

Smoking Among U.S. Hispanic/Latino Adults

The Hispanic Community Health Study/Study of Latinos

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Background: Prior national surveys capture smoking behaviors of the aggregated U.S. Hispanic/Latino population, possibly obscuring subgroup variation.

Purpose: To describe cigarette use among Hispanic/Latino adults across subgroups of age, gender, national background, SES, birthplace, and degree of acculturation to the dominant U.S. culture.

Methods: A cross-sectional survey of 16,322 participants in the Hispanic Community Health Study/Study of Latinos aged 18–74 years, recruited in Bronx NY, Chicago IL, Miami FL, and San Diego CA, was conducted during 2008–2011.

Results: Prevalence of current smoking was highest among Puerto Ricans (men, 35.0%; women, 32.6%) and Cubans (men, 31.3%; women, 21.9%), with particularly high smoking intensity noted among Cubans as measured by pack-years and cigarettes/day. Dominicans had the lowest smoking prevalence (men, 11.0%; women, 11.7%). Individuals of other national backgrounds had a smoking prevalence that was intermediate between these groups, and typically higher among men than women. Non-daily smoking was common, particularly although not exclusively among young men of Mexican background. Persons of low SES were more likely to smoke, less likely to have quit smoking, and less frequently used over-the-counter quit aids compared to those with higher income and education levels. Smoking was more common among individuals who were born in the U.S. and had a higher level of acculturation to the dominant U.S. culture, particularly among women.

Conclusions: Smoking behaviors vary widely across Hispanic/Latino groups in the U.S., with a high prevalence of smoking among population subgroups with specific, readily identifiable characteristics.

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Introduction

In the U.S., cigarette smoking accounts for over 400,000 premature deaths and over \$96 billion in annual productivity loss.¹ Although smoking behaviors are known to differ across U.S. racial and ethnic groups, none of the recent large tobacco-use surveys specifically target the present Hispanic/Latino population living in the U.S.^{2–6} Existing nationwide surveys (e.g., the National Health Interview Survey² and Tobacco Use Supplement to the Current Population Surveys⁴) indicate that the overall prevalence of smoking is relatively modest among U.S. Hispanic/Latino adults, likely obscuring important differences across groups. Using data from the NIH Hispanic Community Health Study/Study of Latinos (HCHS/SOL), we examined smoking behaviors among over 16,000 Hispanic/Latino adults

living in four urban U.S. regions. The goals of the present analyses were to describe smoking behaviors among Hispanic/Latino adults by examining variation by age, gender, personal or family national background, and social and demographic variables, including SES and acculturation to the dominant U.S. culture.

Methods

Participants

Hispanic Community Health Study/Study of Latinos participants included 16,415 adults, aged 18–74 years at the time of screening, living in Bronx NY, Chicago IL, Miami FL, and San Diego CA. Persons eligible for the study were community-dwelling men and women who self-identified as Hispanic or Latino and were able to travel to a local field study center. Individuals who were institutionalized, on active military duty, or planned to move from the study area were excluded. Pregnant women were enrolled after the end of pregnancy.

Eligible participants were selected using a two-stage sampling approach. In the first sampling stage, a stratified-random sample of census block groups was selected within census tracts chosen to provide diversity within the study population with regard to SES, nation of origin, and family national background. In the second sampling stage, households were chosen at random within the randomly selected census block groups, with overselection of households that matched with commercially available lists of Hispanic/Latino households. Household response rates ranged from approximately 30%–40% within each field center. Among the eligible screened individuals, 41.7% were enrolled.

Data Collection and Variable Definitions

Study examinations included completion of standardized clinical measurements and questionnaires, conducted between 2008 and 2011 by a bilingual interviewer in either English or Spanish. Lifetime history of cigarette smoking was elicited by the question *Have you ever smoked at least 100 cigarettes in your entire life?* Use of cigars and pipes (ever use) was queried and analyzed separately from cigarette smoking. Other smoking-related variables included number of cigarettes per day, age at smoking initiation, and periods of smoking cessation. Individuals who reported having ever quit smoking for 6 months or longer were queried about their ever use of smoking-cessation aids such as nicotine gum, patches, and oral medications. Self-reported information was used to define current daily smokers, as well as intermittent or non-daily smokers defined as current smokers who did not report using cigarettes on a daily basis. Among current daily smokers, we estimated lifetime pack-years based on age of smoking initiation, periods of quitting, and average lifetime cigarettes smoked per day. Reproducibility of smoking variables was assessed in a sample of 56 individuals through repeated study visits conducted a median of 42 days apart ($\kappa=0.93$ for smoking status; intraclass correlation coefficient [ICC]=0.89 for age at which smoking started, 0.92 for current cigarettes per day, and 0.83 for lifetime average cigarettes per day). Acculturation was measured using a modified ten-item version of the Short Acculturation Scale for Hispanics (SASH), with five-point Likert-type scale responses coded as an average overall

summary score, and as subscales reflecting language preferences (six items) and socialization practices and preferences (four items).⁷ Higher SASH response values represent greater acculturation to the dominant U.S. culture. The overall scale reliability was acceptable in the full sample (Cronbach's $\alpha=0.90$), and for both English- and Spanish-language versions ($\alpha_{\text{English}}=0.76$, $\alpha_{\text{Spanish}}=0.85$). The reliability of the SASH was similar across Hispanic/Latino background groups (ranging from $\alpha_{\text{South Americans}}=0.85$ to $\alpha_{\text{Mexicans}}=0.89$). For analyses of Hispanic/Latino groups defined by Latin American national background (defined either by personal or family place of origin), we categorized both U.S.-born and non-U.S.-born individuals into mutually exclusive groups based on background.

Statistical Analyses

Weighted prevalences of smoking among men and women were computed using sample weights, which were adjusted, trimmed, and calibrated to the 2010 U.S. Census population age and Hispanic/Latino background (“ethnicity”) distributions for the four geographic study areas. Sample weights were also designed to correct for non-response, with adjustment for characteristics of the non-sampled population. Prevalence, intensity, and cumulative exposure to cigarette smoking were estimated for gender- and national group-specific populations. Multivariable logistic regression was used to assess the association among smoking variables and gender, age, income, education, health insurance status, field center, and Hispanic/Latino background, as quantified by ORs and 95% CIs. We also identified variables associated with quitting smoking in an analysis that was limited to individuals who had ever reported smoking a total of 100 or more cigarettes. Among former smokers, we examined characteristics associated with having ever received prescription or over-the-counter smoking-cessation products. For background groups who were well represented in two sites, we examined regional differences in smoking prevalences. Analyses were performed using SAS, version 9.3 (SAS Institute, Cary NC) in 2012–2013.

Results

A total of 16,322 individuals were included in this study after exclusion of 93 with incomplete smoking data. The mean age was 40.3 years among 6,532 men, 25.0% of whom were born within the 50 states. The mean age was 41.8 years among 9,790 women, 20.9% of whom were born within the 50 states. Approximately half of participants lacked health insurance at the time of examination, and 59.0% of men and 48.8% of women reported having an annual household income above \$20,000 (Table 1).

The age-standardized prevalence of current cigarette smoking was highest among Puerto Rican men and women (35.0% among men and 32.6% among women) followed by Cubans (31.3% among men and 21.9% among women). Analysis of age-specific prevalences revealed that more than 40% of Puerto Rican men and women between the ages of 30 and 50 years were current

Table 1. Characteristics of men and women participating in the Hispanic Community Health Study/Study of Latinos

	Men (n=6,532) n (%)	Women (n=9,790) n (%)
Age (years)		
18–29	1,240 (28.8)	1,424 (25.8)
30–40	1,112 (23.9)	1,552 (22.4)
41–59	3,110 (34.5)	5,106 (36.9)
≥ 60	1,070 (12.9)	1,708 (14.8)
History of coronary heart disease ^a	531 (6.7)	603 (5.4)
History of cancer	158 (2.6)	485 (4.6)
No health insurance	3,323 (52.5)	4,576 (46.9)
Income (\$)		
< 10,000	747 (11.5)	1,582 (17.4)
10,000–20,000	1,827 (29.5)	3,032 (33.8)
> 20,000–40,000	2,178 (34.4)	2,870 (32.3)
> 40,000–75,000	990 (16.8)	1,022 (12.5)
> 75,000	362 (7.8)	283 (4.0)
Less than ninth-grade education	1,375 (16.6)	2,393 (19.3)
Some high school education	1,032 (17.0)	1,309 (14.5)
High school education	1,807 (30.2)	2,320 (26.9)
Some education beyond high school	1,549 (26.8)	2,613 (29.4)
Bachelor's degree or higher	668 (10.9)	925 (11.0)
PERSONAL OR FAMILY NATIONAL BACKGROUND AND BIRTHPLACE		
Dominican		
Born in 50 states	60 (1.6)	77 (1.7)
Born outside of 50 states	449 (6.6)	886 (9.9)
Cuban		
Born in 50 states	53 (1.5)	66 (1.4)
Born outside of 50 states	1,043 (20.4)	1,181 (17.0)
Puerto Rican		
Born in 50 states	487 (8.6)	633 (6.9)
Born outside of 50 states	648 (8.4)	953 (8.2)
Mexican/Mexican-American		
Born in 50 states	460 (9.8)	611 (8.0)
Born outside of 50 states	1,979 (26.7)	3,406 (30.2)

(continued)

Table 1. (continued)

	Men (n=6,532) n (%)	Women (n=9,790) n (%)
Central American^b		
Born in 50 states	37 (0.5)	42 (0.6)
Born outside of 50 states	642 (6.8)	1,002 (6.9)
South American^b		
Born in 50 states	22 (0.3)	23 (0.3)
Born outside of 50 states	414 (4.4)	611 (5.0)
Other or multiple backgrounds		
Born in 50 states	132 (2.6)	146 (2.0)
Born outside of 50 states	95 (1.7)	128 (1.9)

Note: Some percentages do not add up to 100% because of rounding.

^aMyocardial infarction, angina, or coronary revascularization including coronary artery bypass graft, angioplasty, or stent^bCentral and South American backgrounds represented include Nicaragua (n=547); Honduras (n=470); Ecuador (n=349); Guatemala (n=308); Colombia (n=280); Peru (n=147); and El Salvador (n=140).

smokers (Figure 1). Dominican men and women both had a relatively low prevalence of current smoking (11.0% among men and 11.7% among women). Among the other groups, which had prevalences of current smoking that were intermediate between the aforementioned groups, smoking was more common among men than women (23.4% among Mexican men and 10.4% among Mexican women, 20.6% among Central American men and 8.5% among Central American women, 15.8% among South American men and 11.7% among South American women, 23.4% among men and 20.3% among women of multiple or other backgrounds). Among Mexican men, smoking prevalences were similar in Chicago and San Diego sites, whereas Mexican women in San Diego had a significantly higher smoking prevalence than Mexican women in Chicago (12.1% vs 7.8%, $p < 0.05$). Among Puerto Ricans, smoking prevalences were similar in the Bronx and Chicago sites (data not shown).

Analyses of current daily smokers revealed substantial variation in smoking intensity by background (Table 2). Smoking intensity as defined by the number of cigarettes smoked per day was highest among Cuban daily smokers. Half of Cuban men and over one third of Cuban women who smoked daily reported that they consumed ≥ 20 cigarettes per day. Compared with other groups of daily smokers, Mexican men and women less commonly reported consuming ≥ 20 cigarettes per day (7.1% among male daily smokers and 4.2% among female daily smokers).

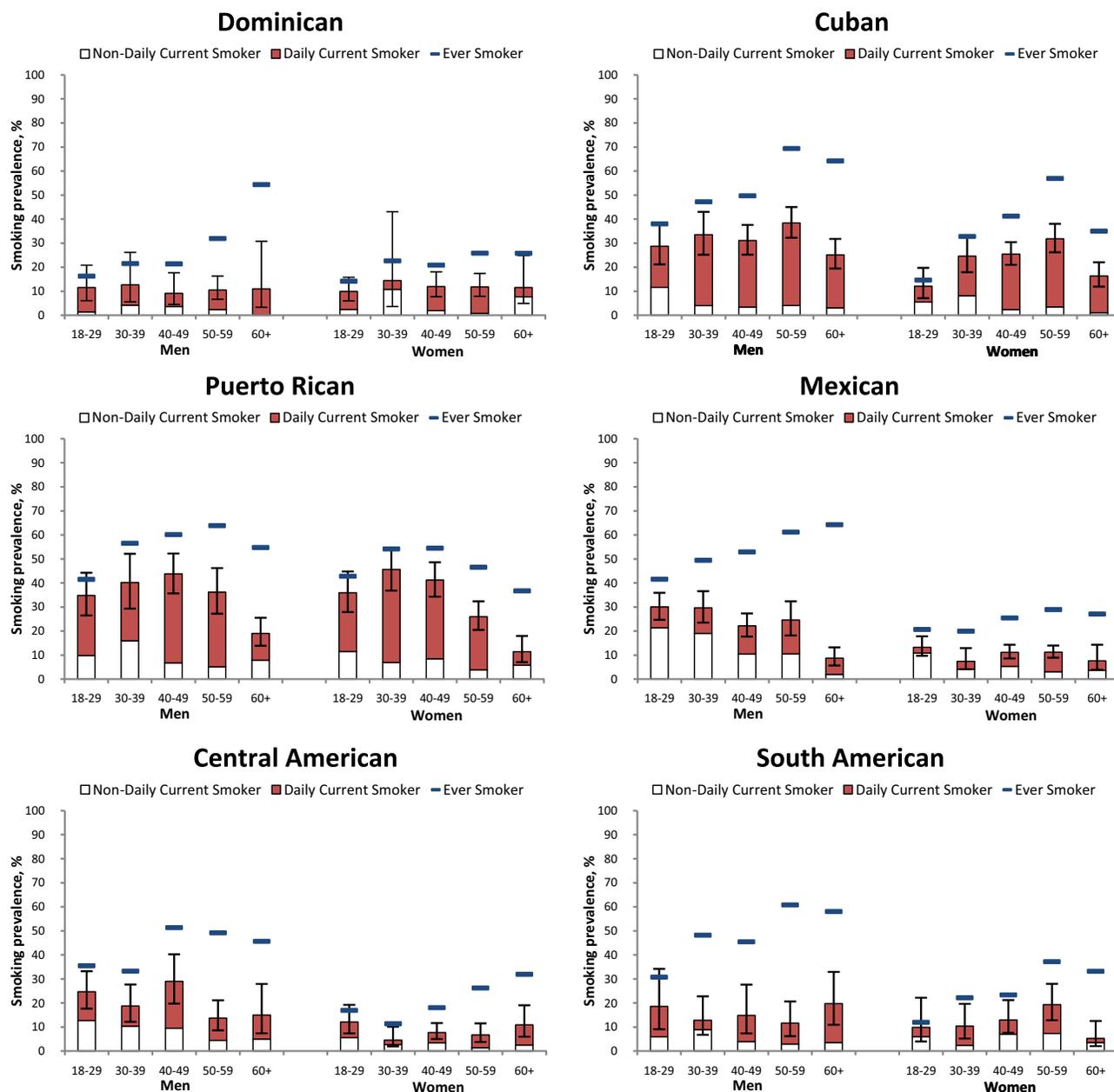


Figure 1. Prevalence of current and ever smoking by age, gender, and Latin American personal or family national background: the Hispanic Community Health Study/Study of Latinos

Note: Current smoking was defined by self-reported use of cigarettes, either on a daily basis (red bars) or non-daily/intermittent basis (white bars), and ever smoking (blue bars) was defined as self-reported lifetime smoking of at least 100 cigarettes. Error bars represent 95% CIs for the prevalence of any (daily or non-daily) smoking. Subjects included 15,322 adults aged 18–74 years living in Bronx NY, Chicago IL, Miami FL, and San Diego CA who were recruited between 2008 and 2011.

A substantial number of current smokers reported that they smoked cigarettes only on some days rather than daily (Table 3). This pattern of intermittent current smoking was most common among Mexican men (15.5%), Central American men (9.8%), and Puerto Rican men (9.0%). Intermittent smoking was reported by participants in nearly all age, gender, and background groups, although it was most common among younger adults

(Figure 1). Within several groups defined by background, over one fifth of intermittent smokers reported having smoked ≥ 20 days in the last month (Puerto Rican and South American men, and Dominican, Cuban, Puerto Rican, and Central American women).

In multivariable adjusted models, the likelihood of being a current smoker was independently associated with male gender, age <60 years, lower income, and

Table 2. Smoking behaviors of current daily smokers among Hispanic Community Health Study/Study of Latinos participants

Cigarettes/day	Age at initiation, years		N	Daily current smokers, % ^a	M (SE)	M (SE)	10–19 cigarettes/day, %	≥ 20 ciga
	M (SE)	M (SE)						
MEN								
Overall	16.9	16.6 (0.2)	1,101	8.8	16.6 (0.6)	17.1 (1.2)	12.1	30.8
Dominican	8.8	16.6 (0.6)	40	26.2	16.1 (0.3)	17.1 (0.6)	12.1	30.9
Cuban	26.2	16.1 (0.3)	315	26.2	16.1 (0.3)	17.1 (0.6)	12.1	30.9
Puerto Rican	27.0	16.2 (0.5)	318	27.0	16.2 (0.5)	10.7 (0.5)	35.1	35.1
Mexican	10.3	17.7 (0.4)	261	10.3	17.7 (0.4)	7.9 (0.5)	30.4	30.4
Central American	12.1	17.5 (0.7)	82	12.1	17.5 (0.7)	12.7 (2.9)	25.0	25.0
South American	9.6	17.7 (0.8)	42	9.6	17.7 (0.8)	9.6 (1.7)	32.5	32.5
Other or multiple	16.4	16.3 (0.6)	43	16.4	16.3 (0.6)	9.0 (1.2)	28.9	28.9
	<i>p</i> < 0.001	<i>p</i> = 0.026				<i>p</i> < 0.001		
WOMEN								
Overall	10.7	17.7 (0.3)	1,055	7.5	17.2 (0.9)	10.4 (0.4)	27.3	27.3
Dominican	7.5	17.2 (0.9)	77	29.1	18.0 (0.5)	13.0 (0.6)	29.1	29.1
Cuban	18.2	18.0 (0.5)	276	18.2	18.0 (0.5)	13.0 (0.6)	29.1	29.1
Puerto Rican	24.2	16.0 (0.3)	355	24.2	16.0 (0.3)	10.3 (0.5)	29.3	29.3
Mexican	4.4	19.8 (1.5)	222	4.4	19.8 (1.5)	6.8 (0.9)	21.0	21.0
Central American	5.0	21.1 (1.2)	49	29.2	21.1 (1.2)	7.5 (1.2)	29.2	29.2
South American	6.6	19.8 (1.4)	37	24.1	19.8 (1.4)	7.8 (1.0)	24.1	24.1
Other or multiple	10.6	17.0 (0.9)	39	21.5	17.0 (0.9)	9.9 (1.5)	21.5	21.5
	<i>p</i> < 0.001	<i>p</i> < 0.001				<i>p</i> < 0.001		

Note: *p* represents statistical tests for comparisons across groups defined by Hispanic/Latino background (ANOVA or Rao-Scott χ^2 tests). Data in the table are not standardized for age. Please refer to the Results section and Figure 1 for age-standardized estimates of smoking prevalence.

Table 4. Associations among current smoking and age, gender, SES, and health insurance coverage in Hispanic Community Health Study/Study of Latinos participants

	% current smokers	p (χ^2)	OR for current smoking ^a (95% CI)	p
Women	16.4	<0.001	1 (ref)	
Men	26.1		1.82 (1.58, 2.09)	<0.001
Age (years)				
18–29	21.9	<0.001	1 (ref)	
30–40	22.4		1.04 (0.82,1.32)	0.753
41–59	22.3		0.97 (0.82,1.15)	0.722
≥60	14.1		0.46 (0.36,0.6)	<0.001
Income (\$)				
<10,000	27.7	<0.001	1 (ref)	
10,000–20,000	22.8		0.75 (0.62,0.9)	0.002
>20,000–40,000	19.0		0.58 (0.48,0.7)	<0.001
>40,000–75,000	19.0		0.58 (0.45,0.75)	<0.001
>75,000	13.9		0.39 (0.26,0.59)	<0.001
Less than ninth-grade education	18.6	<0.001	1 (ref)	
Some high school education	30.3		1.47 (1.18,1.84)	0.001
High school education	23.2		1.04 (0.84,1.27)	0.735
Some education beyond high school	18.5		0.82 (0.67,1.00)	0.053
Bachelor's degree or higher	15.1		0.72 (0.55,0.94)	0.015
Has health insurance	19.7	0.006	1 (ref)	
No health insurance	22.7		1.15 (0.98,1.35)	0.087
Bronx	22.2	<0.001	1 (ref)	
Chicago	20.0		0.96 (0.78,1.19)	0.727
Miami	24.0		1.34 (1.01,1.78)	0.043
San Diego	18.0		1.11 (0.85, 1.45)	0.450

Note: Persons with missing values of covariates were excluded from the analysis. Sample size for Table 4 is 14,379.

^aAdjusted for all listed variables in addition to Hispanic/Latino background.

lower education level (in particular, lacking a high school diploma but having ≥ 9 years of schooling); each of these variables were independently associated with higher likelihood of being a current smoker ($p < 0.05$) (Table 4).

Analyses that were limited to ever-smokers identified several characteristics associated with higher likelihood of quitting (e.g., being a former rather than current smoker) (Table 5). The likelihood of having quit increased with older age and with higher levels of income, more than a high school education, and higher lifetime average cigarettes per day, although quitting was not significantly associated with gender or health insurance coverage.

Among former smokers, the proportion that had ever used prescription smoking-cessation products was 5.5% among individuals with health insurance and 1.7% among those without health insurance ($p_{\chi^2} = 0.002$). Use of over-the-counter prescription smoking-cessation products was also more common among insured than uninsured former smokers (5.8% vs 2.8%, $p_{\chi^2} = 0.021$). After adjustment for health insurance status and other potential confounders, individuals with higher income levels were significantly more likely than those with lower income levels to have used over-the-counter smoking-cessation products ($p < 0.050$), although income was not associated with the use of prescription smoking-cessation products in multivariable analyses (data not shown).

Table 5. Associations among quitting and smoking intensity, demographic, and socioeconomic characteristics in ever-smoker Hispanic Community Health Study/Study of Latinos participants

	<i>n</i>	Among ever smokers, % quit	OR (95% CI) for having quit ^a	<i>p</i>
Women	2,594	44.0	1 (ref)	
Men	3,066	46.5	0.99 (0.83, 1.19)	0.955
Age (years)				
18–29	628	27.4	1 (ref)	
30–40	821	39.5	1.64 (1.16,2.31)	0.005
41–59	3,199	49.5	2.58 (1.94,3.43)	<0.001
≥60	1,012	68.4	6.5 (4.64,9.09)	<0.001
Income (\$)				
<10,000	1,020	40.3	1 (ref)	
10,000–20,000	1,826	42.3	1.17 (0.91,1.5)	0.217
>20,000–40,000	1,875	48.9	1.58 (1.24,2.01)	<0.001
>40,000–75,000	716	47.8	1.5 (1.09,2.07)	0.013
>75,000	223	57.4	1.89 (1.13,3.15)	0.015
Less than ninth-grade education	1,232	52.4	1 (ref)	
Some high school education	972	38.1	0.95 (0.72,1.26)	0.716
High school education	1,464	39.9	0.94 (0.73,1.22)	0.639
Some education beyond high school	1,469	48.8	1.31 (1.03,1.69)	0.031
Bachelor's degree or higher	523	55.3	1.39 (0.99,1.95)	0.057
Has health insurance	2,903	48.2	1 (ref)	
No health insurance	2,757	43.0	0.85 (0.71,1.02)	0.076
Average cigarettes/day (per unit)			1.02 (1.02,1.03)	<0.001
Bronx	609	38.9	1 (ref)	
Chicago	710	45.3	1.17 (0.87,1.57)	0.286
Miami	736	45.5	1.04 (0.72,1.51)	0.839
San Diego	851	52.1	1.09 (0.76,1.58)	0.635

Note: Persons with missing data were excluded from the analysis.

^aAdjusted for all listed variables in addition to Hispanic/Latino background.

After adjustment for demographics, SES, and health insurance status, individuals who were born within the 50 states or were more acculturated to U.S. culture as measured by high SASH scores were significantly more likely to be current smokers (Table 6). These associations were stronger and more consistent among women than men.

Among men, the lifetime prevalence of cigar smoking was 9.2% and the lifetime prevalence of pipe smoking was 3.0%. Cigar smoking was most common among Puerto Rican men (12.9%), followed by Central American men (10.2%) and Mexican men (8.8%), with other groups having a prevalence of ≤5%. Pipe smoking was

reported by 5.0% of Central American men and by fewer than 3% among other groups. Among women, few had a lifetime history of cigar and pipe smoking (2.7% and 0.8%, respectively). Among those who had never smoked cigarettes, only 2% of men and <1% of women reported a history of cigar or pipe use.

Discussion

Smoking prevalences among U.S. Latino adults vary by nearly three-fold when comparing the Hispanic/Latino background groups with the most versus the least cigarette use. Contrasted with earlier studies, our data

Table 6. Associations among place of birth, acculturation, and current smoking in Hispanic Community Health Study/Study of Latinos participants

	Men (n=5,922)			Women (n=8,457)		
	Adjusted OR of smoking per 1 unit higher SASH or for those born in 50 states			Adjusted OR of smoking per 1 unit higher SASH or for those born in 50 states		
	M (SE)	OR (95% CI) ^a	p	M (SE)	OR (95% CI) ^a	p
Overall SASH score	2.25 (0.03)	1.19 (1.02, 1.38)	0.028	2.10 (0.03)	1.57 (1.30, 1.88)	<0.001
Language acculturation score (subscale)	2.22 (0.04)	1.16 (1.03, 1.29)	0.011	2.03 (0.04)	1.42 (1.25, 1.63)	<0.001
Social acculturation score (subscale)	2.28 (0.02)	1.06 (0.90, 1.24)	0.518	2.21 (0.02)	1.25 (1.00, 1.57)	0.049
Born within 50 states	24%	1.21 (0.93, 1.58)	0.157	20%	2.53 (1.91, 3.36)	<0.001

Note: SASH responses were based on a five-point Likert-type scale, with higher values representing greater acculturation to the dominant U.S. culture. For analysis of place of birth, OR represents comparison of smoking prevalence among those born within the 50 states versus those who were foreign-born or born in Puerto Rico.

^aAdjusted for age, education, income, health insurance status, Hispanic/Latino background, and field center SASH, Short Acculturation Scale in Hispanics⁷

portray the evolving epidemiology of smoking among Hispanics and the burden of smoking relative to other U.S. groups. In the 1982–1984 Hispanic Health and Nutrition Examination Survey (HHANES), 40% or more of Puerto Rican, Cuban, and Mexican men were smokers, which equaled the prevalence among African Americans at the time and exceeded the prevalence among non-Hispanic whites.^{5,6} Today, Puerto Rican and Cuban men continue to have high smoking prevalence, which now exceeds that among U.S. non-Hispanic whites by a considerable margin (35.0% and 31.1% among Puerto Rican and Cuban men in this study, respectively, vs 22.6% in 2010 for non-Hispanic whites).⁸ Women from Puerto Rican and Cuban groups, who in the 1980s had smoking prevalences that were similar or lower compared to African Americans and non-Hispanic whites, now smoke more frequently than other groups. In this survey, Mexican and Central American men have a smoking prevalence approximately equal to that among non-Hispanic whites and African Americans, while women in these groups are less likely to smoke than other major U.S. race/ethnicity groups.⁸ Other groups in our survey including Dominican and South American men and women, which have not been well studied, have smoking prevalences well below U.S. national averages.²

Our findings have several implications for tobacco use prevention and cessation strategies among U.S. Hispanic/Latino adults. First, Hispanic/Latino adults often report smoking intermittently rather than on a daily basis, and among some groups (Mexican and Central American) intermittent smokers almost equal or outnumber daily

smokers.^{9,10} Among intermittent smokers, we documented substantial levels of cigarette exposure as measured by smoking days per month and number of cigarettes on smoking days. Physicians should recognize that intermittent smokers are likely to be at an elevated risk of tobacco-related illnesses and, therefore, should actively screen for and intervene when patients report this pattern of cigarette use. It is unclear whether the propensity for intermittent smoking among several Hispanic/Latino groups may reflect lower susceptibility to tobacco addiction, social conventions, or other factors.

Second, the use of smoking-cessation products was relatively low in this population compared with previously reported population-based data.¹¹ This suggests the need for further research on availability, awareness, and acceptability of quit aids in Hispanic/Latino communities.

Third, our data point to potential social and cultural influences that may affect smoking behaviors among Hispanic/Latino populations. We found that being born in the U.S. (among women) and having a greater level of acculturation to the dominant U.S. culture (among both men and women) were associated with a higher likelihood of smoking. This suggests vulnerability, particularly among the women in our study, to acculturation stress and media or cultural influences in the U.S., which may promote smoking. The association between acculturation and tobacco use in women may also reflect gender norms related to smoking in Latin America, with a low prevalence among recently arrived female immigrants. However, among migrant groups in the U.S.,

prevailing smoking behaviors in their country of origin are only weakly associated overall with the likelihood of being a smoker.¹² Of note, although place of birth was not associated with smoking among men, we observed an association between greater acculturation and higher smoking prevalence among men. This contrasts with prior data showing that more highly acculturated Hispanic/Latino men have relatively lower smoking prevalence.^{6,13} The difference in results may be explained by the fact that these prior studies were conducted at least a decade earlier and primarily enrolled Mexican and Central American men who, as compared with those in our study, were younger and more likely to be U.S.-born.

Potential limitations of our study include the reliance on self-reports to measure tobacco use, which were shown to be reliable in a repeated measures study but not validated against biomarkers. We did not assess other tobacco products such as spit tobacco and snuff. Although we provided weighted prevalence estimates that were adjusted for survey nonresponse, the moderate degree of nonresponse may have introduced selection bias, albeit using door-to-door survey methods helped avoid systematic biases associated with telephone surveys.^{4,6,13,14} As we did not recruit individuals living in rural or suburban locations, our cohort members may not be fully representative of U.S. populations. On the other hand, almost half of the total U.S. Hispanic/Latino population is contained within ten large metropolitan areas,¹⁵ which encompass our four study regions.

In summary, although the overall U.S.-wide decline in smoking over recent decades demonstrates the feasibility of effective (albeit incompletely realized) tobacco control efforts, our data suggest that additional efforts are needed to reach the U.S. Hispanic/Latino population. Prior experience shows that it can be difficult to predict the effect that macro-level tobacco control approaches will have on specific populations. For instance, compared to non-Hispanic whites, Latinos nationwide are more likely (and African Americans less likely) to live in localities with smoke-free laws,¹⁶ and Hispanic and African American smokers are particularly sensitive to increases in cigarette prices.^{17,18} However, at the aggregate level, tobacco control policies such as clean indoor air laws and tax increases have appeared to benefit people from all racial and ethnic groups similarly.¹⁹ Ours, like previous studies, suggests several tobacco control opportunities among Hispanics: socioeconomic and demographic variables can be used to target public health interventions toward groups at high risk of smoking initiation; physicians can address non-daily smoking as an important likely risk factor for smoking-associated illness; and steps are needed to increase the availability of smoking-cessation aids for Latinos. Finally, although low smoking

prevalence is a possible reason for longer life expectancy among U.S. immigrants,²⁰ relatively less-aculturated communities are at risk for worsening future epidemics of tobacco use should they become more similar to the mainstream U.S. population over time.

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