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A Comparison of the Health of Older Hispanics in the United States and Mexico:

Methodological Challenges

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Abstract

Objectives—This study compares various dimensions of physical and emotional health between older Mexican-origin individuals in the United States and in Mexico.

Method—The samples are drawn from the Mexican Health and Aging Study (MHAS) and the Hispanic Established Epidemiologic Study of the Elderly (H-EPESE) and include 3,875 Mexican residents with no history of residence in the United States and 2,734 Mexican-origin individuals 65 and older who live in the southwestern United States.

Results—Both immigrant and native-born Mexican-origin elders in the United States report more chronic conditions than elderly Mexicans, but they report fewer symptoms of psychological distress. Longer residence in the United States is associated with higher body mass index scores.

Discussion—The discussion addresses the possibility that access to care influences reports of diagnosed conditions and touches on issues of comparability in cross-cultural research and the difficulty in clearly distinguishing cultural and system-level factors in the production and measurement of health.

Keywords

Hispanic health; older Mexican Americans; health measurement; Hispanic Established Epidemiologic Study of the Elderly; Mexican Health and Aging Study

The life spans of older Mexican-origin men and women in the United States have increased along with those of the population at large, yet this group suffers disproportionately from a number of illnesses and conditions that can seriously compromise health and result in disability (Markides & Eschbach, 2005). Older Mexican-origin individuals face an elevated risk of type 2 diabetes, which some evidence suggests may reflect a genetic predisposition (Haffner, Hazuda, Patterson, & Stern, 1991; Lorenzo et al., 2001). They also face a higher risk of suffering the consequences of diabetes, including circulation and foot problems, and they are more likely than non-Hispanic White older individuals to fall victim to heart disease, stroke, and hypertension (Black, Ray, & Markides, 1999). The risk of developing

these conditions is increased by obesity, which is common among individuals of Mexican origin in the United States (Centers for Disease Control and Prevention, 2004).

For older Mexican-origin individuals, elevated rates of diabetes and related chronic conditions directly translate into higher rates of disability than those found in the non-Hispanic elderly population (Markides, Eschbach, Ray, & Peek, 2007). Chronic physical illness not only compromises functioning but has negative emotional consequences as well. Data from the Hispanic Established Populations for the Epidemiologic Study of the Elderly study (H-EPESE) reveal a great deal of depression among older Mexican-origin diabetics (Black, 1999). Although the older Mexican-origin population faces a generally elevated risk of diabetes and other conditions, the relative risks of specific health conditions differ within this population as a function of more specific factors, including nativity. For many conditions, including the risk of death and dementia resulting from the complications of type 2 diabetes, the native born face a higher risk than do the foreign born (Haan et al., 2003).

Such evidence of nativity differentials in morbidity and mortality, and evidence of a significant impact of the age of migration on physical functioning and mental health in later life, gives rise to questions concerning possible roles of selection, culture, economics, and medical system factors on health and its measurement in comparative contexts (Angel, Angel, & Markides, 2003; Angel & Williams, 2000; Bulatao & Anderson, 2004; Dey & Lucas, 2006; Jasso, Massey, Rosenzweig, & Smith, 2004; Palloni & Arias, 2004). Given the salience of migration for the Mexican-origin population, migration selectivity poses a potentially serious problem in the assessment of nativity differentials in morbidity and mortality. Palloni and Arias (2004) report lower mortality rates among foreign-born Hispanics other than Cubans or Puerto Ricans than either non-Hispanic Whites or native-born Hispanics, despite greater socioeconomic disadvantage among the foreign born. This mortality gap is particularly pronounced for the Mexican-origin population of the border states. One explanation for this “epidemiological paradox” is the possibility that the ill and infirm return home to Mexico to die and thus do not appear in U.S. vital statistics data, resulting in underestimates of foreign-born mortality rates. The possibility of this “salmon effect,” a name that has been used to characterize this potential tendency to return to one's place of birth at the time of death, affects estimates of mortality or the prevalence of specific morbidity conditions and calls for caution in the interpretation of observed or self-reported differences in health outcomes related to nativity.

In addition to selection, economic and health care system factors potentially affect real levels of health and responses to survey probes concerning self-assessed health or diagnosed conditions. Although reasonably high concordance between self-reported and objectively assessed measures of diabetes risks and obesity have been demonstrated in Mexico (Palloni, Soldo, & Wong, 2003), sufficient potential variation in individual reports of these and other conditions related to other factors remains (Patel, Peek, Wong, & Markides, 2006). One such factor is access to health care, which influences both health levels and the likelihood that a respondent will report diagnosed conditions. Thus, to begin to isolate the impact of culture, social class, and other demographic factors from those of other structural factors, we employ similar health-related data collected among older Mexican-origin individuals in the southwestern United States and older individuals in Mexico. Although these individuals

share similar cultural roots, they differ in terms of major health-related risk factors such as migration selectivity, education, income, and the medical environment in which they obtain care.

As in the United States, Mexico's epidemiological profile increasingly reflects the health problems associated with an aging population (Frenk, 2007). Improved nutrition and living conditions have increased life expectancies at all ages, and although Mexico remains young as the result of high fertility, the population older than 60 is growing rapidly; between 1993 and 2003, it increased from 6.1% to 7.4% of the population (World Health Organization, 2005). Between 1970 and 2004, life expectancy at birth increased from 58.5 to 72.7 for men and from 63.2 to 77.6 for women (Organisation for Economic Co-operation and Development [OECD], 2006b). As a consequence, chronic and degenerative diseases such as heart disease and cancer have become leading causes of death (Frenk, 2007).

Despite improvements in general health levels in both the United States and Mexico, access to preventive and acute care remains problematic for many older Mexican-origin individuals in the United States and for older Mexicans, although access to the full range of health care services is clearly superior in the United States than in Mexico. In Mexico, high rates of poverty and a fragmented health care system place poor elderly individuals at risk of inadequate care. In the United States, despite nearly universal Medicare coverage, many poor Mexican-origin elderly do not have supplemental Medigap policies to cover the costs Medicare does not pay (Angel et al., 2003). A large body of research clearly shows that adequate coverage is associated with better health and a lack of coverage with negative health outcomes (Hargraves & Hadley, 2003; Institute of Medicine, 2001). A comparison of the health levels of individuals with roughly similar socioeconomic and cultural profiles in Mexico and the United States allows us to begin to determine how structural factors relate to overall socioeconomic well-being and access to health care and how they affect the health of the elderly.

Difficulties in Comparative Research

Comparative health and health services research introduces a set of problems to which epidemiologists and health system researchers are increasingly sensitive (Angel, 2006; Rogler, 1999). A growing body of literature makes it clear that individual health-related behaviors, including the propensity to seek various forms of treatment and compliance with prescribed regimes, are influenced by predispositions and beliefs that reflect cultural factors and individual experiences and personal capacities (Angel & Williams, 2000). Translation presents only one set of problems that are part of the complex task of assessing and insuring reasonable comparability of the information obtained for individuals in very different cultural, social, and economic situations. Understanding the response task involves much more than the direct application of cognitive models and theories derived from one culture to another culture (Angel, 2006; Angel & Thoits, 1987; Angel & Williams, 2000). In most comparative research, cultural and linguistic factors are inextricably intertwined with structural factors. Although migrants represent a select group from their nation of origin, in most cases they are not the most affluent members of the sending society. The massive

migration of Mexicans to the United States for the purpose of employment directly results from restricted opportunities and a generally lower level of living in Mexico.

Yet individual-level factors make up only part of the explanation for differential health levels. Individual decisions concerning seeking health care are also constrained by economics and higher-level institutional factors related to the organization and financing of health care. One might conceptualize an individual's or a family's decisions concerning seeking health care in terms of a rational choice model in which options are chosen on the basis of culturally based beliefs and perceived constraints from a limited set of structurally determined alternatives based on economic and organizational factors. To fully understand the forces that influence individual behaviors related to health care and health outcomes, therefore, it is necessary to specifically model the influence of such contextual factors. Failure to do so runs the risk of misattributing structural influences to individual characteristics. A key initial step in understanding the impact of structural factors on individual behavior and outcomes, then, is to understand the health care system in which individuals and families choose among whatever options are available. We begin with an examination of the health care systems of the United States and Mexico, with a particular focus on the options available to older individuals in both countries.

Health Care Access in the United States

Since its introduction in 1965, Medicare has become the major source of health care coverage for elderly and disabled Americans. Medicare is the largest government health care entitlement program, with expenditures of \$333 billion in 2005, a figure that represented 2.7% of the gross domestic product (GDP; Congressional Budget Office, 2006). In 2001, the annual program expenditures per beneficiary were approximately \$7,000 (Holtz-Eakin, 2003). Although the elderly, including the Mexican-origin elderly, enjoy nearly universal coverage, Medicare includes premiums, deductibles, and other uncovered expenditures that for older minority Americans living on limited incomes can represent a serious economic burden (Angel, Angel, & Markides, 2002). Only recently has coverage for part of the cost of prescription drugs become available as Medicare Part D, but even with this added coverage older individuals with few assets and limited incomes face serious financial burdens and the possibility of having to do without needed care.

For middle-class Americans, privately purchased Medigap policies or coverage from an employer that is part of a retirement package cover what Medicare does not. In addition, a growing number of middle-class elderly individuals have long-term care insurance to partially offset the massive expenses incurred for nursing home care. The impoverished elderly do not have access to such supplemental coverage, and for those elderly individuals with no assets, Medicaid serves as the safety net to pay for nursing home care and the other expenditures for which they are responsible. Yet only one third (36%) of poor older individuals receive Medicaid (Rowland & Lyons, 1996). Older Mexican-origin individuals, and especially the foreign born and groups with low incomes, few assets, and no Medigap coverage, frequently find themselves completely reliant on Medicare, which means that they are at elevated risk of not receiving the full range of services and supports they need (Angel et al., 2002).

Health Care Access in Mexico

Mexican health care is quite different from that of the United States. Because it is less wealthy than the United States, Mexico simply cannot provide all of the services the elderly need at public expense. Although health care spending has increased in recent years, Mexico spends a relatively small fraction of GDP on public health care compared to other OECD (2006a) countries. The Mexican health care system is fragmented and consists of a number of subsystems of insurers and providers that serve different segments of the population and provide different quality services (OECD, 2005). Although in theory all Mexicans have a right to health care, access to care and the quality of care one receives depend on one's employment status and income. Those with the most complete access, approximately half of the population, are individuals in salaried jobs in which they are covered by various health funds that make up the Social Security System, which also includes smaller funds or other plans such as those sponsored by the military or Petróleos Mexicanos (PEMEX), the Mexican petroleum monopoly (OECD, 2005). An almost insignificant fraction of the population is covered by private health insurance.

The 50% of the Mexican population who are not covered by the Social Security System, which includes individuals who are self-employed and those who work in the informal economy, have access to care through a number of public programs administered by the federal and state governments (Frenk, Lozano, & González-Block, 1994; OECD, 2006a). The public system for the poor receives less funding and is clearly inferior to the system for salaried employees. Even with what is nearly universal health care coverage in theory, more than half of health care expenditures in Mexico are paid for out of pocket. Because of extensive poverty and inadequate coverage, many Mexicans, including the elderly, face serious barriers to health care. Formal long-term care is unavailable, and the infirm elderly must rely on their families when they can no longer care for themselves. Many of the most seriously under-served Mexicans live in rural areas or in the poorer states of the south.

In recent years, Mexico has introduced various programs to improve access for the uninsured and low-income individuals (Knaul & Frenk, 2005; OECD, 2005). These new programs have increased access to medical services and will hopefully further increase coverage for the unemployed and those who work in the informal sector (Frenk, Sepúlveda, Gómez-Dantés, & Knaul, 2003; OECD, 2006a). Although overall levels of health care coverage in Mexico are low for all age groups, individuals aged 60 or older have higher rates of coverage than do younger age groups (Wallace & Gutierrez, 2005). The most recent data available indicate that slightly more than half of those older than 60 have health care coverage of some sort (Wong, Díaz, & Espinoza, 2006). Women tend to receive more health benefits than men in later life, possibly because of a greater tendency to live with family members who have coverage (Wong & Parker, 1999). The health consequences of these differential levels of coverage are as yet poorly understood (Wong et al., 2006). Combined with Mexico's high levels of poverty and its less developed health care system, one would be surprised if these access differences did not parallel different levels of health and functioning.

Given our interest in the relative importance of individual health-related behaviors and predispositions and of economic and system-level factors, in the following analyses we focus on the specific implications of nation of residence and migration on various survey-based measures of health. Although in the data that we analyze elderly Mexican individuals in Mexico tend to report worse health than their U.S. Mexican-origin counterparts, assessing the extent to which these differentials reflect cultural differences, reporting artifacts, or other factors independent of actual health levels can be done only indirectly and inferentially. Few studies provide true objective assessments or diagnoses of specific conditions. The analyses we employ offer indirect evidence of the relative roles of cultural and system factors. In the sort of comparison we conduct, complete equivalence of samples is not possible. Older individuals who have migrated to the United States are potentially quite different from individuals who never migrated or those who returned to Mexico. Comparative research, even of a quantitative sort, remains highly interpretive and requires a sensitive understanding of the cultural groups studied and the economic, political, and social contexts in which they live.

Samples and Method

To begin to understand how responses to health probes in surveys are affected by cultural and structural factors, including those related to the financing and organization of health care for the elderly, we employ H-EPESE to assess health levels in the United States and the Mexican Health and Aging Study (MHAS) with similar, but not identical, data in Mexico. Both surveys include detailed information on demographics, socioeconomic characteristics, migration history where applicable, and physical and mental health and functioning (Wong & Espinoza, 2004). Although they provide useful comparative information, the two data sets differ in important respects, and we focus more on similarities or differences in general patterns rather than on specific prevalence rates.

The H-EPESE is a longitudinal study based on an original probability sample of 3,050 Mexican-origin individuals aged 65 and older in the five southwestern states of Arizona, California, Colorado, New Mexico, and Texas who were first interviewed in 1993-1994. The baseline H-EPESE response rate was 86%. The MHAS consists of a national probability sample of 15,186 Mexicans aged 50 and older interviewed in Mexico in 2001. The baseline MHAS response rate was 90%. To compare MHAS respondents to H-EPESE respondents, we restrict the analysis to MHAS respondents aged 65 and older. In both surveys, information on respondents who could not answer for themselves was provided by proxy respondents. These cases have been deleted from the analyses because of missing or invalid responses on selected outcome variables (MHAS $n = 449$, H-EPESE $n = 316$). H-EPESE respondents were given the option of taking the survey in Spanish, and more than three fourths (77.8%) did so.

From these two data sources, we created five groups: (a) Mexican residents with no history of residence in the United States (MHAS, $n = 3,875$), (b) U.S. residents who were born in Mexico and migrated to the United States between the ages of 1 and 19 (H-EPESE, $n = 383$), (c) U.S. residents who were born in Mexico and migrated to the United States between the ages of 20 and 49 (H-EPESE, $n = 578$), (d) U.S. residents who were born in Mexico and

migrated to the United States between the ages of 50 and 90 (H-EPESE, $n = 232$), and (e) U.S. residents who were born in the United States (H-EPESE, $n = 1,541$). We excluded 578 individuals in the MHAS who reported that they had lived or worked in the United States to isolate the MHAS reference group from significant exposure to U.S. systems and culture. Spanish and English versions of the health questions are presented in the appendix.

Dependent Variables

Psychological distress—We use measures adapted from the Center for Epidemiologic Studies Depression scale (CES-D) that were administered in both surveys to assess psychological distress (see Radloff, 1977). The original CES-D contains 20 items. To more accurately compare rates of psychological distress across groups, subsequent analyses are limited to seven items that appear in both surveys. Both H-EPESE and MHAS respondents were asked to indicate whether during the past week (a) they had felt depressed, (b) that everything they did was an effort, (c) their sleep was restless, (d) they felt unhappy, (e) they felt lonely, (f) they did not enjoy life, or (g) they felt sad. The response categories for each survey are different. H-EPESE respondents were asked whether they experienced these symptoms *rarely or none of the time* (1), *some of the time* (2), *occasionally* (3), or *most or all of the time* (4). MHAS respondents were asked to indicate whether or not they had experienced any symptoms during the “majority” of the past week, and the potential responses were yes (1) and no (0). To increase the comparability of the CES-D between the two samples the H-EPESE items were recoded most or all of the time (1) and otherwise (0). The final psychological distress measure represents a summed index of the seven items.

Health risk factors—Our measurement of health risk factors includes body mass index (BMI), smoking, and drinking behavior. Using the standard formula and documented thresholds provided by the Centers for Disease Control, we coded BMI as 1 for obese, a BMI of 30 or more, and 0 for otherwise. In the MHAS, height and weight were reported by the respondent, whereas in the H-EPESE respondents were measured and weighted by the interviewer. Smoking behavior is operationalized as pack-years. We measure pack-years by multiplying the number of years the respondent smoked by the average number of packs (20 cigarettes per pack) during that time.

To measure heavy drinking and drinking problems, we use items adapted from the CAGE instrument (the first letter of a keyword in each question spells *CAGE*; e.g., cut down, annoyed, guilty, eye opener; Ewing, 1984). H-EPESE respondents were asked: (a) “Have you ever felt you should cut down on your drinking?” (b) “Have people annoyed you by criticizing your drinking?” (c) “Have you ever felt bad or guilty about your drinking?” and (d) “Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover (eye opener)?” In the MHAS all respondents were asked about their drinking behavior: (a) “(When you were drinking), have you ever felt you should (have) cut down on the quantity of drinks you have (had)?” (b) “(When you were drinking), have (did) people ever annoy you by criticizing your drinking?” (c) “Have you ever felt bad or guilty about drinking?” (d) and “Have you ever had an alcoholic drink when you woke up in the morning in order to calm your nerves or to get rid of a hangover?” Following the work of Saitz, Lepore, Sullivan, Amaro, and Samet (1999), in both surveys respondents who answered *yes*

to any of the four questions were coded 1 for problem drinker and 0 otherwise, including individuals without any drinking problem and those who never drink.

Chronic conditions—Our assessment of chronic conditions is based on six self-reported items that asked whether the respondent had ever been told by a doctor or other medical personnel that he or she had any of the conditions. H-EPESE respondents were asked whether they had ever had (a) arthritis or rheumatism; (b) diabetes, sugar in your urine, or high blood sugar; (c) high blood pressure; (d) a heart attack, or coronary, or myocardial infarction, or coronary thrombosis; (e) a stroke, a blood clot in the brain, or a brain hemorrhage; or (f) cancer or a malignant tumor of any type. MHAS respondents were asked if they had ever received a diagnosis of (a) arthritis or rheumatism; (b) diabetes or high blood sugar; (c) hypertension or high blood pressure; (d) a heart attack; (e) a stroke, possible stroke, or transient ischemic attack; or (f) cancer or a malignant tumor, excluding minor skin cancer. Response categories for these items were coded 1 for yes and 0 otherwise.

Self-rated health—Self-rated health was measured with single items in both surveys. MHAS respondents were asked to rate their health as *excellent*, *very good*, *good*, *fair*, or *poor*. H-EPESE respondents were asked to rate their health as *excellent*, *good*, *fair*, or *poor*. To compare self-rated health across surveys, we recoded these items as 1 for fair or poor and 0 for otherwise.

Independent Variables

English language ability—We measure English language ability with a single item. H-EPESE respondents were asked, “In your opinion, how well do you speak English?” The original response categories for this item were 1 (*not at all*), 2 (*not too well*), 3 (*pretty well*), and 4 (*very well*). MHAS respondents were asked, “Do you speak English?” The original response categories for this item were coded 1 (*yes*), 2 (*yes, some*), and 3 (*no*). For our purposes, the H-EPESE item was recoded 1 for not at all and 0 for otherwise, and the MHAS item was recoded 1 for no and 0 for otherwise. English proficiency increases with length of residence in the United States, but we include only those with no history of U.S. residence. As a result, only 6% of the Mexican sample spoke any English. The variable then is really an interaction term and tests for the extent to which those individuals in the United States who do not speak English resemble Mexicans. Given that language is such an important indicator of culture, we include it in the analyses. In the United States, the inability to speak English is a clear practical handicap to gaining access to health care, in addition to reflecting a low level of acculturation. It is also an indicator of social class. We include the variable in our analyses because the majority of the H-EPESE respondents chose to take the interview in Spanish, and a significant number of U.S. residents reported that they did not speak English at all. Clearly, English language proficiency in Mexico is not the same marker of social class as in the United States. In Mexico, the ability to speak English is an indirect measure of social capital given that it is neither essential for participation in the labor force nor necessary for gaining access to the health care system. Nonetheless, English is the international language, and the measure represents older Mexicans who are wealthy, have traveled to the United States, and have taken high school English courses.

Insurance status—H-EPESE respondents were classified as having health insurance if they reported having any of the following forms of coverage: Medicare, Medicaid, and private insurance. H-EPESE respondents were also classified as having health insurance if they reported receiving social security or supplemental security income that qualifies respondents for Medicare. MHAS respondents were classified as having health insurance if they reported receiving coverage from any of the following sources: Mexican Social Insurance Institute, Social Services and Security Institute for State Employees, PEMEX, private insurance, or some other form of insurance.

Sociodemographic characteristics—We control for several known socio-demographic correlates of health status, including age, sex, marital status, educational attainment, and personal income. Age is coded into three categories: (a) 65 to 69, (b) 70 to 79, and (c) 80 and older. Sex is coded 1 for females and 0 for males. Marital status is coded 1 for currently married and 0 otherwise. Education is coded into three categories: (a) no formal years of education, (b) 1 to 5 years of formal education, and (c) 6 or more years of formal schooling. Because the income distributions in the United States and Mexico are so different, personal income is divided into three categories in each country to capture relative income levels. We label these (a) lowest third, (b) middle third, and (c) highest third.

Results

In the following analyses, we examine the influence of country of residence and of life course stage at migration on various measures of physical and emotional health. Table 1 provides baseline descriptive statistics for Mexican residents and the four H-EPESE groups. The modal age category for all but the group that came to the United States in early to middle adulthood (20 to 49) is 70 to 79 years. The five groups are roughly similar in terms of sex composition, and approximately half of each group is married. Again, those who immigrated to the United States in middle to late adulthood stand out as having the highest proportion married. Low levels of education in Mexico are revealed by the more than 73% of Mexicans with no history of residence in the United States who have fewer than 6 years of education. Well more than one third (36.3%) report no education at all. Among Mexicans in the United States, younger age at migration is associated with higher levels of education. Yet more than half of even native-born Mexican Americans report less than 6 years of education. In light of the well-documented health risks associated with low education levels, all of these groups are at elevated risk.

Income is clearly not directly comparable between the two countries because income levels are higher in absolute terms in the United States than in Mexico. As a partial control for relative resources, we compute approximate income terciles for the two samples. By construction, then, approximately one third of the sample falls into each tercile in Mexico. In the United States, because the distribution is based on the whole sample, the proportion in each tercile for each age at migration group varies, and the relative income disadvantage of later-life migration is revealed. More than half of those who migrated after age 50 fall into the lowest income tercile, whereas only 36% of those who immigrated in childhood or adolescence have incomes this low.

The health insurance vulnerability of Mexicans is clearly revealed by the fact that only 63% report any coverage. What is somewhat surprising is that in the H-EPESE, more than 15% of those who immigrated in mature adulthood report no coverage. Among the native born, coverage is basically universal. Finally, our English language variable reflects a clearly predictable pattern. A relatively small proportion of Mexicans speak English. English language ability increases with younger ages of migration. What is notable, though, is that even among native-born Mexican Americans, nearly 20% do not speak English.

Table 2 presents descriptive data on the health measures for the five groups and reveals that Mexicans in Mexico report a substantially higher number of depressive symptoms than any of the U.S. resident groups. Along with U.S. residents who migrated after age 50, they were also more likely than U.S. residents who migrated at earlier ages or who were native born to rate their general physical health as fair or poor. On the other hand, Mexicans had somewhat lower average BMI scores, and they were far less likely to be obese (BMI more than 30) than any of the other four groups. We must repeat that although the BMI is based on interviewer measurements in the H-EPESE, it is based on self-reports of height and weight in the MHAS, a procedure that no doubt introduces error. Older Mexicans reported fewer pack-years of smoking than any of the U.S. groups, but they were roughly similar to the highest U.S. resident groups to report problem drinking. Immigrants who arrived in childhood or adolescence or in early adulthood had the lowest average CAGE scores. The bottom panel of Table 2 presents information on the six chronic physical health conditions. For all but hypertension, a lower percentage of older Mexicans report having received a diagnosis. Far lower percentages of Mexicans report arthritis, diabetes, heart attack, or cancer than do U.S. residents. The table also reveals certain within-group differences among Mexican-origin individuals depending on their age at migration. The native born and those who immigrated earlier in life have somewhat higher rates of diabetes, heart problems, stroke, and cancer than do those who immigrated in later life.

The next phase of the analyses includes testing multivariate models that assess the impact of nation of residence and age at migration on various physical and mental health measures. For these analyses, we merged the H-EPESE and MHAS data sets for exploratory purposes. Clearly, such pooling of separate samples is not in keeping with the strictest requirements for statistical comparison. Yet our argument is that even if one were to translate the same instrument into the target language and interview in both countries at the same time, the samples would be radically different. Given the large differences in income, education, labor market structure, health care systems, and everything else related to health risks and health care access, strict comparability is not possible using any statistical sampling procedure. The contexts in which health outcomes are produced are simply too different. In comparative research of this sort, one looks for similarities or differences in associations among variables and focuses on structural patterns. The interpretation of those patterns requires an understanding of the culture, society, and health care systems involved.

Tables 3 and 4 present unweighted standardized ordinary least squares coefficients for the BMI and psychological distress indexes and odds ratios for the remaining dichotomous dependent variables. Each model contrasts each age at migration group to Mexican residents who serve as the reference category. Each model includes age, sex, marital status, education,

and personal income. The models predicting problem drinking, psychological distress, and self-rated health include English language ability. In Table 4, the models for the six chronic conditions include insurance status. Because English ability is not theoretically associated with BMI or smoking behavior, we omit it from that model in Table 3.

In Table 3, all four H-EPESE age at migration groups have lower psychological distress scores than do Mexican residents. Except for the oldest age at migration group, H-EPESE respondents are less likely than Mexican residents to rate their overall health as fair or poor. The coefficients for English ability are significant in the psychological distress and self-reported health models and indicate that those individuals who do not speak English are more similar to Mexican respondents, the reference category, than those who speak English. In these models, the control variables demonstrate the expected association with psychological distress and self-rated health. In general, women report more distress and poorer overall health. Married individuals have lower psychological distress scores, as do those with more education and income. Higher education and income are associated with a lower probability of distress or poor overall health.

Table 3 also reveals that all age of migration H-EPESE groups have higher average BMI scores and are significantly more likely than Mexican residents to be obese. All age of migration groups have higher pack-years of smoking scores than do Mexican residents. In contrast, H-EPESE respondents who immigrated in childhood or early adulthood are less likely than Mexican residents, the native born, or those who immigrated in later adulthood to report problem drinking.

In Table 4, we examine the impact of residence and age at migration on the six chronic conditions. Consistent with the descriptive tables, H-EPESE respondents are more likely than Mexican residents to report arthritis, diabetes, and cancer. Those H-EPESE respondents who migrated in late adulthood are similar to Mexican residents in terms of heart attacks and strokes. As in the descriptive table, none of the H-EPESE groups differ from Mexican residents in terms of hypertension. The coefficients for health insurance are also revealing. If one has insurance, the probability of reporting a diagnosis of diabetes, hypertension, or heart attack increases, again suggesting that access and reports of particular chronic conditions are confounded.

Further evidence of the confounding of health insurance and reports of chronic conditions is presented in Table 5, which presents the percentage of MHAS respondents who report each of the six conditions separately for those with and without insurance. Reports of diabetes, hypertension, heart attack, and cancer are significantly higher among those with insurance than those without insurance. Pagan and Puig (2005) have also found this to be true in diabetic patients in the MHAS. Similar patterns emerge in the H-EPESE, although fewer of the differences are statistically significant given the very small number of elderly U.S. residents without insurance. These data make it clear that estimates of the prevalence of chronic conditions are confounded with social, economic, and political factors that influence health care access.

Conclusion

With each new decade, understanding how different cultural, economic, political, and social systems influence individuals' worldviews, beliefs, and behaviors, and their health, becomes more imperative. In an increasingly globalized world, inequalities in access to the basic necessities of a decent life, including high-quality health care, have profound political implications and draw international attention and the intervention of various multilateral governmental and nongovernmental organizations. The success of such efforts depends on the ability to determine how different political, economic, and cultural systems function to influence the situations of individuals in different countries. Yet comparative studies present researchers with serious problems related to understanding how individuals in such different contexts interpret and respond to survey and other information-gathering protocols. The most fundamental of these problems cannot be solved solely by more rigorous statistical techniques; they require the time-consuming and difficult procedures that have been developed by the academic disciplines of history, anthropology, and cultural studies. Factor analytic procedures, item analysis, and other techniques for index construction and cross-cultural comparison have proliferated as part of the growth in interest in comparative research. These initiatives have improved everyday practice related to index and scale construction and the cross-cultural use of instruments. Yet statistical techniques can never serve as a substitute for learning the language and understanding the economic, political, and organizational environment in which individuals in the study population make choices about health care and other basic aspects of their lives.

Understanding how health risks and the organization of health care affect health outcomes in different economic, political, and cultural contexts represents a vitally important research agenda for the coming century. The health of elderly individuals reflects a lifetime of exposure to health and mortality risks and their access to health care. Even simple analyses of most comparative health surveys, such as those we presented, make it clear that economic and system factors, and cultural factors, affect reports of symptoms and illness conditions among all age groups. The result is that barriers to health care are likely to result in serious negative biases in estimates of chronic and other health conditions. As we have demonstrated, survey instruments that ask respondents whether they suffer from health conditions that they would be aware of only if told by a doctor produce biased estimates of the prevalence of such conditions in populations with low medical care access. Although Mexico provides high-quality health care to those individuals with regular employment, many Mexicans without such employment and those in rural areas receive inadequate care. For these individuals, chronic conditions, such as diabetes, hyper-tension, and even heart disease, often go undiagnosed and untreated. Although we do not have direct measures of system-level factors, the comparison of Mexico and the United States provides indirect evidence of the roles of economics and medical care financing in assessments of health levels.

Clearly, our analysis has serious limitations and can only be taken as suggestive and exploratory because it is based on two independent samples collected in different ways at different times. In addition, because we did not employ weights, we cannot generalize even within countries, nor can we interpret differences in specific prevalence rates as reflecting

reality. As we noted earlier, though, it is very probable that even if the studies were directly comparable in terms of sampling and questionnaire content, differences in respondents' interpretation of specific probes, and differences in levels of development, mean household income, and differential access to health care, would make such comparisons problematic. In comparative research, one can potentially make sense of patterned similarities or difference, but one runs a major risk in assuming that one is measuring the same underlying phenomenon no matter how the translation of the instrument or the study in general is carried out. Comparative findings can be interpreted only in light of knowledge of the specific cultural, economic, and health systems factors that affect the frequency and amount of health care individuals receive and their actual and reported health levels. Comparative research offers the opportunity to evaluate the context dependency of various factors that affect health and illness, but it poses methodological challenges that clearly require the combination of qualitative and quantitative information.

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Appendix

Appendix

Spanish and English Health Questions

	Hispanic Established Epidemiologic Study of the Elderly		Mexican Health and Aging Study	
	English	Spanish	English	Spanish
Elderly of Mexican Ancestry Aged 65 and Older				
Psychological distress				
Distress index	Now I have some questions about your feelings during the past week. For each of the following statements, please tell me if you felt that way in the past week rarely or none of the time which is less than 1 day, some or a little of the time which is 1 to 2 days, occasionally or a moderate amount of time which is 3 to 4 days, most or all of the time which is 5 to 7 days? I felt depressed. I felt that everything I did was an effort. My sleep was restless. I was happy. I enjoyed life. I felt sad.	Ahora tengo algunas declaraciones explicando las maneras que usted se puede haber sentido durante la semana pasada. Por cada de las declaraciones, por favor dígame si se sintió de este modo durante la semana pasada raramente ó en ningún tiempo que sería menos de un día, algo ó poco del tiempo que sería de uno a dos días, ocasionalmente ó una cantidad de tiempo moderada que sería tres ó cuatro días, ó más de 4 días ó todo el tiempo que sería cinco a siete días. Me sentí deprimido(a). Me sentí que todo lo que hacía me costaba esfuerzo. Dormí sin descansar. Yo estaba feliz. Disfruté de la vida. Me sentí triste.	These questions refer to how you have felt during the past week. For each question please tell me if the majority of the time: You felt depressed. You felt that everything you did was an effort. You felt your sleep was restless. You felt happy. You felt that you enjoyed life. You felt sad.	Estas preguntas se refieren a cómo se ha sentido Usted durante la semana pasada. Para cada pregunta, por favor dígame si la mayor parte del tiempo: Se ha sentido deprimido. Ha sentido que todo lo que hacía era un esfuerzo. Ha sentido que su sueño era intranquilo. Se ha sentido feliz. Ha sentido que disfrutaba de la vida. Se ha sentido triste.
Health risk factors				
Body mass index and obesity	Now we'd like to get your height and weight. Why don't you slip off your shoes and remove heavy jewelry or clothing. Now stand back against this door with your feet, heels together on the floor and with your heels, hips, back and head directly against the wall. Look straight ahead. HEIGHT (TO NEAREST QUARTER INCH) Now let's get your weight. WEIGHT (TO NEAREST POUND)	Ahora nos gustaría medirle la estatura y pesarlo(a). Podría usted quitarse los zapatos y cualquier objeto que pese mucho? Ahora párese de espalda hacia la pared y con los pies juntos, los talones juntos. La cadera, y la cabeza directamente tocando la pared. Mire hacia delante. HEIGHT (TO NEAREST QUARTER INCH) Ahora veamos cuál es su peso. WEIGHT (TO NEAREST POUND)	About how tall are you without shoes? About how much do you weigh now?	¿Como cuánto mide usted sin zapatos? ¿Como cuántos kilos pesa usted ahora?
Smoking	We are interested in the actual # of cigarettes people smoke each day. How many cigarettes do/did you smoke (when you last smoked regularly)? (ONE PACK EQUALS 20 CIGARETTES.)	Estamos interesados en el numero actual de cigarrillos que las personas fuman en un día. ¿Cuántos cigarrillos por día (fuma/fumaba) usted (cuando fumaba regularmente)? (ONE PACK EQUALS 20 CIGARETTES)	When you were smoking the most, about how many cigarettes or packs did you usually smoke in a day? (PACKS/DAY)	Cuando más fumaba Ud. ¿como cuántos cigarrillos o cajetillas se fumaba en un día? (Cajetillas/Día)
Problem drinker	Have you ever felt you should cut down on your drinking? Yes No Have people annoyed you by criticizing your drinking? Yes No Have you ever felt bad or guilty about your drinking? Yes	¿Ha pensado que debería dejar de tomar un poco? Sí No ¿Se ha sentido molesto cuando la gente lo critica por tomar alcohol? Sí No ¿Se ha sentido malo ó culpable por tomar alcohol? Sí	(When you were drinking), have you ever felt that you should (have) cut down on the quantity of drinks you have (had)? Yes No (When you were drinking), have (did) people ever annoyed you by criticizing your drinking? Yes No	(Cuando tomaba) ¿alguna vez considera (ó) Ud. disminuir la cantidad de bebidas alcohólicas que toma (tomaba)? Sí No (Cuando tomaba) ¿Se siente (sintió) Ud. alguna vez mal o culpable porque toma (tomaba)? Sí No

Elderly of Mexican Ancestry Aged 65 and Older	Hispanic Established Epidemiologic Study of the Elderly		Mexican Health and Aging Study	
	English	Spanish	English	Spanish
Chronic conditions	No	No	Have you ever felt bad or guilty about drinking?	¿(Cuando tomaba), ¿toma (tomaba) Ud. alguna bebida alcohólica al levantarse por la mañana para calmar sus nervios o para deshacerse de la "cruda"? Sí No
	Have you ever had a drink first thing in the morning to steady your nerves or to get rid of a hangover? (Eye-opener)	¿Alguna vez ha tomado una bebida alcohólica al levantarse en la mañana para calmarse los nervios, ó para "curarse" de una resaca (cruda)? Sí No	No	Sí
	Yes	Sí	Have you ever had an alcoholic drink when you woke up in the morning in order to calm your nerves or to get rid of a "hangover"? Yes No	(Cuando tomaba) ¿toma (tomaba) Ud. alguna bebida alcohólica al levantarse por la mañana para calmar sus nervios o para deshacerse de la "cruda"? Sí No
Arthritis	In the last month, did you wake-up in the morning with stiffness or aching that lasted at least 15 minutes?	Durante el mes pasado, ¿se ha levantado con algún parte del cuerpo entumida ó tiesa, ó con dolor que le duró por lo menos 15 minutos? Sí No	Has a doctor or medical personnel ever told you that you have arthritis or rheumatism? Yes No	¿Alguna vez le ha dicho un doctor o personal médico que tiene artritis o reumatismo? Sí No
	Have you been told by a doctor that you have diabetes, sugar in your urine or high blood sugar? Yes, definite Yes, borderline No	¿Alguna vez le ha dicho un doctor que usted padece de diabetes, tienes azúcar en la orina, ó el azúcar alta en la sangre? Sí, definitivamente Sí, dudoso No	Has a doctor or medical personnel ever told you that you have diabetes or a high blood sugar level? Yes No	¿Alguna vez le ha dicho un doctor o personal médico que usted tiene diabetes o un nivel alto de azúcar en la sangre? Sí No
Hypertension	Has a doctor ever told you that you have high blood pressure? Yes Suspect or possible No	¿Alguna vez le ha dicho un doctor que tiene la presión alta? Sí Posiblemente No	Has a doctor or medical personnel ever told you that you have hypertension or high blood pressure? Yes No	¿Alguna vez le ha dicho un doctor o personal médico que tiene Usted hipertensión o la presión alta? Sí No
	Has a doctor ever told you that you had a heart attack, or coronary, or myocardial infarction, or coronary thrombosis? Yes Suspect or possible No	¿Alguna vez le ha dicho un doctor que Ud. había sufrido un ataque cardíaco, un ataque del corazón, un coronario, sufrido un infarto ó trombosis coronario? Sí Posiblemente No	Has a doctor or medical personnel ever told you that you have had a heart attack? Yes No	¿Alguna vez le ha dicho un doctor o personal médico que usted ha tenido un ataque al corazón? Sí No
Stroke	Did a doctor ever tell you that you had a stroke, a blood clot in the brain, or brain hemorrhage? Yes Suspect or possible No	¿Alguna vez le ha dicho un doctor que había sufrido una apoplejía cerebral, ó embolia cerebral? Sí Posiblemente No	Has a doctor or medical personnel ever told you that you have had a stroke? Yes No	¿Alguna vez le ha dicho un doctor o personal médico que ha tenido una embolia cerebral? Sí No
	Has a doctor ever told you that you had a cancer, or a malignant tumor of any type? Yes	¿Alguna vez le ha dicho un doctor que usted tenía cancer ó un tumor maligno de cualquier tipo?	Has a doctor or medical personnel ever told you that you have cancer	¿Alguna vez le ha dicho un doctor o personal médico que tiene cáncer

Elderly of Mexican Ancestry Aged 65 and Older	Hispanic Established Epidemiologic Study of the Elderly		Mexican Health and Aging Study	
	English	Spanish	English	Spanish
Self-rated health	Suspect or possible No	Sí Posiblemente No	or a malignant tumor, excluding minor skin cancer? Yes No	o un tumor maligno, excluyendo cáncer menor de la piel? Sí No
	Now I would like to ask you some questions about your health. Overall, how would you rate your health—excellent, good, fair, or poor?	Ahora me gustaría hacerle preguntas acerca de su salud. ¿Diría usted que su salud en general es excelente, muy buena, regular, ó mala?	Now I have some questions about your health. Would you say your health is: excellent, very good, good, fair, or poor?	Ahora tengo algunas preguntas sobre su salud. ¿Diría Ud. que su salud es excelente, muy buena, buena, regular, ó mala?

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Table 1
Sample Percentages by Nativity and Age at Migration (MHAS 2001, H-EPESE 1993)

Mexican Elderly Aged 65 and Older	Mexico Resident (Never Lived in United States)	U.S. Resident (Migration Age 50 to 90)	U.S. Resident (Migration Age 20 to 49)	U.S. Resident (Migration Age 1 to 19)	U.S. Resident (Native Born)
<i>n</i>	3,875	232	578	383	1,541
Age					
65 to 69	38.0	32.8	46.5	27.4	43.0
70 to 79	46.4	44.8	41.5	40.2	45.3
80 and older	15.6	22.4	11.9	32.4	11.7
Sex					
Female	57.4	60.3	56.2	57.2	58.7
Marital status					
Married	51.0	50.0	61.5	47.5	57.4
Education					
No formal education	36.3	27.2	13.7	20.4	13.8
1 to 5 years	37.1	54.4	56.7	46.9	38.3
6 or more years	26.6	18.4	29.6	32.7	47.9
Personal income					
Low	34.8	52.2	36.7	36.0	31.2
Middle	34.6	41.8	54.2	53.3	50.0
High	30.6	06.0	09.2	10.7	18.8
Insurance status					
Insured	62.5	84.3	97.3	95.4	99.1
English proficiency					
Non-English speaker	93.9	65.5	52.9	40.8	18.7

Note: MHAS = Mexican Health and Aging Study; H-EPESE = Hispanic Established Epidemiologic Study of the Elderly.

Table 2

Means and Sample Percentages by Nativity and Age at Migration (MHAS 2001, H-EPESE 1993)

Mexican Elderly Aged 65 and Older	Mexico Resident (Never Lived in United States)	U.S. Resident (Migration Age 50 to 90)	U.S. Resident (Migration Age 20 to 49)	U.S. Resident (Migration Age 1 to 19)	U.S. Resident (Native Born)
<i>n</i>	3,875	232	578	383	1,541
Psychological distress					
Distress index	2.7 (b-e)	0.6 (—)	0.6 (—)	0.6 (—)	0.5
Self-rated health					
Fair or poor	70.3 (c-e)	69.8 (c-e)	59.9 (—)	61.8 (e)	58.7
Health risk factors					
Body mass index	26.3 (b-e)	27.8 (—)	28.0 (d)	27.0 (—)	28.1
Obese	18.2 (b-e)	28.0 (—)	30.8 (—)	25.2 (—)	30.7
Smoking	6.0 (b-e)	13.9 (—)	14.5 (—)	15.1 (—)	17.4
Problem drinker	15.4 (c-d)	17.2 (c-d)	11.6 (e)	9.4 (—)	14.7
Chronic conditions					
Arthritis	26.6 (b-e)	40.7 (—)	44.9 (d-e)	37.8 (—)	38.3
Diabetes	17.5 (b-e)	22.5 (—)	27.5 (—)	25.7 (—)	28.3
Hypertension	43.3 (—)	41.5 (—)	43.7 (—)	40.4 (—)	42.8
Heart attack	4.7 (c-e)	6.9 (—)	8.2 (—)	12.0 (e)	11.0
Stroke	3.5 (d-e)	4.3 (—)	4.7 (—)	6.5 (—)	5.3
Cancer	1.8 (b-e)	3.5 (—)	4.3 (—)	4.5 (—)	6.1

Note: MHAS = Mexican Health and Aging Study; H-EPESE = Hispanic Established Epidemiologic Study of the Elderly. Sample percentages are shown to describe the distribution of obesity, problem drinking, all chronic conditions, and self-rated health. Means are shown to describe the distribution of psychological distress, body mass, and smoking. Minimum and maximum values for continuous variables are as follows: psychological distress (0.00, 7.00), body mass (12.87, 71.07), and smoking (0.00, 237.00). Scripts identify significant differences in means or proportions for corresponding groups (two-tailed *t*-tests, $p < .05$).

Table 3

Ordinary Least Squares and Binary Logistic Regression Models for Corresponding Outcome by Nativity and Age at Migration (MHAS 2001, H-EPESE 1993)

	Psychological Distress (Index)	Self-Rated Health ^a	Body Mass (Index)	Body Mass ^b	Smoking ^c	Alcohol Use ^d
Nativity or migration group						
MHAS	—	—	—	—	—	—
H-EPESE (50 to 90)	−0.19 ***	0.94	0.07 ***	1.75 **	0.06 ***	1.31
H-EPESE (20 to 49)	−0.27 ***	0.72 **	0.10 ***	1.89 ***	0.10 ***	0.69 *
H-EPESE (1 to 19)	−0.23 ***	0.78	0.05 ***	1.60 **	0.08 ***	0.60 *
H-EPESE (U.S. born)	−0.40 ***	0.88	0.14 ***	1.89 ***	0.18 ***	1.19
English proficiency						
Non-English speaker	0.03 *	1.54 ***	—	—	—	1.18
Age						
65-69	—	—	—	—	—	—
70-79	0.00	1.15 *	−0.07 ***	0.80 **	0.01	0.91
80 and older	0.02	1.29 **	−0.13 ***	0.54 ***	0.00	0.71 **
Sex						
Female	0.10 ***	1.51 ***	0.10 ***	1.86 ***	−0.32 ***	0.06 ***
Marital status						
Married	−0.08 ***	1.02	0.01	1.08	−0.03 *	0.82 *
Education						
No formal education	—	—	—	—	—	—
1 to 5 years	−0.05 ***	0.95	0.03 *	1.14	−0.02	0.81 *
6 or more years	−0.11 ***	0.62 ***	0.01	0.97	−0.00	0.62 ***
Personal income						
Low	—	—	—	—	—	—
Middle	−0.01	0.90	0.04 *	1.09	0.00	1.02
High	−0.06 ***	0.68 ***	0.06 **	1.09	0.01	0.93

Note: MHAS = Mexican Health and Aging Study; H-EPESE = Hispanic Established Epidemiologic Study of the Elderly 1993. $n = 5,169$ (body mass index and obesity models only); $n = 6,282$ (all other models). Standardized ordinary least squares coefficients are shown for psychological distress, body mass index, and smoking. Odds ratios are shown for self-rated health, obese, and problem drinker.

^a 1 = fair or poor.

^b 1 = obese.

^c Pack-years.

^d 1 = problem drinker.

* $p < .05$.

**
 $p < .01$.

 $p < .001$.

Table 4

Binary Logistic Regression Models for Corresponding Outcome by Nativity and Age at Migration (MHAS 2001, H-EPESE 1993)

	Arthritis ^a	Diabetes ^a	Hypertension ^a	Heart Attack ^a	Stroke ^a	Cancer ^a
Nativity or migration group						
MHAS	—	—	—	—	—	—
H-EPESE (50 to 90)	1.90***	1.27	0.85	1.36	1.06	2.17*
H-EPESE (20 to 49)	2.24***	1.39**	0.91	1.58*	1.22	2.44**
H-EPESE (1 to 19)	1.59***	1.46***	0.81	2.31***	1.76*	2.20*
H-EPESE (U.S. born)	1.71***	1.52***	0.86	2.07***	1.49*	3.16***
Insurance status						
Insured	1.14	1.97***	1.46***	2.07***	1.37	1.60
Age						
65 to 69	—	—	—	—	—	—
70 to 79	1.25***	0.84*	0.99	1.35*	1.45*	1.00
80 and older	1.26*	0.65***	1.11	1.71***	1.85**	1.25
Sex						
Female	2.08***	1.14	1.92***	0.77*	0.76*	1.34
Marital status						
Married	0.94	1.14	1.00	1.04	1.10	1.10
Education						
No formal education	—	—	—	—	—	—
1 to 5 years	1.05	0.96	1.04	1.01	1.01	0.76
6 or more years	0.97	0.86	1.04	1.30	0.84	1.21
Personal income						
Low	—	—	—	—	—	—
Middle	0.99	1.13	0.98	0.93	1.01	0.99
High	1.01	1.05	1.04	1.12	1.03	1.38

Note: $N = 6,282$. MHAS = Mexican Health and Aging Study; H-EPESE = Hispanic Established Epidemiologic Study of the Elderly 1993. Odds ratios are shown for all models.

^a 1 = yes.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Table 5

Sample Percentages for Chronic Conditions by Insurance Status for Mexican Health and Aging Study Respondents

	Insured	Uninsured
Arthritis	27.3	25.3
Diabetes	20.8*	11.9
Hypertension	46.9*	37.6
Heart attack	5.8*	2.7
Stroke	3.8	3.1
Cancer	2.1*	1.3
Sample size	2,422	1,453

* Statistically significant difference within corresponding data source ($\chi^2, p < .05$).