Life Expectancy among U.S.-born and Foreign-born Older Adults: Estimates from Social Security and Medicare Enrollment Data

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SHORT ABSTRACT

America's foreign-born are becoming increasingly diverse, yet little is known about how life expectancy varies by birth region. We used linked Social Security and Medicare records to examine life expectancy at age 65 (e65) for several foreign-born groups and for native-born Americans in 2000-2009. At age 65, the foreign born had a 2.4 year advantage over the U.S. born for both sexes. Asian-born immigrants had generally the highest longevity, while those born in Europe and Canada had the lowest. Timing of U.S. entry was associated with e65 in a monotonic fashion, with those entering since 1990 enjoying the highest longevity. Next steps will be to: (1) analyze census data to understand the role of socioeconomic and other variables, (2) compare e65 among the immigrants with e65 in their sending region to better understand health selection, and (3) calculate the contribution of the foreign born to U.S. e65 during this period.

Introduction

Population aging and immigration are jointly transforming America's demographic profile. Longer life spans and lower birth rates have shifted America's age structure, and waves of immigration have altered its racial and ethnic composition. While the United States has long been a destination for immigrants, the number and proportion of foreign-born individuals in the US population has fluctuated over time. In 1960, the foreign born comprised approximately 5% of the U.S. population (U.S. Census Bureau 2010). By 2010, policy changes including increased annual immigration quotas, increases in employment-related immigration, and the introduction of diversity visas, this figure rose to 13%, a level similar to that observed in the early 1900s (Grieco et al. 2012). The composition of immigration has changed dramatically: while a century ago nearly nine out of ten immigrants were from Europe, those born in Europe account for just 12% of current immigrants and the number of immigrants from previously low-immigration countries in South America, the Caribbean, Asia, and Africa has been growing. Approximately 10% of the U.S. black population is now foreign born, up from less than 1% in 1960 (Kent 2007; U.S. Census Bureau 2011).

Despite the growing diversity of America's foreign born, the majority of research on immigrant health has focused on Hispanics, and more recently on Asians, (Cho et al. 2004; Frisbie et al. 2001; Gubernskaya et al. 2013; Lauderdale and Kestenbaum 2002; Turra and Elo 2008). Due to the limitations of survey data, less is known about the health of immigrants from other backgrounds. In this paper, we use linked Social Security and Medicare administrative records to consider the full range of origin regions, as well as the timing of US entry, in comparing the longevity of native-born Americans with that of the increasingly diverse foreign-born population. More specifically, we provide sex-specific life expectancy estimates for the U.S. foreign born at age 65 during the period of 2000-2009 by region of birth and period of entry. We also compare these estimates with those for native-born Americans produced using the same data.

Migration and Health

The health of immigrants has attracted considerable attention from demographers, and a substantial literature has documented advantages in health and longevity for the foreign born compared to their U.S.-born race/ethnic counterparts or to U.S.-born non-Hispanic whites (e.g.,

Argeseanu Cunningham et al. 2008). These health advantages are often not trivial: estimates for 1999-2001 indicate that the foreign born have about a 3.5 year advantage in life expectancy at birth compared to the native born (Singh and Hiatt 2006). The odds of having a chronic disease or suffering from a disability also appear to be about 30-40% lower in foreign-born adults compared to U.S.-born adults (Singh and Hiatt 2006).

Many studies find that the foreign-born health advantage is not explained by socio-demographic characteristics such as education or income (e.g.; Elo et al. 2011). Because Hispanics, in particular, generally have lower incomes and levels of educational attainment than non-Hispanic whites, their better health and mortality profile has prompted much research focused on resolving this paradox (Markides and Coreil 1986; Palloni and Arias 2004). Some explanations point to the role of selection: the healthy-migrant effect refers to migrants who are positively selected on health and other observed and unobserved characteristics (e.g., motivation) at the time of migration (Jasso et al. 2004), while the salmon-bias effect is the name given to the phenomenon whereby migrants who experience unemployment or illness return to their country of origin at higher rates than their employed and healthier counterparts (Abraído-Lanza et al. 1999). Some studies additionally emphasize the role of "cultural buffering"—the foreign born often come from cultures that are characterized by strong familial and social networks and norms that restrain risky behaviors (Cho et al. 2004). Despite the advantages that selective migration or cultural factors may play in the foreign-born health advantage, there is also strong evidence that the foreign-born health advantage begins to erode with increasing time spent in the United States (Antecol and Bedard 2006).

Because the U.S. foreign-born come from a wide variety of regions with different levels of health and economic development and which are subject to different U.S. immigration policies, we expect the longevity of the foreign born to vary by region of birth. In addition, some foreign-born groups have been in the U.S. longer than others and to the extent that lengthy U.S. exposure has a negative impact on health, we hypothesize that foreign-born groups whose members have arrived in the United States more recently will have higher life expectancies than migrant groups who arrived earlier.

Data and Methods

Our analysis comes from a synthesis of two master files of the Social Security Administration (SSA) – the Master Beneficiary Record (MBR) and the NUMIDENT. The Master Beneficiary

Record contains information about persons entitled to social security benefits or enrolled in Medicare, the nearly universal health insurance program for persons age 65 and over. The file of applications and re-applications for a social security number (ssn) or card is called the NUMIDENT in the version kept in numerical order and the ALPHIDENT in the version kept in alphabetic name order. These files were used in several studies of mortality at older ages in the United States (Elo et al. 2004; Bert Kestenbaum 1988; Bertram Kestenbaum 1997; Bertram Kestenbaum and Ferguson 2002; Lauderdale and Kestenbaum 2002; Turra and Elo 2008).

We study the mortality of persons age 65 and over while they are enrolled in Medicare Part B (medical insurance). The relatively small number of persons age 65 and over who are enrolled in Part A (hospital insurance) and not Part B include – especially at the older ages – a non-trivial number of persons who are, in fact, deceased, yet their death was either not reported to SSA or not recorded in its files. Unlike Part A, which is generally free of charge, Part B coverage is purchased with monthly premium payments; the non-payment of premiums results in the termination of the Part B enrollment.

Persons entitled to social security benefits are eligible to enroll in Medicare Part B. Furthermore, all citizens are eligible, as are legally-resident aliens who have resided in the United Stated continuously for a minimum of 5 years. Because Part B is heavily subsidized by the Federal government and because State governments typically pay the premiums for poorer folks, relatively few eligible persons elect to not enroll.

From the Master Beneficiary Record as it stood in November 2012 we selected persons who were enrolled in Medicare Part B at some time during the 10-year period 2000-2009 and whose current or last address is in one of the 50 States or the District of Columbia. From the data in the record we can compute mortality by age and sex. A notable strength of the Medicare data for calculating death probabilities is that numerator and denominator come from the same source.

Using the social security number for linkage, we imported from the NUMIDENT the country of birth information collected on the application for a social security card and the posting date of the first NUMIDENT in file for each social security number. While the date of the original application for a social security card is occasionally many years after entry, more often the date will be close to the date of entry into the United States, given that a social security number is needed to obtain gainful employment and in many other contexts. This proximity of

the two dates is especially true for immigrants who participate in SSA's Enumeration at Entry program, by which application for a social security card is part of the visa application, and the card is mailed as soon as the immigrant enters the country. However, the date of application may be many years after U.S. entry for some individuals.

The NUMIDENT has a missing-data problem for some people born before 1916. The NUMIDENT was converted from a paper file to an electronic file in the mid-1970s. In the paper environment, when a claim for a retirement, survivor, or disability benefit was received at SSA, the ssn-application form on file was removed from the file by the adjudicator of the claim and associated with the claim form. A claim record took the place of the ssn-application form in the paper NUMIDENT file, and this claim form does not contain all the information that was on the application. In this study of mortality during the 2000-2009 period, the missing-data problem is of some consequence beginning at about age 85, i.e., for some persons we cannot obtain from the electronic NUMIDENT the country of birth and the date of the original application.

Age-specific probabilities of mortality and expectation of life at age 65 (e_{65}) are computed in the conventional ways. There is a slight upward bias in the mortality probabilities because any experience during the study period from persons who left the United States by the end of the period is lost, since we include only persons whose last address is a U.S. address. Our analysis is based on about 290 million person-years of exposure for the U.S. born (including those born in U.S. territories) and 35 million person-years of exposure for the foreign born.

We organize the foreign born by region of birth roughly adhering to the United Nations Statistics Division's classifications of geographic areas (United Nations Statistics Division 2013). We separate out those born in Canada from those born in other parts of the Americas because of the distinct immigration experience of the Canadian-born, the vast majority of whom applied for a social security card prior to 1980, compared to immigrants from other parts of the Americas who were more likely to have immigrated more recently. We also separate out those born in the former Soviet republics from those born in other parts of Eastern Europe because of the distinct social and political contexts that immigration occurred in for those born in the former Soviet Union (Mehta and Elo 2012). We distinguish between those born in the U.S. territories from those born in the 50 States and DC.

Results

Table 1 provides descriptive characteristics of the sample by region of birth and sex. Those born in Asia tended to be more recent arrivals (35-70% arriving after 1980), with those born in the Americas tending to be an intermediate group with about one-quarter arriving after 1980. Those born in Europe and Canada were generally the least likely to have entered after 1980 (with the exception of those born in the Former Soviet Union, of whom about 60% entered after 1980).

Table 2 shows, for males and females, life expectancy at age 65 for the total Medicare B population and for selected subpopulations, as well as rankings for the foreign-born population subgroups (and for the subgroup of persons born in the U.S. territories). The total sample had an e_{65} of 17.13 years for men and an e_{65} of 20.01 years for women. These expectancies are slightly higher than those published by the Human Mortality Database (HMD) for the same 2000-2009 period, by 0.2 years for men and 0.3 years for women. The HMD estimates are based on vital statistics and census data.

For those born in the 50 States or DC, e_{65} was 16.91 (men) and 19.78 (women) years. The foreign-born had a 2.41 year (e_{65}=19.32) and 2.37 year (e_{65}=22.15) advantage for men and women, respectively. Those born in the U.S. territories had an approximately 0.2-0.5 year advantages of 0.53 for men and 1.23 for women compared to those born in the 50 States or DC. Among the foreign-born subgroups, those born in Asia tended to have the highest life expectancies for both sexes (with the exception of women born in Western Asia), while those born in Europe and Canada tended to have the lowest life expectancies. Those born in the Americas and Africa tended to be at intermediary rankings, with the exception of those born in South America: this group ranked third among men and first among women. Each of the foreign-born subgroups enjoyed a higher life expectancy than the U.S. born. In general, the rankings across sex were well-correlated (r=0.84).

We next turn to the role of timing of U.S. entry. Table 3 shows e_{65} by the timing of social security application. For both men and women a longer time since U.S. entry is associated with lower life expectancy. For women, those arriving prior to 1960 had a 2.5 year lower e_{65} compared to those arriving since 1990, and for men, the difference was approximately 3.0 years. Roughly 3% (men) and 5% (women) of exposure data came from individuals whose date of social security application was unknown. The e65 for those with an unknown application date

was lower than those whose application date was recorded (18.26 years for men and 21.12 years for women).

Discussion

Our findings indicate that the U.S. foreign born are an exceptional population with respect to old-age mortality. The foreign-born had an approximately 2.4 year advantage in e_{65} compared to the U.S. born. To put this advantage into context, e_{65} in the U.S. has been increasing by approximately 2 years per decade since 1960. Therefore, at this pace, the foreign-born are "ahead" of the U.S. born by more than a decade. Our findings additionally indicate that foreign born have an e_{65} comparable to that of Japan, a leading country in terms of longevity, for the same 2000-2009 period (data from HMD). U.S. foreign born have more than a one year advantage over Japanese men and U.S. foreign-born women have only a one year e_{65} disadvantage relative to Japanese women. Our findings also highlight that timing of entry to the United States is associated with e_{65} in a monotonic fashion, with those entering the United States in the period beginning with 1990 having the highest longevity.

Estimating mortality among the foreign born is complicated by the fact that some foreign born return to their countries of origin. This out-migration (or the salmon bias) can downwardly bias estimates made from death registration records linked in follow-up studies to survey participants (e.g., NLMS, NHIS). This bias occurs because deaths occurring outside of the United States are missed, causing understatement of the numerator and overstatement of the denominator of mortality probabilities. (Palloni and Arias 2004; Turra and Elo 2008). Our approach avoids this statistical artifact.

Our findings underscore that there is significant heterogeneity in mortality among the foreign-born by region of birth. In general, Asian subgroups had the highest e_{65} and those from Europe and Canada had the lowest e_{65}. In fact, differences among the foreign-born subgroups are nearly as large as differences between the foreign born and the U.S. born: the bottom quartile of the foreign born regional groups (roughly the bottom 4 groups) examined had an approximately 2.5 year shorter expectancy compared to the top quartile (top 4) examined. As indicated, differences in the timing of U.S. entry may help explain some of this difference. Another, possibly related to this hypothesis is that distance from U.S. is a key predictor of variation in longevity. We plan to investigate this hypothesis further.

The Medicare/NUMIDENT files that we have thus far relied on do not have information on education and other characteristics of value in explaining mortality differentials. The next steps of our analysis will be to: (1) tabulate and analyze data from the American Community Survey (ACS) to understand the role of socioeconomic and other variables, (2) provide a comparison of e_{65} for the foreign-born subgroups with e_{65} in the regions of birth to better understand the effect of health selection for these populations, and (3) calculate the contribution of the foreign born to overall U.S. life expectancy at the beginning and end of the period (2000-2009).

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Table 1. Person-years of exposure and deaths by region of birth and sex, Social Security Administration (SSA) Administrative Files[1]; ages 65+, 2000-2009

	Males			Females		
Place of Birth	Person-Years Exposure	Deaths	U.S. Entry after 1980, %	Person-Years Exposure	Deaths	U.S. Entry after 1980, %
U.S.A	121,475,505	6,235,022		168,962,157	7,376,084	
50 U.S. States and DC	120,607,123	6,197,800	n/a	167,667,602	7,333,219	n/a
Territories	868,382	37,222	n/a	1,294,555	42,865	n/a
Canada	689,902	38,911	4%	1,291,256	60,630	3%
Americas	4,462,487	162,211		6,341,960	182,754	
Central America	2,170,311	75,779	24%	2,868,032	82,264	32%
Caribbean Islands	1,730,680	69,437	26%	2,569,313	79,680	27%
South America	561,496	16,995	25%	904,615	20,810	32%
Europe	4,557,362	208,274		7,524,856	286,200	
Northern Europe	767,315	36,578	7%	1,600,205	64,162	4%
Western Europe	904,327	38,569	3%	2,142,644	73,016	2%
Southern Europe	1,303,201	54,522	4%	1,564,672	57,197	5%
Former Soviet Union	591,331	26,864	61%	919,785	36,949	62%
Other Eastern Europe	991,188	51,741	10%	1297550	54876	13%
Africa	181,916	6,035	31%	224,656	5,947	42%
Asia	3,408,088	110,111		4,774,427	117,712	
Eastern Asia	1,269,020	40,019	44%	2,034,839	49,571	40%
South Central Asia	629,377	16,853	54%	635,027	13,990	70%
Southeast Asia	1,212,067	42,537	55%	1,774,312	44,096	57%
Western Asia	297,624	10,702	34%	330,249	10,055	44%
Oceania	57,064	2,331	21%	111,333	4,406	16%
Unknown	138,280	6,052	22%	201,931	7,110	26%
Total	134,970,608	6,768,947	n/a	189,432,576	8,040,843	n/a

Note: U.S. entry estimated from date of Social Security application.

[1] Medicare Part B enrollees in the Master Beneficiary Record (MBR) linked to NUMIDENT application data.

Table 2. Life Expectancy in years at age 65 (e_{65}) by sex and sex-specific rankings; Social Security Administration (SSA) Administrative Files[1]; ages 65+, 2000-2009

	Males		Females	
Place of Birth	*e-65*	*Rank*	*e-65*	*Rank*
Total	17.13	-	20.01	-
Total U.S. Born	16.91	-	19.78	-
Total Foreign Born	19.32	-	22.15	-
U.S.A				
50 States and DC	16.91	n/a	19.77	-
Territories	17.44	17	21.00	14
Americas				
Central America	19.29	9	22.01	10
Caribbean Islands	18.88	11	22.63	6
South America	20.38	3	24.01	1
Canada	18.07	16	20.96	15
Europe				
Northern Europe	18.47	13	20.78	17
Western Europe	19.34	8	21.53	13
Southern Europe	19.05	10	22.41	7
Former Soviet Union	19.47	6	22.21	8
Other Eastern Europe	18.45	14	21.64	12
Africa	19.41	7	22.71	5
Asia				
Eastern Asia	21.25	2	23.76	2
South Central Asia	21.55	1	23.68	3
Southeast Asia	19.95	4	23.50	4
Western Asia	19.49	5	22.04	9
Oceania	18.18	15	20.85	16
Unknown	18.54	12	21.65	11

Note: Rankings are for foreign-born subgroups and those born in U.S. territories

[1] Medicare Part B enrollees in the Master Beneficiary Record (MBR) linked to NUMIDENT application data.

Table 3. Life Expectancy in years at age 65 (e_{65}) by timing of U.S. entry; Social Security Administration (SSA) Administrative Files[1]; ages 65+, 2000-2009

Date of Social Security Application	*Males*	*Females*
Pre-1960	18.84	21.66
1960s	19.27	22.18
1970s	19.46	22.20
1980s	19.93	23.24
1990+	21.30	24.18
Unknown	18.26	21.12

Note: U.S. entry estimated from date of Social Security application.

[1] Medicare Part B enrollees in the Master Beneficiary Record (MBR) linked to NUMIDENT application data.