Children's Education, Migration and Parents' Mortality in Mexico

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Abstract

In Mexico, shifting demographic, socioeconomic and epidemiological contexts translate to an increasingly older population, one that is living longer, but is not necessarily healthier or wealthier than previous generations. Yet educational expansion and increased international migration among younger cohorts presents an opportunity for aging parents. Using three waves of data from the Mexican Health and Aging Study (2001-2012), we find that among parents, higher levels of offspring are protective of parental mortality. The negative association between children's education and the timing of parents' death is robust to controls for parents' own education, wealth, gender, age, migration status and importantly, the inclusion of children's financial transfers to parents. Our findings add to growing evidence behind the advantageous effects of children's education on parental mortality. However, we find that children's migrant status, a potential resource in this social context, has no bearing on parental health.

Introduction

With declining fertility and increasing life expectancy, the Mexican population is aging at an unprecedented rate. In 2000, approximately 6% of the country's population was aged 60 and over. This share is projected to increase to 28% by 2050 (Partida-Bush, 2005). Rapid growth of the 60+ population challenges existing institutional supports for the elderly. Public social security programs and private retirement programs have a limited reach; only 30% of men and 15% of women aged 50 and over have access to a retirement pension (Parker and Wong, 2001). This is largely due to the share of older adults who worked and continue to work in the informal sector, where participation in public social security programs is not mandatory and access to pension programs is limited (Aguila et al., 2012). The rapid aging of the Mexican population warrants additional research regarding factors which predict healthy aging.

At the family level, adult children in Mexico have historically provided care to elder parents. However, like other countries, changes to family and household structures threaten these intergenerational bonds. An increasing share of elderly report living alone (Saad 2010), although the majority of elderly parents continue to report living with or in the same town as a least one child (Yahirun, Sheehan and Hayward, 2014). Geographic proximity and coresidence characterize elderly living arrangements, which have been linked to changes in health and physical functioning as well (Michael, Berkman, Colditz and Kawachi, 2001; Li, Zhang and Liang, 2009).

Despite these challenges, educational expansion in Mexico over the past decades presents an opportunity to ameliorate some of the problems posed by rapid population aging. According to recent estimates, one-third of Mexicans over the age of 50 have no formal education (Wong and Palloni, 2009). The vast majority of these individuals were raised under a regime when compulsory education was completion of primary school at grade six. Only in 1992 was compulsory education officially raised to completion of lower secondary school at grade nine. Thus, adults today are much better educated than their older parents.

At the same time, approximately 20% of adults aged 50 and over have children who live in the United States (Wong, 2011). Many more are former migrants themselves or have children who are also return migrants. Studies that conceptualize migration as a family resource tend to focus on the path through which migrant parents affect the health and well-being of offspring who remain behind, with less attention devoted to how the effects of migration also flow upwards, to parents from migrant offspring even though adult children in these circumstances may be valuable assets to parents.

This study asks how adult children's resources – broadly conceptualized as children's education and migration histories – affect the timing of parents' death in Mexico. We build on a growing number of studies that examine the effects of children's education on parents' mortality (Friedman and Mare 2014; Torssander 2013; Zimmer et al. 2007) but importantly, extend the research to include children's migrant experiences. This is important for Mexico and other middle-income countries where shifting demographic, socioeconomic and epidemiological contexts are increasing population-level health inequality.

Children's Resources and Parental Mortality

A growing body of research points to the importance of considering family, in particular children's, resources for elderly health across a variety of contexts. The majority of this work focuses on children's education as a central resource to parents. In Taiwan, children's and parents' education are both negatively associated with parental mortality, but only children's education is associated with parental mortality once parents already report a limiting health condition (Zimmer, et al., 2007). Even in countries with fewer cultural obligations of parental care, results indicate that children's resources also matter. In the United States, Friedman and Mare (2014) find that both children and parents' education influence the timing of parents' death. Torssander (2013) also finds that the education of the first-born child is negatively associated with the timing of parents' death in Sweden. Better educated children can provide parents with more material resources and have greater access to specific health-care services and health-related behaviors. Better-educated children, insofar that their education affects their own health, may also influence the health behaviors of their parents.

In the high-migration context of Mexico, ignoring the effects of children's migration on parental health obscures the full array of resources that parents may have available to them. Children's migration, however, may produce a complex web of effects on parental health. By its very definition, migration pulls children away from parents. Thus, parents may suffer from a lack of social support, instrumental assistance or financial transfers that geographic proximity help to provide. Previous research finds mixed results regarding the effects of adult children's migration on parents' physical health. In Mexico, children's migration produces negative effects on physical health (Antman 2010, 2012). Studies based on internal migration in China found negative outcomes related to physical health (Tse, 2013), but mixed outcomes (Guo et al 2009) with respect to emotional well-being and psychological distress. However, these studies fail to account for the cross-border ties that migrant children may continue to have with parents, long after they have left. The emerging literature surrounding transnational migration finds that migrants' ties to their place of origin are strengthened through new technologies; easing communication and remittance-sending to family members who remain behind. Migrant offspring in the United States, through exposure to new health environments or simply through increased monies to give to parents, may be advantageous, rather than harmful, to parental health.

Data and Sample

Data for this analysis come from the Mexican Health and Aging Study (MHAS), a nationally representative panel study of non-institutionalized individuals born prior to 1950. MHAS was modeled after the U.S. Health and Retirement Study (HRS) with several similar design features. The baseline sample was collected in 2001. Households with at least one member aged 50 and over were eligible for inclusion in the baseline sample. If more than one person was age-eligible, then one respondent was randomly selected for the study. Resident spouses and partners of the randomly selected person were also recruited for the study, regardless of their age. 11,000 households were initially sampled in 2001. Two follow up waves were collected in 2003 and 2012. Despite the large gap between waves 2 and 3, MHAS had remarkably low attrition with a response rate of 88% in 2012, nine years after the previous wave

(ENASEM 2013). We combine data from all three waves of MHAS including the preliminary release of the 2012 wave. All-cause mortality was assessed using next of kin interviews. Next of kin provided the year of death, allowing the creation of a person year file between the year of first interview and death.

Our analytic sample includes any respondent aged 51 and over who had one or more children aged 25 or older at baseline (2001). We exclude respondents who were missing data on any predictor variables or those who were missing dates of death. We exclude any children younger than 25. By age 25 most offspring will have completed their education. This provides a total analytical sample of 10,430 parents.

Methods and Measures

In this analysis, we use cox proportional hazard models fit with STATA 13.1 to estimate the timing of death. The risk of death starts at the age of first interview in 2001 and is right censored at the date of the last completed interview or death. All models adjust for household clustering. We use the following progressive adjustment strategy. In Model 1 we include parents' age, gender and educational attainment. In Model 2 we add children's education to assess how the education of the children influences the hazard of mortality net of parents' age and gender. Model 3 adds parents' education back in. In Model 4 we include more parental demographic traits including marital status, number of children and migratory history and children's traits including offspring migration history, gender composition and mean financial status. In Model 5 we exclude mean financial status of the children but include monetary transfers from the children. Model 6 includes parental wealth.

Parent Traits A large share of respondents in our sample received no or little formal schooling, therefore we categorize respondents' education into those with less than a primary education (less than 6 years of schooling), those who completed primary education (6 years of schooling), and those with at least some secondary education (7 years of schooling or more). In addition to education, we include parents' gender, age (measured in years), marital status (single, married/in a consensual union, divorced or widowed) and total number of living children as other variables associated with health in our models. We add a variable capturing the respondent's migration history and urban/rural status, given prior research suggestion their associations with later-life health in Mexico (Smith and Goldman, 2007; Wong and Gonzalez-Gonzalez, 2010). Finally, we include two measures of the respondent's socioeconomic status: transfers to parents and wealth. The transfer variable distinguishes between respondents who report that they and/or their spouse 1) received no transfers from any child/grandchild in the past two years, 2) received transfers below 5,000 pesos in the past two years from all children/grandchildren, or 3) received transfers of 5,000 pesos or more in the past two years from all children/grandchildren. We use a wealth variable constructed by the MHAS research team given the large number of missing data (Wong and Espinoza 2004). Wealth includes the individual or couple's net worth of assets in the form of homes, businesses, rental properties, capital, vehicles, other debts, and other assets. Following prior research using these variables, we use terciles of wealth based on Stata's *–cut-* function which creates three relatively equal groups (Smith and Goldman, 2007).

Offspring Traits Due to educational expansion, offspring in our sample are on average better educated than their parents. Therefore we code education of children as: none of the respondent's offspring received some college education (13+ years of schooling; referent) some offspring have some college education, and all offspring have some college education. We also include in our models measures of the gender composition of the respondent's offspring, and their migration history at baseline. Given the importance of children's gender in predicting who receives financial and/or instrumental assistance in later life, we classified respondents by whether they had all sons, all daughters or both. We include an indicator for children's combined migration histories. We distinguish between parents who have: 1) children who were never U.S. migrants and are not current U.S. migrants versus 2) those with at least one child who is a former U.S. migrant, but no children currently living in the United States versus 3) parents with at least one child who is currently a U.S. migrant. This is a crude measure of the type of social/economic capital that current or former migrants have access to, but is a first pass at the way in which children's migration histories might influence parental health. Finally, we included the mean level of children's financial status. Each child's financial status was reported on a 5-point scale ranging from excellent (1) to poor (5). Responses were re-coded so that higher values indicated better financial status. We use the mean of children's financial status with the assumption that children pool income to help parents. All information except for the time of death is from the baseline interview.

Sample Traits

Table 1 presents the sample's descriptive traits. At the most recent wave of data collection in 2012, 2,438 respondents or 23.4% of our initial baseline analytic sample have died. The sample is predominantly female and the average respondent is aged 63. Approximately 27% of parents in our sample have a primary school education (grade 6) or less while over half have attained primary education. Over two-thirds of respondents are married and 21% are widowed. On average, respondents reported 6.6 living children. Sixty-two percent report having lived in a place different from where they were born, and 8.9% reported having previously lived in the United States (excluding vacations or short visits). A large majority of respondents, 65%, live in urban areas in Mexico. With respect to transfers, 56% of parents in our analytical sample reported receiving monetary transfers from their children or grandchildren in the past two years. Thirty-nine percent reported amounts of 5,000 pesos or more from all of their children combined.

INSERT TABLE 1 HERE

Children, on average, are better educated than their parents. Approximately 40% of respondents reported that some or all of their children completed more than 12 years of schooling, or at least some college education. 11% reported that all of their children had completed 16 years of schooling. Over 30% of parents in our sample reported having at least one child who was a former or current international migrant, reflecting high rates of migration abroad among offspring. Seventy-seven per cent of respondents reported having both sons and daughters.

Results

Table 2 depicts results from our cox proportional hazard models. In Model 1 we find that as expected, education is significantly associated with mortality. Specifically, respondents who have more than a primary school education have a 19% lower hazard of mortality compared to those with less than a primary school education. In addition, gender and age are associated with mortality in predictable ways. Men have a greater risk of dying than women and the risk of death increases with age.

INSERT TABLE 2 HERE

Model 2 adds in children's education and takes out parental education to assess an unadjusted association of children's education. Parents for whom *a share* of their children completed at least 13+ years of schooling (some college education or more) have a 14% lower hazard of mortality than parents who have no children who attended college. Parents with children who *all* completed at least 13+ years of schooling have a 35% lower hazard of mortality than respondents with no children who completed at least 13 years of schooling net of the respondent's gender and age.

In Model 3 we re-add parental education and see that parents' education is no longer significantly associated with the hazard of mortality, but offspring education is. The strength of the association between children's education and parental mortality is only slightly attenuated.

In Model 4 we add demographic traits of parents as well as traits of their children. For parents, we find that being married is protective of mortality, compared to being divorced, but migration history and urban/rural status have no effect on the hazard of dying. Despite previous research showing the effects of children's migration on parent's health, we do not find a significant association between having a former or current migrant child(ren) and parental mortality. We also find no association for offspring gender or children's financial status and parental health. Higher children's education remains protective of parental health.

In Model 5 we remove children's financial status and add financial transfers from children. We find that having received transfers of 5,000 pesos or more over the past two years increases the hazard of mortality by 10% in the follow up period. One reason for this is that children may have transferred money to parents in response to parents' illness. Yet even when we control for financial transfers the association between children's educational attainment and the hazard of parents' mortality remains statistically significant. In Model 6 we add parents' wealth and find that relative to the respondents in the first tercile (least wealthy) of wealth, respondents in the third tercile (most wealthy) have a14% lower hazard of mortality. In this final model, children's education remains protective of parents' mortality.

Discussion and Next Steps

In Mexico, shifting demographic, socioeconomic and epidemiological contexts translate to an increasingly older population, one that is living longer, but is not necessarily healthier or wealthier than previous generations. Yet educational expansion and increased international migration (primarily to the U.S.) among younger cohorts presents an opportunity for aging

parents to benefit from the resources of their adult children. Preliminary results from this study find higher levels of children's education to be protective of parental mortality. The negative association between children's education and the timing of parents' death is robust to controls for parents' own education, wealth, gender, age, migration status and importantly, the inclusion of children's financial transfers to parents. Our findings confirm previous studies from Taiwan (Zimmer et al., 2007), Sweden (Torssander 2013) and the United States (Friedman and Mare 2014) citing the advantageous effects of children's education on parental mortality. However, we find that children's migrant status has no bearing on parental health, despite previous research citing a negative effect of children's migration on parental health in Mexico (Antman 2010, 2013).

We plan several next steps for our analysis. First, we plan to include information on health behaviors of respondents as a potential mechanism linking children's education and parental health. Our finding that offspring education affects parental health even after controlling for children's financial transfers to parents suggests that parents of highly educated children benefit from children's resources even beyond the monetary assistance that highly educated children provide. An unexplored mechanism could be that highly educated children are able to influence parental health behaviors, either by modelling healthier behaviors themselves, or by providing access to new health information to parents, or both (Friedman and Mare 2014; Torssander 2013). Second, we plan a more vigorous testing of whether children's migration affects parents' health by looking at whether the migration of children in between survey waves influences parental mortality. Our current, static measure of children's migration status may not fully capture the effect that migration has on parental health.

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Table 1: Descriptive Statistics in 2001, Wave 1		
	Percent/Mean	S.D.
Parent's Demographic Characteristics		
Age	63.21	9.22
Male	44.0%	
Education		
<Primary	27.0%	
Primary	54.0%	
>Primary	19.0%	
Marital Status		
Married	69.0%	
Single	1.3%	
Divorced	8.5%	
Widowed	21.1%	
Total number of children	6.61	3.46
Ever international migrant	8.9%	
Ever Internal migrant	62.0%	
Urban resident	65.5%	
Children Financial Transfers from grandchildren/children to parents		
No transfers	44.0%	
Transfer to Parents ($0, $4,999)	16.6%	
Transfer to Parents (over $5,000)	39.4%	
Parent's Wealth		
First Tercile	30.2%	
Second Tercile	35.1%	
Third Tercile	34.7%	
Children's Characteristics		
Education		
No Chilldren with College	60.2%	
Some Children With College	28.7%	
All Children With College	11.1%	
International migration history		
No children ever migrated	69.0%	
1+ child current migrant child	23.7%	
1+ former migrant child, no current migrant child	7.6%	
Mean financial status of children	2.24	0.61
Sex Composition		
All sons	12.4%	
All daughters	11.0%	
Sons and daughters	76.7%	
N	10,430	
Source: *Mexican Health and Aging Study, 2001 (Wave 1)*		

Table 2: Cox Proportional Hazard Models Predicting Mortality (Parents 51+ with 1 or more Adult Child aged 25+)

	M1			M2			M3			M4			M5			M6		
	Hazard Ratio	SE	p-value	Hazard Ratio	SE	p-value	Hazard Ratio	SE	p-value	Hazard Ratio	SE	p-value	Hazard Ratio	SE	p-value	Hazard Ratio	SE	p-value
Parent's Demographic Characteristics																		
Age	1.08	0.00	0.000	1.084	0.002	0.000	1.08	0.00	0.000	1.08	0.00	0.000	1.08	0.00	0.000	1.08	0.00	0.000
Male	1.28	0.05	0.000	1.275	0.051	0.000	1.28	0.05	0.000	1.33	0.06	0.000	1.35	0.06	0.000	1.35	0.06	0.000
Education (Omitted: <Primary)																		
Primary	0.96	0.04	0.434				1.00	0.05	0.955	1.00	0.05	0.959	1.00	0.05	0.978	1.01	0.05	0.826
>Primary	0.81	0.05	0.001				0.96	0.07	0.583	0.97	0.08	0.656	0.96	0.08	0.606	0.99	0.08	0.887
Marital Status (Omitted: Married)																		
Single										1.28	0.24	0.183	1.28	0.24	0.182	1.29	0.24	0.173
Divorced										1.23	0.09	0.006	1.23	0.09	0.008	1.20	0.09	0.019
Widowed										1.11	0.06	0.052	1.10	0.06	0.071	1.08	0.06	0.132
Total number of children										1.00	0.01	0.461	1.00	0.01	0.614	1.00	0.01	0.951
U.S. Migrant										1.00	0.07	0.996	1.00	0.07	0.970	1.01	0.07	0.883
Internal Migrant										0.98	0.04	0.690	0.98	0.04	0.661	0.98	0.04	0.597
Urban resident (Omitted: Rural)										1.05	0.05	0.341	1.05	0.05	0.345	1.05	0.05	0.295
Children's Characteristics																		
Education (Omitted: No Children with 13+ years of schooling)																		
Some Children with 13+ years of schooling				0.86	0.04	0.001	0.87	0.04	0.003	0.87	0.04	0.007	0.86	0.04	0.003	0.87	0.04	0.004
All Children with 13+ years of schooling				0.65	0.05	0.000	0.66	0.06	0.000	0.68	0.06	0.000	0.67	0.06	0.000	0.70	0.06	0.000
Migration History (Omitted: No children ever migrated)																		
Child currently living abroad										0.98	0.05	0.748	0.91	0.09	0.348	0.92	0.09	0.373
Child ever but not currently living abroad										1.06	0.08	0.470	1.06	0.08	0.446	1.06	0.08	0.395
Sex Composition (Omitted: All sons)																		
All daughters										0.98	0.05	0.660	0.96	0.05	0.465	0.97	0.05	0.493
Sons and daughters										1.05	0.08	0.516	1.06	0.08	0.466	1.06	0.08	0.473
Mean financial status of children										0.95	0.03	0.137						
Children Financial Transfers (Omitted: No money to parents over past two years)																		
Transfer to Parents ($0, $4,999 in the past two years)													1.09	0.06	0.127	1.08	0.06	0.157
Transfer to Parents (over $5,000 in the past two eyars)													1.11	0.05	0.030	1.10	0.05	0.047
Parent's Wealth (Omitted: First Tercile)																		
Second Tercile																0.96	0.05	0.367
Third Tercile																0.86	0.05	0.006
N	10,430			10,430			10,430			10,430			10,430			10,430		
Deaths	2,438			2,438			2,438			2,438			2,438			2,438		

Source: *Mexican Health and Aging Study, 2001-2012 (Waves 1-3)*