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How Do Immigrant Older Adults in the United States Fare in Later Life? Examining Differences in Immigrant Status and Life-course Timing of Migration on Late-life Disablement and Mortality

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ABSTRACT

This dissertation focuses on immigrant older adults in the United States and their experiences with late-life disablement. Specifically, this dissertation examines immigrant status differences in late-life disability among immigrants compared to non-immigrants and investigates how life-course timing of immigration shapes late-life disability among immigrant older adults using data from the National Health and Aging Trends Study (NHATS) 2011-2016. Drawing from life course and segmented assimilation theoretical frameworks, this research is guided by two broad research aims: 1) To determine if the immigrant health and mortality advantage extends to late-life disablement, 2) To examine how life-course timing of migration affects late-life disablement for immigrants.

Results from Markov transition models show that compared to non-immigrant older adults, immigrants have greater risk of decline and lower risk of recovery from late-life disablement, yet have lower mortality risk. Among immigrant older adults, life-course timing of migration is an important predictor of late-life disability and mortality risk, as immigrants who migrated later-in-life have increased disability risk coupled with lower mortality risk relative to their counterparts who immigrated earlier in life. Moreover, Sullivan based life table calculations indicate longer life expectancies for immigrant older adults compared to their non-immigrant counterparts, but with a smaller proportion of disability-free years.

This research highlights key areas where future research and policy makers can work towards reducing health disparities in late-life disablement and mortality for immigrant older adults in the United States.

HOW DO IMMIGRANT OLDER ADULTS IN THE UNITED STATES FARE IN LATER LIFE? EXAMINING DIFFERENCES IN IMMIGRANT STATUS AND LIFE-COURSE TIMING OF MIGRATION ON LATE-LIFE DISABLEMENT AND MORTALITY

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TABLE OF CONTENTS

LIST OF TABLES AND FIGURES ..……..……...…..……vii

CHAPTER ONE: INTRODUCTION ...……..……1
RESEARCH AIMS ……..…….….2
LATE-LIFE DISABILITY ……2
IMMIGRANT HEALTH AND DISABILITY ……..…….3
RESEARCH CONTRIBUTIONS ……5
DISSERTATION OUTLINE ……...…….5

CHAPTER TWO: LITERATURE REVIEW ……7
LIFE-COURSE FRAMEWORKS
LIFE-COURSE PERSPECTIVE ……7
CUMULATIVE INEQUALITY THEORY ……...8
LATE-LIFE DISABILITY TRENDS ……..12
IMMIGRATION HISTORICAL CONTEXT ……17
SEGMENTED ASSIMILATION THEORY ……...19
NATIVITY DIFFERENCES IN LATE-LIFE DIABILITY ……23
RESEARCH QUESTIONS AND CONCEPTUAL MODELS ……...33
HYPOTHESES ……36

CHAPTER THREE: DATA AND METHODS ……...39
DATA ……..39
MEASURES AND ANALYSIS STRATEGY FOR MARKOV TRANSITION MODELS ..40
MEASURES AND ANALYSIS STRATEGY FOR SULLIVAN BASED LIFE TABLES ..49
SAMPLE VARIABLE DESCRIPTIVES ……52
OUTLINE OF ANALYSIS CHAPTERS ……56

CHAPTER FOUR: EXAMINING THE EFFECTS OF IMMIGRANT STATUS AND LIFE-COURSE TIMING OF MIGRATION ON DISABLEMENT……..58
INTRODUCTION ……...58
UNADJUSTED AND ADJUSTED, FULL SAMPLE RESULTS ……58
UNADJUSTED AND ADJUSTED, IMMIGRANT-ONLY SAMPLE RESULTS ……...68
SUMMARY ……74

CHAPTER FIVE: EXAMINING THE MODERATING EFFECTS OF RACE/ETHNCITIY AND GENDER ON THE RELATIONSHIP BETWEEN IMMIGRANT STATUS AND DISABLEMENT ……77
INTRODUCTION ……...77
UNADJUSTED AND ADJUSTED, RACE/ETHNICITY X IMMIGRANT STATUS INTERACTION RESULTS ……77
UNADJUSTED AND ADJUSTED, GENDER X IMMIGRANT STATUS INTERACTION RESULTS ……82
SUMMARY ……85

CHAPTER SIX: ESTIMATING ACTIVE AND DISABLED LIFE EXPECTANCY BY IMMIGRANT STATUS AND LIFE-COURSE TIMING OF MIGRATION ……..……88
INTRODUCTION ……..……88
LIFE TABLE RESULTS
IMMIGRANT STATUS X RACE/ETHNCITY X GENDER ……88
LIFE-COURSE TIMING OF MIGRATION X RACE/ETHNICITY ……..……97
LIFE-COURSE TIMING OF MIGRATION X GENDER ……103
SUMMARY ……..108

CHAPTER SEVEN: CONCLUSION ……110
SUMMARY OF FINDINGS
IMMIGRANT STATUS DIFFERENCES IN DISABLEMENT ……..110
DIFFERENCES IN DISABLEMENT BY LIFE-COURSE TIMING OF MIGRATION ……112
INTERACTION EFFECTS OF IMMIGRANT STATUS X RACE/ETHNICITY ON DISABLEMENT ……113
INTERACTION EFFECTS OF IMMIGRANT STATUS X GENDER ON DISABLEMENT ……114
ACTIVE AND DISABLED LIFE EXPECTANCIES ……...114
LIMITATIONS AND FUTURE RESEARCH OPPORTUNITIES ……..118
POLICY IMPLICATIONS ……121

APPENDICES
APPENDIX A: RESPECIFIED DEPDENDENT VARIABLE DESCRIPTIONS ……...124
APPENDIX B: SULLIVAN-BASED LIFE TABLE CALCULATIONS ……125

REFERENCES ……..147

VITA ……..166

TABLES AND FIGURES

TABLES

Table 1. Variable descriptions for disability hierarchy …….40

Table 2. Weighted transition percentages from disability stages at previous round to disability stages (disability hierarchy) or death at current round, total sample, NHATS, 2011-2016 ….…47

Table 3. Weighted transition percentages from disability stages at previous round to disability stages (disability hierarchy) or death at current round, immigrant-only sample, NHATS, 2011-2016 ……..….48

Table 4. Sample descriptive statistics, weighted percentages, NHATS 2011 ……..53

Table 5. Immigrant-only sample descriptive statistics, by life course timing of migration, NHATS 2011 ……55

Table 6. Relative risk ratios of transitions across disability states and mortality, base model, full sample, NHATS 2011-2016 ……..59

Table 7. Relative risk ratios of transitions across disability states and mortality, fully adjusted, full sample, NHATS 2011-2016 ……...……63

Table 8. Relative risk ratios of transitions across disability states and mortality, base model, immigrant-only sample, NHATS 2011-2016 ……...68

Table 9. Relative risk ratios of transitions across disability states and mortality, adjusted model, immigrant-only sample, NHATS 2011-2016 ……..……..71

Table 10. Base model relative risk ratios of transitions across disability states and mortality, immigrant status x race interaction, NHATS 2011-2016 …….78

Table 11. Adjusted relative risk ratios of transitions across disability states and mortality, immigrant status x race interaction, NHATS 2011-2016 ……..……81

Table 12. Base model of relative risk ratios of transitions across disability states and mortality, immigrant status x gender interaction, NHATS 2011-2016 …….82

Table 13. Adjusted relative risk ratios of transitions across disability states and mortality, immigrant status x gender interaction, NHATS 2011-2016 ……..……85

Table 14. Gompertz survival model parameter estimates, full sample, NHATS 2011-2016 …...89

Table 15. Log odds of being disabled, full sample, NHATS 2011-2016 ……..92

Table 16. Total life expectancy and disability free life expectancy for adults at age 65, by race/ethnicity, sex, and immigrant status, full sample, NHATS 2011-2016 ……....95

Table 17. Total life expectancy and disability free life expectancy for adults at age 70, by race/ethnicity, sex, and immigrant status, full sample, NHATS 2011-2016 ……....95

Table 18. Total life expectancy and disability free life expectancy for adults at age 75, by race/ethnicity, sex, and immigrant status, full sample, NHATS 2011-2016 ……....95

Table 19. Gompertz survival model parameter estimates, Immigrant-only sample, timing of migration x race/ethnicity, NHATS 2011-2016 ……98

Table 20. Log odds of being disabled, immigrant-only sample, timing of migration x race/ethnicity, NHATS 2011-2016
……..100

Table 21. Total life expectancy and disability free life expectancy for adults at age 65, by life-course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016…102

Table 22. Total life expectancy and disability free life expectancy for adults at age 70, by life-course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016…102

Table 23. Total life expectancy and disability free life expectancy for adults at age 75, by life-course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016…102

Table 24. Gompertz survival model parameter estimates, Immigrant-only sample, timing of migration x gender, NHATS 2011-2016 ……103

Table 25. Log odds of being disabled, immigrant-only sample, timing of migration x gender, NHATS 2011-2016 ……105

Table 26. Total life expectancy and disability free life expectancy for adults at age 65, by life-course timing of migration and gender, immigrant-only sample, NHATS 2011-2016 ...……...107

Table 27. Total life expectancy and disability free life expectancy for adults at age 70, by life-course timing of migration and gender, immigrant-only sample, NHATS 2011-2016 ...……...107

Table 28. Total life expectancy and disability free life expectancy for adults at age 75, by life-course timing of migration and gender, immigrant-only sample, NHATS 2011-2016 ...……...107

FIGURES

Figure 1. Conceptual model, full sample analyses ……..……35

Figure 2. Conceptual model, immigrant-only sample analyses ……..36

Figure 3. Disability hierarchy, three-stage disability state-space model ……..46

Figure 4a: Age patterned survival probability for men, by immigrant status and race/ethnicity, NHATS 2011-2016 ……...90

Figure 4b: Age patterned survival probability for women, by immigrant status and race/ethnicity, NHATS 2011-2016 ……...91

Figure 5a: Age patterned disability probability for men, by immigrant status and race/ethnicity, NHATS 2011-2016 ……...93

Figure 5B: Age patterned disability probability for women, by immigrant status and race/ethnicity, NHATS 2011-2016 ……...94

Figure 6. Age patterned survival probability by life course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016 ……....99

Figure 7. Age patterned disability probability by life course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016 …….…….……101

Figure 8. Age patterned survival probability for immigrant-only sample, by life-course timing of migration and gender, NHATS 2011-2016 …….…….……...104

Figure 9. Age patterned probability of disability for the immigrant-only sample, by life-course timing of migration and gender ……...106

CHAPTER ONE

INTRODUCTION

As of 2019, there are 53.8 million older adults ages 65 and older in the United States (US Census Bureau 2019). At the current growth rate, population projections predict that the 65 and older population in the United States will increase to an estimated 95 million by 2060, or roughly 23% of the total US population (Mather et al. 2019). Simultaneously, the number of immigrant older adults in the United States has substantially increased. In 2019, about 7.4 million immigrant older adult ages 65 and older resided in the United States, accounting for 13.7% of the total US older adult population. (US Census Bureau 2019). The number of immigrant older adults in the United States has increased from 3.3 million in 2000 (Population Reference Bureau 2013) to 7.36 million in 2019, a growth of 123% in just under two decades (US Census Bureau 2019).

The growth of these populations has encouraged increased attention on exploring and documenting the pathways of healthy aging among immigrant older adults, often through the examination of disability in later life. Additionally, researchers recognize that international migration is a unique major life altering event and the lived experiences of immigrant older adults are often quite different compared to their non-immigrant counterparts, which has consequences on later life health and disability. Moreover, this line of research is salient in this particular sociohistoric moment as immigrants face magnified anti-immigrant sentiments against a backdrop of heightened racial and ethnic discrimination. Immigrant status differences, along with racial and ethnic differences, in health and disability are important in understanding social inequality in the United States. Now more than ever, there is a critical need for greater attention

and research on how immigrants in the United States fare later in life, particularly in terms of disability, a key predictor of quality of life in older age.

Therefore, this project focuses on immigrant older adults in the United States and their experiences with late-life disablement. Specifically, this dissertation examines immigrant status differences in late-life disability among immigrants compared to non-immigrants and investigates how life-course timing of immigration shapes late-life disability among immigrant older adults. This research is guided by two broad research aims: 1) To determine if the immigrant health and mortality advantage extends to late-life disablement, 2) To examine how life-course timing of migration affects late-life disablement for immigrants.

Late-life disability

At some point in their lives, the majority of older adults will experience limitations with their daily routine activities, known as late-life disability (Freedman 2018; Freedman and Spillman 2014). This understanding of disability, which reflects the relationships between health conditions, impairments, and capacity in relation to one's surrounding environment, is typically assessed using limitations based on key self-care and mobility activities (Freedman 2018). Studying late-life disability is important as it is a key predictor of being able to live independently and overall quality of life. Moreover, as life expectancy increases, it is important to understand the extent to which disability shapes active life expectancy, as both are likely to have significant impacts on the health care system as well as caregiving and financial burdens on families (Markides and Gerst 2011).

Overall, disability has decreased in the past few decades due to several factors such as advances in medical technology and general increases in education attainment and, consequently, socioeconomic status (Lynch et al. 2009). However, immigrant status and racial/ethnic health

disparities persist. Greater attention is needed as racial/ethnic and immigrant status health disparities have widened and disparities in mortality are projected to increase, with some immigrant groups being most susceptible to extended periods of disability in their life course (Hayward et al. 2014; Levine et al. 2001). While there has been growing research on the health and longevity of immigrant older adults in the US, additional research is warranted to better understand how immigrant older adults in the US move through the disablement process.

Immigrant health and disability

The extant research on immigrant health consistently indicates that immigrant older adults have generally better health outcomes than US-born older adults, a phenomenon known as the immigrant health advantage. Research evidence shows that foreign-born older adults have fewer chronic conditions (Brown 2018), better health behaviors such as lower level of tobacco use (Hill et al. 2014), fewer years with functional limitations (Cantu et al. 2013), and lower mortality rates (Dupre et al. 2012). This mortality advantage is particularly well documented among foreign-born Hispanics in the United States (Cantu et al. 2013, Fenelon et al. 2017, Hayward et al. 2014; Garcia et al. 2019; Lariscy, Hummer, Hayward 2015).

However, the profile of late-life disability for immigrant older adults in the US is less clear, with evidence of mixed results. On the one hand, foreign-born Black and Hispanic older adults have lower levels of disability compared to their US counterparts (Mehta, Sudharanan, & Elo 2013) and foreign-born Hispanic older adult have fewer bed disability days than their US counterparts (Hummer and Gutin 2018). In contrast, a growing body of research shows that the health and mortality advantage does not carry over to late-life ADL disablement (Boen and Hummer 2019 Angel et al. 2014; Hayward et al. 2014). There is evidence that foreign-born older adults are at a much greater risk for living with prolonged periods of disability in later life and

steeper declines in health (Gubernskaya 2014) as well as longer periods of late-life disability (Hayward et al. 2014). Most recently, researchers have emphasized the importance of how the impact of immigrant status on late-life disability varies by not only race/ethnicity and gender (Brown 2018; Elo, Mehta, and Huang 2011) but also by life-course timing of migration (Reyes and Garcia 2020; Garcia & Reyes 2018). However, to my knowledge, no study has examined how late-life disability is shaped by race/ethnicity, gender, and life course timing of migration.

Measurement issues in disability

Finally, to gain a more comprehensive profile of immigrant disability in later life, it is important to recognize how results may vary based on the ways in which disability is measured since the ability to document disability rests on how disability is conceptualized and operationalized. Inconsistent wording in how disability is measured in survey data impacts how results are interpreted (Wolf 2016). Generally, surveys operationalize disability using either a broad or narrow definition of disability. For example, the Health and Retirement Survey (HRS) operationalizes disability using a broad definition, asking respondents about having any difficulty with certain self-care and mobility tasks. In comparison, the National Health Interview Survey (NHIS) operationalizes disability as needing help from another person to complete self-care and mobility activities, reflecting a narrow definition of disability. The National Health and Aging Trends Study (NHATS) is the only survey to capture disability using both measures of difficulty and/or assistance. According to the NHATS, in 2015, about 38% of community dwelling older adults, ages 65 and older, experienced at least some difficulty with self-care and mobility activities and roughly 20% older adults reported requiring assistance with the same tasks (Freedman 2018). Documenting and understanding the differences in measurement is important in building a more comprehensive picture of disability in later life. This research

explores and compares how different operationalizations of disability influence observed disability disparities by immigrant status.

Research contributions

This research contributes to extant scholarly discussion concerning the health and longevity of immigrant older adults in two ways. First, this research examines immigrant status and life course timing of migration differences among white, Black and Hispanic older adults in late-life disability transitions using a hierarchical spectrum that captures severity of self-care and mobility limitations. Second, this research investigates active life expectancy variations by immigrant status, life course timing of migration, race/ethnicity, and gender. As a supplemental research aim, this research compares how different conceptual definitions and measurements of disability may influence observed immigrant status differences in late-life disability transitions.

Dissertation outline

In the next chapter, I provide the theoretical framework that informs this research, namely the life course perspective, cumulative inequality, and segmented assimilation as it relates to immigrant older adults in the United States. I also review extant literature on late-life disability, immigrant status differences in late-life disablement, as well as variations in the impact of immigrant status on disability. I end with my conceptual models and research hypotheses.

In chapter 3, I lay out the data and methods that includes an overview of the data source, six waves from the National Health and Aging Trends Study (NHATS) from 2011 to 2016, the analytic samples, strategies, and hypotheses, as well as an overview of the conceptualization and operationalization of the variables used in the analyses. Sample descriptives are reviewed in this chapter.

In chapter 4, the first analysis chapter, I use Markov transition models to calculate relative risk of transitions of decline and recovery between each state of disablement (fully able, difficulty, unable) and mortality by immigrant status and life course timing of migration using the immigrant-only subset. I test whether the immigrant status and life course timing of migration differences are mediated by key demographic factors as well as various factors across the life course. I extend this analyses in the chapter 5, the second analysis chapter, where I test for possible moderation effects of immigrant status, race/ethnicity, and gender on disability transitions.

In chapter 6, the third analysis chapter, I further explore the research aims of determining whether the immigrant health and mortality advantage extends to late-life disability as well as examining how life-course timing of migration affects late-life disablement among immigrants by using Sullivan-based methods to calculate active and disabled life expectancy by immigrant status, race/ethnicity, and gender. Additionally, I calculate active and disabled life expectancy by life course timing of migration, race/ethnicity, and gender for the immigrant-only subsample.

In the conclusion (chapter 7), I summarize of key analytic findings and review the study hypotheses in relationship to the broader literature. I also compare the observed differences in the findings as a result of various operationalizations of disablement. Finally, I cover study limitations and areas for future research as well as policy implications of the research.

CHAPTER TWO

LITERATURE REVIEW

Life-course frameworks

The life-course perspective and cumulative inequality theory are two complementary frameworks that work particularly well in studying heterogeneity in late-life disability because of they recognize that aging is a lifelong process and influences throughout one's life can shape disability in later life (Taylor, Min, Reid 2020; Garcia and Reyes 2018).

Life-course perspective

The life-course perspective encompasses a range of perspectives and theories stemming from different disciplines and puts forth five key principles. The first principle is lifelong development. That is, human development does not stop at the end when one reaches adulthood. In addition, studying lives over time is important in understanding origins, shapes, and rates of change (Elder, Johnson, and Crosnoe 2006). The second principle highlights the power of human agency and the complex interplay between individual level agency and the structural "constraints of history and social circumstance" (Elder et al. 2006: 11). This principle reminds scholars that individuals are autonomous beings, even though they are situated in larger social structures of inequality. With an emphasis on human agency, scholars can view how key decisions and life choices enacted through human agency may overcome structural barriers. The third principle is historical time and place, which recognizes that individual and collective lives are embedded in history and the interactions with these events, social movements, and changes have the ability to shape lives (Elder et al. 2006). Fourth is the principle of timing and sequencing. This principle underscores the divergent effects of the same event on individuals due to their relative life-course

stage (Elder et al. 2006). Finally, the fifth principle is linked lives (Elder et al. 2006). This principle emphasizes that individual lives must be understood in relation to others. Individual choices and to that extent, life trajectories, are influenced by the social networks such as family, friends, work, and community. In addition, the effects of choices made have ripple effects into the same networks.

Cumulative inequality theory

Perhaps most recent in the life-course theory development, cumulative inequality theory builds on previous theoretical frameworks to demonstrate how inequalities have effects at micro, meso, and macro levels. This theory is comprised of five main axioms. The first axiom is that inequality is not an outcome, but rather a complex social system that structures inequality (Ferraro, Shippee, & Shafer 2009). Additionally, inequality is longitudinal and intergenerational by nature and should be treated as such. Not only are the demographic sources of inequality important to understand, but how they are situated in the larger contexts of cohorts.

The second axiom of the cumulative inequality theory states "disadvantages increase exposure to risk, but advantage increase exposure to opportunity" (Ferraro et al. 2009: 418). This axiom asserts that advantage and disadvantage are not inverse relationships. That is, the effect of an advantage or disadvantage are not the same, nor does one cancel out the other. Moreover, inequality may have a spillover effect as the advantages and disadvantages in one area, or trajectory, may have different effects on another trajectory as lives are comprised of multiple trajectories such as education, health, income, etc.

Building on the second axiom, the third axiom states that outcomes are influenced by available resources, the enactment of said resources, and accumulation of risks. This axiom

underlines the important dialectical relationship between social structure and agency because the social structured inequalities shape the availability and access to resources that may alleviate "unfavorable trajectories" (Ferraro et al. 2009: 420). Scholars in this area have been able to better understand how the timing and duration of resource mobilization such as social, economic or psychological resources impact the magnitude of disability (Ferraro et al. 2009). How long an individual utilizes resources and the initiation point of resource mobilization alter disability trajectories. Not only do individuals with shorter durations of resource mobilization have greater disability levels, the timing of when resources begin matter, as later initiations result in greater disability (Ferraro et al. 2009).

The fourth axiom emphasizes the influential power of perception and reflexivity (Ferraro et al. 2009). That is, how one views their position in social structures plays a role in trajectories. Borrowed from symbolic interactionism, one's perceived reality is important. One's subjective evaluation of their own lives (e.g., socioeconomic standing, health and well-being, etc.) is just as impactful as objective measures.

Finally, the last axiom of cumulative inequality emphasizes the deleterious effects of inequality. Simply put, the inequalities faced by individuals most likely leads to early death (Ferraro et al. 2009). This axiom is a reminder for scholars to account for possible selection effects in research and/or the exclusion of the most vulnerable populations.

Taken together, these frameworks inform the research on late-life disability as they emphasize the resources and risks, such as childhood health or economic status, that may accumulate across the life course that affect later life health. Additionally, these perspectives argue that life-course trajectories are shaped by disparities in exposure to risks and resources as a result of the timing and sequencing of the major events, such as immigration, and encounters

with various social systems across the life course. For example, Mexican men who immigrated to the United States under the Bracero program in the 1940s to 1960s were exposed to difficulty working environment stressors during their working years and the effects of those exposures accumulate over time and may result in worse health and disability profiles in later life compared to other immigrants. Additionally, systems such as race and ethnicity or gender are socially structured and can generate inequality over the life course and shape personal trajectories and individual choices (Phelan and Link 2015; Ferraro et al. 2009).

The principles of the life course perspective provide a useful scaffold in which to research immigrant older adults in the United States as it aids in contextualizing the various later-life health outcomes, particularly the principles of historical time and place as well as timing and sequencing. Understanding the experience of immigrant older adults requires an understanding of the historical context that shapes the push and pull factors of international migration. For example, Mexican immigrants in the 1940s to 1960s were mainly hired as laborers under the federal Bracero program, a labor agreement between the United States and Mexico (Massey, Durand, and Malone 2002). Other historical policies such as the 1986 Immigration Act focused on "illegal immigration" and fueled anti-immigrant sentiment that became the context of reception and incorporation for immigrants at that time, but particularly Hispanic and other non-white immigrant groups (Massey et al. 2002).

Additionally, the timing and sequencing principle emphasizes that life-course timing of major events such as immigration shapes the ability to participate in certain key US institutions where immigrants have more opportunities to learn and assimilate to US society. Immigrants who arrive later in life typically do not get to reap the sociocultural benefits that go along with the education system and workplace. Moreover, later in life immigrants are biologically older,

which makes it potentially more difficult to learn a new language and thus navigate through health care systems, resulting in possible increased risk for poor health outcomes or disablement. Extant research has indicated that immigrant who arrive later in life, typically 55 and older, are potentially negatively selected on health (Gubersnkaya et al 2013; Sheftel 2017).

Disability in later life

Late-life disability is vital area of study because it reflects quality of life among older adults. Broadly, aging into disability can be understood as "the impact that chronic and acute conditions have on the function of specific body systems and on people's ability to act in necessary, usual, expected, and personally desired ways in their society" (Verbugge and Jette 1994:3). Verbrugge and Jette's (1994) classic model of disablement identifies the main pathway as pathology leading to impairments, which in turn leads to functional limitations, then disability, and ultimately death. In other words, disability reflects the relationships between chronic illness, physiological capacity, and environment.

Late-life disability scholarship emphasizes self-care and mobility activities as they enable older adults to live independently in society (Freedman and Spillman 2014). Collectively known as activities of daily living (ADLs), self-care and mobility activities typically include the following: bathing, dressing, toileting, eating, getting out of bed, and getting around inside and outside the home (Freedman and Spillman 2014). Disability is also measured using instrumental activities of daily living, or IADLs, which include routine tasks like household chores, conducting routine business, and shopping. IADL limitations are considered less severe but still represent disability in their participation of societal or community roles.

ADL limitations, which represent necessary tasks for independent living, are a direct reflection of well-being. Suffering limitations in one or more ADL has potentially severe implications on possible institutionalization and/or mortality (Lynch, Brown, and Taylor 2009). Moreover, ADL limitations have a greater implications on the disability-related costs since older adults with ADL limitations likely require help from another person, which can come from unpaid family caregivers or a paid home caregiver or caregiver at an institution, such as a nursing home (Johnson and Wiener 2006).

Late-life Disability trends

It is vital to understand late-life disability trends, particularly ADL limitations, given the documented increase in longevity potentially leads to a greater proportion of older adults living longer, but more disabled lives (Angel, Angel, and Hill 2014). Broadly speaking, late-life disability has decreased in the past few decades due to several factors such as advances in medical technology and general increases in education attainment and, consequently, socioeconomic status (Lynch et al. 2009). However, upon closer inspection, declines in late-life disability vary depending on whether disability is measured by functional limitations, IADLs, or ADLs.

While functional limitations and IADL limitations have decreased, there is less agreement on whether the same can be said for ADL limitations (Crimmins 2004; Freedman, Martin, & Schoeni 2002). Some scholars have suggested that ADL limitations have remained stable (Lin et al. 2012). Using data from NHIS, Lin and colleagues (2012) find that age trends of ADL limitations have remained stable from 1982-2009, even after adjusting for period and cohort. However, Lin and colleagues offer caveats in the interpretation of their results. First, given gains in life expectancy, disabled older adults in more recent cohorts may be surviving

longer and thus contributing to the lack of dip in ADL disability trends. Additionally, more-recent cohorts have lower rates of nursing home use which may not exclude them from the NHIS sampling frame and may contribute to the observed lack of decrease in disability among community dwelling individuals.

Other researchers have found evidence for a small decrease in disability trends (Wolf 2016; Schoeni, Freedman, and Martin 2008). Schoeni, Freedman, and Martin (2008) find that declines in disability were mainly driven by improvements in IADL limitations rather than ADL limitations. From 1983 to 2005, IADL limitations dropped from 14.2% to 7.3%, while ADL limitations dropped from 2.7% to .06%, representing a much more modest decrease.

Measurement issues

Within the study of later-life disability, conceptualized as ADL limitations, there are inconsistencies as to how disability is operationalized, which may be a contributing factor to the inconsistent disability trends among older adults (Freedman et al. 2004; Crimmins 2004). In summary, there are two commonly used measures in surveys: difficulty with ADLS and help with ADLS, each with their share of concerns. Wolf, Hunt, and Knickman (2005) discuss the challenges regarding the measurement of disability and the possibility of "false negative" or "false positive" results. Wolf and colleagues (2005) contend that the wording of survey questions is problematic, particularly the distinction between survey questions asking whether respondents have difficulty with a task or whether they are completely unable to carry out the task without help from another person. The wording of the question and using the term, "difficulty", which may be open to interpretation, results in the possibility of a "false negative". Another critique of relying solely on measuring difficulty is that the severity of difficulty is not captured (Freedman et al. 2004). For example, two individuals might both report difficulty getting in and out of bed,

but one may have mild difficulty getting out of bed while the other individual has more severe difficulty. Major surveys of older adults such as the Health and Retirement Survey (HRS) and the National Long Term Care Survey (NLTCS) use the "difficulty" terminology (Freedman et al. 2004). Alternatively, "false positives" may occur when using the "get help" terminology. Surveys using the "get help" terminology include the National Health Interview Survey (NHIS).

In sum, disability, conceptually defined as ADL limitations, are considered the most severe type of late-life disability, which has the potential for impact on a variety of consequences for individuals, families, and policy makers in the United States (Freedman et al. 2004). Yet, the research is mixed as to whether or not late-life ADL limitations are increasing or decreasing for older adults in the United States, while there is a clear consensus of declines in functional and IADL limitations. Variations in ADL disability operationalization has contributed to possible misreporting of disability trends. If we are to build a more comprehensive understanding of late-life disability, variations in disability measurement should be considered (Wolf et al. 2005; Freedman et al. 2004). This research addresses this clear weak spot in disability research by focusing on ADL limitations using data from the National Health and Aging Trends Study (NHATS), which asks about both difficulty and help with ADLS, thus contributing towards a fuller portrait of late-life disability.

Factors affecting late-life disablement

In the following section, I provide an overview of factors that affect late-life disability. Specifically, I focus on how late-life disability varies by key sociodemographic variables, such as race/ethnicity and gender, as well as early- and middle-life variables.

Race/ethnicity and gender

Late-life disability is patterned by sociodemographic variables such as race and ethnicity, and gender. Despite favorable gains in the overall decrease in disability and increased life expectancy, racial and ethnic disparities persist with non-white older adults at greater risk of disability in later life (Andrasfay and Goldman 2020; Dong et al. 2018; Ferraro, Kemp, and Williams 2017; Mendes et al. 2005). Using data from four sources (LSOA, NHANES, AHEAD, and HRS), Crimmins, Hayward, and Seeman (2004) finds that relative to white older adults, Black and Hispanic are at greater risk for ADL limitations and the increased risk remains net of education and income for Black older adults. Recent research has suggested a "double disadvantage" for race (Kail, Taylor, and Rogers 2020). Using data from the HRS, Kail, Taylor, and Rogers (2020) find a moderating effect between race and number of chronic conditions in the onset and initial of functional limitations. This suggests that not only do Black and Hispanic older adults experience a quicker onset and higher levels of functional limitations, they also experience a higher risk of functional limitation onset with chronic conditions relative to white older adults.

Research has consistently established gender as a key axis of disparities in late-life disability. Women fare worse than men when it comes to various measures of disability. Evidence from NHATS shows that among community dwelling individuals, more women than men have self-care and mobility limitations that require help from another person (Freedman, Wolf, and Spillman 2016; Freedman and Spillman 2014). Additionally, Freedman, Wolf, and Spillman (2016) find that despite increases in life expectancy for both men and women in the past few decades, men experience a later onset of disability that translates to more disability-free

years. In contrast, the gains in life expectancy and survival without disability are much smaller for women thus indicating larger disparities in 2011 versus in 1982.

Early- and middle-life influences

ADL limitations usually initially appear in later-life but considerable research has shown that risk factors for such limitations are linked to exposures in early- and middle-life, consistent with the theoretical underpinnings of the life-course perspective and cumulative inequality theory. Early-life experiences, such as health and economic status and middle-life experiences, such as educational attainment and occupation, have been documented to have influences on later-life disability (Montez & Hayward 2014; Freeman et al 2008; Crimmins and Hayward 2004; Blackwell, Hayward & Crimmins 2001). In a 2008 study using HRS data from 1995 to 2004, Freedman and colleagues (2008) show evidence that early-life health attenuated trend differences in predicting ADL limitations by 10 percent suggesting that early-life health partially explain declines in the prevalence of ADL limitations. Additionally, when middle-life factors (i.e. education and occupation) were included, the relationship between trend year variable and ASL limitations was no longer statistically significant for predicting prevalence of ADL limitations among older adults. In other words, the decline in disability prevalence was, in part, explained by increased educational attainment.

The quantity and quality of early- and middle-life experiences have direct and indirect effects on disability and mortality in later life (Montez & Hayward 2014; Montez 2013; Haas and Rohlfsen 2010; Freedman et al. 2008). Positive early-life factors such as higher parental education and individual higher educational attainment in middle-life are associated with lower prevalence of difficulties with ADLs in later life (Freedman et al. 2008). Using HRS data, Montez and Hayward (2014) investigate how early life adversities such as poor health and low

socioeconomic status, shape functional health, ADL limitations, and active life expectancies in later life for non-Hispanic white and non-Hispanic Black older adults. Consistent with previous research, Montez and Hayward (2014) find that older adults with good childhood health and no childhood socioeconomic adversities were projected to live, on average, three more years than their counterparts who experienced poor health and five or more adversities as a child. Moreover, adults with more early-life adversities have more years of ADL impairment and shorter active life expectancies by about three years, on average.

Race/ethnicity and gender are key axes of persistent disparities in late-life disability. Relative to white older adults, Black and Hispanic older adults are at greater risk for ADL and functional limitations (Andrasfay and Goldman 2020; Hummer and Gutin 2018). Compared to men, women fare worse in terms of disabled life expectancy (Freedman 2018; Mehta et al. 2016). These trends are influenced by early- and middle- life risks and resources such as socioeconomic status, however, they do not fully account for the disparities. Not enough is known about nativity status differences in disability. In the next section, I provide an overview of segmented assimilation theory, which offers considerable utility in understanding nativity differences in late-life disability (Treas 2015; Abdul Malak and Wang 2016).

Immigration historical context

Immigrants arrive in the United States under a variety of contexts. Understanding the motivations for immigration helps contextualize the experiences across the life course of immigrants. This section highlights key 20th century immigration waves and the federal policies and legislation that shaped who immigrated to the United States.

The Hart-Celler Act of 1965 dramatically shaped 20th century immigration to the United States. This legislation lifted race-specific bans and quotas that had been in place since the turn of the century and establishing a preference system centered on labor force needs and family reunification. Consequently, immigration has increased from most countries, but particularly Latin America and Asian countries as a result of increased visas caps and prioritization of family reunification visas, which were, and are still today, exempt from visa caps (Massey and Pren 2012). As a result of the Immigration Act of 1965, the immigrant population has become more racially and ethnically heterogenous (Mehta et al. 2016).

Additionally, other historical immigration-related policies such as the Immigration Act of 1990 have shaped the type of immigrants in the United States. The Immigration Act of 1990 introduced diversity visas, geared towards immigrants from underrepresented nations, indirectly shaping the flow of immigration from African countries. Researchers have pointed to this Immigration Act of 1990 as a major explanation for increased immigration from African countries in the past few decades, as about 40% of Black immigrants come from African countries such as Nigeria and Ethiopia. (Anderson 2015). Caribbean countries such as Jamaica and Haiti, roughly account for half of the Black immigrant population in the United States (Anderson and Lopez 2018).

The Bracero program, a country-specific federal program established in 1942 created large-scale incentives for international migration from Mexico. The Bracero program started as an agreement between the United States and Mexico to contract Mexican male workers to help replace the shortage of US agricultural workers who were drafted into World War II or workers who left for better job opportunities (Massey, Durand, and Malone 2002). The Bracero program officially ended in 1965 as it had come to be seen as “an exploitative labor regime on par with

Southern sharecropping" (Massey and Pren 2012:2). At its peak, between 1955 and 1960, the United States issued almost half a million annual visas for Mexican workers to help meet the labor demand (Portes and Rumbaut 2014; Massey, Durand, and Malone 2002). The Bracero program is important in contextualizing potential differences in health outcomes of Hispanic, specifically Mexican, immigrants as braceros were exclusively men, who were positively selected on health at the time of immigration as a result of the physical requirements for workers, but were exposed to harsh labor conditions. Later-life health and disability of older adult Mexican men is likely influenced due to this highly health selected cohort of Mexican immigrants as well as the physical wear and tear from labor as a result of being a bracero (Angel et al. 2010; Massey Durand and Malone 2002). Such considerations are important when interpreting potential differences in health outcomes to avoid attributing age differences when it may be due to cohort differences.

Segmented assimilation

Using segmented assimilation as a guiding theoretical framework helps explain why immigrants differ from non-immigrants in terms of potential health advantages or disadvantages. Segmented assimilation recognizes that immigrants in the United States are not a homogenous group with similar pathways of incorporation. Whereas classical assimilation theory may be appropriate for mainly white, European immigrants, segmented assimilation accounts for multiple pathways for contemporary US immigrants, who are much more racially and ethnically diverse (Portes and Zhou 1993). How immigrants fare in the United States largely depends on a range of factors such as skin color, racialization, access to economic opportunities and social capital within the immigrant community (Ported and Zhou 1993). Due to the persistent systems of racial and ethnic discrimination in the United States, non-white immigrants are susceptible to

worst outcomes, however, segmented assimilation also recognizes how immigrants may take advantage of social capital from immigrant-only, unique contexts that serve as a buffer that allow for better outcomes (Rumbaut 1997). The framework also helps to explain differences among immigrants such as how life-course timing of migration allows for more or less time to assimilate and gain resources that may serve as protective factors, and perhaps how these effects are mediated of moderated by these gains (Portes et al. 2005).

Historically, assimilation has been documented as a unidirectional, linear process. Assimilation is most often associated with Milton Gordon's (1964) *Assimilation and the American Life*. Gordon's work is known within the field as "classic assimilation" theory. In this book, Gordon (1964) discusses seven key variables, or types of assimilation, in understanding assimilation of immigrants in the US: cultural, structural, marital, identificational, attitude receptional, behavior receptions, and civic. Immigrants who successfully navigated these key forms of assimilation would achieve complete assimilation into American society and shed their ethnic identity in favor for an American identity.

Though scholars have critiqued classic assimilation framework along the way, the theory of segmented assimilation truly shifted the landscape of contemporary immigration incorporation scholarship (Portes and Zhou 1993). This theoretical model was first introduced in 1993 by Alejandro Portes and colleagues, based on data from the Children of Immigrants Longitudinal Study (CILS). Portes and Zhou (1993) argue that classic models of assimilation do not work for the post-1965 "new" immigrants and their second generation offspring because the social and economic contexts are too different from previous waves of Italians, Irish, and eastern Europeans in the 19th century. Moreover, according to Portes and colleagues, pre-migration human capital such as education, occupational skills, etc. are different from previous immigrant waves. In

comparison to immigrants who arrived prior to 1965, the post-1965 immigrants are much more heterogenous than the low skilled laborers from the late 19th and early 20th century (Haller, Portes, and Lynch 2011).

Segmented assimilation rejects the notion of unidirectional, linear assimilation for multidirectional pathways of incorporation. First generation background factors, such as amount of human capital and family structures, interact with intergenerational patterns, such as whether or not second generation children experience dissonant, consonant, or selective acculturation, resulting in divergent trajectories (Portes and Rumbaut 2001). These divergent trajectories are known collectively as segmented assimilation.

In the upward assimilation pathway, immigrants are able to achieve economic and social mobility, sometimes combined with biculturalism among those who experience selective acculturation, like the Punjabi Sikhs in California. Portes (1995) incorporates the influences of linear ethnicity in determining assimilation trajectories. Linear ethnicity refers to "a common cultural memory brought from the home country and which compromises the customs, mores, and language through which immigrants define themselves and communicate" (p. 256). The greater linear ethnicity and social networks allows for greater social capital for parents and children and decreases the overall chances of experiencing downward assimilation.

In contrast, downward assimilation suggests assimilation into disadvantaged communities (Portes and Zhou 1993; Portes 1995; Portes and Rumbaut 2001). Using the example of Haitian immigrants in South Florida, downward assimilation of second generation is shaped by the low levels of parental human capital, absence of protective forces of selective acculturation, increased exposure to racial discrimination, and the absence of mobility opportunities (Portes

sand Zhou 1993). Assimilation can protect, but in disadvantaged communities, assimilation may lose its protective effect (Akresh, Do, & Frank 2016).

Principles of segmented assimilation, when applied to aging, offers a fuller explanation of how and why nativity differences exist in late-life disability (Treas 2015). Segmented assimilation tells us that immigrants are a heterogenous group and their assimilation and acculturation experience largely varies by race as immigrants are subjected to the existing structures of racial/ethnic inequality in the United States, placing them on different paths of incorporation resulting in different outcomes across the life course.

This research layers in segmented assimilation which naturally lends itself to understanding immigrant aging. Principles of segmented assimilation, when applied to aging, offers a fuller explanation of how and why nativity differences exist in late-life disability (Treas 2014). Segmented assimilation underscores the heterogeneity of assimilation and acculturation. It helps us better understand seemingly contrasting findings such as both positive and negative effects of assimilation. Segmented assimilation expands the scholarship beyond examining the effects of the degree of assimilation but the direction of assimilation: upwards, downwards, or selective acculturation, in which some immigrant groups are sometimes able to leverage resources to offset downward assimilation. These different assimilation pathways and experiences shape health and disability outcomes (Reyes and Garcia 2020; Garcia and Reyes 2017; Gubernskaya 2015).

Life course and cumulative inequality theories also complement segmented assimilation and immigrant-based aging research by highlighting how immigrant older adult health outcomes are linked to the effects of early life circumstances, timing and sequencing of major life events such as immigration, as well as broader historical time and place. These theories come together

to underscore how multiple domains interact to generate different access and accumulation of risk and resources that determine health and mortality in later years. This research incorporates principles from the life course perspective, cumulative inequality, and segmented assimilation to evaluate how disablement and mortality is shaped by immigrant status, race/ethnicity, life-course timing of migration, and early- middle- and late-life variables.

Nativity differences in late-life disability

The overview of immigrant health research generally suggests that immigrant older adults have better health outcomes than non-immigrant older adults. Research evidence shows that foreign-born older adults have fewer chronic conditions than their US-born race/ethnic peers (Brown 2018). Compared with US-born Hispanics, foreign-born Hispanics have lower rates of heart disease and cancer, net of socioeconomic status, including income and education, (Crimmins et al 2005). Using NHIS data, Cantu and colleagues (2013) show that compared to US-born white older adults, both foreign-born Hispanic men and women, have longer life expectancies without at least one chronic condition such as coronary heart disease, stroke, diabetes, or cancer. Foreign-born Hispanic men have an estimated 2.8 years difference in life expectancy compared to US-born white older adult men without at least one chronic morbidity condition while foreign-born Hispanic women have 1.3 extra years without morbidity compared to US-born white older adult women. This is supported by Garcia et al. (2017) using data from Hispanic Established Populations for the Epidemiologic Study of the Elderly (H-EPESE). In this study, Garcia et al (2017) find that foreign-born Mexican older adults, compared to US-born Mexicans, have fewer years of life expectancy with certain chronic conditions.

Immigrant older adults also have lower mortality rates and longer life expectancies than US-born older adults (Mehta et al 2016; Dupre et al 2012). Using Social Security Administration

(SSA) linked Medicare files, Dupre and colleagues (2012) show that immigrant white older adults have longer life expectancies than US-born white older adults by about 2 and 3 years for men and women, respectively. The pattern is similar for foreign-born Black older adults relative to US-born white older adults (Dupre et al. 2012). The large majority of research on immigrant mortality focuses on Hispanic immigrants in the US (Boen and Hummer 2019; Crimmins and Zhang 2019; Garcia et al. 2018; Lariscy, Hummer, and Hayward 2015; Cantu et al. 2013; Hayward et al. 2014; Markides and Gerst 2011). Using data from the NHIS, from 1986-2004, Lariscy, Hummer, and Hayward (2015) demonstrate that foreign-born Hispanics have lower mortality rates compared to US-born whites, despite having comparably lower educational attainment and high poverty levels.

Taken together, these patterns are collectively known known as the immigrant health advantage, which has drawn considerable research attention, especially among scholars studying Hispanic immigrant aging. The immigrant health advantage is a well-documented phenomenon in which immigrants in the United States, particularly older adults, have generally better health and mortality compared to their same race/ethnic non-immigrant adults (Riosmena et al. 2013). Scholars have suggested several reasons for this phenomenon. First, immigrants are not only more robust than their counterparts who did not migrate but also compared to their US-born counterparts (Bostean 2013; Wilmoth 2012). For example, Bostean (2013) found that compared to Mexicans who did not immigrant, Mexican immigrants have lower odds of ADLs, which implies that those who migrate tend to be healthier than their non-immigrant counterparts in Mexico. Additionally, immigrant cultural influences (including strong social ties and support networks) and overall better health behaviors (such as reduced tobacco use) may be protective, which in turn leads to better health outcomes and reduced mortality (Lariscy et al 2015; Hill et

al. 2012; Markides and Esbach 2005). Researchers also suggest that the mortality advantage is a product of data issues as sicker, less healthy immigrants may return to their respective native country thus not being included in the mortality data in the United States (Riosmena 2013; Turra and Elo 2008).

Despite the documented advantage in various indicators of health, empirical evidence shows that the immigrant health advantage may not carry over to late-life disability, at least among some immigrant groups, as suggested by research on Hispanic immigrants. Recent research using NHIS data has found that nativity plays a critical role with respect to disability in later life for Hispanic immigrants (Cantu et al. 2013). Hispanic immigrant older adults have a greater risk for living with prolonged periods of disability in later life (Hayward et al. 2014; Angel, Angel, and Hill 2014; Crimmins et al. 2004). One explanation as to why the health advantage does not carry over to disablement is that the factors that influence the advantages in mortality are not the same as those that influence disability (Hayward et al. 2014). For example, looking at occupation, some immigrant groups tend to be more concentrated in blue collar positions (Hayward et al 2014). These occupations are typically more physically demanding and could shape physical disabilities and result in greater physical limitations but may not have as harmful of an impact on mortality. In other words, physical demanding jobs shape disability differently than mortality and the type of work someone does is shaped by nativity as well as race/ethnicity and gender (Hayward et al. 2014). However, more research is needed as it is unclear how nativity, or immigrant status, shapes disability and disabled life expectancy for other immigrant groups such as Black or white immigrants.

Variation in the impact of immigrant status on late-life disability

In this next section, I will review the literature on how race/ethnicity, gender, and timing of migration contributes to the heterogeneity in the impact of immigrant status on disability and mortality. Researchers have identified key axes of immigrant status differences in disability and mortality, focusing on race and ethnicity, gender, and life-course timing of migration (Reyes and Garcia 2020). I highlight current research and knowledge about white, Black, and Hispanic immigrant variation on disablement and mortality. I also emphasize current research on gender and timing of migration on late life disability among immigrants. Additionally, it is important to emphasize that the disability and mortality patterns change over time and are sensitive to sociohistorical time and events. The trends reviewed below are based on immigrants at one specific point in historical time.

Immigrant white older adults

Generally speaking, immigrant white older adults have fairly similar health and mortality profiles as non-immigrant white older adults. For instance, using data from NHIS and NHANES, Hummer and Gutin (2018) find no statistically significant differences in foreign-born white compared to US-born white older adults for functional health and disability. In another study using NHIS, Melvin et al. (2014) find that foreign-born white older adult women have a lower prevalence of functional limitations than their US-born counterparts at age 65-74. However, at ages 85 and older, foreign-born white older adult women have more ADL limitations than US-born white older adult women. For men, there is no statistically significant difference in functional or ADL limitations. Using growth curve models, Brown (2018) provides evidence that white immigrants have a "persistent health advantage" as indicated from the growth curve models using HRS (p. 1532). Looking at mortality rates, there is no statistically significant

difference in white immigrant mortality compared to non-immigrant white older adults (Hummer and Gutin 2018). One explanation for these trends among white immigrants can be drawn from segmented assimilation principles that suggest that the contexts of reception (i.e. degree of racism) for white immigrants are different than non-white immigrants in the United States which ultimately leads to less acculturative, and overall, stressors and better health outcomes (Brown 2018; Portes 1995).

Immigrant Hispanic older adults

In contrast to the favorable profile of white immigrant older adults, Hispanic immigrant older adults have worse outcomes when it comes to late-life disability, relative to US-born white older adults, except for mortality rates. In terms of mortality, immigrant Hispanic older adults have lower rates of mortality (Markides and Gerst 2011; Markides and Esbach 2005). Relative to US-born white older adults, foreign-born Hispanic older adults are more likely to have any activity limitations and a greater number of activity limitations (Boen and Hummer 2019; Hummer and Gutin 2018). Using NHIS pooled data from 1998 to 2011, Melvin and colleagues (2014) find that while there is no statistically significant difference in ADL limitations between foreign-born Mexican older adult men and US-born white older adult men at ages 65-74, after 75+ years of age, foreign-born Mexican older adults have significantly more ADL limitations. It is important to note that for Mexican older adults, particularly Mexican older adult men, the age differences are likely explained by cohort effects as a result of immigrating for the Bracero program in the 1940s to 1960s and worked as laborers doing intensive physical labor. As a result, the cumulative effect of such demanding physical labor would lead to increased allostatic load and worse health outcomes in later life.

Looking at health trajectories based on functional limitations, foreign-born Mexican older adults have fewer conditions, but experience steeper increases with age, compared to US-born white older adults (Brown 2018). Moreover, scholars suggest that disability trajectories of foreign-born Hispanic older adults are similar to US-born Black older adults (Boen and Hummer 2019). Using HRS data, Boen and Hummer (2019) use growth curve models to show that ADL limitation trajectories of foreign-born Hispanic adults are similar to US-born Blacks.

Immigrant Black older adults

Immigrant Black older adults have disability profiles similar to immigrant Hispanic older adults. Foreign-born Black older adults have more functional and ADL limitations (Melvin et al. 2014) and more disadvantaged functional health trajectories compared to US-born white older adults (Brown 2018). Despite having a greater prevalence of ADL limitations than US-born white older adults, Black immigrant older adults have report fewer ADL limitations compared to US-born white older adults (Hummer and Gutin 2018). One recent study using NHIS and NHANES data, Hummer and Gutin (2018) find that the disability differences are patterned by gender as Black women have more activity limitations than men. Additionally, foreign-born Black older adult men have fewer activity limitations than US-born Black older adult men. Foreign-born Black women also have fewer activity limitations compared to their US-born counterparts, but the differences were not found to be statistically significant. Moreover, the differences in number of activity limitations between foreign-born Black men and women to US-born white men and women were not statistically significant. In terms of mortality, immigrant Black older adult men and women have lower mortality rates than their US-born counterparts and US-born white older adult men and women (Hummer and Gutin 2018).

Gender considerations

As seen in the earlier sections, nativity differences in disability and mortality vary by gender as well. Much like the US-born female population, immigrant women have lower mortality rates than US-born and immigrant men within same race/ethnic groups (Mehta et al. 2016). However, despite having longer life expectancy, immigrant women have more years with ADL limitations than immigrant men (Garcia et al. 2016; Payne et al. 2015; Markides and Gerst 2011). Moreover, researchers have shown that racial/ethnic disparities in disability are greater for women than for men (Brown 2018). For instance, foreign-born Hispanic women have the highest level of disability compared to US-born white women (Hummer and Hayward 2015). Using HEPESE data, Angel, Angel, and Hill (2014) find that foreign-born Hispanic older adult women have a longer life expectancy than foreign-born Hispanic older adult men by about 2.2 years, but spend a greater proportion of their later years with at a functional limitation as the ratio of healthy to total life expectancy of .35 compared to .48 for foreign-born Hispanic older adult men. One explanation as to why gender is such a key predictor of late-life disability is that men and women often have different reasons for migrating, suggesting that nativity differences in disability and mortality are smaller among women than men. Men who immigrate in their working age, usually come for work, while women typically migrate for family reunification, thus are less sensitive to selectivity effects (Carr and Tienda 2013). However, selection effects may vary based on life-course timing of migration.

Life-course timing of migration

As mentioned at the beginning of this chapter, immigration is a major life event from the life-course perspective because it relates to the length of time and opportunity for accumulation of socioeconomic (dis)advantages and leads to different pathways for health and disability

(Wakabayashi 2010). Later-in-life immigrants are of particular interest for researchers as their reasons for migration often differ from their earlier-in-life immigrant counterparts. Sometimes referred to as the ".5 generation", or the "invited" elderly, later-in-life immigrants are usually classified as arriving after the age of 60 and are most often sponsored by their adult naturalized immigrant children (Treas and Gubernskaya 2016). Moreover, late-in-life immigrants are more likely to have limited English proficiency which can be, at best, a challenge, or at worst, a barrier to health care (Wilmoth 2012).

Overall, later-in-life immigrants have lower mortality rates compared to earlier-in-life immigrants, which has been explained by scholars as a reflection of the robustness of immigrants compared to their counterparts in their native countries (Mehta et al. 2016; Angel et al. 2010). Using data from social security and Medicare data, Mehta and colleagues find that foreign-born women who applied for social security cards after 1990 have about 2.4 additional years compared to foreign-born women who applied pre-1960, who have a life expectancy from age 65 of 21.41 years (Mehta et al. 2016). For foreign-born men, life expectancy at age 65 is 20.98 for those who applied for social security cards after 1990 versus 18.67 for foreign-born men who applied before 1960, which is a difference of 2.31 years (Mehta et al. 2016). Angel and colleagues (2010) use H-EPESE data to examine life-course timing of migration and mortality for Hispanic older adults and find that mortality risk is slightly lower for Hispanic immigrants who migrated age 50 and older. Angel and colleagues (2010) speculate that the while later-life immigrants are less selected on health compared to earlier arriving labor immigrants, selection effects are still may be present as later life immigrants who arrive later in life are still subject to the "shock" of adjusting to a life altering event such as international migration. Moreover, later-life immigrants who arrive via family reunification may have financially successful and stable

families in the US who may provide a more stable support system that ultimately results in better health and longer life. Additionally, immigrant living arrangements may influence acculturation as qualitative research findings suggest that later-in-life immigrants living with family in a multigenerational home are often responsible for transmitting cultural values and traditions which may be contribute to better protective health behaviors and better health outcomes (Treas and Mazumdar 2004).

Recent research has found evidence that variation in life-course timing of migration on mortality is also shaped by English proficiency and gender (Reyes and Garcia 2020). Using data from H-EPESE, Reyes and Garcia (2020) find that later-life arriving Hispanic immigrants have lower risk of mortality compared to US-born Hispanics but those differences are no longer statistically significant once English proficiency and gender are added into the model. After running the models separately for men and women, Reyes and Garcia (2020) find that late-life Hispanic immigrant women have a 17% lower mortality risk than US-born Hispanic women, net of all other covariates, including English proficiency. A possible explanation for this is that later-in-life immigrant women have a shorter duration of exposure to potentially negative health behaviors, as opposed to their US-born counterparts who have had lifetime exposure to poorer health habits and behaviors. Additionally, immigrant women may have stronger, co-ethnic social support networks that contribute to better health and mortality outcomes (Reyes and Garcia 2020). For Hispanic men, middle-life arriving immigrants have lower mortality risk compared to Hispanic immigrant men who migrated earlier in life and later in life, which is possibly explained by positive immigrant health selection bias at the life course timing of migration for this group of Hispanic men.

In terms of disability, late-life arriving immigrants tend do have fewer disability-free years, steeper trajectories of functional limitations compared to their US-born counterparts, with some findings varying by gender explain (Garcia, Reyes, and Rote 2019; Garcia and Reyes 2017; Garcia et al. 2017; Garcia and Chiu 2016; Hill et al. 2012; Elo et al. 2011). As with research on mortality differences, the research on disability variation by timing of migration is almost exclusively on Hispanic older adults. Compared to US-born Hispanic women, there is no statistically significant difference in predicting ADL disability for late-life immigrant Hispanic women (Garcia, Reyes, and Rote 2019). For men, late-life immigrant Hispanic men are less likely to have ADL compared to US-born Hispanic men and remains statistically significant after controlling for morbidity covariates. This gendered pattern is also seen in the amount of disability-free life expectancy among Hispanic older adults. Later-in-life immigrant women spend a smaller proportion of disability free to disabled years in later life compared to US-born and earlier-in-life immigrants (Garcia and Chiu 2016). For Hispanic older adult men, the reverse is true. Late-life immigrants have a larger proportion of disability free years (Garcia and Chiu 2016).

As for disability trajectories, research has found no differences in life-course timing of migration among Hispanic immigrants when looking at disability trajectories, but significant differences in functional limitation trajectories (Garcia and Reyes 2017). Later-life arriving immigrants have steeper declines in functional limitation trajectories compared to early-life immigrants (Garcia and Reyes 2017; Hill et al. 2012). Little research has looked at life-course timing of migration shapes other immigrant groups. Using data from the 5% PUMS of the 2000 US Census, Elo, Mehta, and Huang (2011) find that relative to middle life Black immigrants,

Black immigrants who migrated later in life are more likely to report physical activity limitations, which is consistent with findings for Hispanic older adults.

Greater research attention is needed as immigrant status and racial/ethnic disparities in disability have widened and disparities in mortality are projected to increase, with some immigrant groups being most susceptible to extended periods of disability in their life course (Hayward et al. 2014; Levine et al. 2001). Recent research has highlighted the role of life-course timing of migration on disability and mortality, mainly focusing on Hispanic older adults. Late-life Hispanic immigrants have a mortality advantage compared to both US born counterparts and early-life immigrants (Garcia et al. 2017). However, later-life Hispanics immigrants also have longer periods of functional limitations in later life, further emphasizing the vulnerabilities of the late-life immigrant population (Garcia et al. 2017; Angel, Angel, Hill 2014). What is unknown is how these late-life disability disparities compare to different racial/ethnic groups, whose differences may highlight the influence of segmented pathways of assimilation in the United States.

Based on the extant research, this research is guided by the following research questions:

1a: How does immigrant status shape disablement process for older adults?

1b: Among immigrants, how does life-course timing of migration shape disablement process?

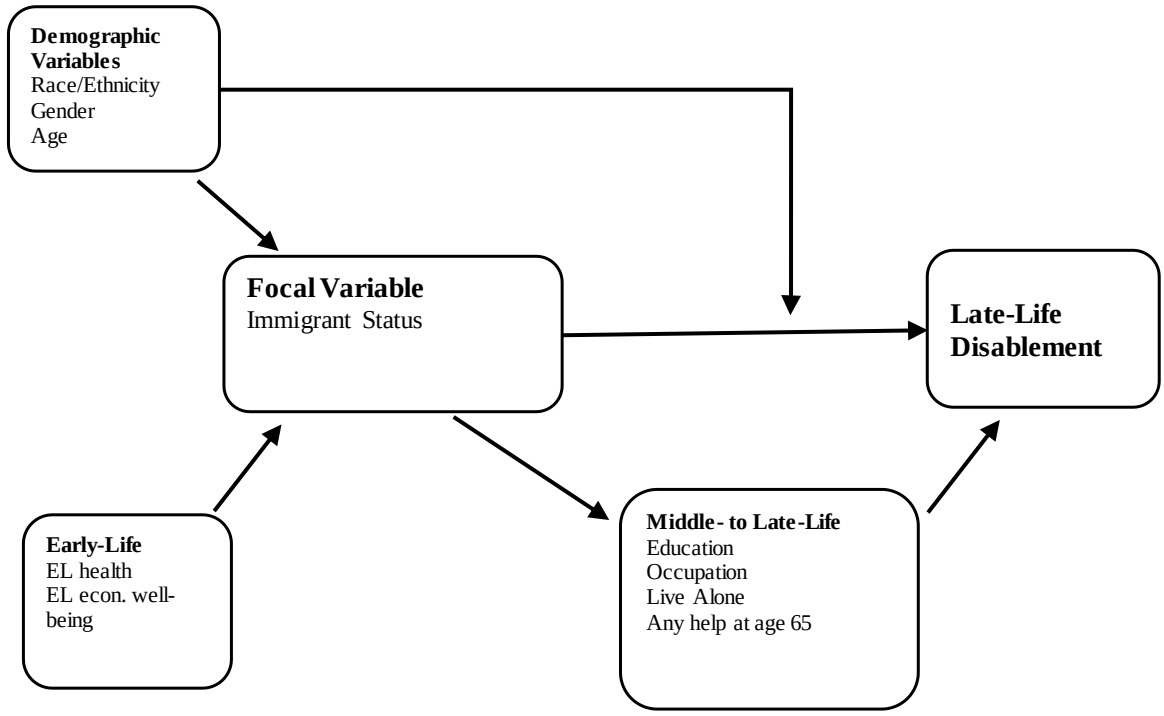
2: How is the relationship between immigrant status and disablement moderated by race and gender?

3a: How does immigrant status shape active and disabled life expectancy for older adults?

3b: Among immigrants, how does life course timing of migration shape active and disabled life expectancy for older adults?

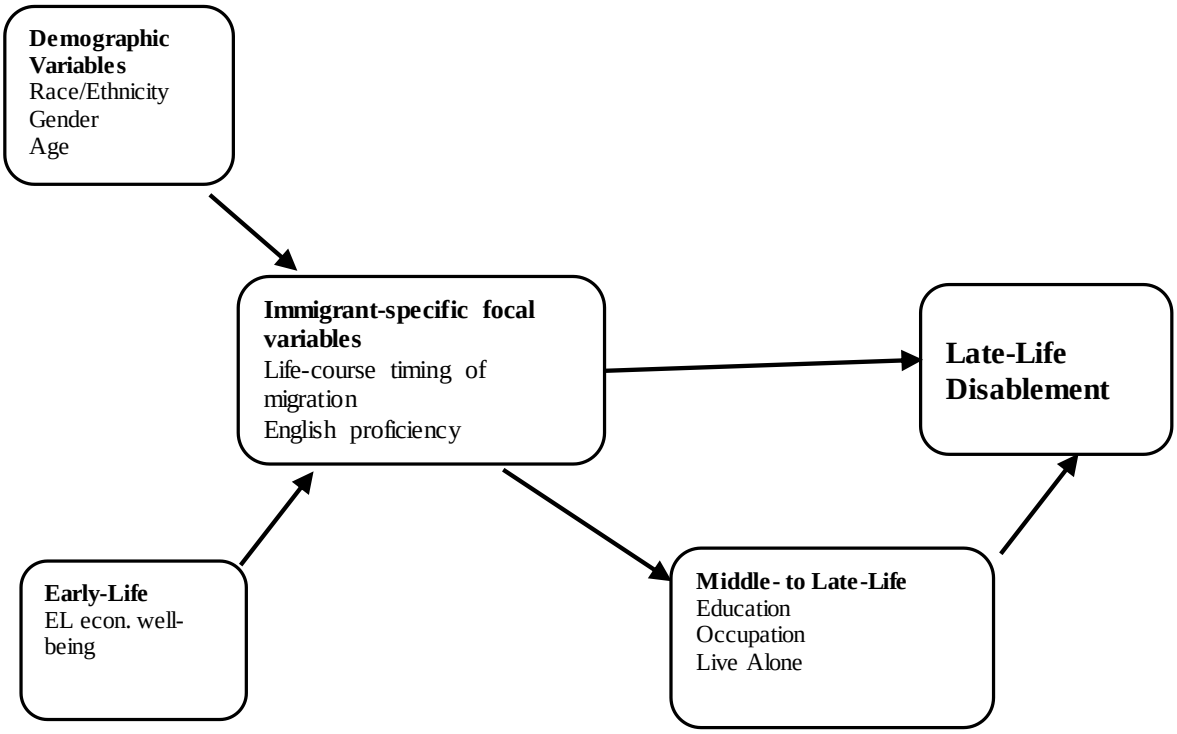
To answer these questions, I propose two conceptual models that organize the investigation of late-life disablement in immigrant older adults. The first conceptual model (Figure 1) emphasizes nativity difference in disability between immigrants and non-immigrant older adults in the United States. In this model, I posit that late-life disability is shaped by immigrant status. As shown on the left of immigrant status are demographic variables that include race/ethnicity, gender, and age, as well as the early-life, compositional variables that precede immigration. Cumulative inequality theory emphasizes that early life compositional factors may influence later-life outcomes. Immigrants arrive with different levels of early-life health and economic backgrounds that have a lasting effect on health in later life (Mehta et al. 2016). Immigrants with better health and socioeconomic status as a child may serve as a buffer in later life. In contrast, immigrants with poor early life health and economic well-being may be more vulnerable to worse health outcomes in terms of disablement and mortality. The effect of immigrant status on disablement may be mediated by middle- and late-life factors, as illustrated with the arrowed pathway from immigrant status to middle- and late-life variables and then to late-life disablement. Additionally, race/ethnicity and gender may have an additive effect on immigrant status differences in late-life disablement as pictured by the top moderation arrow from the demographic variables to the pathway between immigrant status and late-life disablement.

Figure 1. Conceptual model, full sample



The second conceptual model (Figure 2) emphasizes differences within immigrant older adults, testing for differences in life-course timing of migration on late-life disability. Similar to the first conceptual model, the blocks to the far left precede life-course timing of migration and include key demographic variables such as race/ethnicity, gender, and age as well as early-life economic well-being. Together, these blocks serve as the base model in predicting disablement and mortality. The arrows to the right of life-course timing of migration identify middle- and late-life factors that may mediate the risk for disablement and mortality. The mediating variables consist of education, occupation, and living arrangement.

Figure 2. Conceptual model, immigrant-only sample



Hypotheses

Based on the research questions, I propose the following hypotheses:

H1a: Immigrant older adults will have greater risk for disability compared to non-immigrants but will have lower mortality risk, compared to non-immigrants. As the life course perspective and segmented assimilation theories have suggested, the event of immigration itself is a stressful event that may lead to cumulative health disadvantages, which may shape later life outcomes such as disability, and the effects of immigrant status may not be offset, or mediated, by middle and late life factors. However, immigrant older adults are predicted to have lower mortality risk, compared to non-immigrants, given health selection effects at immigration, health behaviors, and/or return migration explanations that have been suggested by current research on Hispanic

immigrants (Garcia, Reyes, and Rote 2019). Additionally, researchers have suggested that potential risks which lead to increased disablement for immigrants may differ from the forces that shape mortality (Hummer and Hayward 2015).

H1b: Later-in-life immigrants will have greater risk for disablement but will have lower mortality risk compared to earlier-in-life immigrants. Later-in-life immigrants are less likely to be positively selected on health as they often arrive on family reunification visas causing them to be more vulnerable to disablement. However, compared to earlier-in-life immigrants, mortality risk is predicted to will be lower for later-in-life immigrants, who are more likely to engage in selective acculturation and retain social and cultural characteristics associated with positive health behaviors that are associated with lower mortality risk. (Reyes and Garcia 2020).

H2a: Black and Hispanic immigrant older adults will have greater risk of disability, but lower mortality risk compared to white immigrant older adults. Research suggests that Black and Hispanic immigrant older adults are exposed to additional challenges and barriers that can have negative health consequences due to their race/ethnicity and persistent racial/ethnic inequalities in the United States (Hamilton and Hagos 2021; Brown 2018). However, Black and Hispanic immigrant older adults are expected to have lower mortality risk compared to white immigrant older adults, due to health selectivity.

H2b: Immigrant older adult women will have greater risk of disability but will have lower mortality risk compared to immigrant older adult men. Immigrant women have been found to be less sensitive to selection effects compared to immigrant men resulting in increased risk for disablement (Garcia et al. 2019). However, immigrant older adult women are expected to have lower mortality risk, as women may be more likely than men to have tighter support networks

that may result in the slowing of unhealthy acculturation and retainment of more culturally protective health behaviors (Reyes and Garcia 2020).

H3a: Immigrant older adults will have longer life expectancies but will have greater proportions of disabled life expectancy compared to non-immigrant older adults. Extended life expectancy for immigrant older adults, compared to non-immigrants, may be due to their lowered mortality risk as a result of health selectivity and/or better, protective health behaviors. However, compared to non-immigrants, immigrants are expected to experience greater proportions of disabled life expectancy compared to non-immigrant older adults, due to the cumulative health disadvantages as a result of increased exposure to discrimination as well as other uniquely immigrant stressors (Hamilton and Hagos 2021).

H3b: Later-in-life immigrants will have longer life expectancies but greater proportions of disabled life expectancy compared to earlier-in-life immigrants. Longer life expectancies for later-in-life arriving immigrants may be due to shorter duration in the United States and therefore less exposure to forces that may lessen the effect of culturally protective health behaviors (Treas and Gubernskaya 2016). Later-in-life immigrants are predicted to have greater proportions of disabled life expectancy compared to earlier-in-life immigrant older adults as a result of being less selected on health. Later-in-life immigrants are more likely to arrive on family reunification visas, sponsored by their adult children, whereas earlier-in-life immigrants are more likely to have immigrated based on employment visas and thus are more likely to be positively selected on health (Carr and Tienda 2013; Elo Mehta, and Huang 2011).

CHAPTER THREE

DATA AND METHODS

Data

The hypotheses are tested with data from the National Health and Aging Trends Study (NHATS). NHATS is sponsored by the National Institute on Aging (grant number NIA U01AG32947) and is conducted by the Johns Hopkins University. NHATS is a longitudinal study that investigates a nationally representative sample of Medicare enrollees ages 65 years and older. The NHATS sampling design utilizes a three-stage stratified sampling design based on 5-year age groups, oversampling for persons over 90 years of age, and oversampling of Black individuals.

Baseline interviews were conducted in 2011 with participants being interviewed every year. For wave one, the total sample drawn is 12,411. The response rate for the base year is 71%, resulting in a sample of 8,245 interviewed individuals. Non-response documented categories include: deceased before data collection (n=697), refusals/other non-response (n=3,392), and ineligible (n=77). Ineligible sample persons consist of dropouts between selection and data collection due to causes such as moving out of the country. Proxy respondents completed the survey for 7% of the sample persons who were unable to independently participate in the survey (Kasper and Freedman 2014). The data used for this research include the public and sensitive demographic files from six waves from 2011 to 2016. Data were downloaded from the NHATS website (nhats.org) and analyzed using STATA v.16.0 statistical analysis software package.

Measures and Analysis strategy for Hypotheses 1a/1b and 2a/2b

The following measures will be used to estimate Markov transition models that test Hypotheses 1 and 2.

Dependent Variable

The dependent variable for this analysis is drawn from the Freedman et al. (2014) hierarchy of late-life mobility and self-care limitations (see Table 1). Freedman and colleagues' hierarchy consists of five levels: fully able without accommodation, successful accommodation, reduced activity, difficulty with accommodations, and assistance received.

Table 1. Variable descriptions for disability hierarchy (Freedman et al. 2014)

Disability Hierarchy	Disability categories (a) fully able, (b) successful accommodation, (c) behavior/activity reduction (d) Difficulty, with accommodations, (e) assistance from others Derived from 7 mobility and self-care activities: going outside, getting around inside, getting out of bed, eating, getting cleaned up, toileting, and dressing
Fully Able	No assistance from person in past year in all 7 mobility and self-care activities and no difficulty performing activities independently.
Successful accommodation	At least one device used, but no difficulty when doing activity independently, no assistance, and no reduction in activity.
Behavior/activity reduction	Reporting no difficulty doing activity independently and has reduction of behavior. Reduction of behavior is operationalized as: "Compared to a year ago, do you now leave your house more often, less often, or about the same?" (Only for the following: going outside, getting around inside, getting cleaned up, dressing)
Difficulty, with accommodations	Reporting some difficulty in doing activity independently with device, if used. "In the last month, when you used your [device], how much difficulty did you have [with the activity] by yourself? Would you say none, a little, some, or a lot"
Assistance from others	Received assistance from others in past year to complete at least one of the 7 mobility and self-care activities.

The battery of self-care and mobility questions use self-reported measures of ability related to seven activities: eating, bathing, showering, toileting, dressing, getting into bed, getting

around inside home, and leaving home. The use of self-reported measures of disability has been tested to be "valid measures of underlying physical health and future risks of mortality" (Mehta, Sudharanan, & Elo 2013: 124). According to Freedman and colleagues (2014):

> For each activity…participants first reported their use of devices or environmental modifications (canes, walkers, wheelchairs, scooters, grab bars, bath/shower seat, or eating and dressing devices) and help from another person during the previous month. Respondents who ever performed the activity without help then reported about difficulty they had in the last month when doing the activity alone… For activities other than getting out of bed, toileting, and eating, participants also reported about changes in the last year in the frequency with which they performed the activity (p. 89).

The measures are collected for each activity and then assigned a summary measure based on all activities. Freedman and colleagues have done extensive statistical tests for both validity and reliability of the hierarchical categories (Freedman et al. 2014; Freedman et al. 2013). Due to small sample sizes and insufficient cell counts, the hierarchy is collapsed in the Chapter 4 analysis from five categories to three categories: fully able/successful accommodation, difficulty with accommodation/reduction in activity, assistance required. In Chapter 5, due to small sample sizes and insufficient cell counts, the analysis uses a further collapses the outcome variable to able (with or without difficulty) and assistance required.

In the supplementary analyses not shown, preliminary tests were conducted using alternative measurements of disability to perform sensitivity tests and check whether the results across different dependent variable specifications. I compared how different operationalizations of disability influence observed differences in the transition models. Within the late-life

disability literature, researchers have emphasized the importance of documenting and understanding the differences in measurement to build a more comprehensive picture of disability in later life. How disability is operationalized is important to consider as it may affect the analyses. I tested this by running the Markov transition models with two additional respecified measures of disability as the outcome variable. Results from the supplementary analyses show that the transition risk is not sensitive to the respecified models.

Independent variables

Independent variables encompass the following: (1) immigrant status, (2) key demographics, (3) early-life conditions, (4) middle- and late-life conditions (5) immigrant-only characteristics. See Figures 1 and 2 for an overview of the conceptual models.

Immigrant status is the key variable in first set of analyses that examine differences between immigrant and non-immigrant respondents. Immigrant status is measured as whether the respondent was born in the United States and is measured at the 2011 baseline. The variable is dichotomously coded as foreign-born/immigrant=1 and US-born/non-immigrant=0. It is important to note that country of birth does not accurately capture immigrant status as there may be a small number of respondents who are not born in the United States, but are born to US citizens in another country. Because legal status is not asked in NHATS, I am unable to identify and exclude this subpopulation from the analyses. Immigrant status is also used to identify the sample for the immigrant-only portion of the analyses.

Key demographics are comprised of race and ethnicity, gender, and age. Race/ethnicity is a nominal variable that is coded into three categories: non-Hispanic white, non-Hispanic Black, and Hispanic. In the survey, race and ethnicity has eight categorical responses, including Asian,

Pacific Islander, American Indian, etc. but due to low cell counts, only non-Hispanic white, non-Hispanic Black, and Hispanic are included in the final analyses. Gender is dichotomously coded as female = 1 and male = 0. Age is measured at baseline. Age is measured as a continuous variable, indicating age in years.

Early-life conditions are comprised of two variables measured at baseline: health as a child and economic status as a child. The early-life measures are used for both analyses of the full sample and immigrant-only. In the immigrant-only analyses, only early life economic well-being is included due to low cell counts for the early-life health measure. Health as a child is drawn from the question, "Thinking about when you were growing up, would you say that your health as a child was excellent, very good, good, fair, or poor?" Responses indicating "fair" or "poor" are recoded as 0 and "excellent", "very good", and "good" responses coded as 1. Early-life financial well-being is drawn from the question, "How well off financially was your family when you were growing up? Was it well off, above average, average, below average, or poor?" Responses of "well off" "above average" and "average" are recoded as 1 and "below average" and "poor" response are recoded as 0.

Middle- and late-life conditions include: educational attainment and longest held occupation, any self-care or mobility help at age 65, and living arrangement. The middle- and late-life variables are used for both analyses, total sample and immigrant-only. Education is a time-invariant, ordinal variable that indicates highest level of education completed (e.g., less than high school, high school degree or GED equivalent, some college, Bachelor's degree or more.) Due to low cell counts, for the immigrant-only analyses, the education variable is collapsed to "less than high school", "high school degree or GED equivalent", and "some college or higher". Occupation is a categorical variable that indicates whether the respondent's longest held

occupation was blue collar, white collar, or no paid work. The variable any help at age 65 comes from two questions in the survey, the first asking "Where you getting help with getting out of bed, getting around you home or leaving your home around the time when you turned 65? "Yes" was recoded as 1 and "No" was recoded as 0. The second question asks "Were you getting help with eating, getting cleaned up, using the toilet, or getting dressed around the time when you turned 65? "Yes" response are recoded as 1 and "No" responses are recoded as 0. Any response of "yes" is coded as 1 for the any help at 65 variable. This variable is included to test for intertemporal dependence. This variable aids in understanding late-life disablement and how much of that variation may be due to whether the respondent required help at age 65. Due to low cell counts, this variable is not used for the immigrant-only analyses. Current living arrangement is a dichotomously coded variable indicating whether the respondent currently lives alone.

Immigrant-only characteristics include life-course timing of migration and English proficiency, both measured at the baseline. Life-course timing of migration is a dichotomously-coded variable derived from the age of migration variable with the following age of migration cut points: Earlier-in-life migrants are individuals who migrated before the age of 55 and later-in-life migrants are individuals who migrated after the age of 55 years old. I dichotomized the variable as a proxy for immigrants who arrived during working age and those who most likely immigrated for non-employment based reasons. The age cut point for later-life immigrant is lower than commonly used cut points in immigration research because the NHATS sample is drawn from Medicare files. The immigrant respondents in the data have met Medicare stipulations such as acquiring an employment history of at least 40 quarters in the United States. Thus, the number of later-life immigrants are sparser in the data and requires a more conservative age measure of later-life migration. I conducted preliminary tests to identify a cut

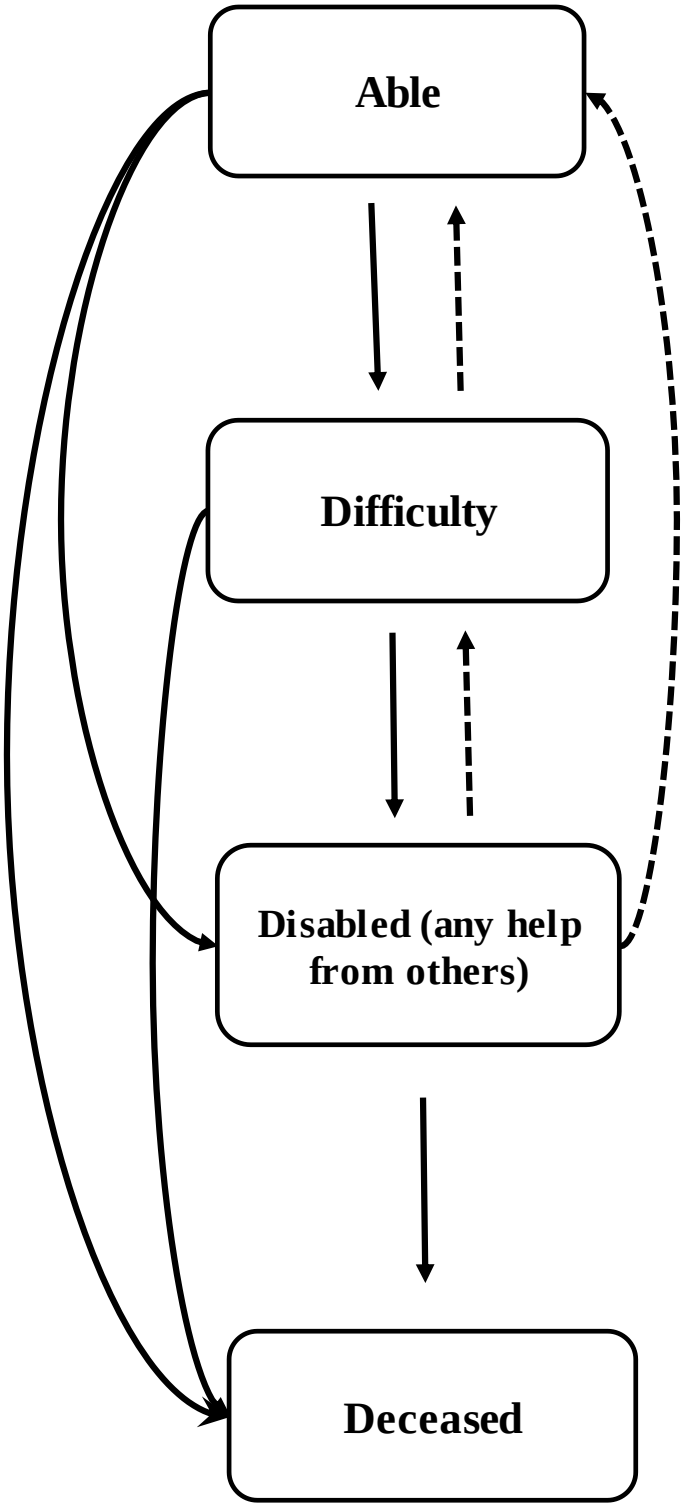
point that made sense conceptually as well as consulted extant research that used similar age cut points. English proficiency is a dichotomously coded control variable indicating whether the respondent speaks English well/very well (1) or not well/not at all (0).

Analytic sample and person-period file

Hypotheses 1a and 1b will be tested with an analytic sample that is based on the following criteria: individuals must be community dwelling individuals and identify as non-Hispanic white, non-Hispanic Black, or Hispanic. The total number of respondents used to create the pooled person-period file is 6,540 persons. Respondents with missing data on the dependent variables and focal independent variables were dropped from the analytic sample. The percentages of the sample that were dropped for these analyses are shown in Table 4. I use listwise deletion for cases that were missing for any of the variables. I also created a missing flag variables for each independent variable and ran bivariate analyses against the other variables to check for statistically significant difference and there were none. The missingness in the full sample was not more than 2.7% on any individual variable but for the immigrant only sample, the missingness was a larger issue with some with close to 10% of the immigrant only sample (see Table 4). Most of the respondents missing on race/ethnicity were also missing for education, occupation, etc. Due to the amount of missingness, I chose to use listwise deletion over mean or mode substitution.

In the person-period file sample persons are aged by approximately one year beginning with their first interview in 2011 through their death or 2016 follow-up. The person-year file measures possible transitions between disabled and non-disabled state spaces. Figure 3 provides a diagram of the possible pathways for each disability measure.

Figure 3. Disability hierarchy, three-stage disability state-space model



For the three tier disability hierarchy, there are nine possible transitions: (1) fully able to difficulty, (2) difficulty to fully able, (3) fully able to disabled, (4) disabled to fully able, (5) difficulty to disabled, (6) disabled to difficulty, (7) difficulty to death, (8) disabled to death, and (9) fully able to death. Table 2 displays the total disability transitions for the person-year file based on the full sample, including immigrant and non-immigrant respondents. There were a total of 18,666 transitions during the 6 year study period between 2011-2016.

Table 2. Weighted transition percentages from disability stages at previous round to disability stages (disability hierarchy) or death at current round, total sample, NHATS, 2011-2016

	Weighted percentage, current round				
	Fully able	Difficulty	Any help	Death	Total
Previous round					
Fully able	79.1	16.2	1.6	3.1	100.0 (n=11,797)
Difficulty	31.3	53.7	8.5	6.5	100.0 (n=5,289)
Any help	3.7	14.2	57.3	24.9	100.0 (n=1,580
Total	59.2	26.7	8.3	5.9	100.0 (n=18,666)

The total disability transitions for the immigrant-only sample are displayed in Table 3. Among the immigrant-only sample, there were 1,627 transitions during the 6-wave study period between 2011-2016.

Table 3. Weighted transition percentages from disability stages at previous round to disability stages (disability hierarchy) or death at current round, immigrant-only sample, NHATS, 2011-2016

	Weighted percentage, current round				
	Fully able	Difficulty	Any help	Death	Total
Previous round					
Fully able	74.8	19.3	2.4	3.3	100.0 (n=907)
Difficulty	35.3	44.6	16.7	3.4	100.0 (n=473)
Any help	2.8	15.0	63.6	18.6	100.0 (n=247)
Total	52.5	26.0	15.9	5.7	100.0 (n=1,627)

Markov transition models

To test hypotheses 1a/b and 2a/b, which examine immigrant status and life-course timing of migration differences in disability transitions, I use Markov transition models, which assumes that the conditional distribution of disability stage in the following round is a function of the current round disability stage, as well as all control variables (Crimmins, Hayward, and Saito 1994). Transition models are estimated based on the following equation:

$$logit\Pr\left(Y_j = y_{j+1} \middle| Y_j = y_j\right) = \chi'\beta_{j,j+1}$$

where j is the current round, j+1 is the following round, Y_j is the current disability status of the respondent, Y_{j+1} is the disability status at the following round, and Pr $(Y_j|Y_{j+1})$ is the probability

of being in a particular disability state in the following round given the disability state in the current round.

The transition model is fitted using svy: mlogit in STATA for multinomial logistic regression with the analytic weights provided by NHATS in order to incorporate sampling design of the study. The STATA option rrr is used to report the estimated coefficients transformed to relative-risk ratios. These models will be presented in chapters 4 and 5.

Measures and Analysis Strategy for Hypotheses 3a and 3b

Hypotheses 3a and 3b are tested by using Sullivan based life tables. The Sullivan approach is a descriptive and informative cross-sectional approach and reports age-specific disability status in a population at a given point in time. The Sullivan method is likely to yield similar results as the multi-state method of calculating life tables, especially when the follow-up period is relatively short (Jagger et al., 2006). Immigrant-based aging research regularly uses Sullivan life tables as a method to assess various life expectancies in older adults (Hayward et al. 2014; Cantu et al. 2013).

Measures

Two measures are needed to calculate the life tables: mortality and disability. Mortality in NHATS is obtained by proxy via a "Last Month of Life" interview after the sample respondent is deceased. For disability prevalence, disability is measured as requiring help from another person to perform select mobility and self-care activities (eating, bathing, showering, toileting, dressing, getting into bed, getting around inside home, and leaving home). Responses are dichotomously coded with 1 being that the respondent has received help from another person, in the last month, to perform any of the ADLs indicating that the respondent requires assistance to complete the

self-care or mobility task. All other responses, including having difficulty performing any of the tasks with or without assistive technologies, are coded as 0. I chose to calculate prevalence using the "any help" measure of disability instead of the "any difficulty" measure of disability, which has been critiqued for its subjective nature and potential for a wide range of interpretations, thus leading to over- or under-estimations (Wolf 2016). Additionally, the "any help" measure of disability represents a stricter definition of disability compared to using "any difficulty" definition and has more direct consequences on costs related to requiring help from another person, such as unpaid family caregiver or a paid home caregiver (Johnson and Wiener 2006). In addition, this analysis uses the previously discussed measures of immigrant status, race/ethnicity, gender, and life course timing of migration to generated stratified life tables for specific groups.

Sullivan method life tables

The Sullivan-based method is used to calculate total life expectancy, disability-free life expectancy, and disabled life expectancy (Jagger et al. 2006). Six pooled NHATS waves from 2011-2016 are used to estimate statistical models of mortality incidence and disability prevalence. Mortality incidence is estimated using Gompertz model (Klein and Moeschberger 2003). The parameter estimates from the Gompertz model are estimated in STATA using streg for parametric survival models fitted to Gompertz distribution using analytic weights provided by NHATS. The parameter estimates from the model are then plugged into calculations to predict survival to age x via Microsoft Excel (See appendix). The survival equation used is:

$$Survival_{(\chi)} = \exp\left[\frac{e^{\alpha}}{\beta}(1 - e^{\beta\chi})\right]$$

where e^{α}, or the intercept with covariates, is calculated as exp^{a+bx}. Once the probability of survival at age x is calculated, it is applied to a hypothetical population of 100,000 to calculate

the person years lived at age x as well as total numbers of person years lived from age x, which is then divided by the number surviving to age x (from the 100,000) to get the total life expectancy (Jagger et al. 2006; Freedman, Wolf, Spillman 2016). Survival is calculated for each one-year age interval from age 65 to 110.

To calculate disability prevalence, log odds of receiving any help are estimated using a logit model. For the full sample analyses, the model includes a three-way interaction between immigrant status, race/ethnicity, and gender, plus age and age squared. Age-squared is included to test for non-linear relationship. Additional testing shows no statistically significant differences in age and age-squared patterns of disability prevalence. For the immigrant-only analyses, the model includes a two-way interaction between life course timing of migration and race/ethnicity, along with age and age-squared as covariates. The second set of immigrant-only analyses includes a two-way interaction between life course timing of migration and gender, along with age and age-squared as covariates. The log odds are estimated using svy:logit with analytic weights provided by NHATS. Then, the disability prevalence estimates are plugged into the following equation to predict disability prevalence:

$$P = \frac{exp^{a+bx}}{1 + exp^{a+bx}}$$

The probability of disability at age x (P) is used to calculate disability-free life expectancy. Finally, the proportion of life spent disability-free is calculated by dividing disability-free life expectancy by total life expectancy. The life tables will be presented in Chapter 6.

Sample Variable Descriptives

Table 4 presents weighted descriptive statistics for the full sample of 6,540 respondents. Complex survey design of NHATS is accounted for by using Stata svy commands, which adjusted for population stratification, primary sampling unit, and sample weights. Approximately 10% of the sample are immigrants. In terms of race and ethnicity, the overwhelming majority of the total sample is non-Hispanic white (82.7%), 8.7% non-Hispanic Black, and 7.4% Hispanic. In contrast, among the immigrant-only sample, 45% of the sample are Hispanic and about 38% are non-Hispanic white and 7% are non-Hispanic Black. About 55% of the sample are women. The majority of the sample had good early life health and stable early life financial well-being.

Table 4. Sample descriptive statistics, weighted percentages, NHATS 2011

	Total Sample	Non-immigrant	Immigrant
Immigrant status			
Non-immigrant	88.8	--	--
Immigrant	10.1	--	--
Missing	1.0	--	--
Key Demographic Variables			
Race/Ethnicity			
non-Hispanic white	82.7	88.3	37.9
non-Hispanic Black	8.7	8.9	7.1
Hispanic	7.4	2.7	45.3
Missing	1.2	0.0	9.7
Female	55.1	55.0	55.6
Missing	0.0	0.0	0.0
Early-Life			
Good EL health	92.2	93.5	81.9
Missing	1.2	0.2	9.3
No EL fin. adversities	62.4	63.0	57.9
Missing	1.7	0.7	9.6
Middle- to Late-Life			
Education			
Less than HS	21.4	18.8	47.5
HS degree or GED equivalent	27.4	29.0	14.8
Some college	26.0	27.2	16.2
BA or higher	24.0	24.9	17.0
Missing	1.2	0.2	9.5
Occupation			
Blue collar	31.6	30.4	41.5
White collar	58.1	61.1	34.9
No paid work	7.9	7.3	12.8
Missing	2.3	1.3	10.8
Heart attack	13.6	13.6	13.1
Missing	0.0	0.0	0.3
Any help at age 65	3.0	2.9	3.6
Missing	3.3	3.2	3.6
Mean age (in years)	74.5	74.5	74.9
Std. Error	0.09	0.10	0.26
Missing	0.0	0.0	0.0
Live alone	26.1	26.6	22.1
Missing	0.4	0.3	0.9
	n=6540	n=5825	n=715

Note: Data are weighted.

Looking at middle-life experiences, about half of the sample had at least some college experience. However, among the immigrant sample, almost half of the sample have less than a high school degree. Among the total sample, over half of the sample had white collar occupations and about 8% had no paid work. In comparison, about 42% of the immigrant sample had blue collar occupations. Looking at baseline health and demographics, about 14% have suffered from a heart attack. Three percent of the sample had some type of mobility or self-care help at age 65. This variable has the greatest percentage of missingness at 3.3% missing. The mean age of the sample is 74.5 years of age and about a quarter of the sample live alone.

Table 5 reports the sample characteristics for the immigrant-only sample and is stratified by life course timing of migration. In total, there are 715 respondents in the immigrant-only sample. About 86% of the sample immigrated to the US before 55 years of age. In terms of race, half of the later-in-life immigrants are Hispanic versus roughly 45% of earlier-in-life immigrants.

Looking at early life conditions, the majority of sample respondents had good early life health and no early life financial adversities. Later-in-life immigrants reported better early life health and early life financial well-being than earlier-in-life immigrants. Looking at middle- and late-life variables, 41% of earlier-in-life immigrants have less than a high school degree compared almost 52% of later-in-life immigrants. About a third of both earlier- and later-in-life immigrants have some college experience. In terms of occupation, the two immigrant groups are similar with the exception of having no paid work. About 24% of later-in-life immigrants have no paid work as their longest occupation compared to 11% of earlier-in-life immigrants. About 7% of later-in-life immigrants have needed help at age 65 compared to about 3% of earlier-in-life immigrants. Later-in-life immigrants have a higher mean age than earlier-in-life immigrants at 77.4 and 74.5 years of age, respectively.

Table 5. Immigrant-only sample descriptive statistics, by life course timing of migration, NHATS 2011

	Total Sample	Earlier-in-Life	Later-in-Life
Focal Variables			
Life Course Timing of Migration			
Before 55 years of age	85.9	--	--
After 55 years of age	14.1	--	--
Missing	0.0	--	--
Speak English well	53.1	57.9	24.0
Missing	9.2	10.7	0.0
Key Demographic Variables			
Race			
non-Hispanic white	37.9	37.7	39.2
non-Hispanic Black	7.1	6.5	10.8
Hispanic	45.3	44.5	50.0
Missing	9.7	11.3	0.0
Female	55.6	55.5	56.3
Missing	0.0	0.0	0.0
Early-Life			
Good EL health	81.9	80.4	91.4
Missing	9.3	10.9	0.0
No EL fin. Adversities	57.9	56.6	66.0
Missing	9.6	11.3	0.0
Middle- to Late-Life			
Education			
Less than HS	42.3	41.0	51.8
HS degree or GED	14.8	14.8	14.9
Some college or higher	33.2	33.2	33.3
Missing	9.5	11.0	0.0
Occupation			
Blue collar	41.5	41.2	43.6
White collar	34.9	35.3	32.4
No paid work	12.8	11.1	23.7
Missing	10.8	12.5	0.3
Heart attack	13.1	13.2	12.7
Missing	0.3	0.3	0.0
Any help at age 65	3.6	3.1	6.7
Missing	3.6	3.7	2.9
Age (in years)	74.9	74.5	77.4
Std. Error	0.26	0.31	0.53
Missing	0.0	0.0	0.0
Live alone	22.1	22.7	18.6
Missing	0.9	0.8	1.5
	n=715	n=600	n=115

Note: Data are weighted.

Outline of analysis chapters

Analysis chapter 4 tests hypotheses1a and 1b by examining the effects of immigrant status and life-course timing of migration on transition rates across different states of disability, controlling for key sociodemographic variables, early-, middle- and late-life characteristics. Chapter 4 uses both the full analytic sample and immigrant-only subset to estimate the unadjusted and adjusted models. As seen in Figure 1, which shows the conceptual model for the full sample analysis, immigrant status is the focal variable that predicts late-life disablement, but allows for mediation through other covariates that shape late-life disablement. Like the conceptual model using the full sample analysis, the conceptual model for the immigrant-only subset (Figure 2) shows that the focal variables have possible direct effects on late-life disablement as well as possible mediating effects through other covariates. Transition models for each possible pathway for each disability state and death are estimated using disability hierarchy outcome variables, as seen in Figure 3.

Analysis chapter 5 builds on the previous chapter and tests hypothesis 2a and 2b, by examining interactions between immigrant status, race/ethnicity, and gender using the total analytic sample. The potential moderation effect is shown in the top half of the conceptual model (Figure 1) with the key demographic variable arrow pointing towards the pathway of the focal variable, immigrant status.

Chapter 6 addresses the hypotheses 3a and 3b by calculating Sullivan-based life tables to calculate total life expectancy, disability-free life expectancy, and disabled life expectancy using the full sample and the immigrant-only sample. For the full sample, life expectancies are calculated by immigrant status and race/ethnicity as well as immigrant status and gender. For the immigrant only sample, due to small sample size, life tables could not be constructed by life

course timing of migration, race/ethnicity, and gender together. For the immigrant-only sample, I construct two sets of Sullivan-based life tables to calculate total life expectancy, disability-free life expectancy, and disabled life expectancy: one set has estimates by life course timing of migration and race/ethnicity and the second set of life tables has estimated by life course timing of migration and gender.

CHAPTER FOUR

EXAMINING THE EFFECTS OF IMMIGRANT STATUS AND LIFE-COURSE TIMING OF MIGRATION ON DISABLEMENT

This chapter addresses research questions 1a and 1b: 1a) How does immigrant status shape disablement process for older adults? 1b) Among immigrants, how does life-course timing of migration shape disablement process? To answer these questions, I test the following hypotheses: H1a) Immigrant older adults will have greater risk of disablement, but lower mortality risk, than non-immigrant older adults, net the effects of key sociodemographic and life-course factors. H1b) Later-in-life immigrants will have greater risk of disablement, but lower risk for mortality, compared to earlier-in-life immigrants. To test the hypotheses, I estimate Markov transition models using the full sample as well as the immigrant-only subset. The dependent variable is the disability hierarchy previously shown in Figure 3. First, I will report the results for the base and mediation models for the total sample, which allows for the examination of immigrant status differences. Then I will report the results for the base and mediation models for the immigrant-only sample which allows for the examination of life-course timing of migration.

Full Sample

Unadjusted, full sample

Fully Able

Table 6 presents results for the unadjusted model, which includes immigrant status as well as key demographic confounders (race/ethnicity, gender, age) and early-life compositional

factors to determine whether being an immigrant is associated with a differential risk of transitioning between disability states and between disability states and mortality.

Table 6. Relative risk ratios of transitions across disability states and mortality, base model, full sample, NHATS 2011-2016

	Fully able (n=11,797)			Difficulty (n=5,289)			Any help (n=1,580)		
Model	1	2	3	4	5	6	7	8	9
State at start of interval	Fully able	Fully able	Fully able	Difficulty	Difficulty	Difficulty	Any help	Any help	Any help
State at end of interval	Difficulty	Any help	Deceased	Fully able	Any help	Deceased	Fully able	Difficulty	Deceased
Focal Variable									
Immigrant	1.054	1.227	1.236	1.329	1.926 ***	0.614	1.110	0.591	0.590
Key Demo. Variables									
Race/Ethnicity									
non-Hisp., Black	1.488 ***	2.252 ***	1.649 ***	0.819 *	1.465 **	1.040	0.404 *	0.808	0.703 *
Hispanic	1.466 **	2.031	1.016	0.973	1.917 *	0.944	0.300	1.217	0.656
Female	1.168 *	1.516 **	0.715 **	0.895	1.489 ***	0.552 ***	1.704	0.678	0.479 ***
Age (in years)	1.051 ***	1.122 ***	1.130 ***	0.974 ***	1.091 ***	1.084 ***	0.898 ***	0.930 ***	1.020
Early-Life									
Early-life health	0.676 **	0.923	0.626	1.362	0.978	1.131	1.882	0.670	0.748
Early-life econ. status	0.865 *	0.886	0.854	1.226 *	1.139	1.092	0.706	1.079	0.822

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

Models 6.1-6.3 show the relative risk of older adults who are fully able at the start point of the time interval. Model 6.1 shows the relative risk of the decline from being fully able to having difficulty with carrying out self-care and mobility activities. In this model, immigrant status is not statistically significant (RR=1.054, 95% CI=0.860-1.292). Black and Hispanic older adults have an increase in risk of transitioning from being fully able to having difficulty. Women have a 17% increase in risk of decline compared to men. Each additional increase in age year increases disability risk by 5 percent. Older adults with good early-life health have a 32% decrease in risk of moving from being fully able to having difficulty, relative to older adults with poor early-life health. Additionally, older adults with good early-life economic status have a 13% decrease in risk of moving from being fully able to having difficulty, relative to older adults with poor early-life economic status.

Immigrant status is not statistically significant in Model 6.2, which examines risk of decline from being fully able to receiving help. However, the immigrant status coefficients in

Models 6.2 and 6.3 suggest that immigrants have an increased risk of transitioning from being able to having difficulty relative to non-immigrant older adults (RR= 1.227, 95% CI=0.546-2.759). Black older adults have 2.25 times the risk of transition from being fully able to receiving help, relative to white older adults. Compared to men, women have a 52% increase in risk of transition from being fully able to receiving help. Age is also statistically significant as each additional year increase results in a 12% increase in relative risk for transition from fully able to receiving help.

Model 6.3 examines mortality risk from being fully able. Immigrant status is not statistically significant, however the coefficient suggests that immigrants may have an increased mortality risk from being fully able, relative to non-immigrant older adults (RR=1.236, 95% CI=0.759-2.012). Black older adults have a 65% increase in mortality risk from the fully able state, compared to white older adults. Relative to men, women have a 28% reduction in mortality risk from being fully able. Each increase in age year also increases mortality risk by 13 percent. Early-life compositional factors are not statistically significant.

Overall, these models suggest that immigrants may have an increased risk of disability onset and mortality from being fully able. However, they are not statistically significant, most likely due to lack of statistical power. With a more robust sample, the immigrant status coefficients may be statistically significant.

Difficulty

Models 6.4-6.6 show relative risk of older adults who start the time interval in the difficulty state. Model 6.4 shows the relative risk of recovering from having difficulty to being fully able to carry out self-care and mobility activities. In this model, immigrant status is not

statistically significant, however, the immigrant status coefficient (RR=1.329, 95% CI=0.947-1.865) suggests that immigrants have an increased risk of recovering from having some difficulty with self-care and mobility activities to being fully able to complete self-care and mobility activities, compared to non-immigrant older adults. Black older adults have a 18% reduction in risk of recovery from having difficulty to being fully able, relative to white older adults. Each age year increase decreases risk of recovery by 3 percent. Older adults with good early-life economic status have a 23% increase in risk of recovery relative to older adults with poor early-life economic status.

Immigrant status is statistically significant in Model 6.5, which examines the risk of movement between difficulty and getting help. Immigrant older adults have about 1.9 times the risk as their non-immigrant counterparts for transitioning from having difficulty to getting help. Additionally, Black and Hispanic older adults have an increase of 47% and 92%, respectively, in risk of transitioning from having difficulty to receiving help compared to white older adults. Women have a 49% increase in risk of decline compared to men. Age also increases risk for decline from difficulty to receiving help.

Immigrant status is not statistically significant in Model 6.6, which shows the unadjusted mortality risk among those who have difficulty for immigrant older adults relative to non-immigrant older adults. However, the immigrant status coefficient (RR=0.614, 95% CI=0.307-1.230) suggests that immigrants have a lower mortality risk from the difficulty state, compared to non-immigrants. Relative to men, women have a 45% reduction in mortality risk from the difficulty state while age increases mortality risk by 8% for each additional increase in age year.

Any help

Models 6.7-6.9 show the relative risk of older adults who start the wave interval receiving assistance to perform self-care and mobility tasks. Model 6.7 examines recovery risk of transitioning from receiving help to being fully able. Immigrant status is not statistically significant in this model. Race is statistically significant, as Black older adults have a 60% reduction in risk of recovery from receiving help to being fully able to perform self-care and mobility tasks. Additionally, each increase in age year reduced recovery risk by 10 percent.

Model 6.8 examines recovery transitions from receiving help to the any difficulty state. In this model, immigrant status is not statistically significant but the coefficient (RR=0.591, 95% CI=0.303-1.151) suggests that immigrants may have a lowered risk of recovery from the receiving help state to the having difficulty state. Age progression also lowers risk of recovery by 7% for each additional age year.

Model 6.9 shows the mortality risk for older adults from the receiving help state. The immigrant status coefficient (RR=0.590, 95% CI=0.335-1.038) implies that immigrants may have a lower mortality risk compared to non-immigrants. Black older adults have a 30% lower mortality risk from the receiving help compared to white older adults and women have a 52% reduction in mortality rate compared to men. Early-life compositional factors are not statistically significant in this model.

Adjusted, full sample

Fully Able

Table 7 reports relative risk ratios for the fully adjusted models. These models include the base model variables, which consist of immigrant status as the focal predictor variable

race/ethnicity, gender, age, and early-life conditions, as well as the addition of middle- and late-life variables including educational attainment, occupation, living arrangement, and whether the respondent had received any help at age 65.

Table 7. Relative risk ratios of transitions across disability states and mortality, fully adjusted, full sample, NHATS 2011-2016

	Fully able (n=11,797)			Difficulty (n=5,289)			Any help (n=1,580)		
Model	1	2	3	4	5	6	7	8	9
State at start of interval	Fully able	Fully able	Fully able	Difficulty	Difficulty	Difficulty	Any help	Any help	Any help
State at end of interval	Difficulty	Any help	Deceased	Fully able	Any help	Deceased	Fully able	Difficulty	Deceased
Focal Variable									
Immigrant	1.068	1.162	1.268	1.317	1.684 **	0.582	0.962	0.567	0.601
Key Demo. Variables									
Race/Ethnicity									
non-Hisp., Black	1.452 ***	2.006 ***	1.428 *	0.869	1.299	0.953	0.489	0.798	0.729 *
Hispanic	1.380 *	1.438	0.828	1.049	1.464	0.770	0.394	1.277	0.696
Female	1.148	1.355	0.575 ***	0.892	1.552 ***	0.535 ***	1.290	0.647 *	0.483 ***
Age (in years)	1.051 ***	1.120 ***	1.118 ***	0.975 ***	1.095 ***	1.082 ***	0.885 ***	0.920 ***	1.021
Early-Life									
Early-life health	0.671 **	0.944	0.655	1.346	0.955	1.107	1.431	0.599	0.740
Early-life econ. status	0.893	0.971	0.950	1.183	1.196	1.161	0.632	1.109	0.828
Mid- to Late-Life									
Education									
HS deg./GED	0.952	0.446 **	0.649 **	1.125	0.677 *	0.684 *	1.075	0.727	1.200
Some college	0.887	0.638	0.612 **	1.196	0.584 **	0.664 *	1.155	0.698	0.967
Bach. or higher	0.757 *	0.362 ***	0.310 ***	1.276	0.690	0.606 *	1.462	0.839	0.899
Occupation (ref: no paid work)									
White collar	1.194	0.520 *	1.189	0.890	0.515 **	0.559	0.606	1.297	1.333
Blue collar	1.075	0.480 *	0.921	0.873	0.571 *	0.579 *	0.435	1.021	1.156
Live alone	0.934	0.707	1.452 **	0.952	0.577 ***	0.797	1.947 *	1.392	0.980
Any help at age 65	1.774 **	1.451	0.640	0.732	1.680	0.666	0.221 *	0.456 *	0.999

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

Models 7.1-7.3 examine transitions for older adults who all start at the fully able state. Model 7.1 examines the pathway of decline from fully able to having difficulty. Black and Hispanic older adults both have a risk increase relative to White older adults of 45% and 38%, respectively. Each additional increase in age year increases disability risk by 5 percent. Older adults with good early-life health have a 33% decrease in the risk of moving into a state of having some difficulty relative to older adults with poor early-life health. Gender and early-life economic status are no longer statistically significant once the middle- and late-life variables are

included in the model, indicating that the gender and early-life economic status effects are mediated by education and whether the respondent received help at age 65. Older adults with bachelor's degrees have a 24% lower risk of increased disability relative to those without a high school degree. Additionally, receiving any help at age 65 increases risk by 77 percent.

Model 7.2 examines relative risk of decline in the pathway from being fully able to receiving help. In this adjusted model, the key focal variable, immigrant status, remains not statistically significant. Black older adults have an increased risk of transitioning from being fully able to receiving any assistance by 200% relative to white older adults. Age increases relative risk of decline from fully able to receiving help by 12% for each additional year.

Greater educational attainment decreases relative risk of moving from being fully able to getting help for those with at least high school and bachelor's degrees relative to those with less than a high school degree by 56% and 64% respectively. Older adults who worked in both white collar and blue collar occupations also saw decrease in risk relative to those who did not have paid work, by 48% and 52% respectively.

Model 7.3 shows mortality risk from being fully able. In Model 7.3, immigrant status remains not statistically significant after adjusting for other covariates. Black older adults have an increased mortality risk of 43% compared to white older adults. Women decrease risk by 42% relative to men. Early-life characteristics were not significant. Age increases mortality risk from being fully able by 12% for each year.

Greater educational attainment decreases relative risk of those with at least high school, some college experience, and bachelor's degree relative to those with less than a high school degree with the greatest risk reduction. For high school graduates, mortality risk declined by 35%

compared to individuals with less than a high school degree. For individuals with some college experience, relative risk declined by 39 percent. For people with bachelor's degrees or higher, their mortality risk decreased by 69% compared to people without high school degrees. Living alone also increased mortality risk from being fully able by 45 percent.

Difficulty

Models 7.4-7.6 examine pathways for older adults who all started at the difficulty state. Model 7.4 presents relative risks for recovery from having difficulty to being fully able. In this adjusted model, the key focal variable immigrant status is not statistically significant. For each additional year increase in age, older adults have a 2% reduction in risk of moving from having difficulty to being fully able.

Model 7.5 presents the relative risk of decline in the pathway from having difficulty to being receiving help to perform self-care and mobility tasks. In this model, immigrant status remains statistically significant after adjusting for other covariates. Immigrant older adults increase their risk of decline from having difficulty to receiving help to carry out self-care and mobility tasks, relative to non-immigrant older adults by 68%, controlling for all other covariates. The relative risk ratio is reduced from 1.926 to 1.684, which is a -0.242 change compared to the unadjusted, base model, which suggests that the middle-and late-life mediating variables reduce the immigrant status coefficient. Relative to men, women have an increased risk of 55% for decline from having difficulty to getting help. Among older adults who started with some self-care and mobility difficulty, age increases risk of decline to receiving help by 10% for each additional year.

Relative to respondents with less than a high school degree, older adults with greater educational attainment have a decreased risk of decline from having some difficulty to getting help. Older adults with high school degrees have a 32% reduced risk of transition from having difficulty to getting help, relative to those with less than a high school degree. For adults with come college experience, risk of transition from having difficulty to getting help is reduced by 42% compared to those with less than a high school degree. Older adults who had either white or blue collar occupations have decreased risk of transitioning from having difficulty to receiving help relative to older adults without paid work occupations by 48% and 43%, respectively. Older adults living alone have a 42% decrease in risk of transition from having difficulty to receiving help to perform self-care and mobility tasks.

Model 7.6 estimates mortality risk from having difficulty performing self-care and mobility tasks. Immigrant status remains not statistically significant after adjusting for other covariates. Women's mortality risk from the state of having difficulty is 46% less than men's mortality risk. Each increase in age year increases mortality risk by 8% for older adults who started with some difficulty performing self-care and mobility tasks.

Once again, greater educational attainment reduces mortality risk. Relative to older adults who did not graduate high school, mortality risk from the having difficulty state reduces by 32% for those with high school degrees, 34% for older adults with some college experience, and 39% for older adults with bachelor's degrees of higher. Among those who started with some difficulty performing self-care and mobility tasks, older adults with blue collar occupations also have a reduced mortality risk of 42% relative to older adults without paid work.

Any help

Models 7.7-7.9 examine increasing and decreasing disability pathways and mortality risk of older adults who all started at the receiving help, or disabled, state and are adjusted for all other covariates. Immigrant status remains not statistically significant in Model 7.7, which presents relative risks of recovering from receiving help to being fully able to perform self-care and mobility activities. For each one year increase in age, older adult individuals have a 12% reduction in recovery risk of moving from getting help back to being fully able.

Older adults who live alone have a 95% increase in risk of recovering from being receiving help to being fully able. Additionally, older adults who received any type of help with self-care and mobility activities at age 65, have a 78% reduction in risk in moving from getting help to fully able.

Model 7.8 examines the recovery pathway of moving from getting help to experiencing some difficulty with self-care or mobility activities. In this adjusted model, the focal variable, immigrant status, remains not statistically significant. Women have a 35% reduction in risk of recovery from receiving any help to having difficulty. Additionally, for each additional increase in age year, older adults have an 8% reduction in recovery risk from receiving help to having difficulty. Older adults who received any help at age 65 have a 54% reduction in risk in recovery from getting help to having difficulty.

Finally, Model 7.9 examines mortality risk from getting any help. Immigrant status is not statistically significant and the added mediating variables are not statistically significant. Black older adults also have a reduced mortality risk of 28% from being disabled, relative to white older adults. Older adult women have a reduced mortality risk by 51%, relative to men.

Immigrant-only analyses

The focal predictors in the immigrant-only analyses are life course timing of migration and English proficiency. In these models, later-in-life immigrant older adults refers specifically to immigrants who migrated to the United States after the age of 55 years whereas earlier-in-life immigrant older adults refers to immigrants who migrated to the United States before the age of 55 years.

Unadjusted, immigrant-only sample

Table 8 presents results for the unadjusted, base model with life course timing of migration and English proficiency as the focal predictors, along with race/ethnicity, gender, age, and early-life economic status. The base model examines relative risk of transition between the disability states and mortality. Models 8.1 through 8.3 examine relative risk for immigrant older adults who are fully able at the start point of the time interval.

Table 8. Relative risk ratios of transitions across disability states and mortality, base model, immigrant-only sample, NHATS 2011-2016

	Fully able (n=907)			Difficulty (n=473)			Any help (n=247)	
Model	1	2	3	4	5	6	7	8
State at start of interval	Fully able	Fully able	Fully able	Difficulty	Difficulty	Difficulty	Any help	Any help
State at end of interval	Difficulty	Any help	Deceased	Fully able	Any help	Deceased	Difficulty	Deceased
Focal Variables								
Migration age 55+	1.580	2.955	0.521	1.046	0.749	0.370	0.781	0.444
English proficiency	0.970	1.101	0.193 ***	2.514 *	0.977	0.979	0.769	1.261
Key Demo. Variables								
Race/Ethnicity								
non-Hisp., Black	1.750	1.817	0.935	0.471 *	1.243	0.158	1.941	2.536
Hispanic	1.367	1.957	0.378 *	1.312	2.111 *	0.918	1.089	1.857
Female	2.147 **	1.704	1.347	1.021	1.904	0.990	1.537	0.522
Age (in years)	1.094 ***	1.159 ***	1.123 ***	0.992	1.090 ***	1.038	0.962	1.098 **
Early-Life								
Early-life econ. status	0.697	1.397	0.436 *	0.512 **	0.796	1.082	1.736	1.180

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

Note: Any help to fully able pathway not available due to insufficient cases.

In Model 8.1, which examines the risks of transition from being fully able to having difficulty, the life-course timing of migration coefficient (RR=1.580, 95% CI=0.802-3.111) suggests that later-in-life immigrants have an increased risk of transitioning from being fully able to having difficulty, relative to earlier-in-life immigrant older adults. For key demographic variables, women have 2.1 times the risk of moving from being fully able to having difficulty, relative to men. Additionally, each additional increase in age year increases risk for decline by 9 percent.

Model 8.2 shows the relative risk of moving from being fully able to receiving help with self-care and mobility activities among immigrant older adults. In this model, life-course timing of migration (RR=2.955, 95% CI=0.711-12.273) is not statistically significant, but the coefficient suggests that later-in-life immigrants may have increased risk for decline from being fully able to receiving help. In the model, age is statistically significant as relative risk of decline is increased by 16% for each additional age year.

Model 8.3 examines immigrants' risk of mortality from being fully able. The life-course timing of migration coefficient (RR=0.521, 95% CI=0.175-1.551) is not statistically significant but suggests that later-in-life immigrants may have a decreased mortality risk compared to earlier-in-life immigrants. In this model, English proficiency is statistically significant as better English proficiency reduces mortality risk from the fully able state by about 80 percent. Additionally, Hispanic immigrant older adults have a reduction in mortality risk by about 61% relative to white immigrant older adults. Increasing age also increases mortality risk while having better early-life socioeconomic status reduces mortality risk by 56 percent compared to immigrant older adult with poor early-life socioeconomic status.

Overall, this first set of models suggest that later-in-life immigrants who start out the wave interval being fully able to perform self-care and mobility activities face increased risk of decline to having difficulty or receiving help, but lower mortality risk from being fully able, relative to earlier-in-life immigrants. While these coefficients are not statistically significant, this is likely due to the small sample size and lack of statistical power.

Models 8.4 through 8.6 which examine relative risk for immigrant older adults who start the wave interval in the having difficulty state. Model 8.4 shows the relative risk of recovery from having difficulty to being fully able. In this model, English proficiency is statistically significant. Immigrant older adults with good English proficiency have about 2.5 times the risk of recovery from having difficulty to being fully able. Race/ethnicity is statistically significant in this model as Black immigrant older adults have a lower risk of recovery compared to white immigrant older adults. Additionally, having better early-life socioeconomic status reduces risk of recovery by 49%, compared to immigrant older adults with poor early-life socioeconomic status. Model 8.5 shows immigrants' relative risk of decline from having difficulty to receiving help with mobility or self-care activities. In this model, race/ethnicity is statistically significant as Hispanic immigrants have 2.1 times the risk of decline from having difficulty to receiving help, relative to white immigrant older adults. In addition, increasing age also increases risk for decline from difficulty to receiving help. Model 8.6 examines mortality risk from having difficulty. The predictor variables in this model are not statistically significant.

Finally, Models 8.7 through 8.8 examine relative risk for immigrant older adults who start the time interval in the any help state. Due to small sample size and low cell counts, relative risk ratios of recovery transition from any help to being fully able is not reported in the table. In these models, the immigrant focal variables, life-course timing of migration and English

proficiency are not statistically significant. Model 8.8, which examines mortality risk from the any help state shows that age is statistically significant with an almost 10% increase in mortality risk for each additional increase in age year.

Adjusted, immigrant-only sample

Fully Able

Table 9 reports relative risk ratios for the fully adjusted models which includes the base model variables (life-course timing of migration and English proficiency, race/ethnicity, gender, age, and early-life variables) as well as middle- and late-life variables which consists of educational attainment, longest occupation held, and living arrangement.

Table 9. Relative risk ratios of transitions across disability states and mortality, adjusted model, immigrant-only sample, NHATS 2011-2016

	Fully able (n=907)			Difficulty (n=473)			Any help (n=247)	
Model	1	2	3	4	5	6	7	8
State at start of interval	Fully able	Fully able	Fully able	Difficulty	Difficulty	Difficulty	Any help	Any help
State at end of interval	Difficulty	Any help	Deceased	Fully able	Any help	Deceased	Difficulty	Deceased
Focal Variables								
Migration age 55+	1.525	3.949 *	0.510	1.021	0.764	0.315	0.709	0.345 *
English proficiency	0.864	2.799	0.118 ***	2.561 *	1.784	1.140	0.789	1.127
Key Demo. Variables								
Race/Ethnicity								
non-Hisp., Black	1.834	1.470	0.888	0.373 *	0.757	0.149	2.724	3.676
Hispanic	1.366	1.537	0.333 *	1.192	1.442	1.053	0.808	1.652
Female	2.188 **	0.799	1.079	1.114	1.262	0.703	1.853	0.442
Age (in years)	1.095 ***	1.165 ***	1.120 ***	0.989	1.086 **	1.053	0.963	1.117 ***
Early-Life								
Early-life econ. status	0.676 *	1.741	0.390 *	0.538 *	1.015	0.998	2.285	1.200
Middle- and Late-Life								
Education								
HS deg./GED	0.890	0.390	0.704	0.713	0.320 *	1.595	0.984	1.058
Some college	0.919	0.382	0.404	0.570	0.133 ***	0.921	0.492	2.180
Occup. (ref: no paid work)								
White collar	1.748	0.028 ***	3.819	4.106 **	1.122	0.513	0.588	0.380
Blue collar	1.190	0.200 **	0.738	2.538 *	0.393 *	0.342	1.505	0.741
Live alone	0.867	0.879	1.669	1.104	0.689	0.124	1.036	0.547

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

Note: Any help to fully able pathway not available due to insufficient cases.

Models 9.1 through 9.3 examine relative risk for immigrant older adult who are fully able at the beginning of the wave interval. Model 9.1 examines risk for decline from fully able to having difficulty. Life-course timing of migration is not statistically significant, but the coefficient (RR 1.525, 95% CI 0.762-3.051) suggests that later-in-life immigrant older adults may have increased risk of transition from being fully able to having difficulty with self-care and mobility activities, relative to earlier-in-life immigrant older adults. Older adult immigrant women have 2.188 times the risk as men for decline from fully able to having difficulty. Each additional increase in year increase risk for decline from being fully able to having difficulty by 9 percent. Immigrant older adults who did not have financial adversity as a child have a 32% reduction in risk for decline from being fully able to having difficulty. The middle- and late-life variables that were added to the model are not statistically significant.

Model 9.2 examines immigrants' risk for decline from being fully able to having difficulty. Later-in-life immigrant older adults have 3.95 times the risk for decline from fully able to unable than earlier-in-life immigrant older adults. Risk for moving from being fully able to unable declines by 17% for each additional increase in age year. Immigrant older adults with both white collar and blue collar occupations have a reduction in risk for decline from fully able to unable relative to immigrant older adults with no paid work, at 97% and 80%, respectively.

Model 9.3 examines mortality risk from being fully able for immigrant older adults. In this model, mortality risk from being fully able is reduced by 85% for immigrant older adults with greater English proficiency. Immigrant older adults without early-life financial hardships have a 61% decrease in mortality risk from being fully able. Mortality risk from being fully able is increased by 12% for each additional increase in age year.

Models 9.4 through 9.6 examine relative risk for immigrant older adult who have difficulty at the beginning of the wave interval. Model 9.4 looks at recovery from having difficulty to being fully able. English proficiency remains statistically significant. Immigrant older adults with greater English proficiency have an increase in recovery risk of 2.56 times relative to immigrant older adults with poor English proficiency. Black immigrant older adults have a 63% decrease in recovery risk from having difficulty to being fully able relative to white immigrant older adults. Immigrant older adults who did not have financial adversity as a child have a 53% reduction in risk for recovery from having difficulty to being fully able. Immigrant older adults with white collar occupations have three times the risk for recovery from having difficulty to being fully able relative to those without paid work.

Model 9.5 examines decline from having difficulty to receiving help. In this model, life course timing of migration and English proficiency are not statistically significant. Risk for decline from having difficulty to getting any help increases by 9% for each increase in age year. Greater educational attainment reduces risk for decline from having difficulty to getting any help for immigrant older adults. Relative to individuals who did not complete high school, high school graduates, have a 68% reduction in a risk for decline from having difficulty to getting any help. Those who completed some college or more have a reduction in risk of 87% for decline from having difficulty to getting any help. Immigrant older adults with blue collar occupations also have a reduction of risk for decline from having difficulty to getting any help by 61% relative to those without paid work. As with the base model, none of the variables are statistically significant in Model 9.6, which examines mortality risk for immigrant older adults who have difficulty with self-care and mobility tasks at the beginning of the wave interval.

Any help

Models 10.7 and 10.8 examine relative risk for immigrant older adult who are receiving help at the beginning of the wave interval while adjusting for all covariates. Model 10.7 looks at recovery from getting help to having difficulty with self-care and mobility tasks. In this model, none of the variables are statistically significant. Model 10.8 examines mortality risk from getting help. In this model, life course timing of migration is statistically significant. Later-in-life immigrant older adults have a 72% reduction in mortality risk from receiving help. Mortality risk from receiving help increases by 12% for each additional increase in age year.

Summary

The tables and models in this chapter focus on exploring how immigrant status and life course timing of migration shapes late-life disablement and mortality for immigrant older adults in the United States. Overall, immigrant status and life-course timing of migration are statistically significant predictors in some pathways of disability onset, decline, and mortality and the results show limited support for the hypotheses 1a and 1b.

Immigrant status is a statistically significant predictor of disablement decline as seen in Model 6.5, providing evidence that immigrant older adults have greater risk of disability progression compared to non-immigrant older adults. This relationship remains statistically significant net of all key demographic variables as well as early-life compositional variables. When the middle- and late-life variables are included, immigrant status remains statistically significant. The immigrant status is coefficient is reduced from 1.926 to 1.684, which indicates that the additional of the middle- and late-life variables partially mediates the relationships between immigrant status and disablement. Better educational attainment as well as having a

white or blue collar occupation (compared to no paid work), and living alone reduces the risk for disability progression.

Taken together, the results from the first half of the chapter offer partial support for hypothesis 1a which states that immigrant older adults will have greater risk of disablement, but lower mortality risk, than non-immigrant older adults, net the effects of key sociodemographic and life-course factors. Immigrant older adults indeed have a greater risk of disablement progression, compared to non-immigrant older adults (see Model 7.5). However, the results did not provide evidence that immigrant older adults have a lower mortality risk compared to non-immigrants. Rather, mortality differences are explained by demographic variables such as race/ethnicity, gender, and age, as well as middle- and late- life variables such as educational attainment occupation and living arrangement.

The models in the second part of the chapter focus on exploring how life-course timing of migration shapes late-life disability as well as mortality for immigrant older adults in the United States. The results show support for hypothesis 1b, which states that later-in-life immigrants will have greater risk for disablement, but lower risk for mortality, compared to earlier-in-life immigrants, net of all other control variables. Life-course timing of migration is statistically significant in the transition from being fully able to receiving help with mobility or self-care activities, as seen in Model. 9.2. Later-in-life immigrant are at greater risk of disability onset than earlier-in-life immigrant older adults. Later-in-life immigrants also see a mortality advantage as seen in Model 9.8, indicating that later-in-life immigrants have a reduced mortality risk compared to earlier-in-life immigrant older adults, providing additional support for the hypothesis. Immigrant older adults with better English proficiency also have a mortality advantage as seen in Model 9.3, which examines mortality risk from being fully able.

Additionally, immigrants with better English proficiency have an increased risk of recovery from having difficulty to being fully able, as seen in Model 9.4.

CHAPTER FIVE

EXAMINING THE MODERATING EFFECTS OF RACE/ETHNCITIY AND GENDER ON THE RELATIONSHIP BETWEEN IMMIGRANT STATUS AND DISABLEMENT

This chapter addresses research question two: How is the relationship between immigrant status and disablement moderated by race and gender? In this chapter, I use Markov transition models and use the full sample that includes both immigrants and non-immigrants. The interaction models separately test for an immigrant status and race interaction and immigrant status and gender interaction. Due to low cell counts, a three-way interaction is not possible with the dependent variable. Instead, two two-way interactions between immigrant status and race/ethnicity and immigrant status and gender are included. Also due to low cell counts, I used a simplified, collapsed version of the disability hierarchy as the dependent variable. The dependent variable used for these models is a dichotomous measure of disability as able to perform self-care and mobility tasks or received help on any self-care or mobility task. The hypotheses are as follows: 2a) Immigrant Black and Hispanic older adults will have greater risk of disability, but lower mortality rates compared to immigrant white older adults. 2b) Immigrant older adult women will have greater risk of disability, but lower mortality rates compared to immigrant older adult men.

Immigrant status x race/ethnicity interaction

Base model, full sample

Able

Table 10 presents the relative risk ratios of transitions across self-care and mobility disability states and mortality. These models include immigrant status as the focal predictor

variable while adjusting for key demographic variables, early-life compositional variables, and a two-way interaction between race/ethnicity and immigrant status.

Table 10. Base model relative risk ratios of transitions across disability states and mortality, imm. status x race interaction, NHATS 2011-2016

	Able (n=17,086)				Any help (n=1,580)			
Model	1		2		3		4	
State at start of interval	Able		Able		Any help		Any help	
State at end of interval	Any help		Deceased		Able		Deceased	
Focal Variable								
Immigrant	1.456		0.920		0.663		0.402	*
Key Demo. Variables								
Race/Ethnicity								
non-Hisp., Black	1.933	***	1.463	**	0.661	+	0.672	*
Hispanic	1.808		0.818		1.035		0.376	***
Female	1.704	***	0.658	***	0.809		0.466	***
Age (in years)	1.121	***	1.115	***	0.923	***	1.021	
Early-Life								
Early-life health	0.774		0.754		0.803		0.759	
Early-life econ. status	0.921		0.903		0.976		0.827	
Interactions								
Black x immigrant	1.231		0.342		1.764		1.966	
Hispanic x immigrant	1.390		1.292		0.873		2.984	+

Note: ***p<0.001, **p<0.01, *p<0.05 +p<0.06; Data are weighted

Model 10.1 shows the relative risk of moving from being able to carry out self-care and mobility tasks to getting help with self-care and mobility tasks. In this model, the interaction terms are not statistically significant, meaning that there is no added effect of being a Black immigrant or Hispanic immigrant on transition risk, relative to white immigrant older adults. However, compared to white non-immigrant older adults, black older adults have a 93% increase in relative risk of disability onset from the being able state. Women have a 70% increase in

disability risk relative to men. Finally, age increase risk of disability onset by 12% for each additional age year.

Model 10.2 examines mortality risk for respondents from the able state. As with the previous disability onset model, there is no statistically significant difference in the interaction between race/ethnicity and immigrant status, relative to white immigrant older adults. Black, non-immigrant older adults have a 46% increase in mortality risk compared to white non-immigrant older adults. Older adult women, who have an increased risk of disability onset from being able as seen in Model 10.1, have a decreased mortality risk from the able state, compared to older adult men Older adults women have a 34% reduction in mortality risk from being able, compared to men. Additionally, age increase mortality risk by about 12% for each additional age year.

Any help

Models 10.3 and 10.4 examines the recovery transition and mortality risk for older adults who all started at the receiving help, or disabled, state and are adjusted for key demographic and early-life variables and tests for interactions between race/ethnicity and immigrant status. In Model 10.3, which presents relative risks for recovery from getting help to being able to perform self-care and mobility activities, the interaction terms are not statistically significant. In other words, there is no significant differential effect of immigration in recovery risk among Black or Hispanic immigrant older adults, relative to white immigrant older adults. There is one marginally statistically significant race effect for Black older adults. Relative to white older adults, Black older adults have a reduced risk (RR=.661, 95% CI=0.430-1.014, p-value=.058) of recovery from being disabled to being able to do self-care or mobility activities. Age is

statistically significant, as each increase in age year decreases recovery risk from receiving help to being able by 8 percent.

Model 10.4 examines the mortality risk for older adults from the receiving help, or disabled, state. In this model, the race/ethnicity and immigrant status interaction is marginally statistically significant. In this model, compared to white immigrant older adults, Hispanic immigrant older adults have 2.9 times the risk for mortality from being disabled. Compared to white non-immigrant older adults, Hispanic immigrant older adults have a relative mortality risk of 0.451 (2.984*0.402*0.376=0.451 RR). Additionally, the effect of immigration among Hispanics on mortality risk is 1.20 (0.451/0.376), meaning that compared to non-immigrant Hispanics, immigrant Hispanic older adults have a 20% increase in mortality risk from being disabled. For white immigrant older adults, the effect of immigration compared to white non-immigrant older adults is 0.40 (.40/1.00).

Adjusted model, race x immigrant status interaction

Table 11 presents the relative risk ratios adjusted model includes the middle- and late-life variables, which consist of educational attainment, occupation, and living arrangement. The inclusion of these additional variables does not change the statistical significance for any of the interaction terms in the models except for Model 11.4 which examines mortality risk from being disabled, or receiving help. In this model, the Hispanic x immigrant interaction coefficient is statistically significant. The Hispanic x immigrant interaction coefficient increases from 2.984 and marginally significant ($p<.06$) in the base model to 3.478 in the adjusted model and is consequently statistically significant ($p<.05$), indicating a suppressor effect. Hispanic immigrants have 3.4 times the risk for mortality from being disabled compared to white immigrant older adults. In supplementary analyses not shown, the Hispanic x immigrant interaction coefficient

becomes statistically significant once education is included in the model which suggests that there were existing differences across the groups in the distribution of the education variable. Once educational attainment is added and held constant, the interaction term becomes significant.

Table 11. Adjusted relative risk ratios of transitions across disability states and mortality, imm. status x race interaction, NHATS 2011-2016

	Able (n=17,086)				Any help (n=1,580)			
Model	1		2		3		4	
State at start of interval	Able		Able		Any help		Any help	
State at end of interval	Any help		Deceased		Able		Deceased	
Focal Variable								
Immigrant	1.382		0.931		0.666		0.399	*
Key Demo. Variables								
Race/Ethnicity								
non-Hisp., Black	1.666	***	1.278	*	0.677		0.706	*
Hispanic	1.395		0.699		1.039		0.370	***
Female	1.723	***	0.606	***	0.734		0.468	***
Age (in years)	1.122	***	1.108	***	0.919	***	1.021	
Early-Life								
Early-life health	0.773		0.773		0.781		0.751	
Early-life econ. status	1.011		0.984		0.962		0.834	
Mid- to Late-Life								
Education								
HS deg./GED	0.548	***	0.657	***	0.835		1.255	
Some college	0.528	***	0.509	***	0.881		0.939	
Occupation (ref: no paid work)								
White collar	0.551	***	0.844		1.105		1.002	
Blue collar	0.604	**	0.805		0.877		1.346	
Live alone	0.618	***	1.134		1.511	*	1.169	
Interactions								
Black x immigrant	1.276		0.353		1.543		1.812	
Hispanic x immigrant	1.203		1.133		0.875		3.478	*

Note: ***p<0.001, **p<0.01, *p<0.05 +p<0.06; Data are weighted

Immigrant status x gender interaction

Base model, gender x immigrant status interaction

Fully Able

Table 12 presents the relative risk ratios associated with transitions across self-care and mobility disability states and mortality. These models include immigrant status as the focal predictor variable while adjusting for key demographic variables, early-life variables, and tests for an interaction effect between immigrant status and gender.

Table 12. Base model of relative risk ratios of transitions across disability states and mortality, imm. status x gender interaction, NHATS 2011-2016

	Able (n=17,086)				Any help (n=1,580)			
Model	1		2		3		4	
State at start of interval	Able		Able		Any help		Any help	
State at end of interval	Any help		Deceased		Able		Deceased	
Focal Variable								
Immigrant	1.361		0.713		0.425		0.474	
Key Demo. Variables								
Race/Ethnicity								
non-Hisp., Black	1.974	***	1.380	**	0.690		0.698	*
Hispanic	2.125	***	0.995		0.889		0.635	*
Female	1.626	***	0.636	***	0.728		0.453	***
Age (in years)	1.121	***	1.116	***	0.923	***	1.020	
Early-Life								
Early-life health	0.779		0.757		0.798		0.749	
Early-life econ. status	0.919		0.898		0.968		0.814	
Interactions								
Female x immigrant	1.342		1.549		1.847		1.378	

Note: ***p<0.001, **p<0.01, *p<0.05 +p<0.06; Data are weighted

Model 12.1 examines relative risk from being able to receiving help with self-care and mobility tasks. In this model, there is not statistically significant interaction between being female and being an immigrant on disability onset from the able state, relative to immigrant men. Black older adults have a 97% increase in risk of disability onset from being fully able relative to white older adults. Hispanic older adults have 2.1 times the risk of decline relative to white older adults. Women, relative to men have, have a 63% increase in risk for disability onset from being able. Age is also statistically significant with each age year increasing disability risk by 12 percent.

Model 12.2 shows results for mortality risk from the able state and includes an interaction term for immigrant and gender. As with the previous model, the interaction term is not statistically significant, meaning that there is differential effect of immigration among women compared to immigrant men. However, the coefficient for non-immigrant women is statistically significant. Compared to non-immigrant men, women have a 36% reduction in mortality risk from being able. In addition to gender, race and age are significant predictors of mortality risk in this model. Black older adults, compared to white older adults, have a 38% increase in mortality risk from being able to carry out self-care and mobility tasks. Age increases mortality risk from the able state by about 12% for each additional age year.

Any help

Models 12.3 and 12.4 examine transition pathways for older adults who all started at the receiving help, or disabled, state and are adjusted for key demographic variables, early-life compositional factors, and tests for an interaction effect between gender and immigrant status. Model 12.3 examines the recovery pathway from disabled to being able. In this model, neither gender or immigrant status is statistically significant in predicting recovery risk from being

disabled and receiving help from another person to carry out self-care or mobility tasks back to being able to carry out the activities independently. Age is the only statistically significant covariate as the risk for recovery decreased by 8% for each additional age year.

Model 12.4 shows results for mortality risk from being disabled, or receiving help to perform mobility and self-care tasks and includes an interaction term for immigrant and gender. As with the previous models, there is no interaction effect between immigrant status and gender when looking at mortality risk for older adults who started the wave interval as disabled, or receiving help from another person to carry out any self-care or mobility task. Compared to non-immigrant men, women have a 55% reduction in mortality risk from the disabled state. Race and age are also statistically significant predictors of mortality risk for older adults who started the wave interval as being disabled, or receiving help with any self-care or mobility activities. Relative to white older adults, Black older adults have a 30% reduction in mortality risk from receiving help. Mortality risk from the receiving help state increases 2% for each additional increase in age year.

Adjusted Model, gender x immigrant status interaction

Table 13 presents the relative risk ratios adjusted model includes the middle- and late-life variables, which consist of educational attainment, occupation, and living arrangement. The inclusion of these additional variables does not change the statistical significance for any of the interaction terms in the models. After controlling for middle- and late-life mediators, there are no statistically significant difference in disablement or mortality risk between immigrant older adult women and immigrant older adult men.

Table 13. Adjusted relative risk ratios of transitions across disability states and mortality, imm. status x gender interaction, NHATS 2011-2016

	Able (n=17,086)				Any help (n=1,580)			
Model	1		2		3		4	
State at start of interval	Able		Able		Any help		Any help	
State at end of interval	Any help		Deceased		Able		Deceased	
Focal Variable								
Immigrant	1.330		0.698		0.420		0.466	
Key Demo. Variables								
Race/Ethnicity								
non-Hisp., Black	1.712	***	1.207		0.702		0.724	*
Hispanic	1.508		0.799		0.923		0.674	
Female	1.672	***	0.587	***	0.661		0.455	***
Age (in years)	1.122	***	1.109	***	0.919	***	1.021	
Early-Life								
Early-life health	0.775		0.776		0.772		0.739	
Early-life econ. status	1.010		0.978		0.952		0.815	
Mid- to Late-Life								
Education								
HS deg./GED	0.548	***	0.652	***	0.864		1.225	
Some college	0.526	***	0.508	***	0.887		0.945	
Occupation (ref: no paid work)								
White collar	0.554	***	0.848		1.139		1.336	
Blue collar	0.606	**	0.813		0.900		1.174	
Live alone	0.620	***	1.139		1.538	*	0.991	
Interactions								
Female x immigrant	1.220		1.563		1.854		1.470	

Note: ***p<0.001, **p<0.01, *p<0.05 +p<0.06; Data are weighted

Summary

The models in this chapter focus on exploring possible interaction effects of immigrant status, race, and gender in late-life disablement as well as mortality for older adults in the United

States. This chapter explores research question number 2 which asks how the relationship between immigrant status and disablement is moderated by race and gender.

Based on the results from Table 10, there is limited support for hypothesis 2a, immigrant black and Hispanic older adults will have greater risk of disability, but lower mortality rates, compared to immigrant white older adults. In terms of disablement, the results from Models 10.1 and 10.3 indicate that there are no statistically significant differences between immigrant Black or immigrant Hispanic older adults and immigrant white older adults in predicting transitions of disability onset from being able to receiving help with self-care or mobility activities, as well as recovery transitions from being disabled to being able.

Compared to non-immigrant white older adults, non-immigrant Black older adults have a statistically significant increase in risk for disability onset from the able state. Specifically, non-immigrant Black older adults have an increased risk of 93% to become disabled after starting the wave interval in the able state. Moreover, non-immigrant Black older adults have a lower risk of recovery from being disabled back to being able, compared to non-immigrant white older adults.

The results from the models predicting mortality risk (Models 10.2 and 10.4) do not indicate support for the hypothesis 2a as the results for the interaction between race/ethnicity and immigrant status do not indicate that Black or Hispanic immigrant older adults have lower mortality rates compared to white immigrant older adults. In contrast to the hypothesis, the results from Model 10.4 suggest that Hispanic immigrant older adults have a higher mortality risk than white immigrant older adults.

Based on results from Table 12, there is no evidence that supports hypothesis 2b, which states that immigrant older adult women will have greater risk of disability onset, but lower

mortality rates compared to immigrant older adult men. The immigrant status and gender interactions are not statistically significant in the models predicting disability onset or recovery from being able to carry out self-care and mobility activities. In other words, there is no statistically significant difference in the risk of disability onset from being able, between immigrant older adult men and immigrant older adult women. However, non-immigrant women, compared to non-immigrant men have increased risk of disability onset from being able to carry out mobility and self-care activities, but that is not the case for immigrant women compared to immigrant men.

Similarly, as reflected in Models 12.2 and 12.4, there are not statistically significant differences in mortality risk between immigrant older adult women and immigrant older adult men. These results do not provide evidence for the hypothesis that immigrant older adult women will have a lower mortality risk than immigrant older adult men. However, among non-immigrant older adults, women have a lower mortality risk than men.

CHAPTER SIX

ESTIMATING ACTIVE AND DISABLED LIFE EXPECTANCY BY IMMIGRANT STATUS AND LIFE-COURSE TIMING OF MIGRATION

This chapter addresses research questions 3a and 3b: 3a) How does immigrant status shape active and disabled life expectancy for older adults? 3b) Among immigrants, how does life course timing of migration shape active and disabled life expectancy for older adults? To answer these questions, I test the following hypotheses: 3a) Immigrant older adults will have longer life expectancies, but greater proportions of disabled life expectancy compared to non-immigrant older adults. 3b) Later-in-life immigrants will have longer life expectancies but greater proportions of disabled life expectancy compared to earlier-in-life immigrant older adults. I test the hypotheses using Sullivan based life tables and use the full sample and the immigrant-only sample. The Sullivan method of calculating life expectancies is commonly used by other scholars studying immigrant related research on health and disability (Hayward et al 2014, Garcia et al 2018, Cantu et al 2013).

The first half of the chapter reports results for the full sample and the second half of the chapter reports results for the immigrant-only sample. For each sample, key components of calculating Sullivan-based life tables are reported: the Gompertz survival parameter estimates as well as disability prevalence. Next, the life and health expectancies are reported.

Full Sample

Survival, full sample

The age patterned survival probability by immigrant status, race/ethnicity, and gender is shown in Figures 4a (men) and 4b (women). The data is taken from column 4, Probability of

surviving to age x, or ℓ_x, in the Sullivan-based method Excel table (see Appendix), which is calculated using the parameter estimates from the Gompertz mortality model. The Gompertz results are reported in Table 14. Three parameter estimates are statistically significant in comparison to non-immigrant white men: non-immigrant, white women, non-immigrant Black men, and immigrant Black women.

Table 14. Gompertz survival model parameter estimates, full sample, NHATS 2011-2016

	Coefficient		SE
Immigrant status x race x gender			
Non-immigrant, white female	-0.278	***	0.078
Non-immigrant, Black male	0.494	***	0.108
Non-immigrant, Black female	-0.087		0.105
Non-immigrant, Hispanic male	0.061		0.258
Non-immigrant, Hispanic female	-0.505		0.476
Immigrant, white male	-0.524		0.301
Immigrant, white female	-0.317		0.239
Immigrant, Black male	-0.463		0.536
Immigrant, Black female	-0.828	*	0.431
Immigrant, Hispanic male	0.071		0.239
Immigrant, Hispanic female	-0.153		0.205
Constant	-4.683	***	0.103
gamma	0.112	***	0.004

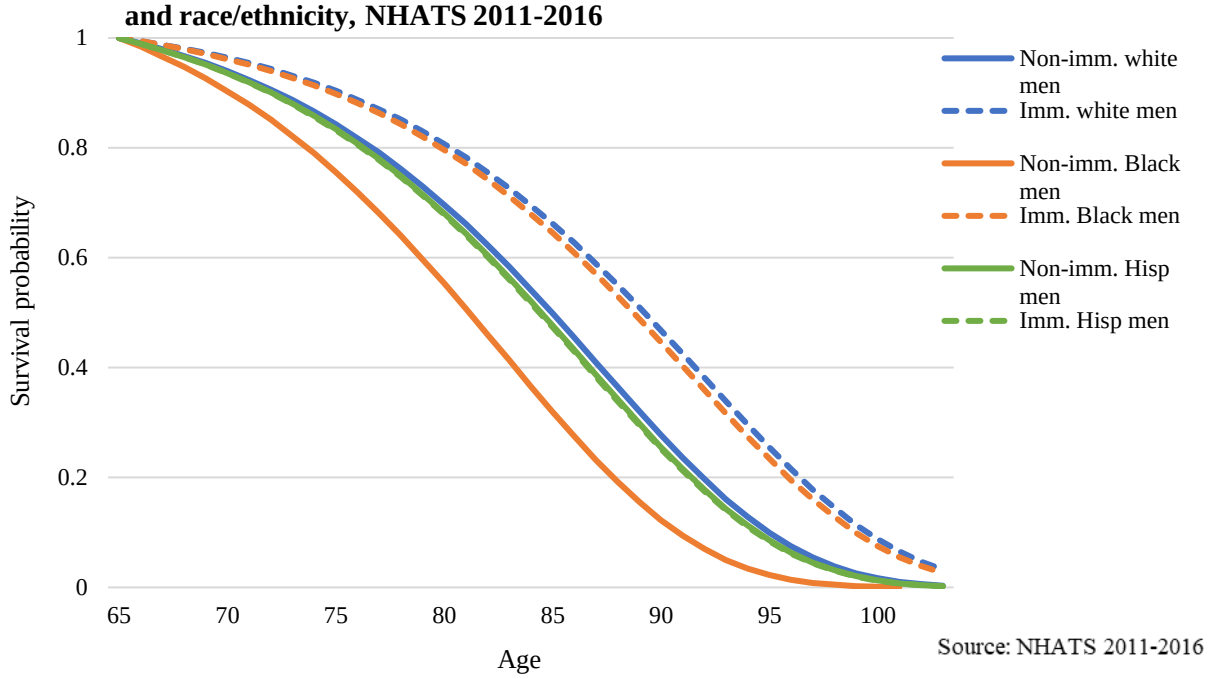
n=5,268

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

As shown in Figure 4a, both immigrant white and Black men have the greatest chance for survival beyond age 65, with immigrant white men having a slightly better survival probability between the ages of 80 and 90. In comparison, survival probability is lowest for non-immigrant black men across all ages. With relation to immigrant status differences, the largest difference is among Black men as shown by the wide gap between the lines for non-immigrant and immigrant

Black older adult men in Figure 4a. Immigrant status difference in Hispanic men are very small, with both survival curves looking almost identical.

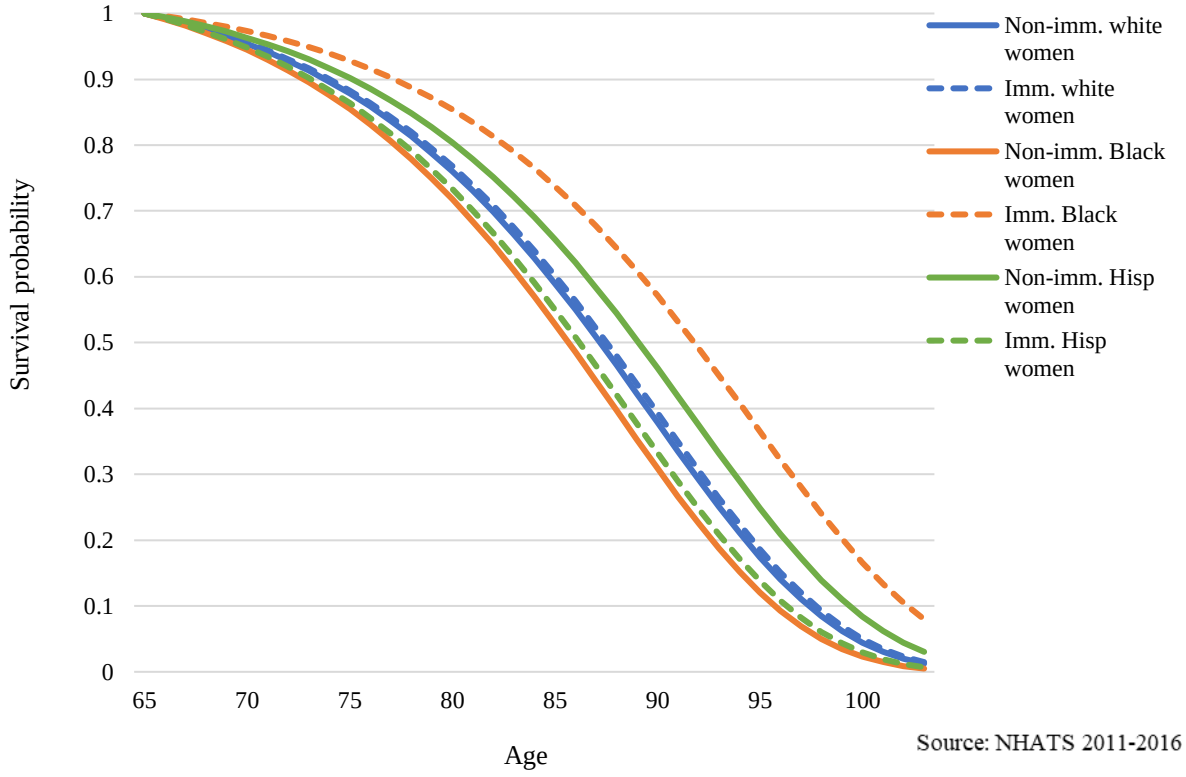
Figure 4a: Age patterned survival probability for men, by immigrant status and race/ethnicity, NHATS 2011-2016



The survival curves for women are shown in Figure 4b. Immigrant Black older adults women have the best chances beyond age 65 for survival. And in the same pattern as older adult men, non-immigrant Black women have the lowest probability of survival across all ages beyond 65. That also means that Black women have the largest immigrant status difference compared to white and Hispanic older adult women. White women have the smallest immigrant status difference in probability of mortality. The survival curves are very similar for immigrant and non-immigrant white women with the former group having a slightly better survival probability across all ages beyond 65. Finally, Hispanic women are only group of older adult women in which non-immigrants have higher survival probability than their immigrant counterparts. For

Black and white older adult women, their respective immigrant counterparts have better survival probabilities.

Figure 4b: Age patterned survival probability for women, by immigrant status and race/ethnicity, NHATS 2011-2016



Disability prevalence, full sample

Disability is measured using the "any help" disability measure. The age patterning of disability prevalence by immigrant status, race/ethnicity, and gender is shown in Figures 5a (men) and 5b (women). The y-axis shows the probability of disability and the x-axis is age. Prevalence is taken from column 9, "Probability of disability at age x", or π_x, in the Sullivan-based Excel table. Prevalence is calculated using the log odds from logit model seen in Table 15.

Table 15. Log odds of being disabled, full sample, NHATS 2011-2016

	Coefficient		SE
Age	0.028		0.100
Age-squared	0.001		0.001
Immigrant status x race x gender			
Non-immigrant, white female	0.287	***	0.083
Non-immigrant, Black male	0.739	***	0.122
Non-immigrant, Black female	1.010	***	0.109
Non-immigrant, Hispanic male	0.705	*	0.282
Non-immigrant, Hispanic female	0.829	**	0.310
Immigrant, white male	0.536		0.367
Immigrant, white female	0.454		0.235
Immigrant, Black male	0.192		0.319
Immigrant, Black female	0.916	***	0.254
Immigrant, Hispanic male	0.575	**	0.189
Immigrant, Hispanic female	1.667	***	0.243
Constant			
F-statistic	89.47***		

n=26,034

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

As seen in Figure 5a, non-immigrant Black men and non-immigrant Hispanic men have the highest disability prevalence across all ages. In comparison, non-immigrant men have the lowest disability prevalence across all ages. Among immigrant men, Hispanic men have the highest disability prevalence, with immigrant white men with slightly lower levels of disability. Both Black and white men have quite large differences in disability prevalence between non-immigrant and their immigrant counterparts, however they have opposite patterns. Non-immigrant Black men experience an increasing gap in disability prevalence across all ages compared to their immigrant counterparts. Whereas the opposite can be found for white men, where non-immigrant white men have much lower disability prevalence compared to their immigrant counterparts.

Figure 5a: Age patterned disability probability for men, by immigrant status and race/ethnicity, NHATS 2011-2016

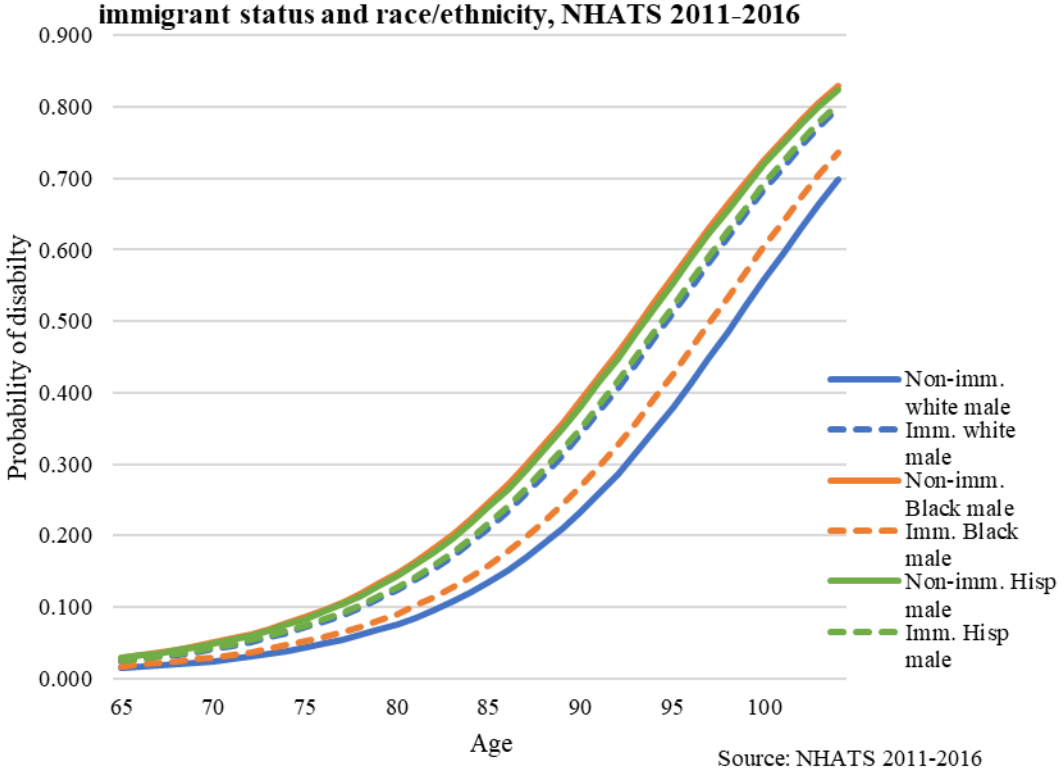
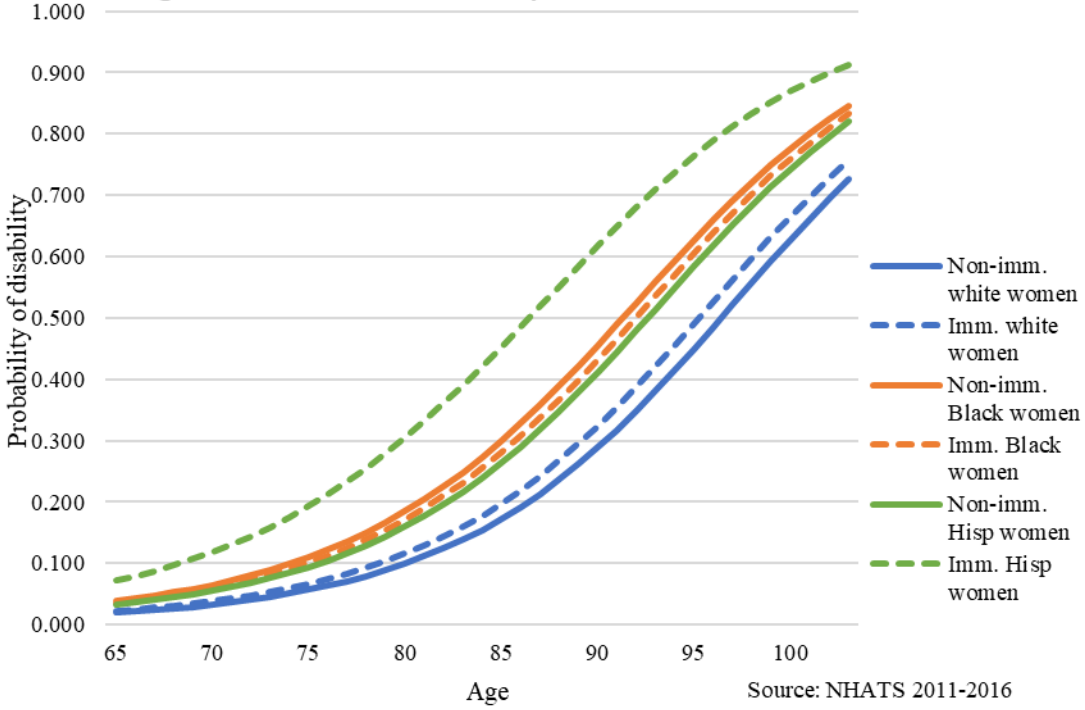


Figure 5b displays the line graph for disability prevalence for women. Immigrant Hispanic women have the highest disability prevalence across all ages. Non-immigrant white women have the lowest disability prevalence across all ages. Both white and Hispanic women's patterns of disability prevalence indicate that immigrant counterparts have higher disability probability of disability, with the largest difference between immigrant and non-immigrant Hispanic women. In comparison, immigrant Black women have lower probability of disability across all ages compared to their non-immigrant counterparts, though the difference is much narrower than the other racial and ethnic groups.

Figure 5b: Age patterned disability probability for women, by immigrant status and race/ethnicity, NHATS 2011-2016



Total, disability-free, and disabled life estimates – full sample

Table 16 shows life expectancies for older adults at the age of 65 by race, gender, and immigrant status. The life tables are constructed using the "any help" measure of disability. The total life expectancy at age 65 is greater for immigrant older adults compared to their non-immigrant counterparts, except for Hispanic older adults. Immigrant Black women and immigrant white men and have the longest estimated life expectancy at age 65: 25.69 years for immigrant Black women and 23.3 years for immigrant white men. In comparison, non-immigrant white men have an estimated life expectancy of 19.34 years at age 65. Interestingly, immigrant Hispanic men have a shorter estimated life expectancy at age 65 than non-immigrant white men at 18.83 years versus 19.34 years, respectively. Compared to non-immigrant Hispanic men, immigrant Hispanic men have a marginally shorter life expectancy, a difference of -.07 years (18.9 versus 18.83 years). A similar pattern is seen for immigrant Hispanic women, who

have an estimated life expectancy of 20.47 years at age 65, compared to 23.15 years for non-immigrant Hispanic women.

Table 16. Total life expectancy and disability free life expectancy for adults at age 65, by race/ethnicity, sex, and immigrant status, full sample, NHATS 2011-2016

		Immigrant Status					
		Non-Immigrant			Immigrant		
Gender	Race/Ethnicity	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
Men	white	19.34	17.92	0.93	23.30	19.86	0.85
	Black	15.86	14.20	0.90	22.83	20.29	0.89
	Hispanic	18.90	16.52	0.87	18.83	16.70	0.89
Women	white	21.41	19.09	0.89	21.71	18.98	0.87
	Black	19.99	16.62	0.83	25.69	20.13	0.78
	Hispanic	23.15	19.01	0.82	20.47	15.03	0.73

Table 17. Total life expectancy and disability free life expectancy for adults at age 70, by race/ethnicity, sex, and immigrant status, full sample, NHATS 2011-2016

		Immigrant Status					
		Non-Immigrant			Immigrant		
Gender	Race/Ethnicity	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
Men	white	15.41	13.98	0.91	19.07	15.64	0.82
	Black	12.27	10.63	0.87	18.63	16.07	0.86
	Hispanic	15.00	12.64	0.84	14.94	12.82	0.86
Women	white	17.31	15.00	0.87	17.59	14.87	0.85
	Black	16.00	12.67	0.79	21.32	15.80	0.74
	Hispanic	18.93	14.82	0.78	16.44	11.15	0.68

Table 18. Total life expectancy and disability free life expectancy for adults at age 75, by race/ethnicity, sex, and immigrant status, full sample, NHATS 2011-2016

		Immigrant Status					
		Non-Immigrant			Immigrant		
Gender	Race/Ethnicity	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
Men	white	11.87	10.44	0.88	15.16	11.77	0.78
	Black	9.15	7.53	0.82	14.76	12.22	0.83
	Hispanic	11.51	9.19	0.80	11.46	9.36	0.82
Women	white	13.57	11.26	0.83	13.81	11.13	0.81
	Black	12.39	9.14	0.74	17.23	11.82	0.69
	Hispanic	15.03	11.00	0.73	12.79	7.74	0.61

Looking at disability-free life expectancy, non-immigrant white men spend the greatest percentage of total years of life without disability. The percentage of total years of life without disability is 93% for non-immigrant white men. In comparison, immigrant Hispanic women have

the lowest percentage of total years of life without disability at 73 percent. In other words, while immigrant Hispanic women have a higher total life expectancy than most other groups of older adults, they spend greater proportion of that time disabled. Similarly, immigrant Black women have the highest total life expectancy across all groups but also have second highest proportion of remaining life expectancy spent disabled. Overall, compared to their male counter parts, women have a smaller proportion of disability free years to total life expectancy

Tables 17 and 18 display life expectancies for older adults at the age of 70 and 75, respectively. These life expectancies are calculated by race/ethnicity, gender, and immigrant status. Similar to Table 16, non-immigrant white men have the greatest percentage of total years of life without disability at 65, 70, and 75 years old. Non-immigrant white men spend an estimated 93% of their remaining years at age 65 without a disability, as measured as receiving any help from another person on self-care and mobility tasks. In comparison, at age 65, immigrant Hispanic women spend an estimated 73% of their remaining years without a disability.

Looking at the change in the proportion of disability-free life expectancy to total life expectancy, the greatest change between ages 65 to 70 and 70 to 75 occurs for immigrant Hispanic women. The proportion of disability-free life expectancy to total life expectancy is reduced from .68 at 70 years old, to .61 at 75 years old. In comparison, non-immigrant white men see a reduction of .02 and .03 between ages 65 and 70, and 70 and 75, respectively.

Immigrant-only sample

The second part of this chapter addresses research question 2b, which asks how life-course timing of migration shapes active and disabled life expectancy for immigrant older adults. Similar to how results are reported for the full sample in the first half of the chapter, I will review the immigrant-only Gompertz survival parameter estimates as well as disability prevalence, followed by a discussion of the life and health expectancies. Due to the small sample size of the immigrant-only sample, life table were unable to be constructed by life course timing of migration, race/ethnicity, and gender all together. For this immigrant-only sample, two sets of life tables are constructed: one set by life-course timing of migration and race/ethnicity and a second set by life-course timing of migration and gender.

Timing of migration x race/ethnicity

Survival, immigrant-only sample

The age patterned survival probability by life-course timing of migration and race/ethnicity is shown in Figure 6. The data for this graph is taken from column 4, "Probability of surviving to age x", or ℓ_x, in the Sullivan-based method Excel table (see Appendix). The probabilities are calculated using the parameter estimates from the Gompertz mortality model (Table 19) that includes life course timing of migration by race/ethnicity, which yield no statistically significant coefficients, with early-life white immigrant older adults as the reference group.

Table 19. Gompertz survival model parameter estimates, immigrant-only sample, timing of migration x race/ethnicity, NHATS 2011-2016

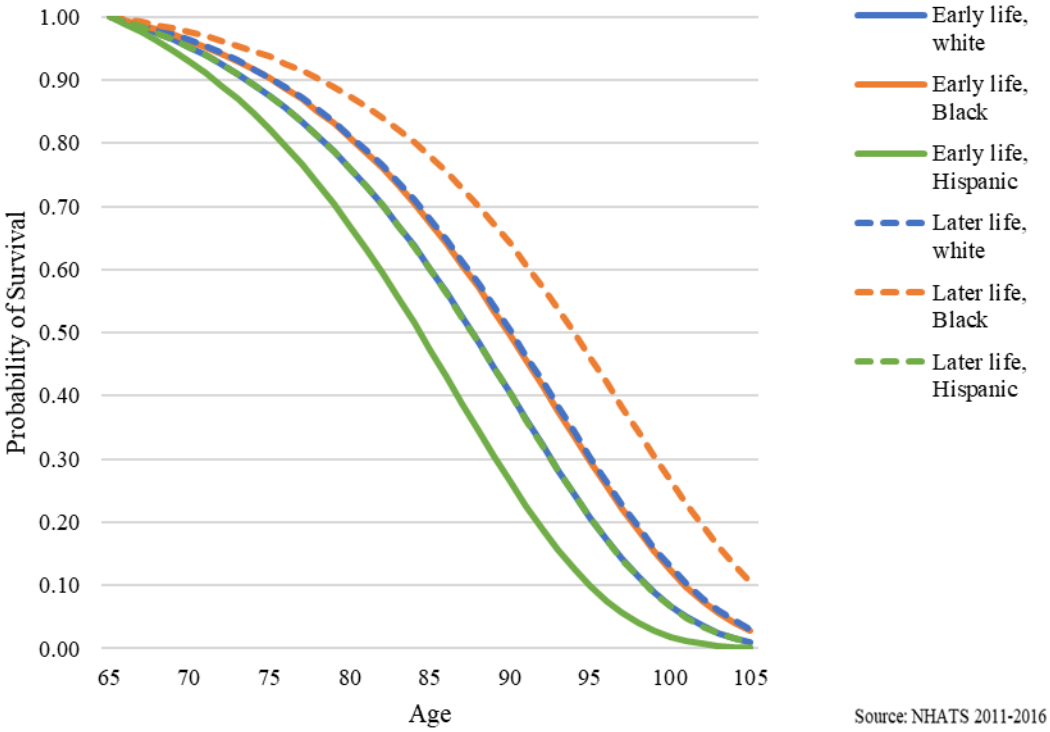
	Coefficient		SE
Life-course timing of migration x race			
Earlier-in-life x Black	-0.258		0.456
Earlier-in-life x Hispanic	0.385		0.262
Later-in-life x white	-0.277		0.631
Later-in-life x Black	-0.711		0.619
Later-in-life x Hispanic	0.002		0.364
Constant	-4.883	***	0.365
Gamma	0.104	***	0.013

n=543

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

As shown in Figure 6, later-in-life immigrants have the highest probability of survival across all aged beyond 65, compared to earlier-in-life immigrants. Later-in-life Black immigrant older adults have the best probability for survival beyond age 65 while earlier-in-life Hispanic immigrant older adults have the lowest probability of survival beyond age 65. The survival curve for later-in-life white immigrant older adults is almost identical to earlier-in-life Black immigrant older adults, who have the second highest survival probabilities for survival. Additionally, earlier-in-life white immigrant older adults have nearly identical survival curves as later-in-life Hispanic older adults.

Figure 6. Age patterned survival probability by life course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016



Disability prevalence, immigrant-only sample

Disability is measured in the same way as the full sample life tables, which uses the "any help" disability measure. The age patterning of disability prevalence by life-course timing of migration and race/ethnicity is shown in Figure 7. The y-axis shows the probability of disability and the x-axis is age. Prevalence is taken from column 9, "Probability of disability at age x", or π_x, in the Sullivan-based Excel table. Prevalence is calculated using the log odds from logit model seen in Table 20. The logit model includes age, age-squared, and life course timing of migration by race/ethnicity. The coefficients for earlier-in-life and later-in-life Hispanic older adults are statistically significant.

Table 20. Log odds of being disabled, immigrant-only sample, timing of migration x race/ethnicity, NHATS 2011-2016

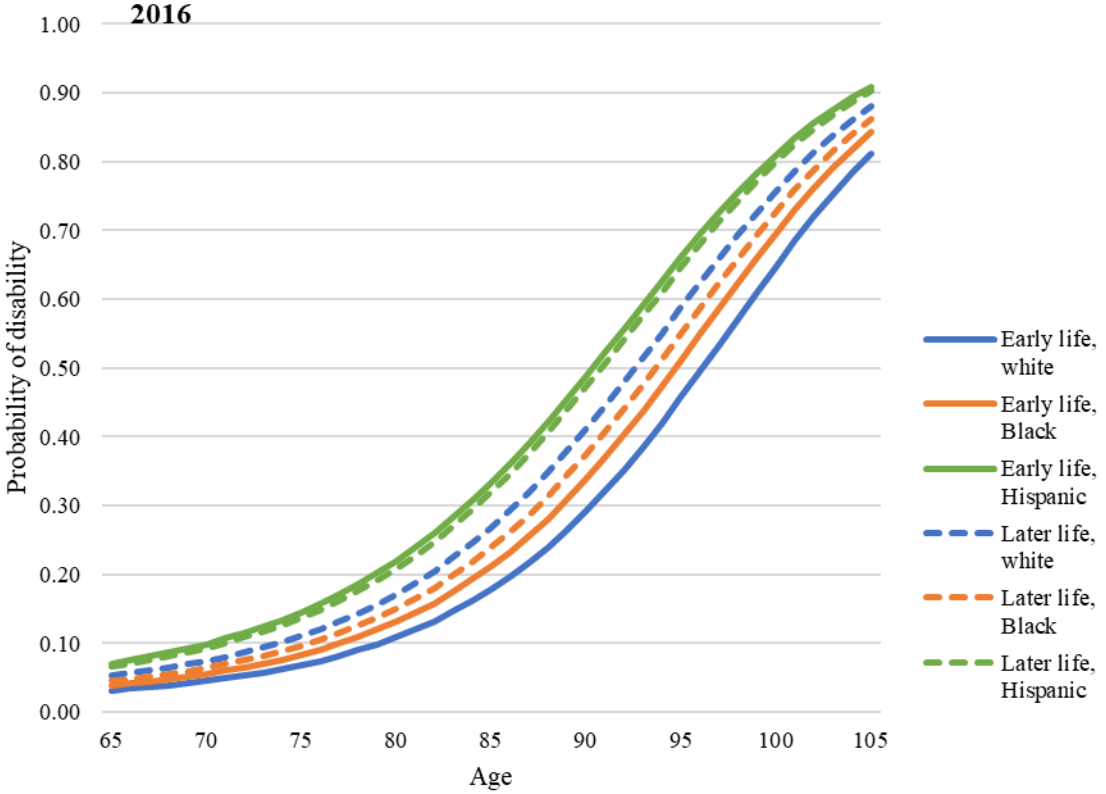
	Coefficient		SE
Age	-0.114		0.239
Age-squared	0.001		0.001
Life-course timing of migration x race/ethnicity			
Earlier-in-life x Black	0.216		0.333
Earlier-in-life x Hispanic	0.840	***	0.248
Later-in-life x white	0.529		0.431
Later-in-life x Black	0.372		0.475
Later-in-life x Hispanic	0.774	*	0.355
Constant	-1.871		9.721
F-statistic	10.870	***	

n=2573

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

As seen in Figure 7 both earlier- and later-in-life Hispanic immigrant older adults have the highest disability prevalence across all ages beyond 65 while earlier-in-life white immigrant older adults have the lowest disability prevalence. Generally, later-in-life immigrant have greater disability prevalence compared to their earlier-in-life immigrant counterparts, except for Hispanic immigrants who have the opposite pattern. Hispanic immigrant older adults also have the narrowest gap between life-course timing of migration while white immigrant older adults have the widest disability prevalence gap.

Figure 7. Age patterned disability probability by life course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016



Total, disability-free, and disabled life estimates - immigrant-only sample

Table 21 shows life expectancies for immigrant older adults at the age of 65 by life course timing of migration and race/ethnicity. Total life expectancy is greater for later-in-life immigrant older adults, with the greatest total life expectancy seen for black later-in-life immigrant older adults at 27.75 years. Hispanic earlier-in-life immigrant older adults have the shortest total life expectancy of 18.86 years.

Looking at disability free life expectancy, the greatest percentage of total years of life without disability is 87% which is for white earlier-in-life immigrant older adults. In comparison, black and Hispanic later-in-life immigrant older adults have the lowest proportion of disability free life expectancy at 78 percent. Overall, earlier-in-life immigrant older adults have a greater

proportion of disability-free years to total life expectancy compared to immigrant older adults who migrated after the age of 55 years old.

Table 21. Total life expectancy and disability free life expectancy for adults at age 65, by life-course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016

	Life-course timing of migration					
	Younger			Older		
Race/Ethnicity	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
white	21.87	19.12	0.87	24.12	19.14	0.79
Black	23.96	19.98	0.83	27.75	21.55	0.78
Hispanic	18.86	15.18	0.80	21.85	17.12	0.78

Table 22. Total life expectancy and disability free life expectancy for adults at age 70, by life-course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016

	Life-course timing of migration					
	Younger			Older		
Race/Ethnicity	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
white	17.84	15.14	0.85	19.94	15.08	0.76
Black	19.79	15.88	0.80	23.37	17.28	0.74
Hispanic	15.08	11.54	0.77	17.83	13.25	0.74

Table 23. Total life expectancy and disability free life expectancy for adults at age 75, by life-course timing of migration and race/ethnicity, immigrant-only sample, NHATS 2011-2016

	Life-course timing of migration					
	Younger			Older		
Race/Ethnicity	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
white	14.16	11.51	0.81	16.07	11.35	0.71
Black	15.95	12.10	0.76	19.23	13.28	0.69
Hispanic	11.70	8.32	0.71	14.15	9.74	0.69

Tables 22 and 23 display life expectancies for older adults at the age of 70 and 75, respectively. These life expectancies are calculated by life course timing of migration and race/ethnicity. Similar to Table 20, black immigrant older adults have the longest total life expectancy at ages 70 and 75. White earlier-in-life immigrant older adults have the greatest percentage of total years of life without disability at both 70 and 75 years old. Looking at the change in the proportion of disability-free life expectancy to total life expectancy, the largest change between ages 65 to 70 occurs for Black and Hispanic later life immigrant older adults.

The proportion of disability-free life expectancy to total life expectancy is reduced from .78 at 65 years old, to .74 at 70 years old. And the largest change between ages 70 and 75 occurs for Hispanic earlier-in-life immigrant older adults. The proportion of disability-free life expectancy to total life expectancy is reduced from .77 at 70 years old, to .70 at 75 years old.

Life-course timing of migration by gender

Survival, immigrant-only sample

The age patterned survival probability by life-course timing of migration and gender is shown in Figure 8. The data for this graph is taken from column 4, "Probability of surviving to age x", or ℓ_x, in the Sullivan-based method Excel table (see Appendix). The probabilities are calculated using the parameter estimates from the Gompertz mortality model (Table 24) that includes life course timing of migration by gender, which yield no statistically significant coefficients.

Table 24. Gompertz survival model parameter estimates, immigrant-only sample, timing of migration x gender, NHATS 2011-2016

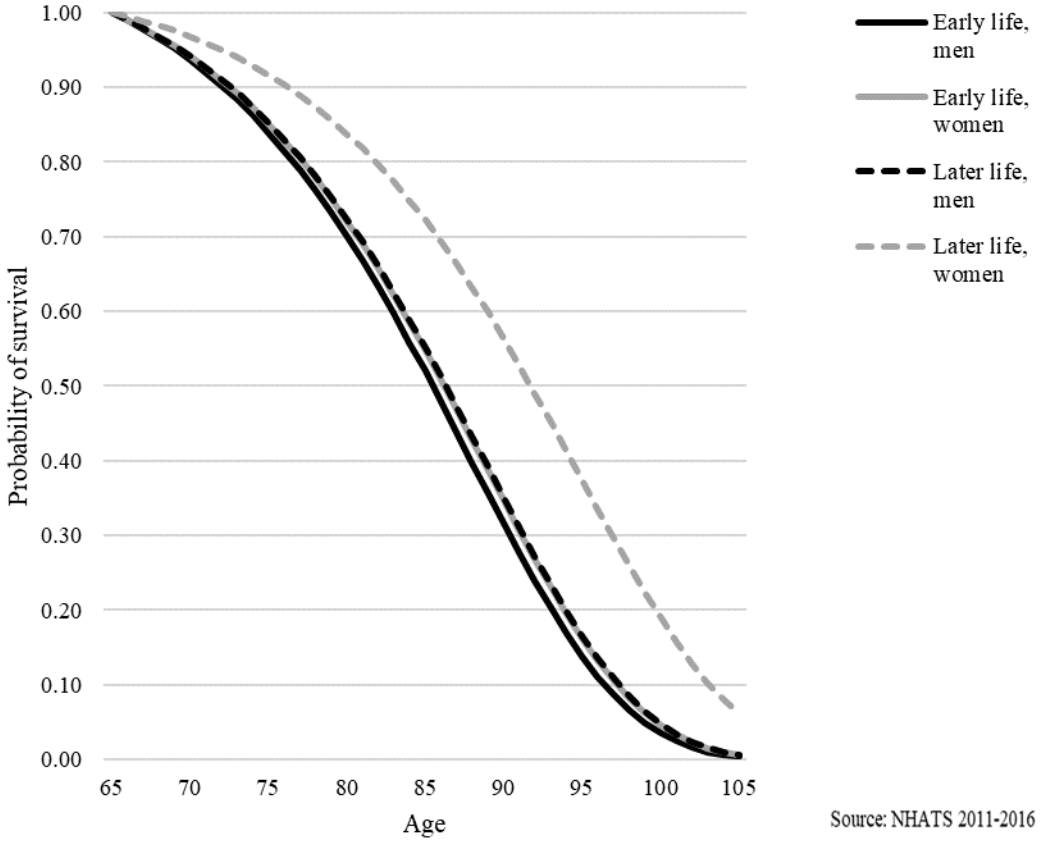
	Coefficient		SE
Life-course timing of migration x gender			
Earlier-in-life x women	-0.084		0.241
Later-in-life x men	-0.096		0.405
Later-in-life x women	-0.698		0.408
Constant	-4.598	***	0.309
Gamma	0.101	***	0.012

n=543

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

As shown in Figure 8, later-in-life immigrants have the highest probability of survival across all aged beyond 65, compared to earlier-in-life immigrants. Later-in-life immigrant women have the best probability for survival beyond age 65 while earlier-in-life immigrant men have the lowest probability of survival beyond age 65. The survival curve for later-in-life immigrant men is almost identical to earlier-in-life immigrant women, who have the second highest survival probabilities for survival. Also noteworthy, the gap between the survival curve for later-in-life immigrant women is much wider compared to the gaps between the other three curves, all of which are pretty similar.

Figure 8. Age patterned survival probability for immigrant-only sample, by life-course timing of migration and gender, NHATS 2011-2016.



Disability prevalence, immigrant-only sample

The age patterning of disability prevalence by life-course timing of migration and gender is shown in Figure 9. Prevalence is calculated using the log odds from logit model seen in Table 25. The logit model includes age, age-squared, and life course timing of migration by race/ethnicity. The coefficients for earlier- and later-in-life immigrant women are statistically significant.

Table 25. Log odds of being disabled, immigrant-only sample, timing of migration x gender, NHATS 2011-2016

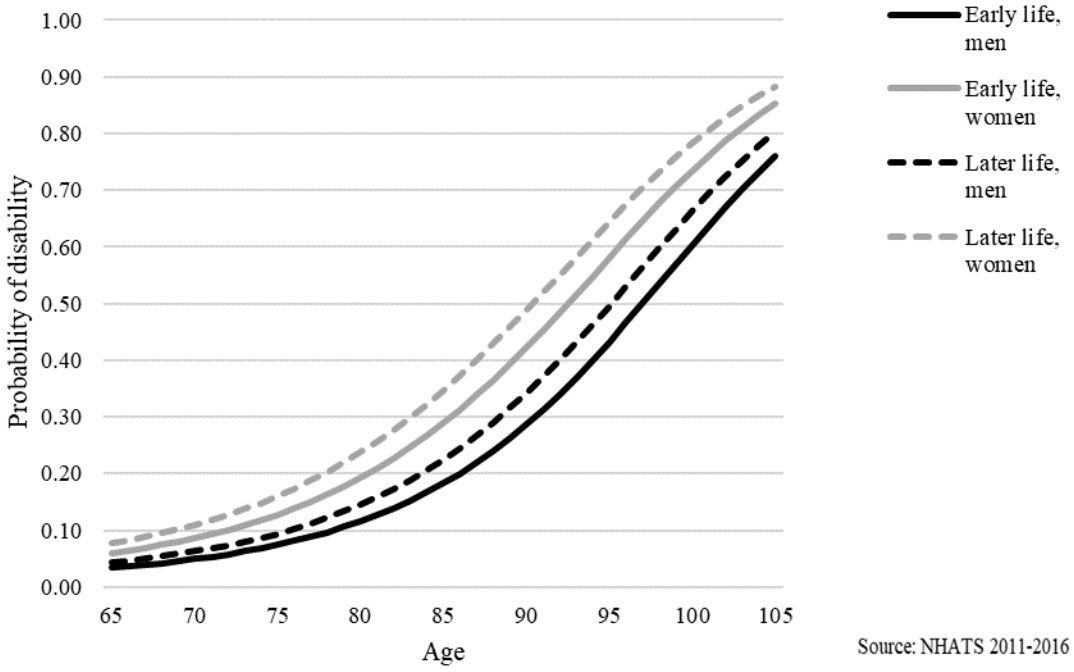
	Coefficient		SE
Age	-0.057		0.222
Age-squared	0.001		0.001
Life-course timing of migration x gender			
Earlier-in-life x women	0.599	*	0.276
Later-in-life x men	0.259		0.322
Later-in-life x women	0.865	*	0.405
Constant	-3.838		9.119
F-Statistic	19.890	***	

n=2573

Note: ***p<0.001, **p<0.01, *p<0.05; Data are weighted

As seen in Figure 9, both earlier- and later-in-life immigrant women have the highest disability prevalence across all ages beyond 65 while earlier-in-life immigrant men have the lowest disability prevalence. Later-in-life immigrant have greater disability prevalence compared to their earlier-in-life immigrant counterparts.

Figure 9. Age patterned probability of disability for the immigrant-only sample, by life-course timing of migration and gender



Total, disability-free, and disabled life estimates - immigrant-only sample

Table 26 shows life expectancies for immigrant older adults at the age of 65 by life course timing of migration and gender. Total life expectancy is greater for later-in-life immigrant older adults with the greatest total life expectancy seen for later-in-life immigrant women at 25.69 years. In comparison, earlier-in-life immigrant men have the shortest total life expectancy of 19.93 years.

Table 26. Total life expectancy and disability free life expectancy for adults at age 65, by life-course timing of migration and gender, immigrant-only sample, NHATS 2011-2016

	Life course timing of migration					
	Younger			Older		
Gender	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
Men	19.93	17.64	0.89	20.70	17.65	0.85
Women	20.60	16.74	0.81	25.69	18.56	0.72

Table 27. Total life expectancy and disability free life expectancy for adults at age 70, by life-course timing of migration and gender, immigrant-only sample, NHATS 2011-2016

	Life course timing of migration					
	Younger			Older		
Gender	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
Men	16.10	13.86	0.86	16.80	13.84	0.82
Women	16.71	12.98	0.78	21.45	14.54	0.68

Table 28. Total life expectancy and disability free life expectancy for adults at age 75, by life-course timing of migration and gender, immigrant-only sample, NHATS 2011-2016

	Life course timing of migration					
	Younger			Older		
Gender	TLE	DFLE	DFLE/TLE	TLE	DFLE	DFLE/TLE
Men	12.65	10.45	0.83	13.27	10.39	0.78
Women	13.19	9.60	0.73	17.49	10.86	0.62

Looking at disability free life expectancy, the greatest percentage of total years of life without disability is 89% which is for earlier-in-life immigrant men. In comparison, later-in-life

immigrant women have the smallest proportion of disability free life expectancy at 72 percent. Overall, earlier-in-life immigrant older adults have a greater proportion of disability-free years to total life expectancy compared to later-in-life immigrant older adults.

Tables 27 and 28 display life expectancies for older adults at the age of 70 and 75, respectively. These life expectancies are calculated by life course timing of migration and gender. Similar to the findings in Table 26, later-in-life immigrant older women have the longest total life expectancy and earlier-in-life immigrant older men have the greatest proportion of disability-free life expectancy. Looking at the change in the proportion of disability-free life expectancy to total life expectancy, the largest change between ages 65 to 70 and 70 and 75 occurs for later-in-life immigrant women. The proportion of disability-free life expectancy to total life expectancy is reduced from .72 at 65 years old, to .68 at 70 years old and is reduced from .68 at 70 years old, to .62 at 75 years old.

Summary

This chapter examined the total, disability-free, and disabled life expectancies from the age of 65 for older adults. Overall, at age 65, non-immigrant men and women spend more of their remaining years disability-free compared to their immigrant counterparts. For example, at age 65, non-immigrant white men can expect to spend 93% of their remaining years without disability as measured as receiving help to complete self-care and/or mobility tasks whereas for immigrant Hispanic women, they can expect to spend only 73% of their remaining years without disability. As such, these results support hypothesis 3a which states that immigrant older adults will have a smaller proportion of disability-free years compared to non-immigrant older adults.

Looking at the life tables, in general, later-in-life immigrants have smaller proportions of disability-free life expectancy compared to their earlier-in-life immigrant counterparts. After layering in race and ethnicity, Hispanic later-in-life immigrants have the smallest proportion of disability-free life expectancy at .78 compared to white earlier-in-life immigrants who have a disability-free life expectancy proportion of .87 (See Table 21). Looking at gender differences, women have a smaller proportion of disability-free life expectancy compared to men, regardless of life course timing of migration. Later-in-life immigrant women have the smallest proportion for disability-free life expectancy at .72 (See Table 26) and earlier-in-life immigrant men have the greatest proportion of disability-free life expectancy at .89 (See Table 26). Taken together, the results indicate support for hypothesis 3b, later-in-life immigrants have longer lives but with greater proportion of disabled life expectancy.

CHAPTER SEVEN

CONCLUSION

This dissertation is guided by two main research aims. The first aim is to determine if the immigrant health and mortality advantage extends to late-life disablement. The second aim is to explore how the life-course timing of migration affects late-life disablement for immigrant older adults in the United States. I examine these aims through three sets of research questions. First, 1a) how does immigrant status shape disablement process for older adults? 1b) Among immigrants, how does life-course timing of migration shape disablement process? Next, 2) How is the relationship between immigrant status and disablement moderated by race and gender? And finally, 3a) How does immigrant status shape active and disabled life expectancy for older adults? 3b) Among immigrants, how does life course timing of migration shape active and disabled life expectancy for older adults? The rest of this chapter will review the results in relation to the research questions, hypotheses, and broader literature. Then I will discuss limitations and opportunities for future research as well as policy implications.

Immigrant status differences in disablement

Results from Chapter 4 show that immigrant older adults have a greater risk of disability decline than non-immigrant older adults. Immigrant status is a statistically significant predictor of disablement decline as seen in Model 6.5, providing evidence that immigrant older adults have greater risk of disability progression compared to non-immigrant older adults. This relationship remains statistically significant net of all key demographic variables as well as early-life compositional factors. When the middle- and late-life variables are included, immigrant status remains statistically significant. The immigrant status coefficient is reduced from 1.926 in the

base model to 1.684 in the final, fully adjusted model, indicating that the additional of the middle- and late-life variables partially mediates the relationships between immigrant status and disablement. Better educational attainment as well as having a white or blue collar occupation (compared to no paid work), and living alone reduces the risk for disability progression, which is consistent with research on educational attainment and later life health for immigrants and non-immigrants (Mehta et al. 2016). Socioeconomic gains in the middle life via education and occupation partially explain the increased disability risk for immigrants. The remaining immigrant risk may be explained by the unmeasured stressors that are faced by immigrants arriving to a new country and having to adjust to a different set of cultural norms, institutions, languages, etc. The event of immigration can be challenging and may increase wear and tear on the body as well as less familiarity and access with US health care systems, resulting in increased risk of disability (Brown 2018; Angel et al. 2015).

Results from Table 6 in Chapter 4 did not provide evidence that immigrant older adults have a statistically significant lower mortality risk compared to non-immigrants, thus does not support the immigrant mortality advantage hypothesis. One possible explanation of this could be due to lack of statistical power in analytic sample data. With limited waves and limited mortality data, the data and measures may not have been sensitive enough to detect mortality risk. Another possible explanation may be that the immigrant mortality advantage may be decreasing and closing over time. As mentioned earlier, immigrant status differences in disability and mortality are sensitive to sociohistorical time and the sociohistorical context. Recent data has shown rates of chronic conditions such as hypertension, diabetes, and obesity, are increasing rapidly for Black and Hispanic immigrants (Hamilton and Hagos 2021). While these chronic diseases may not be immediately fatal, good control of these diseases take strict and regimented medical care,

which is difficult as Black and Hispanic immigrants are likely to face more barriers to accessing and utilizing health care (Hummer and Gutin 2018; Hummer and Hayward 2015). Immigrant Black and Hispanic older adults are more likely than white non-immigrant older adults to delay medical care due to costs or be unable to afford medical care, which could lead to complications with chronic conditions, and eventually death (Hummer and Gutin 2018). This could be a possible explanation of why these models did not find conclusive evidence for an immigrant mortality advantage over non-immigrant older adults.

Differences in disablement by life-course timing of migration

Looking closer at differences among immigrants, results from Chapter 4 show partial support for hypothesis 1b, which states that later-in-life immigrants may have greater risk of disablement, but lower risk for mortality, compared to earlier-in-life immigrants. As seen in Model 9.2., later-in-life immigrant are at greater risk of disability onset than earlier-in-life immigrant older adults, net of all other control variables. These findings support current literature on life-course timing of migration. Scholars suggest that immigrants who arrive later-in-life are less positively selected on health because they typically arrive on family reunification visas, sponsored by their adult children whereas earlier-in-life immigrants are more likely to have immigrated based on employment visas and are more likely to be positively selected on health (Brown 2018; Carr and Tienda 2013; Elo, Mehta, and Huang 2011).

Later-in-life immigrants have a reduced mortality risk from being disabled compared to earlier-in-life immigrants. Later-in-life immigrants spent most of their lives in their respective countries of origin and may be more likely than earlier in life immigrants to engage in a form of selective acculturation through which later-in-life immigrants may choose to retain some of their more culturally protective health behaviors. Additionally, later-in-life immigrants social support

networks may be tighter as result of immigrating later in life and having limited exposure to education and occupational settings in the US, where most adults are likely to form their social support networks. As a result, the limited support networks of later-in-life immigrants may consist of mostly family members who are also likely to share similar health behaviors that lessen mortality risk.

The results from Chapter 4 Table 9 also indicate that better English proficiency is associated with greater risk of recovery from having any difficulty to being fully able. This may suggest that linguistic assimilation may is beneficial for recovery. For instance, immigrant older adults with good English proficiency may communicate better with healthcare providers if they experiencing self-care or mobility difficulty, and as a result, increase their chances for recovery.

Interaction effects of immigrant status x race/ethnicity on disablement

Chapter 5 uses Markov transition models to test for interactions between immigrant status and race/ethnicity as well as immigrant status and gender. Overall, the results from Chapter 5 indicate inconclusive data to be able to support or reject hypothesis 2 that the relationship between immigrant status and disablement is moderated by race and gender.

Hypothesis 2a states immigrant Black and Hispanic immigrant older adults are more susceptible to declines in self-care and mobility activities than immigrant white older adults but have a lower mortality risk than immigrant white older adults. This hypothesis draws from principles of segmented assimilation which posits that immigrant outcomes vary by race and ethnicity and their experiences with racialized systems in the United States. Other scholars have also suggested that racism, systemic and otherwise, faced by Black and Hispanic older adults structures access to health risks and resources throughout the life course and results in worse

health outcomes compared to white older adults (Boen and Hummer 2019; Brown 2018; Hummer and Gutin 2018). Based on the literature, I would expect to see that there would be an effect of race/ethnicity among immigrant older adults on disability and mortality.

Interaction effects of immigrant status x gender on disablement

Results from Table 13 indicate inconclusive evidence to support hypothesis 2b that the relationships between immigrant status and disablement is moderated by gender. The difference in disability and mortality risk between immigrant older adult women and immigrant older adult men is not statistically significant. However, there may be true differences that are not captured by these models due to small sample size and low statistical power. Based on the literature, it is expected that gender plays an important role in understanding differences in disability and mortality for immigrant older adults (Reyes and Garcia 2020; Garcia et al. 2019; Warner and Brown 2011). Gender differences are important because they reflect different possible pathways to disablement as researchers suggest that immigrant women are less likely to be positively selected on health compared to immigrant men which would make immigrant women more vulnerable to disability.

Sullivan-based life tables

Immigrant status, race/ethnicity, and gender influences

Chapter 6 examined the total, disability-free, and disabled life expectancies from the age of 65 for older adults using Sullivan based life tables. The results support hypothesis 3a which states immigrant older adults will have longer life expectancies but greater proportions of disabled life expectancy compared to non-immigrant older adults. For example, at age 65, white, Black, and Hispanic immigrant men and women can expect a smaller proportion of their

remaining years disability-free compared to non-immigrant white men, who have the largest proportion of disability-free life expectancy. Non-immigrant white men, at age 65, can expect to spend 93% of their remaining years without disability as measured as receiving help to complete self-care and/or mobility tasks. In comparison, immigrant Hispanic women, at age 65, can expect to spend only 73% of their remaining years without disability (see Table 16). This is consistent with the main findings of previous research by Hayward et al. (2014) that found that immigrant Hispanic men and women both had a smaller proportion of disability-free life expectancy to total life expectancy compared to non-immigrant white older adults. Researchers posit that disability for immigrant immigrants might be a result of musculoskeletal damage as opposed to disability due to disease. This may explain why immigrant older adults have "healthier" profiles when it comes to morbidity and some diseases but less so when it comes to disablement (Hayward et al. 2014). Immigrants are often overrepresented in blue collar, more physically demanding occupations which, from a cumulative inequality framework, shapes late life outcomes as a result of the accumulation of increased exposure to higher occupational risks over time (Ferraro and Kelley-Moore 2003).

It should be noted that confidence intervals were not obtained for the life table expectancies, which would allow me to statistically evaluate differences across group. Immigrant-based researchers using Sullivan based life tables typically obtain confidence intervals using bootstrapping technique with multiple, often several hundred samples (Hayward et al. 2014; Cantu et al 2013). Without the confidence intervals, I cannot confirm whether the differences are statistically significant, thus the findings should be interpreted with caution. This is an important consideration for subsequent research.

Life-course timing of migration influences

Looking at the life tables, in general, later-in-life immigrants have greater total life expectancies, but smaller proportions of disability-free life expectancy compared to their earlier-in-life immigrant counterparts. This pattern remains after examining differences by both race/ethnicity and gender. For example, after layering in race and ethnicity on life-course timing of migration, Hispanic later-in-life immigrants have the smallest proportion of disability-free life expectancy at .78 compared to white earlier-in-life immigrants who have a disability-free life expectancy proportion of .87 (See Table 21). Looking at gender differences with life-course timing of migration, the results indicate that both later-in-life immigrant men and women have longer life expectancies with a smaller proportion of disability-free life expectancy compared to their earlier-on-life counterparts. Moreover, women have a smaller proportion of disability-free life expectancy compared to men, regardless of life-course timing of migration. Later-in-life immigrant women have the smallest proportion of disability-free life expectancy at .72 (See Table 26) and earlier-in-life immigrant men have the greatest proportion of disability-free life expectancy at .89 (See Table 26). Taken together, the results indicate support for hypothesis 3b, which states later-in-life immigrants will have longer life expectancies but greater proportions of disabled life expectancy compared to earlier-in-life immigrant older adults.

These results also build on previous research showing that immigrant health selectivity varies by life-course timing of migration, race/ethnicity, and gender (Garcia and Chiu 2016). There are a few possible explanations for this patterning of lower levels of disability-free to total life expectancy among later-in-life immigrants compared to earlier-in-life immigrants. First, later- in-life immigrants are less selected on health because they are likely to migrate with for family reunification rather than for job opportunities and be less selected on health (Garcia and Chiu

2016; Treas 2015). Second, the immigrant health advantage might be offset by interactions with racialized incorporation processes that adversely affect immigrant older adults as suggested by some researchers (Boen and Hummer 2019; Brown 2018). For example, limited English proficiency may result in older adults delaying health care visits so they are more vulnerable to disability. Additionally, researchers have linked higher levels of IADL disability with lower levels of acculturation as earlier in life immigrants have more opportunities to acculturate to US society and gain the knowledge to navigate through existing systems in the United States compared to immigrants who arrive later in life (Garcia et al 2015; Treas 2015).

The findings from this research demonstrate a move towards a theoretical perspective that can allow immigrant-based aging researchers to think about immigration and immigrants in a systematic way by pulling from theories of immigrant incorporation such as segmented assimilation. Moving towards a more complete framework is of particular importance at this time due to the rapidly increasing growth of immigrant older adults in the United States.

Segmented assimilation underscores the importance of the multidimensional and multidirectional components of immigrant incorporation, which can be used to help explain and make sense of differences in health outcomes. For example, based on the findings that later-in-life immigrants have a mortality risk advantage over earlier-in-life immigrants may be explained by the segmented assimilation concept of selective acculturation in which preservation of certain cultural behaviors may result in better health or mortality outcomes. In this case, the “late” arrival of older immigrants to the United States and the exclusion from the American education and workplace could be beneficial.

Limitations and future research opportunities

Despite its strengths, this study has limitations. First, due to small sample size of immigrant older adults in the data set, I was not able to include Asian immigrants in the analytic sample. Asian immigrants comprise a large proportion of immigrant older adults. Moreover, the average socioeconomic profile of Asians is different from other immigrant groups and may shape their experiences with late-life disability. Future research should attend to these differences to better understand how immigrants move through late-life disablement. Melvin et al. (2014) find that Asian immigrant have lower levels of functional limitations than US-born white older adults in middle- and late-life, but after 75 years of age, that pattern is reversed in terms of ADL limitations. Mutchler, Prakash, and Burr (2007) also find that there is an immigrant health advantage for Asian immigrants.

Second, I was not able to examine variation within Hispanic panethnicity. Recent scholarship shows evidence that there are important differences in country of origin. For example, Cubans tend to have favorable health outcomes compared to Mexicans and Puerto Ricans (Cho et al. 2004; Hummer 2000). Mexican older adults account for almost two-thirds of all Hispanics with one third of Mexicans being immigrant (Hummer and Gutin 2018). Similarly, I was unable to include national origin for Black immigrants. Previous research suggests that Black immigrants who migrate from predominantly white countries, such as in Europe, are exposed to racist environments that result in worse health outcomes compared to Black immigrants who migrated from predominantly black or non-white countries (Elo, Mehta, and Huang 2011). National origin is an important indicator of stratification and should be included in future research.

Third, I chose Sullivan method to make life tables which is consistent with immigrant-based research on healthy life expectancy. Though researchers have found that results are similar (Jagger et al. 2006), one of the main critiques of the Sullivan method is that it is uses cross-sectional data and reports age-specific disability status in a population at a given point in time. In contrast, the multistate method uses longitudinal data which allows researchers to take into account dynamic pathways (decline and recovery) (Mathers and Robine 1997). Future research should examine these data longitudinally with the multistate method and compare whether the results are substantively different.

Fourth, the older adults in the NHATS data were drawn from Medicare files, which means that older adults, particularly immigrant older adults, who are uninsured are not included. Newly arrived immigrants in the United States do not qualify for Medicare for at least five years unless they have a spouse who is eligible for Medicare (via 40 quarters of income in the United States) or is an asylee, refugee, or other temporary protected status (Burke and Kean 2019). Then, the opportunities to opt into Medicare Part A requires a fee, which may be a barrier for low-income immigrant older adults (Burke and Kean 2019). However, some researchers have estimated that about 90% of immigrant older adults ages 65 and older are enrolled in Medicare (Mehta et al. 2016). Nevertheless, findings from research based on a broader immigrant sample may yield different results. It also suggests that the immigrant status differences may be larger than what is shown in this research as the uninsured population is less likely to seek out health care and may be at greater risk for disability and mortality. Previous research consistently finds poorer health incomes for the socioeconomically disadvantaged older population. Future research should incorporate a broader sample of immigrants.

Fifth, I was unable to include undocumented immigrants in the research. Undocumented immigrants are a very vulnerable population, as they are what researchers refer to as a "hidden population" due to their legal status. Pew Research Center estimates about 10.5 million undocumented immigrants in the United States and account for almost one-quarter of the immigrant population in the United States (Budiman et al. 2020). What is known is that undocumented older adults have minimal to no access to health care and pay for services out of pocket, which is not sustainable and is cost prohibitive (Ayón et al. 2020; Ayón 2019). Future research should attempt to incorporate the undocumented immigrant older adult populations.

Sixth, I was unable to distinguish between true foreign-born immigrants versus foreign-born US citizens. The NHATS survey did not ask for legal status of foreign-born older adults, only whether the respondent was born in the United States. Though this subpopulation likely represents a small proportion of the sample data, it is important to acknowledge the potential biases in the results. The true immigrant effect on disablement and mortality may be understated as the results may be conservatively biased.

Another data limitation is related to amount of missingness on some of the key variables which resulted in sample size issues as I chose to use listwise deletion. Moreover, the missingness disproportionally affected the immigrant sample. For some variables, such as race/ethnicity, the missingness was only about 1% for the entire sample but among immigrant only sample, the missingness for the same variable was almost 10 percent. By choosing to use listwise deletion, this may have biased the final results. However, if I chose to use single imputation procedures such as mode substitution, research has suggested that the results would also be suboptimal and subject to biased results, standard errors and invalid inferences (Feng,

Cong, and Silverstein 2012). Techniques such as multiple imputation should be used in future research to minimize bias and retain statistical power.

Additionally, the observed age patterns in the results may be due to historical context and that results must be interpreted with caution so as to not confound age effects and cohort effects since the effects of age or age of immigration cannot be separated from possible cohort effects. This is of particular importance for immigrant older adults who arrived earlier-in-life and were braceros. While the program created a cohort of highly health selected men at the time, the Bracero program has had long lasting effects as the hard manual labor would lead to more physical impairments, disability in the long term, or possible premature death (Massey Durand and Malone 2002). Future research should examine if/when an epidemiological crossover occurs for these former braceros.

Finally, the results may be influenced by survivor bias where the least healthy individuals may have died before being eligible for the NHATS survey which samples from the Medicare files, which consists of older adults ages 65 and above. Selectivity of who is included and not included in the survey as a function selective survival. This may be evident among the non-immigrant black older adult population, which is the most vulnerable to survivor bias. Moreover, research has found that racial and ethnic health disparities are lessened due to selective survival (Palloni and Webank 2004). Racial and ethnic differences in late-life health disparities should be examined in relation to mid-life and earlier-life health disparities in future research.

Policy implications

The rapidly growing and diverse immigrant older population provides a unique set of challenges to not only families and caregivers, but also health agencies and policy makers.

Broadly speaking, policy makers should focus on the development of culturally relevant policies for immigrant groups and public health programs to delay the onset and progression of disability. For example, results from this research show that immigrant older adults are at greater risk for decline from the pre-disability state of "having difficulty with self-care and mobility tasks" to the disabled state of "receiving help with self-care and mobility tasks". Compared to non-immigrant older adults, immigrant older adults have a 70% increase in risk for disability progression net of all control variables. These findings highlight an intermediate stage where interventions via accommodations and assistive devices may play a role in postponing disability. Increasing funding of existing health organizations can allow for a more detailed programs that target immigrant populations who are not only more likely to have limited English proficiency, but also likely to be less knowledgeable about available resources to them.

Additionally, policies should be implemented to help offset the burden of caregiving. The increased risk of disability, coupled with greater longevity raises concerns for the potential burden on caregivers, who are likely to be family members. Recent research finds that Black and Hispanic older adults more reliant on family for support than whites (Rote and Moon 2016). Black and Hispanic older adults are also less likely to utilize assistive devices and technologies compared to white older adults (Freedman et al. 2009). It is important for the United States to implement social and health policies that can help lower the risk of self-care and mobility disability for immigrant older adults. Policies that target disability can alleviate the burden on families, caregivers, and health agencies.

Finally, there is a need for more attention to address the needs of the later-in-life immigrant older adult population, known as the invited elderly. Most of them arrive for family reunification and provide mostly unpaid labor and support for families, such as childcare for

grandchildren. Moreover, researchers suggest that later-in-life immigrant older adults are often less acculturated and integrated into society, leading to greater difficulty navigating through health care systems, among other things, which may result in increased risk of disability and extended disabled life expectancies compared to their earlier-in-life counterparts (Treas and Gubernskaya 2016; Treas 2015). It would be in the best interest of policy makers to develop programs and policies that in turn support these individuals so all immigrant older adults can have better quality of life.

APPENDIX A

RESPECIFIED DEPDENDENT VARIABLE DESCRIPTIONS

Dependent variable (2): Any Difficulty

The second measure of disability is conceptualized as having any difficulty performing specific activities of daily living (ADLs). ADLs typically consist of specific activities including eating, bathing, showering, toileting, dressing, getting into bed, getting around inside home, and leaving home. Respondents are asked how much difficulty they experienced in the past month performing each of the seven ADLs, with or without the help of assistive devices. Responses that indicated no difficulty, with or without a device, are coded as 0. All other responses, including "a little", "some", and "a lot", in addition to respondents who require help to perform the task, are coded as 1. This strategy of coding is consistent with extant research on disability-free trends in later life (Hayward et al. 2013; Crimmens et al. 2009; Payne 2015).

Dependent variable (3): Any Help

Disability is also measured as the inability to perform ADLs. Responses are dichotomously coded with 1 being that the respondent has received help from another person, in the last month, to perform any of the ADLs indicating that the respondent requires assistance to complete the self-care or mobility task. All other responses, including having difficulty performing any of the tasks with or without assistive technologies, are coded as 0. Specifically, the dependent variable will utilize a dichotomous measure of disability that is conceptualized as receiving help in the past month for any of the following ADLs: eating, bathing, showering, toileting, dressing, getting into bed, getting around inside home, and leaving home.

APPENDIX B

SULLIVAN-BASED LIFE TABLE CALCULATIONS

B1. Life table calculations for non-immigrant, white, men, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99512.98	1934287.051	19.34	0.01443	98077.29	1791840.17	17.92	0.93
1	66	0.0097	0.99026	99025.9502	98486.68	1834774.076	18.53	0.01603	96907.91	1693762.89	17.10	0.92
2	67	0.0205	0.979474	97947.4029	97351.01	1736287.399	17.73	0.01783	95615.31	1596854.97	16.30	0.92
3	68	0.0325	0.967546	96754.6175	96095.96	1638936.389	16.94	0.01985	94188.51	1501239.66	15.52	0.92
4	69	0.0456	0.954373	95437.311	94711.02	1542840.425	16.17	0.02212	92616.08	1407051.15	14.74	0.91
5	70	0.0602	0.939847	93984.7256	93185.23	1448129.406	15.41	0.02467	90886.25	1314435.07	13.99	0.91
6	71	0.0761	0.923857	92385.7299	91507.35	1354944.179	14.67	0.02754	88987.13	1223548.82	13.24	0.90
7	72	0.0937	0.90629	90628.9608	89665.99	1263436.833	13.94	0.03077	86906.93	1134561.70	12.52	0.90
8	73	0.1130	0.88703	88703.014	87649.85	1173770.846	13.23	0.03440	84634.29	1047654.76	11.81	0.89
9	74	0.1340	0.865967	86596.6921	85448.01	1086120.993	12.54	0.03850	82158.64	963020.47	11.12	0.89
10	75	0.1570	0.842993	84299.3196	83050.23	1000672.987	11.87	0.04310	79470.70	880861.83	10.45	0.88
11	76	0.1820	0.818011	81801.1328	80447.44	917622.761	11.22	0.04828	76563.09	801391.13	9.80	0.87
12	77	0.2091	0.790938	79093.7523	77632.25	837175.318	10.58	0.05412	73430.99	724828.04	9.16	0.87
13	78	0.2383	0.761707	76170.7438	74599.51	759543.070	9.97	0.06068	70072.89	651397.05	8.55	0.86
14	79	0.2697	0.730283	73028.2666	71347.04	684943.565	9.38	0.06805	66491.53	581324.16	7.96	0.85
15	80	0.3033	0.696658	69665.8063	67876.39	613596.529	8.81	0.07634	62694.77	514832.63	7.39	0.84
16	81	0.3391	0.66087	66086.9775	64193.67	545720.137	8.26	0.08563	58696.56	452137.86	6.84	0.83
17	82	0.3770	0.623004	62300.3702	60310.39	481526.463	7.73	0.09605	54517.84	393441.30	6.32	0.82
18	83	0.4168	0.583204	58320.4017	56244.26	421216.077	7.22	0.10769	50187.30	338923.46	5.81	0.80
19	84	0.4583	0.541681	54168.116	52019.98	364971.818	6.74	0.12069	45741.90	288736.16	5.33	0.79
20	85	0.5013	0.498719	49871.8538	47669.78	312951.833	6.28	0.13515	41227.07	242994.26	4.87	0.78
21	86	0.5453	0.454677	45467.6978	43233.64	265282.057	5.83	0.15121	36696.28	201767.19	4.44	0.76
22	87	0.5900	0.409996	40999.5784	38759.25	222048.419	5.42	0.16897	32210.05	165070.91	4.03	0.74
23	88	0.6348	0.365189	36518.9167	34301.30	183289.172	5.02	0.18854	27834.16	132860.85	3.64	0.72
24	89	0.6792	0.320837	32083.6804	29920.22	148987.873	4.64	0.21000	23636.97	105026.69	3.27	0.70
25	90	0.7224	0.277568	27756.7522	25680.15	119067.657	4.29	0.23342	19685.97	81389.72	2.93	0.68
26	91	0.7640	0.236036	23603.5504	21646.24	93387.505	3.96	0.25882	16043.76	61703.75	2.61	0.66
27	92	0.8031	0.196889	19688.9224	17881.18	71741.269	3.64	0.28620	12763.55	45659.99	2.32	0.64
28	93	0.8393	0.160734	16073.4331	14441.37	53860.091	3.35	0.31551	9885.00	32896.44	2.05	0.61
29	94	0.8719	0.128093	12809.3032	11372.84	39418.723	3.08	0.34663	7430.67	23011.43	1.80	0.58
30	95	0.9006	0.099364	9936.38626	8707.54	28045.878	2.82	0.37940	5403.86	15580.76	1.57	0.56
31	96	0.9252	0.074787	7478.69214	6460.35	19338.339	2.59	0.41361	3788.29	10176.91	1.36	0.53
32	97	0.9456	0.05442	5442.016	4627.60	12877.985	2.37	0.44897	2549.97	6388.62	1.17	0.50
33	98	0.9619	0.038132	3813.19174	3187.25	8250.381	2.16	0.48514	1640.98	3838.65	1.01	0.47
34	99	0.9744	0.025613	2561.31399	2101.14	5063.128	1.98	0.52178	1004.81	2197.67	0.86	0.43
35	100	0.9836	0.01641	1640.97287	1319.07	2961.985	1.81	0.55848	582.40	1192.86	0.73	0.40
36	101	0.9900	0.009972	997.15872	784.14	1642.919	1.65	0.59484	317.70	610.46	0.61	0.37
37	102	0.9943	0.005711	571.112235	438.63	858.784	1.50	0.63046	162.09	292.76	0.51	0.34
38	103	0.9969	0.003061	306.138889	229.26	420.158	1.37	0.66499	76.80	130.67	0.43	0.31
39	104	0.9985	0.001524	152.383538	111.10	190.897	1.25	0.69809	33.54	53.87	0.35	0.28
40	105	0.9993	0.000698	69.81628	49.49	79.797	1.14	0.72949	13.39	20.32	0.29	0.25

B2. Life table calculations for immigrant, white, men, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99710.99	2329770.014	23.30	0.02442	97276.41	1985726.04	19.86	0.85
1	66	0.0058	0.99422	99421.9795	99100.61	2230059.025	22.43	0.02710	96415.09	1888449.64	18.99	0.85
2	67	0.0122	0.987792	98779.2365	98422.14	2130958.417	21.57	0.03010	95459.43	1792034.55	18.14	0.84
3	68	0.0193	0.98065	98065.045	97668.58	2032536.276	20.73	0.03347	94400.05	1696575.12	17.30	0.83
4	69	0.0273	0.972721	97272.1102	96832.33	1934867.698	19.89	0.03723	93226.95	1602175.07	16.47	0.83
5	70	0.0361	0.963926	96392.554	95905.23	1838035.366	19.07	0.04145	91929.50	1508948.12	15.65	0.82
6	71	0.0458	0.954179	95417.9102	94878.52	1742130.134	18.26	0.04618	90496.57	1417018.62	14.85	0.81
7	72	0.0566	0.943391	94339.1329	93742.88	1647251.613	17.46	0.05148	88916.59	1326522.05	14.06	0.81
8	73	0.0685	0.931466	93146.6224	92488.45	1553508.735	16.68	0.05742	87177.74	1237605.46	13.29	0.80
9	74	0.0817	0.918303	91830.2732	91104.91	1461020.287	15.91	0.06407	85268.16	1150427.72	12.53	0.79
10	75	0.0962	0.903795	90379.5493	89581.57	1369915.376	15.16	0.07150	83176.23	1065159.55	11.79	0.78
11	76	0.1122	0.887836	88783.5946	87907.49	1280333.804	14.42	0.07982	80890.95	981983.32	11.06	0.77
12	77	0.1297	0.870314	87031.3851	86071.66	1192426.314	13.70	0.08910	78402.38	901092.37	10.35	0.76
13	78	0.1489	0.851119	85111.9302	84063.23	1106354.657	13.00	0.09946	75702.25	822689.99	9.67	0.74
14	79	0.1699	0.830145	83014.534	81871.83	1022291.424	12.31	0.11099	72784.58	746987.74	9.00	0.73
15	80	0.1927	0.807291	80729.1224	79487.88	940419.596	11.65	0.12381	69646.46	674203.16	8.35	0.72
16	81	0.2175	0.782466	78246.647	76903.11	860931.712	11.00	0.13802	66288.91	604556.70	7.73	0.70
17	82	0.2444	0.755596	75559.5693	74111.00	784028.603	10.38	0.15373	62717.79	538267.80	7.12	0.69
18	83	0.2734	0.726624	72662.432	71107.47	709917.603	9.77	0.17105	58944.75	475550.01	6.54	0.67
19	84	0.3045	0.695525	69552.5142	67891.54	638810.130	9.18	0.19006	54988.09	416605.26	5.99	0.65
20	85	0.3377	0.662306	66230.5643	64466.08	570918.590	8.62	0.21085	50873.49	361617.17	5.46	0.63
21	86	0.3730	0.627016	62701.5935	60838.65	506452.511	8.08	0.23347	46634.57	310743.68	4.96	0.61
22	87	0.4102	0.589757	58975.7016	57022.30	445613.864	7.56	0.25796	42312.93	264109.11	4.48	0.59
23	88	0.4493	0.550689	55068.8905	53036.35	388591.568	7.06	0.28431	37957.80	221796.18	4.03	0.57
24	89	0.4900	0.510038	51003.8045	48907.06	335555.221	6.58	0.31247	33625.06	183838.38	3.60	0.55
25	90	0.5319	0.468103	46810.317	44668.09	286648.160	6.12	0.34236	29375.47	150213.32	3.21	0.52
26	91	0.5747	0.425259	42525.8642	40360.64	241980.069	5.69	0.37384	25272.25	120837.85	2.84	0.50
27	92	0.6180	0.381954	38195.4112	36033.17	201619.431	5.28	0.40671	21378.04	95565.60	2.50	0.47
28	93	0.6613	0.338709	33870.9297	31740.60	165586.261	4.89	0.44074	17751.29	74187.56	2.19	0.45
29	94	0.7039	0.296103	29610.2724	27542.81	133845.660	4.52	0.47563	14442.61	56436.27	1.91	0.42
30	95	0.7452	0.254754	25475.3564	23502.49	106302.846	4.17	0.51106	11491.26	41993.66	1.65	0.40
31	96	0.7847	0.215296	21529.6215	19682.22	82800.357	3.85	0.54668	8922.34	30502.39	1.42	0.37
32	97	0.8217	0.178348	17834.8111	16141.02	63118.140	3.54	0.58212	6745.04	21580.05	1.21	0.34
33	98	0.8555	0.144472	14447.236	12930.52	46977.117	3.25	0.61701	4952.23	14835.01	1.03	0.32
34	99	0.8859	0.114138	11413.8114	10091.05	34046.593	2.98	0.65101	3521.63	9882.79	0.87	0.29
35	100	0.9123	0.087683	8768.2848	7648.23	23955.545	2.73	0.68380	2418.33	6361.15	0.73	0.27
36	101	0.9347	0.065282	6528.17098	5610.55	16307.317	2.50	0.71511	1598.40	3942.82	0.60	0.24
37	102	0.9531	0.046929	4692.93439	3968.41	10696.764	2.28	0.74470	1013.14	2344.42	0.50	0.22
38	103	0.9676	0.032439	3243.87858	2694.93	6728.358	2.07	0.77241	613.35	1331.29	0.41	0.20
39	104	0.9785	0.02146	2145.9913	1748.83	4033.423	1.88	0.79812	353.06	717.94	0.33	0.18
40	105	0.9865	0.013517	1351.66856	1078.76	2284.593	1.69	0.82177	192.27	364.88	0.27	0.16

B3. Life table calculations for non-immigrant, Black, men, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99204.57	1586325.001	15.86	0.02973	96255.69	1420485.44	14.20	0.90
1	66	0.0159	0.984091	98409.1399	97534.18	1487120.431	15.11	0.03297	94318.36	1324229.74	13.46	0.89
2	67	0.0334	0.966592	96659.2287	95698.74	1389586.247	14.38	0.03660	92196.09	1229911.38	12.72	0.89
3	68	0.0526	0.947382	94738.2453	93686.23	1293887.510	13.66	0.04066	89876.97	1137715.29	12.01	0.88
4	69	0.0737	0.926342	92634.2212	91484.88	1200201.277	12.96	0.04520	87349.78	1047838.33	11.31	0.87
5	70	0.0966	0.903355	90335.5289	89083.39	1108716.402	12.27	0.05028	84604.51	960488.54	10.63	0.87
6	71	0.1217	0.878312	87831.2442	86471.42	1019633.015	11.61	0.05596	81632.88	875884.03	9.97	0.86
7	72	0.1489	0.851116	85111.5909	83640.03	933161.597	10.96	0.06230	78429.04	794251.15	9.33	0.85
8	73	0.1783	0.821685	82168.4751	80582.29	849521.564	10.34	0.06939	74990.33	715822.11	8.71	0.84
9	74	0.2100	0.789961	78996.1134	77293.93	768939.270	9.73	0.07731	71318.12	640831.78	8.11	0.83
10	75	0.2441	0.755918	75591.7529	73774.11	691645.337	9.15	0.08615	67418.80	569513.66	7.53	0.82
11	76	0.2804	0.719565	71956.4747	70026.27	617871.223	8.59	0.09599	63304.67	502094.86	6.98	0.81
12	77	0.3190	0.680961	68096.0622	66058.98	547844.955	8.05	0.10694	58994.94	438790.19	6.44	0.80
13	78	0.3598	0.640219	64021.902	61886.88	481785.973	7.53	0.11909	54516.51	379795.24	5.93	0.79
14	79	0.4025	0.597519	59751.8675	57531.49	419899.088	7.03	0.13257	49904.61	325278.73	5.44	0.77
15	80	0.4469	0.553111	55311.1187	53021.92	362367.595	6.55	0.14746	45203.11	275374.12	4.98	0.76
16	81	0.4927	0.507327	50732.7271	48395.37	309345.672	6.10	0.16388	40464.30	230171.00	4.54	0.74
17	82	0.5394	0.46058	46058.0185	43697.26	260950.299	5.67	0.18191	35748.10	189706.70	4.12	0.73
18	83	0.5866	0.413365	41336.5066	38980.90	217253.037	5.26	0.20165	31120.49	153958.60	3.72	0.71
19	84	0.6337	0.366253	36625.286	34306.52	178272.140	4.87	0.22315	26651.15	122838.11	3.35	0.69
20	85	0.6801	0.319878	31987.7599	29739.69	143965.617	4.50	0.24645	22410.25	96186.97	3.01	0.67
21	86	0.7251	0.274916	27491.6117	25348.80	114225.932	4.15	0.27158	18464.55	73776.71	2.68	0.65
22	87	0.7679	0.23206	23205.9845	21201.96	88877.134	3.83	0.29851	14873.00	55312.17	2.38	0.62
23	88	0.8080	0.191979	19197.9314	17363.12	67675.176	3.53	0.32717	11682.40	40439.17	2.11	0.60
24	89	0.8447	0.155283	15528.3162	13887.90	50312.052	3.24	0.35746	8923.51	28756.77	1.85	0.57
25	90	0.8775	0.122475	12247.4922	10819.36	36424.148	2.97	0.38922	6608.25	19833.26	1.62	0.54
26	91	0.9061	0.093912	9391.22154	8184.31	25604.791	2.73	0.42224	4728.57	13225.01	1.41	0.52
27	92	0.9302	0.069774	6977.40262	5990.80	17420.479	2.50	0.45627	3257.39	8496.45	1.22	0.49
28	93	0.9500	0.050042	5004.19259	4227.10	11429.681	2.28	0.49101	2151.56	5239.06	1.05	0.46
29	94	0.9655	0.0345	3450.01559	2862.86	7202.577	2.09	0.52614	1356.61	3087.50	0.89	0.43
30	95	0.9772	0.022757	2275.70899	1852.20	4339.715	1.91	0.56130	812.56	1730.89	0.76	0.40
31	96	0.9857	0.014287	1428.6987	1138.69	2487.511	1.74	0.59615	459.86	918.34	0.64	0.37
32	97	0.9915	0.008487	848.675192	661.28	1348.824	1.59	0.63034	244.45	458.48	0.54	0.34
33	98	0.9953	0.004739	473.87611	360.39	687.548	1.45	0.66353	121.26	214.03	0.45	0.31
34	99	0.9975	0.002469	246.897627	182.97	327.161	1.33	0.69544	55.73	92.78	0.38	0.28
35	100	0.9988	0.00119	119.048704	85.84	144.188	1.21	0.72582	23.54	37.05	0.31	0.26
36	101	0.9995	0.000526	52.6369093	36.88	58.345	1.11	0.75446	9.06	13.51	0.26	0.23
37	102	0.9998	0.000211	21.1223054	14.36	21.466	1.02	0.78121	3.14	4.46	0.21	0.21
38	103	0.9999	7.6E-05	7.60454615	5.01	7.102	0.93	0.80599	0.97	1.32	0.17	0.19
39	104	1.0000	2.42E-05	2.42486484	1.55	2.088	0.86	0.82875	0.27	0.34	0.14	0.16
40	105	1.0000	6.75E-06	0.67502518	0.42	0.538	0.80	0.84949	0.06	0.08	0.12	0.15

B4. Life table calculations for immigrant, Black, men, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99692.93	2282719.792	22.83	0.01743	97955.49	2028541.71	20.29	0.89
1	66	0.0061	0.993859	99385.8679	99044.55	2183026.858	21.97	0.01936	97127.25	1930586.22	19.43	0.88
2	67	0.0130	0.987032	98703.2324	98324.14	2083982.308	21.11	0.02152	96207.98	1833458.97	18.58	0.88
3	68	0.0205	0.97945	97945.0404	97524.35	1985658.171	20.27	0.02395	95188.58	1737250.99	17.74	0.87
4	69	0.0290	0.971037	97103.6593	96637.26	1888133.821	19.44	0.02668	94059.29	1642062.41	16.91	0.87
5	70	0.0383	0.961709	96170.8672	95654.36	1791496.558	18.63	0.02974	92809.76	1548003.12	16.10	0.86
6	71	0.0486	0.951379	95137.8553	94566.55	1695842.197	17.83	0.03318	91429.04	1455193.36	15.30	0.86
7	72	0.0600	0.939952	93995.2447	93364.18	1601275.647	17.04	0.03704	89905.72	1363764.33	14.51	0.85
8	73	0.0727	0.927331	92733.1241	92037.12	1507911.462	16.26	0.04139	88228.05	1273858.61	13.74	0.84
9	74	0.0866	0.913411	91341.1117	90574.78	1415874.345	15.50	0.04627	86384.11	1185630.56	12.98	0.84
10	75	0.1019	0.898084	89808.4494	88966.29	1325299.564	14.76	0.05175	84362.07	1099246.45	12.24	0.83
11	76	0.1188	0.881241	88124.1346	87200.62	1236333.272	14.03	0.05791	82150.52	1014884.38	11.52	0.82
12	77	0.1372	0.862771	86277.0989	85266.77	1149132.655	13.32	0.06483	79738.86	932733.86	10.81	0.81
13	78	0.1574	0.842564	84256.4418	83154.08	1063865.885	12.63	0.07259	77117.81	852995.00	10.12	0.80
14	79	0.1795	0.820517	82051.7267	80852.54	980711.801	11.95	0.08129	74280.03	775877.19	9.46	0.79
15	80	0.2035	0.796534	79653.3503	78353.17	899859.262	11.30	0.09103	71220.83	701597.15	8.81	0.78
16	81	0.2295	0.77053	77052.9905	75648.56	821506.092	10.66	0.10191	67938.97	630376.32	8.18	0.77
17	82	0.2576	0.742441	74244.1394	72733.43	745857.527	10.05	0.11406	64437.59	562437.35	7.58	0.75
18	83	0.2878	0.712227	71222.722	69605.26	673124.096	9.45	0.12758	60725.12	497999.76	6.99	0.74
19	84	0.3201	0.679878	67987.7973	66265.06	603518.836	8.88	0.14259	56816.28	437274.64	6.43	0.72
20	85	0.3546	0.645423	64542.3291	62718.17	537253.773	8.32	0.15921	52732.93	380458.36	5.89	0.71
21	86	0.3911	0.60894	60894.0038	58975.03	474535.607	7.79	0.17754	48504.81	327725.43	5.38	0.69
22	87	0.4294	0.570561	57056.0589	55052.06	415560.575	7.28	0.19767	44169.94	279220.62	4.89	0.67
23	88	0.4695	0.530481	53048.0678	50972.34	360508.512	6.80	0.21968	39774.61	235050.68	4.43	0.65
24	89	0.5110	0.488966	48896.6102	46766.17	309536.173	6.33	0.24362	35372.80	195276.07	3.99	0.63
25	90	0.5536	0.446357	44635.7369	42471.43	262770.000	5.89	0.26951	31024.90	159903.27	3.58	0.61
26	91	0.5969	0.403071	40307.1196	38133.44	220298.571	5.47	0.29732	26795.64	128878.37	3.20	0.59
27	92	0.6404	0.359598	35959.7671	33804.48	182165.128	5.07	0.32698	22751.18	102082.73	2.84	0.56
28	93	0.6835	0.316492	31649.1865	29542.54	148360.651	4.69	0.35836	18955.61	79331.54	2.51	0.53
29	94	0.7256	0.274359	27435.8874	25409.53	118818.114	4.33	0.39130	15466.90	60375.94	2.20	0.51
30	95	0.7662	0.233832	23383.1654	21468.67	93408.588	3.99	0.42554	12332.83	44909.04	1.92	0.48
31	96	0.8045	0.195542	19554.1726	17781.28	71939.919	3.68	0.46082	9587.34	32576.20	1.67	0.45
32	97	0.8399	0.160084	16008.3795	14403.02	54158.643	3.38	0.49679	7247.74	22988.86	1.44	0.42
33	98	0.8720	0.127977	12797.6599	11380.01	39755.623	3.11	0.53309	5313.39	15741.12	1.23	0.40
34	99	0.9004	0.099624	9962.35962	8745.09	28375.613	2.85	0.56935	3766.11	10427.73	1.05	0.37
35	100	0.9247	0.075278	7527.82884	6514.89	19630.519	2.61	0.60516	2572.36	6661.62	0.88	0.34
36	101	0.9450	0.05502	5501.96028	4688.10	13115.625	2.38	0.64015	1687.02	4089.26	0.74	0.31
37	102	0.9613	0.038742	3874.24615	3245.48	8427.521	2.18	0.67398	1058.10	2402.24	0.62	0.29
38	103	0.9738	0.026167	2616.71672	2151.78	5182.040	1.98	0.70633	631.91	1344.14	0.51	0.26
39	104	0.9831	0.016868	1686.84519	1359.49	3030.259	1.80	0.73697	357.59	712.23	0.42	0.24
40	105	0.9897	0.010321	1032.13497	813.93	1670.769	1.62	0.76568	190.72	354.64	0.34	0.21

B5. Life table calculations for non-immigrant, Hispanic, men, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99482.41	1889733.701	18.90	0.02878	96619.26	1652230.23	16.52	0.87
1	66	0.0104	0.989648	98964.8115	98392.06	1790251.295	18.09	0.03193	95250.73	1555610.97	15.72	0.87
2	67	0.0218	0.978193	97819.3159	97186.37	1691859.232	17.30	0.03545	93741.55	1460360.24	14.93	0.86
3	68	0.0345	0.965534	96553.418	95854.96	1594672.865	16.52	0.03938	92080.04	1366618.69	14.15	0.86
4	69	0.0484	0.951565	95156.5107	94387.04	1498817.900	15.75	0.04379	90254.27	1274538.65	13.39	0.85
5	70	0.0638	0.936176	93617.5605	92771.40	1404430.865	15.00	0.04871	88252.30	1184284.38	12.65	0.84
6	71	0.0807	0.919252	91925.2303	90996.64	1311659.469	14.27	0.05422	86062.49	1096032.08	11.92	0.84
7	72	0.0993	0.90068	90068.0481	89051.34	1220662.830	13.55	0.06039	83673.81	1009969.59	11.21	0.83
8	73	0.1197	0.880346	88034.6284	86924.29	1131611.492	12.85	0.06728	81076.34	926295.79	10.52	0.82
9	74	0.1419	0.85814	85813.9577	84604.85	1044687.199	12.17	0.07497	78261.82	845219.44	9.85	0.81
10	75	0.1660	0.833958	83395.7503	82083.32	960082.345	11.51	0.08356	75224.27	766957.62	9.20	0.80
11	76	0.1923	0.807709	80770.8857	79351.41	877999.027	10.87	0.09314	71960.77	691733.35	8.56	0.79
12	77	0.2207	0.779319	77931.9306	76402.84	798647.619	10.25	0.10380	68472.30	619772.59	7.95	0.78
13	78	0.2513	0.748738	74873.7514	73233.98	722244.778	9.65	0.11565	64764.65	551300.29	7.36	0.76
14	79	0.2841	0.715942	71594.2134	69844.59	649010.795	9.07	0.12879	60849.36	486535.64	6.80	0.75
15	80	0.3191	0.68095	68094.9577	66238.60	579166.210	8.51	0.14333	56744.65	425686.28	6.25	0.73
16	81	0.3562	0.643822	64382.2362	62425.00	512927.613	7.97	0.15937	52476.18	368941.64	5.73	0.72
17	82	0.3953	0.604678	60467.7713	58418.68	450502.609	7.45	0.17702	48077.69	316465.46	5.23	0.70
18	83	0.4363	0.563696	56369.5922	54241.19	392083.927	6.96	0.19634	43591.23	268387.76	4.76	0.68
19	84	0.4789	0.521128	52112.778	49921.40	337842.742	6.48	0.21743	39066.91	224796.53	4.31	0.67
20	85	0.5227	0.4773	47730.0214	45495.96	287921.342	6.03	0.24033	34562.10	185729.63	3.89	0.65
21	86	0.5674	0.432619	43261.9058	41009.34	242425.379	5.60	0.26505	30139.85	151167.53	3.49	0.62
22	87	0.6124	0.387568	38756.773	36513.42	201416.039	5.20	0.29159	25866.54	121027.68	3.12	0.60
23	88	0.6573	0.342701	34270.0582	32066.52	164902.624	4.81	0.31989	21808.76	95161.14	2.78	0.58
24	89	0.7014	0.29863	29862.9742	27731.72	132836.108	4.45	0.34986	18029.61	73352.38	2.46	0.55
25	90	0.7440	0.256005	25600.465	23574.44	105104.388	4.11	0.38134	14584.56	55322.77	2.16	0.53
26	91	0.7845	0.215484	21548.4076	19659.27	81529.952	3.78	0.41414	11517.49	40738.21	1.89	0.50
27	92	0.8223	0.177701	17770.1341	16046.30	61870.681	3.48	0.44803	8857.14	29220.72	1.64	0.47
28	93	0.8568	0.143225	14322.4684	12787.04	45824.380	3.20	0.48270	6614.78	20363.59	1.42	0.44
29	94	0.8875	0.112516	11251.6083	9920.46	33037.341	2.94	0.51783	4783.30	13748.81	1.22	0.42
30	95	0.9141	0.085893	8589.31133	7469.62	23116.882	2.69	0.55309	3338.22	8965.51	1.04	0.39
31	96	0.9365	0.063499	6349.93681	5439.42	15647.257	2.46	0.58812	2240.40	5627.29	0.89	0.36
32	97	0.9547	0.045289	4528.89512	3815.92	10207.841	2.25	0.62255	1440.31	3386.89	0.75	0.33
33	98	0.9690	0.031029	3102.94941	2567.76	6391.919	2.06	0.65607	883.14	1946.58	0.63	0.30
34	99	0.9797	0.020326	2032.56472	1649.35	3824.162	1.88	0.68835	514.02	1063.45	0.52	0.28
35	100	0.9873	0.012661	1266.14305	1005.86	2174.808	1.72	0.71915	282.50	549.43	0.43	0.25
36	101	0.9925	0.007456	745.5827	578.93	1168.945	1.57	0.74824	145.75	266.93	0.36	0.23
37	102	0.9959	0.004123	412.269534	312.37	590.019	1.43	0.77547	70.14	121.18	0.29	0.21
38	103	0.9979	0.002125	212.467202	156.84	277.651	1.31	0.80073	31.25	51.04	0.24	0.18
39	104	0.9990	0.001012	101.203334	72.67	120.816	1.19	0.82397	12.79	19.79	0.20	0.16
40	105	0.9996	0.000441	44.1392918	30.79	48.144	1.09	0.84518	4.77	7.00	0.16	0.15

B6. Life table calculations for immigrant, Hispanic, men, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99477.51	1882877.377	18.83	0.02537	96954.18	1669889.18	16.70	0.89
1	66	0.0104	0.98955	98955.0215	98376.92	1783399.866	18.02	0.02815	95607.64	1572935.01	15.90	0.88
2	67	0.0220	0.977988	97798.8138	97160.02	1685022.948	17.23	0.03127	94122.25	1477327.37	15.11	0.88
3	68	0.0348	0.965212	96521.2277	95816.42	1587862.927	16.45	0.03475	92486.38	1383205.12	14.33	0.87
4	69	0.0489	0.951116	95111.6074	94335.24	1492046.510	15.69	0.03866	90688.11	1290718.74	13.57	0.87
5	70	0.0644	0.935589	93558.8794	92705.28	1397711.267	14.94	0.04304	88715.46	1200030.63	12.83	0.86
6	71	0.0815	0.918517	91851.6786	90915.10	1305005.988	14.21	0.04794	86556.69	1111315.17	12.10	0.85
7	72	0.1002	0.899785	89978.5212	88953.28	1214090.888	13.49	0.05343	84200.61	1024758.48	11.39	0.84
8	73	0.1207	0.87928	87928.0318	86808.63	1125137.611	12.80	0.05957	81637.03	940557.86	10.70	0.84
9	74	0.1431	0.856892	85689.2341	84470.57	1038328.978	12.12	0.06645	78857.29	858920.83	10.02	0.83
10	75	0.1675	0.832519	83251.9143	81929.49	953858.404	11.46	0.07414	75854.89	780063.54	9.37	0.82
11	76	0.1939	0.806071	80607.065	79177.24	871928.914	10.82	0.08274	72626.23	704208.66	8.74	0.81
12	77	0.2225	0.777474	77747.416	76207.74	792751.674	10.20	0.09233	69171.45	631582.43	8.12	0.80
13	78	0.2533	0.746681	74668.0541	73017.59	716543.939	9.60	0.10302	65495.30	562410.98	7.53	0.78
14	79	0.2863	0.713671	71367.1302	69606.89	643526.347	9.02	0.11491	61608.13	496915.68	6.96	0.77
15	80	0.3215	0.678466	67846.6429	65979.96	573919.460	8.46	0.12812	57526.77	435307.55	6.42	0.76
16	81	0.3589	0.641133	64113.2775	62146.27	507939.500	7.92	0.14274	53275.43	377780.77	5.89	0.74
17	82	0.3982	0.601793	60179.2666	58121.24	445793.228	7.41	0.15889	48886.30	324505.35	5.39	0.73
18	83	0.4394	0.560632	56063.2221	53927.04	387671.984	6.91	0.17667	44399.97	275619.04	4.92	0.71
19	84	0.4821	0.517909	51790.8678	49593.23	333744.939	6.44	0.19616	39865.23	231219.08	4.46	0.69
20	85	0.5260	0.473956	47395.5833	45157.12	284151.713	6.00	0.21743	35338.50	191353.84	4.04	0.67
21	86	0.5708	0.429187	42918.6518	40663.87	238994.596	5.57	0.24055	30882.34	156015.34	3.64	0.65
22	87	0.6159	0.384091	38409.0878	36166.00	198330.726	5.16	0.26552	26563.29	125132.99	3.26	0.63
23	88	0.6608	0.339229	33922.9206	31722.37	162164.722	4.78	0.29233	22448.86	98569.71	2.91	0.61
24	89	0.7048	0.295218	29521.8182	27396.40	130442.352	4.42	0.32094	18603.90	76120.85	2.58	0.58
25	90	0.7473	0.25271	25270.9759	23253.61	103045.955	4.08	0.35122	15086.39	57516.95	2.28	0.56
26	91	0.7876	0.212363	21236.2535	19358.45	79792.341	3.76	0.38304	11943.35	42430.56	2.00	0.53
27	92	0.8252	0.174806	17480.6447	15770.46	60433.891	3.46	0.41619	9207.01	30487.20	1.74	0.50
28	93	0.8594	0.140603	14060.2829	12540.30	44663.428	3.18	0.45040	6892.11	21280.19	1.51	0.48
29	94	0.8898	0.110203	11020.3253	9705.76	32123.124	2.91	0.48540	4994.62	14388.08	1.31	0.45
30	95	0.9161	0.083912	8391.18682	7288.43	22417.368	2.67	0.52083	3492.38	9393.47	1.12	0.42
31	96	0.9381	0.061857	6185.67679	5291.63	15128.936	2.45	0.55636	2347.60	5901.09	0.95	0.39
32	97	0.9560	0.043976	4397.58923	3699.88	9837.303	2.24	0.59160	1511.02	3553.49	0.81	0.36
33	98	0.9700	0.030022	3002.17401	2480.42	6137.421	2.04	0.62621	927.14	2042.47	0.68	0.33
34	99	0.9804	0.019587	1958.65889	1586.64	3657.005	1.87	0.65985	539.70	1115.33	0.57	0.30
35	100	0.9879	0.012146	1214.62694	963.14	2070.362	1.70	0.69220	296.45	575.63	0.47	0.28
36	101	0.9929	0.007117	711.654907	551.48	1107.221	1.56	0.72301	152.75	279.18	0.39	0.25
37	102	0.9961	0.003913	391.298836	295.85	555.744	1.42	0.75207	73.35	126.43	0.32	0.23
38	103	0.9980	0.002004	200.39285	147.59	259.898	1.30	0.77921	32.59	53.08	0.26	0.20
39	104	0.9991	0.000948	94.7813605	67.90	112.311	1.18	0.80435	13.28	20.49	0.22	0.18
40	105	0.9996	0.00041	41.0135548	28.54	44.413	1.08	0.82743	4.93	7.21	0.18	0.16

B7. Life table calculations for non-immigrant, white, women, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99630.84	2141438.684	21.41	0.01914	97724.30	1909281.32	19.09	0.89
1	66	0.0074	0.992617	99261.6826	98851.89	2041807.842	20.57	0.02125	96751.18	1811557.03	18.25	0.89
2	67	0.0156	0.984421	98442.0958	97987.62	1942955.953	19.74	0.02362	95672.96	1714805.85	17.42	0.88
3	68	0.0247	0.975331	97533.1422	97029.64	1844968.334	18.92	0.02628	94479.60	1619132.89	16.60	0.88
4	69	0.0347	0.965261	96526.1285	95968.95	1747938.699	18.11	0.02926	93160.48	1524653.29	15.80	0.87
5	70	0.0459	0.954118	95411.7777	94796.02	1651969.745	17.31	0.03261	91704.44	1431492.80	15.00	0.87
6	71	0.0582	0.941803	94180.2584	93500.75	1557173.727	16.53	0.03637	90099.90	1339788.36	14.23	0.86
7	72	0.0718	0.928212	92821.2383	92072.60	1463672.979	15.77	0.04059	88335.02	1249688.46	13.46	0.85
8	73	0.0868	0.91324	91323.9671	90500.68	1371600.376	15.02	0.04533	86397.91	1161353.44	12.72	0.85
9	74	0.1032	0.896774	89677.3952	88773.87	1281099.695	14.29	0.05066	84276.90	1074955.53	11.99	0.84
10	75	0.1213	0.878703	87870.3369	86881.01	1192325.829	13.57	0.05663	81960.88	990678.64	11.27	0.83
11	76	0.1411	0.858917	85891.6854	84811.19	1105444.818	12.87	0.06333	79439.77	908717.76	10.58	0.82
12	77	0.1627	0.837307	83730.6889	82553.99	1020633.631	12.19	0.07085	76705.06	829277.99	9.90	0.81
13	78	0.1862	0.813773	81377.2969	80099.94	938079.638	11.53	0.07927	73750.43	752572.93	9.25	0.80
14	79	0.2118	0.788226	78822.5836	77440.92	857979.698	10.88	0.08869	70572.51	678822.50	8.61	0.79
15	80	0.2394	0.760593	76059.2558	74570.75	780538.778	10.26	0.09922	67171.75	608249.99	8.00	0.78
16	81	0.2692	0.730822	73082.2476	71485.82	705968.026	9.66	0.11097	63553.29	541078.24	7.40	0.77
17	82	0.3011	0.698894	69889.4007	68185.81	634482.202	9.08	0.12404	59727.95	477524.96	6.83	0.75
18	83	0.3352	0.664822	66482.2198	64674.45	566296.392	8.52	0.13856	55713.15	417797.01	6.28	0.74
19	84	0.3713	0.628667	62866.6862	60960.39	501621.939	7.98	0.15464	51533.76	362083.85	5.76	0.72
20	85	0.4095	0.590541	59054.0963	57057.99	440661.548	7.46	0.17237	47222.67	310550.10	5.26	0.70
21	86	0.4494	0.550619	55061.8775	52988.10	383603.561	6.97	0.19187	42821.14	263327.43	4.78	0.69
22	87	0.4909	0.509143	50914.3163	48778.71	330615.464	6.49	0.21321	38378.61	220506.29	4.33	0.67
23	88	0.5336	0.466431	46643.1135	44465.39	281836.749	6.04	0.23644	33951.84	182127.68	3.90	0.65
24	89	0.5771	0.422877	42287.6615	40091.29	237371.362	5.61	0.26160	29603.44	148175.84	3.50	0.62
25	90	0.6211	0.378949	37894.9269	35706.87	197280.067	5.21	0.28867	25399.46	118572.40	3.13	0.60
26	91	0.6648	0.335188	33518.8147	31368.86	161573.197	4.82	0.31759	21406.34	93172.94	2.78	0.58
27	92	0.7078	0.292189	29218.9021	27138.68	130204.338	4.46	0.34827	17687.08	71766.59	2.46	0.55
28	93	0.7494	0.250585	25058.4595	23080.10	103065.657	4.11	0.38054	14297.11	54079.51	2.16	0.52
29	94	0.7890	0.211017	21101.7393	19256.17	79985.558	3.79	0.41420	11280.27	39782.40	1.89	0.50
30	95	0.8259	0.174106	17410.5979	15725.62	60729.389	3.49	0.44897	8665.24	28502.13	1.64	0.47
31	96	0.8596	0.140406	14040.6398	12538.92	45003.771	3.21	0.48455	6463.16	19836.88	1.41	0.44
32	97	0.8896	0.110372	11037.1998	9734.41	32464.851	2.94	0.52059	4666.79	13373.72	1.21	0.41
33	98	0.9157	0.084316	8431.61233	7334.96	22730.445	2.70	0.55671	3251.53	8706.93	1.03	0.38
34	99	0.9376	0.062383	6238.30021	5345.76	15395.488	2.47	0.59253	2178.25	5455.41	0.87	0.35
35	100	0.9555	0.044532	4453.22518	3753.68	10049.726	2.26	0.62767	1397.61	3277.15	0.74	0.33
36	101	0.9695	0.030541	3054.13635	2528.48	6296.045	2.06	0.66178	855.17	1879.55	0.62	0.30
37	102	0.9800	0.020028	2002.81437	1625.99	3767.570	1.88	0.69455	496.66	1024.38	0.51	0.27
38	103	0.9875	0.012492	1249.16273	992.89	2141.581	1.71	0.72569	272.36	527.71	0.42	0.25
39	104	0.9926	0.007366	736.607524	572.27	1148.696	1.56	0.75501	140.20	255.36	0.35	0.22
40	105	0.9959	0.004079	407.941074	309.27	576.422	1.41	0.78233	67.32	115.15	0.28	0.20

B8. Life table calculations for immigrant, white, women, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99644.77	2170729.541	21.71	0.02253	97399.96	1898283.01	18.98	0.87
1	66	0.0071	0.992895	99289.5476	98895.10	2071084.767	20.86	0.02501	96421.88	1800883.05	18.14	0.87
2	67	0.0150	0.985007	98500.6584	98063.06	1972189.664	20.02	0.02779	95338.21	1704461.16	17.30	0.86
3	68	0.0237	0.976255	97625.4585	97140.47	1874126.605	19.20	0.03090	94138.87	1609122.95	16.48	0.86
4	69	0.0334	0.966555	96655.4791	96118.57	1776986.137	18.38	0.03439	92813.17	1514984.08	15.67	0.85
5	70	0.0442	0.955817	95581.6631	94988.03	1680867.565	17.59	0.03830	91349.93	1422170.91	14.88	0.85
6	71	0.0561	0.943944	94394.3876	93738.95	1585879.540	16.80	0.04269	89737.53	1330820.98	14.10	0.84
7	72	0.0692	0.930835	93083.509	92360.97	1492140.592	16.03	0.04760	87964.14	1241083.45	13.33	0.83
8	73	0.0836	0.916384	91638.4342	90843.33	1399779.620	15.28	0.05312	86017.87	1153119.31	12.58	0.82
9	74	0.0995	0.900482	90048.2266	89174.99	1308936.290	14.54	0.05930	83887.09	1067101.44	11.85	0.82
10	75	0.1170	0.883018	88301.7521	87344.81	1219761.300	13.81	0.06622	81560.81	983214.35	11.13	0.81
11	76	0.1361	0.863879	86387.8751	85341.79	1132416.487	13.11	0.07397	79029.10	901653.54	10.44	0.80
12	77	0.1570	0.842957	84295.7123	83155.33	1047074.693	12.42	0.08264	76283.69	822624.44	9.76	0.79
13	78	0.1799	0.82015	82014.9526	80775.60	963919.361	11.75	0.09232	73318.56	746340.75	9.10	0.77
14	79	0.2046	0.795363	79536.2526	78193.98	883143.758	11.10	0.10312	70130.81	673022.19	8.46	0.76
15	80	0.2315	0.768517	76851.7136	75403.58	804949.775	10.47	0.11514	66721.41	602891.38	7.84	0.75
16	81	0.2604	0.739554	73955.4453	72399.83	729546.195	9.86	0.12850	63096.18	536169.97	7.25	0.73
17	82	0.2916	0.708442	70844.2151	69181.20	657146.365	9.28	0.14331	59266.71	473073.79	6.68	0.72
18	83	0.3248	0.675182	67518.1785	65749.93	587965.168	8.71	0.15968	55251.31	413807.08	6.13	0.70
19	84	0.3602	0.639817	63981.6729	62112.86	522215.243	8.16	0.17769	51075.74	358555.77	5.60	0.69
20	85	0.3976	0.602441	60244.0502	58282.28	460102.381	7.64	0.19746	46773.82	307480.04	5.10	0.67
21	86	0.4368	0.563205	56320.5053	54276.67	401820.103	7.13	0.21905	42387.60	260706.22	4.63	0.65
22	87	0.4777	0.522328	52232.8409	50121.47	347543.430	6.65	0.24250	37967.10	218318.62	4.18	0.63
23	88	0.5199	0.480101	48010.0918	45849.50	297421.964	6.19	0.26784	33569.32	180351.52	3.76	0.61
24	89	0.5631	0.436889	43688.9091	41501.25	251572.463	5.76	0.29504	29256.63	146782.21	3.36	0.58
25	90	0.6069	0.393136	39313.5929	37124.62	210071.212	5.34	0.32405	25094.32	117525.58	2.99	0.56
26	91	0.6506	0.349356	34935.6493	32774.20	172946.591	4.95	0.35475	21147.41	92431.26	2.65	0.53
27	92	0.6939	0.306128	30612.7544	28509.89	140172.389	4.58	0.38699	17476.95	71283.86	2.33	0.51
28	93	0.7359	0.26407	26407.0309	24394.81	111662.497	4.23	0.42053	14136.00	53806.91	2.04	0.48
29	94	0.7762	0.223826	22382.5918	20492.49	87267.685	3.90	0.45513	11165.82	39670.91	1.77	0.45
30	95	0.8140	0.186024	18602.3849	16863.43	66775.197	3.59	0.49046	8592.61	28505.09	1.53	0.43
31	96	0.8488	0.151245	15124.4807	13561.28	49911.764	3.30	0.52619	6425.52	19912.48	1.32	0.40
32	97	0.8800	0.119981	11998.0752	10628.84	36350.486	3.03	0.56194	4656.04	13486.96	1.12	0.37
33	98	0.9074	0.092596	9259.61307	8094.58	25721.642	2.78	0.59736	3259.22	8830.93	0.95	0.34
34	99	0.9307	0.069295	6929.53896	5969.88	17627.066	2.54	0.63206	2196.54	5571.70	0.80	0.32
35	100	0.9499	0.050102	5010.2276	4247.90	11657.183	2.33	0.66572	1419.99	3375.16	0.67	0.29
36	101	0.9651	0.034856	3485.57786	2904.07	7409.280	2.13	0.69802	876.96	1955.17	0.56	0.26
37	102	0.9768	0.023226	2322.56435	1898.65	4505.209	1.94	0.72872	515.07	1078.21	0.46	0.24
38	103	0.9853	0.014747	1474.72648	1180.96	2606.564	1.77	0.75759	286.27	563.14	0.38	0.22
39	104	0.9911	0.008872	887.190156	694.82	1425.605	1.61	0.78451	149.73	276.86	0.31	0.19
40	105	0.9950	0.005025	502.456474	384.22	730.782	1.45	0.80938	73.24	127.14	0.25	0.17

B9. Life table calculations for non-immigrant, Black, women, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99553.54	1998557.867	19.99	0.03862	95708.72	1661909.69	16.62	0.83
1	66	0.0089	0.991071	99107.0876	98612.31	1899004.324	19.16	0.04280	94392.16	1566200.97	15.80	0.82
2	67	0.0188	0.981175	98117.5239	97569.80	1800392.018	18.35	0.04745	92939.80	1471808.81	15.00	0.82
3	68	0.0298	0.970221	97022.0846	96416.53	1702822.214	17.55	0.05265	91340.19	1378869.01	14.21	0.81
4	69	0.0419	0.95811	95810.9723	95142.42	1606405.685	16.77	0.05845	89581.61	1287528.82	13.44	0.80
5	70	0.0553	0.944739	94473.8631	93736.92	1511263.267	16.00	0.06491	87652.29	1197947.21	12.68	0.79
6	71	0.0700	0.93	92999.9809	92189.09	1417526.345	15.24	0.07212	85540.70	1110294.91	11.94	0.78
7	72	0.0862	0.913782	91378.206	90487.72	1325337.252	14.50	0.08014	83235.86	1024754.22	11.21	0.77
8	73	0.1040	0.895972	89597.2261	88621.48	1234849.536	13.78	0.08907	80727.82	941518.36	10.51	0.76
9	74	0.1235	0.876457	87645.7373	86579.22	1146228.054	13.08	0.09900	78008.19	860790.53	9.82	0.75
10	75	0.1449	0.855127	85512.7045	84350.20	1059648.833	12.39	0.11001	75070.75	782782.34	9.15	0.74
11	76	0.1681	0.831877	83187.6903	81924.47	975298.636	11.72	0.12221	71912.16	707711.59	8.51	0.73
12	77	0.1934	0.806613	80661.2593	79293.36	893374.161	11.08	0.13570	68532.86	635799.43	7.88	0.71
13	78	0.2207	0.779255	77925.4669	76449.95	814080.798	10.45	0.15058	64937.84	567266.57	7.28	0.70
14	79	0.2503	0.749744	74974.4352	73389.73	737630.847	9.84	0.16695	61137.63	502328.73	6.70	0.68
15	80	0.2819	0.71805	71805.0171	70111.28	664241.121	9.25	0.18488	57149.12	441191.09	6.14	0.66
16	81	0.3158	0.684175	68417.5401	66617.08	594129.842	8.68	0.20446	52996.33	384041.97	5.61	0.65
17	82	0.3518	0.648166	64816.6159	62914.30	527512.764	8.14	0.22576	48710.96	331045.64	5.11	0.63
18	83	0.3899	0.61012	61011.9867	59015.68	464598.463	7.61	0.24880	44332.59	282334.69	4.63	0.61
19	84	0.4298	0.570194	57019.3645	54940.28	405582.787	7.11	0.27360	39908.48	238002.10	4.17	0.59
20	85	0.4714	0.528612	52861.2042	50714.27	350642.503	6.63	0.30014	35492.73	198093.62	3.75	0.56
21	86	0.5143	0.485673	48567.3287	46371.32	299928.236	6.18	0.32836	31144.83	162600.89	3.35	0.54
22	87	0.5582	0.441753	44175.3057	41952.88	253556.919	5.74	0.35815	26927.50	131456.06	2.98	0.52
23	88	0.6027	0.397305	39730.4628	37507.94	211604.035	5.33	0.38936	22903.83	104528.56	2.63	0.49
24	89	0.6471	0.352854	35285.4127	33092.19	174096.097	4.93	0.42180	19133.96	81624.73	2.31	0.47
25	90	0.6910	0.30899	30898.9728	28766.68	141003.904	4.56	0.45522	15671.42	62490.77	2.02	0.44
26	91	0.7337	0.266344	26634.3822	24595.58	112237.227	4.21	0.48936	12559.57	46819.36	1.76	0.42
27	92	0.7744	0.225568	22556.7743	20643.36	87641.649	3.89	0.52389	9828.54	34259.79	1.52	0.39
28	93	0.8127	0.187299	18729.9431	16971.25	66998.290	3.58	0.55849	7492.97	24431.25	1.30	0.36
29	94	0.8479	0.152126	15212.5539	13633.32	50027.042	3.29	0.59282	5551.18	16938.27	1.11	0.34
30	95	0.8795	0.120541	12054.0794	10672.48	36393.725	3.02	0.62655	3985.61	11387.09	0.94	0.31
31	96	0.9071	0.092909	9290.87905	8116.91	25721.246	2.77	0.65937	2764.90	7401.48	0.80	0.29
32	97	0.9306	0.069429	6942.94048	5977.39	17604.336	2.54	0.69097	1847.17	4636.58	0.67	0.26
33	98	0.9499	0.050118	5011.84282	4246.14	11626.944	2.32	0.72113	1184.11	2789.41	0.56	0.24
34	99	0.9652	0.034804	3480.4275	2897.45	7380.809	2.12	0.74964	725.40	1605.30	0.46	0.22
35	100	0.9769	0.023145	2314.46402	1890.37	4483.363	1.94	0.77635	422.78	879.90	0.38	0.20
36	101	0.9853	0.014663	1466.2737	1173.08	2592.994	1.77	0.80115	233.26	457.12	0.31	0.18
37	102	0.9912	0.008799	879.882809	688.40	1419.916	1.61	0.82401	121.15	223.86	0.25	0.16
38	103	0.9950	0.004969	496.913676	379.56	731.518	1.47	0.84490	58.87	102.71	0.21	0.14
39	104	0.9974	0.002622	262.211653	195.23	351.955	1.34	0.86387	26.58	43.84	0.17	0.12
40	105	0.9987	0.001282	128.243233	92.93	156.728	1.22	0.88096	11.06	17.26	0.13	0.11

B10. Life table calculations for immigrant, Black, women, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99786.70	2569066.468	25.69	0.03529	96264.83	2012518.91	20.13	0.78
1	66	0.0043	0.995734	99573.4049	99335.84	2469279.765	24.80	0.03912	95449.45	1916254.08	19.24	0.78
2	67	0.0090	0.990983	99098.2774	98833.83	2369943.924	23.92	0.04340	94544.43	1820804.63	18.37	0.77
3	68	0.0143	0.985694	98569.3808	98275.18	2271110.095	23.04	0.04818	93540.72	1726260.20	17.51	0.76
4	69	0.0202	0.97981	97980.9845	97653.91	2172834.912	22.18	0.05351	92428.66	1632719.47	16.66	0.75
5	70	0.0267	0.973268	97326.8356	96963.48	2075181.002	21.32	0.05946	91197.98	1540290.81	15.83	0.74
6	71	0.0340	0.966001	96600.1342	96196.82	1978217.517	20.48	0.06610	89837.88	1449092.83	15.00	0.73
7	72	0.0421	0.957935	95793.5139	95346.27	1882020.693	19.65	0.07351	88337.15	1359254.94	14.19	0.72
8	73	0.0510	0.94899	94899.0296	94403.59	1786674.422	18.83	0.08177	86684.32	1270917.79	13.39	0.71
9	74	0.0609	0.939082	93908.1568	93359.98	1692270.829	18.02	0.09096	84867.85	1184233.47	12.61	0.70
10	75	0.0719	0.928118	92811.804	92206.07	1598910.848	17.23	0.10118	82876.46	1099365.63	11.85	0.69
11	76	0.0840	0.916003	91600.344	90932.01	1506704.774	16.45	0.11253	80699.46	1016489.17	11.10	0.67
12	77	0.0974	0.902637	90263.6688	89527.47	1415772.768	15.68	0.12510	78327.22	935789.71	10.37	0.66
13	78	0.1121	0.887913	88791.2726	87981.82	1326245.297	14.94	0.13901	75751.71	857462.49	9.66	0.65
14	79	0.1283	0.871724	87172.3725	86284.22	1238263.475	14.20	0.15434	72967.11	781710.78	8.97	0.63
15	80	0.1460	0.853961	85396.0714	84423.82	1151979.253	13.49	0.17120	69970.61	708743.66	8.30	0.62
16	81	0.1655	0.834516	83451.5731	82390.02	1067555.430	12.79	0.18967	66763.12	638773.05	7.65	0.60
17	82	0.1867	0.813285	81328.4583	80172.74	985165.415	12.11	0.20983	63350.16	572009.94	7.03	0.58
18	83	0.2098	0.79017	79017.0281	77762.88	904992.671	11.45	0.23173	59742.66	508659.78	6.44	0.56
19	84	0.2349	0.765087	76508.7252	75152.68	827229.795	10.81	0.25541	55957.72	448917.12	5.87	0.54
20	85	0.2620	0.737966	73796.6367	72336.36	752077.114	10.19	0.28087	52019.17	392959.40	5.32	0.52
21	86	0.2912	0.708761	70876.0819	69310.68	679740.755	9.59	0.30807	47957.89	340940.23	4.81	0.50
22	87	0.3225	0.677453	67745.2826	66075.69	610430.072	9.01	0.33695	43811.78	292982.34	4.32	0.48
23	88	0.3559	0.644061	64406.1061	62635.48	544354.378	8.45	0.36737	39625.28	249170.56	3.87	0.46
24	89	0.3914	0.608649	60864.8608	58998.99	481718.895	7.91	0.39917	35448.34	209545.28	3.44	0.43
25	90	0.4287	0.571331	57133.1138	55180.80	422719.907	7.40	0.43214	31334.85	174096.94	3.05	0.41
26	91	0.4677	0.532285	53228.4797	51201.90	367539.111	6.90	0.46603	27340.52	142762.09	2.68	0.39
27	92	0.5082	0.491753	49175.3173	47090.28	316337.212	6.43	0.50052	23520.43	115421.57	2.35	0.36
28	93	0.5499	0.450052	45005.2475	42881.32	269246.930	5.98	0.53532	19926.18	91901.14	2.04	0.34
29	94	0.5924	0.407574	40757.3906	38617.80	226365.611	5.55	0.57007	16603.14	71974.96	1.77	0.32
30	95	0.6352	0.364782	36478.2061	34349.51	187747.812	5.15	0.60442	13587.89	55371.82	1.52	0.29
31	96	0.6778	0.322208	32220.8171	30132.26	153398.301	4.76	0.63806	10906.19	41783.93	1.30	0.27
32	97	0.7196	0.280437	28043.7095	26026.22	123266.037	4.40	0.67065	8571.61	30877.75	1.10	0.25
33	98	0.7599	0.240087	24008.733	22093.56	97239.816	4.05	0.70194	6585.17	22306.14	0.93	0.23
34	99	0.7982	0.201784	20178.3904	18395.44	75146.254	3.72	0.73168	4935.83	15720.97	0.78	0.21
35	100	0.8339	0.166125	16612.4907	14988.43	56750.814	3.42	0.75969	3601.86	10785.14	0.65	0.19
36	101	0.8664	0.133644	13364.3614	11920.65	41762.388	3.12	0.78583	2552.99	7183.28	0.54	0.17
37	102	0.8952	0.104769	10476.9421	9228.07	29841.736	2.85	0.81003	1753.05	4630.29	0.44	0.16
38	103	0.9202	0.079792	7979.20667	6931.32	20613.662	2.58	0.83225	1162.76	2877.25	0.36	0.14
39	104	0.9412	0.058834	5883.43787	5033.66	13682.339	2.33	0.85249	742.53	1714.49	0.29	0.13
40	105	0.9582	0.041839	4183.87807	3520.52	8648.681	2.07	0.87080	454.85	971.96	0.23	0.11

B11. Life table calculations for non-immigrant, Hispanic, women, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99705.54	2315246.109	23.15	0.03245	96469.63	1900990.37	19.01	0.82
1	66	0.0059	0.994111	99411.0859	99083.70	2215540.566	22.29	0.03599	95517.90	1804520.74	18.15	0.81
2	67	0.0124	0.987563	98756.3054	98392.57	2116456.870	21.43	0.03994	94463.20	1709002.85	17.31	0.81
3	68	0.0197	0.980288	98028.8328	97625.05	2018064.301	20.59	0.04435	93295.63	1614539.65	16.47	0.80
4	69	0.0278	0.972213	97221.27	96773.45	1920439.249	19.75	0.04928	92004.65	1521244.02	15.65	0.79
5	70	0.0367	0.963256	96325.6335	95829.49	1823665.798	18.93	0.05479	90579.24	1429239.37	14.84	0.78
6	71	0.0467	0.953334	95333.3513	94784.31	1727836.305	18.12	0.06094	89007.96	1338660.13	14.04	0.77
7	72	0.0576	0.942353	94235.2745	93628.49	1633051.992	17.33	0.06781	87279.13	1249652.17	13.26	0.77
8	73	0.0698	0.930217	93021.7062	92352.08	1539423.502	16.55	0.07548	85381.05	1162373.04	12.50	0.76
9	74	0.0832	0.916825	91682.4535	90944.68	1447071.422	15.78	0.08403	83302.28	1076991.99	11.75	0.74
10	75	0.0979	0.902069	90206.9086	89395.54	1356126.741	15.03	0.09356	81032.02	993689.72	11.02	0.73
11	76	0.1142	0.885842	88584.1654	87693.67	1266731.204	14.30	0.10415	78560.59	912657.70	10.30	0.72
12	77	0.1320	0.868032	86803.1799	85828.08	1179037.531	13.58	0.11591	75879.95	834097.11	9.61	0.71
13	78	0.1515	0.84853	84852.9808	83787.96	1093209.451	12.88	0.12894	72984.38	758217.16	8.94	0.69
14	79	0.1728	0.827229	82722.9412	81563.03	1009421.490	12.20	0.14335	69871.25	685232.77	8.28	0.68
15	80	0.1960	0.804031	80403.1189	79143.90	927858.460	11.54	0.15923	66541.80	615361.52	7.65	0.66
16	81	0.2212	0.778847	77884.6731	76522.52	848714.564	10.90	0.17669	63002.08	548819.73	7.05	0.65
17	82	0.2484	0.751604	75160.3638	73692.75	772192.046	10.27	0.19580	59263.82	485817.64	6.46	0.63
18	83	0.2777	0.722251	72225.1377	70650.97	698499.295	9.67	0.21664	55345.21	426553.83	5.91	0.61
19	84	0.3092	0.690768	69076.7975	67396.77	627848.327	9.09	0.23926	51271.62	371208.62	5.37	0.59
20	85	0.3428	0.657167	65716.7475	63933.77	560451.555	8.53	0.26368	47076.02	319937.00	4.87	0.57
21	86	0.3785	0.621508	62150.7954	60270.39	496517.783	7.99	0.28988	42798.99	272860.97	4.39	0.55
22	87	0.4161	0.5839	58389.98	56420.68	436247.396	7.47	0.31783	38488.27	230061.99	3.94	0.53
23	88	0.4555	0.544514	54451.3784	52405.10	379826.716	6.98	0.34743	34197.80	191573.72	3.52	0.50
24	89	0.4964	0.503588	50358.8274	48251.15	327421.613	6.50	0.37854	29985.96	157375.92	3.13	0.48
25	90	0.5386	0.461435	46143.4756	43993.77	279170.462	6.05	0.41098	25913.31	127389.96	2.76	0.46
26	91	0.5816	0.418441	41844.0647	39675.44	235176.692	5.62	0.44450	22039.70	101476.65	2.43	0.43
27	92	0.6249	0.375068	37506.8222	35345.83	195501.248	5.21	0.47884	18421.00	79436.95	2.12	0.41
28	93	0.6682	0.331848	33184.8456	31060.86	160155.414	4.83	0.51367	15105.78	61015.95	1.84	0.38
29	94	0.7106	0.289369	28936.8655	26881.09	129094.559	4.46	0.54867	12132.17	45910.17	1.59	0.36
30	95	0.7517	0.248253	24825.3064	22869.47	102213.473	4.12	0.58349	9525.35	33778.00	1.36	0.33
31	96	0.7909	0.209136	20913.6241	19088.30	79344.007	3.79	0.61778	7295.96	24252.65	1.16	0.31
32	97	0.8274	0.17263	17262.9821	15595.72	60255.704	3.49	0.65120	5439.71	16956.69	0.98	0.28
33	98	0.8607	0.139285	13928.4512	12441.75	44659.988	3.21	0.68347	3938.22	11516.98	0.83	0.26
34	99	0.8904	0.10955	10955.0416	9664.52	32218.241	2.94	0.71430	2761.15	7578.76	0.69	0.24
35	100	0.9163	0.08374	8374.00813	7286.98	22553.717	2.69	0.74349	1869.20	4817.61	0.58	0.21
36	101	0.9380	0.062	6199.9536	5314.61	15266.736	2.46	0.77086	1217.77	2948.41	0.48	0.19
37	102	0.9557	0.044293	4429.26661	3734.80	9952.126	2.25	0.79631	760.73	1730.64	0.39	0.17
38	103	0.9696	0.030403	3040.32767	2518.01	6217.328	2.04	0.81977	453.81	969.90	0.32	0.16
39	104	0.9800	0.019957	1995.68506	1620.87	3699.322	1.85	0.84123	257.34	516.09	0.26	0.14
40	105	0.9875	0.012461	1246.06155	990.86	2078.449	1.67	0.86072	138.01	258.75	0.21	0.12

B12. Life table calculations for immigrant, Hispanic, women, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99581.71	2047175.967	20.47	0.07197	92415.03	1503314.93	15.03	0.73
1	66	0.0084	0.991634	99163.4227	98699.58	1947594.256	19.64	0.07945	90857.98	1410899.89	14.23	0.72
2	67	0.0176	0.982357	98235.7338	97721.92	1848894.677	18.82	0.08773	89148.69	1320041.91	13.44	0.71
3	68	0.0279	0.972081	97208.0975	96639.59	1751172.762	18.01	0.09689	87276.19	1230893.22	12.66	0.70
4	69	0.0393	0.960711	96071.0916	95442.92	1654533.167	17.22	0.10701	85229.76	1143617.03	11.90	0.69
5	70	0.0519	0.948147	94814.7398	94121.65	1559090.252	16.44	0.11817	82999.34	1058387.28	11.16	0.68
6	71	0.0657	0.934286	93428.569	92665.13	1464968.597	15.68	0.13046	80575.89	975387.94	10.44	0.67
7	72	0.0810	0.919017	91901.6965	91062.33	1372303.464	14.93	0.14397	77951.94	894812.05	9.74	0.65
8	73	0.0978	0.90223	90222.9549	89302.01	1281241.139	14.20	0.15879	75122.12	816860.11	9.05	0.64
9	74	0.1162	0.883811	88381.0617	87372.95	1191939.130	13.49	0.17499	72083.90	741737.99	8.39	0.62
10	75	0.1364	0.863648	86364.8434	85264.18	1104566.178	12.79	0.19265	68838.21	669654.09	7.75	0.61
11	76	0.1584	0.841635	84163.5217	82965.30	1019301.995	12.11	0.21184	65390.30	600815.88	7.14	0.59
12	77	0.1823	0.817671	81767.0711	80466.86	936336.699	11.45	0.23260	61750.41	535425.57	6.55	0.57
13	78	0.2083	0.791667	79166.6561	77760.90	855869.835	10.81	0.25497	57934.50	473675.16	5.98	0.55
14	79	0.2364	0.763552	76355.1529	74841.46	778108.931	10.19	0.27895	53964.76	415740.66	5.44	0.53
15	80	0.2667	0.733278	73327.76	71705.23	703267.474	9.59	0.30451	49870.03	361775.90	4.93	0.51
16	81	0.2992	0.700827	70082.6931	68352.32	631562.248	9.01	0.33161	45685.76	311905.87	4.45	0.49
17	82	0.3338	0.66622	66621.9555	64787.06	563209.924	8.45	0.36015	41453.70	266220.11	4.00	0.47
18	83	0.3705	0.629522	62952.1633	61018.78	498422.864	7.92	0.39001	37221.14	224766.41	3.57	0.45
19	84	0.4091	0.590854	59085.3904	57062.69	437404.087	7.40	0.42100	33039.54	187545.27	3.17	0.43
20	85	0.4496	0.5504	55039.9855	52940.64	380341.399	6.91	0.45292	28962.82	154505.72	2.81	0.41
21	86	0.4916	0.508413	50841.2905	48681.73	327400.761	6.44	0.48553	25045.08	125542.91	2.47	0.38
22	87	0.5348	0.465222	46522.1728	44322.72	278719.030	5.99	0.51857	21338.15	100497.83	2.16	0.36
23	88	0.5788	0.421233	42123.2648	39908.03	234396.311	5.56	0.55175	17888.89	79159.67	1.88	0.34
24	89	0.6231	0.376928	37692.7911	35489.32	194488.283	5.16	0.58476	14736.65	61270.78	1.63	0.32
25	90	0.6671	0.332859	33285.8579	31124.48	158998.958	4.78	0.61731	11911.03	46534.13	1.40	0.29
26	91	0.7104	0.289631	28963.095	26875.83	127874.482	4.42	0.64912	9430.32	34623.10	1.20	0.27
27	92	0.7521	0.247886	24788.5741	22807.78	100998.647	4.07	0.67991	7300.53	25192.78	1.02	0.25
28	93	0.7917	0.20827	20826.9898	18983.59	78190.865	3.75	0.70946	5515.47	17892.25	0.86	0.23
29	94	0.8286	0.171402	17140.185	15461.70	59207.278	3.45	0.73757	4057.61	12376.78	0.72	0.21
30	95	0.8622	0.137832	13783.224	12291.79	43745.574	3.17	0.76408	2899.86	8319.17	0.60	0.19
31	96	0.8920	0.108003	10800.35	9510.82	31453.787	2.91	0.78888	2007.91	5419.31	0.50	0.17
32	97	0.9178	0.082213	8221.29051	7139.87	21942.966	2.67	0.81190	1343.00	3411.41	0.41	0.16
33	98	0.9394	0.060585	6058.45591	5182.01	14803.093	2.44	0.83311	864.83	2068.40	0.34	0.14
34	99	0.9569	0.043056	4305.56999	3621.86	9621.080	2.23	0.85251	534.18	1203.57	0.28	0.13
35	100	0.9706	0.029382	2938.15199	2427.08	5999.219	2.04	0.87015	315.17	669.39	0.23	0.11
36	101	0.9808	0.01916	1916.01325	1551.79	3572.137	1.86	0.88607	176.79	354.22	0.18	0.10
37	102	0.9881	0.011876	1187.57296	941.49	2020.343	1.70	0.90038	93.79	177.43	0.15	0.09
38	103	0.9930	0.006954	695.405492	538.76	1078.854	1.55	0.91316	46.78	83.64	0.12	0.08
39	104	0.9962	0.003821	382.119276	288.84	540.092	1.41	0.92453	21.80	36.86	0.10	0.07
40	105	0.9980	0.001956	195.551553	143.98	251.256	1.28	0.93458	9.42	15.06	0.08	0.06

B13. Life table calculations for white immigrants who immigrated earlier-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99602.55	2186586.919	21.87	0.03182	96433.41	1911936.46	19.12	0.87
1	66	0.0079	0.992051	99205.1015	98767.80	2086984.368	21.04	0.03398	95412.11	1815503.05	18.30	0.87
2	67	0.0167	0.983305	98330.4908	97849.78	1988216.572	20.22	0.03637	94290.87	1720090.94	17.49	0.87
3	68	0.0263	0.973691	97369.0616	96841.17	1890366.796	19.41	0.03903	93061.19	1625800.07	16.70	0.86
4	69	0.0369	0.963133	96313.2767	95734.23	1793525.626	18.62	0.04199	91714.14	1532738.87	15.91	0.85
5	70	0.0484	0.951552	95155.1919	94520.84	1697791.392	17.84	0.04529	90240.42	1441024.74	15.14	0.85
6	71	0.0611	0.938865	93886.494	93192.53	1603270.549	17.08	0.04895	88630.49	1350784.32	14.39	0.84
7	72	0.0750	0.924986	92498.5596	91740.55	1510078.022	16.33	0.05304	86874.63	1262153.83	13.65	0.84
8	73	0.0902	0.909825	90982.5358	90155.99	1418337.475	15.59	0.05760	84963.16	1175279.20	12.92	0.83
9	74	0.1067	0.893294	89329.4487	88429.90	1328181.482	14.87	0.06269	82886.65	1090316.03	12.21	0.82
10	75	0.1247	0.875303	87530.3451	86553.41	1239751.585	14.16	0.06837	80636.13	1007429.39	11.51	0.81
11	76	0.1442	0.855765	85576.4714	84517.98	1153198.177	13.48	0.07471	78203.52	926793.26	10.83	0.80
12	77	0.1654	0.834595	83459.4956	82315.64	1068680.194	12.80	0.08180	75581.98	848589.73	10.17	0.79
13	78	0.1883	0.811718	81171.7772	79939.23	986364.557	12.15	0.08973	72766.38	773007.76	9.52	0.78
14	79	0.2129	0.787067	78706.6889	77382.84	906425.324	11.52	0.09859	69753.91	700241.38	8.90	0.77
15	80	0.2394	0.76059	76058.994	74642.14	829042.483	10.90	0.10848	66544.69	630487.47	8.29	0.76
16	81	0.2677	0.732253	73225.2784	71714.86	754400.347	10.30	0.11953	63142.48	563942.78	7.70	0.75
17	82	0.2980	0.702044	70204.4365	68601.32	682685.489	9.72	0.13186	59555.43	500800.30	7.13	0.73
18	83	0.3300	0.669982	66998.2026	65304.96	614084.169	9.17	0.14560	55796.83	441244.86	6.59	0.72
19	84	0.3639	0.636117	63611.7162	61832.91	548779.210	8.63	0.16087	51885.84	385448.03	6.06	0.70
20	85	0.3995	0.600541	60054.1002	58196.56	486946.302	8.11	0.17782	47848.07	333562.19	5.55	0.69
21	86	0.4366	0.56339	56339.0238	54412.12	428749.740	7.61	0.19658	43716.02	285714.13	5.07	0.67
22	87	0.4751	0.524852	52485.2105	50501.03	374337.623	7.13	0.21726	39529.18	241998.11	4.61	0.65
23	88	0.5148	0.485168	48516.8419	46490.32	323836.597	6.67	0.23998	35333.67	202468.93	4.17	0.63
24	89	0.5554	0.444638	44463.7974	42412.73	277346.277	6.24	0.26481	31181.45	167135.26	3.76	0.60
25	90	0.5964	0.403617	40361.6603	38306.54	234933.548	5.82	0.29180	27128.74	135953.81	3.37	0.58
26	91	0.6375	0.362514	36251.419	34215.11	196627.008	5.42	0.32095	23233.94	108825.07	3.00	0.55
27	92	0.6782	0.321788	32178.792	30185.95	162411.903	5.05	0.35219	19554.75	85591.13	2.66	0.53
28	93	0.7181	0.281931	28193.1178	26269.45	132225.948	4.69	0.38541	16144.90	66036.39	2.34	0.50
29	94	0.7565	0.243458	24345.7776	22516.97	105956.500	4.35	0.42041	13050.57	49891.48	2.05	0.47
30	95	0.7931	0.206882	20688.1568	18978.68	83439.533	4.03	0.45692	10306.94	36840.92	1.78	0.44
31	96	0.8273	0.172692	17269.2081	15700.98	64460.851	3.73	0.49459	7935.42	26533.97	1.54	0.41
32	97	0.8587	0.141327	14132.7456	12723.71	48759.874	3.45	0.53301	5941.80	18598.55	1.32	0.38
33	98	0.8869	0.113147	11314.6767	10077.56	36036.163	3.18	0.57173	4315.93	12656.75	1.12	0.35
34	99	0.9116	0.088404	8840.44276	7781.72	25958.603	2.94	0.61025	3032.96	8340.82	0.94	0.32
35	100	0.9328	0.06723	6722.98853	5842.29	18176.887	2.70	0.64807	2056.09	5307.87	0.79	0.29
36	101	0.9504	0.049616	4961.58408	4251.68	12334.601	2.49	0.68472	1340.47	3251.78	0.66	0.26
37	102	0.9646	0.035418	3541.76792	2989.16	8082.925	2.28	0.71977	837.66	1911.30	0.54	0.24
38	103	0.9756	0.024366	2436.56088	2022.74	5093.760	2.09	0.75285	499.93	1073.64	0.44	0.21
39	104	0.9839	0.016089	1608.91798	1312.04	3071.021	1.91	0.78367	283.84	573.71	0.36	0.19
40	105	0.9898	0.010152	1015.17153	812.09	1758.976	1.73	0.81203	152.65	289.88	0.29	0.16

B14. Life table calculations for Black immigrants who immigrated earlier-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99692.51	2396129.755	23.96	0.03919	95785.53	1997509.56	19.98	0.83
1	66	0.0061	0.99385	99385.0215	99046.05	2296437.244	23.11	0.04183	94903.32	1901724.03	19.13	0.83
2	67	0.0129	0.987071	98707.0789	98333.67	2197391.194	22.26	0.04475	93933.26	1806820.71	18.30	0.82
3	68	0.0204	0.979603	97960.2582	97549.24	2099057.525	21.43	0.04799	92867.45	1712887.46	17.49	0.82
4	69	0.0286	0.971382	97138.212	96686.18	2001508.290	20.60	0.05160	91697.51	1620020.01	16.68	0.81
5	70	0.0377	0.962342	96234.1569	95737.52	1904822.106	19.79	0.05560	90414.58	1528322.50	15.88	0.80
6	71	0.0476	0.952409	95240.8793	94695.82	1809084.587	18.99	0.06005	89009.39	1437907.92	15.10	0.79
7	72	0.0585	0.941508	94150.7523	93553.26	1714388.772	18.21	0.06500	87472.33	1348898.53	14.33	0.79
8	73	0.0704	0.929558	92955.7663	92301.67	1620835.512	17.44	0.07051	85793.55	1261426.20	13.57	0.78
9	74	0.0835	0.916476	91647.5763	90932.57	1528533.841	16.68	0.07664	83963.16	1175632.65	12.83	0.77
10	75	0.0978	0.902176	90217.5705	89437.27	1437601.268	15.93	0.08348	81971.37	1091669.49	12.10	0.76
11	76	0.1134	0.88657	88656.9638	87806.94	1348164.000	15.21	0.09109	79808.82	1009698.12	11.39	0.75
12	77	0.1304	0.869569	86956.9205	86032.82	1260357.058	14.49	0.09957	77466.85	929889.30	10.69	0.74
13	78	0.1489	0.851087	85108.7124	84106.31	1174324.242	13.80	0.10901	74937.97	852422.45	10.02	0.73
14	79	0.1690	0.831039	83103.9165	82019.29	1090217.927	13.12	0.11952	72216.31	777484.48	9.36	0.71
15	80	0.1907	0.809347	80934.6568	79764.28	1008198.641	12.46	0.13121	69298.19	705268.17	8.71	0.70
16	81	0.2141	0.785939	78593.897	77334.84	928434.364	11.81	0.14420	66182.85	635969.98	8.09	0.68
17	82	0.2392	0.760758	76075.7845	74725.92	851099.523	11.19	0.15862	62873.09	569787.13	7.49	0.67
18	83	0.2662	0.733761	73376.0502	71934.26	776373.606	10.58	0.17458	59376.13	506914.04	6.91	0.65
19	84	0.2951	0.704925	70492.4613	68958.89	704439.350	9.99	0.19221	55704.39	447537.91	6.35	0.64
20	85	0.3257	0.674253	67425.3245	65801.68	635480.457	9.42	0.21163	51876.24	391833.52	5.81	0.62
21	86	0.3582	0.64178	64178.0277	62467.82	569678.781	8.88	0.23294	47916.63	339957.28	5.30	0.60
22	87	0.3924	0.607576	60757.6056	58966.46	507210.964	8.35	0.25623	43857.52	292040.65	4.81	0.58
23	88	0.4282	0.571753	57175.3049	55311.21	448244.509	7.84	0.28156	39737.99	248183.13	4.34	0.55
24	89	0.4655	0.534471	53447.1151	51520.67	392933.299	7.35	0.30894	35603.82	208445.14	3.90	0.53
25	90	0.5041	0.495942	49594.2212	47618.77	341412.631	6.88	0.33836	31506.56	172841.32	3.49	0.51
26	91	0.5436	0.456433	45643.3245	43635.05	293793.858	6.44	0.36973	27501.97	141334.76	3.10	0.48
27	92	0.5837	0.416268	41626.7666	39604.58	250158.813	6.01	0.40290	23647.73	113832.79	2.73	0.46
28	93	0.6242	0.375824	37582.3881	35567.72	210554.235	5.60	0.43768	20000.55	90185.06	2.40	0.43
29	94	0.6645	0.33553	33553.0486	31569.40	174986.517	5.22	0.47376	16612.92	70184.52	2.09	0.40
30	95	0.7041	0.295857	29585.745	27658.01	143417.120	4.85	0.51082	13529.67	53571.59	1.81	0.37
31	96	0.7427	0.257303	25730.281	23883.88	115759.107	4.50	0.54845	10784.78	40041.92	1.56	0.35
32	97	0.7796	0.220375	22037.4745	20297.21	91875.229	4.17	0.58620	8398.91	29257.14	1.33	0.32
33	98	0.8144	0.185569	18556.9356	16945.72	71578.024	3.86	0.62362	6377.98	20858.22	1.12	0.29
34	99	0.8467	0.153345	15334.5107	13872.03	54632.301	3.56	0.66025	4713.08	14480.24	0.94	0.27
35	100	0.8759	0.124096	12409.5592	11110.93	40760.266	3.28	0.69564	3381.77	9767.16	0.79	0.24
36	101	0.9019	0.098123	9812.30137	8686.92	29649.336	3.02	0.72940	2350.66	6385.40	0.65	0.22
37	102	0.9244	0.075615	7561.53218	6612.28	20962.419	2.77	0.76122	1578.91	4034.73	0.53	0.19
38	103	0.9434	0.05663	5663.02543	4885.98	14350.140	2.53	0.79082	1022.03	2455.82	0.43	0.17
39	104	0.9589	0.041089	4108.92467	3493.63	9464.165	2.30	0.81805	635.66	1433.79	0.35	0.15
40	105	0.9712	0.028783	2878.33334	2408.75	5970.536	2.07	0.84281	378.63	798.13	0.28	0.13

B15. Life table calculations for Hispanic immigrants who immigrated earlier-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99417.05	1885740.966	18.86	0.07074	92384.15	1517539.30	15.18	0.80
1	66	0.0117	0.988341	98834.098	98195.22	1786323.917	18.07	0.07533	90797.87	1425155.14	14.42	0.80
2	67	0.0244	0.975563	97556.3386	96857.11	1688128.699	17.30	0.08040	89069.61	1334357.27	13.68	0.79
3	68	0.0384	0.961579	96157.8865	95393.76	1591271.586	16.55	0.08600	87190.06	1245287.67	12.95	0.78
4	69	0.0537	0.946296	94629.6414	93795.99	1495877.822	15.81	0.09218	85150.13	1158097.61	12.24	0.77
5	70	0.0704	0.929623	92962.3408	92054.52	1402081.831	15.08	0.09900	82941.17	1072947.48	11.54	0.77
6	71	0.0885	0.911467	91146.6964	90160.13	1310027.313	14.37	0.10653	80555.25	990006.31	10.86	0.76
7	72	0.1083	0.891736	89173.5664	88103.87	1219867.181	13.68	0.11485	77985.55	909451.06	10.20	0.75
8	73	0.1297	0.870342	87034.172	85877.27	1131763.312	13.00	0.12402	75226.81	831465.51	9.55	0.73
9	74	0.1528	0.847204	84720.361	83472.64	1045886.045	12.35	0.13414	72275.80	756238.71	8.93	0.72
10	75	0.1778	0.822249	82224.9248	80883.45	962413.403	11.70	0.14529	69131.94	683962.90	8.32	0.71
11	76	0.2046	0.79542	79541.9709	78104.66	881529.955	11.08	0.15757	65797.89	614830.96	7.73	0.70
12	77	0.2333	0.766674	76667.3536	75133.26	803425.292	10.48	0.17107	62280.23	549033.07	7.16	0.68
13	78	0.2640	0.735992	73599.1606	71968.71	728292.035	9.90	0.18589	58590.17	486752.84	6.61	0.67
14	79	0.2966	0.703382	70338.2498	68613.54	656323.330	9.33	0.20214	54744.20	428162.68	6.09	0.65
15	80	0.3311	0.668888	66888.8258	65073.93	587709.792	8.79	0.21989	50764.63	373418.48	5.58	0.64
16	81	0.3674	0.63259	63259.0367	61360.30	522635.861	8.26	0.23925	46680.06	322653.85	5.10	0.62
17	82	0.4054	0.594616	59461.5652	57487.87	461275.560	7.76	0.26027	42525.47	275973.79	4.64	0.60
18	83	0.4449	0.555142	55514.1761	53477.17	403787.689	7.27	0.28302	38342.12	233448.32	4.21	0.58
19	84	0.4856	0.514402	51440.1723	49354.44	350310.515	6.81	0.30752	34176.89	195106.20	3.79	0.56
20	85	0.5273	0.472687	47268.7003	45151.77	300956.079	6.37	0.33378	30081.18	160929.31	3.40	0.53
21	86	0.5697	0.430348	43034.8369	40907.11	255804.310	5.94	0.36174	26109.19	130848.13	3.04	0.51
22	87	0.6122	0.387794	38779.3818	36663.83	214897.201	5.54	0.39134	22315.71	104738.94	2.70	0.49
23	88	0.6545	0.345483	34548.2825	32469.95	178233.369	5.16	0.42244	18753.36	82423.23	2.39	0.46
24	89	0.6961	0.303916	30391.6247	28376.89	145763.415	4.80	0.45485	15469.60	63669.87	2.09	0.44
25	90	0.7364	0.263621	26362.1459	24437.71	117386.530	4.45	0.48834	12503.68	48200.27	1.83	0.41
26	91	0.7749	0.225133	22513.265	20704.97	92948.824	4.13	0.52264	9883.82	35696.59	1.59	0.38
27	92	0.8110	0.188967	18896.6721	17228.13	72243.856	3.82	0.55740	7625.20	25812.77	1.37	0.36
28	93	0.8444	0.155596	15559.5935	14050.76	55015.723	3.54	0.59228	5728.79	18187.57	1.17	0.33
29	94	0.8746	0.125419	12541.9194	11207.69	40964.967	3.27	0.62690	4181.56	12458.78	0.99	0.30
30	95	0.9013	0.098735	9873.45844	8722.55	29757.278	3.01	0.66090	2957.86	8277.22	0.84	0.28
31	96	0.9243	0.075716	7571.63708	6605.81	21034.730	2.78	0.69390	2022.07	5319.36	0.70	0.25
32	97	0.9436	0.0564	5639.9846	4853.84	14428.919	2.56	0.72557	1332.02	3297.29	0.58	0.23
33	98	0.9593	0.040677	4067.70482	3449.12	9575.074	2.35	0.75564	842.81	1965.27	0.48	0.21
34	99	0.9717	0.028305	2830.53404	2361.72	6125.955	2.16	0.78387	510.43	1122.46	0.40	0.18
35	100	0.9811	0.018929	1892.91241	1552.10	3764.232	1.99	0.81009	294.76	612.02	0.32	0.16
36	101	0.9879	0.012113	1211.28081	974.69	2212.135	1.83	0.83418	161.62	317.27	0.26	0.14
37	102	0.9926	0.007381	738.096436	582.05	1237.447	1.68	0.85611	83.75	155.65	0.21	0.13
38	103	0.9957	0.00426	425.997638	328.75	655.400	1.54	0.87587	40.81	71.90	0.17	0.11
39	104	0.9977	0.002315	231.496173	174.58	326.653	1.41	0.89352	18.59	31.09	0.13	0.10
40	105	0.9988	0.001177	117.667532	86.60	152.071	1.29	0.90915	7.87	12.50	0.11	0.08

B16. Life table calculations for white immigrants who immigrated later-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99698.40	2412141.950	24.12	0.05281	94433.31	1914264.10	19.14	0.79
1	66	0.0060	0.993968	99396.806	99064.29	2312443.547	23.26	0.05631	93486.12	1819830.79	18.31	0.79
2	67	0.0127	0.987318	98731.7712	98365.42	2213379.258	22.42	0.06018	92445.71	1726344.67	17.49	0.78
3	68	0.0200	0.979991	97999.0682	97595.75	2115013.839	21.58	0.06447	91303.92	1633898.96	16.67	0.77
4	69	0.0281	0.971924	97192.4375	96748.81	2017418.086	20.76	0.06922	90052.11	1542595.04	15.87	0.76
5	70	0.0369	0.963052	96305.1842	95817.68	1920669.275	19.94	0.07448	88681.21	1452542.93	15.08	0.76
6	71	0.0467	0.953302	95330.1818	94795.03	1824851.592	19.14	0.08031	87181.81	1363861.72	14.31	0.75
7	72	0.0574	0.942599	94259.887	93673.13	1730056.558	18.35	0.08678	85544.27	1276679.91	13.54	0.74
8	73	0.0691	0.930864	93086.3669	92443.86	1636383.431	17.58	0.09395	83758.84	1191135.65	12.80	0.73
9	74	0.0820	0.918013	91801.3437	91098.80	1543939.575	16.82	0.10190	81815.88	1107376.81	12.06	0.72
10	75	0.0960	0.903963	90396.2584	89629.31	1452840.774	16.07	0.11071	79706.13	1025560.92	11.35	0.71
11	76	0.1114	0.888624	88862.3593	88026.59	1363211.465	15.34	0.12048	77420.99	945854.79	10.64	0.69
12	77	0.1281	0.871908	87190.8188	86281.85	1275184.876	14.63	0.13130	74952.93	868433.81	9.96	0.68
13	78	0.1463	0.853729	85372.8845	84386.48	1188903.025	13.93	0.14327	72296.02	793480.87	9.29	0.67
14	79	0.1660	0.834001	83400.0685	82332.22	1104516.548	13.24	0.15651	69446.41	721184.85	8.65	0.65
15	80	0.1874	0.812644	81264.3808	80111.50	1022184.324	12.58	0.17112	66403.02	651738.44	8.02	0.64
16	81	0.2104	0.789586	78958.6117	77717.64	942072.827	11.93	0.18721	63168.24	585335.43	7.41	0.62
17	82	0.2352	0.764767	76476.6654	75145.31	864355.189	11.30	0.20489	59748.70	522167.19	6.83	0.60
18	83	0.2619	0.738139	73813.9496	72390.88	789209.881	10.69	0.22427	56156.03	462418.49	6.26	0.59
19	84	0.2903	0.709678	70967.8175	69452.94	716818.998	10.10	0.24542	52407.55	406262.46	5.72	0.57
20	85	0.3206	0.679381	67938.0619	66332.76	647366.058	9.53	0.26843	48526.92	353854.91	5.21	0.55
21	86	0.3527	0.647275	64727.45	63034.87	581033.302	8.98	0.29334	44544.50	305328.00	4.72	0.53
22	87	0.3866	0.613423	61342.2859	59567.63	517998.434	8.44	0.32014	40497.40	260783.50	4.25	0.50
23	88	0.4221	0.57793	57792.9769	55943.78	458430.803	7.93	0.34883	36429.13	220286.10	3.81	0.48
24	89	0.4591	0.540946	54094.5736	52180.91	402487.028	7.44	0.37930	32388.72	183856.97	3.40	0.46
25	90	0.4973	0.502672	50267.2405	48301.92	350306.121	6.97	0.41143	28429.18	151468.25	3.01	0.43
26	91	0.5366	0.463366	46336.605	44335.26	302004.198	6.52	0.44501	24605.43	123039.07	2.66	0.41
27	92	0.5767	0.423339	42333.9242	40314.96	257668.933	6.09	0.47980	20971.68	98433.65	2.33	0.38
28	93	0.6170	0.38296	38295.9977	36280.38	217353.972	5.68	0.51548	17578.42	77461.97	2.02	0.36
29	94	0.6574	0.342648	34264.7571	32275.61	181073.595	5.28	0.55169	14469.37	59883.55	1.75	0.33
30	95	0.6971	0.302865	30286.464	28348.47	148797.984	4.91	0.58804	11678.57	45414.17	1.50	0.31
31	96	0.7359	0.264105	26410.4672	24548.98	120449.519	4.56	0.62409	9228.13	33735.60	1.28	0.28
32	97	0.7731	0.226875	22687.4971	20927.51	95900.537	4.23	0.65945	7126.86	24507.47	1.08	0.26
33	98	0.8083	0.191675	19167.5207	17532.38	74973.028	3.91	0.69371	5370.05	17380.61	0.91	0.23
34	99	0.8410	0.158972	15897.2411	14407.32	57440.647	3.61	0.72650	3940.39	12010.55	0.76	0.21
35	100	0.8708	0.129174	12917.3914	11588.72	43033.331	3.33	0.75752	2809.98	8070.17	0.62	0.19
36	101	0.8974	0.102601	10260.0518	9103.16	31444.609	3.06	0.78653	1943.24	5260.18	0.51	0.17
37	102	0.9205	0.079463	7946.27322	6965.30	22341.446	2.81	0.81335	1300.10	3316.94	0.42	0.15
38	103	0.9402	0.059843	5984.33024	5176.62	15376.145	2.57	0.83787	839.30	2016.85	0.34	0.13
39	104	0.9563	0.043689	4368.90928	3725.19	10199.525	2.33	0.86006	521.32	1177.55	0.27	0.12
40	105	0.9692	0.030815	3081.46456	2586.65	6474.338	2.10	0.87994	310.56	656.23	0.21	0.10

B17. Life table calculations for Black immigrants who immigrated later-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99804.32	2774852.017	27.75	0.04552	95261.16	2155081.10	21.55	0.78
1	66	0.0039	0.996086	99608.6327	99392.40	2675047.700	26.86	0.04856	94565.82	2059819.95	20.68	0.77
2	67	0.0082	0.991762	99176.1716	98937.35	2575655.298	25.97	0.05193	93799.57	1965254.12	19.82	0.76
3	68	0.0130	0.986985	98698.5185	98434.87	2476717.953	25.09	0.05566	92955.58	1871454.55	18.96	0.76
4	69	0.0183	0.981712	98171.216	97880.32	2378283.086	24.23	0.05981	92026.48	1778498.97	18.12	0.75
5	70	0.0241	0.975894	97589.4279	97268.67	2280402.764	23.37	0.06440	91004.34	1686472.49	17.28	0.74
6	71	0.0305	0.969479	96947.9218	96594.49	2183134.089	22.52	0.06951	89880.66	1595468.15	16.46	0.73
7	72	0.0376	0.962411	96241.0535	95851.91	2086539.601	21.68	0.07517	88646.46	1505587.49	15.64	0.72
8	73	0.0454	0.954628	95462.7568	95034.65	1990687.696	20.85	0.08147	87292.23	1416941.03	14.84	0.71
9	74	0.0539	0.946065	94606.5383	94136.01	1895653.049	20.04	0.08847	85808.10	1329648.80	14.05	0.70
10	75	0.0633	0.936655	93665.4802	93148.87	1801517.039	19.23	0.09624	84183.89	1243840.70	13.28	0.69
11	76	0.0737	0.926323	92632.2524	92065.69	1708368.173	18.44	0.10489	82409.32	1159656.80	12.52	0.68
12	77	0.0850	0.914991	91499.1371	90878.60	1616302.478	17.66	0.11449	80474.20	1077247.48	11.77	0.67
13	78	0.0974	0.902581	90258.0698	89579.38	1525423.875	16.90	0.12515	78368.71	996773.28	11.04	0.65
14	79	0.1110	0.889007	88900.6977	88159.58	1435844.491	16.15	0.13698	76083.80	918404.57	10.33	0.64
15	80	0.1258	0.874185	87418.4624	86610.59	1347684.911	15.42	0.15009	73611.62	842320.77	9.64	0.63
16	81	0.1420	0.858027	85802.7093	84923.77	1261074.325	14.70	0.16459	70946.08	768709.15	8.96	0.61
17	82	0.1596	0.840448	84044.8299	83090.64	1176150.556	13.99	0.18061	68083.46	697763.08	8.30	0.59
18	83	0.1786	0.821364	82136.4403	81103.02	1093059.921	13.31	0.19826	65023.20	629679.62	7.67	0.58
19	84	0.1993	0.800696	80069.603	78953.35	1011956.899	12.64	0.21766	61768.64	564656.42	7.05	0.56
20	85	0.2216	0.778371	77837.0945	76634.91	933003.550	11.99	0.23889	58327.92	502887.78	6.46	0.54
21	86	0.2457	0.754327	75432.7249	74142.22	856368.641	11.35	0.26203	54714.73	444559.86	5.89	0.52
22	87	0.2715	0.728517	72851.7092	71471.40	782226.424	10.74	0.28714	50949.09	389845.13	5.35	0.50
23	88	0.2991	0.700911	70091.0935	68620.66	710755.022	10.14	0.31423	47057.87	338896.04	4.84	0.48
24	89	0.3285	0.671502	67150.2304	65590.76	642134.360	9.56	0.34328	43075.02	291838.17	4.35	0.45
25	90	0.3597	0.640313	64031.2982	62385.57	576543.596	9.00	0.37419	39041.36	248763.15	3.89	0.43
26	91	0.3926	0.607398	60739.8485	59012.61	514158.023	8.46	0.40684	35003.86	209721.79	3.45	0.41
27	92	0.4271	0.572854	57285.3637	55483.58	455145.417	7.95	0.44102	31014.34	174717.93	3.05	0.38
28	93	0.4632	0.536818	53681.7934	51814.91	399661.838	7.45	0.47646	27127.44	143703.59	2.68	0.36
29	94	0.5005	0.49948	49948.0306	48028.15	347846.926	6.96	0.51282	23398.14	116576.15	2.33	0.34
30	95	0.5389	0.461083	46108.279	44150.27	299818.771	6.50	0.54975	19878.85	93178.01	2.02	0.31
31	96	0.5781	0.421923	42192.2511	40213.69	255668.506	6.06	0.58680	16616.29	73299.16	1.74	0.29
32	97	0.6176	0.382351	38235.1305	36256.18	215454.815	5.63	0.62355	13648.68	56682.88	1.48	0.26
33	98	0.6572	0.342772	34277.2282	32320.25	179198.636	5.23	0.65955	11003.35	43034.19	1.26	0.24
34	99	0.6964	0.303633	30363.2655	28452.25	146878.389	4.84	0.69439	8695.22	32030.84	1.05	0.22
35	100	0.7346	0.265412	26541.2314	24701.01	118426.141	4.46	0.72769	6726.26	23335.62	0.88	0.20
36	101	0.7714	0.228608	22860.7865	21116.01	93725.132	4.10	0.75913	5086.13	16609.37	0.73	0.18
37	102	0.8063	0.193712	19371.2296	17745.16	72609.124	3.75	0.78847	3753.72	11523.23	0.59	0.16
38	103	0.8388	0.161191	16119.0954	14632.31	54863.961	3.40	0.81551	2699.47	7769.52	0.48	0.14
39	104	0.8685	0.131455	13145.5218	11814.56	40231.653	3.06	0.84018	1888.22	5070.05	0.39	0.13
40	105	0.8952	0.104836	10483.5954	9319.77	28417.094	2.71	0.86243	1282.10	3181.83	0.30	0.11

B18. Life table calculations for Hispanic immigrants who immigrated later-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99601.87	2185204.215	21.85	0.06654	92974.36	1712033.31	17.12	0.78
1	66	0.0080	0.992037	99203.7351	98765.68	2085602.347	21.02	0.07088	91765.19	1619058.95	16.32	0.78
2	67	0.0167	0.983276	98327.6338	97846.11	1986836.663	20.21	0.07567	90441.74	1527293.76	15.53	0.77
3	68	0.0264	0.973646	97364.5815	96835.81	1888990.555	19.40	0.08097	88995.03	1436852.02	14.76	0.76
4	69	0.0369	0.96307	96307.0332	95727.04	1792154.748	18.61	0.08682	87415.84	1347857.00	14.00	0.75
5	70	0.0485	0.95147	95147.0369	94511.66	1696427.713	17.83	0.09329	85694.82	1260441.15	13.25	0.74
6	71	0.0612	0.938763	93876.2732	93181.19	1601916.058	17.06	0.10043	83822.61	1174746.34	12.51	0.73
7	72	0.0751	0.924861	92486.1127	91726.91	1508734.865	16.31	0.10833	81790.13	1090923.72	11.80	0.72
8	73	0.0903	0.909677	90967.6985	90139.88	1417007.959	15.58	0.11705	79588.77	1009133.59	11.09	0.71
9	74	0.1069	0.893121	89312.0546	88411.14	1326868.082	14.86	0.12668	77210.81	929544.82	10.41	0.70
10	75	0.1249	0.875102	87510.2286	86531.85	1238456.941	14.15	0.13731	74649.75	852334.01	9.74	0.69
11	76	0.1445	0.855535	85553.4707	84493.46	1151925.091	13.46	0.14904	71900.83	777684.27	9.09	0.68
12	77	0.1657	0.834335	83433.4571	82288.01	1067431.627	12.79	0.16195	68961.60	705783.44	8.46	0.66
13	78	0.1886	0.811426	81142.5601	79908.37	985143.619	12.14	0.17615	65832.51	636821.83	7.85	0.65
14	79	0.2133	0.786742	78674.1718	77348.63	905235.253	11.51	0.19174	62517.62	570989.32	7.26	0.63
15	80	0.2398	0.760231	76023.0811	74604.49	827886.626	10.89	0.20882	59025.28	508471.70	6.69	0.61
16	81	0.2681	0.731859	73185.9078	71673.75	753282.132	10.29	0.22749	55368.86	449446.42	6.14	0.60
17	82	0.2984	0.701616	70161.5887	68556.75	681608.384	9.71	0.24781	51567.37	394077.56	5.62	0.58
18	83	0.3305	0.669519	66951.9102	65256.99	613051.634	9.16	0.26987	47645.98	342510.19	5.12	0.56
19	84	0.3644	0.635621	63562.0737	61781.67	547794.642	8.62	0.29370	43636.27	294864.21	4.64	0.54
20	85	0.4000	0.600013	60001.2743	58142.27	486012.968	8.10	0.31932	39576.21	251227.94	4.19	0.52
21	86	0.4372	0.562833	56283.2627	54355.06	427870.700	7.60	0.34671	35509.69	211651.74	3.76	0.49
22	87	0.4757	0.524269	52426.8523	50441.59	373515.642	7.12	0.37580	31485.59	176142.05	3.36	0.47
23	88	0.5154	0.484563	48456.3211	46428.98	323074.055	6.67	0.40649	27556.17	144656.46	2.99	0.45
24	89	0.5560	0.444016	44401.6472	42350.08	276645.071	6.23	0.43861	23775.10	117100.29	2.64	0.42
25	90	0.5970	0.402985	40298.5115	38243.25	234294.992	5.81	0.47194	20194.82	93325.19	2.32	0.40
26	91	0.6381	0.36188	36187.9929	34151.94	196051.740	5.42	0.50622	16863.69	73130.37	2.02	0.37
27	92	0.6788	0.321159	32115.8856	30123.73	161899.800	5.04	0.54112	13823.03	56266.68	1.75	0.35
28	93	0.7187	0.281316	28131.5826	26209.04	131776.066	4.68	0.57631	11104.43	42443.65	1.51	0.32
29	94	0.7571	0.242865	24286.4894	22459.23	105567.030	4.35	0.61140	8727.59	31339.22	1.29	0.30
30	95	0.7937	0.20632	20631.9784	18924.46	83107.796	4.03	0.64601	6699.06	22611.63	1.10	0.27
31	96	0.8278	0.172169	17216.9457	15651.02	64183.334	3.73	0.67976	5012.12	15912.57	0.92	0.25
32	97	0.8591	0.140851	14085.1023	12678.65	48532.310	3.45	0.71229	3647.75	10900.45	0.77	0.22
33	98	0.8873	0.112722	11272.2063	10037.86	35853.656	3.18	0.74330	2576.69	7252.70	0.64	0.20
34	99	0.9120	0.088035	8803.50966	7747.62	25815.798	2.93	0.77253	1762.37	4676.01	0.53	0.18
35	100	0.9331	0.066917	6691.73882	5813.84	18068.174	2.70	0.79977	1164.11	2913.64	0.44	0.16
36	101	0.9506	0.049359	4935.93307	4228.67	12254.338	2.48	0.82489	740.48	1749.53	0.35	0.14
37	102	0.9648	0.035214	3521.40803	2971.20	8025.667	2.28	0.84782	452.16	1009.06	0.29	0.13
38	103	0.9758	0.02421	2420.99099	2009.24	5054.468	2.09	0.86854	264.13	556.90	0.23	0.11
39	104	0.9840	0.015975	1597.49221	1302.33	3045.226	1.91	0.88710	147.03	292.77	0.18	0.10
40	105	0.9899	0.010072	1007.16152	805.42	1742.899	1.73	0.90357	77.67	145.74	0.14	0.08

B19. Life table calculations for immigrant men who immigrated earlier-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99473.04	1993277.588	19.93	0.03411	96079.74	1763953.86	17.64	0.88
1	66	0.0105	0.989461	98946.087	98369.40	1893804.544	19.14	0.03662	94767.35	1667874.13	16.86	0.88
2	67	0.0221	0.977927	97792.7128	97162.35	1795435.144	18.36	0.03937	93336.67	1573106.77	16.09	0.88
3	68	0.0347	0.96532	96531.9922	95843.87	1698272.792	17.59	0.04241	91779.12	1479770.10	15.33	0.87
4	69	0.0484	0.951557	95155.7479	94405.66	1602428.922	16.84	0.04576	90086.04	1387990.98	14.59	0.87
5	70	0.0634	0.936556	93655.5818	92839.28	1508023.257	16.10	0.04945	88248.74	1297904.95	13.86	0.86
6	71	0.0798	0.92023	92022.9708	91136.18	1415183.980	15.38	0.05352	86258.76	1209656.20	13.15	0.85
7	72	0.0975	0.902494	90249.3898	89287.93	1324047.800	14.67	0.05801	84108.01	1123397.44	12.45	0.85
8	73	0.1167	0.883265	88326.4679	87286.32	1234759.871	13.98	0.06298	81789.06	1039289.44	11.77	0.84
9	74	0.1375	0.862462	86246.1818	85123.64	1147473.546	13.30	0.06847	79295.48	957500.37	11.10	0.83
10	75	0.1600	0.840011	84001.0897	82792.85	1062349.911	12.65	0.07453	76622.14	878204.89	10.45	0.83
11	76	0.1842	0.815846	81584.6113	80287.98	979557.060	12.01	0.08124	73765.69	801582.76	9.83	0.82
12	77	0.2101	0.789914	78991.3549	77604.42	899269.077	11.38	0.08865	70725.03	727817.07	9.21	0.81
13	78	0.2378	0.762175	76217.4941	74739.34	821664.653	10.78	0.09684	67501.81	657092.04	8.62	0.80
14	79	0.2674	0.732612	73261.192	71692.13	746925.310	10.20	0.10588	64101.04	589590.23	8.05	0.79
15	80	0.2988	0.701231	70123.0683	68464.88	675233.179	9.63	0.11587	60531.61	525489.19	7.49	0.78
16	81	0.3319	0.668067	66806.7011	65062.92	606768.295	9.08	0.12689	56806.94	464957.58	6.96	0.77
17	82	0.3668	0.633191	63319.1468	61495.30	541705.371	8.56	0.13903	52945.43	408150.64	6.45	0.75
18	83	0.4033	0.596715	59671.4584	57775.31	480210.068	8.05	0.15239	48970.91	355205.22	5.95	0.74
19	84	0.4412	0.558792	55879.171	53920.94	422434.753	7.56	0.16706	44912.92	306234.30	5.48	0.72
20	85	0.4804	0.519627	51962.7162	49955.22	368513.810	7.09	0.18314	40806.66	261321.39	5.03	0.71
21	86	0.5205	0.479477	47947.7182	45906.42	318558.593	6.64	0.20071	36692.76	220514.73	4.60	0.69
22	87	0.5613	0.438651	43865.1158	41808.08	272652.176	6.22	0.21985	32616.58	183821.97	4.19	0.67
23	88	0.6025	0.39751	39751.0489	37698.75	230844.093	5.81	0.24064	28627.07	151205.39	3.80	0.66
24	89	0.6435	0.356464	35646.4472	33621.36	193145.345	5.42	0.26311	24775.16	122578.32	3.44	0.63
25	90	0.6840	0.315963	31596.2644	29622.29	159523.989	5.05	0.28730	21111.70	97803.17	3.10	0.61
26	91	0.7235	0.276483	27648.3139	25750.00	129901.700	4.70	0.31320	17685.01	76691.46	2.77	0.59
27	92	0.7615	0.238517	23851.6901	22053.24	104151.698	4.37	0.34077	14538.13	59006.45	2.47	0.57
28	93	0.7975	0.202548	20254.7963	18578.92	82098.455	4.05	0.36993	11706.10	44468.32	2.20	0.54
29	94	0.8310	0.169031	16903.0517	15369.73	63519.531	3.76	0.40054	9213.55	32762.22	1.94	0.52
30	95	0.8616	0.138364	13836.4076	12461.64	48149.801	3.48	0.43244	7072.74	23548.67	1.70	0.49
31	96	0.8891	0.110869	11086.8689	9881.57	35688.163	3.22	0.46541	5282.63	16475.94	1.49	0.46
32	97	0.9132	0.086763	8676.26579	7645.41	25806.596	2.97	0.49918	3829.00	11193.31	1.29	0.43
33	98	0.9339	0.066146	6614.55627	5756.74	18161.185	2.75	0.53345	2685.80	7364.31	1.11	0.41
34	99	0.9510	0.048989	4898.93127	4206.44	12404.441	2.53	0.56790	1817.59	4678.50	0.96	0.38
35	100	0.9649	0.035139	3513.94047	2973.34	8198.005	2.33	0.60219	1182.83	2860.91	0.81	0.35
36	101	0.9757	0.024327	2432.74495	2026.10	5224.662	2.15	0.63596	737.58	1678.08	0.69	0.32
37	102	0.9838	0.016194	1619.4457	1325.85	3198.567	1.98	0.66889	439.01	940.50	0.58	0.29
38	103	0.9897	0.010323	1032.25565	829.69	1872.716	1.81	0.70066	248.36	501.49	0.49	0.27
39	104	0.9937	0.006271	627.117483	494.19	1043.030	1.66	0.73100	132.94	253.13	0.40	0.24
40	105	0.9964	0.003613	361.265582	278.75	548.838	1.52	0.75969	66.99	120.19	0.33	0.22

B20. Life table calculations for immigrant women who immigrated earlier-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99515.16	2059719.297	20.60	0.06039	93505.87	1674168.64	16.74	0.81
1	66	0.0097	0.990303	99030.3282	98499.26	1960204.132	19.79	0.06469	92127.31	1580662.77	15.96	0.81
2	67	0.0203	0.979682	97968.194	97387.12	1861704.871	19.00	0.06941	90627.67	1488535.46	15.19	0.80
3	68	0.0319	0.968061	96806.053	96171.04	1764317.748	18.23	0.07458	88998.61	1397907.79	14.44	0.79
4	69	0.0446	0.95536	95536.0283	94843.00	1668146.707	17.46	0.08025	87231.73	1308909.18	13.70	0.78
5	70	0.0585	0.9415	94149.9638	93394.73	1573303.711	16.71	0.08647	85318.79	1221677.45	12.98	0.78
6	71	0.0736	0.926395	92639.4991	91817.83	1479908.980	15.97	0.09329	83251.90	1136358.66	12.27	0.77
7	72	0.0900	0.909962	90996.1687	90103.85	1388091.146	15.25	0.10077	81023.73	1053106.76	11.57	0.76
8	73	0.1079	0.892115	89211.53	88244.43	1297987.296	14.55	0.10898	78627.84	972083.03	10.90	0.75
9	74	0.1272	0.872773	87277.3236	86231.50	1209742.870	13.86	0.11797	76059.01	893455.19	10.24	0.74
10	75	0.1481	0.851857	85185.6722	84057.50	1123511.372	13.19	0.12782	73313.66	817396.17	9.60	0.73
11	76	0.1707	0.829293	82929.3205	81715.62	1039453.875	12.53	0.13859	70390.26	744082.52	8.97	0.72
12	77	0.1950	0.805019	80501.9207	79200.14	957738.255	11.90	0.15038	67289.90	673692.26	8.37	0.70
13	78	0.2210	0.778984	77898.3656	76506.77	878538.112	11.28	0.16325	64016.77	606402.36	7.78	0.69
14	79	0.2488	0.751152	75115.1707	73633.04	802031.344	10.68	0.17729	60578.75	542385.59	7.22	0.68
15	80	0.2785	0.721509	72150.9027	70578.78	728398.307	10.10	0.19256	56987.93	481806.84	6.68	0.66
16	81	0.3099	0.690066	69006.6499	67346.59	657819.531	9.53	0.20915	53261.12	424818.91	6.16	0.65
17	82	0.3431	0.656865	65686.5242	63942.35	590472.944	8.99	0.22711	49420.24	371557.79	5.66	0.63
18	83	0.3780	0.621982	62198.1784	60375.75	526530.592	8.47	0.24651	45492.57	322137.55	5.18	0.61
19	84	0.4145	0.585533	58553.3172	56660.74	466154.844	7.96	0.26738	41510.75	276644.98	4.72	0.59
20	85	0.4523	0.547682	54768.1693	52816.03	409494.101	7.48	0.28975	37512.50	235134.23	4.29	0.57
21	86	0.4914	0.508639	50863.8822	48865.34	356678.075	7.01	0.31362	33540.04	197621.73	3.89	0.55
22	87	0.5313	0.468668	46866.7894	44837.64	307812.740	6.57	0.33897	29638.99	164081.69	3.50	0.53
23	88	0.5719	0.428085	42808.4959	40767.11	262975.097	6.14	0.36574	25856.96	134442.69	3.14	0.51
24	89	0.6127	0.387257	38725.7187	36692.77	222207.990	5.74	0.39384	22241.67	108585.73	2.80	0.49
25	90	0.6534	0.346598	34659.821	32657.90	185515.220	5.35	0.42315	18838.75	86344.07	2.49	0.47
26	91	0.6934	0.30656	30655.9865	28708.99	152857.316	4.99	0.45350	15689.38	67505.32	2.20	0.44
27	92	0.7324	0.26762	26761.9934	24894.29	124148.326	4.64	0.48470	12827.91	51815.94	1.94	0.42
28	93	0.7697	0.230266	23026.5773	21262.00	99254.041	4.31	0.51652	10279.66	38988.02	1.69	0.39
29	94	0.8050	0.194974	19497.4132	17858.10	77992.046	4.00	0.54870	8059.28	28708.37	1.47	0.37
30	95	0.8378	0.162188	16218.7962	14723.98	60133.941	3.71	0.58097	6169.81	20649.09	1.27	0.34
31	96	0.8677	0.132292	13229.1633	11893.91	45409.961	3.43	0.61303	4602.61	14479.28	1.09	0.32
32	97	0.8944	0.105587	10558.6587	9392.83	33516.050	3.17	0.64459	3338.26	9876.68	0.94	0.29
33	98	0.9177	0.08227	8226.99448	7234.44	24123.224	2.93	0.67539	2348.38	6538.42	0.79	0.27
34	99	0.9376	0.062419	6241.88637	5420.11	16888.783	2.71	0.70515	1598.11	4190.04	0.67	0.25
35	100	0.9540	0.045983	4598.32884	3938.62	11468.676	2.49	0.73365	1049.03	2591.93	0.56	0.23
36	101	0.9672	0.032789	3278.91044	2767.08	7530.056	2.30	0.76070	662.16	1542.90	0.47	0.20
37	102	0.9774	0.022553	2255.25057	1872.86	4762.975	2.11	0.78614	400.53	880.74	0.39	0.18
38	103	0.9851	0.014905	1490.47642	1216.48	2890.112	1.94	0.80986	231.30	480.20	0.32	0.17
39	104	0.9906	0.009425	942.478926	755.00	1673.634	1.78	0.83179	127.00	248.90	0.26	0.15
40	105	0.9943	0.005675	567.529436	445.64	918.630	1.62	0.85190	66.00	121.90	0.21	0.13

B21. Life table calculations for immigrant men who immigrated later-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99521.04	2069503.442	20.70	0.04377	95165.42	1765475.29	17.65	0.85
1	66	0.0096	0.990421	99042.0728	98517.37	1969982.406	19.89	0.04694	93892.48	1670309.87	16.86	0.85
2	67	0.0201	0.979927	97992.6719	97418.49	1871465.033	19.10	0.05044	92504.87	1576417.39	16.09	0.84
3	68	0.0316	0.968443	96844.3045	96216.72	1774046.545	18.32	0.05428	90994.17	1483912.52	15.32	0.84
4	69	0.0441	0.955891	95589.1401	94904.10	1677829.823	17.55	0.05850	89351.81	1392918.35	14.57	0.83
5	70	0.0578	0.942191	94219.0617	93472.40	1582925.722	16.80	0.06315	87569.22	1303566.54	13.84	0.82
6	71	0.0727	0.927257	92725.7382	91913.23	1489453.322	16.06	0.06827	85637.95	1215997.32	13.11	0.82
7	72	0.0890	0.911007	91100.7202	90218.14	1397540.093	15.34	0.07391	83549.90	1130359.37	12.41	0.81
8	73	0.1066	0.893356	89335.5635	88378.77	1307321.951	14.63	0.08012	81297.55	1046809.47	11.72	0.80
9	74	0.1258	0.87422	87421.9863	86387.02	1218943.176	13.94	0.08697	78874.29	965511.92	11.04	0.79
10	75	0.1465	0.853521	85352.062	84235.26	1132556.152	13.27	0.09450	76274.73	886637.63	10.39	0.78
11	76	0.1688	0.831185	83118.4541	81916.57	1048320.894	12.61	0.10280	73495.17	810362.89	9.75	0.77
12	77	0.1929	0.807147	80714.6955	79425.11	966404.319	11.97	0.11194	70534.00	736867.72	9.13	0.76
13	78	0.2186	0.781355	78135.5157	76756.37	886979.213	11.35	0.12200	67392.29	666333.72	8.53	0.75
14	79	0.2462	0.753772	75377.2164	73907.66	810222.847	10.75	0.13305	64074.27	598941.43	7.95	0.74
15	80	0.2756	0.724381	72438.0941	70878.50	736315.192	10.16	0.14519	60588.00	534867.15	7.38	0.73
16	81	0.3068	0.693189	69318.9054	67671.14	665436.692	9.60	0.15849	56945.84	474279.16	6.84	0.71
17	82	0.3398	0.660234	66023.3654	64291.01	597765.557	9.05	0.17306	53165.06	417333.32	6.32	0.70
18	83	0.3744	0.625587	62558.6636	60747.32	533474.542	8.53	0.18896	49268.21	364168.26	5.82	0.68
19	84	0.4106	0.58936	58935.9763	57053.46	472727.222	8.02	0.20630	45283.43	314900.05	5.34	0.67
20	85	0.4483	0.551709	55170.9454	53227.51	415673.762	7.53	0.22513	41244.47	269616.62	4.89	0.65
21	86	0.4872	0.512841	51284.0838	49292.57	362446.247	7.07	0.24552	37190.42	228372.15	4.45	0.63
22	87	0.5270	0.473011	47301.0614	45276.94	313153.674	6.62	0.26751	33165.12	191181.73	4.04	0.61
23	88	0.5675	0.432528	43252.8149	41214.12	267876.736	6.19	0.29112	29216.03	158016.61	3.65	0.59
24	89	0.6082	0.391754	39175.4212	37142.55	226662.618	5.79	0.31634	25392.76	128800.58	3.29	0.57
25	90	0.6489	0.351097	35109.6732	33104.99	189520.071	5.40	0.34315	21745.04	103407.81	2.95	0.55
26	91	0.6890	0.311003	31100.3003	29147.55	156415.084	5.03	0.37146	18320.41	81662.77	2.63	0.52
27	92	0.7281	0.271948	27194.7929	25318.31	127267.538	4.68	0.40116	15161.61	63342.36	2.33	0.50
28	93	0.7656	0.234418	23441.8172	21665.53	101949.233	4.35	0.43209	12303.98	48180.75	2.06	0.47
29	94	0.8011	0.198892	19889.2414	18235.55	80283.703	4.04	0.46406	9773.09	35876.77	1.80	0.45
30	95	0.8342	0.165818	16581.8492	15070.36	62048.158	3.74	0.49683	7582.96	26103.68	1.57	0.42
31	96	0.8644	0.135589	13558.8741	12205.21	46977.796	3.46	0.53012	5734.98	18520.72	1.37	0.39
32	97	0.8915	0.108515	10851.5498	9666.24	34772.584	3.20	0.56364	4218.00	12785.74	1.18	0.37
33	98	0.9152	0.084809	8480.92247	7468.56	25106.348	2.96	0.59706	3009.39	8567.74	1.01	0.34
34	99	0.9354	0.064562	6456.2045	5615.07	17637.785	2.73	0.63007	2077.18	5558.35	0.86	0.32
35	100	0.9523	0.047739	4773.93655	4096.05	12022.714	2.52	0.66236	1383.01	3481.18	0.73	0.29
36	101	0.9658	0.034182	3418.16983	2889.97	7926.661	2.32	0.69362	885.43	2098.17	0.61	0.26
37	102	0.9764	0.023618	2361.76665	1965.26	5036.693	2.13	0.72360	543.21	1212.74	0.51	0.24
38	103	0.9843	0.015688	1568.75951	1283.14	3071.430	1.96	0.75206	318.14	669.53	0.43	0.22
39	104	0.9900	0.009975	997.528834	800.96	1788.285	1.79	0.77884	177.14	351.39	0.35	0.20
40	105	0.9940	0.006044	604.398148	475.77	987.322	1.63	0.80379	93.35	174.25	0.29	0.18

B22. Life table calculations for immigrant women who immigrated later-in-life, NHATS 2011-2016

1	2	3	4	5	6	7	8	9	10	11	12	13
Age x	Age	cumulative probability of death by age x	prob surviving to age x	numbers surviving to age x lx	person years lived at age x Lx	total number of years lived from x Tx	total life expect. ex	prob of disability at age x pix	person years lived without disability	total years lived without disability from age x	disability-free life expectancy DFLEx	proportion of life spent disability-free %dfle/tle
0	65	0.0000	1	100000	99737.16	2568523.837	25.69	0.07737	92020.83	1856426.92	18.56	0.72
1	66	0.0053	0.994743	99474.3252	99185.07	2468786.674	24.82	0.08278	90975.00	1764406.09	17.74	0.71
2	67	0.0110	0.988958	98895.8057	98577.66	2369601.609	23.96	0.08869	89835.13	1673431.09	16.92	0.71
3	68	0.0174	0.982595	98259.506	97909.81	2271023.953	23.11	0.09515	88593.86	1583595.96	16.12	0.70
4	69	0.0244	0.975601	97560.1138	97176.02	2173114.143	22.27	0.10221	87243.58	1495002.09	15.32	0.69
5	70	0.0321	0.967919	96791.9302	96370.40	2075938.121	21.45	0.10993	85776.48	1407758.52	14.54	0.68
6	71	0.0405	0.959489	95948.8656	95486.65	1979567.723	20.63	0.11836	84184.69	1321982.04	13.78	0.67
7	72	0.0498	0.950244	95024.4421	94518.12	1884081.070	19.83	0.12757	82460.41	1237797.35	13.03	0.66
8	73	0.0599	0.940118	94011.8037	93457.77	1789562.947	19.04	0.13762	80596.06	1155336.94	12.29	0.65
9	74	0.0710	0.929037	92903.738	92298.22	1696105.176	18.26	0.14858	78584.55	1074740.88	11.57	0.63
10	75	0.0831	0.916927	91692.7104	91031.81	1603806.952	17.49	0.16052	76419.50	996156.32	10.86	0.62
11	76	0.0963	0.903709	90370.9149	89650.63	1512775.139	16.74	0.17351	74095.56	919736.83	10.18	0.61
12	77	0.1107	0.889303	88930.3446	88146.61	1423124.509	16.00	0.18762	71608.82	845641.26	9.51	0.59
13	78	0.1264	0.873629	87362.8849	86511.66	1334977.894	15.28	0.20291	68957.17	774032.44	8.86	0.58
14	79	0.1434	0.856604	85660.4341	84737.74	1248466.235	14.57	0.21947	66140.77	705075.27	8.23	0.56
15	80	0.1618	0.838151	83815.0557	82817.11	1163728.490	13.88	0.23732	63162.54	638934.50	7.62	0.55
16	81	0.1818	0.818192	81819.1661	80742.46	1080911.379	13.21	0.25654	60028.66	575771.96	7.04	0.53
17	82	0.2033	0.796658	79665.7625	78507.23	1000168.915	12.55	0.27715	56749.01	515743.30	6.47	0.52
18	83	0.2265	0.773487	77348.693	76105.83	921661.687	11.92	0.29917	53337.62	458994.30	5.93	0.50
19	84	0.2514	0.74863	74862.974	73534.06	845555.854	11.29	0.32259	49812.97	405656.68	5.42	0.48
20	85	0.2779	0.722052	72205.153	70789.44	772021.790	10.69	0.34739	46198.19	355843.71	4.93	0.46
21	86	0.3063	0.693737	69373.7171	67871.63	701232.355	10.11	0.37351	42520.99	309645.52	4.46	0.44
22	87	0.3363	0.663695	66369.5415	64782.96	633360.726	9.54	0.40087	38813.44	267124.52	4.02	0.42
23	88	0.3680	0.631964	63196.3696	61528.84	568577.770	9.00	0.42935	35111.33	228311.08	3.61	0.40
24	89	0.4014	0.598613	59861.3084	58118.31	507048.931	8.47	0.45880	31453.35	193199.76	3.23	0.38
25	90	0.4362	0.563753	56375.3199	54564.50	448930.617	7.96	0.48905	27879.89	161746.40	2.87	0.36
26	91	0.4725	0.527537	52753.6772	50885.01	394366.119	7.48	0.51987	24431.53	133866.51	2.54	0.34
27	92	0.5098	0.490163	49016.3489	47102.31	343481.106	7.01	0.55103	21147.44	109434.98	2.23	0.32
28	93	0.5481	0.451883	45188.2653	43243.84	296378.798	6.56	0.58229	18063.58	88287.54	1.95	0.30
29	94	0.5870	0.412994	41299.4126	39342.05	253134.959	6.13	0.61337	15211.00	70223.96	1.70	0.28
30	95	0.6262	0.373847	37384.6965	35434.11	213792.905	5.72	0.64401	12614.34	55012.96	1.47	0.26
31	96	0.6652	0.334835	33483.5171	31561.26	178358.798	5.33	0.67395	10290.58	42398.62	1.27	0.24
32	97	0.7036	0.29639	29638.9991	27767.92	146797.540	4.95	0.70295	8248.35	32108.04	1.08	0.22
33	98	0.7410	0.258968	25896.8424	24100.31	119029.619	4.60	0.73080	6487.72	23859.69	0.92	0.20
34	99	0.7770	0.223038	22303.7764	20604.71	94929.310	4.26	0.75731	5000.53	17371.97	0.78	0.18
35	100	0.8109	0.189056	18905.6465	17325.43	74324.598	3.93	0.78233	3771.26	12371.44	0.65	0.17
36	101	0.8425	0.157452	15745.2053	14302.47	56999.172	3.62	0.80574	2778.39	8600.18	0.55	0.15
37	102	0.8714	0.128597	12859.7406	11569.24	42696.700	3.32	0.82748	1995.96	5821.79	0.45	0.14
38	103	0.8972	0.102787	10278.7311	9150.25	31127.464	3.03	0.84750	1395.42	3825.82	0.37	0.12
39	104	0.9198	0.080218	8021.76943	7059.39	21977.213	2.74	0.86581	947.31	2430.41	0.30	0.11
40	105	0.9390	0.06097	6097.01845	5298.74	14917.819	2.45	0.88243	622.97	1483.09	0.24	0.10

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Rebecca Wang

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Education

2021	Ph.D., Sociology, Maxwell School of Citizenship and Public Affairs at Syracuse University Dissertation: "How do immigrant older adults in the United States fare in later life? Examining differences in immigrant status and life-course timing of migration on late-life disablement and mortality."
2010	M.A., Sociology, San Jose State University
2007	B.A., Sociology, University of California, Irvine B.A., Psychology and Social Behavior, University of California, Irvine

Research Interests

Aging and the life course, Health and disability in later life, Asian and Latino immigration

Awards, Fellowships, and Research Experience

2016-2018	Research Assistant for Dr. Merril Silverstein, Aging Studies Institute, Syracuse University
2013-2017	Research Assistant for Dr. Amy Lutz, Center for Policy Research, Maxwell School, Syracuse University
2013-2014	Syracuse University Fellowship, Syracuse University
2010-2011	Syracuse University Fellowship, Syracuse University
2010	Provost Service Learning Award, San Jose State University
2009-2010	Research Assistant, Dr. Yoko Baba, San Jose State University
2008-2010	Graduate Research Assistant, Office of Institutional Research, San Jose State University.
2007	Sociology Department Certificate Program in Diversity, University of California, Irvine
2006	Undergraduate Research Opportunities Program Grant Recipient, University of California, Irvine

Publications

Forthcoming

Andrew S. London, Carrie Elliott**, Rebecca Wang**, Tre Wentling, and Natalee Simpson. "Gender Transition and Same-Sex Marriage: A Qualitative Consideration." In Aaron Hoy (Ed.), *The Social Science of Same-Sex Marriage: LGBT People and Their Relationships in the Era of Marriage Equality*. New York, NY: Routledge. *Accepted July 15, 2021.*

Publications, continued

Published

Wentling, Tre, Carrie Elliott, Andrew London, Natalee Simpson, and **Rebecca Wang**. 2021. ""Every Now and Then I get Flagged for a Pap Smear": Gender Transition and 'Sex-Specific' Screenings" in *Sexual and Gender Minority Health, Volume 21*, edited by A.J. LeBlanc and B.L. Perry. Emerald Publishing

Lutz, Amy, Pamela Bennett, and **Rebecca Wang.** 2020. "State Bans on Affirmative Action and Talent Loss Among Blacks and Latinos in the United States." *Ethnic Studies* 42(2):58-76. https://doi.org/10.1525/esr.2020.43.2.58

Lutz, Amy, Pamela Bennett, and **Rebecca Wang.** 2019. "How Affirmative Action Context Shapes Collegiate Outcomes at America's Selective Colleges and Universities." *Journal of Law and Social Policy* 31(1):71-91.

*Lutz, Amy, Pamela Bennett, and **Rebecca Wang.** 2017. "Mismatch and Academic Performance at America's Selective Colleges and Universities." *Ethnic and Racial Studies.*1-16.

Wang, Rebecca and Janet Wilmoth. 2015. "Demography of Aging" in *Encyclopedia of Sociology, 2nd Edition*, edited by G. Ritzer. Blackwell Publishing.

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Silverstein, Merril and **Rebecca Wang**. 2015. "Does Familism Inhibit Demand for Long-Term Care? Public Policy Implications of Growing Ethnic Diversity in the United States." *Public Policy & Aging Report* 25(3):83-87. doi: 10.1093/ppar/prv016

*December 2020 editor's choice selection at *Ethnic and Racial Studies*

Conference Presentations

2018	"Race, Nativity, and Timing of Migration Effects on Disablement in Later Life" Presented at the Annual Meeting of the American Sociological Association
2017	"Religion in Later Life: Patterns of Change When Approaching the End of Life" Merril Silverstein, Vern. L. Bengston, and Rebecca Wang. Presented at the Society for the Scientific Study of Religion Meeting.
2017	"Patterns of Change in Values of Altruism with Aging and the Approaching End of Life." Merril Silverstein, Vern L. Bengston, and Rebecca Wang. Presented at the Society of the Study of Human Development Meeting.
2017	"Mismatch and Academic Performance at America's Selective Colleges and Universities" (co-author with Amy Lutz and Pamela Bennett) Paper session presentation at the Annual Meeting of the American Sociological Association
2016	"Life Course Influences on Late-Life Disability in Immigrant and Non-Immigrant Older Adults in the United States" Roundtable presentation at the Annual Meeting of the American Sociological Association
2015	"Does Familism Inhibit Demand for Long-Term Care? Public Policy Implications of Growing Ethnic Diversity in the United States" Presented at the Annual Meeting of the Gerontological Society of America
2015	"Explicating Gender and Ambivalence in Intergenerational Relationships: Insights from Case Studies of Transgender Adult-Children" Presented at the Annual Meeting of the Society for the Study of Social Problems

2014 "Change as the Rule, Not the Exception: Celebrating Diversity in Transgender Life Course" Presented at the Annual Meeting of the Eastern Sociological Society
2013 "(Re)Discovery: Examining Transgender Life Using the Life Course Perspective" Presented at the Annual Meeting of the Eastern Sociological Society
2012 "Likelihood to Intergroup Date at a Racially Diverse College Campus." Presented at the Annual Meeting of the Midwestern Sociological Society
2010 "Social Outcomes of Latino Children at Sunday Friends." Presented at the Annual Meeting of the Pacific Sociological Association Annual Conference
2009 "Sunday Friends: A Working Alternative to Charity." Presented at the Annual Meeting of the Association of Applied and Clinical Sociology
2007 "Asian and Latino Couples: A Qualitative Look," Presented at the Undergraduate Research Symposium, Irvine

Teaching Experience

Courses Taught

Summer 2013 SOC 252: Racial and Cultural Minorities, Utica College
Summer 2014 SOC 101: Introduction to Sociology, Syracuse University
Fall 2015 MAX 123: Critical Issues for the United States, Syracuse University
Spring 2016 MAX 123: Critical Issues for the United States, Syracuse University
Summer 2018 SOC 102: Social Problems, Syracuse University

Teaching Assistant

Sum. 2013-
Sum. 2021 SOC 400/SWK600: Aging in the Context of Family Life with Merril Silverstein, Syracuse University
Spring 2013 SOC 281: Sociology of Families with Merril Silverstein, Syracuse University
Fall 2012 SOC 101: Introduction to Sociology with Janet Wilmoth, Syracuse University
Spring 2012 SOC 101: Introduction to Sociology with Jackie Orr, Syracuse University
Fall 2011 SOC 248: Racial and Ethnic Inequalities with Amy Lutz, Syracuse University

Invited Speaker

Fall 2014 "Emerging Issues Among Asian and Latino Immigrant Elders in the US," Prepared for Aging and Society, taught by Dr. Merril Silverstein.
Fall 2014 "Conquering Your Comp Exams" with Dr. Amy Lutz, Future Professoriate Program, Syracuse University
Spring 2014 "Gender Transition and Intergenerational Relationships Across the Life Course" Women and Gender Studies Brown Bag Speaker Series, Colgate University
Spring 2014 "Publishing: A View from the Inside" with Dr. Merril Silverstein, Future Professoriate Program, Syracuse University
Spring 2014 "New Arrivals, Emerging Issues: Aging in the United States" Prepared for Introduction to Asian American Studies taught by Yasmin Ortiga, Syracuse University
Fall 2013 "Creating those Aha! Moments: Activities and Assignments that Work," with Tracy Peterchak. Future Professoriate Program, Syracuse University

Fall 2011 "Intergroup Romantic Relationships." Racial and Ethnic Inequalities taught by Dr. Amy Lutz, Syracuse University
Summer 2011 "Contemporary US Immigration issues" Social Problems taught by Jessica Hausauer, Syracuse University
Spring 2011 "Asian Americans and the Model Minority." Introduction to Asian American Studies taught by Dr. Prema Kurien, Syracuse University

University and Department Service

2014-2016 Member, Sociology Department Graduate Committee, Syracuse University
2014-2015 Member, "Aging Families, Changing Families" Conference Planning Committee
2013-2014 Member, LGBT Concerns Committee, Syracuse University
Fall 2014 Student Member, Sociology Faculty Search Committee, Syracuse University
2011-2013 University Senator, Syracuse University Senate
2010-2012 Senator-at-large, Graduate Student Organization, Syracuse University
2010-2012 Member, InnComplete Committee, Syracuse University
2010-2011 Vice-President, Sociology Graduate Student Assemblage, Syracuse University
2011-2012 President, Sociology Graduate Student Assemblage, Syracuse University

Professional Service

2016-2018 Graduate Student Council Member, ASA Section on Aging and the Life Course
2015-2018 Member, ASA Section on Aging and the Life Course Membership Committee
2014 Mentored reviewer, Journals of Gerontology, Series B: Psychological Sciences and Social Sciences