Ethnic Differences in Smoking Patterns: Findings from NHIS

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Synopsis

This research endeavors to broaden our knowledge of smokers' characteristics within ethnic groups. Special attention is given to Mexican Americans, a group that until recently has received scant attention in comparative research on smoking. In general, we find that ethnic differences in smoking vary across several dimensions. Many Mexican American females never smoke. If they do, they begin smoking late, smoke few cigarettes per day, and are likely to quit. Although many anglo (non-Hispanic white) males and females have tried smoking, a much higher proportion of males have quit. Blacks generally display rates intermediate to Mexican Americans and anglos, with relatively low rates of cigarette consumption. Discussed in this report are potential mortality effects, possible intervention strategies, and possible directions for future research.

RESEARCHERS HAVE DEMONSTRATED that mortality rates for lung cancer differ by ethnic group. These differences are usually attributed to variations in smoking patterns. Nevertheless, only a handful of studies have investigated smoking patterns across ethnic groups. Moreover, until recently, Mexican Americans were seldom included in this research. This study endeavors to partially fill this gap by comparing data from a national sample concerning the smoking characteristics of Mexican Americans, anglos, and blacks.

Continued interest has been displayed in the high rates of lung cancer mortality among older Mexican American women, especially when compared with rates for anglo (non-Hispanic white) women (*1*). Mexican-born females in California exhibited a threefold excess of lung cancer deaths for the years 1949-53 when compared with other females residing in California. Excess lung cancer occurred among women 45 years and older, with a mortality peak at ages 65-74 (*2*). This excess, however, has steadily declined with time. By 1950 through 1962, Mexican-born versus other females in Los Angeles County displayed a twofold excess of lung cancer deaths. Compared with other females, Mexican immigrants smoked more and began to smoke earlier. Excess lung cancer occurred among women ages 65 and older, with a mortality peak at ages 75 and older (*3*). By 1969 through 1971, the lung cancer deaths of Mexican American and anglo females were similar, but Spanish-surnamed females displayed a lung cancer mortality peak at ages 80-84 (*4*). Finally, for the period 1974-76, and in 1979, lung cancer rates for Mexican American females dropped below those for anglo females (*5*).

These high lung cancer rates for older Mexican American women have been attributed to a cohort of females who were born in Mexico before 1900 and who began smoking early, smoked heavily, and frequently used nontobacco products as tobacco substitutes (*3*). As this cohort has aged out of the population, rates of cigarette smoking and, concomitantly, mortality rates for lung cancer have dropped among Mexican Americans. Thus, there are now significantly lower levels of lung cancer among Hispanic females than in the past (*5-7*). Less researched are Hispanic males, who histori-

Table 1. Percentage distribution of smoking status by ethnicity, age, and sex, United States, 1979–80

Category	Males			Females		
	Never smoked	Present smoker	Former smoker	Never smoked	Present smoker	Former smoker
	Anglo					
Number	4,518	5,132	3,703	8,549	5,093	2,272
Age (years):						
17–24	56.2	35.2	8.7	56.0	34.8	9.3
25–34	35.6	45.0	19.4	49.8	35.4	14.8
35–44	28.6	44.1	27.3	43.2	39.6	17.1
45–54	22.2	43.4	34.4	49.1	35.5	15.4
55–64	21.6	38.9	39.5	52.3	30.5	17.1
65 and older	31.4	21.7	46.9	70.6	16.4	13.0
Total sample	33.8	38.4	27.7	53.7	32.0	14.3
	Mexican American					
Number	207	202	83	379	110	64
Age (years):						
17–24	60.4	31.2	8.3	71.1	20.7	8.2
25–34	38.8	46.9	14.3	69.4	20.6	10.0
35–44	28.2	46.2	25.6	64.8	22.9	12.4
45–54	37.5	48.2	14.3	61.5	25.6	12.8
55–64	20.5	43.6	35.9	75.6	7.3	17.1
65 and older	42.9	28.6	28.6	73.5	5.9	20.6
Total sample	42.1	41.1	16.9	68.5	19.9	11.6
	Black					
Number	542	610	230	1,181	640	182
Age (years):						
17–24	59.4	35.5	5.0	67.7	29.4	2.9
25–34	36.8	49.5	13.7	54.4	36.8	8.8
35–44	33.0	50.9	16.1	51.6	39.6	8.9
45–54	23.3	52.2	24.4	48.0	39.1	12.9
55–64	28.2	48.8	22.9	52.0	33.0	15.0
65 and older	41.7	28.6	29.7	79.2	9.7	11.2
Total sample	39.2	44.1	16.6	59.0	31.9	9.1

cally have experienced lower lung cancer rates than anglos.

Beyond the research on the pre-1900 cohort of Mexican American women, attention has focused more on lung cancer prevalence than on the impact of age on smoking differences among ethnic groups. That practice has resulted in an examination of age groups that are most prone to lung cancer, that is, older age groups. Unfortunately, such research generated little empirical information about early smoking history among ethnic- and age-specific groups. Policy directed at cancer prevention and, relatedly, smoking prevention or cessation must develop knowledge of smoking characteristics among young age groups, especially the teen years. There is a need, therefore, for comparative research on smoking patterns among different ethnic groups, which includes age- and sex-specific rates. Several recent studies have addressed this need.

Investigations of anglos and Hispanics have demonstrated the importance of age and sex for identifying differences in smoking patterns (*6–9*). Hispanic males are as likely to smoke as anglo males; however, Hispanic males consume fewer cigarettes. Hispanic females, compared with anglo females, seldom smoke; when they do, they smoke fewer cigarettes (*5–7*). Although these studies have contributed to the knowledge of Hispanic smoking patterns, results from several of these studies are hampered by their focus on a particular geographic area (*5,6,9*), absence of young respondents (*6*), aggregation of age groups and of Hispanic subpopulations (*7*), or emphasis on smoking status—but not cigarette consumption (*8,9*).

This research examines the impact of age, sex, and ethnicity on smoking histories at the national level. We focus on the characteristics of the Mexican American population to extend the current knowledge of ethnic smoking differences in four important ways: First, our analysis includes information on early smoking histories. Second, we focus on Mexican Americans, as opposed to the more heterogeneous classification that comprises all persons of Spanish descent. Third, we examine the unique impact of each of the predictors—ethnicity, age, and sex—on cigarette consumption to determine whether the predictors exert a significant effect on daily smoking when the impact of the others are partialed out. Fourth, although we focus on current smokers, we also include information on former smokers and nonsmokers.

Methods

We used the National Health Interview Survey (NHIS) to study smoking patterns among ethnic groups. NHIS, a continuing annual survey that began in 1957, collects information through personal interviews on the "amount, distribution, and effects of illness and disability in the United States" (*10*). NHIS data are derived from a population sample, based on a multistage probability design, that continuously samples households over a year. The primary sampling units include all 50 States and the District of Columbia. Respondents are drawn from the civilian noninstitutionalized population of the United States through both cluster and stratified sampling techniques (*10*). Special supplements periodically collect information on such items as child care, migration, and

smoking. The 1979 and 1980 smoking supplements, which include a total of 37,604 individual interviews (26,271 and 11,333, respectively), contained the standard demographic questions asked in the Health Interview Survey plus questions about the number of cigarettes smoked per day, type of cigarette smoked, and smoking status (*11,12*). Thus, the results of these supplements on smoking contained demographic characteristics of a national sample of smokers.

Studies of Hispanics are hampered by a number of problems. Most studies are locally or regionally based, usually in California, New Mexico, or Texas, so that the generalizability of the results is limited. In addition, these studies are frequently based on small samples so that the accuracy of the rates is often in question, and the margin of error may be substantial. Some studies combine several data sets, so that operational ethnic group definitions may be diluted. Different methods of classifying the Hispanic populations have fueled heated debates and controversies over results. Further, examining Hispanics—a heterogeneous group that includes Puerto Ricans, Mexican Americans, and persons of Spanish descent—as a single ethnic group may result in misleading findings (*13–18*). The NHIS data set minimizes these criticisms through its focus on one period, self-identification of ethnicity, comprehensiveness, and its national base.

To measure ethnicity, we identified the three subpopulations: Mexican Americans, anglos, and blacks. Respondents who identified themselves as Mexican, Mexicano, Mexican American, and Chicano were recoded as Mexican American. Cubans, Puerto Ricans, and the group "Other Hispanics" were excluded from the data set because they were too small to analyze separately and too diverse to combine with Mexican Americans. Anglos and blacks were selected from among those who did not identify themselves as being of Spanish origin.

We were concerned not only with ethnic differences in smoking behavior, but also with the way these differences were affected by age and sex. Ages of smokers were aggregated to compare the smoking characteristics of different age groups within the subpopulations. The youngest age group consisted of the respondents ages 17–24. We also investigated the association of sex on smoking status, an important factor in previous work. The principal thrust of our analysis was on the ethnic characteristics of smokers.

Three dimensions of smoking behavior were examined. First, we looked at the prevalence of smoking behavior, specifying the percentages of the subpopulation who never smoked, who currently smoke, and who are former smokers. Next, we examined smoking frequency as measured by the number of cigarettes smoked per day by those respondents who smoke. Finally, we analyzed the age at which smokers began smoking. Thus, we examined the impact of three demographic factors—age, sex, and ethnicity—on smoking behavior.

Results

The prevalence of selected smoking characteristics (percentages of nonsmokers, smokers, and former smokers), by age, sex, and ethnicity is displayed in table 1. Overall, more Mexican Americans than blacks have never smoked, and more blacks than anglos have never smoked. By far, Mexican American females are most likely to have never smoked; almost 70 percent of all Mexican American females have never smoked cigarettes.

Comparing the differences in and between ethnic groups enables us to further specify smoking patterns for the sexes. Males smoke more frequently than females across all ethnic groups. The greatest differences by sex occur among Mexican Americans, with twice as many Mexican American males as females currently smoking (41.1 versus 19.9 percent). The contrast between Mexican American males and females is interesting: the distribution of males who smoke at present is similar to that of other ethnic groups, whereas females show a marked departure, having extremely high rates of never smoking and, consequently, low rates of past or present smoking status. Indeed, among Mexican Americans, 41 percent of males but only 20 percent of females currently smoke; 42 percent of males but almost 70 percent of females have never smoked.

Age-specific divisions by ethnic group yield more detail. Generally, smoking status is curvilinearly related to age, with the number of persons who have smoked increasing with age and then declining at the oldest ages. For Mexican American males, 31 percent in the youngest age group currently smoke. This percentage increases to 48 percent of all Mexican American males ages 45–54 who smoke. By ages 65 and older, only 29 percent of all Mexican American men smoke. Similar patterns persist for the other age groups. Mexican American females, however, display a more pronounced pattern. By ages 55–64, only 7 percent

Table 2. Mean age when respondents began smoking, by ethnicity and sex, United States, 1979–80

Sex	Anglo (N = 15,402)	Mexican American (N = 429)	Black (N = 1,554)	Total sample (N = 17,385)
Males:				
Mean	17.16	17.50	17.64	17.21
Standard error	.05	.32	.17	.04
Females:				
Mean	19.56	20.55	19.88	19.61
Standard error	.08	.61	.25	.07
Total sample:				
Mean	18.25	18.65	18.74	18.31
Standard error	.04	.31	.15	.04

smoke; by ages 65 and older, only 6 percent of all Mexican American women smoke.

We can gain additional insight on smoking characteristics by comparing the percentage of present with ever smokers:

Group	Percent
Anglo males	58
Anglo females	69
Mexican American males	71
Mexican American females	63
Black males	73
Black females	78

These percentages, which were calculated by dividing the prevalence of present smokers by present and former smokers, are interpreted as the chance that a smoker in a particular subpopulation will continue smoking. For example, from table 1 we see that for anglo males the equation is 38 divided by 66 percent (38 plus 28 percent), or 58 percent. In other words, 58 percent of all anglo males who begin smoking continue. The percentage for anglo females is 69 percent. Thus, females are proportionally more likely than males to continue smoking once they begin, although they are also less likely to begin smoking (table 1). We must recognize that in increasing numbers the advertisements aimed at females focus not only on the new smoker, but also on reinforcing smoking among current smokers.

Mexican American males compared with females are more likely to continue smoking once they begin (71 versus 63 percent). This is a reversal of our finding for anglos and may be related to the overall low prevalence of smoking for Mexican American females. More specifically, Mexican American females are more likely to be around nonsmoking peers than any other group. For blacks, the percentage of present to ever smokers is high for males and females (73 and 78 percent, respectively) and is higher than for any other ethnic or sex subgroup.

To more fully explore the characteristics of early smokers, we examined the age when respondents began smoking (table 2). Among ethnic groups, there is little variation. The greatest difference is between anglo and Mexican American females, with anglos initiating their smoking about 1 year before Mexican Americans. The differences between anglo and black males show little variation, ranging from 17.2 to 17.6 years. More substantial differences occur by sex. In general, males begin smoking just after their 17th birthday, whereas females do not begin until past their 19th or 20th birthday.

Table 3 focuses on the mean cigarette consumption of smokers and shows differences by age, sex, and ethnicity. Overall, anglos smoke significantly more than do Mexican Americans or blacks. The greatest disparity is between anglo males and Mexican American females. The former smoke more than 2½ times as many cigarettes per day. Anglo males and females average about a pack of cigarettes per day. Black males and females and Mexican American males average three-quarters of a pack of cigarettes daily. Mexican American females, however, average less than one-half pack of cigarettes per day.

Each ethnic and sex group smokes fewer cigarettes per day in the youngest age category than any other age category. Generally, differences by sex increase as respondents' age increases, up to age group 45–54. This pattern is most pronounced for anglos. For anglos ages 17–24, the difference in cigarette consumption between males and females is not substantial, though men smoke, on average, about 1½ more cigarettes per day (18.8 versus 17.3 cigarettes). However, anglo men ages 25–34 smoke about 2½ cigarettes more per day, those ages 35–44 smoke about 5 cigarettes more per day, and those ages 45–54 smoke about 6 cigarettes per day more than anglo women. The overall measure for cigarettes smoked per day demonstrates that males smoke significantly more than do females—between 2 and 3½ cigarettes more.

Differences in smoking patterns based on sex are greater among Mexican Americans than among anglos. Overall, Mexican American males smoke about 3½ cigarettes per day more than females (12.81 for males and 9.16 for females). Mexican American males, like the anglos, have low cigarette

Table 3. Mean number of cigarettes smoked per day, by ethnicity, age, and sex, United States, 1979–80

Age (years)	Males			Females		
	Anglo (N = 4,728)	Mexican American (N = 189)	Black (N = 580)	Anglo (N = 4,781)	Mexican American (N = 99)	Black (N = 599)
17–24:						
Mean	18.82	11.02	12.29	17.33	7.77	11.03
Standard error	.36	1.38	.81	.33	1.19	.60
25–34:						
Mean	23.13	12.38	14.97	20.56	9.03	13.94
Standard error	.36	1.13	.71	.35	1.46	.80
35–44:						
Mean	26.94	12.94	17.60	21.95	9.70	14.56
Standard error	.48	1.49	1.05	.41	2.10	.92
45–54:						
Mean	27.63	14.43	17.52	21.55	10.67	13.34
Standard error	.52	1.95	1.47	.45	1.88	.98
55 and older:						
Mean	22.79	15.42	14.66	18.53	9.60	12.27
Standard error	.43	3.12	1.01	.33	2.71	1.16
Total sample:						
Mean	23.75	12.81	15.25	19.89	9.16	13.10
Standard error	.20	.73	.44	.17	.77	.40

consumption at the age extremes; cigarette consumption is slightly higher in the middle ages. Mexican American females, on the other hand, have lower cigarette consumption at all ages, and they consistently smoke less than half a pack per day. These data suggest that the older cohort of Mexican American females with high cigarette consumption and characteristically high rates of lung cancer mortality, who would have been older than 80 years in 1980, have a small impact on all Mexican American females (*2*).

In general, we note that all ethnic groups display relatively low smoking frequencies for the youngest ages, 17–24 years. For anglos and blacks, we note sharp increases in the middle ages; however, this pattern is not replicated for Mexican Americans. Mexican Americans display little variation in smoking behavior across age groups. Thus, cigarette consumption among Mexican Americans no longer shows the dramatic increases in the older age groups as among anglos and blacks. When we examine column totals in table 3, we note that Mexican American males and females smoke about one-half a pack fewer cigarettes per day than anglos. Mexican American males smoke almost 2½ fewer cigarettes than black males, whereas Mexican American females smoke almost 4 fewer cigarettes per day than black females. Black males smoke approximately 8½ fewer cigarettes per day than anglo males, and black females smoke approximately 6¾ fewer cigarettes per day than their anglo counterparts.

Our final concern was with the overall contributions of ethnicity, age, and sex in explaining smoking behavior. Do these predictors exert a significant impact on smoking frequency when we control for the effects of the other predictors? To answer this question, we recoded ethnicity, sex, and age into dummy variables and regressed them on the number of cigarettes respondents smoked per day. The regression coefficients thus generated are partial coefficients and represent the impact of a particular variable with the effects of the other predictors partialed out. For model identification, we excluded the category "female" from the variable sex, "Mexican American" from ethnicity, and "respondents aged 17 to 24" from age. Thus, the unstandardized regression coefficients in table 4 represent deviations from the smoking frequency of Mexican American females ages 17–24.

Differences by sex are significant, with males smoking over 3½ cigarettes per day more than females, when the effects of the other predictors are controlled ($B = 3.59$, $P \leq .001$). Next, we turn to the impact of ethnicity. We find that both blacks and anglos have significantly different smoking behaviors from Mexican Americans ($B = 3.12$ and 10.74, $P \leq .001$). Thus, Mexican Americans smoke the least number of cigarettes per day of the three ethnic groups, about 3½

Table 4. Summary of regression analysis for the impact of ethnicity, sex, and age on number of cigarettes smoked per day, United States, 1979–80

Variable	Unstandardized coefficient B	Standardized coefficient Beta
Intercept	5.82	...
Sex:		
Men	3.59	.14
Ethnicity:		
Anglo	10.74	.28
Black	3.12	.08
Age (yéars):		
25–34	3.50	.12
35–44	5.94	.18
45–54	6.08	.18
55 and older	2.38	.08
	R^2 = .10	

NOTE: The intercept 5.82 represents the mean of the excluded categories or the average number of cigarettes Mexican American females ages 17–24 smoke per day; $P \leq .001$ for all of the coefficients shown.

fewer a day than blacks, and over 10 fewer than anglos. Finally, we turn to age. The youngest group (17–24) smokes significantly fewer cigarettes than any other group. Indeed, the youngest age group smokes 3½ fewer cigarettes per day than respondents ages 25–34 (B = 3.50), 6 fewer cigarettes per day than respondents ages 35–44 and 45–54 (B = 5.94 and 6.08, respectively), and over 2 fewer per day than the oldest age group (B = 2.38). Again, we find evidence that young smokers are smoking much less than older smokers.

Discussion

In the past, Mexican American females displayed higher rates of lung cancer, and by inference, higher rates of cigarette consumption relative to other ethnic groups. This finding was later shown to apply to an age-specific cohort of Mexican American women born in Mexico, who later immigrated to the United States, who in 1980 would be ages 85 and older, and who are now numerically and proportionally few and exert negligible effects on overall Mexican American smoking patterns. Currently, Mexican American females at every age seldom smoke, and when they do, they begin smoking late, smoke only a few cigarettes per day, and are likely to quit. Thus, from our findings, we should expect that Mexican American females at every age may expect lower rates of lung cancer than females of other ethnic groups. We suspect that a combination of factors, including peer influence, lack of commercial advertising aimed at this group, and nonsmoking familial and community role models all contribute to low smoking within this group (*9*). Mexican American males, on the other hand, display higher levels of smoking and are relatively less likely to quit, although they smoke few cigarettes per day when compared with other ethnic groups. Effective programs for Mexican Americans, then, should recognize these important gender differences and implement appropriate strategies. For example, Mexican American females should be encouraged to maintain their low levels of smoking, and policies for Mexican American males could focus on encouraging those who have already started smoking to quit.

Our findings that relate to anglos are intriguing. Anglos smoke many more cigarettes per day than other ethnic groups. Interestingly, although males smoke more than females and start at younger ages, they are the least likely group to continue smoking. In other words, anglo females are less likely to begin smoking, but they are also more likely to continue smoking once they begin. We suspect that the increasing recognition and research on smoking among females, the development of grade- and high-school curriculums to combat the onset of smoking within this group, and antismoking campaigns launched from local, State, and national levels are having a significant impact on young female smokers (*19*). Therefore, younger female anglos (17–24) may be no more likely to smoke than any other age group. Unfortunately, the large majority of smoking programs are in educational settings; our findings suggest that smoking among older age groups is in some ways a more pervasive problem. Additional community-based programs for adults are needed to convince nonsmokers not to smoke and to enhance the chances for smoking reduction or cessation for smokers.

The youngest age groups of blacks smoke substantially less than older age groups, suggesting that young blacks are successfully avoiding the temptations of cigarette consumption. It appears that smoking onset is most pervasive in the early to mid thirties, well beyond the period of maximum exposure to high-school programs on smoking prevention and cessation. The percentage of present to ever smokers is much higher for blacks than anglos or Mexican Americans. In other words, blacks are much more likely to continue smoking once they begin. The relatively low chance among blacks of becoming a former smoker, as well as the high percentages of smokers

at all age levels, strongly indicates the need for intervention programs aimed at smoking prevention, reduction, and cessation, with special emphases on the latter two areas.

Generally, smoking patterns by ethnicity anticipate future diseases. Thus, Mexican Americans smoke little and have low rates of lung cancer; anglos smoke more and have higher rates of lung cancer. Parenthetically, Hispanics compared with anglos have lower mortality rates from other diseases affected by cigarette smoking, including low mortality from cancer of the larynx, chronic obstructive pulmonary disease, and ischemic heart disease (*1,20*). Therefore, smoking prevention, reduction, and cessation programs will become most effective when they incorporate ethnic factors into their programs.

Recently, the Office on Smoking and Health identified 436 State and local programs on smoking cessation and prevention, and only 2 were geared toward identifiable ethnic subpopulations (*21*). Yet, we have found that significant differences in smoking patterns exist across ethnic groups, even when controlling for age and sex. Therefore, for maximum effectiveness, agendas must recognize unique ethnic smoking characteristics and the way these characteristics interact with age and sex.

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