

Section III
Interpersonal and Contextual Factors That
Contribute to Tobacco-Related Health Disparities

Chapter 7
Tobacco-Related Health Disparities
Among Immigrant Populations

Contents

Introduction.....	237
U.S. Immigration Patterns 1800–2010.....	237
Countries of Origin and Smoking Behavior	238
Impact of Acculturation and Assimilation to the United States	241
Literature Search Strategy.....	242
Acculturation, Immigrant Status, and Smoking Behavior	243
Acculturation, Immigrant Status, and Current Tobacco Use – Adolescents	243
Acculturation, Immigrant Status, and Current and Ever Smoking – Adults	257
Acculturation, Immigrant Status, Current Smoking, and Mortality	257
Acculturation, Immigrant Status, and Smoking Cessation	257
Gender, Acculturation, Immigrant Status, and Smoking Behavior/Outcomes.....	258
Gender, Acculturation, Immigrant Status, and Current Smoking.....	258
Gender, Acculturation, Immigrant Status, and Smoking Cessation	258
Gender, Acculturation, Immigrant Status, and Smoking at Home	259
Gender, Acculturation, Immigrant Status, Smoking, and Cancer Mortality	259
Socioeconomic Status, Acculturation, Immigrant Status, and Smoking Behavior.....	259
Education, Acculturation, Immigrant Status, and Current Smoking	259
Education, Acculturation, Immigrant Status, and Smoking Cessation.....	259
Occupation, Employment Status, Acculturation, Immigrant Status, and Current Smoking.....	260
Income, Acculturation, Immigrant Status, and Current Smoking	260
Immigrant Ethnicity and Smoking Behavior	260
Ethnicity and Current Smoking	260
Ethnicity and Smoking Cessation	261
Ethnicity and Secondhand Smoke Exposure	261
Chapter Summary	261
Research Needs.....	262
References.....	264

Figures and Tables

Figure 7.1	Five Source Countries With the Largest Populations in the United States as Percentages of the Total Foreign-Born Population, 2010.....	239
Table 7.1	Total and Country-Specific Foreign-Born Populations Living in the United States, 1960–2010.....	239
Table 7.2	Tobacco Use Behaviors and Knowledge Among Adults (%), by Country, 2009.....	240
Table 7.3	Summary of Reviewed Studies Examining Smoking Behavior Among Immigrants (n = 59).....	244

Introduction

Variations in smoking by age, gender, race/ethnicity, education, income, and region are well documented in the scientific literature. A small but growing body of evidence further suggests intersections between health outcomes and immigrant or nativity status (i.e., U.S.-born versus foreign-born) and disparities in these outcomes. In 2015 nearly 42 million people, or 13% of the total U.S. population, were foreign-born¹—the largest absolute number of immigrants ever recorded and the highest proportion of foreign-born people since the 1920s. With diversity among immigrants in terms of national origin, language, religion, social class, reasons for migration, and processes of migration also greater than ever before,² the evidence on smoking behavior among immigrants is similarly complex. Social and structural determinants, including the processes of assimilation and acculturation for new immigrants, appear to play different roles within and across immigrant groups and across different aspects of smoking behavior (i.e., initiation, cessation, daily smoking, cigarette consumption, tobacco-related disease/mortality).

The chapter begins with a brief overview of immigration to the United States, including the processes of immigrant adaptation and an introduction to the countries sending the largest share of immigrants to the United States, to frame the discussion of smoking behavior of immigrants. Because immigrants largely come from cultures that are different from mainstream U.S. culture, policymakers, program planners, and researchers often ask whether the prevalence of certain behaviors and the social factors associated with them are similar or different for immigrants compared with U.S.-born individuals, who also come from diverse cultures. By placing immigrants in a broader social and cultural context, the complex interplay between factors affecting smoking behavior in both sending countries and the United States can be better understood, and the tobacco-related health and health care concerns of different immigrant groups can be more effectively addressed.³

This chapter reviews the literature on the smoking behavior of foreign-born people in the United States, including differences within and between immigrant groups, comparisons between immigrant groups and the majority population (U.S.-born, non-Hispanic white), and differences between immigrants and their U.S.-born racial/ethnic counterparts. Issues related to immigrant health generally and smoking behavior are also discussed, and unexpected intersections of tobacco, immigration, and demographic and socioeconomic factors are highlighted. The chapter concludes by identifying theoretical, methodological, and empirical gaps in the literature and opportunities for future research.

U.S. Immigration Patterns 1800–2010

American Indians were the first inhabitants of what became the United States, and with the exception of people brought to the country as slaves, all other racial/ethnic groups immigrated to the United States. Before 1800, migration to the United States consisted of a small but influential flow of European settlers whose preindustrial plantations required large amounts of cheap labor⁴ from workers and slaves to secure their profit share. The most important source of plantation labor became the forced migration of more than 10 million African slaves. Diseases brought by European colonists and others sharply reduced the number of indigenous American Indians, who had not developed immunity to what were, to them, new diseases.⁴

Valuable insight into the demographic transformation of the United States can be derived from census counts, despite their notable limitations. Early censuses used inconsistent definitions of racial/ethnic categories, undercounted some groups, and, before 1860, did not count some groups at all. According

to the first U.S. Census in 1790, approximately 3.9 million people resided in the United States. Only two racial/ethnic categories were enumerated at that time: 81% of the population were classified as white, and the remaining 19% were classified as black.⁵ By the 1850 census, the first year in which immigrant status was indicated, foreign-born individuals totaled 2.2 million, or 9.7% of the total U.S. population.⁶ Mass movements of people from Europe and, to a lesser extent, Canada increased the U.S. immigrant population rapidly through the early 1920s as part of what historians often term the age of mass migration. The United States alone absorbed about 60% of Europe's total outflow between 1800 and 1929.⁴ By 1910 approximately 87% of U.S. immigrants were from Europe, and another 9% were from Canada.⁷

The Immigration Act of 1924 (The Johnson-Reed Act) included strict limitations on the number of immigrants allowed to enter the United States. It established a national origins quota, which provided immigration visas to 2% of the total number of people of each nationality in the United States as of the 1890 national census. Between 1930 and 1948, migration to the United States was greatly decreased as a result of the Great Depression, the onset of the Second World War, and stricter enforcement of existing U.S. immigration policies.⁸ Whereas an annual average of 621,000 immigrants entered the United States between 1900 and 1930, only 53,000 immigrants came to the United States during the decade of the 1930s, and only slightly more during the 1940s.⁹ The Cold War continued to stifle migration through the mid-1960s, but by the 1970s immigration to the United States was again on the rise.⁶ Unlike earlier migration patterns, however, more immigrants arrived from Latin America, especially Mexico, and Asia than from Europe and Canada, a pattern that continued through 2010 (Table 7.1). This trend was still in evidence as of 2015.¹⁰ At the beginning of the 21st century, the five countries from which the largest proportions of foreign-born people in the United States originated were: Mexico (29.5%), the Philippines (4.4%), China (3.8%, excluding Hong Kong and Taiwan), India (3.3%), and Vietnam (3.2%). By 2010 the breakdown was similar, although India provided slightly more immigrants to the United States than either China or the Philippines (Figure 7.1).

Countries of Origin and Smoking Behavior

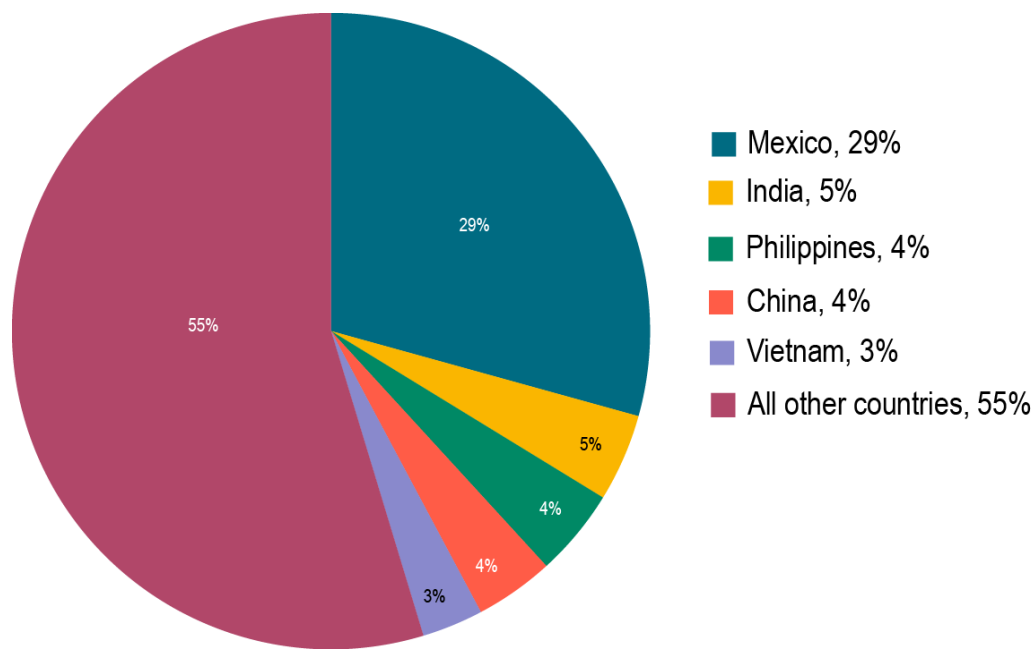
Immigrants arrive from diverse cultures shaped by unique social and cultural factors that inevitably transcend national borders. Not surprisingly, the prevalence of some health behaviors, including smoking, and specific factors associated with those behaviors, vary by country. For example, of the five countries with the largest number of immigrants in the United States in 2010, the prevalence of current tobacco smoking in 2009 was highest in the Philippines (28.3%)¹¹ and China (28.1%),¹² followed by Vietnam (23.8%),¹³ Mexico (15.9%),¹⁴ and India (14.0%),¹⁵ which has roughly half the rate of the leading two countries (Table 7.2). A more striking pattern is apparent when these prevalence rates are examined by gender. In all five countries, a large proportion of tobacco users are men, with 52.9% of Chinese,¹² 47.7% of Filipino,¹¹ 47.4% Vietnamese,¹³ 24.8% of Mexican,¹⁴ and 24.3% of Indian¹⁵ men classified as current smokers according to the 2009 Global Adult Tobacco Survey. In contrast, the average smoking rate among women in these countries is 4.7%.¹¹⁻¹⁵ However, in India, where as many as one in four people use smokeless tobacco (ST), men are only 1.7 times more likely to be ST users than women (32.9% versus 18.4%).¹⁵ By way of comparison, the smallest male-to-female ratio among current tobacco smokers (as opposed to ST users) in the top five sending countries is 3.2 to 1 in Mexico,¹⁴ and the largest ratio is 33.8 to 1 in Vietnam¹³ (Table 7.2).

Table 7.1 Total and Country-Specific Foreign-Born Populations Living in the United States, 1960–2010

Year	Total Foreign-born	Mexico			India			Philippines			China			Vietnam		
		Number	%	Rank	Number	%	Rank	Number	%	Rank	Number	%	Rank	Number	%	Rank
1960	9,738,091	575,902	5.9	7	12,296	0.1	42	104,843	1.1	21	314,226	3.2	9	—	—	—
1970	9,619,302	759,711	7.9	4	51,000	0.5	30	184,842	1.9	12	299,202	3.1	9	—	—	—
1980	14,079,906	2,199,221	15.6	1	206,087	1.5	16	501,440	3.6	8	363,277	2.6	10	231,120	1.6	12
1990	19,797,316	4,298,014	21.7	1	450,406	2.3	12	912,674	4.6	2	583,513	2.9	7	543,262	2.7	9
2000	31,107,889	9,177,487	29.5	1	1,022,552	3.3	4	1,369,070	4.4	2	1,192,437	3.8	3	988,174	3.2	5
2010	39,955,854	11,711,103	29.3	1	1,780,322	4.5	2	1,777,588	4.4	3	1,601,147	4.0	4	1,240,542	3.1	5

Note: Rank refers to the order of countries having the largest number of foreign-born immigrants living in the United States.
 Sources: Gibson and Jung 2006⁹⁶ and the U.S. Census Bureau 2010.³⁶

Figure 7.1 Five Source Countries With the Largest Populations in the United States as Percentages of the Total Foreign-Born Population, 2010



Source: U.S. Census Bureau 2010.³⁶

Table 7.2 Tobacco Use Behaviors and Knowledge Among Adults (%), by Country, 2009

Category	Mexico			India			Philippines			China			Vietnam		
	All	Men	Women	All	Men	Women	All	Men	Women	All	Men	Women	All	Men	Women
Tobacco use behaviors															
Current tobacco smokers	15.9	24.8	7.8	14.0	24.3	2.9	28.3	47.7	9.0	28.1	52.9	2.4	23.8	47.4	1.4
Daily tobacco smokers	7.6	11.8	3.7	10.7	18.3	2.4	22.5	38.2	6.9	24.1	45.4	2.0	19.5	38.7	1.2
Average number of cigarettes consumed	9.4	9.7	8.4	—	—	—	10.6	11.3	7.0	—	—	—	13.5	13.6	10.9
Smokeless tobacco users	0.3	0.3	0.3	25.9	32.9	18.4	2.0	2.8	1.2	—	—	—	4.8	—	—
Cessation															
Quit during past year among daily ever-smokers	32.0	31.6	33.1	12.6	12.1	16.2	21.5	20.9	25.0	—	—	—	23.5	23.3	28.6
Are interested in quitting	72.1	71.1	75.2	—	—	—	60.6	60.5	61.1	—	—	—	—	—	—
Secondhand smoke															
Exposed to tobacco smoke at work	19.7	23.3	13.9	29.9	32.2	19.4	36.9	43.3	28.8	63.3	71.1	53.2	55.9	68.7	41.4
Exposed to tobacco smoke at home	17.3	17.2	17.4	52.3	52.2	52.5	48.8	50.9	46.7	67.3	70.5	63.9	73.1	77.2	69.2
Media															
Noticed any advertisements for cigarettes	50.6	—	—	64.5	68.5	58.5	71.2	74.7	67.7	19.6	24.7	17.6	16.9	19.1	16.2
Knowledge															
Believe that smoking causes serious illness	98.1	—	—	90.2	91.5	88.8	94.0	93.1	94.9	—	—	—	95.7	—	—

Notes: Adults refer to people 15 years old and over. Values presented in table are percentages.

Sources: World Health Organization 2010¹¹⁻¹⁴ (country reports for the Philippines, China, Vietnam, and Mexico, respectively). International Institute for Population Studies 2010¹⁵ (country report for India).

Impact of Acculturation and Assimilation to the United States

The prevalence rates of tobacco use and cessation and the proportions exposed to secondhand smoke and tobacco marketing, shown in Table 7.2, provide a broad indication of the often gendered tobacco-related contexts from which immigrants originate. In many Southeast Asian countries, smoking is an expected behavior among men, particularly older men, and an indicator of social status, whereas female smoking is socially unacceptable.^{16,17} Similarly, smoking among females may not be fully accepted in some Latin American countries, but is often a sanctioned social activity among male peers.^{18,19}

On arriving in the United States, immigrants are inevitably confronted with a different set of smoking-related norms and expectations. For example, among the overall U.S. population an estimated 15.1% of adults were current cigarette smokers in 2015, including 16.7% of men and 13.6% of women.²⁰ The U.S. prevalence of current smoking falls at the lower end of the range found in the top five source countries, and gender disparities are considerably less pronounced in the overall U.S. population than in those countries.

The effects on health and health behavior of navigating these varied and potentially conflicting norms and expectations are often discussed in the context of acculturation.²¹ Although definitions vary, *acculturation* has commonly been defined as “the process of change that occurs within populations or societies because of interaction with other populations or societies, specifically with respect to [the] evolution of cultural traditions, customs, beliefs, or artifacts.”^{2,p.112} Acculturation does not just apply to individual immigrants, but has often been measured among immigrant populations. Acculturation can be posited as either a salutary process of increased economic and social mobility as immigrants more fully integrate into mainstream society or, conversely, as a harmful force in which residual protective effects of immigrant status (presumably related to “cultural orientation” and strong social networks) decline over the time spent in the United States.²² In practice, of course, the incorporation patterns of recent immigrants are far more complex and multidimensional than the dichotomy just presented. What constitutes healthy versus unhealthy acculturation largely depends on which health outcomes are examined, for whom, and on the conditions in which acculturation occurs. Some initial discussion of both extremes, however, is instructive.

On the one hand, research has long documented a strong and consistent direct relationship between social position and health—often referred to as the *health gradient*—in which individuals of higher socioeconomic status (SES) have better health than those of lower SES.^{23–31} For example, some immigrants have higher rates of poverty and lower educational attainment compared to non-immigrants,¹ although there are significant exceptions to this generalization. Poverty and educational attainment are some of the most common indicators of SES. Furthermore, immigrants often endure the added burden of living in hostile environments or resource-poor neighborhoods³¹; experience difficulties finding good, secure jobs in safe work settings³¹; and have inadequate access to social networks that could provide instrumental and emotional support.³⁰ All of these conditions have been linked to poor health, either directly (e.g., via stress processes or epigenetic changes^{25,30,31}) or indirectly (e.g., via access to and mobilization of resources³¹). Taken together, these findings suggest that some immigrants will suffer from worse health than non-immigrants. A more in-depth discussion of the relationship between SES, smoking, and health is provided in chapter 9.

On the other hand, researchers often find that immigrants, especially Latino immigrants, are healthier (e.g., lower morbidity, mortality, and rates of low birthweight) than non-immigrants with similar socioeconomic profiles—what is commonly referred to as the *healthy immigrant effect* or, more specifically, the *Latino health paradox*.^{2,32} Research has documented that Latino immigrants often appear to have a health advantage over non-Latinos and their U.S.-born counterparts, and that for certain outcomes, the protective effect of immigrant status also extends to immigrants of other racial/ethnic groups.² For some researchers, these better-than-expected health outcomes are rooted in the “cultural orientation” (presumably related to engagement in healthy behaviors) and strong social networks attributed to immigrants’ countries of origin. In the process of acculturation, however, immigrants could be exposed to different risk factors or could adopt unhealthy behaviors and lifestyles (e.g., poor diet and physical inactivity) that result in shifts in morbidity and mortality for various diseases, leading in turn to declines in their overall health status.^{33–35}

Although neither of the above scenarios is intended to capture all the complexities of immigrant adaptation or its effects on health, together they might provide clues about the potential smoking behavior of immigrants in the United States and differences within and across groups. For example, there is considerable variation in SES among immigrants from the top five source countries. Mexican immigrants tend to report low SES; in 2010, 60% of Mexican immigrants had less than a high school diploma. In contrast, almost one-quarter of Vietnamese immigrants (23%), nearly one-half of both Chinese and Filipino immigrants (44% and 50%, respectively), and about three-quarters of Indian immigrants (74%) had a bachelor’s degree or higher, according to the 2010 American Community Survey.³⁶ In contrast, about 27% of all foreign-born and 28% of the total U.S. population had attained a bachelor’s degree or higher.³⁶

Hypothetically, immigrants from Vietnam, China, the Philippines, and India (especially those from the latter three countries) could adopt norms and expectations associated with higher SES in the United States, leading in turn to lower rates of tobacco use among men and higher rates among women as their smoking behavior becomes more consistent with that of their socioeconomic counterparts in the general U.S. population. Among Mexican immigrants, however, stronger orientation toward the culture of their home country could provide some initial protection against lower SES, but the combination of greater acculturation, norms linking smoking and social integration, and tobacco marketing targeted toward immigrants might serve to reinforce smoking behavior among Latino men while increasing tobacco use among women.

The remainder of this chapter examines whether the above conjectures reflect the existing empirical reality of immigrants and their smoking behavior.

Literature Search Strategy

A literature search was conducted to identify the current state of the science on smoking behavior of immigrants. Empirical studies examining the smoking behavior of immigrants were identified using the PubMed and Web of Science database search engines. Key search terms included immigration, nativity, acculturation, assimilation, foreign-born, “smoke or tobacco,” “frequency or intensity,” cancer, gender, age, “psychographic or lifestyle,” and SES. For this literature review, searches were limited to articles published between 2000 and 2011, although several papers included in this review reference earlier studies on the smoking behavior of Asian American and Latino immigrants.^{37–41} All journals in the databases were searched. When searches yielded many results, the fields were limited to more specific

subfields (e.g., title). After the searches were completed, all databases were merged ($n = 1,282$), and duplicate ($n = 366$) and irrelevant ($n = 832$) articles were removed, leaving a final sample of 84 articles. Of these, 59 articles focused specifically on studies that addressed the intersections of acculturation, gender, SES, and/or race/ethnicity with nativity and, to the extent possible, different aspects of smoking behavior. These 59 articles are summarized in Table 7.3 and discussed throughout the remainder of the chapter. An article may be discussed in more than one section if it examines multiple relationships within immigrant smoking behavior.

Acculturation, Immigrant Status, and Smoking Behavior

The process of immigrant acculturation is difficult to capture in most surveys available for health research, which are primarily cross-sectional. Thus, many studies use proxy measures for acculturation, such as nativity (U.S.-born versus foreign-born), length of U.S. residence, language preference, and generational status, whereas other studies use more formal acculturation scales often involving some combination of the above measures. The studies included in this review employed a range of measures for acculturation, and most of these studies documented an association between acculturation and smoking behavior, and in particular, current smoking.

Acculturation, Immigrant Status, and Current Tobacco Use – Adolescents

In the nine studies that involved adolescent samples,^{38,42–49} acculturation was most often indirectly associated with tobacco use. For example, Allen and colleagues⁴² found that Latino adolescents who spoke mostly Spanish with social network members were less likely to use tobacco, alcohol, and other drugs; however, when parental monitoring and the demographics of network members were controlled for, the association was no longer significant. Such findings suggest that less language acculturation could be indirectly associated with less substance use, including tobacco, through protective social network characteristics such as greater parental monitoring and more extended family members versus peers, and more adults versus peers of middle school age or younger in an adolescent's network.⁵⁰ Similarly, Castro and colleagues⁴³ found that higher ethnic pride and traditional family values had indirect effects on decreased cigarette and alcohol use among Latino adolescents. Unger and colleagues⁴⁹ reported that English language use was associated with an increased risk of lifetime smoking among both Latino and Asian American youths, but not after controlling for access to cigarettes, perceived consequences of smoking, friends' smoking, and cigarette offers. Studies by Lorenzo-Blanco and colleagues⁴⁴ and Trinidad and colleagues⁴⁸ further suggested that discrimination and emotional intelligence, respectively, could mediate the acculturation–smoking relationship during adolescence.

Rosario-Sim and O'Connell⁴⁵ found a positive relationship between greater English language acculturation and current smoking among Asian American adolescents. Choi and colleagues³⁸ also showed that acculturated Asian adolescents were two times more likely to smoke than non-acculturated youths. These studies suggest that acculturation is more often indirectly associated with smoking behavior among Hispanic/Latino adolescents but is more directly associated with smoking behavior among Asian adolescents.

Table 7.3 Summary of Reviewed Studies Examining Smoking Behavior Among Immigrants (n = 59)

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Abraido-Lanza et al. 2005 ⁵² : To test the health behavior and acculturation hypotheses on smoking, alcohol use, exercise activity, and body mass index	National Health Interview Survey	Latino Americans	3,100	After adjusting for age and SES, higher acculturation was associated with current smoking, alcohol use, high body mass index, and more exercise.	—	—	—
Acevedo-Garcia et al. 2005 ⁷⁹ : To investigate the relationship between immigrant generation and daily smoking	Tobacco Use Supplement to the Current Population Survey (TUS-CPS)	U.S. general	221,798	Being foreign-born and being second generation with two immigrant parents had a protective effect. Being foreign-born was especially protective for females, low-income individuals, and racial/ethnic minority groups.	—	—	—
Allen et al. 2008 ⁴² : To identify Spanish-language-sensitive individual and social network attributes associated with substance use, including tobacco, alcohol, and drug use	Original	Latino adolescents	258	Use of Spanish within an adolescent's social network was associated with a substance use scale in bivariate, but not multivariate models.	—	—	—
Al-Omari and Scheibmeir 2009 ⁵⁸ : To describe the relationship between tobacco dependence and acculturation	Original	Arab Americans	96	There was a significant inverse association between acculturation and tobacco dependence.	—	—	—
An et al. 2008 ⁶⁶ : To examine ethnic- and gender-specific smoking prevalence and quitting status and the effects of three acculturation indicators	California Health Interview Survey	Chinese, Filipino, South Asian, Korean, Japanese, and Vietnamese American adults	8,192	Men who used only English at home had lower current smoking prevalence and higher quit rates, except for Filipino and South Asian men. Women who used only English at home had higher current smoking prevalence, except Japanese women.	Women's current smoking prevalence was lower than men's in all six Asian American groups.	Less-educated men and women had higher smoking prevalence and lower quit rates.	Current smoking was higher, and the quit rate was lower for Korean, Filipino, and Vietnamese American men compared with Chinese American men.

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Bennett et al. 2008 ⁸² : To examine the association between nativity and cigarette smoking	Harvard Cancer Prevention Program Project	Black Americans	667	Language acculturation was positively associated with cigarette smoking. U.S.-born blacks were more likely to be smokers than those born in the Caribbean or Africa.	—	—	—
Bethel and Schenker 2005 ³⁷ : To conduct a systematic review of published studies investigating the association of acculturation and smoking patterns	N/A	Hispanic Americans	26,611	9 of 11 studies showed a positive association between acculturation and smoking among women, and one study involving men showed a negative association.	—	—	—
Blue and Fenelon 2011 ⁶¹ : To test whether different levels of smoking-related mortality can explain part of the “healthy immigrant effect” or the “Hispanic paradox”	Multiple Cause-of-Death Public-Use Microdata Files, U.S. Census 5% Public Use Microdata Sample Files, CDC tabulations of smoking-related mortality	Hispanic and non-Hispanic white Americans	2,392,452	Smoking explained >50% of the difference in life expectancy at 50 years between foreign- and U.S.-born men and >70% of the difference between foreign- and U.S.-born women.	—	—	Smoking explained >75% of the difference in life expectancy at 50 years between U.S. Hispanic and non-Hispanic white men, and close to 75% of the Hispanic advantage among women.
Bock et al. 2005 ⁶² : To examine differences in cognitive and behavioral characteristics relevant to smoking cessation	Original	Latino Americans	615	Less-acculturated Latinos had higher cessation rates than bicultural and non-Latino whites.	—	—	Nicotine dependence and smoking rates were lower among Latinos than non-Latinos.

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Borrelli et al. 2011 ⁸⁴ : To examine differences in smoking attitudes and behavior	Original	Latino Americans	225	Compared to Dominicans, Puerto Ricans were more acculturated, more nicotine dependent, less motivated to quit, and identified more benefits of smoking.	—	—	Compared to non-Latino whites, Puerto Ricans smoked fewer cigarettes per day and reported greater pros of smoking, while Dominicans were less nicotine dependent, more confident of quitting, reported greater cons of smoking, and were more likely to have a home smoking ban.
Castro et al. 2009 ⁴³ : To examine the influence of ethnic pride, traditional family values, and acculturation on cigarette and alcohol use	Original	Latino adolescents	945	Higher ethnic pride and traditional family values had indirect effects on cigarette and alcohol use (i.e., they resulted in decreases of both). Greater ethnic pride had a direct effect on cigarette and alcohol use among girls (i.e., it decreased them). Greater acculturation predicted more cigarette and alcohol use among girls but not boys.	—	—	—
Castro et al. 2009 ⁷¹ : To examine the influence of gender, acculturation, and their interaction on smoking cessation	Original	Latino Americans	271	Greater acculturation predicted higher abstinence rates but only among men.	—	—	—

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Chae et al. 2006 ⁶⁵ : To estimate the prevalence of current and lifetime smoking by gender, nativity, and other sociodemographic factors	National Latino and Asian American Study	Asian Americans	2,073	The prevalence of current smoking was higher among foreign-born vs. U.S.-born men, whereas U.S.-born women had a higher prevalence than foreign-born women.	—	—	—
Choi et al. 2008 ³⁸ : Meta-analysis to describe the extent to which acculturation affects smoking behavior	N/A	Asian Americans	16,759	Acculturated men were 53% less likely to smoke than non-acculturated men. Acculturated women were five times more likely to smoke than non-acculturated women.	—	—	—
Chou et al. 2010 ⁹⁷ : To examine indicators of health status and health care use by immigrant status	National Health Interview Survey (United States and Taiwan)	Chinese (in Taiwan) and Chinese Americans	1,217 (United States) 15,549 (Taiwan)	Chinese in Taiwan had higher odds of having ever smoked than recent Chinese immigrants. U.S.-born Chinese were more likely to report having ever smoked compared to new Chinese immigrants who had been in the U.S. <5 years.	—	—	—
Constantine et al. 2009 ¹⁸ : To examine the relationship between acculturation, knowledge of smoking and health, and perception of the benefits of smoking	Original	Latino Americans	804	Greater acculturation was a significant predictor of perceiving the benefits of smoking.	Men perceived more benefits of smoking than did women.	Less than a high school education was a significant predictor of perceiving the benefits of smoking.	—
Constantine et al. 2010 ¹⁷ : To explore the relationship between smoking and acculturation	Original	Americans of Hmong, Vietnamese, Lao, and Cambodian origin	1,628	Less-acculturated male respondents and more-acculturated female respondents were more likely to be smokers. Most male Hmong respondents started smoking after immigration.	—	Less education was associated with greater odds of being a smoker.	Vietnamese and Cambodian men smoked at higher rates than men in the general U.S. population.

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Cooper et al. 2011 ⁵⁵ : To examine smoking-related behaviors among young adult college students	Original	Hispanic Americans	174	Smokers were more likely to be less acculturated than nonsmokers.	—	—	—
de Castro et al. 2010 ⁷⁸ : To examine smoking prevalence by occupational classification, gender, and nativity	National Latino and Asian American Study	Asian Americans	1,528	Among Asian immigrants, smoking was highest among blue-collar workers.	Smoking prevalence was higher among males than among females.	Blue-collar employment was associated with being a current smoker.	—
Detjen et al. 2007 ⁹⁸ : To explore whether higher levels of acculturation were associated with higher rates of cigarette smoking during pregnancy	Latina Gestational Diabetes Mellitus Study	Hispanic women	1,231	Acculturation was associated with elevated smoking rates in pregnant women. U.S.-born women who preferred English had more than twice the odds of smoking compared with Puerto Rican or foreign-born women who preferred Spanish.	—	—	—
Elo and Culhane 2010 ⁸¹ : To examine relationships between nativity and tobacco, alcohol, and marijuana use and measures of physical and mental health during pregnancy	Original	Black women	3,101	Foreign-born black women were less likely to engage in substance use and had better self-rated physical and mental health than U.S.-born black women. The foreign-born advantage was somewhat stronger for African-born women than for Caribbean-born women.	—	Women with higher levels of education were less likely to report use of tobacco.	—
Fitzgerald et al. 2006 ⁹⁹ : To study associations of acculturation and SES with obesity and lifestyle traits that could be risk factors for diabetes and cardiovascular disease	Original	Puerto Rican women	200	Less-acculturated women were 57% less likely to smoke than their more-acculturated counterparts.	—	—	—

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Fu et al. 2003 ⁶⁸ : To assess the relationship between linguistic aspects of acculturation and cigarette smoking	Original	Chinese Americans	541	Increased English proficiency was associated with decreased current smoking among men.	Smoking prevalence was higher for men than for women.	—	—
Gollenberg et al. 2008 ¹⁰⁰ : To assess dietary behaviors, physical activity, and cigarette smoking during pregnancy	Latino Gestational Diabetes Mellitus Study	Puerto Rican women	1,231	Spanish language preference was associated with approximately 40% less likelihood of smoking.	—	College education was associated with a lower likelihood of smoking.	—
Gonzales et al. 2006 ¹⁰¹ : To assess the prevalence of home and automobile smoking bans on children's exposure to secondhand smoke by nativity	Original	Mexican American women	269	Children of U.S.-born mothers had increased odds of exposure to secondhand smoke indoors but not in automobiles.	—	—	—
Guevarra et al. 2005 ⁸³ : To reconfirm relationships between acculturation and cigarette smoking	Original	Black women	66	Results replicated the negative association between acculturation and lifetime smoking among African American women.	—	—	—
Hofstetter et al. 2004 ⁶⁷ : To examine the relationship between tobacco use and acculturation	Original	Korean Americans	2,830	Less-accultured men and more-accultured women reported higher present and predicted future rates of smoking.	More men than women reported smoking >100 cigarettes during their lifetime and smoking in the past 30 days.	—	—

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Hu et al. 2010 ¹⁰² : To analyze the impact of immigration status on current tobacco use	Original	Chinese Americans	1,054	Smoking rates among recent immigrant men (<5 years in the U.S.) were significantly higher than in the general Texas population. U.S.-born men initiated smoking 4 years earlier than their immigrant counterparts.	Men's smoking rates were much higher than women's.	Lower household income and education increased smoking among males, but more-educated females had a tendency to smoke more than less educated females.	—
Juon et al. 2003 ¹⁰³ : To examine the prevalence and correlated factors of cigarette smoking	Healthy Korean American Project	Korean American men	333	Men in the U.S. for more than 20 years were less likely to be current smokers than those in the U.S. for less than 10 years.	Men were far more likely to be current smokers than women.	—	—
Kim et al. 2007 ³⁹ : To conduct an integrative review of the literature on tobacco use and dependence	N/A	Asian Americans	N/A	Smoking prevalence was higher among Asian American men with low acculturation, but the reverse pattern was observed among Asian American women.	Smoking rates were higher for men than women, regardless of country of origin.	—	—
Lee et al. 2000 ¹⁰⁴ : To examine how acculturation is related to smoking, physical activity, fat intake, body weight, and reported health	Original	Korean Americans	356	Bicultural men were least likely to smoke, while acculturated and bicultural women were more likely to smoke than traditional women.	Fewer women smoked and were former smokers than men.	—	—
Lorenzo-Blanco et al. 2011 ⁴⁴ : To examine whether perceived discrimination explained the associations of acculturation with depressive symptoms and cigarette smoking	Original	Hispanic adolescents	1,124	Discrimination explained the relationship between acculturation and cigarette smoking among girls (effect only marginally significant).	—	—	—

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Loury and Kulbok 2007 ⁵⁶ : To examine the relationship among sociodemographic, cultural, and psychological factors associated with alcohol and tobacco use in the rural South	Original	Mexican immigrants	173	Pre-immigration use of tobacco was significantly associated with current tobacco use. Acculturation level was not a significant single predictor of current tobacco use.	—	—	—
Ma et al. 2003 ⁷⁰ : To assess the impact of demographics and acculturation on stages of change in smoking behavior	Original	Asian Americans	1,174	Time living in the U.S. showed a significant positive correlation with the stages of smoking behavior change.	Women were much more likely than men to be in the precontemplation stage, while men were somewhat more likely than women to be in the preparation stage.	Education was negatively associated with stages of smoking behavior change.	Chinese respondents had the highest rate of those not wanting to quit (38%), while Cambodians (9%) had the lowest rate of those not wanting to quit.
Ma et al. 2004 ⁷³ : To examine the relationship between acculturation and smoking in homes	Original	Asian Americans	1,374	Living in the U.S. 5 or fewer years, experiencing less acculturation, and being foreign-born predicted smoking in the home and visitors being allowed to smoke there.	Being female predicted smoking in the home.	Being more educated protected against smoking in the home and against visitors being allowed to smoke in the home.	Being Korean, Vietnamese, or Cambodian predicted smoking in the home and visitors being allowed to smoke in the home.
Ma et al. 2004 ⁶⁹ : To assess knowledge, attitudes, and behaviors related to tobacco use and tobacco-related cancer issues	Original	Asian Americans	1,374	More-accultured youths and less-accultured male adults had higher smoking rates. Acculturated adult females had a higher smoking rate than those who were less acculturated.	Smoking rates for all females were generally lower than those for males regardless of acculturation status.	—	—

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Masel et al. 2006 ⁵⁴ : To determine if acculturation is associated with smoking, alcohol use, and physical activity	Hispanic Established Populations for the Epidemiologic Studies of the Elderly	Mexican Americans	4,901	Those who were more proficient in English or who had more contact with Anglo Americans were more likely to be former or current smokers than nonsmokers.	Many more males than females were smokers (former or current).	—	—
Maxwell et al. 2005 ⁸⁰ : To report prevalence rates and correlates of cigarette smoking in California	California Health Interview Survey	Chinese and Filipino Americans	53,907	Smoking rates were higher among foreign-born than U.S.-born Asian males. Acculturation is associated with increased smoking rates among women. Effect of acculturation was stronger for foreign-born Chinese men and for foreign-born Filipino women.	—	Having more than a high school education was protective except for Chinese females and Filipino males.	—
Maxwell et al. 2007 ⁷² : To examine tobacco-related knowledge and attitudes, cessation efforts, and preferences for smoking cessation programs	Original	Filipino American men	318	Smokers were defined as less acculturated based on language use and English fluency. More than half of current smokers requested smoking cessation activities in Tagalog or a combination of Tagalog and English.	—	Smokers had lower levels of education and income compared with nonsmokers.	—
Myers et al. 2009 ¹⁰⁵ : To investigate baseline influences on initial smoking and the transition to established smoking among college students who had not smoked prior to college	Original	Chinese and Korean Americans	267	Acculturation was not a significant predictor of experimentation or established smoking.	Overall, men were significantly more likely than women to experiment and progress to established smoking.	—	Students of Korean ethnicity were more likely to become established smokers.
Parker et al. 2010 ¹⁰⁶ : To examine differences in tobacco use associated with acculturation	Electronic medical records	U.S. general	100,329	More-accultured Hmong and Mexican women were more likely to be tobacco users. Among those who did not speak English, current tobacco use was more prevalent among men than women.	—	—	—

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Perez-Stable et al. 2001 ⁵³ : To examine differences in cigarette smoking behavior by gender and country of origin	Original	Latino Americans	8,882	Foreign-born respondents were less likely to be smokers than U.S.-born respondents. High acculturation was associated with more smoking in women and less smoking in men.	Current smoking was more prevalent among men than women.	Respondents with 12 years or fewer of education had increased odds of smoking.	Central American men and women had the lowest smoking rates; Puerto Rican women had the highest smoking rates.
Perreira and Cortes 2006 ¹⁰⁷ : To examine race/ethnicity and nativity correlates of substance use during pregnancy	The Fragile Families and Child Wellbeing Study	U.S. women	4,185	Foreign-born women were less likely to smoke during pregnancy than their U.S.-born counterparts.	—	Tobacco use during pregnancy was concentrated among less-educated and poorer white and black women, but not among Hispanic women.	Newborns with white mothers were most at risk of tobacco exposure. Black and Hispanic mothers were less likely than whites to smoke during pregnancy.
Reitzel et al. 2010 ¹⁰⁸ : To identify individual- and neighborhood-level variables predicting the association of subjective social status with acculturative and socioeconomic variables among immigrant smokers	Adiós al Fumar	Latino Americans	297	Less acculturation predicted low subjective social status among immigrant Latino smokers.	—	Low income and low education predicted lower subjective social status.	—
Rosario-Sim and O’Connell 2009 ⁴⁵ : To explore the correlates of smoking status	Original	Asian American adolescents	328	More English language acculturation was significantly associated with current smoking.	—	Having poor academic performance was significantly associated with current smoking.	Asian American adolescents initiated smoking later than non-Asian Americans.

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Saint-Jean et al. 2008 ⁴⁶ : To identify and evaluate sociopsychological factors that are associated with substance use.	Florida Youth Substance Abuse Survey	U.S. adolescents	63,000	Acculturation status was a strong predictor of substance use among adolescents.	—	—	—
Shankar et al. 2000 ⁵⁷ : To describe the prevalence of cigarette smoking	Original	Salvadoran immigrants	1,458	Smoking behavior exclusively represented the smoking pattern that the Salvadorans had adopted before immigration to the U.S.	Men were significantly more likely than women to have ever smoked.	—	—
Shelley et al. 2004 ¹⁰⁹ : To examine the relationship between acculturation and tobacco use behaviors	Original	Chinese Americans	712	Acculturation was positively associated with never smoking among men, but not with smoking cessation.	Being male was positively correlated with ever smoking.	Having less than a high school education was associated with ever smoking relative to never smoking.	—
Stoddard 2009 ¹¹⁰ : To estimate the relationship between nativity and risk of initiation of regular smoking in children and young adults ages 10 to 30	National Health Interview Survey	Mexican Americans	61,358	Odds of smoking initiation declined among Mexican immigrants after immigration, relative to the risk before immigration to the U.S.	—	—	Mexican Americans and those born in Mexico were significantly less likely to ever initiate regular smoking than other racial and ethnic groups, except Asian Americans.

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Stoddard and Adler 2011 ⁴⁷ : To assess whether associations between education and smoking and leisure-time physical activity depend on nativity and age at immigration	National Health Interview Survey	Hispanic and Asian American adolescents	13,345 Hispanic 2,528 Asian American	For both Hispanics and Asians, smoking prevalence was higher among U.S.-born individuals than among foreign-born individuals. Associations between education and smoking among foreign-born Hispanics who had immigrated at an early age more closely resembled those of U.S.-born Hispanics than did education associations among Hispanics who had immigrated at an older age.	—	The association of education with smoking and physical activity was weaker for foreign-born Hispanics but did not vary by nativity for Asian Americans.	—
Sussman and Truong 2011 ¹¹ : To examine the effects of acculturation and gender on smoking attitudes and smoking prevalence	Original	Chinese and Russian immigrants	215 Chinese immigrants 149 Russian immigrants	More years living in the U.S. and more use of English led to more negative attitudes toward smoking. Acculturated immigrants were less likely to date, befriend, or marry smokers. Acculturated females had a more positive attitude toward smoking and were more likely to smoke, which is similar to U.S.-born females.	—	—	—
Tong et al. 2008 ¹¹² : To examine how the interaction between having a smoke-free home rule and immigrating to the U.S. is associated with quitting smoking	California Health Interview Survey	Asian Americans	1,050	Smoke-free home rules were associated with status as a former smoker, especially among recent immigrants (<10 years in the U.S.), and with lighter smoking in long-term residents (>10 years in the U.S.).	—	—	—
Trinidad et al. 2005 ⁴⁸ : To examine the effects of emotional intelligence and acculturation on smoking in early adolescents	Original	U.S. adolescents	416	A significant interaction between emotional intelligence and acculturation suggests that adolescents with high emotional intelligence could perceive more social consequences from smoking.	—	—	—

Table 7.3 continued

Study and aim(s)	Data source	Population(s)	Sample size	Acculturation findings	Gender findings	SES findings	Race/ethnicity findings
Unger et al. 2000 ⁴⁹ : To examine associations between English language use and smoking	Independent Evaluation Consortium	Hispanic and Asian American adolescents	4,167 Hispanic Americans 2,836 Asian Americans	English language use was associated with increased risk of lifetime smoking in both groups but not after access to cigarettes, perceived consequences of smoking, friends' smoking, and cigarette offers were controlled.	—	—	—
Wilkinson et al. 2005 ⁵¹ : To investigate the effects of nativity, age at migration, and acculturation on smoking	Original	Mexican Americans	5,030	Higher acculturation predicted a history of smoking among U.S.- and Mexican-born participants. Younger age at migration predicted a history of smoking among those who are Mexican-born.	Male gender predicted a history of smoking among U.S.- and Mexican-born respondents.	Having more than a high school education predicted a history of smoking among the U.S.-born.	—
Zhang and Wang 2008 ⁴¹ : A systematic meta-review to examine factors associated with smoking	N/A	Asian Americans	N/A	Acculturation was negatively associated with men's smoking but was positively associated with women's smoking.	Men were more likely to smoke than women.	Education was uniformly found to be negatively related to smoking.	—
Zinser et al. 2011 ⁶³ : To determine the extent to which smokers are using effective interventions for smoking cessation, especially NRT	Original	Latinos and non-Latino whites	1,010 Latino 519 white	Latinos reported using NRT less often than whites, and this difference was more pronounced among less-acculturated Latinos. The daily smoking rate was higher among highly acculturated Latinos than low-acculturated Latinos.	—	Latinos who had graduated from college were more likely to report NRT use, but this effect was significant only for the low-acculturation group.	Non-Latinos reported smoking significantly more cigarettes per day than Latinos.

Notes: Due to study design, two studies discussed in this chapter are not included in this table. A "—" indicates no findings on that topic. SES = socioeconomic status. NRT = nicotine replacement therapy.

Acculturation, Immigrant Status, and Current and Ever Smoking – Adults

The association between acculturation and smoking behavior was generally stronger and more persistent among adults than among adolescents. Studies of this association have reached different conclusions about whether greater acculturation is associated with greater likelihood of smoking. On the one hand, greater acculturation and younger age at migration were significant predictors of ever smoking among Mexican-born respondents in Wilkinson and colleagues⁵¹ study of smoking behavior. Abraido-Lanza and colleagues⁵² found that higher acculturation among Latino adults was associated with current smoking after adjusting for age and SES. Perez-Stable and colleagues⁵³ showed that foreign-born Latinos were less likely to smoke than their U.S.-born counterparts. Similarly, Masel and colleagues⁵⁴ suggested that Mexican Americans who were more proficient in English or who had more contact with Anglo Americans were more likely to be former or current smokers than nonsmokers.

On the other hand, in a study of Hispanic college students, Cooper and colleagues⁵⁵ reported that current smokers were more likely to be less acculturated than nonsmokers. Similarly, Loury and Kulbok⁵⁶ suggested that tobacco use among Mexican immigrants in the rural South might be related to pre-migration behavior rather than the process of acculturation, a finding consistent with Shankar and colleagues,⁵⁷ who concluded that the smoking behavior of Salvadoran immigrants represented patterns adopted before immigration.

Another study by Al-Omari and Scheibmeir⁵⁸ found that less-acculturated Arab Americans were more tobacco dependent than acculturated Arab Americans. The prevalence of current tobacco use in some Arab countries (including Iraq, Egypt, the Palestinian Territories, Lebanon, Jordan, Syria, Tunisia, and Yemen) was as high as 63.6% for men in 2012 (Jordan)⁵⁹ and 34.0% for women in 2014 (Lebanon).⁶⁰ According to the Al-Omari and Scheibmeir⁵⁸ study, in many Middle Eastern countries cigarette smoking is an acceptable social and cultural behavior, and the offer of a cigarette is considered a sign of hospitality.

Acculturation, Immigrant Status, Current Smoking, and Mortality

Estimates by Blue and Fenelon⁶¹ suggest that, in 2000, smoking explained at least 50% of the difference in life expectancy at age 50 between foreign- and U.S.-born men and at least 70% of this difference in women (i.e., the “healthy immigrant effect”). Smoking explained greater than 75% of the difference in life expectancy at age 50 between U.S. Hispanic and non-Hispanic white men and close to 75% of this difference in women (i.e., the “Latino health paradox”). Therefore, the authors concluded that lower smoking-related mortality was the main reason for this longevity advantage enjoyed by immigrants and U.S. Hispanics. Such an advantage could be attributable to lower rates of current smoking among less-acculturated Hispanic immigrants, as documented by many of the aforementioned studies. Another possible cause of this longevity advantage among Hispanic immigrants, as reported by Constantine and colleagues,¹⁸ could be the fact that more-acculturated Latino Americans perceive more benefits from smoking, which could lead in turn to higher rates of smoking and greater smoking-related mortality among these more-acculturated Latinos.

Acculturation, Immigrant Status, and Smoking Cessation

Smoking cessation among less-acculturated immigrants could also contribute to their low rates of current smoking. Bock and colleagues⁶¹ found higher overall cessation rates among less-acculturated Latinos compared with bicultural and non-Latino whites. Regarding specific smoking cessation

techniques, Zinser and colleagues⁶³ found that Latinos, especially less-acculturated Latinos, were less likely than non-Latino whites to use nicotine replacement therapy. However, Wetter and colleagues⁶⁴ found that a telephone-based smoking cessation intervention could reach, retain, and deliver efficacious treatment to a sample of low-SES, Spanish-speaking smokers, most of whom (90%) were immigrants.

Gender, Acculturation, Immigrant Status, and Smoking Behavior/Outcomes

Gender, Acculturation, Immigrant Status, and Current Smoking

Among adults of Asian descent, the effects of acculturation on smoking behavior appear more gender-specific, although similar patterns emerged in one systematic review³⁷ and a study of Latino and Asian Americans.⁶⁵ For example, according to An and colleagues,⁶⁶ greater English language acculturation appeared to increase the risk of cigarette smoking among women from China, the Philippines, South Asia, Korea, and Vietnam but not from Japan, and it decreased current smoking prevalence among men of Chinese, Japanese, Korean, and Vietnamese backgrounds, but not among Filipino or South Asian men. Moreover, Hofstetter and colleagues⁶⁷ showed that among Korean Americans in California, less-acculturated men but more-acculturated women reported higher current and predicted future rates of smoking (the latter based on a measure of smoking uptake). Similarly, Constantine and colleagues¹⁷ showed that less-acculturated Hmong, Vietnamese, Cambodian, and Laotian men were more likely to be current smokers, whereas the opposite was observed among their female counterparts. However, these authors also noted that most Vietnamese, Cambodian, and Laotian men started smoking prior to immigration to the United States, whereas most Hmong men initiated smoking after immigration. In their study of Chinese Americans in Philadelphia, Fu and colleagues⁶⁸ found that greater English language proficiency was associated with decreased current smoking among men, but there were too few current smokers to conduct a similar analysis among females.

In a meta-analysis of nine studies published between 1994 and 2005, Choi and colleagues³⁸ showed that acculturated Asian men were 53% less likely to smoke than non-acculturated (traditional) men, whereas acculturated Asian women were five times more likely to smoke than traditional women. This general pattern was echoed in studies by Kim and colleagues,³⁹ Ma and colleagues,⁶⁹ and Zhang and Wang.⁴¹

Gender, Acculturation, Immigrant Status, and Smoking Cessation

In terms of behaviors other than current smoking, Ma and colleagues⁷⁰ showed that among Korean, Chinese, Vietnamese, and Cambodian smokers in the Delaware Valley region, time living in the United States (0–2 years versus 3 or more years) was positively correlated with being further along in three stages of smoking behavior change (precontemplation, contemplation, and preparation), particularly among men. Women were much more likely than men to be in the precontemplation stage, whereas men were somewhat more likely than women to be in the preparation stage (i.e., more inclined to plan to quit within 1 month). Immigration status (i.e., U.S. citizen, permanent resident, noncitizen) did not have a statistically significant effect on readiness to quit smoking in this study.

Castro and colleagues⁷¹ showed that among Latino smokers, time living in the United States, proportion of life in the United States, and preference for English language media significantly predicted higher rates of abstinence, but only among men. However, despite the seemingly positive association between acculturation and inclinations to quit, Maxwell and colleagues⁷² found that more than half of Filipino American men requested smoking cessation interventions in Tagalog or a combination of Tagalog and English.

Gender, Acculturation, Immigrant Status, and Smoking at Home

Ma and colleagues⁷³ showed that the following characteristics predicted smoking in the home: 5 or fewer years living in the United States; lower level of acculturation; being female; being foreign-born; having a family size of four or more; being Korean, Vietnamese, or Cambodian (versus Chinese); and being smokers. These same variables, except female gender, also predicted allowing visitors to smoke in the home.

Gender, Acculturation, Immigrant Status, Smoking, and Cancer Mortality

A study by Gomez and colleagues⁷⁴ showed that, among Asian/Pacific Islander and Latina women who had never smoked, immigrant women had a slight advantage in their rates of surviving lung cancer compared with their U.S.-born counterparts, but not compared to non-Hispanic whites.

Socioeconomic Status, Acculturation, Immigrant Status, and Smoking Behavior

It is widely accepted that higher SES is associated with improved health outcomes, including lower morbidity and mortality and better self-rated health and quality of life.^{75–77} As indicated in chapter 9, which explores the relationships between SES and smoking in greater detail, educational attainment is one of the most widely used indicators of SES and consistently demonstrates a positive association with health. Education is often the route to economic and social rewards. Progressing through the educational pipeline often leads to better quality jobs, more secure jobs in safe work environments, more opportunities to enhance income, greater capacity to increase wealth, and access to a wider range of social networks that provide instrumental and emotional support, all of which can influence smoking behavior.

Education, Acculturation, Immigrant Status, and Current Smoking

Few studies have examined the relationships between education, acculturation, and smoking. An and colleagues,⁶⁶ in a study of Californians of Asian descent, found that less-educated men and women had higher prevalence of current smoking than their more-educated counterparts, when indicators of acculturation such as the following were controlled for: generational status (first generation: born in foreign countries; second generation and above: born in the United States), time living in the United States, and language spoken at home. Constantine and colleagues¹⁷ showed a similar relationship: Having less than a high school education significantly increased the odds of being a smoker, when controlling for acculturation as measured by fluency with U.S. culture. However, Stoddard and Adler⁴⁷ show a slightly different association between education and smoking in their study of Hispanic and Asian Americans. They found that the association between education and smoking held for foreign- and U.S.-born Asian Americans but was considerably weaker among foreign- versus U.S.-born Hispanics.

Education, Acculturation, Immigrant Status, and Smoking Cessation

The above-mentioned study by An and colleagues⁶⁶ found, after controlling for indicators of acculturation such as generational status, time living in the United States, and language spoken at home, that less-educated men and women also had lower quit rates than their more-educated counterparts.

Occupation, Employment Status, Acculturation, Immigrant Status, and Current Smoking

Examining occupational status, another commonly used measure of SES, de Castro and colleagues⁷⁸ showed that, among Asian and Latino immigrants in the labor force, smoking prevalence was highest among blue-collar workers and lowest among white-collar workers. Notably, immigrants with blue-collar jobs had the highest smoking rates of any occupational status, and individuals who were unemployed had the highest rate among those who were U.S.-born. The relationship between occupation and smoking is explored in greater detail in chapter 8.

Income, Acculturation, Immigrant Status, and Current Smoking

Little research has focused on relationships between income, acculturation, and smoking frequency. Acevedo-Garcia and colleagues⁷⁹ reported that being foreign-born and being second generation with two immigrant parents were protective against daily smoking, especially among low-income individuals.

Immigrant Ethnicity and Smoking Behavior

Ethnicity and Current Smoking

Measures of health and health behavior, including tobacco use, vary in important ways for different ethnic groups. More-nuanced analyses by ethnicity or country of origin provide an imperfect but useful means of understanding immigrants in the context of the cultural norms of their countries of origin, and of linking immigrants to appropriate social services. The current review included several studies that delineated smoking behavior by ethnicity, primarily among Asian groups. For example, in the previously mentioned comprehensive analysis of acculturation, gender, ethnicity, and smoking behavior among Chinese, Filipino, South Asian, Japanese, Korean, and Vietnamese adults in California, An and colleagues⁶⁶ showed that current smoking prevalence varied from 14.6% to 36.7% among men and from 1.7% to 13.2% among women. Men of Korean, Vietnamese, and Filipino descent reported higher smoking prevalence than Chinese American men, while women of Filipino, Japanese, and Korean ancestry reported higher smoking prevalence compared with Chinese American women. Constantine and colleagues¹⁷ also found that Vietnamese and Cambodian (but not Hmong or Laotian) men in Minnesota smoke at higher rates than men in the general U.S. population and, as previously mentioned, that most Hmong men started smoking after immigrating to the United States.

According to Maxwell and colleagues,⁸⁰ the positive effect of acculturation on smoking among men was stronger for foreign-born Chinese men than Filipino men, and the negative effect of acculturation on smoking among women was stronger for Filipina women than Chinese women. Elo and Culhane⁸¹ further examined ethnic variation among black women in Philadelphia in terms of tobacco, alcohol, and marijuana use during pregnancy and showed that foreign-born black women were less likely to engage in substance use than U.S.-born black women. Similar findings were also reported by Bennett and colleagues⁸² and Guevarra and colleagues.⁸³ Regarding ethnicity more specifically, this foreign-born advantage was somewhat stronger for African-born women than for Caribbean-born women.⁸¹

Among Hispanics/Latinos in the United States, Perez-Stable and colleagues⁵³ found that Puerto Rican and Cuban respondents were significantly more likely to be current smokers and to smoke more than 20 cigarettes per day compared with Mexican American respondents, controlling for age, gender, SES, nativity status, and acculturation. No statistically significant differences were observed between Central or South American respondents and Mexican American respondents.

Ethnicity and Smoking Cessation

American men of Korean, Vietnamese, and Filipino descent reported lower quit rates than Chinese American or Japanese American men, while women of Korean or Chinese ancestry reported lower quit rates than Vietnamese, Filipina, or Japanese American women.⁶⁶ Borrelli and colleagues⁸⁴ found that compared to Dominicans, Puerto Rican caregivers who smoke and have a child with asthma were significantly more acculturated, more nicotine dependent, less motivated and confident of quitting, and identified more benefits of smoking, although Puerto Ricans smoked fewer cigarettes per day than their non-Latino white counterparts.

Ethnicity and Secondhand Smoke Exposure

Differences in the potential for secondhand smoke exposure can be seen in results of the study by Ma and colleagues,⁷³ which showed that Americans of Korean, Vietnamese, and Cambodian descent were more likely than Chinese Americans to smoke in the home and to allow visitors to smoke in the home.

Chapter Summary

In 2015 almost 42 million people, representing 13% of the U.S. population, were born outside the United States. In 2010 about half of all foreign-born people in the United States came from five countries (Mexico, India, Philippines, China, and Vietnam). In these countries, social norms and behaviors regarding tobacco use are quite different from those in the United States. For example, the prevalence of current smoking is generally lower in the United States than in these five countries, and male/female smoking rates are far more similar. In addition to differences in norms and behaviors regarding tobacco use, immigrants to the United States bring diverse cultures, languages, religions, social classes, and reasons and processes for migration. These and other factors make the study of immigrant status, the tobacco use continuum (initiation, current use and intensity, intentions to quit and quit attempts, cessation, relapse, and tobacco-related morbidity and mortality), and tobacco-related health disparities quite complex.

In this review of 59 studies, most of the evidence on different aspects of immigration status, gender, SES, and race/ethnicity focused on the relationship between immigration status and current smoking. Some studies reported data by the aggregate race/ethnicity category (e.g., Asian) or by specific ethnic group (e.g., Mexican). Some studies examined acculturation using formal scales, while others used proxy measures such as foreign-born versus U.S.-born, English language use, and ethnic identity. It should be noted that this review did not include refugee populations as a specific focus.

The literature demonstrates that, in general, foreign-born men are more likely to smoke than their U.S.-born counterparts; conversely, foreign-born women are less likely to smoke than U.S.-born women. The evidence suggests that for youth and adults, acculturation is both a risk and a protective factor for current cigarette smoking behavior, but the direction of the relationship depends on gender, ethnicity, and the intersection of gender and ethnicity. The relationship between acculturation and the intensity and frequency of tobacco use is not yet clear. Few studies have examined the relationship between SES and smoking among foreign-born individuals; studies on SES identified for this review focused primarily on the Asian and Hispanic aggregate racial/ethnic groups. These studies suggest that high SES is protective against smoking in some immigrant ethnic groups but a risk factor for smoking in other groups, with the relationship depending on whether education, income, or occupation is examined.

As described further below, there are many gaps in the literature. Few studies have examined whether immigration status is associated with smoking initiation among youth from different ethnic groups. Research is needed to examine the relationship between acculturation and smoking cessation and the direction of the relationship among different immigrant groups, as well as the question of whether there is a relationship between acculturation and smoking relapse. Studies are also needed to determine the relationship between a person's country of origin (that is, whether born in the United States or another country) and tobacco-related cancer morbidity and mortality. Finally, studies are needed on the relationship between sexual identity, immigrant status, and smoking status.

Research Needs

Research on immigration and tobacco use would benefit from further study of the social/contextual factors that are especially relevant to immigrants. This section presents three research topics that are particularly important. First, *the issue of time spent in the United States* should be investigated more systematically in longitudinal studies of smoking. Only a handful of the 59 studies reviewed for this chapter examined smoking behavior, usually smoking cessation, over time. A few more studies analyzed cross-sectional data from longitudinal data sets. A life-course perspective argues that the timing of events can shape future events, especially as they relate to social mobility, marriage and having children, and health trajectories. Time spent in the United States is often conceptualized as a critical factor for immigrants, especially as they adjust to life in a new country. A widely held assumption is that the longer immigrants stay in a new society, the more likely they are to expand their social networks, which in turn can promote greater social and economic opportunities. Other temporal factors are also critical in determining how immigrants manage life in their communities.⁸⁵⁻⁸⁷ One particularly neglected dimension is the age at which immigrants come to the United States, although this is sometimes captured as part of acculturation scales. Age at immigration can be conceptualized as the developmental context of an individual's experiences at the time of arrival in the United States. Seen in this light, age at immigration has the potential to play a powerful role in delineating how a person negotiates life in a new country and a different culture. In addition, consideration of arrival cohort is important because of changes in smoking patterns over time in both the United States and country of origin.⁸⁸

The contexts in which people immigrate help shape language ability and use, density and heterogeneity of social networks, place of residence, and exposure to risky behaviors and stressful environments. The immigrant's generation further frames the immigration experience into unique opportunities and challenges occurring during discrete developmental periods. The social institutions that affect peoples' lives can vary depending on their generational status, leading to different life-course trajectories^{85,86}; different social institutions provide access to unique types of social networks and relationships. Social networks provide a mechanism by which structural characteristics of society exert influence on individuals.^{89,90} Social networks can be seen as opportunity structures because when a person's social ties have access to societal resources and opportunities, the person has greater access to those resources and opportunities. The number of social groups and institutions (e.g., schools, clubs, friendship networks, family ties) geared toward teaching children about the new society is far greater than those available for adults, giving children greater access to the opportunity structures in a new culture. Conversely, because immigrant children can have a larger set of social groups available to them, they could also experience a greater amount of negative stressors and influences which could lead to negative social and health outcomes as they mature. Chapter 5 provides an in-depth discussion of stressors, and chapter 6 discusses the influence of social relationships on tobacco use and disparities.

A second priority research topic is *the link between SES and smoking in immigrant populations* (SES and TRHD are explored in greater depth in chapter 9). Some studies show that the relationship between education and smoking has a more pronounced effect for U.S.-born individuals than for immigrants. It is possible that educational attainment, country of educational attainment, and other SES indicators might not fully measure social advantage or inequalities among immigrants or ethnic minorities. Other studies have shown that SES measures, including education, do not have the same predictive power for immigrants and ethnic minorities that they have for whites in the United States.^{91,92} As researchers refine current measures of SES, it might also be useful to examine alternative indicators of SES that could describe social hierarchies in different groups. Some of these possibilities include studies of wealth, spatial stratification, and perceptions of social status. Studies of alternative indicators could enhance our understanding of how social inequalities are associated with smoking and could also provide insights about targeted smoking cessation and prevention efforts.

The final priority research topic is *tobacco industry marketing strategies that target immigrants*. Acevedo-Garcia and colleagues⁹³ describe three distinct marketing strategies aimed at immigrants: (1) geographically based marketing directed toward immigrant communities; (2) segmentation based on assimilation status; and (3) coordinated marketing based on immigrant country of origin. Each of these strategies has the potential to maintain the high levels of smoking among immigrant men, reduce the quit rate among immigrants overall, and encourage the initiation of smoking among immigrant women. These strategies could also encourage smoking initiation among immigrant adolescents. Systematic research is needed to determine the effects of tobacco marketing approaches within immigrant communities and across immigrant groups. An extensive discussion of the role of communications and marketing in TRHD is presented in chapter 10.

Given the lack of evidence on the relationship between immigration status and smoking behavior, to better understand disparities and inform appropriate interventions, additional research is needed on tobacco use by immigrants across the tobacco use continuum. Research and data are especially limited on immigrants and TRHD. Moreover, although immigration status is relatively easy to measure, the mechanisms linking immigrants to smoking and TRHD, including acculturation and assimilation, are considerably more difficult to measure and interpret. In particular, although articles and data can be found for smoking behavior, few published studies are available on how or to what extent smoking is linked to different health outcomes among immigrants. More research on immigration and tobacco-related morbidity and mortality is appropriate, particularly in light of the relatively high rates of tobacco use among some immigrant groups. Most studies on immigrants and tobacco use tend to be cross-sectional; longitudinal studies are needed in order to investigate the process of migration and adaptation that leads to smoking, especially among immigrant women.

Prevention and cessation programs are needed for all populations, including immigrant populations who may not have access to resources because of their immigrant status. Barriers could include a lack of (1) bilingual clinicians, (2) adequate financial resources, (3) access to mental health services, (4) culturally congruent treatment approaches, and (5) ethnically congruent counselors.⁹⁴ The enduring nature of these barriers reflects the complexities that confront any intervention. As noted in the 2008 Public Health Service Guidelines, additional studies are needed on the ability of culturally tailored interventions, compared with generic interventions, to enhance cessation interventions.⁹⁵ Finally, research is needed to determine how to prevent increased smoking among immigrant women, whose use rates are often low, so as to protect the health of women, children, and families.

References

1. U.S. Census Bureau. Selected characteristics of the native and foreign-born populations. 2011-2015 American Community Survey, 5-year estimates [Table, 2015]. Available from: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_S0501&prodType=table.
2. Dubowitz T, Bates LM, Acevedo-Garcia D. The Latino health paradox: looking at the intersections of sociology and health. In: Bird CE, Conrad P, Fremont AM, Timmermans S, editors. Handbook of medical sociology, 6th edition. Nashville, TN: Vanderbilt University Press; 2010. p. 106-23.
3. Mukherjea A, Morgan PA, Snowden LR, Ling PM, Ivey SL. Social and cultural influences on tobacco-related health disparities among South Asians in the USA. *Tob Control*. 2012;21(4):422-8. doi:10.1136/tc.2010.042309 2012.
4. Massey DS. Patterns and processes of international migration in the 21st century. Paper presented at the Conference on African Migration in Comparative Perspective, Johannesburg, South Africa, June 2003.
5. Gibson C, Jung K. Historical census statistics on population totals by race, 1790 to 1990, and by Hispanic origin, 1970 to 1990, for the United States, regions, divisions, and states. Working paper no. 56. Washington, DC: U.S. Census Bureau, Population Division; 2002. Available from: <https://www.census.gov/content/dam/Census/library/working-papers/2002/demo/POP-twps0056.pdf>.
6. Gibson C, Lennon E. Historical census statistics on the foreign-born population of the United States: 1850 to 1990. Working paper no. 29. Washington, DC: U.S. Census Bureau, Population Division; 1999. Available from: <https://www.census.gov/population/www/documentation/twps0029/twps0029.html>.
7. Muller T. 1993. Immigrants and the American City. New York: University Press; 1993.
8. Office of the Historian. Milestones: 1921-1936: The Immigration Act of 1924 (The Johnson-Reed Act). Washington, DC: U.S. Department of State, Bureau of Public Affairs; [no date]. Available from: <https://history.state.gov/milestones/1921-1936/immigration-act>.
9. Massey DS. The new immigration and ethnicity in the United States. *Popul Dev Rev*. 1995;21(3):631-52. doi: 10.2307/2137753.
10. Zong J, Batalova J. Frequently requested statistics on immigrants and immigration in the United States. Washington, DC: Migration Policy Institute; 2017. Available from: <http://www.migrationpolicy.org/article/frequently-requested-statistics-immigrants-and-immigration-united-states>.
11. World Health Organization. 2009 Philippines' Global Adult Tobacco Survey: country report. Geneva: World Health Organization; 2010. Available from: http://www.who.int/tobacco/surveillance/2009_gats_report_philippines.pdf?ua=1.
12. World Health Organization, Chinese Center for Disease Control and Prevention. Global Adult Tobacco Survey (GATS): China 2010 country report. Geneva: World Health Organization; 2010. Available from: http://www.who.int/tobacco/surveillance/survey/gats/en_gats_china_report.pdf?ua=1.
13. World Health Organization, Ministry of Health of Viet Nam, Centers for Disease Control and Prevention (U.S.). Global Adult Tobacco Survey: Vietnam, 2010. Geneva: World Health Organization; 2010. Available from: http://www.who.int/tobacco/surveillance/en_tf_gats_vietnam_report.pdf?ua=1.
14. World Health Organization, National Institute of Public Health (INSP). Global Adult Tobacco Survey, Mexico 2009. Geneva: World Health Organization; 2010. Available from: http://www.who.int/tobacco/surveillance/gats_rep_mexico.pdf?ua=1.
15. International Institute for Population Sciences, Ministry of Health and Family Welfare, Government of India. Global Adult Tobacco Survey (GATS India), 2009–2010. New Delhi: Ministry of Health Family Welfare, Government of India; 2010 [cited 21 June 2012]. Available from: <http://searo.who.int/tobacco/documents/2010-pub2.pdf?ha=1>.
16. Sreeramareddy CT, Pradhan PM, Mir IA, Sin S. Smoking and smokeless tobacco use in nine South and Southeast Asian countries: prevalence estimates and social determinants from Demographic and Health Surveys. *Popul Health Metr*. 2014;12:22. doi: 10.1186/s12963-014-0022-0.
17. Constantine ML, Rockwood TH, Schillo BA, Alesci N, Foldes SS, Phan T, et al. Exploring the relationship between acculturation and smoking behavior within four Southeast Asian communities of Minnesota. *Nicotine Tob Res*. 2010;12(7):715-23. doi: 10.1093/ntr/ntq070.
18. Constantine ML, Rockwood TH, Schillo BA, Castellanos JW, Foldes SS, Saul JE. The relationship between acculturation and knowledge of health harms and benefits associated with smoking in the Latino population of Minnesota. *Addict Behav*. 2009;34(11):980-3. doi: 10.1016/j.addbeh.2009.05.008.
19. Everhart J, Ferketich AK, Browning K, Wewers ME. Acculturation and misclassification of tobacco use status among Hispanic men and women in the United States. *Nicotine Tob Res*. 2009;11(3):240-7. doi: 10.1093/ntr/ntn030.
20. Jamal A, King BA, Neff LJ, Whitmill J, Babb SD, Graffunder CM. Current cigarette smoking among adults – United States, 2005-2015. *MMWR Morb Mortal Wkly Rep*. 2016;65:1205–1211. doi: 10.15585/mmwr.mm6544a2.

21. Elder JP, Broyles SL, Brennan JJ, Zuniga de Nuncio ML, Nader PR. Acculturation, parent-child acculturation differential, and chronic disease risk factors in a Mexican-American population. *J Immigr Health*. 2005;7(1):1-9. doi: 10.1007/s10903-005-1385-x.
22. Angel JL, Buckley AJ, Sakamoto A. Duration or disadvantage? Exploring nativity, ethnicity, and health in midlife. *J Gerontol B Psychol Sci Soc Sci*. 2001;56(5):S275-84. doi: 10.1093/geronb/56.5.S275.
23. Phelan JC, Link BG, Tehranifar P. Social conditions as fundamental causes of health inequalities: theory, evidence, and policy implications. *J Health Soc Behav*. 2010;51(1):S28-40. doi:10.1177/0022146510383498.
24. Cutler D, Deaton A, Lleras-Muney A. The determinants of mortality. *J Econ Perspect*. 2006;20(3):97-120. doi: 10.1257/jep.20.3.97.
25. House JS. Understanding social factors and inequalities in health: 20th century progress and 21st century prospects. *J Health Soc Behav*. 2002;43(2):125-42. doi: 10.2307/2137277.
26. Kitagawa EM, Hauser PM. Differential mortality in the United States: a study of socioeconomic epidemiology. Cambridge, MA: Harvard University Press; 1973.
27. Mirowsky J, Ross CE. Education, social status and health. New York: Aldine de Gruyter; 2003.
28. Schnittker J, McLeod JD. The social psychology of health disparities. *Annu Rev Sociol*. 2005;31:75-103. doi: 10.1146/annurev.soc.30.012703.110622.
29. Elo IT, Preston SH. Educational differentials in mortality: United States, 1979-85. *Soc Sci Med*. 1996;42(1):47-57. doi: 10.1016/0277-9536(95)00062-3.
30. Williams DR. Socioeconomic differentials in health: a review and redirection. *Soc Psychol Q*. 1990;53:81-99. doi: 10.2307/2786672.
31. Williams DR, Collins C. U.S. socioeconomic and racial differences in health: patterns and explanations. *Annu Rev Sociol*. 1995;21:349-86. doi: 10.1146/annurev.so.21.080195.002025.
32. Markides KS, Coreil J. The health of Hispanics in the southwestern United States: an epidemiologic paradox. *Public Health Rep*. 1986;101(3):253-65.
33. Finch BK, Frank R, Vega W. Acculturation and acculturation stress: a social-epidemiological approach to Mexican migrant farm workers' health. *Int Migr Rev*. 2004;38(1):236-62. doi: 10.1111/j.1747-7379.2004.tb00195.x.
34. Cho T, Frisbie WP, Hummer RA, Rogers RG. Nativity, duration of residence, and the health of Hispanic adults in the United States. *Int Migr Rev*. 2004;38(1):184-211. doi: 10.1111/j.1747-7379.2004.tb00193.x.
35. Mainous AG 3rd, Diaz VA, Geesey ME. Acculturation and healthy lifestyle among Latinos with diabetes. *Ann Fam Med*. 2008;6(2):131-7. doi: 10.1370/afm.814.
36. U.S. Census Bureau. Selected characteristics of the native and foreign-born populations. 2006-2010 American Community Survey, 5-year estimates [2010, Table]. Available from: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_15_5YR_S0501&prodType=table.
37. Bethel JW, Schenker MB. Acculturation and smoking patterns among Hispanics: a review. *Am J Prev Med*. 2005;29(2):143-8. doi: 10.1016/j.amepre.2005.04.014.
38. Choi S, Rankin S, Stewart A, Oka R. Effects of acculturation on smoking behavior in Asian Americans: a meta-analysis. *J Cardiovasc Nurs*. 2008;23(1):67-73. doi: 10.1111/j.1751-7117.2008.08461.x.
39. Kim SS, Ziedonis D, Chen KW. Tobacco use and dependence in Asian Americans: a review of the literature. *Nicotine Tob Res*. 2007;9(2):169-84. doi: 10.1080/14622200601080323.
40. Kim SS, Ziedonis D, Chen K. Tobacco use and dependence in Asian American and Pacific Islander adolescents: a review of the literature. *J Ethn Subst Abuse*. 2007;6(3-4):113-42. doi: 10.1300/J233v06n03_05.
41. Zhang J, Wang Z. Factors associated with smoking in Asian American adults: a systematic review. *Nicotine Tob Res*. 2008;10(5):791-801. doi: 10.1080/14622200802027230.
42. Allen ML, Elliott MN, Fuligni AJ, Morales LS, Hambarsoomian K, Schuster MA. The relationship between Spanish language use and substance use behaviors among Latino youth: a social network approach. *J Adolesc Health*. 2008;43(4):372-9. doi: 10.1016/j.jadohealth.2008.02.016.
43. Castro FG, Stein JA, Bentler PM. Ethnic pride, traditional family values, and acculturation in early cigarette and alcohol use among Latino adolescents. *J Prim Prev*. 2009;30(3-4):265-92. doi: 10.1007/s10935-009-0174-z.
44. Lorenzo-Blanco EI, Unger JB, Ritt-Olson A, Soto D, Baezconde-Garbanati L. Acculturation, gender, depression, and cigarette smoking among U.S. Hispanic youth: the mediating role of perceived discrimination. *J Youth Adolesc*. 2011;40(11):1519-33. doi: 10.1007/s10964-011-9633-y.
45. Rosario-Sim MG, O'Connell KA. Depression and language acculturation correlate with smoking among older Asian American adolescents in New York City. *Public Health Nurs*. 2009;26(6):532-42. doi: 10.1111/j.1525-446.2009.00811.x.
46. Saint-Jean G, Martinez CA, Crandall LA. Psychosocial mediators of the impact of acculturation on adolescent substance abuse. *J Immigr Minor Health*. 2008;10(2):187-95. doi: 10.1007/s10903-007-9060-z.

47. Stoddard P, Adler NE. Education associations with smoking and leisure-time physical inactivity among Hispanic and Asian young adults. *Am J Public Health.* 2011;101(3):504-11. doi: 10.1016/j.socscimed.2009.03.035.
48. Trinidad DR, Unger JB, Chou CP, Johnson CA. Emotional intelligence and acculturation to the United States: interactions on the perceived social consequences of smoking in early adolescents. *Subst Use Misuse.* 2005;40(11):1697-706. doi: 10.1080/10826080500222925.
49. Unger JB, Cruz TB, Rohrbach LA, Ribisl KM, Baezconde-Garbanati L, Chen X, et al. English language use as a risk factor for smoking initiation among Hispanic and Asian American adolescents: evidence for mediation by tobacco-related beliefs and social norms. *Health Psychol.* 2000;19(5):403-10. doi: 10.1037/0278-6133.19.5.403.
50. Pokhrel P, Unger JB, Wagner KD, Ritt-Olson A, Sussman S. Effects of parental monitoring, parent-child communication, and parents' expectation of the child's acculturation on the substance use behaviors of urban, Hispanic adolescents. *J Ethn Subst Abuse.* 2008;7(2):200-13. doi: 10.1080/15332640802055665.
51. Wilkinson AV, Spitz MR, Strom SS, Prokhorov AV, Barcenas CH, Cao Y, et al. Effects of nativity, age at migration, and acculturation on smoking among adult Houston residents of Mexican descent. *Am J Public Health.* 2005;95(6):1043-9. doi: 10.2105/AJPH.2004.055319.
52. Abraido-Lanza AF, Chao MT, Florez KR. Do healthy behaviors decline with greater acculturation? Implications for the Latino mortality paradox. *Soc Sci Med.* 2005;61(6):1243-55. doi: 10.1016/j.socscimed.2005.01.016.
53. Perez-Stable EJ, Ramirez A, Villareal R, Talavera GA, Trapido E, Suarez L, et al. Cigarette smoking behavior among US Latino men and women from different countries of origin. *Am J Public Health.* 2001;91(9):1424-30. doi: 10.2105/AJPH.91.9.1424.
54. Masel MC, Rudkin LL, Peek MK. Examining the role of acculturation in health behaviors of older Mexican Americans. *Am J Health Behav.* 2006;30(6):684-99. doi: 10.5993/AJHB.30.6.14.
55. Cooper TV, Rodriguez de Ybarra D, Charter JE, Blow J. Characteristics associated with smoking in a Hispanic college student sample. *Addict Behav.* 2011;36(12):1329-32. doi: 10.1016/j.addbeh.2011.07.021.
56. Loury S, Kulbok P. Correlates of alcohol and tobacco use among Mexican immigrants in rural North Carolina. *Fam Community Health.* 2007;30(3):247-56. doi: 10.1097/01.FCH.0000277767.00526.f1.
57. Shankar S, Gutierrez-Mohamed ML, Alberg AJ. Cigarette smoking among immigrant Salvadoreans in Washington, DC: behaviors, attitudes, and beliefs. *Addict Behav.* 2000;25(2):275-81. doi: 10.1016/S0306-4603(99)00009-X.
58. Al-Omari H, Scheibmeir M. Arab Americans' acculturation and tobacco smoking. *J Transcult Nurs.* 2009;20(2):227-33. doi: 10.1177/1043659608330353.
59. World Bank. Smoking prevalence, males (% of adults). World Health Organization, Global Health Observatory Data Repository. 2000-2012. Available from: <http://data.worldbank.org/indicator/SH.PRV.SMOK.MA>.
60. World Health Organization. WHO report on the global tobacco epidemic, 2015: country profile, Lebanon. Geneva: World Health Organization; 2015. Available from: http://www.who.int/tobacco/surveillance/policy/country_profile/lbn.pdf.
61. Blue L, Fenelon A. Explaining low mortality among US immigrants relative to native-born Americans: the role of smoking. *Int J Epidemiol.* 2011;40(3):786-93. doi: 10.1093/ije/dyr011.
62. Bock BC, Niaura RS, Neighbors CJ, Carmona-Barros R, Azam M. Differences between Latino and non-Latino white smokers in cognitive and behavioral characteristics relevant to smoking cessation. *Addict Behav.* 2005;30(4):711-24. doi: 10.1016/j.addbeh.2004.08.017.
63. Zinser MC, Pampel FC, Flores E. Distinct beliefs, attitudes, and experiences of Latino smokers: relevance for cessation interventions. *Am J Health Promot.* 2011;25(Suppl 5):eS1-15. doi: 10.4278/ajhp.100616-QUAN-200.
64. Wetter DW, Mazas C, Daza P, Nguyen L, Fouladi RT, Li Y, et al. Reaching and treating Spanish-speaking smokers through the National Cancer Institute's Cancer Information Service. A randomized controlled trial. *Cancer.* 2007;109(Suppl 2):406-13. doi: 10.1002/cncr.2236.
65. Chae DH, Gavin AR, Takeuchi DT. Smoking prevalence among Asian Americans: findings from the National Latino and Asian American Study (NLAAS). *Public Health Rep.* 2006;121(6):755-63.
66. An N, Cochran SD, Mays VM, McCarthy WJ. Influence of American acculturation on cigarette smoking behaviors among Asian American subpopulations in California. *Nicotine Tob Res.* 2008;10(4):579-87. doi: 10.1080/14622200801979126.
67. Hofstetter CR, Hovell MF, Lee J, Zakarian J, Park H, Paik HY, et al. Tobacco use and acculturation among Californians of Korean descent: a behavioral epidemiological analysis. *Nicotine Tob Res.* 2004;6(3):481-9. doi: 10.1080/14622200410001696646.
68. Fu SS, Ma GX, Tu XM, Siu PT, Metlay JP. Cigarette smoking among Chinese Americans and the influence of linguistic acculturation. *Nicotine Tob Res.* 2003;5(6):803-11. doi: 10.1080/14622200310001614566.
69. Ma GX, Tan Y, Toubbeh JI, Su X, Shive SE, Lan Y. Acculturation and smoking behavior in Asian-American populations. *Health Educ Res.* 2004;19(6):615-25. doi: 10.1093/her/cyg070.

70. Ma GX, Tan Y, Toubbeh J, Su X. Differences in stages of change of smoking behavior among current smokers of four Asian American subgroups. *Addict Behav.* 2003;28(8):1431-9. doi: 10.1016/S0306-4603(03)00071-6.
71. Castro Y, Reitzel LR, Businelle MS, Kendzor DE, Mazas C, Li Y, et al. Acculturation differentially predicts smoking cessation among Latino men and women. *Cancer Epidemiol Biomarkers Prev.* 2009;18(12):3468-75. doi: 10.1158/1055-9965.EPI-09-0450.
72. Maxwell AE, Garcia GM, Berman BA. Understanding tobacco use among Filipino American men. *Nicotine Tob Res.* 2007;9(7):769-76. doi: 10.1080/14622200701397890.
73. Ma GX, Shive SE, Tan Y, Feeley RM. The impact of acculturation on smoking in Asian American homes. *J Health Care Poor Underserved.* 2004;15(2):267-80. doi: 10.1353/hpu.2004.0024.
74. Gomez SL, Chang ET, Shema SJ, Fish K, Sison JD, Reynolds SP, et al. Survival following non-small cell lung cancer among Asian/Pacific Islander, Latina, and Non-Hispanic white women who have never smoked. *Cancer Epidemiol Biomarkers Prev.* 2011;20(3):545-54. doi: 10.1158/1055-9965.EPI-10-0965.
75. Bratsberg B, Ragan JF. The impact of host-country schooling on earnings. *J Hum Resour.* 2002;37(1):63-105. doi: 10.2307/3069604.
76. House JS, Lepkowski JM, Kinney AM, Mero RP, Kessler RC, Herzog AR. The social stratification of aging and health. *J Health Soc Behav.* 1994;35(3):213-34.
77. Pappas G, Queen S, Hadden W, Fisher G. The increasing disparity in mortality between socioeconomic groups in the United States, 1960 and 1986. *N Engl J Med.* 1993;329(2):103-9. doi: 10.1056/NEJM199307083290207. Erratum in: *N Engl J Med.* 1993;329(15):1139.
78. de Castro AB, Garcia G, Gee GC, Tsai JH, Rue T, Takeuchi DT. Smoking and the Asian American workforce in the National Latino and Asian American Study. *Am J Ind Med.* 2010;53(2):171-8. doi: 10.1002/ajim.20697.
79. Acevedo-Garcia D, Pan J, Jun HJ, Osypuk TL, Emmons KM. The effect of immigrant generation on smoking. *Soc Sci Med.* 2005;61(6):1223-42. doi: 10.1016/j.socscimed.2005.01.027.
80. Maxwell AE, Bernaards CA, McCarthy WJ. Smoking prevalence and correlates among Chinese- and Filipino-American adults: findings from the 2001 California Health Interview Survey. *Prev Med.* 2005;41(2):693-9. doi: 10.1016/j.ypmed.2005.01.014.
81. Elo IT, Culhane JF. Variations in health and health behaviors by nativity among pregnant black women in Philadelphia. *Am J Public Health.* 2010;100(11):2185-92. doi: 10.2105/AJPH.2009.174755.
82. Bennett GG, Wolin KY, Okechukwu CA, Arthur CM, Askew S, Sorensen G, et al. Nativity and cigarette smoking among lower income blacks: results from the Healthy Directions Study. *J Immigr Minor Health.* 2008;10(4):305-11. doi: 10.1007/s10903-007-9088-0.
83. Guevarra JS, Kwate NO, Tang TS, Valdimarsdottir HB, Freeman HP, Bovbjerg DH. Acculturation and its relationship to smoking and breast self-examination frequency in African American women. *J Behav Med.* 2005;28(2):191-9. doi: 10.1007/s10865-005-3668-z.
84. Borrelli B, Hayes RB, Gregor K, Lee CS, McQuaid EL. Differences in smoking behavior and attitudes among Puerto Rican, Dominican, and non-Latino white caregivers of children with asthma. *Am J Health Promot.* 2011;25(Suppl 5):S91-5. doi: 10.4278/ajhp.100624-ARB-214.
85. Fuligni AJ. Convergence and divergence in the developmental contexts of immigrants to the United States. In: Schaie W, Elder G, editors. *Historical influences on lives and aging.* New York: Springer; 2004. p. 89-98.
86. Rumbaut RG. Ages, life stages, and generational cohorts: decomposing the immigrant first and second generations in the United States. *Int Migr Rev.* 2004;38(3):1160-205. doi: 10.1111/j.1747-7379.2004.tb00232.x.
87. Takeuchi DT, Hong S, Giles K, Alegria M. Developmental contexts and mental disorders among Asian Americans. *Res Hum Dev.* 2007;4:49-69. doi: 10.1080/15427600701480998.
88. Bostean G, Ro A, Fleischer NL. Smoking trends among U.S. Latinos, 1998-2013: the impact of immigrant arrival cohort. *Int J Environ Res Public Health.* 2017;14(3):255. doi:10.3390/ijerph14030255.
89. Granovetter M. The strength of weak ties. *Am J Sociol.* 1973;78(6):1360-80. doi: 10.1086/225469.
90. Laumann EO, Pappi FU. *Networks of collective action: a perspective on community influence systems.* New York: Academic Press; 1976.
91. Farmer M, Ferraro K. Are racial disparities in health conditional on socioeconomic status? *Soc Sci Med.* 2005;60(1):191-204. doi: 10.1016/j.socscimed.2004.04.026.
92. Gavin AR, Walton E, Chae D, Alegria M, Jackson J, Takeuchi D. The associations between socio-economic status and major depressive disorder among blacks, Latinos, Asians, and non-Hispanic whites: findings from the Collaborative Psychiatric Epidemiologic Studies. *Psychol Med.* 2010;40(1):51-61. doi: 10.1017/S0033291709006023.
93. Acevedo-Garcia D, Barbeau E, Bishop JA, Pan J, Emmons KM. Undoing an epidemiological paradox: the tobacco industry's targeting of US Immigrants. *Am J Public Health.* 2004;94(12):2188-93. doi: 10.2105/AJPH.94.12.2188.

94. Ramos-Sánchez L, Atkinson DR. The relationships between Mexican American acculturation, cultural values, gender, and help-seeking intentions. *J Couns Dev.* 2009;87(1):62-71. doi: 10.1002/j.1556-6678.2009.tb00550.
95. Fiore MC, Jaén CR, Baker TB, Bailey WC, Benowitz NL, Curry SJ, et al. Treating tobacco use and dependence: 2008 update. *Clinical Practice Guideline.* Rockville, MD: U.S. Department of Health and Human Services. Public Health Service; 2008.
96. Gibson C, Jung K. Historical census statistics on the foreign-born population of the United States: 1850 to 2000. Working paper no. 81. Washington, DC: U.S. Census Bureau, Population Division; 2006. Available from: <https://www.census.gov/population/www/documentation/twps0081/twps0081.pdf>.
97. Chou CF, Johnson PJ, Blewett LA. Immigration and selected indicators of health status and healthcare utilization among the Chinese. *J Immigr Minor Health.* 2010;12(4):470-9. doi: 10.1007/s10903-009-9240-0.
98. Detjen MG, Nieto FJ, Trentham-Dietz A, Fleming M, Chasan-Taber L. Acculturation and cigarette smoking among pregnant Hispanic women residing in the United States. *Am J Public Health.* 2007;97(11):2040-7. doi: 10.2105/AJPH.2006.095505.
99. Fitzgerald N, Himmelgreen D, Damio G, Segura-Perez S, Peng YK, Perez-Escamilla R. Acculturation, socioeconomic status, obesity and lifestyle factors among low-income Puerto Rican women in Connecticut, U.S., 1998-1999. *Rev Panam Salud Publica.* 2006;19(5):306-13.
100. Gollenberg A, Pekow P, Markenson G, Tucker KL, Chasan-Taber L. Dietary behaviors, physical activity, and cigarette smoking among pregnant Puerto Rican women. *Am J Clin Nutr.* 2008;87(6):1844-51.
101. Gonzales M, Malcoe LH, Kegler MC, Espinoza J. Prevalence and predictors of home and automobile smoking bans and child environmental tobacco smoke exposure: a cross-sectional study of U.S.- and Mexico-born Hispanic women with young children. *BMC Public Health.* 2006;6:265. doi: 10.1186/1471-2458-6-265.
102. Hu SS, Pallonen UE, Meshack AF. The impact of immigration status on tobacco use among Chinese-American adults in Texas. *J Immigr Minor Health.* 2010;12(2):206-14. doi: 10.1007/s10903-007-9097-z.
103. Juon HS, Kim M, Han H, Ryu JP, Han W. Acculturation and cigarette smoking among Korean American men. *Yonsei Med J.* 2003;44(5):875-82.
104. Lee SK, Sobal J, Frongillo EA Jr. Acculturation and health in Korean Americans. *Soc Sci Med.* 2000;51(2):159-73. doi: 10.1016/S0277-9536(99)00446-3.
105. Myers MG, Doran NM, Trinidad DR, Wall TL, Klonoff EA. A prospective study of cigarette smoking initiation during college: Chinese and Korean American students. *Health Psychol.* 2009;28(4):448-56. doi: 10.1037/a0014466.
106. Parker ED, Solberg LI, Foldes SS, Walker PF. A surveillance source of tobacco use differences among immigrant populations. *Nicotine Tob Res.* 2010;12(3):309-14. doi: 10.1093/ntr/ntp211.
107. Perreira KM, Cortes KE. Race/ethnicity and nativity differences in alcohol and tobacco use during pregnancy. *Am J Public Health.* 2006;96(9):1629-36. doi: 10.2105/AJPH.2004.056598.
108. Reitzel LR, Mazas CA, Cofta-Woerpel L, Vidrine JI, Businelle MS, Kendzor DE, et al. Acculturative and neighborhood influences on subjective social status among Spanish-speaking Latino immigrant smokers. *Soc Sci Med.* 2010;70(5):677-83. doi: 10.1016/j.socscimed.2009.11.024.
109. Shelley D, Fahs M, Scheinmann R, Swain S, Qu J, Burton D. Acculturation and tobacco use among Chinese Americans. *Am J Public Health.* 2004;94(2):300-7. doi: 10.2105/AJPH.94.2.300.
110. Stoddard P. Risk of smoking initiation among Mexican immigrants before and after immigration to the United States. *Soc Sci Med.* 2009;69(1):94-100. doi: 10.1016/j.socscimed.2009.03.035.
111. Sussman NM, Truong N. "Please extinguish all cigarettes": the effects of acculturation and gender on smoking attitudes and smoking prevalence of Chinese and Russian immigrants. *Int J Intercult Relat.* 2011;35(2):163-78. doi: 10.1016/j.ijintrel.2010.11.009.
112. Tong EK, Nguyen TT, Vittinghoff E, Perez-Stable EJ. Smoking behaviors among immigrant Asian Americans: rules for smoke-free homes. *J Gen Intern Med.* 2008;35(1):64-7.