Estimates of Active Life Expectancy among Mexican-Origin Elders

This study examines nativity differentials in life expectancy among Mexican-origin elderly with ADL/IADL disability. Our objective is to determine whether the "Latino paradox" in mortality extends to disability. We employ 17 years of data from the Hispanic Established Population for the Epidemiologic Study of Elderly to calculate multistate life tables with disabilities and provide detailed comparisons in length of life and disabled life specific to gender. Estimated life expectancies are higher among the foreign-born. Native-born males and foreign-born females spend more years with ADL disability than their counterparts. Conversely, foreign-born elderly spend more years with IADL disability than their native-born peers. The Latino paradox does not extend to disability within this sample. Foreign-born elderly are living longer, but doing so in a disabled state particularly with regards to IADL disability. In light of the aging of the Latino population, prevention or effective management of disabling medical conditions warrants greater attention.

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Introduction

Between 2000 and 2010, the number of individuals over the age of 65 increased by 15 percent, expanding from 35 million to 40.3 million (U.S. Census Bureau 2011). In 2010, Latinos represented 2.8 million (or 6.9 percent) of the older population and are projected to grow to over 17.5 million by 2060 (U.S. Census Bureau 2009). As these demographic trends indicate, there is an urgent need for research focused on the health of the elderly. While previous research has tried to understand the health of the elderly, less is known about the health of Latino elders, particularly Mexican Americans (Angel and Whitfield 2007).

Objectives

This study examines nativity differentials in life expectancy by gender in Activities of Daily Living (ADL) and Instrumental Activities of Daily Living (I-ADL) disability among Mexican elders 65 and older residing in the southwestern United States. The integration of mortality and disability is used to assess whether the "Latino paradox" in mortality extends to disability within a single ethnic group. We focus specifically on Mexican-origin elders, the largest segment of the growing Latino population.

Background

Foreign-born individuals residing in the United States tend to show better physical health and mortality outcomes than their native-born counterparts (Hummer, Lariscy, and Hayward 2011; Akresh and Frank 2008; Sing and Hyatt 2006; Palloni and Arias 2004; Hummer, Rogers, Amir, Forbes and Frisbie 2000; Hummer, Rogers, Nam, and LeClere 1999). Among studies of Latino immigrants, the concept of a Latino paradox arises because of their favorable health relative to their poor economic profile (Markides and Corelie 1986). However, recent evidence suggests that Latino's mortality advantages are not reflected in disability relative to whites (Cantu, Hayward, Chiu, and Hummer 2013); Hayward, Hummer, Chiu, Gonzalez, and Wong 2011; Markides, Eschbach, Ray, and Peek 2007).

Data

This research employs data from the Hispanic Established Population for the Epidemiological Study of the Elderly (HEPESE). The HEPESE contains a representative sample of community-dwelling Hispanic elderly, aged 65 years and older, residing in the five southwestern states of Arizona, California, Colorado, New Mexico, and Texas. We use aggregated individual level data from 1993-2011 to obtain prevalence estimates across survey years. Respondents ranged in age from 65-107 years. The final analytic sample includes 3952 unique individuals and 35,674 person years.

Methods

The study integrates age-specific mortality rates with age-specific prevalence of ADL and I-ADL disabilities to calculate Sullivan-based multistate life table models of ADL and I-ADL disabilities free and life expectancy with ADL and I-ADL for each group (Sullivan 1971). This is a prevalence-based method of estimating healthy life expectancy. This method divides total life expectancy into the different health states based on the age-specific prevalence of healthy (ADL and I-ADL free) /unhealthy (with ADL and I-ADL) states.

To estimate mortality rates, the Gompertz models of the following form stratified by sex and nativity are used.

$\ln m(x) = \beta_0 + \beta_1 \cdot age$……………………………………………......(1)

where, x is age.

To estimate prevalence probability, the logistic regressions of the following form stratified by sex and nativity are fitted.

$\ln(\pi/(1-\pi)) = \beta_0 + \beta_1 \cdot age$………………………………......(2)

where, π is the prevalence probability.

By using equation (1), age-specific mortality rates can be estimated and total life expectancy can be obtained. From equation (2), the age-specific prevalence of ADL and I-ADL can be obtained. The estimated prevalence is used to divide total life expectancy into the different health states based on the age-specific prevalence of healthy (ADL and I-ADL free) /unhealthy (with ADL and I-ADL) states. For the detail, please refer to Jagger et al. (2006).

A bootstrapping technique is used to obtain standard errors for the total life expectancy, healthy life expectancy and unhealthy life expectancy. Bootstrapping generates repeated estimates of the healthy life expectancy by randomly drawing a series of bootstrap samples from the analytic samples. Repeating this approach for 300 times and distributions of the total life expectancy, healthy life expectancy and unhealthy life expectancy are obtained, which allow us to estimate sampling variability for the total life expectancy, healthy life expectancy and unhealthy life expectancy. Based on the 300 life tables for a given group, 95% confidence intervals were obtained for the distributions of the total life expectancy, healthy life expectancy and unhealthy life expectancy for that group. Statistical significant tests can be performed according to the 95% confidence intervals.

Results

Point estimates (shown in Tables 1 and 2) of total life expectancy for the foreign-born are higher than those of native-born groups. Native-born male and foreign-born female Mexican elderly spend a larger fraction of their remaining years with ADL disability in comparison to foreign-born males and native-born females. Conversely, both foreign-born males and females spend a significantly larger fraction of their remaining years with I-ADL disability than their native-born peers. Although foreign-born Mexican elderly are living longer, they are doing so in

a disabled state particularly with regards to I-ADL disability. The Latino paradox does not appear to apply to disability within this sample.

Conclusion

As with previous research foreign-born Mexican elderly mortality rates are not matched by low disability rates (Hayward et al. 2011; Markides et al. 2007; Eschbach et al. 2007). Extended life expectancy of foreign-born Mexican elderly in the United States is accompanied by a lengthy period of disability particularly for foreign-born Mexican females. Results support the Latino paradox for foreign-born Mexican elderly in terms mortality, but not disability. There is no evidence of advantage in terms of disability; indeed the opposite appears to be the case. With the number of Latino elderly projected to grow rapidly in the future, prevention and treatment of medical conditions deserves serious attention to promote independence of ADL and I-ADL disability in the community.

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Life Expectancies at age 65 ADL	Native Born			Foreign Born		
Females	**Years (SE)**	**95% CI**		**Years (SE)**	**95% CI**	
Total Life Expectancy	17.5 (0.34)	16.86	18.13	18.1 (0.42)	17.39	18.93
Health Life Expectancy	13.2 (0.27)	12.77	13.78	13.4 (0.33)	12.86	14.06
Unhealthy Life Expectancy	4.2 (0.15)	3.96	4.55	4.7 (0.21)*	4.35	5.10
Ratio of Healthy to Total	0.76 (0.01)	0.74	0.77	0.74 (0.01)*	0.72	0.76
Males						
Total Life Expectancy	14.5 (0.33)	13.87	15.13	16.2 (0.44)**	15.34	17.00
Health Life Expectancy	11.9 (0.31)	11.34	12.60	13.7 (0.38)***	12.87	14.38
Unhealthy Life Expectancy	2.6 (0.13)	2.32	2.84	2.5 (0.16)	2.23	2.83
Ratio of Healthy to Total	0.82 (0.01)	0.80	0.84	0.84 (0.01)	0.83	0.86

Source: HEPESE Wave 1-7

*p≤=0.05 **p≤=0.01***p≤=0.001

Life Expectancies at age 65 IADL	Native Born			Foreign Born		
Females	**Years (SE)**	**95% CI**		**Years (SE)**	**95% CI**	
Total Life Expectancy	17.5 (0.35)	16.80	18.15	18.1 (0.42)	17.21	18.92
Health Life Expectancy	7.00 (0.20)	6.63	7.41	5.3 (0.24)***	4.82	5.76
Unhealthy Life Expectancy	10.5 (0.27)	9.95	11.00	12.8 (0.38)***	12.11	13.51
Ratio of Healthy to Total	0.40 (0.01)	0.39	0.42	0.29 (0.01)***	0.27	0.31
Males						
Total Life Expectancy	14.5 (0.35)	13.75	15.14	16.2 (0.44)**	15.25	16.99
Health Life Expectancy	8.3 (0.26)	7.73	8.74	8.7 (0.32)	8.10	9.26
Unhealthy Life Expectancy	6.2 (0.22)	5.81	6.67	7.5 (0.31)***	6.94	8.10
Ratio of Healthy to Total	0.57 (0.01)	0.55	0.59	0.54 (0.01)*	0.51	0.56

Source: HEPESE Wave 1-7

*p≤=0.05 **p≤=0.01***p≤=0.001