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Journal

Journal of Health and Social Behavior, 54(4)

Authors

Gubernskaya, Zoya
Van Hook, Jennifer
Bean, Frank

Publication Date

2013

DOI

10.1177/0022146513504760

Peer reviewed



Published in final edited form as:

J Health Soc Behav. 2013 ; 54(4): 427–443. doi:10.1177/0022146513504760.

(Un)Healthy Immigrant Citizens: Naturalization and Activity Limitations in Older Age*

Zoya Gubernskaya,
State University of New York, Albany

Frank D. Bean, and
University of California, Irvine

Jennifer Van hook
Pennsylvania State University

Abstract

This research argues that immigrants' political, social and economic incorporation experiences, which are embedded in individual life-course trajectories and heavily influenced by governmental policies, play an important role in producing diverse health outcomes among older U.S. foreign-born persons. Using data from the 2008–2010 American Community Surveys and 1998–2010 Integrated Health Interview Surveys, we demonstrate how naturalization, a key indicator of social and political inclusion, is related to functional health in midlife and older age. Consistent with the theoretical framework, we find that among those foreign-born who immigrated as children and young adults, naturalized citizens show better health at older ages compared to non-citizens, although this relationship is partly mediated by education. But among those older foreign-born who immigrated at middle and older ages, naturalized citizens report worse health compared to non-citizens. Moreover, this negative health selection into naturalization becomes stronger for those naturalizing after the 1996 Welfare Reform Act.

Keywords

ACS; activity limitations; aging; functional limitations; IHIS; “immigrant health paradox”; naturalization; older immigrants; selection mechanisms

As of 2010, there were 13.7 million foreign-born ages 50 and above in the United States, or 13.8 percent of all persons of these ages and 34.2 percent of all foreign-born (Ruggles et al. 2012). Despite the size of this demographic group and mounting concerns over its possible healthcare costs (Keehan et al. 2011), we know relatively little about older immigrants' health, and even less about the factors contributing to health disparities within the group. The extensive “immigrant health paradox” literature focuses primarily on mortality and health disparities by nativity (Acevedo-Garcia and Bates 2008; Hummer et al. 2007; Jasso et

*This research also benefited from a grant from NICHD (RC2 HD064497), as well as from support from the Center for Research on Immigration, Population and Public Policy at the University of California-Irvine and from the Population Research Institute at Pennsylvania State University. We express thanks to Judith Treas, Susan K. Brown, Andrew Noymer and the editor and reviewers of JHSB for their helpful comments and suggestions.

Address correspondence to: Zoya Gubernskaya, University at Albany-SUNY, Department of Sociology, 351 Arts & Sciences Bldg. 1400 Washington Ave, Albany, NY, 12222 (zguberns@gmail.com will be updated).

This is a revision of papers presented at the annual meetings of the Population Association of America in San Francisco, California, May 2012 and at the University of California Summer Institute on Migration and Health at the California Endowment and UCLA, May 27–31, 2012.

al. 2004; Markides and Gerst 2011; Palloni and Arias 2004; Palloni and Morenoff 2001; Riosmena and Dennis 2012; Smith and Bradshaw 2006), and thus often downplays important health differentials among the foreign-born, which can become especially visible in later life (González et al. 2009; Markides et al. 2007; Schoeni et al. 2005). Rather than extrapolating the “immigrant health paradox” framework to older immigrants, this paper attempts to develop theoretically grounded expectations about the patterns of health disparities likely to characterize older U.S. foreign-born persons.

We argue that immigrants’ political, social and economic incorporation experiences, which are embedded in individual life-course trajectories and heavily influenced by governmental policies, play an important role in producing diverse health outcomes among the older foreign-born. Using data from the 2008–2010 American Community Surveys and the 1998–2010 Integrated Health Interview Surveys, this research shows how naturalization, a key indicator of social and political inclusion, is related to functional health in midlife and older age. For reasons discussed below, we expect naturalization to be associated with better health in later life, although several sources of selection related to the timing of migration in the life course may mask this positive association. Consistent with theoretical predictions, we find that among those foreign-born who immigrated as children and young adults, naturalized citizens show better health in older age compared to non-citizens. This relationship is partly explained by other important determinants of immigrants’ incorporation and health, such as race/ethnicity and education. But among those older foreign-born who immigrated in middle and older ages, naturalized citizens show worse health compared to non-citizens, which is consistent with the idea of negative health selection into naturalization.

The paper is structured as follows. First, we briefly review the “immigrant health paradox” literature and the limitations of this framework for studying older immigrants’ health. Then we describe in detail our theoretical model that predicts how naturalization is related to health in later life and how this relationship may vary depending on the timing of migration in the life course. Then we assess these hypotheses with the available empirical data. Finally, we discuss the findings in the context of continuing immigration and population aging, as well as in terms of their implications for the “immigrant health paradox” literature and naturalization and welfare policies.

“Immigrant health paradox” and Older Foreign-born

The extensive “immigrant health paradox” literature is surprisingly unclear on what might happen to immigrants’ health in older age. On the one hand, immigrants have lower mortality and better health than the native-born, most likely because of the positive selectivity of migration (the “healthy immigrant effect”), but also because of healthier life styles and greater social support in immigrant families and communities (Acevedo-Garcia and Bates 2008; Hummer et al. 2007; Jasso et al. 2004; Markides and Gerst 2011; Palloni and Arias 2004; Palloni and Morenoff 2001; Riosmena and Dennis 2012; Smith and Bradshaw 2006). On the other hand, this health advantage seems to become smaller the longer the foreign-born reside in the country. Such findings have led to hypotheses that exposure to and acculturation into American society worsens immigrant health through various mechanisms like the loss of protective cultural practices and the adoption of unhealthy lifestyles (so-called “negative acculturation”) (Abraído-Lanza, Chao and Flórez 2005; Antecol and Bedard 2006; Kaplan et al. 2004; Uretsky and Mathiesen 2007), as well as exposure to hazardous work conditions, stress, and discrimination (Carrasquillo, Carrasquillo and Shea 2000; Finch and Vega 2003; Hunter 2000; Leclere, Jensen and Biddlecom 1994).

Although such findings come primarily from studies on the general adult population, it is unclear whether they can be extrapolated to older immigrants. First by focusing on health disparities by nativity, the “immigrant health paradox” literature underemphasizes differences in health among the foreign-born. Such health disparities may be relatively small among young adult immigrants who are generally in good health, but as research on health disparities by race and socio-economic status show, they tend to persist and even increase in midlife and older age (Frytak, Harley and Finch 2003; House, Lantz and Herd 2005; Kelley-Moore and Ferraro 2004; Liang et al. 2010). Second, if anything, “negative acculturation” suggests that those who have spent many years in the country will be in worse health compared to recent arrivals. However, recent studies of older immigrants do not find this pattern (Choi 2011; González et al. 2009; Lum and Vanderkaa 2010; Wakabayashi 2010). Finally, there are several theoretical and methodological concerns about the common practice of using duration-of-residence as a proxy for acculturation. The concept of acculturation is not always well defined (Abraído-Lanza et al. 2006; Hunt, Schneider and Comer 2004). Moreover, duration is highly correlated with age, and in most conventional statistical models these two effects are confounded. Also, the pace of acculturation may vary dramatically depending on many factors, but particularly on age-at-migration. Last but not least, over time immigrants not only acculturate but also undergo economic, social and political integration into the host society. The majority over time learn English, move to better neighborhoods, become homeowners, gain relevant work experience and, overall, improve their socio-economic status (Alba and Nee 2003; Espenshade and Fu 1997; Myers and Lee 1998; Waters and Jimenez 2005), which is one of the strongest predictors of good health (Adler and Newman 2002; Elo 2009; Pampel, Krueger and Denney 2010). Thus, the relationship between duration-of-residence and immigrants’ health is complex and requires careful theorizing.

In sum, rather than extrapolating the “immigrant health paradox” framework to older immigrants, this research focuses on the factors contributing to health disparities among the older foreign-born by showing how naturalization, a key indicator of social and political inclusion, relates differently to functional health in younger, midlife and older ages depending on age-at-arrival.

Naturalization and Health in Later Life

Although primarily studied as an indicator of political incorporation (DeSipio 2011), citizenship can also be seen as a marker of more complete social incorporation (Bean and Stevens 2003; Jasso et al. 2004; Van Hook, Brown and Bean 2006). As Figure 1 illustrates, naturalization is likely to be positively related to health in later life, although mediation and selection mechanisms are likely to influence this association.

Naturalization as an indicator of incorporation

Naturalization is likely to be positively related to health in later life as becoming a full member of society is generally associated with notable tangible and intangible benefits. Only citizens can vote in elections, serve as elected officials, hold certain federal and state jobs, sponsor the immigration of close relatives into the country, enjoy fewer restrictions on participation in the public welfare programs, and live secure from deportation (Gilbertson and Singer 2003; Van Hook, Brown and Bean 2006). Thus, the specific mechanisms that link naturalization and health could be higher socio-economic status (e.g. through access to better jobs, greater employment security, higher wages, eligibility for public welfare programs); through improved access to healthcare (e.g. eligibility for public healthcare programs); and improved psychological wellbeing (e.g. through reduced stress and increased “sense of belonging”). Consistent with these mechanisms, previous research shows that foreign-born naturalized citizens are more likely to be better educated, have higher earnings,

own a home, live in better neighborhoods and have health insurance (Aguirre and Saenz 2002; Bloemraad 2000; Carrasquillo, Carrasquillo and Shea 2000; Gonzalez-Barrera et al. 2013; Liang 1994; Yang 1994).

Naturalization may also exert positive effects on health by fostering the development of symbolic connections to a new country and the willingness and desire to take on new civic engagements, commitments, and identities. Becoming a new citizen is associated with a shift in social role or identity and an increased “sense of belonging” (Bloemraad 2002; Bloemraad 2006; Van Hook, Brown and Bean 2006). On the other hand, being a non-citizen, especially one who is unauthorized or in a temporary status, and not receiving such benefits may negatively affect health by boosting stress and anxiety (Jasso et al. 2004), factors associated with a host of negative health conditions (Lantz et al. 2005).

The relationship between naturalization and education may be partially mediated by educational attainment because education is strongly associated with both naturalization and health (Adler and Newman 2002; Liang 1994; Pampel, Krueger and Denney 2010; Yang 1994). More highly educated foreign-born persons are more likely to naturalize if only because the intangible costs of naturalization are lower for those who can easily pass the civic and English language test. Similarly, immigrants with lower levels of education often delay naturalization due to the lack of English language proficiency, difficulties navigating the application process and having to pay high application fees (Gonzalez-Barrera et al. 2013). Additionally, getting an education is an important avenue of socio-economic incorporation for immigrant children and young adults. Thus, naturalization may also affect health in later life by fostering improved educational opportunities among the foreign-born (Bean et al. 2011; Mirowsky and Ross 2003). For example, only citizens and legal permanent residents are eligible for lower tuition at many public universities, federal education loans and grants, and many fellowships and scholarships. Also, families of unauthorized immigrants often devote considerable resources to legalization (e.g. lawyers’ fees, application fees), which may lower their ability to invest in the higher education of their children (Bean et al. 2011). Thus, it may be more difficult for non-citizens to obtain higher education, which in turn may negatively influence health in older age.

Given persistent racial/ethnic health disparities and the history of U.S. racial exclusion, minority status is also likely to influence the relationship between naturalization and health (Angel and Angel 2006). Racial and ethnic minorities experience more barriers to socioeconomic and political incorporation because of negative stereotypes and discriminatory practices. Unauthorized immigrants, the majority of whom are of Hispanic origin, face even greater barriers to incorporation as they are not eligible to naturalize (Bean, et al. 2013; Gonzalez-Barrera et al. 2013). Even though black and Hispanic foreign-born persons often have better health than the native-born of the same race and ethnicity, several studies point to substantial heterogeneity within Hispanic, Black and Asian foreign-born groups in terms of health outcomes (Cunningham, Ruben and Venkat Narayan 2008; Frisbie, Cho and Hummer 2001; Read and Emerson 2005). Overall, researchers have understudied racial and ethnic disparities *among* the foreign-born. Nevertheless, it is likely that full political and social inclusion will be beneficial for health of all foreign-born who are able to naturalize.

Health selection into naturalization

As Figure 1 shows, various selection mechanisms may theoretically confound the positive relationship between naturalization and health.¹ For example, it is plausible that foreign-born in good health are more likely to naturalize either because it is easier for them to fulfill naturalization requirements² or because they anticipate more benefits from becoming a citizen (e.g. employment privileges, easier international travel). Similarly, immigrants in

poor health may be less likely to naturalize because it is challenging for them to pass the naturalization exams. Selective outmigration or “salmon bias” may also contribute to the observed association between naturalization and health if those foreign-born experiencing health problems seek to return to their home countries. However, little reason exists to expect any of these processes to generate sizeable effects (e.g., recent research reviews have failed to find evidence of strong “salmon bias” effects on mortality) (Abraido-Lanza et al. 1999; Turra and Elo 2008).

A much stronger selection effect, however, is likely to derive from public policy changes (Binstock and Jean-Baptiste 1999; Borjas 2002). The Welfare Reform Act of 1996 (PRWORA) restricted non-citizens’ eligibility for the main federal welfare and health care programs such as Medicaid and SSI (Supplemental Security Income). Currently most legal permanent residents are ineligible for these programs during their first five years in the country. After the 5-year period, they become eligible for Medicaid, Medicare and SCHIP (State Children’s Health Insurance Program) if they meet other eligibility criteria for these programs.³ For SSI and Medicare Part A, the current legislation requires that non-citizens accumulate 40 quarters (10 years) of employment to become eligible. Additionally, if a non-citizen immigrant has a sponsor, the sponsor’s income counts toward determining SSI and Medicaid eligibility. Refugees and asylees are exempt from the 5-year-residency and 40-quarters-of-employment restrictions but like other foreign-born, they cannot receive SSI beyond 7 years unless they naturalize. Unauthorized immigrants and those on temporary visas are not eligible for any of these programs. Given these policies, immigrants in poor health may seek naturalization to ensure they are eligible for Medicaid and/or Medicare Part B, and to the degree that this mechanism predominates over socio-economic incorporation, the overall association between naturalization and health might turn negative rather than positive.

Age-at-migration

If both positive effects of incorporation on health and negative health selection into naturalization are plausible mechanisms, then the question becomes: Under what conditions can one be stronger than the other? Based on life-course perspective ideas (Dannefer 2003; Elder, Johnson and Crosnoe 2003), we argue that the timing of migration in the life course, or age-at-migration, is one such condition. First, opportunities for socio-economic incorporation in a new society decline with age (Angel et al. 1999; Treas and Mazumdar 2002), so 10 years’ time in the country for someone who migrated at age 12 and for someone who migrated at age 55 would result in quite different experiences and incorporation outcomes. Second, age-at-migration can be used to sort out some of the selection effects by predicting (albeit imperfectly) whether health decline could have preceded migration and naturalization. Our expectations for how the relationship between naturalization and health will vary depending on age-at-arrival are summarized in Figure 2.

¹By “selection” mechanisms we mean when health status enters into the decision to naturalize or not to naturalize. We label selection effects as “positive” if the association between naturalization and health is more positive and as “negative” if it is negative.

²In order to be eligible to naturalize most foreign-born have to reside in the United States as legal permanent residents for at least 5 years (3 for the spouses of U.S. citizens). To naturalize an eligible legal permanent resident has to pass civic and English-language exams and pay fees (\$680 as of 2012). Foreign-born children under 18 acquire citizenship automatically when their parents naturalize.

³After the 5-year period, legal permanent residents become eligible for Medicaid, Medicare and SCHIP (State Children’s Health Insurance Program) if they meet other eligibility criteria for these programs. For SSI and Medicare Part A, the current legislation requires that non-citizens work 40 quarters (10 years) in the U.S. to become eligible. Additionally, if a non-citizen immigrant has a sponsor, the sponsor’s income counts toward determining SSI and Medicaid eligibility. Refugees and asylees are exempt from the 5-year residency and 40 quarters of employment restrictions but like other foreign-born, they cannot receive SSI for more than 7 years unless they naturalize. Undocumented immigrants and those on temporary visas are not eligible for any of these programs. Subsequently, the benefits were restored for those legal permanent residents who were receiving them as of August 1992. States have some freedom in introducing or lifting other restrictions on non-citizens’ eligibility for joint federal-state programs such as Medicaid.

Those who migrated as children or young adults have had more time and opportunities to learn English and participate in mainstream social institutions through school and workplace involvements. What sets them apart is that many of them completed most of their schooling in the United States, which would make them similar to the native-born in terms of education and employment opportunities. Compared to immigrants who came at older ages, they would be more likely to benefit more from acquiring citizenship because they have spent more years and a greater share of their lives as U.S. citizens. They are also likely to become citizens at younger ages when fewer people experience health problems; thus, their naturalization is unlikely to be driven by poor health. Moreover, because foreign-born children under 18 acquire citizenship automatically when their parents naturalize, their naturalization would also not likely be driven by their own socio-economic status.

Those who migrated as young adults may be more positively selected on health compared to migrant children because the former are more likely to have migrated to seek better employment opportunities while the latter are more likely to have been brought by their parents. Such migrants are highly motivated to succeed economically and are likely to naturalize for similar reasons – employment opportunities, easier travel, bringing parents/relatives into the country, etc. Similarly to immigrant children, they tend to naturalize at ages when relatively few people experience health problems.

Despite a sizable share of employment-based migrants, many of the foreign-born who migrate in middle age (34–49) come through the family reunification program. An extremely diverse group in terms of human capital and socio-economic status, these immigrants are also likely to benefit from incorporation if it occurs, but the selection effects described above should be stronger for this group compared to younger migrants.

Finally, those who migrated in midlife and old age have had less time but also fewer opportunities to incorporate into the host society (Angel et al. 1999; Treas and Mazumdar 2002). Previous research has shown that elderly foreign-born have higher rates of participation in public welfare and healthcare programs (Binstock and Jean-Baptiste 1999; Burr et al. 2008; Nam and Jung 2008; Van Hook 2000). However, existing research rarely distinguishes the foreign-born by age-at-arrival. It is plausible that the tendency to rely heavily on welfare is much stronger for (if not limited to) those foreign-born who migrated at advanced ages. Because of their age, older newcomers are more likely to have health problems when they come to the country or develop them shortly after arrival (Angel, Buckley and Sakamoto 2001; Wakabayashi 2010). The cost of private health insurance or medical expenses for an uninsured elderly person can be quite high, so there is a strong incentive to naturalize to get (or retain) access to proper health care (Nam and Kim 2012). Even for healthy immigrants in advanced age it is difficult to learn a new language and find a full-time job, so they are unlikely to meet the 10-year-work requirement to become eligible for social security and Medicare Part A. Thus, given the eligibility criteria for SSI and Medicare Part B and the often precarious situations of many elderly newcomers, stronger negative health selection into citizenship is likely to occur for this group.

We therefore examine the magnitude and direction of the overall association between naturalization and health across age-at-arrival groups. As shown in Figure 2, if naturalization does in fact enhance immigrants' health, then we should find the strongest positive association between naturalization and health among those who arrived in the country at younger ages. If there is negative health selection into naturalization, it would result in negative associations between naturalization and health among those who migrated at older ages. We further test these hypotheses by distinguishing between those who naturalized sooner after arrival (fast naturalization) compared to those who naturalized later. We expect both the positive effects of naturalization on health and negative health-selection

into naturalization to be stronger for those who naturalized sooner. Further, if negative health selection into naturalization is affected by policy changes, we would expect the negative association between naturalization and health to be stronger among those who naturalized after the passage of PRWORA in 1996.

Data and Method

Data

We use Integrated Public Use Microdata Series (IPUMS) data from the 2008, 2009, and 2010 American Community Surveys (Ruggles et al. 2012) and the 1998–2010 Integrated Health Interview Series (IHIS) files (Minnesota Population Center and State Health Access Data Assistance Center Minneapolis 2012). The main advantage of the ACS for this research is its large and nationally representative sample of the foreign-born with detailed individual-level demographic information. It is the only large-scale survey that (since 2008) asks about year of naturalization. Its main disadvantage is that it includes very few health indicators. To overcome this, we also use IHIS data, which have more measures of health but limited information about the timing of migration, no information on the year of naturalization, and considerably smaller sample sizes. We could not use IHIS data collected before 1998 because the question about the citizenship status of the foreign-born was not included. Our analytic samples consist of all non-institutionalized foreign-born persons age 50 and over who resided at least 5 years in the country. We exclude foreign-born group quarters' residents from the ACS sample to make it comparable to the IHIS sample, which by design is representative of the non-institutionalized population. Those who spent fewer than 5 years in the country are excluded in consideration of the eligibility criteria for naturalization for the majority of immigrants.

Measures

We use the reporting of functional limitations as a measure of health status in the ACS data. The question asks: "Because of a physical, mental, or emotional condition, does this person have serious difficulty walking or climbing stairs?" Affirmative responses are coded as "1" and non-affirmative as "0". In the IHIS sample, we analyze three activity limitations measures: presence of any functional limitation, being in need of assistance with activities of daily living (ADLs), and being in need of assistance with instrumental activities of daily living (IADLs). All three measures are dichotomous with "1" indicating the presence of a limitation. We also analyze self-reported health (dichotomized where 1 = poor/fair health; 0 otherwise) to ascertain if such a more general and omnibus health indicator gives similar results. Since the dependent variables are binary, we use logistic regression models.

The main independent variables are citizenship status and age-at-arrival. We distinguish between those foreign-born who have naturalized and those who have not (reference category) and we construct separate models for 4 age-at-arrival groups: those who migrated as children (age 1–17), young adults (18–34), middle-aged adults (35–49), and older adults (age 50 and older). The public use IHIS data do not provide information about age or year of migration so we constructed it by subtracting the number of years in the United States from the respondent's age. Since duration-of-stay is a categorical variable in the public use IHIS, we could not ascertain exact ages at arrival; instead, we calculated the upper and the lower limits and assigned the average of the two to each respondent (e.g., for someone age 50 who spent between 5 and 10 years in the United States, the age-at-arrival could be between 40 (=50–10) and 45 (=50–5), so we assume it is 42.5 (=40+45)/2). Then we use the constructed age-at-arrival variable to place respondents in categories, but since duration-of-stay is top coded at "15 years or more", we could not distinguish between those who arrived as children and those who arrived as young adults. As a result, for the IHIS data, the age-at-

migration variable has only 3 categories (1–34, 35–49 and 50+) and its results need to be interpreted with caution.

We include age, gender, race, Hispanic ethnicity and education in our models. Age is a continuous variable (top coded at 85 in IHIS). In preliminary analyses, we also include the squared term for age, but this neither changed the main results nor improved model fit, so we exclude it from the final models. Gender is a dummy variable, with females coded “1” and males coded “0”. Respondents who self-identify as Hispanic are coded “1” and all others constitute a reference category. Race is a categorical variable that distinguishes between those who identify as whites (the reference), Black, Asian/Pacific Islander and “other” race. Although education is a categorical variable in the ACS, we treat it as a continuous because of the large number of categories (ranging from 0 (“no schooling”) to 11 (“5+ years of college”). Educational attainment is also reported in categories in the IHIS data, which range from 0 (“no schooling”) to 22 (“doctoral degree”).

Analytical Approach

We begin by presenting briefly descriptive statistics for the ACS and IHIS samples by citizenship status and age-at-arrival. Then we estimate a series of logistic regression models to test whether the relationship between naturalization and functional health in later life is explained by race/ethnicity and education. We run these models by age-at-arrival groups, controlling for age and gender. To see if similar patterns hold for other measures of health, namely, presence of any functional limitation, ADL, IADL and self-rated health, we run the full models on the IHIS sample. Then, with the ACS data we contrast the functional health of those who naturalized within 10 years after arrival and those who naturalize after spending more than 10 years in the country⁴, expecting to find stronger associations between naturalization and health among the former. Finally, to see if PRWORA indeed increased negative health selection into naturalization, we run the full models on two subsamples of the ACS data. The first subsample includes all non-citizens and those who naturalized before 1996. The second subsample includes all non-citizens and those who naturalized after 1996; we expect that negative health selection into naturalization will be stronger in this latter case.

Results

Descriptive statistics for the ACS and IHIS samples are presented in Table 1 and Appendix Table A. About 13.2% of the foreign-born over age 50 in the ACS sample report having a functional limitation. The differences by citizenship status are small and insignificant, but non-citizens tend to be younger, have lower levels of education, are less likely to be female or Asian, and are more likely to be Hispanic or of “other” race. About 19.3% of older foreign-born in the IHIS data report activity limitations, 3.9% report needing help with one or more ADLs, 6.6% indicate needing help with one or more IADLs, and 22% evaluate their general health as “fair” or “poor.” In this sample, non-citizens show better health outcomes on all measures except self-rated health but they also are, on average, younger, have lower levels of education and older ages-at-migration, more likely to be Hispanic and less likely to be Asian, compared to naturalized citizens. As Appendix Table A shows, older age-at-migration is associated with worse health on all measures in both data sets. But the foreign-born who migrated at older ages are, on average, older, more likely to be female, have lower levels of education, less likely to be white and less likely to be naturalized citizens.

⁴A small percentage of the respondents in the ACS sample show some inconsistent data responses involving date-of-naturalization preceding date-of-immigration. These cases are excluded from the analyses.

Because older age and being female are associated with worse functional health, it is important to account for these demographic differences between citizens and non-citizens. The descriptive differences in the levels of education, racial and ethnic composition, and age-at-migration are consistent with our expectations but it remains to be seen how all these factors taken together affect the association between naturalization and health in old age.

The four panels of Table 2 present a series of the logistic regression models of having a functional limitation by age-at-migration groups using the ACS data. The coefficients in all columns are log odds. In each panel, Model 1 controls only for age and gender. Model 2 and Model 3 add race/ethnicity and education, respectively. Finally, Model 4, the full model, includes all these variables.

Panel A presents the results for those who migrated before age 18. As Model 1 shows, for this group naturalization is associated with lower odds of having functional limitations after age 50, which is consistent with our expectation of positive association between naturalization and health in later life. Model 2 shows that Hispanic, Black and those foreign-born who identify as “other race” have higher odds of having functional limitations while Asians have lower odds of having functional limitations compared to foreign-born non-Hispanic whites. Although controlling for race decreases the size of naturalization coefficients, it remains significant. Not surprisingly, higher levels of education are associated with lower odds of having functional limitations in old age (Model 3), but education does not fully explain the effect of naturalization as it remains statistically significant. Adding both race/ethnicity and education in Model 4, however, reduces the naturalization coefficient to insignificance, suggesting that among those who immigrated as children the positive effect of naturalization on health in old age is jointly explained by race, ethnicity and education.

Panel B presents the results for those who migrated between ages 18 and 35. The findings for this group are very similar to those presented in Panel A. However, the naturalization coefficient remains statistically significant in Model 4, suggesting that in this group, naturalization exerts positive effects on health in later life even net of race/ethnicity and education.

Panel C presents the results for those who migrated in prime adulthood, between ages 35 and 50. For this group, even though naturalization is associated with lower odds of having functional limitations in Model 1, it retains some insignificance in Models 2 and 3. Moreover, it reverses its sign in Model 4. Controlling for race/ethnicity and education, naturalization is associated with higher odds of having functional limitations after age 50, which is consistent with the idea of negative health selection into citizenship. Also, the size of the race and ethnicity coefficients in this set of models is considerably reduced, suggesting smaller racial/ethnic health disparities among this subgroup of older foreign-born persons.

Finally, Panel D presents the results for those who migrated after age 50; they are quite different from those presented above. Naturalization is now associated with higher odds of having functional limitations in all four models, which is consistent with the idea of negative health selection into naturalization we expected to find among this group. Moreover, this association is even stronger in Model 4 that controls for race/ethnicity and education. Interestingly, the pattern of racial and ethnic health disparities is also very different among this group, as all minority groups, including Black and Hispanics, have lower odds of having functional limitations compared to non-Hispanic white foreign-born.

In order to ascertain if the patterns just observed for functional limitations are also evident in the IHIS data, we replicate these analyses on the IHIS sample. Appendix Table B presents

the naturalization coefficients from logistic regression models similar to Model 4 in Table 2. Even though we could not build the exact same models due to data constraints, similar patterns emerge. Specifically, among those who migrated before age 35, naturalization is associated with lower odds of having any limitation, being in need of assistance with ADLs and IADLs, and also with lower odds of being in “poor/fair” health (although the latter is not statistically significant). But among those who migrated after age 50, naturalization is associated with higher odds of being in need of assistance with IADLs and being in “poor/fair” health.

To explore further the association between naturalization and health in later life, we contrast those foreign-born who naturalized within 10 years of arrival with those who naturalized after spending more than 10 years in the country using the ACS data. We hypothesize that positive effects on naturalization will be stronger for those who naturalized sooner rather than later. Similarly, we expect stronger negative health selection into naturalization among those foreign-born who migrated at older ages and naturalized soon after arrival. The results presented in Panel A of Table 3 support these expectations. Each column in Table 3 presents only coefficients for naturalization from a full model, similar to Model 4 in each panel of Table 2. Those who migrated as children or young adults and naturalized sooner have lower odds of having functional limitations in older ages compared to those who naturalized later and non-citizens. But those who migrated after age 50 and naturalized sooner have higher odds of having functional limitations compared to those who naturalized later (Wald test is statistically significant $\alpha < 0.001$) or not at all.

Finally, we contrast those foreign-born who naturalized before 1996 to those who naturalized after 1996. Given that the PRWORA legislation that made citizenship a prerequisite for many government benefits was passed in 1996, immigrants who naturalized after 1996 should be more likely to have done so for reasons of poor health than those naturalizing earlier. The results presented in Panel B and Panel C of Table 3 are consistent with this expectation. Even though there is some evidence of negative health selection into naturalization among those late-age migrants who acquired citizenship before 1996 (Table 3, Panel B), naturalization after 1996 (Table 3, Panel C) is associated with much higher odds of having functional limitations⁵.

Discussion and Conclusions

This research argues that immigrants’ political, social and economic incorporation experiences, which are embedded in individual life-course trajectories and heavily influenced by governmental policies, play an important role in producing diverse health outcomes among older U.S. foreign-born persons. We show this by demonstrating how naturalization, a key indicator of social and political inclusion, is related to functional health in midlife and older age, testing our hypotheses using data from the 2008–2010 American Community Survey and 1998–2010 Integrated Health Interview Survey. Consistent with theoretical expectations, we find that among those foreign-born who immigrated as children and young adults, naturalized citizens, especially those who naturalized within 10 years of arrival, have better health in older age compared to non-citizens. This positive association, which is partly explained by education and race/ethnicity, is likely to reflect the health benefits of greater socio-economic incorporation as well as the psycho-social benefits of becoming a full member of the U.S. society. On the contrary, among those older foreign-

⁵We run additional models with the interaction coefficients. The results (available upon request) show that among those who migrated after age 50, fast naturalization after 1996 is more strongly associated with poor health than fast naturalization before 1996. Among those who migrated between ages 34–49, naturalization after 10 years in the country after 1996 is more strongly associated with poor health than naturalization after 10 years in the country before 1996.

born who immigrated at middle and older ages, naturalized citizens have worse health compared to non-citizens, which is consistent with the idea of negative health selection into naturalization. The relationship is even stronger among those who naturalized within 10 years of arrival and after the 1996 PRWORA reforms, which renders additional support to our interpretation.

Our findings have important implications for the “immigrant health paradox” literature. First, those who migrated as children and young adults have spent the most time in the country. In this group, naturalized citizens are likely to be more “acculturated” than non-citizens. Nevertheless, they have the lowest rates of functional limitations, which is inconsistent with the “negative acculturation” explanation of changes in health status of the foreign-born over time. Second, the associations with commonly used predictors of health seem to decrease in size or even reverse direction for those older foreign-born who come at older ages. This research focuses specifically on negative health selection into naturalization, but the reversed direction of racial and ethnic disparities in functional health among this group are noteworthy and warrant further investigation in their own right. Our findings suggest overall that the health status of older immigrants depends on a complex interplay of acculturation, socio-economic incorporation (or lack of thereof) and selection mechanisms, all of which are additionally influenced by the timing of events (such as migration and naturalization) in the life course as well as the changes in governmental policies.

Our findings also have important policy implications. First, age-at-arrival is crucial for understanding divergent health outcomes among the foreign-born in later life, as there are systematic differences between those who migrated as children, young adults or older adults. Those immigrants who arrive in middle and older ages constitute a risk group. Unlike younger migrants who are positively selected on health, at least some of the older newcomers may migrate because they have experienced health decline. Older newcomers also have extremely limited opportunities for socioeconomic incorporation due to their age. Coming mostly from less economically developed countries, they are unlikely to have accumulated the resources for retirement. Given that private health insurance is often unaffordable for older people with low income and health problems, they often have no choice but rely on public healthcare programs.

Second, naturalization (especially soon after arrival) for those who migrated as children and young adults seems to be protective of health in older age. This suggests that legal status may be a powerful risk factor for poor health in later life. Unauthorized status may result in worse health in later life not only because it blocks upward mobility by reducing employment opportunities, denying access to safety nets and fostering political exclusion, but also because it interacts with other barriers on incorporation, such as low education and minority status. These two implications are of special importance as the number of unauthorized older immigrants and older immigrant newcomers will likely to increase in the coming decades due to population aging and continuing immigration, respectively (Bean et al. 2012; Bean et al. 2013). In the absence of comprehensive immigration and healthcare reform, this might lead to growing health disparities among the older foreign-born and increased pressure on public health care programs.

This research is not free from limitations, which suggest directions for future research. Due to data constraints we could not identify those foreign-born who are ineligible to naturalize. It would be helpful to know the current immigration status of foreign-born non-citizens (e.g. LPR, temporary visa, or unauthorized) as well as the date of becoming an LPR, since only those who spent five years as an LPR (3 years for the spouses of the U.S. citizens) are eligible to naturalize. The major health divide may fall between the unauthorized and the

rest of the foreign-born rather than between non-citizens and citizens. The health measures we use here are limited to functional and self-rated health, so it is important to investigate whether similar findings would emerge for other measures, such as chronic conditions, cognitive functioning or mental health. We also did not separate the foreign-born by country of origin, partly because separating the older foreign-born by citizenship status and age-at-migration significantly reduces sample size even in very large population-based samples. Additional analyses (not shown here) show that the general pattern of the association holds for several subgroups, including the older foreign-born from Mexico (Gubernskaya 2012), although there are some interesting differences that need to be investigated further. There also may be important gender differences in the relationship between naturalization and health in later life because women are more likely to immigrate by joining a spouse, to work informally as homemakers and to have higher rates of disability in old age. Finally, the available data did not allow us to examine all direct and indirect associations between naturalization, other measures of incorporation (e.g. employment history, income) and health. We hope that more comprehensive tests of the causal and selection mechanisms identified in the theoretical model will be possible in the future as new data become available.

Biographies

Zoya Gubernskaya is an assistant professor in the Department of Sociology and the Center for Social and Demographic Analysis (CSDA) at the University at Albany, SUNY. Her current research aims at better understanding of health and wellbeing of older immigrants in the United States.

Frank D. Bean is Chancellor's Professor of Sociology and Director, Center for Research on Immigration, Population and Public Policy at UC- Irvine. His current research focuses on migration status and Mexican-American integration (including health disparities), improving estimates of the U.S. foreign-born population, and relationships between diversity and U.S. social boundaries. His most recent book (with J. Lee) is *The Diversity Paradox: Immigration and the Color Line in 21st-Century America*.

Jennifer Van Hook is Professor of Sociology and Demography at The Pennsylvania State University. One strand of her research focuses on the incorporation of U.S. immigrants and their children, especially with respect to outcomes related to their diet, weight, and health. Another work seeks to evaluate and improve estimates of the size and composition of the foreign-born population.

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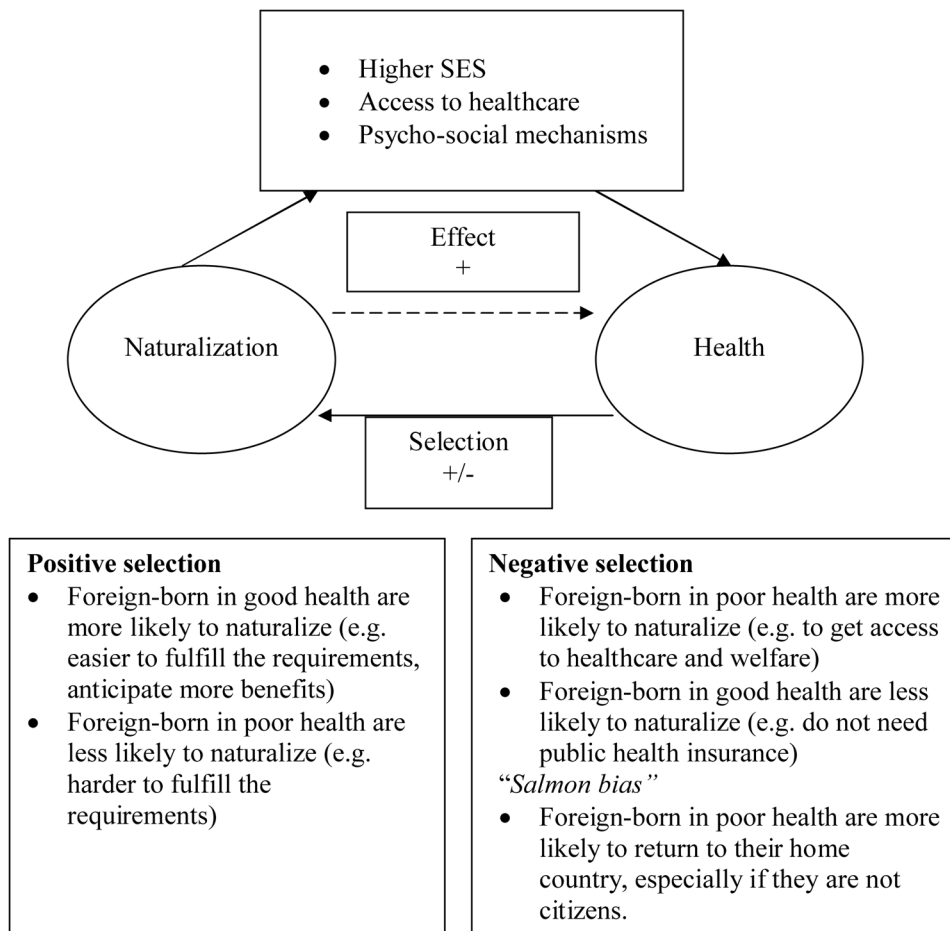


Figure 1.
Theoretical Model of Relationships between Naturalization and Health

	Age-at-migration			
	1-17	18-34	35-49	50+
Incorporation	+++	+++	++	+
Negative selection	0	-	--	---
Predicted association	+++	++	0	--

Figure 2.
Predicted direction and magnitude of association between naturalization and health by age-at-arrival

Table 1

Percentages (or means) for health indicators and control variables by citizenship status: Non-institutionalized foreign-born ages 50 and over

	ACS 2008–2010			1998–2010 IHIS		
	All foreign-born	Naturalized in 10 years	Non-citizens	All foreign-born	Naturalized	Non-citizens
Functional limitations	13.2	13.2	12.6	-	-	-
Any limitations	-	-	-	19.3	19.8	17.9
Need help with ADLs	-	-	-	3.9	4.0	3.4
Need help with IADLs	-	-	-	6.6	7.0	5.6
“Poor/fair” self-rated health	-	-	-	22.5	21.4	25.0
Age (mean)	63.0	64.5	61.0	62.9	63.8	60.7
Female	54.5	55.6	53.0	54.9	55.5	53.6
Hispanic	36.3	16.6	52.1	36.7	30.4	51.9
White	53.9	52.1	55.7	67.5	66.2	70.5
Black	7.6	6.7	7.0	7.4	7.3	7.7
Asian/Pacific Islander	25.7	35.8	18.0	22.2	23.9	18.2
Other	12.8	5.4	19.3	2.9	2.6	3.6
Education (mean) ^a	6.0	7.0	4.8	16.4	16.8	15.5
Age-at-migration (mean)	31.5	31.1	37.0	28.4	26.9	32.1
N	336,948	117,357	107,985	44,978	3,808	13,170
%	100	34.8	32.1	100	70.7	29.3

^aEducation ranges from 0 (“no schooling”) to 11 (“5+ years of college”) in the ACS and from 0 (“no schooling”) to 22 (“doctoral degree”) in the IHIS.

Table 2

Log odds coefficients from the models predicting presence of functional limitations: Non-institutionalized foreign-born age 50 and over, ACS 2008–2010

A. Migrated at age 1–17 (N=47,710)							
	Model 1	Model 2	Model 3	Model 4			
	B	SE	B	SE			
<i>(Not a citizen)</i>							
Naturalized	-0.392***	(0.049)	-0.275***	(0.050)	-0.128* (0.052)	-0.087 (0.052)	
Age	0.067***	(0.002)	0.074***	(0.002)	0.063***	(0.002)	0.068*** (0.002)
Female	0.396***	(0.037)	0.402***	(0.037)	0.356***	(0.038)	0.362*** (0.038)
<i>(Non-Hispanic)</i>							
Hispanic	-		0.497***	(0.044)	-		0.283*** (0.047)
<i>(White)</i>							
Black	-		0.501***	(0.095)	-		0.541*** (0.095)
Asian	-		-0.413***	(0.092)	-		-0.411*** (0.093)
Other	-		0.218***	(0.061)	-		0.136* (0.062)
Education	-		-		-0.129***	(0.006)	-0.110*** (0.007)
Constant	-6.267***	(0.107)	-7.011***	(0.127)	-5.433***	(0.113)	-6.009*** (0.140)
DF	3		7		4		8
Log likelihood	-14759		-14573		-14470		-14388
chi2	2019		2202		2368		2445
Pseudo R-squared	0.086		0.097		0.104		0.109
B. Migrated at age 18–34 (N=168,140)							
	Model 1	Model 2	Model 3	Model 4			
	B	SE	B	SE			
<i>(Not a citizen)</i>							
Naturalized	-0.321***	(0.024)	-0.196***	(0.024)	-0.102***	(0.025)	-0.063* (0.025)
Age	0.071***	(0.001)	0.075***	(0.001)	0.068***	(0.001)	0.072*** (0.001)
Female	0.345***	(0.020)	0.380***	(0.020)	0.324***	(0.020)	0.351*** (0.020)
<i>(Non-Hispanic)</i>							

B. Migrated at age 18–34 (N=168,140)

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Hispanic (White)	-		0.542***	(0.024)	-		0.314***	(0.026)
Black	-		0.366***	(0.039)	-		0.384***	(0.040)
Asian	-		-0.135***	(0.031)	-		-0.080*	(0.031)
Other	-		0.146***	(0.032)	-		0.082*	(0.032)
Education	-		-		-0.124***	(0.003)	-0.106***	(0.003)
Constant	-6.638***	(0.062)	-7.278***	(0.077)	-5.919***	(0.064)	-6.447***	(0.083)
DF	3		7		4		8	
Log likelihood	-52918		-52225		-51737		-51502	
chi2	6590		6992		8088		8099	
Pseudo R-squared	0.082		0.094		0.103		0.107	

C. Migrated at age 35–49 (N= 82,819)

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
<i>(Not a citizen)</i>								
Naturalized	-0.135***	(0.030)	-0.028	(0.031)	0.038	(0.031)	0.093**	(0.031)
Age	0.087***	(0.001)	0.085***	(0.001)	0.081***	(0.001)	0.080***	(0.001)
Female	0.466***	(0.027)	0.465***	(0.027)	0.403***	(0.028)	0.410***	(0.028)
<i>(Non-Hispanic)</i>								
Hispanic	-		0.310***	(0.034)	-		0.099**	(0.036)
<i>(White)</i>								
Black	-		0.183***	(0.050)	-		0.096	(0.051)
Asian	-		-0.151***	(0.037)	-		-0.216***	(0.038)
Other	-		0.095*	(0.043)	-		0.018	(0.044)
Education	-		-		-0.101***	(0.004)	-0.094***	(0.004)
Constant	-7.838***	(0.085)	-7.893***	(0.093)	-6.983***	(0.092)	-6.963***	(0.104)
DF	3		7		4		8	

C. Migrated at age 35-49 (N= 82,819)

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
Log likelihood	-27303		-27140		-26854		-26792	
chi2	5441		5839		5839		6001	
Pseudo R-squared	0.126		0.131		0.140		0.142	

D. Migrated at age 50 and over (N= 35,837)

	Model 1		Model 2		Model 3		Model 4	
	B	SE	B	SE	B	SE	B	SE
<i>(Not a citizen)</i>								
Naturalized	0.201***	(0.031)	0.196***	(0.032)	0.281***	(0.032)	0.268***	(0.033)
Age	0.091***	(0.002)	0.093***	(0.002)	0.088***	(0.002)	0.089***	(0.002)
Female	0.542***	(0.032)	0.552***	(0.032)	0.497***	(0.032)	0.499***	(0.032)
<i>(Non-Hispanic)</i>								
Hispanic	-		-0.257***	(0.041)	-		-0.425***	(0.044)
<i>(White)</i>								
Black	-		-0.400***	(0.066)	-		-0.502***	(0.067)
Asian	-		-0.461***	(0.037)	-		-0.550***	(0.038)
Other	-		-0.076	(0.058)	-		-0.129*	(0.058)
Education	-		-		-0.049***	(0.004)	-0.064***	(0.005)
Constant	-8.266***	(0.138)	-8.068***	(0.139)	-7.821***	(0.146)	-7.404***	(0.149)
DF	3		7		4		8	
Log likelihood	-18349		-18245		-18263		-18112	
chi2	3062		3143		3217		3316	
Pseudo R-squared	0.126		0.131		0.130		0.137	

*** p<0.001,
 ** p<0.01,
 * p<0.05.

Standard errors in parentheses.

Table 3

Log odds coefficients from the models predicting having functional limitations by age-at-arrival groups: Non-institutionalized foreign-born age 50 and over, 2008–2010 ACS

	Age-at-migration			
	1–17	18–34	35–49	50+
Panel A: Fast/Slow Naturalization (N=336,948)				
<i>(Non-citizens)</i>				
Naturalized within 10 yrs	–0.129* (0.060)	–0.086** (0.029)	0.094** (0.036)	0.332*** (0.035)
Naturalized after 10 yrs	–0.067 (0.054)	–0.050 (0.027)	0.093** (0.035)	0.130** (0.046)
Panel B: Fast/Slow Naturalization before 1996 (N=255,999)				
<i>(Non-citizens)</i>				
Naturalized within 10 yrs	–0.127* (0.061)	–0.112*** (0.030)	0.030 (0.042)	0.209*** (0.054)
Naturalized after 10 yrs	–0.062 (0.057)	–0.107*** (0.030)	–0.036 (0.051)	–0.041 (0.088)
Panel C: Fast/Slow Naturalization after 1996 (N=175,089)				
<i>(Non-citizens)</i>				
Naturalized within 10 yrs	-	–0.389* (0.166)	0.203*** (0.054)	0.408*** (0.039)
Naturalized after 10 yrs	–0.075 (0.072)	0.006 (0.032)	0.138*** (0.040)	0.156** (0.050)

p<0.001,

**
p<0.01,

*
p<0.05.

Standard errors in parentheses.

Models also include age, gender, race, ethnicity and education.

Appendix Table A

Percentages (or means) on health indicators, naturalization status and control variables by age-at-migration: Non-institutionalized foreign-born ages 50 and over

	Age-at-migration						
	1-17	18-34	35-49	50+	1-34	34-49	50+
	ACS 2008-2010						1998-2010 IHIS
Functional limitations	10.6	10.8	12.5	27.2	-	-	-
Any limitations	-	-	-	-	17.3	28.1	26.2
Need help with ADLs	-	-	-	-	2.7	9.3	6.8
Need help with IADLs	-	-	-	-	4.9	14.2	12.0
Poor/fair self-rated health	-	-	-	-	21.2	24.0	34.8
Age (mean)	60.4	61.6	62.3	73.1	61.9	66.2	68.4
Female	52.0	54.1	54.3	59.8	54.1	57.6	59.1
Hispanic	39.2	36.5	36.7	32.3	37.5	33.3	33.2
White	75.0	52.3	48.7	45.4	68.3	68.3	54.6
Black	4.5	8.0	8.7	7.5	7.4	7.4	7.8
Asian/Pacific Islander	8.1	26.1	30.0	36.2	21.3	21.6	35.1
Other race	12.5	13.5	12.7	10.9	3.0	2.7	2.5
Education (mean) ^a	6.6	6.1	5.8	4.9	16.2	17.3	17.9
Naturalized	82.7	75.1	56.0	47.4	75.9	55.4	37.9
Within 10 years in U.S.	46.3	39.3	23.4	12.9	-	-	-
After 10 years in U.S.	36.4	35.7	32.6	34.4	-	-	-
Age-at-migration (mean)	10.5	25.9	41.3	58.3	24.0	40.2	59.1
<i>N</i>	45,310	162,254	86,897	40,045	36,113	5,872	2,993
%	13.6	48.5	26.0	12.0	80.3	13.1	6.7

^a Education variable ranges from 0 "no schooling" to 11 "5+ years of college" in ACS and from 0 "no schooling" to 22 "doctoral degree" in IHIS.

Appendix Table B

Log odds coefficients from the models predicting various health outcomes: Non-institutionalized foreign-born population ages 50 and over, 1998–2010 IHIS

	Age-at-migration		
	1–34	35–49	50+
Any limitations (N=45,034)			
<i>(Non-citizens)</i>			
Naturalized	–0.140*** (0.038)	0.204 (0.107)	0.108 (0.105)
Poor/fair self-rated health (N=45,061)			
<i>(Non-citizens)</i>			
Naturalized	–0.226*** (0.033)	0.012 (0.090)	0.200* (0.094)
Needs help with ADLs (N=45,117)			
<i>(Non-citizens)</i>			
Naturalized	–0.262** (0.088)	0.135 (0.171)	0.228 (0.183)
Needs help with IADLs (N=45,113)			
<i>(Non-citizens)</i>			
Naturalized	–0.130 (0.069)	0.202 (0.142)	0.290* (0.144)

p<0.001,

**
p<0.01,

*
p<0.05.

Standard errors in parentheses.

Models also include age, gender, race, ethnicity and education.