Smoking Prevalence Among Asian Americans: Findings from the National Latino and Asian American Study (NLAAS)

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SYNOPSIS

Objective. National studies suggest that the prevalence of current smoking among Asian Americans is lower than that for other racial/ethnic groups. However, these studies may have yielded inaccurate estimates because of the underrepresentation of non-English-speaking groups. Using data from the National Latino and Asian American Study (NLAAS), the authors estimated the prevalence of current and lifetime smoking among Asian Americans.

Methods. Current and lifetime smoking status was assessed through a population-based survey administered to Asian American adults aged 18 and older.

Results. An overall current smoking prevalence of 14.9% was found, with notable differences by gender, nativity, and other sociodemographic factors. The prevalence of current smoking was higher among foreign-born vs. U.S.-born men (24.9% vs. 15.6%), while U.S.-born women had a higher prevalence than foreign-born women (6.3% vs. 11.7%). Overall, 28.3% of Asian Americans were ever smokers (including current and former smokers), suggesting that approximately half of ever smokers cease smoking. Results indicated that some Asian American groups are more likely to initiate smoking and/or be more likely to continue smoking.

Conclusion. Results revealed that the prevalence of current smoking exceeds that of the general U.S. population for some Asian American groups and suggest that excluding non-English-speaking Asian Americans may underestimate the prevalence of smoking among men. Findings indicate that some Asian American groups are at greater risk for initiating smoking and/or continuing smoking, and highlight the need for tailored interventions that address differential smoking patterns by gender, nativity, and other social characteristics.

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Although estimates from previous national studies suggest that Asian Americans have the lowest prevalence of smoking among major ethnic groups,[1,2] such studies may have systematically excluded or underrepresented non-English-speaking populations by their exclusive use of English language instruments.[3–5] Consequently, Asian American participants recruited in these studies are potentially more likely to be U.S.-born or disproportionately more acculturated. The use of English-only instruments in prevalence studies is problematic in light of the fact that a majority of the Asian American population is foreign-born, and a substantial portion of Asian Americans speak English "not well," "not at all," or live in linguistic isolation.[6] The exclusion of non-English-speaking Asian Americans limits existing smoking prevalence estimates given that substance use has strong associations with cultural dimensions.[7–15]

In addition, a lack of adequate sample size has often prohibited examining interethnic group and nativity-related differences in smoking.[3–5] Studies suggest that aggregated Asian American data may obscure considerable heterogeneity in smoking patterns between Asian American subgroups, subsequently misrepresenting smoking patterns. For example, studies suggest that among men the prevalence of smoking in some Asian ancestry groups may exceed that of the general male population.[3–5]

Previous studies that have focused on Asian Americans have tended to target specific ethnic ancestry groups from a particular geographic area. For example, Chinese men in Chicago Chinatown were found to have a smoking prevalence of 33.6%;[16] Vietnamese men in Franklin County, Ohio, were found to have a prevalence of 43.3%.[17] However, these findings may not be generalizable to the overall Asian American population or a particular ethnic ancestry group, and may not be directly comparable to findings from other studies.

In summary, existing Asian American smoking prevalence data face several limitations. To our knowledge, no studies have presented smoking prevalence estimates by ethnic ancestry, nativity, age, and socioeconomic factors among Asian Americans using nationally representative samples. Although data on lifetime smoking may provide additional insights into patterns of initiation and cessation among Asian Americans as well as guide tobacco control interventions, such research is lacking. The present study addresses the limitations of previous studies on smoking among Asian Americans, providing current and lifetime smoking prevalence estimates using data from the National Latino and Asian American Study (NLAAS).

METHODS

The NLAAS protocol and sampling methods have been previously documented.[18–20] Briefly, we recruited 2,095 Asian American participants from May 2002 to November 2003 using three sampling methods: (*1*) Core sampling using a multistage stratified area probability design, in which primary sampling units defined as metropolitan statistical areas or county units, and secondary sampling units formed from contiguous groups of census blocks were selected using probability proportionate to size. Households were sampled and one eligible household member was selected using standard Kish methods.[21] (*2*) We used high-density supplemental sampling to over-sample census block groups with ≥5% density of target ancestry groups (Chinese, Filipino, Vietnamese). (*3*) We used second respondent sampling to recruit participants from households where one participant had already been interviewed. Using this sampling design, participants were recruited from a total of 25 states.

A response rate of 83.5% was achieved for Asian American participants (83.9% for first and 82.2% for second respondents; weighted response rates for total, first, and second respondents were 65.6%, 69.3%, and 73.7%, respectively). We constructed weighting corrections to take into account joint probabilities of selection under the sampling design. Trained lay interviewers administered the NLAAS interview in Chinese, Tagalog, Vietnamese, Spanish, or English, either face-to-face or via telephone (mean duration=2.6 hours).[22] All study procedures were approved by the Internal Review Boards of the University of Washington, University of Michigan, and Cambridge Health Alliance.

Ethnicity was classified using two questions—one assessing ancestry and one assessing self-identified race. Participants who reported a single ancestry and/or race were classified as belonging to that ethnic group. Single ethnic ancestry group categories used were: Chinese, Filipino, Vietnamese, and "Other" Asian Ancestry (including Bangladeshi, Burmese, Cambodian, Hmong, Indian, Indonesian, Japanese, Korean, Laotian, Malaysian, Mongolian, Myanmai, Pakistani, Singaporean, Sri Lankan, Taiwanese, and Thai). Participants who reported multiple and discordant ancestries and/or races were classified as biracial or mixed Asian ancestry.

Ratio of household income to poverty was calculated as the sum of total self-reported earnings, income from social security retirement benefits, government assistance, and "other income" (e.g. pensions, investments, child support) for all household members divided by poverty threshold defined by U.S. Census

2000, taking into account family size and number of related children younger than 18 years of age.[23] Poverty ratio categories were created reflecting poor (less than 1.00), near-poor (1.00 to 1.99), and non-poor (2.00 or more).[24] Selected sociodemographic characteristics, including gender, age (based on date of birth and date of interview), years of education, nativity, and region of residence (Northeast, Midwest, South, West; defined using the Census definition of region) were also based on self-report.

Current smoking status was defined based on Centers for Disease Control and Prevention (CDC) recommended criteria used in the 2002 National Health Interview Survey (NHIS), in which participants who smoked ≥100 cigarettes in their lifetime and reported smoking every day/some days were classified as smokers.[25] In the present study, participants who smoked an estimated lifetime number of cigarettes ≥100 (calculated by multiplying number of smoking years, smoking days per year, and average number of cigarettes smoked on smoking days), and who reported being a "current smoker" were classified as smokers. "Ever smokers" were defined as those who self-identified as being "former" smokers or who were classified as "current" smokers. Using self-identification as a current smoker as the sole criterion for identifying current smoking did not significantly change our estimates.

Twenty-two participants were determined to be not of Asian ancestry using the census definition (e.g. Middle Eastern, Pacific Islander) and were excluded, yielding a final sample size of 2,073. Participants with missing data on sociodemographic variables with near complete data were omitted from the corresponding analyses (education: one participant with missing data; nativity: two participants; region: two participants).[26] Two hundred sixty-three participants had missing data on one or more income variables used to determine household income. Analyses that included poverty ratio were first conducted using a dummy variable representing missing data on poverty ratio. Missing data on income variables were later imputed using hot-deck imputation.[27] Because analyses using imputed poverty ratio categories did not substantively differ from those using a dummy variable, results are presented using the imputed poverty ratio variable. All analyses were weighted and took into account sampling design effects using SAS-callable SUDAAN.[28]

RESULTS

Comparisons with Census 2000 were performed to examine whether characteristics of the sample were concordant with the Asian American population.[28]

Results indicated that sociodemographic characteristics of the sample were largely concordant with the Census (see Table 1), although the unavailability of "other" Asian language instruments may have resulted in the under-representation of persons of "other" Asian ancestry. Additional comparisons were conducted restricting the NLAAS sample to Chinese, Filipino, and Vietnamese participants. Results revealed that sociodemographic characteristics of this sample were consistent with the Census.

Current smoking

In our study, an estimated 14.9% of Asian Americans were current smokers (see Table 2). We found that 22.6% of men and 7.3% of women were smokers (relative risk [RR] 3.09; 95% confidence interval [CI] 1.22, 7.82; $\chi^2=5.62$, 1 degree of freedom [df]; $p<0.05$).

Table 1. NLAAS weighted percents for the Asian American sample

	n	Weighted percent	Census 2000
Gender			
Men	987	49.7	47.7
Women	1,086	50.3	52.3
Ethnicity			
Chinese	488	25.1	21.0
Filipino	393	17.6	16.6
Vietnamese	460	12.1	9.4
Other Asian alone	411	30.4	42.7
Biracial/mixed	321	14.9	10.4
Age			
18–34 years	791	41.7	40.6
35–49 years	712	29.5	32.0
50–64 years	408	18.7	17.5
≥65 years	162	10.1	9.9
Education			
≤11 years	315	17.2	18.1
12 years	370	18.1	16.7
13–15 years	520	24.9	24.3
≥16 years	867	39.9	37.5
Poverty ratio			
Poor (<1.0)	354	18.6	12.3
Near poor (1.0–1.9)	207	10.3	14.3
Non-poor (≥2.0)	1,512	71.2	73.4
Nativity			
U.S.-born	447	20.3	22.3
Foreign-born	1,624	79.8	77.7
Region			
Northeast	152	26.9	20.3
Midwest	84	11.2	11.2
South	144	9.9	19.0
West	1,691	52.0	49.5

Table 2. Weighted current smoking prevalence estimates by sociodemographic variables

	Weighted percent					
Characteristic	Total	95% CI	Male	95% CI	Female	95% CI
Gender						
Men	22.6	(15.6, 31.6)				
Women	7.3	(3.5, 14.5)				
Ethnicity						
Chinese	13.4	(6.7, 25.0)	23.6	(10.9, 43.8)	2.4	(1.1, 4.9)
Filipino	15.1	(9.0, 24.1)	24.4	(13.7, 39.6)	7.0	(3.6, 13.1)
Vietnamese	14.5	(11.6, 18.0)	29.5	(22.8, 37.2)	0.6	(0.2, 2.3)
Other Asian	15.4	(8.0, 27.4)	18.0	(7.8, 36.2)	12.8	(3.7, 35.7)
Biracial/mixed	16.8	(10.3, 26.0)	23.0	(12.3, 38.8)	10.1	(6.1, 16.3)
Age group						
18–34 years	17.6	(12.5, 24.1)	24.7	(14.4, 39.0)	10.3	(5.7, 18.0)
35–49 years	15.2	(9.4, 23.7)	26.7	(15.6, 41.8)	3.6	(1.8, 7.2)
50–64 years	15.2	(9.5, 23.3)	20.4	(13.0, 30.5)	10.1	(2.7, 31.4)
≥65 years	2.8	(0.8, 8.7)	4.8	(1.5, 13.9)	1.0	(0.2, 4.8)
Education						
≤11 years	20.2	(11.1, 34.0)	43.4	(21.3, 68.5)	2.3	(0.5, 10.8)
12 years	22.8	(15.7, 31.8)	29.8	(22.7, 38.0)	15.6	(6.1, 34.4)
13–15 years	11.8	(7.4, 18.4)	19.9	(11.1, 32.9)	5.8	(3.1, 10.6)
≥16+ years	11.0	(7.5, 15.8)	14.0	(8.9, 21.4)	7.1	(2.6, 18.3)
Poverty ratio						
Poor (<1.0)	17.8	(11.3, 26.7)	33.8	(20.1, 50.9)	4.0	(1.5, 10.5)
Near poor (1.0–1.9)	13.6	(8.6, 20.9)	32.1	(18.1, 50.2)	3.2	(1.0, 10.2)
Non-poor (≥2.0)	14.4	(10.6, 19.1)	19.1	(12.4, 28.2)	9.1	(4.2, 18.5)
Nativity						
U.S.-born	13.8	(9.7, 19.4)	15.6	(11.3, 21.1)	11.7	(7.0, 19.1)
Foreign-born	15.3	(11.7, 19.7)	24.9	(16.1, 35.5)	6.3	(2.3, 16.5)
Region						
Northeast	16.8	(9.3, 28.6)	28.0	(12.1, 52.3)	4.2	(1.8, 9.6)
Midwest	20.5	(14.9, 27.5)	29.0	(13.1, 52.6)	11.1	(1.8, 46.5)
South	17.7	(11.0, 27.2)	18.0	(7.9, 36.0)	17.6	(5.3, 44.7)
West	12.2	(10.2, 14.6)	18.9	(16.1, 22.1)	5.7	(4.1, 8.0)
Total	14.9	(11.6, 19.0)				

CI = confidence interval

Analyses conducted by ethnicity and gender revealed that Vietnamese men had the highest prevalence of current smoking (29.5%). Ethnicity was significantly associated with current smoking among women ($\chi^2=28.78$, 4 df; $p<0.001$), with Vietnamese women having the lowest prevalence (0.6%).

Age was significantly associated with current smoking status ($\chi^2=9.06$, 3 df; $p<0.05$), with participants 65 years of age and older having the lowest prevalence of smoking (2.8%). Age was not significantly associated with current smoking among men, but was associated with current smoking among women ($\chi^2=11.57$, 3 df; $p<0.05$), with women 65 years of age and older having the lowest prevalence of current smoking (1.0%).

Analyses conducted by socioeconomic variables revealed that education was significantly associated with current smoking ($\chi^2=38.12$, 3 df; $p<0.0001$) with participants having 16 or more years of education having the lowest prevalence (11.0%). Among men, education was also a significant predictor ($\chi^2=25.71$, 3 df; $p<0.001$), and a strong education gradient in current smoking was evident. Men with less than 12 years of education had the highest prevalence of current smoking (43.4%), while those with 16 years of education or more had the lowest prevalence (14.0%). Among women, however, education was not significantly associated with current smoking, and an education gradient was not apparent. Poverty ratio was not significantly associated with current smoking overall. However, among men, poverty ratio was significantly associated with current smoking ($\chi^2 = 7.91$, 2 df; $p<0.05$), with those who were non-poor (poverty ratio of 2.0 or more) having the

lowest prevalence of smoking (19.1%). Poverty ratio was not significantly associated with current smoking among women.

Prevalence estimates by gender suggested that foreign-born men had a higher prevalence of current smoking than U.S.-born men (24.9% vs. 15.6%), while U.S.-born women had a higher prevalence of current smoking than foreign-born women (11.7% vs. 6.3%). Effect moderation by gender and nativity was tested in a logistic regression model that included nativity, gender, and their interaction. Results indicated that the interaction between gender and nativity was significant at the trend level in predicting current smoking (ß= –1.26; p=0.10).

Additional analyses revealed that region of residence was significantly associated with current smoking (χ^2=9.51, 3 df; p<0.05), with participants residing in the West having the overall lowest prevalence (12.2%).

Among current smokers, the median age of first puff was 15.3 years (mean=16.6 years, standard error [SE]=0.63). The median number of cigarettes smoked per day among current smokers (calculated as the number of cigarettes smoked per smoking day multiplied by the number of smoking days in the past year, divided by 365 days) was 9.98 (mean=9.20; SE=0.59).

Lifetime smoking
The prevalence of ever smoking was almost two times the prevalence of current smoking (28.3% vs. 14.9%) (see Table 3). Similar to results from current smoking analyses, men had a higher prevalence of ever smoking

Table 3. Weighted lifetime smoking prevalence estimates by sociodemographic variables

Characteristic	Weighted percent					
	Total	95% CI	Male	95% CI	Female	95% CI
Gender						
Men	41.6	(35.2, 48.3)				
Women	15.1	(8.8, 24.7)				
Ethnicity						
Chinese	24.4	(17.1, 33.6)	42.5	(30.0, 56.0)	4.8	(2.4, 9.6)
Filipino	35.8	(27.8, 44.7)	51.9	(41.0, 62.5)	22.1	(13.4, 34.2)
Vietnamese	25.9	(19.8, 33.0)	50.7	(36.4, 64.9)	2.8	(1.2, 6.1)
Other Asian	26.4	(17.3, 38.2)	35.4	(20.8, 53.4)	17.6	(5.7, 43.0)
Biracial/mixed	31.6	(20.3, 45.6)	34.4	(22.78, 48.3)	28.6	(13.9, 49.8)
Age group						
18–34 years	28.2	(24.8, 31.9)	36.6	(26.3, 48.2)	19.8	(5.8, 10.5)
35–49 years	25.0	(19.2, 31.8)	39.8	(29.2, 51.4)	10.1	(7.1, 14.2)
50–64 years	30.6	(23.0, 39.5)	45.6	(32.9, 58.8)	16.1	(7.2, 32.3)
≥65 years	33.7	(23.1, 46.3)	62.1	(43.2, 77.9)	9.1	(2.9, 24.8)
Education						
≤11 years	32.0	(24.9, 40.1)	65.6	(49.3, 77.3)	6.9	(4.2, 11.3)
12 years	31.9	(24.9, 39.9)	42.8	(35.4, 50.5)	20.7	(10.4, 37.0)
13–15 years	29.9	(25.5, 34.8)	42.0	(29.4, 55.8)	21.1	(10.8, 37.0)
≥16+ years	23.9	(19.0, 29.7)	33.2	(25.7, 41.7)	11.9	(5.8, 22.9)
Poverty ratio						
Poor (<1.0)	30.8	(23.9, 38.6)	58.0	(48.7, 66.7)	7.5	(4.1, 13.6)
Near poor (1.0–1.9)	20.0	(13.3, 28.8)	39.5	(23.1, 58.7)	8.9	(3.6, 20.5)
Non-poor (≥2.0)	28.8	(25.6, 32.3)	38.1	(31.1, 45.5)	18.6	(19.8, 30.1)
Nativity						
U.S.-born	31.0	(24.2, 38.8)	29.5	(21.1, 39.5)	32.8	(20.9, 47.3)
Foreign-born	27.7	(23.9, 31.8)	45.5	(38.4, 52.7)	11.1	(5.2, 22.3)
Region						
Northeast	24.1	(17.9, 31.6)	40.6	(25.6, 57.6)	5.5	(1.9, 14.8)
Midwest	29.1	(23.0, 36.0)	35.4	(20.7, 53.5)	22.1	(4.8, 61.3)
South	34.9	(24.1, 47.6)	37.6	(21.7, 56.7)	33.2	(16.1, 56.3)
West	28.9	(25.5, 32.6)	44.1	(38.0, 50.3)	14.2	(11.0, 18.3)
Total	28.3	(25.4, 31.3)				

CI = confidence interval

than women (41.6% vs. 15.1%; RR 2.75, 95% CI 1.47, 5.15), and this difference was significant ($\chi^2=10.67$, 1 df; $p<0.01$).

Results conducted by sociodemographic characteristics revealed that ethnicity was significantly associated with ever smoking among women ($\chi^2=98.52$, 4 df; $p<0.001$), with Vietnamese women having the lowest prevalence (2.8%). Ethnicity was not significantly associated with ever smoking overall or among men.

Although age was not significantly associated with ever smoking overall or gender, age appeared to have a positive association with ever smoking among men, with men 65 years of age and older having the highest prevalence (62.1%) and men 18 to 34 years of age having the lowest prevalence (36.6%).

Analyses conducted by socioeconomic factors indicated that among men, education was significantly associated with ever smoking ($\chi^2=10.14$, 3 df; $p<0.05$), and also showed a graded association. Men with 11 years of education or less had the highest prevalence (65.6%) and men with 16 years of education or more had the lowest prevalence (33.2%). Among women, however, an education gradient in ever smoking was not apparent, and women with 11 years of education or less had the lowest prevalence (6.9%). Poverty ratio was also significantly associated with ever smoking among men ($\chi^2=10.90$, 2 df; $p<0.01$) and appeared to have a positive association among men. Poor men had the highest prevalence of ever smoking (58.0%), while non-poor men had the lowest prevalence (38.1%). Poverty ratio was also significantly associated with ever smoking among women ($\chi^2=9.28$, 2 df; $p<0.05$), but appeared to have a positive association, with poor women having the lowest prevalence (7.5%) and non-poor women having the highest prevalence (18.6%).

Concordant with results for current smoking, analyses conducted by nativity suggested effect moderation by gender, with foreign-born men having a higher prevalence of ever smoking than U.S.-born men (45.5% vs. 29.5%), but with U.S.-born women having a higher prevalence of ever smoking than foreign-born women (32.8% vs. 11.1%). A logistic regression model including nativity, gender, and their interaction revealed a significant interaction between nativity and gender in predicting ever smoking ($n=$ –2.05; $p<0.001$). Although foreign-born men had a significantly higher prevalence of ever smoking than foreign-born women (45.5% vs. 11.1%; RR=4.11; 95% CI 1.82, 9.16; $\chi^2=14.11$, 1 df; $p<0.001$), U.S.-born women had a slightly higher prevalence of ever smoking than U.S.-born men (32.8% vs. 29.5%).

Former smoking

Analyses that compared ever smokers to current smokers also provided information on the percent of ever smokers who were former smokers (calculated as the difference between the prevalence of ever smoking and current smoking divided by the prevalence of ever smoking). Overall, 47.3% of ever smokers were former smokers, suggesting that approximately half of ever smokers quit smoking. Overall, women had a higher rate of former smoking than men (51.7% vs. 45.7%). Comparisons between ever smokers and current smokers conducted by ethnicity and gender suggested that a majority of biracial/mixed Asian men who were ever smokers were current smokers (66.9%). In addition, ever smoking women of other Asian ancestry had the lowest rate of former smoking (27.3%).

An overall graded association between age and former smoking was found, with increasing age associated with a greater rate of former smoking. A minority of ever smokers 65 years of age and older were current smokers (8.3%); a majority of ever smokers between 18 and 34 years of age were current smokers (62.4%).

Overall, a majority of ever smokers with less than 12 years of education and 12 years of education were current smokers (63.1% and 71.5%), a pattern that was also observed for men. In addition, a majority of near-poor men who were ever smokers were current smokers (81.3%).

Comparisons conducted by nativity suggested that a minority of ever smoking U.S.-born women were current smokers (35.7%), while a majority of ever smoking U.S.-born men were current smokers (52.9%).

Analyses conducted by region indicated that participants residing in the West had the highest rate of former smoking (57.8%). On the other hand, a majority of ever smokers living in the Northeast and Midwest regions of the U.S. were current smokers (69.7% and 70.4%).

DISCUSSION

Our overall prevalence estimate for current smoking among Asian Americans is higher than that reported in the 2002 NHIS (14.9% vs. 13.3%).[2] Findings stratified by gender were similar to those reported in the 2002 NHIS (men: 22.6% vs. 19.0%; women: 7.3% vs. 6.5%). Our results overall and by gender were concordant with those estimates reported in the NHIS, albeit lower than those reported in previous studies specifically targeting Asian Americans.[16,17] Previous studies targeting Asian Americans have been regional or local in scope, and the characteristics of samples drawn from

particular areas may be different from those sampled nationally. For example, Chinese American men living in Chinatowns may be more likely to be foreign-born, be poor or near-poor, or have lower levels of educational attainment, which we found were associated with greater risk of smoking. On the other hand, we believe that the characteristics of the NLAAS sample represent the characteristics of the Asian American population more proportionately.

Analyses conducted by additional sociodemographic characteristics revealed several interesting patterns in current smoking. Our findings suggest that the prevalence of current smoking among some Asian American groups is higher than estimates for the general population reported in previous national studies, and in particular, that the underrepresentation of non-English-speaking groups may underestimate the prevalence of current smoking among Asian American men. We found that Vietnamese men had a higher prevalence of current smoking than that for the general population of men (25.2%),[2] concordant with previous studies that have found that Southeast Asian men have a higher prevalence of smoking than men of other racial/ethnic ancestry groups.[14,15] We also found a higher prevalence of current smoking among men with lower levels of educational attainment and among men who were poor and near-poor. However, the prevalence of current smoking among Asian American women was consistently lower than the prevalence for women in the general population (20.0%).[2]

Although the prevalences of current and ever smoking among U.S.-born and foreign-born Asian Americans were similar as a whole, further stratification by gender revealed notable differences, highlighting the importance of reporting smoking prevalence statistics by both nativity and gender.[3] While foreign-born men had a higher prevalence of smoking than U.S.-born men, U.S.-born Asian American women had a higher prevalence of smoking than foreign-born women. The interaction between gender and nativity may reflect the adoption of culture-specific gender and smoking norms associated with being foreign- vs. U.S.-born.[7-11] Norms around gender and smoking may account for the higher prevalence of smoking found among foreign-born Asian American men, for whom smoking may be a more culturally acceptable behavior, and may also explain the lower prevalence of smoking found among foreign-born Asian American women, for whom social prohibitions against smoking may be more salient.[8]

Research on the association between education and smoking has suggested that there is an education gradient in smoking, such that individuals with lower levels of education are at greater risk for smoking compared with those with college or graduate degrees.[12,13] While we found a strong negative association between educational attainment and current smoking prevalence among Asian American men, we found no evidence for such a gradient among women. Rather, we found that Asian American women with 16 or more years of education had a higher prevalence of smoking than those with less than 12 years of education. Similarly, we found that non-poor women had a higher prevalence of both ever and current smoking, while non-poor men had the lowest prevalence. This observation may be explained by the over-representation of U.S.-born women in higher socioeconomic groups, who we found were more likely to smoke than foreign-born women. In addition, more educated and non-poor Asian American women may feel less bound to cultural prohibitions against smoking, or may be more likely to adopt behaviors that oppose traditional Asian gender norms.

Our findings on ever smoking provide additional insights into trends in smoking initiation and cessation among Asian Americans. Older age was associated with lower current smoking, but with higher lifetime smoking among men. This finding is not entirely unexpected, however, because older age may be associated with greater opportunities to both initiate and cease smoking. Examining rates of former smoking among ever smoking men suggested that increasing age was associated with greater rates of smoking cessation. In contrast, among women, those in the lowest age group had the highest prevalence of ever smoking, while those 65 years of age and greater had the lowest prevalence of ever smoking. This pattern may reflect cohort or period effects associated with social norms around women smoking in a particular space (nativity) or point in time, which may be associated with age as well as immigration.

We also found that men had a higher prevalence of ever smoking than women, and also had a lower rate of cessation. Men with lower levels of educational attainment had a greater prevalence of ever smoking, as well as lower rates of smoking cessation. Men in lower poverty ratio categories had a higher prevalence of ever smoking, suggesting that men who are poor and near-poor may be at greater risk for initiating smoking. In addition, men who were near-poor had the lowest rate of smoking cessation.

The results of our study have several tobacco control implications for Asian American communities. While some state and local health departments have undertaken anti-smoking campaigns targeting Asian Americans, such programs remain rare or uninformed.[3,4] Our findings highlight that the development and implementation of smoking cessation interventions should

be considered a priority for some Asian American groups, and should be part of the agendas of health departments and tobacco control organizations. Our findings also suggest that culture-specific tobacco control programs should be designed and implemented, such as Asian-language campaigns targeting specific ethnic ancestry groups and foreign-born populations, particularly foreign-born men who we found had a high prevalence of current and ever smoking. In addition, interventions should be designed to prevent smoking initiation among U.S.-born women, who had a prevalence of ever smoking somewhat higher than U.S.-born men.

Our findings also suggest that state-level anti-smoking and tobacco control policies may be effective in promoting smoking cessation. For example, although we found that Asian American men residing in the West region of the U.S. had the highest prevalence of ever smoking, we found that Asian American men living in the West were most likely to discontinue smoking. Asian American women living in the West were also most likely to discontinue smoking, and overall, Asian Americans living in the West had the lowest prevalence of current smoking. Our findings suggest that regional tobacco control legislation, such as California's clean indoor air policies, may promote smoking cessation.

We believe that the use of Asian language instruments in the NLAAS makes the results of the present study more valid than previous national estimates. However, the survey was not translated into "other" Asian languages, and therefore potentially excluded non-English-speaking Asians who did not belong to target ancestry groups. The underrepresentation of Asians belonging to other Asian ancestry groups may also have attenuated our overall prevalence estimate. Consequently, findings are most generalizable to Chinese, Filipino, and Vietnamese populations. Furthermore, our "Other Asian" category consisted of a heterogeneous grouping of Asian American ancestries, and may mask differences in smoking among Asian ethnic ancestries that were not specifically targeted. In addition, in some cases, subgroup analyses resulted in small sample sizes, leading to high standard errors and large confidence intervals, thereby prohibiting more precise estimates of smoking prevalence.

Despite these limitations, the present study is the first to report more accurate current and lifetime smoking prevalence estimates by sociodemographic factors using a sample that we believe is more representative of the Asian American adult population, particularly for Chinese, Filipino, and Vietnamese ethnic ancestry groups. Results indicate considerable heterogeneity in smoking between Asian American subgroups, suggesting that aggregated Asian American data may obscure patterns by various sociodemographic factors. Our findings also emphasize the need to develop interventions tailored to address patterns by gender, nativity, ethnicity, age, and socioeconomic characteristics.

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