

Lung Cancer Mortality and Smoking Habits: Mexican-American Women

SUSAN E. HOLCK, MD, CHARLES W. WARREN, PhD, ROGER W. ROCHAT, MD,
AND JACK C. SMITH, MS

Abstract: Lung cancer mortality was reported to be higher among Mexican-American women as compared with Anglo women from 1950 until 1970; however, smoking habits of Mexican-American women have not been adequately described. This study updates lung cancer mortality data in Texas, describes smoking patterns of 1,255 Mexican-American women from a household survey in the four states bordering Mexico, and compares these findings to a reference group of Anglo women residing in the same area. In 1970, lung cancer mortality rates were similar for Mexican-American and Anglo women in Texas; however, by 1974–1976 Mexican-American women in Texas had a

40 per cent lower rate than Anglo women and by 1979, a 46 per cent lower rate. In our 1979 survey results, Mexican-American women reported lower levels of smoking, both in prevalence and amount smoked, as compared with Anglo women. The lower prevalence was reported for all social and demographic categories examined. The relatively low lung cancer mortality rate is most likely due to relatively low levels of cigarette smoking among Mexican-American women. Based on the trend in lung cancer deaths and our survey findings, we would anticipate a continuing low level of lung cancer mortality among Mexican-American women. (*Am J Public Health* 1982; 72:38–42.)

Introduction

In the United States, lung cancer mortality among Mexican-American women was reported to be three times higher than lung cancer mortality among other White women in 1950,^{1,2} two times higher in 1960,^{2,3} and at a similar level in 1970.^{4,5} Cigarette smoking has been proposed as the chief determinant of the differences observed^{1,2,4,6}; however, the only survey to report smoking habits of Mexican-American women was in 1963–1964, and it lacked a comparable Anglo (non-Mexican-American) reference group.²

In this report, we examine lung cancer mortality and smoking habits among Mexican-American women* in three ways:

- We update information on lung cancer mortality for Mexican-American women in Texas by calculating age-specific lung cancer mortality rates for the years 1970, 1974–1976, and 1979;
- We describe the smoking habits and attitudes about the health effects of smoking among 1,255 Mexican-American women from a household probability survey conducted along the US border with Mexico;

From the Family Planning Evaluation Division, Centers for Disease Control, Atlanta. Address reprint requests to Charles W. Warren, PhD, Statistical Services Branch, Family Planning Evaluation Division, Center for Health Promotion and Education, DHHS/PHS/CDC, Atlanta, GA 30333. This paper, submitted to the *Journal* May 22, 1981, was revised and accepted for publication August 5, 1981.

*The term "Mexican-American," as used in this report, refers to White persons with a Spanish surname for the mortality data, and to women self-identified as Mexican-American, Chicano, Mexican, or Mexicana for the smoking data.

- We compare our findings of the lung cancer mortality rates and smoking patterns of Mexican-American women to a reference group of Anglo women of the same age group who reside in the same area, during the same time period.

Data and Methods

We used death reports from the Texas Department of Health to identify lung cancer deaths (ICDA code 162.1, malignant neoplasm of the bronchus and lung), for years 1970, 1974–1976, and 1979; published US census reports for 1970 population data; and the 1970 census report of Hispanic women in Texas with later US census estimates of all White women in Texas to estimate the population size in 1975 and 1979. For both deaths and census population, Mexican-American women were selected from the group of "White" women by identifying Spanish surnames. We calculated age-specific lung cancer mortality rates for each 10-year age group, ages 35 and older, and an overall age-standardized rate for both Mexican-American and Anglo women. The standardized rates were calculated by the direct standardization method using the age distribution of the combined Mexican-American and Anglo population groups.

The data on the smoking habits of Mexican-American and Anglo women were obtained from a 1979 sample survey of 5,005 households conducted in 51 selected counties on the US side of the US-Mexico border by the Family Planning Evaluation Division of the Center for Health Promotion and Education at the Centers for Disease Control.^{7,8} In addition to questions on demographic characteristics and use of contraception, female respondents 15–44 years of age were asked about their current and past smoking habits and their

TABLE 1—Lung Cancer Mortality Rates* by 10-Year Age Group, Mexican-American and Anglo Women, Ages 35 and Older, Texas, 1970, 1974–1976, 1979**

| Age Group (years) | 1970 | | 1974–1976 (3-Year Average) | | 1979 | |
|-------------------------|------------------|-------|-------------------------------|-------|------------------|-------|
| | Mexican-American | Anglo | Mexican-American | Anglo | Mexican-American | Anglo |
| 35–44 | 0.9 | 11.0 | 2.0 | 10.5 | 1.5 | 7.3 |
| 45–54 | 8.6 | 26.4 | 12.1 | 36.2 | 10.1 | 41.7 |
| 55–64 | 31.2 | 42.9 | 27.5 | 69.2 | 26.7 | 84.2 |
| 65–74 | 42.3 | 56.7 | 51.8 | 78.8 | 49.1 | 106.3 |
| 75+ | 138.0 | 56.8 | 96.7 | 72.2 | 128.9 | 92.3 |
| TOTAL, Age-Standardized | 32.7 | 33.2 | 28.2 | 47.1 | 31.0 | 57.4 |

*Lung cancer deaths per 100,000 female population.

**Anglo women are White women with a surname other than Spanish; Mexican-American women are White women with a Spanish surname.

opinion of the harmful effects of cigarette smoking to their health. A total of 2,135 women were interviewed, 1,255 of whom were Mexican-American, 798 were Anglo, and 82 were of other racial/ethnic groups (as self-identified). The reported data have been weighted to adjust for sampling procedure, for non-response, and for temporal changes in the total population of the survey area. The computer software program STDERROR⁹ was used to produce the survey estimates, with accompanying precision measures. By using STDERROR, the complexities of the sample design were accounted for (including differential sampling weights and selection probabilities) and appropriate ratio type estimates in variances for population domains were produced using a first order Taylor series linearization approximation of the deviations of estimates from their expected values.^{10,11}

Results

Lung Cancer Mortality

The age-standardized lung cancer mortality rate for Mexican-American women remained at approximately the same level for the three time periods analyzed (1970 = 32.7; 1974–1976 = 28.2; 1979 = 31.0) (Table 1). During this same time period the comparable Anglo rate increased by 73.0 per cent from 33.2 in 1970 to 57.4 in 1979. Examination of the age-specific mortality rates for Mexican-Americans and Anglos indicated three important differences (Table 1):

- The age-response curve for the Mexican Americans was much steeper than the Anglo curve after age 74;
- Within each age group, except for the 75 + age group, the Mexican-American rate was less than the Anglo rate during each time period;
- Over time the Mexican-American age-specific mortality rates were relatively stable, but from 1970 to 1979 the Anglo age-specific rates over age 45 increased substantially.

Smoking Habits—Mexican Americans

Less than one-fifth (18.5 per cent) of Mexican-American women were current smokers (Table 2). Current smokers

were less common among teenagers (ages 15–19) than among older women; however, after age 20, there was little difference in the levels of current smoking for the age groups. When respondents ages 20 to 44 were stratified by years of completed education, the level of current smoking was highest for woman with less than 12 years of education (24.2 per cent) and lower for the two groups with more education (14.8 per cent and 15.4 per cent for 12 and greater than 12 years, respectively). Smoking was much more prevalent among women who were previously married (37.9 per cent) than among women who were currently married (17.6 per cent) or never married (13.9 per cent). When Mexican-American women were classified according to country of birth, proportions of current smokers were similar: 18.8 per cent of US-born and 17.5 per cent of Mexico-born. Mexican-American current smokers began smoking at an average of 19.2 years (Table 3). Nearly 85 per cent of current smokers among Mexican-Americans smoked less than one pack of cigarettes per day (Table 4). More than 80 per cent of current smokers in each age group smoked less than one pack per day.

Comparison with Anglos

When the per cent of Mexican-American current smokers is compared with Anglo current smokers living in the same area, a number of striking differences are found. First, the overall level of current smoking among Mexican-Americans was 70 per cent lower than the Anglo level (Table 2). In every social and demographic category examined, Mexican-American women had a lower level of smoking than Anglo women. Second, while the percentage of current smokers was only slightly lower among Mexican-Americans than among Anglos for ages 15–19, the percentage of current smokers increased sharply among Anglos after age 20 while the Mexican-American percentage rose only slightly. The difference between the smoking levels of the two ethnic groups generally increased with increasing age. Third, the Mexican-American smokers reported having begun smoking at a later age than Anglo smokers (Table 3). Finally, Mexican-American smokers smoked fewer packs per day, both

TABLE 2—Per Cent of Respondents Who Are Current Smokers by Ethnicity and Selected Characteristics, US-Mexico Border Survey, 1979

| Characteristic | Mexican-American (1) | Anglo (2) | Difference (2) — (1) | Standard Error of the Difference |
|-----------------------|----------------------|-----------|----------------------|----------------------------------|
| Age Group (years) | | | | |
| 15–19 | 15.4 | 18.1 | 2.7 ns | 5.1 |
| 20–24 | 19.1 | 32.7 | 13.6 * | 5.6 |
| 25–34 | 18.8 | 30.9 | 12.1 *** | 3.7 |
| 35–44 | 20.9 | 39.9 | 19.0 *** | 5.4 |
| Education (age 20–44) | | | | |
| <12 | 24.2 | 51.9 | 27.7 *** | 8.0 |
| 12 | 14.8 | 36.3 | 21.5 *** | 4.3 |
| >12 | 15.4 | 29.9 | 14.5 ** | 4.5 |
| Marital Status | | | | |
| Never Married | 13.9 | 26.4 | 12.5 * | 5.0 |
| Currently Married | 17.6 | 31.6 | 14.0 *** | 3.1 |
| Previous Married | 37.9 | 51.2 | 13.3 ns | 9.5 |
| Place of Birth | | | | |
| United States | 18.8 | — | — | — |
| Mexico | 17.5 | — | — | — |
| TOTAL | 18.5 | 31.6 | 13.1*** | 2.7 |

ns = Not statistically significant
 * = p < .05
 ** = p < .01
 *** = p < .001

TABLE 3—Mean Age at Which Currently Smoking Respondents Began Smoking, by Age and Ethnicity, US-Mexico Border Survey, 1979

| Age at Interview | Mexican-American (1) | Anglo (2) | Difference (1) — (2) | Standard Error of the Difference |
|------------------|----------------------|-----------|----------------------|----------------------------------|
| 15–19 | 14.8 | 14.0 | 0.8 ns | .67 |
| 20–24 | 17.2 | 16.3 | 0.9 ns | .55 |
| 25–34 | 19.7 | 17.6 | 2.1 *** | .62 |
| 35–44 | 23.5 | 18.3 | 5.2 *** | 1.42 |
| TOTAL | 19.2 | 17.3 | 1.9 *** | .56 |

ns = Not statistically significant
 *** = p < .001

TABLE 4—Per Cent of Current Smokers Who Smoke Less than One Pack Daily, by Age and Ethnicity, US-Mexico Border Survey, 1979

| Age at Interview | Mexican-American (1) | Anglo (2) | Difference (1) — (2) | Standard Error of the Difference |
|------------------|----------------------|-----------|----------------------|----------------------------------|
| 15–19 | 80.8 | 67.6 | 13.2 ns | 13.1 |
| 20–24 | 81.9 | 51.5 | 30.4 ** | 10.4 |
| 25–44 | 86.9 | 40.5 | 46.4 *** | 6.3 |
| TOTAL | 84.8 | 45.1 | 39.7 *** | 5.4 |

ns = Not statistically significant
 ** = p < .01
 *** = p < .001

overall and within each age group when compared with Anglo smokers (Table 4).

Attitudes toward Smoking

Mexican-Americans and Anglos responded similarly to the question, "Do you believe cigarette smoking is bad for your health?" Overall, 95.5 per cent of Mexican-Americans

and 94.2 per cent of Anglos responded affirmatively. However, the proportion responding affirmatively was somewhat lower among the subgroup of current smokers—87.5 per cent of Mexican-American and 84.5 per cent of Anglo smokers. In contrast, among both ethnic groups, more than 96 per cent of never smokers and former smokers responded affirmatively.

Limitations

Although the mortality data were limited to one state, almost one-third of Mexican-American women in the United States live in Texas.¹² Misidentification of ethnicity using Spanish surname has been discussed extensively elsewhere¹³ but could not account for all of the differences observed in lung cancer mortality. Inaccurate reporting of behavior patterns by survey respondents is always a potential bias; underreporting is particularly likely with questions regarding behavior which is considered undesirable. Although we do not know the extent of selective underreporting in our survey, two aspects of our findings suggest that any possible underreporting does not markedly bias our results: 1) similar proportions among both current smokers and nonsmokers in each ethnic group responded affirmatively when asked if smoking was harmful to their health; and 2) in contrast to the similar responses about the harmful effects of smoking, a lower proportion of Mexican-Americans than Anglos, among all social and demographic categories, reported that they were current smokers.

Discussion

Previous reports indicated an excess in lung cancer mortality for Mexican-American women as compared with Anglo women, but this excess declined from 1950 to 1970. Detailed analysis showed that the high lung cancer mortality rate for Mexican-Americans in 1950 was largely due to the foreign-born Mexican-Americans who were characterized as: 1) women who started smoking at an early age, 2) were heavy smokers, and 3) while living in Mexico, were exposed to the effects of cooking indoors over open fires.² By 1970, the lung cancer mortality rate for Mexican-Americans and Anglos was similar.⁵ It has been suggested that the decline in the Mexican-American excess in lung cancer mortality is a consequence of the 1950 cohort of foreign-born Mexican-Americans aging out of the population. To support this idea it is noted that the 1950 Mexican-American excess began in ages 45–54,² and by 1970 the Mexican-American excess was only in the 70+ age group.⁵ Our results are consistent with this view because in 1979 the Mexican-American lung cancer mortality rate was extremely high only in the 75+ age group. Our findings also showed that the decline in the Mexican-American lung cancer mortality rate continued into the 1970s. In 1974–1976 and in 1979 the Mexican-American and Anglo differential was the reverse of that observed previously, with a significantly lower lung cancer mortality rate among Mexican-American women than among Anglo women. The mortality rate among Anglo women in Texas was similar to that reported for all White women in the United States.¹⁴

Earlier reports of lung cancer mortality proposed that smoking differences would account for the difference observed in lung cancer.^{1,2,4,6} The only survey to report smoking habits among Mexican-American women was in Los Angeles County, California, in 1962–1963. While similar smoking levels were reported for Mexican-American women

older than age 44 when compared with all women in a statewide California Survey in 1960–1961, smoking was less prevalent among Mexican-American women ages 25 to 44.² This lower prevalence of smoking in the early 1960s among Mexican-Americans as compared with Anglos is consistent with the relatively low level of lung cancer mortality in the mid- and late-1970s among Mexican-American women ages 35 to 74. Although the smoking habits of Mexican-American women prior to 1963 are not known, national surveys have indicated that smoking among White women in the United States (the vast majority being Anglo) increased in prevalence until the late 1960s.^{15,16} Increasing smoking among Anglos with either no change or a decrease in prevalence among Mexican-Americans could account for the observed shift in lung cancer mortality from a relative excess among Mexican-Americans as compared with Anglos, to a relative deficit. Previously increasing smoking among Anglos with little change among Mexican-Americans would also be consistent with our findings of increasing lung cancer mortality rates among Anglos from 1970 to 1979, and little change in the mortality rate among Mexican-Americans during the same period.

Our survey results show the current level of smoking to be quite low among Mexican-American women for all social and demographic categories examined. We would expect the level of lung cancer mortality to remain relatively low over the next years based on both the smoking habits reported and the trend in lung cancer mortality over the past three decades. By preventing an increase in smoking among this ethnic group, lung cancer mortality can be expected to remain relatively low for Mexican-American women in the United States.

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