CHAPTER 7

Latino Health Paradoxes: Empirical Evidence, Explanations, Future Research, and Implications

Dolores Acevedo-Garcia
Lisa M. Bates

INTRODUCTION

In the last decades, the growth of the U.S. Latino population and the adaptation of Latino immigrants have increasingly been the subject of scholarly and policy attention. Some see the growth of the Latino population as a positive force that will redefine U.S. society and might strengthen diversity and democracy (Suarez-Orozco & Paez, 2002). On the other hand, some argue that Hispanic immigration constitutes a threat to the Anglo-Protestant values and practices that form the core of American culture (Huntington, 2004). In health research, the topic of Latino health paradoxes (defined below) is also becoming the subject of increased debate. For some, the health advantage that Latinos appear to have might be rooted in their "cultural orientation" and strong social networks. For others, the so-called paradoxes are the result of selection processes that bring to the United States Latino immigrants that are healthier than their nonimmigrant conationals. Hence, this school argues, "paradoxes" are, after all, not paradoxical.

This chapter describes the empirical evidence on Latino health paradoxes and discusses possible explanations for and implications of such paradoxes. We argue that research on Latino health should be embedded in a complex understanding of the context of Latino immigration, including the Latin American sending countries and the process of immigrant adaptation. Thus, studying Latino health should involve an interdisciplinary dialogue between sociologists of immigrant adaptation and public health researchers.

Large-scale Latino immigration is relatively recent and is rapidly evolving (e.g., the emergence of secondary destinations in addition to the traditional metro area gateways, the growth of non-Mexican Latin American immigration, and the resurgence of highly contentious immigration politics and policy debates). Because of this fluidity, understanding Latino immigration and Latino health often seems elusive. Therefore, the objective of this chapter is not to provide answers but to suggest research approaches that might enrich our inquiry into Latino health. Other chapters in this volume discuss in-depth important dimensions of the Latino experience in the United States, such as the demographics of the U.S. Latino population and immigrant adaptation. Here we discuss how these factors might influence Latino health and highlight some issues that are critical for understanding observed patterns of health in this population.

THE DEMOGRAPHICS AND SOCIOECONOMIC STATUS OF THE *U.S.* LATINO POPULATION

Latinos are the largest U.S. racial/ethnic minority group: 12.5% (35.3 million) of the U.S. population in 2000 and 24.4% (102.6 million) by 2050 (U.S. Census Bureau, 2004). The foreign-born from Latin America represent 52.2% of the total U.S. foreign-born population (32.5 million; 11.5% of the total U.S. population) (Schmidley, 2003; U.S. Census Bureau, 2003b). Mexicans comprise 66.9% of the U.S. Latino population (25.1 million) and 8.9% of the total U.S. population. Given the size of the Mexican-origin population, discussions of Latino immigration and health often focus on this Latino subgroup. In other cases, Latinos are not disaggregated by national origin, which might conceal important variation across Latino subgroups.

During 1970–2000, the first generation (i.e., foreign-born Latinos) contributed 45% of the growth of the Latino population, whereas the second generation (i.e., U.S.-born Latinos of immigrant parents) contributed 25%. In contrast, in 2000–2020, the second generation will contribute 47% of the growth of the Latino population, whereas the first generation will contribute only 28%. The second generation will surpass the first generation in size by 2020 (Suro & Passel, 2003). Given that foreign-born Latinos appear to have a health advantage over U.S.-born Latinos, the increase in the second generation might have implications for the health status of Latinos.

Overall, Latinos experience low socioeconomic status (SES) (Ramirez & De la Cruz, 2003). In 2002, among those aged 25+ years, 27% of Latinos had not completed ninth grade, whereas only 4% of non-Hispanic Whites had such low educational attainment. The Mexican-origin population is more likely to be of low SES than other Latino subgroups.

LATINO HEALTH PARADOXES

Some patterns in Latino health have received attention because they appear to contradict our expectations based on the well-documented social gradient in health [i.e., individuals of a higher SES have better health than those of a lower SES (Berkman & Kawachi, 2000) and the pervasive patterns of poor health among African Americans vis-à-vis Whites (Williams, 2001)]. However, the question of Latino health paradoxes is far from settled due to ambiguity in the definition(s) of paradox, limited comparable empirical evidence, limited testing of possible explanations for it, and limited discussion of its policy and intervention applications (Franzini, Ribble, & Keddie, 2001; Palloni & Arias, 2004 Palloni & Morenoff, 2001; Jasso et al., 2004).

TOWARD A WORKING DEFINITION OF LATINO HEALTH PARADOXES

The term *health* or *epidemiologic paradox* typically refers to a pattern of morbidity and/or mortality for a particular group (e.g., Latinos, immigrants) that is at odds with what would be expected given its socioeconomic profile. However, definitions and reference groups are often not explicit and might vary from study to study. For example, epidemiologic paradoxes are sometimes defined in relation to the *average* SES of a population group (e.g., it is paradoxical that Latinos have low rates of low birth weight given that, on average, they have a low SES). In other cases, the term *paradox* is used to denote a *residual protective effect* of Latino (or foreign-born) status that cannot be accounted for by measured demographic, socioeconomic, behavioral, and/or medical risk factors.

Because the notion of a health paradox presumes a socioeconomic gradient in health, an important first step should entail examining whether the association between SES and health is different among Latinos than among other racial/ethnic groups. Ideally, understanding Latino health paradoxes requires addressing the combined effects of race/ethnicity, immigrant status (i.e., nativity), and SES on health outcomes.

A significant issue in the study of health paradoxes is the choice of an appropriate reference group. Some studies have compared immigrants with the majority (i.e., U.S.-born non-Hispanic White) population, whereas others have compared immigrants to their U.S.-born racial/ethnic counterparts (e.g., foreign-born Mexicans to U.S.-born Mexicans) or to other U.S.-born racial/ethnic minorities (e.g., African Americans). Social science and health research on immigrant adaptation suggests that all these comparisons might be important, because Latino immigrants follow multiple adaptation pathways, including *assimilation* into the majority culture and preservation of an ethnic identity and assimilation into a U.S.-born ethnic minority group (Portes & Rumbaut, 2001a). Additionally, intergenerational comparisons within a given national-origin group allow us to test whether there is intergenerational advancement in health (or other) outcomes (Smith, 2003).

As described below, research has documented that Latino immigrants often exhibit a health advantage over non-Latinos and their U.S.-born counterparts. The protective effect of immigrant status though is not exclusive to Latinos. For some outcomes, immigrants of other racial/ethnic groups have also been shown to exhibit better health than their U.S.-born counterparts. A central research question is the extent to which Latino health paradoxes are related to Latino ethnicity versus immigration. Given that Latino health paradoxes are often attributed to cultural and/or social factors presumed to be specific to Latinos, the comparison with other immigrant groups might help clarify the role of such factors vis-à-vis immigrant health selectivity.

EMPIRICAL EVIDENCE ON LATINO HEALTH PARADOXES

Due to limited comparability across studies and the variety of health outcomes examined, it is difficult to characterize the empirical evidence on Latino health paradoxes. The fact that a U.S.-born comparison group is not used consistently across studies alone makes it difficult to draw conclusions about the extent and nature of these "paradoxes." Several review articles (Franzini, Ribble, & Keddie, 2001; Hayes-Bautista, 2002; Jasso et al., 2004; Palloni & Arias, 2004 Palloni & Morenoff, 2001) indicate that there is evidence that some Latino health outcomes exhibit paradoxical patterns. Instead of offering another review of the literature, this chapter presents some examples of mortality and health outcomes for which a Latino health

advantage has been documented. We focus on highlighting the questions that should inform future research on Latino health.

Adult Mortality

Based on the National Longitudinal Mortality Study (1979–1989), Singh and Siahpush (2001) found that all-cause mortality was significantly lower among immigrants than among the U.S.-born (18% lower for men and 13% lower for women), after adjusting for age, race/ethnicity, marital status, urban/rural residence, education, occupation, and family income. Black and Latino immigrant men (47% and 22% lower, respectively) and women (45% and 37% lower, respectively) exhibited a stronger reduction in mortality risk vis-à-vis their U.S.-born counterparts than immigrant White men (17% lower) and women (11% lower). Compared with U.S.-born whites of equivalent socioeconomic and demographic background, foreign-born Blacks, Latinos, Asians/Pacific Islanders (APIs), and Whites had respectively 48%, 45%, 43%, and 16% lower mortality risks. U.S.-born APIs and U.S.-born Hispanics also had lower mortality risk than comparable U.S.-born whites (32%, and 26%, respectively), whereas U.S.-born Blacks had an 8% higher mortality risk (Singh & Siahpush, 2002).

Research by Singh and Siahpush (2001) highlighted the need to study Latino health using as a comparison the experience of other racial/ethnic groups. The mortality data discussed earlier suggest that both Latino immigrants and U.S.-born Latinos have a health advantage over U.S.-born whites of comparable SES. However, the health advantage of Latino immigrants over Whites appears greater than that of U.S.-born Latinos.

Infant Health

Several studies have documented that infants born to Latino immigrant women tend to have better birth outcomes [i.e., lower rates of low birth weight (birth weight <2,500 g; LBW) and infant mortality (death during the first year of life)], than infants of U.S.-born women (Acevedo-Garcia, Soobader, & Berkman, 2005). In the 2004 Pediatric Nutrition Surveillance System, the crude prevalence of LBW was highest among Black infants (13.1%) and lowest among Latinos (7.6%), with White (8.8%) and API (8.3%) infants falling in the middle.

Using data from the 1998 Vital Statistics, Acevedo-Garcia and colleagues (Acevedo-Garcia, Soobader, & Berkman, 2005) showed that although immigrant status was not protective against LBW among Whites and it increased the risk among Asians by 24%, it reduced the risk by about 25% among Blacks and by about 19% among Latinos, after adjusting for maternal age, prenatal care, health behaviors and medical risk factors during pregnancy, and education. By educational attainment, for Whites, Blacks, and Latinos, the protective effect of foreign-born status was stronger among women with low education (i.e., 0–11 years) than among women with more education. The association between maternal education and LBW was less pronounced among foreign-born White, Black, and Hispanic women than among their U.S.-born counterparts. Although there was a clear negative education gradient (i.e., LBW rates decreased as education level increased) among U.S.-born women in these three racial/ethnic groups, the gradient was less pronounced among foreign-born Whites and Blacks and nearly flat among foreign-born Hispanics. This research illustrates again that the health advantage of immigrants vis-à-vis the U.S.-born is not confined to Latinos. Here, as in the above mortality example, the immigrant health advantage was strongest among Blacks. Also, instead of merely controlling for SES, this

research examined whether the effect of SES on health is different among immigrants than among the US-born. It appears that a low SES increases the risk of LBW among U.S.-born Latinos but not Latino immigrants.

Additionally, the research on infant health outcomes has shown that there are variations across Latino subgroups. Immigrant status is associated with a reduced risk of LBW among Mexicans by about 20% but does not seem to be protective against LBW among other Latino subgroups (i.e., Puerto Ricans, Cubans, and Central/South Americans) (Acevedo-Garcia, Soobader, & Berkman, in press).

Health Behaviors

Some studies suggest that Latinos and immigrants have more positive health behaviors, particularly related to substance use, than their non-Latino and U.S.-born counterparts. For example, compared to non-Latino whites, Latinos are less likely to consume cigarettes or alcohol, independent of SES (Abraido-Lanza, Chao, & Florez, 2005). Foreign nativity has also been found to be protective for illicit drug use among Mexican Americans, particularly women (Vega et al., 1998). Data from the 1995–1996 Tobacco Use Supplement of the Current Population Survey indicated that for all racial/ethnic groups, smoking rates were lower among first-generation immigrants (foreign born) and also among the second generation (those born in the United States of foreign-born parents) than among the third generation (those born in the United States of U.S.-born parents) (Acevedo-Garcia, Pan, et al., 2005).

The protective effect of being second generation or of being foreign born varied across racial/ethnic groups. For Whites, Asians, and Latinos being second generation or being foreign born were similarly protective against smoking. In contrast, for Blacks, although being foreign born was highly protective, being second generation was not. The protective effect of foreign-born status was highest for Blacks [odds ratio (OR) = 0.32] and lowest for Whites (OR = 0.77), whereas Asians (OR = 0.45) and Latinos (OR = 0.42) fell in the middle.

Mental Health

Research also suggests that Latino ethnicity and foreign nativity might be protective against psychiatric disorders. In broad racial/ethnic comparisons, "Hispanics" as well as non-Hispanic Blacks were at lower risk for disorders such as depression, generalized anxiety disorder, and social phobia compared to non-Hispanic Whites (Breslau et al., 2006). In national estimates, foreign-born Mexicans were at lower risk for substance use and mood and anxiety disorders compared to their U.S.-born counterparts, and U.S.-born Mexican Americans were, in turn, at lower risk than U.S.-born non-Hispanic Whites (Grant et al., 2004). Once again, however, it is not clear that this relative advantage extends to all Latinos (Ortega et al., 2000) or, conversely, that it is unique to Mexican Americans; foreign nativity has also been shown to be protective for non-Hispanic Whites (Grant et al., 2004).

Challenges to Latino Health

Although the focus of this chapter is on Latino health paradoxes, it is essential to recognize that there are health conditions for which Latinos do not exhibit a health advantage [e.g. diabetes, obesity, human immunodeficiency virus/autoimmunodeficiency syndrome (HIV/AIDS)]. In some cases (e.g., overweight/obesity) although Latino immigrants show lower rates than U.S.-born

Latinos, the rates among both groups are high from a clinical perspective as well as compared to other racial/ethnic groups. National estimates show the prevalence of obesity (among Mexican Americans) to be comparable to that of non-Hispanic Whites in 2001–2002 (31.0% and 30.2%, respectively) but considerably higher in 2003–2004 (36.8% compared to 31.0%, respectively) (Ogden et al., 2006). In 2002–2003, the prevalence of obesity among Latinos overall was 29.1%, compared to 9.4% among Asian Americans (Bates et al., 2008). These data also reveal dramatic increases in obesity among Latinos with each generation in the United States, ranging from 25.4% among the foreign-born to 35.7% in the third generation (U.S. born with two U.S.-born parents) (Bates et al., 2008). A similar pattern is suggested by analyses showing that obesity appears to increase among immigrants with years in the United States (Antecol & Bedard, 2006; Goel, McCarthy, Phillips, & Wee, 2004).

There are also health conditions for which some Latino subgroups show a disadvantage while other Latino subgroups show an advantage. For instance, although Puerto Ricans are the U.S. racial/ethnic group with the highest adult asthma rate (17% vs. a national average of 8.9%), Mexicans have the lowest rate (3.9%) (Rose, Mannino, & Leaderer, 2006). Whereas Puerto Rican children have the highest prevalence of lifetime asthma (26%), compared with Black children (16%) and White children (13%), Mexican children have the lowest prevalence (10%) (Lara et al., 2006).

Similarly, the attention toward Latino health paradoxes should not make us overlook the considerable barriers facing the Latino population: the highest health uninsurance rates (Brown & Yu, 2002); large numbers of individuals with undocumented immigrant status; and limited access to social benefits for immigrants who entered the United States after the 1996 Welfare Reform Act (Fix & Passel, 2002). For example, among individuals under 65 years, Mexicans have the lowest rate of health insurance (less than 60%), compared to both of the other Latino subgroups, such as Cubans (75%) and Puerto Ricans (85%), and to non-Hispanic Whites (87%) (National Center for Health Statistics, Centers for Disease Control and Prevention and Services, 2002). Also, certain Latino subpopulations, such as migrant farm workers (Villarejo, 2003) and residents of *colonias* along the Mexico-U.S. border (Weinberg et al., 2004) are at high risk for dangerous occupational and environmental exposures, such as musculoskeletal disorders, infectious diseases, and injuries.

PROPOSED EXPLANATIONS FOR LATINO HEALTH PARADOXES

There are least three types of explanation for Latino health paradoxes. First, some studies maintain that paradoxes are due to *cultural and/or social protective factors* (Hayes-Bautista, 2002), such as social support, familism, religion, and norms related to diet and substance use. This hypothesis is often presented in association with an acculturation hypothesis—that is, that there is an erosion of such protective factors with time spent in the United States (within one generation) and across generations, which results in a deterioration of health outcomes. Some studies have shown that the initial health advantage that Latino immigrants have over their U.S.-born counterparts declines with length of residence and/or in subsequent generations. However, acculturation is often poorly defined and is operationalized through demographic and/or English-language-use proxy indicators (Hunt, Schneider, & Corner, 2004). Some health research also tends to romanticize the experience of being a Latino immigrant, by speculating about (but rarely measuring) the role that social networks and families might play in protecting health while ignoring that socioeconomic

hardship and tenuous immigration status might severely compromise the effectiveness of these social supports (Menjivar, 2000).

Second, several authors contend that health paradoxes arise from a process of *healthy immigrant selection*. According to this view, some patterns in Latino health indeed run against our expectations based on social epidemiologic regularities observed in other populations, but they should not be interpreted as paradoxical because they reflect this selection effect (Palloni & Morenoff, 2001). A parallel selection process might also yield an "unhealthy remigration effect." There is evidence that the likelihood of staying in the destination country or reemigrating occurs selectively (Lindstrom, 1996) in ways that might similarly correspond to health status.

Third, some researchers suggest that paradoxical patterns might be due to data artifacts, including undercount of Latino deaths, inconsistent definitions of Latino identity (e.g., self-identification vs. Latino surnames), and underreporting of health problems (Franzini, Ribble, & Keddie, 2001; Jasso et al., 2004; Palloni & Morenoff, 2001). Additionally, some nonhealth studies of Mexican intergenerational performance suggest that inappropriate cross-sectional comparisons might create an erroneous impression of deterioration in health outcomes across generations (Jasso et al., 2004).

LIMITATIONS OF RESEARCH ON LATINO HEALTH

For the most part, the possible explanations for Latino health paradoxes have not been empirically tested, due to the interplay of conceptual and data limitations. Palloni and Morenoff (2001) argued that testing of these hypotheses might be precluded by a tendency to prematurely dismiss selection and data artifacts as possible mechanisms. Our reading of the relevant literature indicates that studies that advance selection as a possible explanation also dismiss complementary and/or alternative explanations, such as social and cultural factors. A tendency in some studies is to exclude the possibility that several mechanisms might be operating simultaneously and/or to acknowledge that with the data at hand, the ability to test for competing explanations is limited.

Other conceptual issues seem to prevent a more comprehensive examination of Latino health paradoxes. The notion of "acculturation" has been used in health research with a limited attention to its conceptualization. Often, immigrant health outcomes are examined with a focus on demographic variables or English use as markers for acculturation, without considering the broader concept of immigrant adaptation (i.e., social integration) as postulated, for example, in the segmented assimilation theory (Portes & Rumbaut, 2001a). Encouragingly, though, health studies have begun to address socioeconomic factors, contextual factors, and discrimination in the host society along with acculturation (Arcia et al., 2001). For instance, Finch, Kolody, & Vega (2000) showed that perceived discrimination and acculturative stress had independent effects on depression among Mexican-origin adults in California.

Another conceptual limitation, strongly influenced by lack of relevant data, is the limited attention paid to the country of origin background and influence. Some studies have begun to examine Latino health in relation to the immigrants' country of origin. Using health data for Mexico and the United States, Soldo, Wong, and Palloni (2002) examined the health of Mexican immigrants in the United States vis-à-vis their nonimmigrant counterparts in Mexico and those immigrants to the United States who did return to Mexico. Increasingly, health researchers

realize that a meaningful examination of immigrant health will require health data on the origin and destination countries.

TESTING POSSIBLE EXPLANATIONS FOR LATINO HEALTH PARADOXES

Although it appears that for various health outcomes, Latino and/or foreign-born Latino status confer a protective effect, new research designs are needed to test possible explanations. For instance, on average, immigrants might have better health than those in their country of origin who do not migrate and than those immigrants who return to their country of origin. Ideally, in order to explore the issue of selection, we would like to compare health outcomes among the foreign-born from a given country of origin with their U.S.-born ethnic counterparts, as well as with comparable individuals in their country of origin, including both those who have never migrated and return migrants. If we are interested in testing the effect of immigrant adaptation on health outcomes, we need longitudinal study designs that allow the long-term follow-up of immigrant trajectories since arrival in the United States. The New Immigrant Survey (Jasso et al., 2000) will allow such analyses for several documented immigrant cohorts.

To date, research has suggested intriguing patterns in Latino health, but the findings are open to different interpretations. In our research, we have found that education gradients in LBW are considerably attenuated among immigrant women (Latino and non-Latino) compared to their U.S.-born counterparts (Acevedo-Garcia, Soobader et al., 2005; Acevedo-Garcia et al., in press). This pattern leaves room for several explanations. If immigrant women are selected for being healthier or having better health behaviors across education levels, such health selection might override the education gradient. If, as suggested by Jasso et al. (2004), there is a minimum health level that would make migration worthwhile, selection might limit the dispersion in health outcomes among immigrants, thus flattening SES gradients. Alternatively, if present across SES levels, protective cultural factors might attenuate SES gradients.

Some studies have integrated data from multiple sources with the development of migration models of health selectivity (Jasso et al., 2004) or simulation exercises (Palloni & Morenoff, 2001). These studies strongly suggest that paradoxical patterns in Latino health could result from migrant health selection. Some data presented to support this view are suggestive but not conclusive. Jasso et al. (2004) have shown that foreign-born Latinos (and Asians) in the United States have higher life expectancy than their U.S.-born counterparts and than those in their sending regions. Although compelling, these data do not prove that the health advantage among the foreign-born is driven entirely or even primarily by immigrant selection.

Disentangling the potential effects on health of selection processes, immigration, and long-term adaptation in the receiving country is at best only approximated by existing study designs. Currently available data do not allow definitive determination of the causal role of any of these factors; theory would suggest that all three play a role to some degree and that the relative influence of each might vary by immigrant subgroup. For example, the selection hypothesis suggests that, other factors being equal, health selection would be stronger among immigrant groups that have to overcome greater obstacles (e.g., longer distances) to migrate to the United States. The evidence of health paradoxes among Mexicans might not be consistent with this logic. Until the mid-1980s, border controls along the Mexico-U.S. border were relatively loose, and Mexican immigration was dominated by a largely male-initiated, *circular* migration flow (seeking work in the United States during a specific season) (Massey, Durand, & Malone, 2002). Despite the

relative smoothness that characterized Mexican migration to the United States prior to 1986, there is empirical evidence of health paradoxes among Mexicans. In fact, the articulation of the Latino health paradox has been based largely on the Mexican case.

DIRECTIONS FOR FUTURE RESEARCH

Research on Latino health paradoxes might benefit from better explicit definitions of what is meant by health paradox, including the variables involved (e.g., race/ethnicity, immigrant status, SES), the group of interest, and the reference group (Palloni & Morenoff, 2001). Research questions should involve both the verification of Latino health paradoxes and their possible explanations. Ideally, studies should simultaneously and rigorously address the three types of explanation discussed earlier and allow for the possibility that more than one explanation might account for the observed patterns. Exploring possible explanations for Latino health paradoxes should involve explicit definitions (and sound operationalization) of concepts such as "acculturation," "protective cultural factors," and "social support." Qualitative study designs might allow a better conceptualization and measurement of protective factors at the individual level, as well as various contextual levels (e.g., family, neighborhood). For example, although it is often assumed that social networks are supportive, under economic hardship and unfavorable contexts of reception, immigrant social networks might offer limited support (Menjivar, 2000). Therefore, examining the role of social factors in Latino health paradoxes might require measuring the structure of social networks, the content of their exchanges in different contexts, and specifically how these exchanges benefit (or hinder) health.

EXPLICIT RESEARCH DESIGNS TO STUDY LATINO IMMIGRANTS AND THEIR ADAPTATION

Health researchers should be more proactive, incorporating theories and research designs that have been fruitful in the study of Latino immigrant adaptation. Only recently, new health surveys have begun to incorporate such information. The National Latino and Asian American Study (NLAAS) is a nationally representative study of psychiatric morbidity and mental health service use among Latino and Asian American adults that samples eight ethnic subgroups (Puerto Ricans, Cubans, Mexicans, other Latinos, Chinese, Filipinos, Vietnamese, and other Asians). The survey was administered in five languages and provides extensive data on immigration parameters (e.g., generation status, length of time in the United States, citizenship), acculturation processes, SES, and important aspects of immigrants' experience of the social context (e.g., social capital and support, and perceptions of discrimination and neighborhood safety) (Alegria et al., 2004). Similarly, studies of immigrant adaptation such as the New Immigrant Survey (Jasso et al., 2000), a longitudinal study of several documented immigrant cohorts, have begun to include extensive questions on health status, health behaviors, and access to health care before and after immigration to the United States.

As noted earlier, previous research has highlighted heterogeneity in health outcomes among Hispanics/Latinos showing, for example, a higher burden of asthma, LBW, and self-reported physical limitations among Puerto Ricans on the U.S. mainland (Hajat, Lucas, & Kington, 2000; Mendoza et al., 1991 Rose, Mannino, & Leaderer, 2006) and higher levels of obesity

among U.S.-born Mexican Americans (Bates et al., 2008). However, nationally representative prevalence data accounting for the full heterogeneity of Latinos are rare, and sample size limitations almost always preclude analyses of subgroup differences in health determinants. Study designs should ideally allow comparisons across various national-origin groups and among immigrants with different durations in the United States, their U.S.-born ethnic counterparts (including the second generation), their nonmigrant counterparts in the country of origin, and return migrants. Due to the large size of the Mexican-origin population, any distinct pattern among Mexicans is likely to dominate patterns among Latinos overall. Differences across Latino subgroups might reflect differences in country of origin background factors, migration experiences, as well as incorporation into U.S. society. Puerto Ricans constitute an important subgroup both because they often have unfavorable health outcomes compared to other Latino groups and because they can serve as a reference group to test the selection hypothesis. As U.S. citizens, Puerto Ricans face relatively lower obstacles to migration to the mainland and therefore might be less health selected—or selected differently—than other Latino subgroups.

There is also need for studies that address the issue of immigration broadly and allow us to compare Latino health paradoxes for different outcomes to the health profiles and trajectories of other immigrant groups and to examine what individual and contextual factors account for any differences. The NLAAS (Alegria et al., 2004) and the New Immigrant Survey (Jasso et al., 2000) constitute important steps in this direction.

The lack of longitudinal data on immigrant health is a significant limitation. Important developments in sociological research on immigrant adaptation have relied on longitudinal surveys that collect information from immigrant parents and their children on various domains of life such as family relations, employment, and school performance (Portes & Rumbaut, 2001b; Suarez-Orozco & Suarez-Orozco, 2001). In addition to longitudinal studies, using sound analytic methods to make proper intergenerational comparisons might lead to reassessing whether health and other outcomes deteriorate across generations (Alba et al, 2006; Jasso et al., 2004). Studying intergenerational health patterns in light of differences in the context of immigration might help us assess the role of selection. For example, Mexicans who migrated to the United States after stricter border controls were implemented in 1986 (Massey, Durand, & Malone, 2002) might be more health-selected than those who migrated earlier.

IMPLICATIONS OF LATINO HEALTH PARADOXES IN THE CONTEXT OF DEMOGRAPHIC CHANGE

Why should we pay attention to Latino health paradoxes? Given the growing demographic significance of the Latino population, the apparent resilience of Latinos in relation to some health outcomes might imply that the health of the overall U.S. population is considerably better than it would have been if Latinos did not have paradoxical health outcomes. Consider, for example, the relatively low rates of LBW among Latino women with less than a high school education (Acevedo-Garcia, Soobader et al., 2005). Given that 43% of U.S. Hispanic women have less than high school education (U.S. Census Bureau, 2003b), what would be the implications if Latino women with limited education had the high rates of LBW of U.S.-born White women or African American women with the same educational attainment?

Because it appears that the first generation has a better health profile than Latinos born in the United States, the rapid growth in the second generation might imply that the health profile of the total U.S. Latino population might worsen over time, assuming no persistence of health paradoxes from the first into the second generation. Neither the selection nor acculturation hypotheses explicitly negate the possibility of preserving the foreign-born health advantage into the second generation and beyond. The presumed bases for health selection are not well specified in the literature, but both genes and behaviors consistent with good health can potentially be passed on to subsequent generations. However, empirical evidence to date, although limited, is not consistent with this scenario. Further research should clarify whether this apparent deterioration in health across generations is real and inevitable or whether in fact through immigration policies and programs that facilitate successful immigrant adaptation (e.g., by strengthening immigrant families; Portes & Rumbaut, 2001a), the health advantages of the foreign born could be sustained.

REFERENCES

Abraido-Lanza, A. F., Chao, M. T., & Florez, K. R. (2005). Do Healthy Behaviors Decline with Greater Acculturation? Implications for the Latino Mortality Paradox. *Social Science and Medicine*, *61*(6), 1243–1255.

Acevedo-Garcia, D., Pan, J., Jun, H. J., Osypuk, T. L., & Emmons, K. M. (2005). The Effect of Immigrant Generation on Smoking. *Social Science and Medicine, 61*(6), 1223–1242.

Acevedo-Garcia, D., Soobader, M. J., & Berkman, L. F. (2005). The Differential Effect of Foreign-Born Status on Low-Birthweight by Race/Ethnicity and Education. *Pediatrics, 115*, e20–e30.

Acevedo-Garcia, D., Soobader, M. J., & Berkman, L. F. (in press). Low Birthweight Among US Hispanic/Latino Subgroups: The Effect of Maternal Foreign-Born Status and Education. *Social Science and Medicine*.

Alba, R. D., Abdel-Hady, D., Islam, T., & Marotz, K. (2006). Downward Assimilation and Mexican-Americans: An Examination of Intergenerational Advance and Stagnation in Educational Attainment. In Alba, R. and Waters, M. (Eds.), *Proceedings from the Second Generation Conference*.

Alegria, M., Takeuchi, D., Canino, G., Duan, N., Shrout, P., Meng, X., Vega. W., Zane, N., Vila, D., Woo, M., Vera, M., Guarnaccia, P., Aguilar-Gaxiola, S., Sue, S., Escobar, J., Lin, K., & Gong, F. (2004). Considering Context, Place and Culture: the National Latino and Asian American Study. *International Journal of Methods in Psychiatric Research, 13*(4), 208–220.

Antecol, H., & Bedard, K. (2006). Unhealthy Assimilation: Why Do Immigrants Converge to American Health Status Levels? *Demography, 43*(2), 337–360.

Arcia, E., Skinner, M., Bailey, D., & Correa, V. (2001). Models of Acculturation and Health Behaviors Among Latino Immigrants to the US. *Social Science and Medicine, 53*(1), 41–53.

Bates, L., Acevedo-Garcia, D., Alegria, M., & Krieger, N. (forthcoming Jan, 2008). Immigration and Generational Trends in Body Mass Index and Obesity in the United States: Results of the National Latino and Asian-American Survey (NLAAS), 2002–2003. *American Journal of Public Health*.

Berkman, L., & Kawachi, I. (Eds.). (2000). *Social Epidemiology*. New York: Oxford University Press.

Breslau, J., Aquilar-Gaxiola, S., Kendler, K., Su, M., Williams, D., & Kessler, R. (2006). Specifying Race-Ethnic Differences in Risks for Psychiatric Disorder in a USA National Sample. *Psychological Medicine 36*(1), 57–68.

Brown, E. R., & Yu, H. (2002). Latinos'' Access To Employment-Based Health Insurance. In M. M. Suarez-Orozco & M. Paez (Eds.), *Latinos Remaking America* (pp. 215–235). Berkeley: University of California Press; David Rockefeller Center for Latin American Studies.

Finch, B., Kolody, B., & Vega, W. (2000). Perceived Discrimination and Depression Among Mexican-Origin Adults in California. *Journal of Health and Social Behavior, 41*(3), 295–313.

Fix, M., & Passel, J. (2002). Assessing Welfare Reform's Immigrant Provisions. In A. Weil & K. Finegold (Eds.), *Welfare Reform: The Next Act* (pp. 179–202). Washington, DC: The Urban Institute.

Franzini, L., Ribble, J. C., & Keddie, A. M. (2001). Understanding the Hispanic Paradox. *Ethnicity and Disease, 11*(3), 496–518.

Goel, M. S., McCarthy, E., Phillips, R., & Wee, C. (2004). Obesity Among US Immigrant Subgroups by Duration of Residence. *Journal of the American Medical Association, 292*(23), 2860–2867.

Grant, B., Stinson, F., Hasin, D., Dawson, D., Chou, S., & Anderson, K. (2004). Immigration and Lifetime Prevalence of DSM-IV Psychiatric Disorders Among Mexican Americans and Non-Hispanic Whites in the United States: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry, 61*(12), 1226–1233.

Hajat, A., Lucas, J. B., & Kington, R. (2000). Health Outcomes Among Hispanic Subgroups: Data from the National Health Interview Survey, 1002-95. *Advance Data, 310,* 1–14.

Hayes-Bautista, D. E. (2002). The Latino Health Research Agenda for the Twenty-first Century. In M. M. Suarez-Orozco & M. Paez (Eds.), *Latinos Remaking America* (pp. 215–235). Berkeley: University of California Press; David Rockefeller Center for Latin American Studies.

Hunt, L. M., Schneider, S., & Corner, B. (2004). Should "Acculturation" Be a Variable in Health Research? A Critical Review of Research on US Hispanics. *Social Science and Medicine, 59*(2004), 973–986.

Huntington, S. P. (2004). *Who Are We? The Challenges to America's National Identity*. New York: Simon and Schuster.

Jasso, G., Massey, D. S., Rosenzweig, M. R., & Smith, J. P. (2000). The New Immigrant Survey Pilot (NIS-P): Overview and New Findings about US Legal Immigrants at Admission. *Demography, 37*(1), 127–138.

Jasso, G., Massey, D. S., Rosenzweig, M. R., & Smith, J. P. (2004). Immigrant Health Selectivity and Acculturation. In N. B. Anderson, R. A. Bulatao, & B. Cohen, In Panel on Race Ethnicity and Health in Later Life and National Research Council (Eds.), *Critical Perspectives on Racial and Ethnic Differences in Health in Late Life* (pp. 227–266). Washington, DC: The National Academies Press.

Lara, M., Akinbami, L., Flores, G., & Morgenstern, H. (2006). Heterogeneity of Childhood Asthma Among Hispanic Children: Puerto Rican Children Bear a disproportionate Burden. *Pediatrics, 117*(1), 43–53.

Lindstrom, D. P. (1996). Economic Opportunity in Mexico and Return Migration from the United States. *Demography, 33*(3), 367–374.

Massey, D. S., Durand, J., & Malone, N. J. (2002). *Beyond Smoke and Mirrors: Mexican Immigration in an Era of Economic Integration*. New York: Russell Sage Foundation.

Mendoza, F. S., Ventura, S. J., Valdez, R. B., Castillo, R. O., Saldivar, L. E., Baisden, K., & Martorell, R. (1991). Selected Measures of Health Status for Mexican-American, Mainland Puerto Rican, and Cuban-American Children. *Journal of the American Medical Association, 265*(2), 227–232.

Menjivar, C. (2000). *Fragmented Ties: Salvadoran Immigrant Networks in America*. Berkeley: University of California Press.

National Center for Health Statistics, Centers for Disease Control and Prevention, Department of Health and Human Services. (2002). A Demographic and Health Snapshot of the U.S. Hispanic/Latino Population. 2002 National Hispanic Health Leadership Summit, National Center for Health Statistics, Centers for Disease Control and Prevention, 2006. Retrieved July 17, 2006, from http://www.cdc.gov/NCHS/data/ hpdata2010/chcsummit.pdf.

Ogden, C., Carroll, M., Curtin, L., McDowell, M., Tabak, C., & Flegal, K. (2006). Prevalence of Overweight and Obesity in the United States, 1999–2004. *Journal of the American Medical Association, 295*(13), 1549–1555.

Ortega, A. N., Rosenheck, R., Alegria, M., & Desai, R. A. (2000). Acculturation and the Lifetime Risk of Psychiatric and substance Use Disorders Among Hispanics. *Journal of Nervous and Mental Disease*, *188*(11), 728–735.

Palloni, A., & Arias, E. (2004). Paradox Lost: Explaining the Hispanic Adult Mortality Advantage. *Demography, 41*(3), 385–415.

Palloni, A., & Morenoff, J. D. (2001). Interpreting the Paradoxical in the Hispanic Paradox: Demographic and Epidemiologic Approaches. *Annals of the New York Academy of Sciences*, *954*, 140–174.

Portes, A., & Rumbaut, R. G. (2001a). *Legacies: The Story of the Immigrant Second Generation*. Los Angeles: University of California Press, Russell Sage Foundation.

Portes, A., & Rumbaut, R. G. (2001b). *The New Americans*. Los Angeles: University of California Press, Russell Sage Foundation.

Ramirez, R. R., & De la Cruz, G. P. (2003). *The Hispanic Population in the United States: March 2002* (U.S. Census Bureau No. 8). Washington, DC: Government Printing Office.

Rose, D., Mannino, D., & Leaderer, B. (2006). Asthma Prevalence Among US Adults, 1998–2000: Role of Puerto Rican Ethnicity and Behavioral and Geographic Factors. *American Journal of Public Health, 96*(5), 880–888.

Rumbaut, R. G. (1999). Assimilation and Its Discontents: Ironies and Paradoxes. In C. Hirschman, J. Dewind, & P. Kasinitz, (Eds.), *The Handbook of International Migration: The American Experience* (pp. 172–195). New York: Russell Sage Foundation.

Schmidley, A. D. (2003). *The Foreign-Born Population in the United States: March 2002* (U.S. Census Bureau No. 70). Washington, DC: Government Printing Office. Retrieved July 17, 2006, from http://www.census.gov/prod/ 2003pubs/p20-539.pdf.

Singh, G. K., & Siahpush, M. (2001). All-Cause and cause-Specific Mortality of Immigrants and Native Born in the United States. *American Journal of Public Health*, *91*(3), 392–399.

Singh, G. K., & Siahpush, M. (2002). Ethnic-Immigrant Differentials In Health Behaviors, Morbidity, and Cause-Specific Mortality in the United States: An Analysis of Two National Data Bases. *Human Biology*, *74*(1), 83–109.

Smith, J. P. (2003). Assimilation Across the Latino Generations. *AEA Papers and Proceedings*, *93*(May), 315–319.

Soldo, B., Wong, R., & Palloni, A. (2002). Migrant Health Selection: Evidence from Mexico and the US. Annual Meetings of the Population Association of America, Atlanta, GA, May 9–11.

Suarez-Orozco, C., & Suarez-Orozco, M. M. (2001). *Children of Immigration*. Cambridge, MA: Harvard University Press.

Suarez-Orozco, M. M., & Paez, M. (Eds.). (2002). *Latinos Remaking America*. Berkeley, CA: University of California Press, David Rockefeller Center for Latin American Studies.

Suro, R., & Passel, J. S. (2003). *The Rise of the Second Generation: Changing Patterns in Hispanic Population Growth*. Washington, DC: Pew Hispanic Center.

U.S. Census Bureau. (2003b). Table 7.2. Educational Attainment of the Population Age 25 years and over by Sex and Hispanic Origin Type: March 2002, U.S. Census Bureau, Population Division, Ethnic & Hispanic Statistics Branch, 2005. Available at: http://www.census.gov/population/socdemo/hispanic/pp1–165/tab07–2.pdf.

U.S. Census Bureau. (2004). Table 1a. Projected Population of the United States, by Race and Hispanic Origin: 2000 to 2050, U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin, Washington, DC: US Census Bureau. Retrieved July 17, 2006, from http://www.census.gov/ipc/www/usinterimproj/natprojtab01a.pdf.

Vega, W.A., Alderete, E., Kolody, B., & Aguilar-Gaxiola, S. (1998). Illicit drug use among Mexicans and Mexican Americans in California: The Effects of Gender and Acculturation. *Addiction*, *93*(12), 1839–1850.

Villarejo, D. (2003). The Health of U.S. Hired Farm Workers. *Annual Review of Public Health, 24*, 175–193.

Weinberg, M., Hopkins, J., Farrington, L., Gresham, L., Ginsberg, M., & Bell, B. (2004). Hepatitis A in Hispanic Children Who Live Along the United States-Mexico Border: The Role of International Travel and Food-Borne Exposures. *Pediatrics, 114*(1), e68–e73.

Williams, D. R. (2001). Racial Variations in Adult Health Status: Patterns, Paradoxes, and Prospects. In N. J. Smelser, W. J. Wilson, F. Mitchell, & National Research Council (Eds.), *America Becoming: Racial Trends and Their Consequences* (pp. 371–410). Washington, DC: National Academy Press.