WR, et al. Evaluation plan for the Community Intervention Trial for Smoking Cessation (COMMIT). *Int J Community Health Educ*. 1991; 11:271-290.

13. COMMIT Research Group. Community Intervention Trial for Smoking Cessation (COMMIT), II: Changes in adult smoking prevalence. *Am J Public Health*. 1995;85:193-200.

14. *The Tax Burden on Tobacco*. Washington, DC: Tobacco Institute; 1995.

15. US Food and Drug Administration. FDA regulations restricting the sale and distribution of cigarettes and smokeless tobacco to protect children and adolescents (executive summary). *Tob Control*. 1996;5:236-246.

Differences in the Effect of Patients' Socioeconomic Status on the Use of Invasive Cardiovascular Procedures Across Health Insurance Categories

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ABSTRACT

Objectives. This study evaluated the effect of patients' socioeconomic status on use of coronary angiography, bypass grafting, and angioplasty across health insurance categories.

Methods. Multiple logistic regression was used to compute the odds of receiving each procedure among 206 233 ischemic heart disease patients residing in urban California zip codes from 1991 through 1993.

Results. Residents of high socioeconomic status areas were more likely (odds ratios [ORs]=1.20-1.41) and residents of low socioeconomic status areas were less likely (ORs=0.79-0.84) than residents of middle socioeconomic status areas to undergo each procedure. These effects were common among Medicare and health maintenance organization patients and uncommon for privately insured and uninsured patients.

Conclusions. The effect of socioeconomic status varies across health insurance categories. (*Am J Public Health*. 1998;88:1089-1092)

Introduction

Evidence has shown that many factors not directly related to medical need affect the use of health services. These factors include race and ethnicity,¹⁻³ health insurance status and type,⁴⁻⁷ and socioeconomic status.⁸⁻¹³ Previous analyses of the effect of socioeconomic status have tended to be restricted either to one payer type or to patients without regard to type of payer.^{8,14} While higher socioeconomic status may have a positive effect on medical and surgical procedure use across insurance categories,¹⁵⁻¹⁹ this effect may not be consistent across all health insurance types because of variations in both the financial burden on patients and provider incentives.²⁰

We undertook this study to evaluate the use of 3 invasive cardiovascular procedures (coronary artery angiography, bypass graft surgery, and angioplasty) by residents of low, middle, and high socioeconomic status zip codes in California. Our purpose was to confirm the effect of socioeconomic status as a predictor of procedure use and examine whether this effect was consistent across different health insurance categories.

Methods

Our methods were similar to those used by Wenneker et al.⁴ and many other investigators. We combined information from the California Hospital Discharge Data set²¹ with median household income from the 1990 census (used as a proxy for zip code socioeconomic status).

Sample

All California residents between 30 and 89 years of age who were discharged from California hospitals from January 1, 1991, through December 31, 1993, with principal diagnoses of acute myocardial infarction (*International Classification of Diseases*,

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