

Inclusion of Immigrant Status in Smoking Prevalence Statistics

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Cigarette smoking is a health risk behavior with strong cultural dimensions and is a major cause of disease in the United States. Much of the recent research on smoking has focused on variations in tobacco use, smoking initiation, smoking cessation, responses to cigarette price increases, and the effects of workplace smoking restrictions within and among racial and ethnic minority groups.^{1–16} Studies have shown that smoking prevalence rates are highest among American Indians and Alaska Natives and lowest among Asian/Pacific Islanders and Hispanics.¹⁷ Results from the 1998 National Health Interview Survey (NHIS) revealed overall adult smoking prevalence rates of 19.1% among Hispanics, 13.7% among Asian/Pacific Islanders, 25.0% among Whites, 24.7% among African Americans, and 40.0% among American Indians and Alaska Natives.

The 1998 NHIS results also showed that smoking prevalence estimates by sex indicate a higher smoking rate among men than among women. Smoking prevalence estimates by sex and race/ethnicity were 29.0% among African American men, 21.3% among African American women, 26.5% among White men, 23.6% among White women, 24.7% among Hispanic men, 13.3% among Hispanic women, 17.9% among Asian/Pacific Islander men, 9.9% among Asian/Pacific Islander women, 41.7% among American Indian and Alaska Native men, and 38.1% among American Indian and Alaska Native women. Age, education, and socioeconomic status are associated with tobacco use. Overall, adults aged 18 to 45 years, those with 9 to 11 years of education, and those below the poverty line are more likely to smoke. However, these effects vary among racial/ethnic groups.¹⁰

Research relying on large population surveys has largely ignored the heterogeneity in tobacco use patterns that exists within racial and ethnic groups, especially by immigrant status. (Note that our use of the term *immigrant* refers to foreign-born residents of the United States. It does not refer to legal status of entry into the United States as defined by the Immi-

gration and Naturalization Service.) According to the 2000 Current Population Survey (CPS), there are approximately 28.4 million foreign-born persons residing in the United States, and these individuals represent 10.4% of the total population, the largest percentage since the 1940s.¹⁸ In the case of certain race categories, percentages of foreign-born individuals are much higher. For example, foreign-born individuals represent 61.4% of the Asian population and 39.2% of the Hispanic population.¹⁹ Thus, the growing size of the foreign-born population underscores the importance of examining various health risk behaviors according to immigrant status.

Small or localized studies of immigrant smoking patterns have revealed differences in smoking behaviors between foreign-born and US-born members of the same ethnic or racial group. A Centers for Disease Control and Prevention (CDC) study conducted in Seattle–King County, Washington, showed that Southeast Asian immigrant men were 1.6 times more likely to smoke than men statewide.⁶ Using culturally adapted versions of the Behavioral Risk Factor Surveillance System in 3 communities in California, CDC also found that Vietnamese, Hispanic, and Chinese immigrants had higher smoking prevalence rates than US-born members of these ethnic groups.⁵ A recent study involving the use of a telephone survey of almost 9000 individuals examined the cigarette smoking behavior of US Latinos

from different countries of origin and revealed that foreign-born respondents were less likely to be smokers than US-born respondents.²⁰ Other studies have shown that acculturation plays a key role in the smoking behavior of immigrants.^{5,15,21–26} Studies such as those just described indicate that if immigrant status is ignored, national-level smoking prevalence statistics may obscure segments of racial and ethnic groups that have vastly different smoking behaviors than the overall groups.

Important potential gains in understanding both tobacco risk behavior and immigrant adaptation have been forestalled by the lack of suitable data. The primary deficiency has been the absence of large data sets that include questions on both smoking behavior and immigration status. The tobacco use supplements of the CPS, which were sponsored by the National Cancer Institute in a series of data waves collected in 1985, 1989, 1992–1993, 1995–1996, and 1998–1999, allow such analyses to be conducted. Standardized immigrant status questions began to be included in the main CPS questionnaire in 1994, and the subsequent tobacco use supplements provide the data needed to link smoking behavior and immigrant status.^{27,28} Using the CPS tobacco use supplements from 1995–1996 and 1998–1999, we sought to calculate smoking prevalence estimates by race/ethnicity and by immigrant status. We decomposed these estimates further, by coun-

Objectives. Data from the 1995–1996 and 1998–1999 Current Population Survey tobacco use supplements were used to examine smoking prevalence statistics by race/ethnicity and immigrant status.

Methods. Smoking prevalence statistics were calculated, and these data were decomposed by country of birth for Asian immigrants to illustrate the heterogeneity in smoking rates present within racial/ethnic groups.

Results. Except in the case of male Asian/Pacific Islanders, immigrants exhibited significantly lower smoking prevalence rates than nonimmigrants. However, rates varied according to country of birth.

Conclusions. This research highlights the need to disaggregate health statistics by race/ethnicity, sex, immigrant status, and, among immigrants, country of birth. Data on immigrants' health behaviors enhance the development of targeted and culturally sensitive public health smoking prevention programs. (*Am J Public Health.* 2003;93:642–646)

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METHODS

CPS Tobacco Use Supplements

The CPS is a national survey of the US civilian population 15 years and older conducted monthly by the Census Bureau for the Bureau of Labor Statistics. The primary goal of the CPS is to collect civilian labor force data; however, other data are also collected, some via monthly questions and some via special supplements administered on a one-time-only or recurring basis. Examples of supplement topics include race and ethnicity, voting behavior, education, and tobacco. The tobacco supplements are described in more detail in the paragraphs to follow.

The CPS involves interviews conducted with members of a random sample of nonmilitary and noninstitutionalized US households. The sampling frame is constructed from occupied housing units enumerated in the 1990 census. Currently, approximately 56 000 households are selected via multistage stratified sampling. A selected housing unit participates in the survey for 4 months, sits out for the following 8 months, and then rejoins the survey for a final 4 months. This survey format yields accurate estimates of change on both a month-to-month and a year-to-year basis.²⁸

Each month, field representatives conduct in-person interviews, or else interviews are conducted via computer-assisted telephone interviewing (CATI) methods. All first-month interviews are conducted in person, and subsequent interviews are conducted via CATI methods. As a means of accommodating Spanish-speaking respondents, a Spanish version of the tobacco use supplement questionnaire is available, and Spanish-speaking interviewers are available in some CATI facilities. In the case of interviews conducted in other languages, a Bureau of the Census employee translates the questionnaire; if no Census Bureau employees are available, a community or household member provides translations as necessary. During the first-month interview, the field representative determines whether the selected housing unit has at least 1 eligible member. A household member is consid-

ered eligible if he or she is a civilian 15 years or older and does not have a usual residence elsewhere.²⁹

Until 1994, the decennial census was one of the few sources of periodic information on the foreign-born population of the United States. Information on place of birth has been collected on the census since 1850, and information on citizenship has been collected since 1870; information on parents' place of birth was collected from 1880 to 1970. In 1994, nativity, parents' nativity, year of entry, and citizenship questions were added to the CPS. These questions had been asked on the CPS occasionally in the past, but never on a recurring basis. Currently, these questions are asked when a household first enters the survey and then are carried along for the duration of the household's tenure in the sample. One problem associated with asking these questions only once is that any changes in immigration or citizenship status that occur over the course of survey participation are undetected.²⁷

Tobacco use supplements were included in the CPS in September 1985, September 1989, September 1992, January 1993, May 1993, September 1995, January 1996, May 1996, September 1998, January 1998, and May 1999. We pooled data from the 1995–1996 and 1998–1999 supplements to create the sample used in the present research, because information on immigration status was available for these years. As a result of the nature of the CPS sampling design, no households appear twice in the pooled, cross-sectional sample.

The sample sizes for the 1995–1996 and 1998–1999 versions of the CPS were approximately 245 000 and approximately 240 000, respectively.³⁰ Only household members 15 years or older are eligible to answer questions on the tobacco use supplement. Both self-responses and proxy responses are permitted; however, self-respondents can answer all questions, whereas proxies can respond only to certain items. Information collected from proxies includes smoking status and a few other tobacco use questions. In addition to the smoking status and other tobacco use questions, self-respondents are asked about smoking history and habits, medical advice received regarding smoking, quitting attempts and intentions, workplace smoking policies,

and opinions about smoking. Response rates for the tobacco use supplements range from 84% to 89%.²⁹

Measurement of Key Variables and Statistical Analyses

Smoking status was ascertained through 2 questions: "Have you smoked 100 cigarettes in your lifetime?" and "Do you now smoke cigarettes every day, some days, or not at all?" Current smokers were defined as those who had ever smoked 100 cigarettes and who currently smoked every day or on some days.^{28,31} Smoking prevalence estimates and 95% confidence intervals were calculated. The US Census Bureau's standard error parameters for the tobacco use supplements were used in calculating standard errors.²⁸

We created race/ethnicity categories by combining the race and Hispanic origin questions. We assigned Hispanic origin more weight than the White and Black race categories but not more than the American Indian or Asian categories. We categorized respondents as immigrants if they were (1) foreign born and US citizens by naturalization or (2) foreign born and not US citizens. We classified persons born in Puerto Rico or in other US outlying areas and persons born abroad to American parents as native born.

RESULTS

As shown in Table 1, the 1995–1996 and 1998–1999 CPS tobacco use supplement estimates indicated that the overall national smoking prevalence rate was 21.6% (24.0% among men and 19.4% among women). Hidden in these overall smoking prevalence statistics are differences according to race/ethnicity. Smoking prevalence statistics broken down by race/ethnicity, without regard to immigrant status, are also shown in Table 1. The highest smoking prevalence rate was reported among American Indians (33.2%), followed by Whites (21.6%), Blacks (20.9%), Hispanics (15.5%), and Asian/Pacific Islanders (12.7%). Smoking prevalence statistics disaggregated by sex followed a similar pattern, American Indian men and women having the highest smoking rates (36.0% and 30.7%, respectively) and Asian/Pacific Islander men and women the lowest (19.4% and 6.8%, respec-

TABLE 1—Smoking Prevalence Rates, by Race and Sex: Current Population Survey Tobacco Use Supplements, 1995–1996 and 1998–1999

	Men			Women			Overall		
	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI
All race/ethnicity groups combined	225 670	24.0	23.7, 24.3	258 431	19.4	19.1, 19.6	484 101	21.6	21.4, 21.8
White, non-Hispanic	178 982	24.4	24.1, 24.8	200 379	21.2	20.9, 21.5	379 361	22.7	22.5, 23.0
Black, non-Hispanic	18 409	25.1	24.3, 26.0	26 475	17.6	16.9, 18.3	44 884	20.9	20.3, 21.4
American Indian	2 596	36.0	32.5, 39.5	2 928	30.7	27.4, 33.9	5 524	33.2	30.9, 35.6
Asian/Pacific Islander	7 758	19.4	18.0, 20.8	8 776	6.8	5.9, 7.6	16 534	12.7	11.9, 13.5
Hispanic	17 925	20.3	19.2, 21.4	19 873	10.7	9.8, 11.6	37 798	15.5	14.7, 16.2

Note. The Hispanic category included individuals of White and Black racial backgrounds but not individuals of American Indian and Asian/Pacific Islander racial backgrounds. CI = confidence interval.

TABLE 2—Smoking Prevalence Rates, by Immigrant Status, Race, and Sex: Current Population Survey Tobacco Use Supplements, 1995–1996 and 1998–1999

	Men			Women			Overall		
	No.	%	95% CI	No.	%	95% CI	No.	%	95% CI
All race/ethnicity/immigration statuses combined	225 670	24.0	23.8, 24.2	258 431	19.4	19.2, 19.6	484 101	21.6	21.5, 21.7
Native born									
Overall	203 717	24.7	24.4, 25.0	233 392	20.7	20.4, 21.0	437 109	22.6	22.4, 22.8
White, non-Hispanic	172 701	24.6	24.3, 24.9	192 516	21.5	21.2, 21.8	365 217	23.0	22.7, 23.2
Black, non-Hispanic	17 085	26.1	25.2, 27.0	24 846	18.4	17.4, 19.4	41 931	21.8	21.2, 22.4
American Indian	2 468	37.1	33.5, 40.7	2 813	32.1	28.7, 35.5	5 281	34.5	32.0, 37.0
Asian/Pacific Islander	2 618	18.7	16.1, 21.3	2 694	12.2	10.0, 14.3	5 312	15.5	13.8, 17.1
Hispanic	8 845	21.8	20.1, 23.5	10 523	14.4	13.0, 15.8	19 368	17.9	16.8, 19.0
Foreign born									
Overall	21 953	19.0	18.1, 19.8	25 039	8.2	7.6, 8.8	46 992	13.4	12.9, 13.9
White, non-Hispanic	6 281	20.1	18.3, 21.8	7 863	14.1	12.7, 15.6	14 144	16.8	15.7, 17.9
Black, non-Hispanic	1 324	12.2	9.7, 14.7	1 629	3.8	2.4, 5.3	2 953	7.8	6.4, 9.3
Asian/Pacific Islander	5 140	19.7	18.1, 21.3	6 082	5.0	4.2, 5.8	11 222	11.8	10.9, 12.7
Hispanic	9 080	18.9	17.4, 20.5	9 350	6.7	5.7, 7.7	18 430	13.0	12.0, 13.9

Note. The Hispanic category included individuals of White or Black racial backgrounds but not individuals of American Indian or Asian/Pacific Islander racial backgrounds. CI = confidence interval.

tively). These smoking prevalence estimates are similar to those reported by the US Department of Health and Human Services.¹⁷

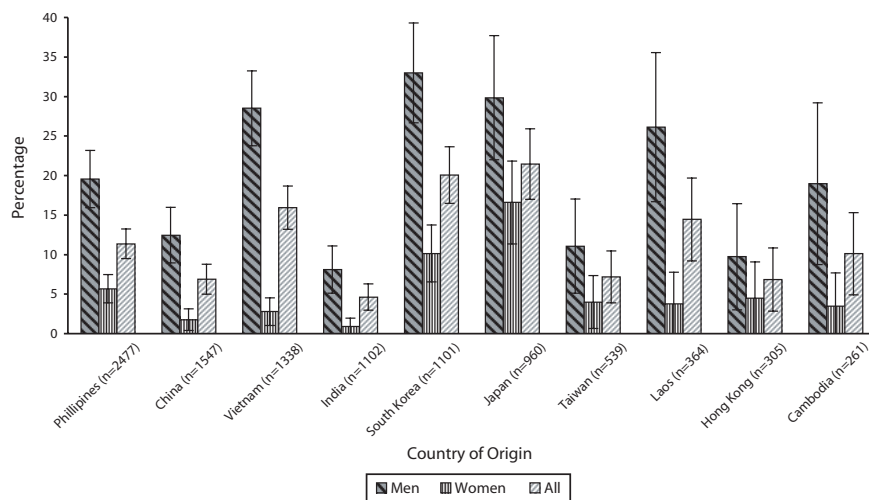
As a means of revealing the heterogeneity present within the race categories, Table 2 shows smoking patterns by race/ethnicity, sex, and immigrant status (native born vs foreign born). Overall smoking prevalence rates were higher among native-born respondents (22.6% overall, 24.7% among men, and 20.7% among women) than among immigrant respondents (13.4% overall, 19.0% among men, and 8.2% among women). The same pattern was evident when the data were disaggregated by race/ethnicity: native-born

Whites (23.0%) vs foreign-born Whites (16.8%), native-born Blacks (21.8%) vs foreign-born Blacks (7.8%), native-born American Indians (34.5%) vs foreign-born American Indians (15.2%), native-born Asian/Pacific Islanders (15.5%) vs foreign-born Asian/Pacific Islanders (11.8%), and native-born Hispanics (17.9%) vs foreign-born Hispanics (13.0%).

In the case of all race/ethnicity categories other than Asian/Pacific Islander, smoking prevalence rates were higher among native-born men and women than among their foreign-born counterparts. In the case of Asian/Pacific Islanders, rates were higher among na-

tive-born female respondents than among foreign-born female respondents (12.2% and 5.0%, respectively), whereas rates were slightly lower among native-born male respondents than among foreign-born male respondents (18.7% and 19.7%, respectively).

In most health research, members of a particular racial/ethnic category are examined as an undifferentiated whole. However, recent research has called this practice into question, especially in terms of reporting of health statistics.^{32–35} To determine whether the race/ethnicity and immigrant status variables concealed heterogeneity within the smoking prevalence estimates for immigrants, we examined



Note. Countries of origin are listed in order from largest to smallest representation in the CPS data set.

FIGURE 1—Smoking prevalence rates and confidence intervals among Asian/Pacific Islander immigrants from the 10 most prevalent countries of origin: Current Population Survey (CPS) tobacco use supplements, 1995–1996 and 1998–1999.

smoking prevalence rates among immigrants originating from the 10 Asian countries with the largest representation in the CPS data. Figure 1 shows these results. Note that a similar examination of rates among US-born members of specific Asian/Pacific Islander groups was not possible owing to limitations in the CPS data set. The ethnicity question mentions only 1 ethnic group—Hispanics—asking only whether a respondent is of Hispanic origin. Hence, we were not able to ascertain membership in specific Asian/Pacific Islander groups.

The overall smoking prevalence rate among Asian/Pacific Islander immigrants was 11.8%; when disaggregated by country of origin, however, rates ranged from an overall prevalence of 4.6% among Indian immigrants to an overall prevalence of 21.4% among Japanese immigrants. In the case of male Asian/Pacific Islander immigrants, the highest smoking prevalence rates were found among those migrating from South Korea (33.0%), Japan (29.8%), and Vietnam (28.5%), and the lowest were found among those migrating from India (8.1%) and Hong Kong (9.7%). Among female Asian/Pacific Islander immigrants, the highest rates were observed in those migrating from Japan (16.6%) and South Korea (10.1%), while the lowest were reported in those migrating from India (0.9%) and China (1.7%).

DISCUSSION

This research highlights the need to disaggregate health statistics not only by race/ethnicity and sex but also by immigrant status and, when possible, country of origin. Our results show that undifferentiated racial/ethnic categories obscure large amounts of heterogeneity in terms of smoking prevalence statistics and that smoking rates are generally lower among immigrants than among non-immigrants. In addition, we found significant variations in country-of-origin-specific overall, male, and female smoking prevalence rates among Asian/Pacific Islander immigrants.

Data on the health behavior of immigrants can provide a sound basis for developing and evaluating national public health programs designed to reduce the prevalence of high-risk behaviors such as smoking. These data would also make it possible to develop the targeted antismoking interventions recommended by the National Cancer Institute. A recent study that examined the smoking behavior of Chinese adolescents residing in California revealed that although antismoking campaigns were targeted toward the state's 4 major racial/ethnic groups, no programs were specifically targeted toward the Chinese community.²⁰ The authors stressed that such pro-

grams are vital because they aid in the prevention of smoking initiation among Chinese adolescents in the United States as they acculturate into American society.

Calculation of smoking prevalence rates for various immigrant groups would help in identifying additional communities for whom targeted and culturally sensitive antismoking interventions are needed. The data presented here suggest the need for smoking prevention programs targeted toward male immigrants from South Korea, Japan, and Vietnam.

Our results are subject to a number of limitations. Whereas we focused our attention on examining smoking prevalence rates according to immigrant status and country of origin, future studies would benefit from the inclusion of factors such as age, period of arrival, and length of US residence. For example, some of the variation observed in smoking prevalence statistics may be explained if the age distributions of various immigrant groups are taken into account. In addition, duration variables would permit assessment of the effects of acculturation and modes of adjustment on the smoking behavior of immigrants.

Similarly, context variables such as decade of arrival would yield further insights into immigrant behavior. Small-scale studies indicate that Asian/Pacific Islander immigrants who have recently entered the United States may exhibit higher rates of smoking than second- or third-generation immigrants. This increase in smoking may be due in part to tobacco companies' aggressive overseas marketing campaigns.^{36,37} However, comprehensive analyses of the smoking patterns of immigrants have not yet been conducted to assess the results of these smaller studies. Such analyses would help in elucidating more clearly the roles of acculturation in the smoking behavior of immigrants while taking into consideration country-of-origin smoking cultures. They may also help in determining possible causes of differences found between the smoking behavior of recent immigrants and that of second- and third-generation immigrants.

There is mounting interest among scholars and policymakers in the health risk behaviors of immigrants as their proportion in terms of the overall US population continues to increase. However, information about these health behaviors remains scant. Analyzing

smoking rates of immigrants can reveal their adaptation to receiving communities as well as the effectiveness of smoking regulations and antismoking campaigns. Changes in the smoking behavior of immigrants may stem from shifts in lifestyle or cultural practices or may be related to age at migration, socioeconomic status, generation, community characteristics, or English language ability. The CPS tobacco use supplements allow analyses to be conducted in at least some of these areas. Findings from such research could greatly enhance the development of targeted and culturally sensitive public health smoking prevention programs. ■

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This article was accepted April 1, 2002.

Contributors

K.F. Baluja conducted the literature review, assisted with the analyses, and had major responsibility for the writing of the article. J. Park had major responsibility for data management and analysis and participated in the writing of the article. D. Myers supervised all aspects of the study's implementation. All of the authors contributed to interpreting findings, drawing conclusions, and reviewing drafts of the article.

Acknowledgments

This research was supported by the Population Dynamics Core of the Transdisciplinary Tobacco Use Research Center, University of Southern California (funded by National Cancer Institute grant 5 P50 CA84735-03).

Human Participant Protection

No protocol approval was needed for this study.

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