Age at Migration and Mortality in the Older Mexican-origin Population

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Abstract

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At least two decades of research on the mortality experience of the Mexican-origin population in the United States reveals lower age-adjusted mortality among the foreign born than native born Mexican-Americans or non-Hispanic whites. Other evidence suggests that the age at which an immigrant arrives in the U.S. is associated with long-term morbidity. Although foreign-born individuals have more favorable mortality experiences than the native born, those who arrive later in life report poorer health and worse functioning than either the native born or those who arrive early in life.

In this paper, we summarize twenty years of research on the mortality and morbidity correlates of age of migration among Mexican migrants and examine the fifteen year mortality experience of the H-EPESE sample, a panel of 3,050 individuals of Mexican-origin who were 65 or older in 1993 and followed-up several times, finally in 2008. The analysis assesses the impact of age at migration on social support and other risk factors for mortality. A series of survival analyses shows that migration after age fifty is associated with a mortality advantage over the compared with earlier arrivals and the native born or those who arrived early in life net of demographic and other social factors. Lack of family support, chronic illness, and depressive symptoms were associated with an elevated risk of death by 2008.

The patterns of morbidity and mortality suggest that individuals who arrive later in life may be selected for longevity, but because of a lack of medical care earlier in life may suffer more non-fatal chronic and disabling conditions. These possibilities call for further research.

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Background

More than 20 years ago what has been termed a "paradox" related to mortality was reported for the Hispanic population. The paradox refers to the finding that the Mexican-origin population experiences lower mortality than would be expected given its depressed socioeconomic profile and low educational levels (Palloni and Arias, 2004; Cho, Hummer, Frisbie, and Rogers, 2004). Mexican-Americans, and in some cases only the foreign born, experience lower mortality than either blacks, non-Hispanic whites, or other Hispanics (Markides and Coreil, 1986; Franzini, Ribble, and Keddie, 2001; Palloni and Arias, 2004). A similar foreign-born advantage related to morbidity has been reported (Hummer, Rogers, Nam, & Le Clere, 1999; Stephen, Foote, Hendershot, and Schoenborn, 1994).

These favorable morbidity and mortality patterns have been attributed to many factors. Immigrants, for example, have been found to have a positive outlook on life and to be optimistic about their futures, attitudes associated with good health (Markides, 2001). Recent research suggests that the Mexican-origin mortality advantage is even more pronounced among older people (Markides and Eschbach, 2005). Research based on the National Health Interview Survey- Multiple Cause of Death data reveal that despite the fact that elderly Hispanics have overall worse health than non-Hispanic whites, older Hispanics enjoy an advantage in mortality (Hummer, Benjamins, and Rogers, 2004).

Many explanations for the mortality advantage have been offered. Some researchers relate it to selection bias in return migration to Mexico. This phenomenon has been termed the "salmon effect." The salmon bias explanation offers the explanation that Mexican-born individuals in poor health return to Mexico at higher rates than healthier Mexican immigrants leaving a relatively healthy U.S. elderly population. Other studies show that duration of residence, namely longer time spent in the United States increases risk of mortality (Cho, Frisbie, Hummer, Rogers, 2004).

As of yet, however, data to permit a close examination of mortality patterns among older Mexican-origin adults have not existed (Turra, Elo, Kestenbaum, 2005). Recent findings from cross-sectional analyses of the Hispanic EPESE suggest that immigrants who arrived in the United States early in life have better health and fewer chronic conditions than those who arrived later in life (Gonzalez et al., 2009).

In the following analysis, we extend previous research by investigating the Hispanic Epidemiological Paradox in the Mexican-origin population in mature adulthood. Employing proportional hazard functions we examine the risk of death as a function of life course stage at migration controlling for socioeconomic, health, and family resource variables. Specifically, the objective of the research is to examine the interplay of nativity and life course stage of migration (U.S. born, childhood, young adult hood, and mature adulthood) on mortality in older Mexican-origin people. The second objective is to determine the extent to which the effect of age at migration is associated with known risk factors associated with death, including chronic conditions, limitations in activities of daily life, psychological distress, living alone, and low social support in later life.

Methods

The data used for this research comes from the Hispanic Established Populations for the Epidemiologic Studies of the Elderly (H-EPESE from now on) that was collected in five U.S. States (Texas, California, Colorado, Arizona and New Mexico) in 1993-2008 in six waves. For our analyses the sample size consisted of 3,050 individuals of Mexican-origin who were 65 and older and interviewed at baseline. We used the all-cause mortality data at each wave to create a dummy variable to code the respondent as dead (0) or alive (1) at the end of wave 6. The independent variables include demographic measures of: the timing of immigration to the United States, measured by three life course stages at migration: childhood (1 to 17 years), middle-age (18 to 49 years), and late-life (age 50 and older). Morbidity and disability were determined by: chronic conditions (i.e., heart attack, stroke, cancer,

diabetes and arthritis). Respondent were coded as physically disabled at baseline if they were unable to perform one of seven basic activities of daily living: bathing, using the toilet, transferring from bed to chair, walking across a small room, personal grooming, dressing, and eating . Respondents were coded as social disabled at baseline if they reported needing help with household tasks, such as meal preparation, shopping, handling money, driving, housework, and medication. Cognitive function was assessed with the mini-mental status exam with a score of 18 or over indicating a mental impairment versus; 0 otherwise). Baseline sociodemographic variables included age, gender, and years of education. Other covariates included indicators of protective factors related to mortality, including marriage, living with family, social support, and religious attendance.

Results

The descriptive results show that by wave 6 more than half of the respondents were dead. Of the deceased, the native born were more likely to die than the foreign born: 58% of the sample were native born; compared with 68% who migrated during childhood; 52% in midlife; and 55% in late life. Late-life migrants were far more likely than those who arrived earlier in life and the native born to be older, and to report low education, few economic resources, live with family, and worse health and functioning.

Table 1 presents the hazard model introduced in a stepwise procedure to assess how mortality is affected by each potential risk factor. Model 1 includes the life stages of migration using native as the reference category. A person who migrates to the U.S. in childhood (ages 1 to 17 years) would increase his/her mortality risk by 33.6%. Meanwhile, a person who migrates in midlife (ages 18 to 49 years) will reduce the mortality risk by 12.8% (100%-87.2%). Model 2 introduces the demographic characteristics in addition to the life course stage at migration. In this model a shift in the life course stage at migration where migrating during the respondent's childhood is no longer statistically significant compared with later arrival to the United States which reduces the mortality risk by 13.7% and 21.9%, respectively. Model 3 introduces five chronic conditions and the size of the coefficients remains similar to the previous

model. In Model 4 reveals that late-life migrants (those coming to the U.S. at age 50 or over) reduces the relative risk of mortality by 19.2% after controls for cognitive and mental health problems. None of the other migrant categories are statistically significant. Predictably disability increases the risk of mortality in model 5, the coefficient for late-life migration is still significant. In the final model, after all relevant confounding individual, demographic, and social support factors were controlled, late-life migrants were significantly more likely than earlier arrivals to survive by 2008. Social support indicators, including daily religious attendance and couple-headed extended living arrangements also increased the chances of survival.

Conclusion

The results corroborate previous studies showing a mortality advantage among the foreign born compared to the native born in a subgroup of the older Hispanic population (Hummer, Benjamins, and Rogers, 2004; Rogers, 1992). Our results go beyond what is already known about the effect of immigration on the health and mortality of aging Hispanics by documenting the extent to which time spent in the United States affects older Mexican American's health and longevity. These data suggest that these individuals who arrive later in life may be selected for longevity, but because of a lack of medical care earlier in life may suffer more non-fatal chronic and disabling conditions. These possibilities call for further research.

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Table 1 - Hazard Model of Mortality on Age at Migration and Covariates: Hispanic-Established Populations for the Epidemiologic Studies of the Elderly, 1993-2008

Variable	Model 1, HR (SE)	Model 2, HR (SE)	Model 3, HR (SE)	Model 4, HR (SE)	Model 5, HR (SE)	Model 6, HR (SE)
Life Course Stage at Migration						
Childhood	1.336*** (0.076)	0.937 (0.080)	0.943 (0.081)	0.957 (0.083)	0.955 (0.087)	0.959 (0.088)
Middle Age	0.872** (0.062)	0.863** (0.064)	0.889* (0.065)	0.904 (0.067)	0.929 (0.071)	0.925 (0.071)
Late Life	0.973 (0.087)	0.781*** (0.091))	0.831** (0.092)	0.808** (0.097)	0.799** (0.104)	0.810** (0.105)
Demographics						
Age		1.078† (0.004)	1.080† (0.004)	1.064† (0.004)	1.070† (0.005)	1.068† (0.005)
Male		1.441† (0.049)	1.432† (0.051)	1.556† (0.054)	1.575† (0.058)	1.565† (0.063)
6+ Years of Schooling		1.060 (0.058)	1.027 (0.059)	1.051 (0.061)	1.131* (0.067)	1.119* (0.067)
Proxy		1.834† (0.074)	1.678† (0.077)	1.355*** (0.087)	1.049 (0.146)	1.101 (0.148)
Chronic Conditions						
Heart			1.237*** (0.074)	1.164** (0.076)	1.109 (0.082)	1.105 (0.082)
Stroke			1.268*** (0.089)	1.032 (0.095)	1.025 (0.107)	1.004 (0.109)
Cancer			1.526† (0.096)	1.496† (0.099)	1.528† (0.109)	1.507*** (0.110)
Diabetes			1.643† (0.054)	1.583† (0.055)	1.597† (0.058)	1.607† (0.059)
Arthritis			0.944 (0.052)	0.845*** (0.055)	0.833*** (0.058)	0.823*** (0.058)
ADL and IADL items						
Total ADL				1.039** (0.018)	1.050** (0.021)	1.051** (0.021)
No Drive				1.087 (0.071)	1.051 (0.073)	1.027 (0.073)
No Heavy				1.318† (0.072)	1.260*** (0.075)	1.249*** (0.075)
No Stairs				1.085 (0.088)	0.991 (0.091)	0.985 (0.091)
No Walk				1.329*** (0.086)	1.288*** (0.088)	1.262*** (0.089)
CES-D and MMSE						
Total CES-D score					1.013† (0.003)	1.013† (0.003)
Total MMSE score					0.979*** (0.007)	0.982** (0.007)
Living Arrangements						
Alone						1.040 (0.078)
Single + Family						0.986 (0.079)
Married + Family						0.843** (0.078)
Religious Attendance						
Several Times per yr.						0.889 (0.085)
Once per month						0.886 (0.102)
Almost every week						0.760*** (0.074)
More than once a week						0.805** (0.110)

Note: HR's are Hazard Ratios. Results are based on a sample of n=3,050 older Mexican Americans who participated in the baseline wave (1993-1994) of the H-EPESE. Reference category for stages of migration is native; for education is less than 6 years of schooling; for gender is female; for living arrangements is married living only with spouse; for religious attendance is never attends.

P<.10; **P<.05; *<.01; †P<.001.*