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# The Case for Intersectionality: An Intersectional Look At Disability in The Labor Market

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## ABSTRACT

While approximately 10% of adults ages 18 to 64 living in the United States identify as having a disability, workers with disabilities make up only 3% of the labor force (Livermore and Schimmel Hyde 2020; Paul et al. 2020). When compared to their non-disabled counterparts, those with disabilities have lower employment rates and earnings, are more likely to work in precarious and low wage jobs and report higher levels of workplace discrimination (BLS 2020; Maroto and Pettinicchio 2014b; Robert and Harlan 2006). Yet, recent evidence suggests that disabled people's labor market disadvantages may be disproportionately experienced by those with multiple marginalized statuses, such as women with disabilities, disabled people of color, and those with more significant and multiple disabilities (Pettinicchio and Maroto 2017; Brooks 2019c; Shaw et al. 2012; Kadijk et al.2018). Informed by the Disablement Process, Cumulative Inequality theory, and Intersectionality, this dissertation examines the factors related to the intersectional connections between race/ethnicity, gender, disability type and combination, and labor market disadvantages. Using data from the American Community Survey, this dissertation employs logistic regression models to predict employment probabilities for those with and without disabilities, stratified by race/ethnicity, gender, and limitation type, as well as combinations of these statuses. These models adjust for individual characteristics, receipt of government assistance, and several state-level policies and characteristics. This dissertation also estimates the number of years over the working life span that an individual can expect to be employed while disabled. Findings show that disparities in labor market disadvantages among certain sub-groups of those with disabilities are reduced when accounting for individual characteristics and receipt of government assistance, suggesting that the intersectional effects of race/ethnicity, gender, and disability on certain aspects of a disabled individual's life, such as

education and government assistance, “spillover” to affect their labor-market outcomes. Findings from this dissertation suggest several policy innovations, including a restructuring of the network of disability-specific government assistance programs, a federal subsidy for workplace accommodations, and the centering of the voices of those most marginalized when it comes to policy creation.

# THE CASE FOR INTERSECTIONALITY: AN INTERSECTIONAL LOOK AT DISABILITY IN THE LABOR MARKET

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## Dissertation

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**Dedications:**

To my mom, Darlene Brooks
Looks like your "visions of grandeur"[1] for me came true

To one of my favorite humans, Meagan McKinstry
Thank you for walking through this life with me as my dearest friend and companion

To my future family (who I probably haven't met yet)
I went through the storm of academia to give us a better life

[1] Written in an affidavit by the special education director of Gwinnett County Schools in 1997, in response to my mother's request for me to be educated in a general education setting. They felt that unless I was educated in a self-contained special education program, I would not be able to learn. Meanwhile in a Montessori setting, I was reading at the age of three.

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# Table of Contents

# List of Tables and Figures

# List of Abbreviation

| Abbreviation | Meaning |
|---|---|
| ACS | American Community Survey |
| ADA | American Disability Act |
| ADHD | Attention Deficit Hyperactivity Disorder |
| ADL | Activities of Daily Living |
| AIC | Akaike Information Criterion (AIC) |
| ASD | Autism Spectrum Disorder |
| BIC | Bayesian Information Criterion |
| BLS | United States Bureau of Labor Statistics |
| CI | Cumulative Inequality Theory |
| DP | Disablement Process |
| ELs | Employment Longevities |
| GQ | Group quarters facilities |
| HU | Housing unit |
| HRS | Health and Retirement Survey |
| IADL | Instrumental Activities of Daily Living |
| ICF | International Classification of Functioning, Disability and Health |
| KHB | Karlson-Holm-Breen method |
| LMD | Labor market disadvantages |
| MAF | Master Address File |
| MBI | Medicaid Buy-In program |
| NH | Non-Hispanic |
| NHB | Non-Hispanic Black |
| NHO | Non-Hispanic Other |
| NHW | Non-Hispanic White |
| NHIS | National Health Interview Survey |
| PSID | Panel Study of Income Dynamics |
| PEP | Probabilities of employment |
| SES | Socioeconomic status |
| SGA | Substantial gainful activity |
| SNAP | Supplemental Nutrition Assistance Program |
| SSA | Social Security Administration |
| SSDI | Social Security Disability Income |
| SSI | Supplementary Security Income |
| TANF | Temporary Assistance for Needy Families |
| VR | Vocational Rehabilitation |
| WHO | World Health Organization |

# Chapter 1: Introduction

## MOTIVATIONS

Despite numerous legislative attempts to reduce the labor market disadvantages (LMD) of persons with disabilities, employment rates for those with disabilities have rapidly declined since the late 1980s (Maroto and Pettinicchio 2015). For instance, while the employment rate of adults aged 25-61 with work-limiting disabilities was approximately 50% in 1988, only 22% of adults with such disabilities within this age group reported paid employment in 2014—a 28 percentage point decline (Maroto and Pettinicchio 2015). The LMD of those with disabilities is evident across multiple measures (United States Bureau of Labor Statistics [BLS] 2021). For instance, while the unemployment rate among individuals with disabilities ages 16-64 in 2019 was 8%, it was still over twice that of the 3.6% unemployment rate of those without disabilities in the same age group (BLS 2021). Looking at those who are actively seeking a job, however, only tells one part of this story. In fact, because it only captures those who are actively looking for work rather than the entire non-working population, the unemployment rate may minimize the labor market disadvantages experienced by those with disabilities (Brooks 2019a). In terms of the employment rate, there was approximately a 44-percentage point gap between those with and without disabilities ages 16-64 in 2019 (33.6% vs. 77.3%) (BLS 2021).

Hidden behind these statistics, however, is a bi-directional relationship between disability and LMD that depends on timing of disability onset. For instance, those who develop disabilities in childhood may experience substantial barriers to employment entry, which reduces their employment rates (Stanford et al. 2011). These individuals are also more likely to work in low-status and precarious jobs, limiting the time they spend employed (see chapter 5), and further

reducing their overall employment rates. Thus, early-life disabilities may result in later-life LMD.

The majority of people with disabilities, however, develop their disabilities in adulthood (LaPlante 2014). These disabilities may arise due to numerous factors, including obesity, work related injuries, adverse childhood conditions, illness, pain, or poor health, and generally are more prevalent among minorities and those with low SES (Kelley-Moore and Ferraro 2003; Metzler et al. 2017; Jenkins and Rigg 2004; Verbrugge and Jette 1994). Thus, poor health and unfavorable life conditions may lead to disability. Because these individuals often find themselves in physically demanding jobs and may not have the training for alternative careers, they are often forced out of employment and onto disability benefits (Jenkins and Rigg 2004). In other words, LMD leads to disability, which, in turn, leads to more LMD. While this dissertation is concerned with both those who develop disabilities prior to their working years and those who experience disability onset during their working years, it is important to note that the data used for this research primarily consists of the latter.

The LMD of those with disabilities are linked to the barriers that they encounter when attempting to enter and navigate the labor market. These barriers fall into three categories: policy barriers, demand-side factors, and individual-level characteristics. Policy barriers, such as disability-related social safety net programs (specifically Supplemental Security Income [SSI] and Social Security Disability Income [SSDI]), force many people with disabilities to forgo gainful employment in lieu of needed disability-related government benefits and services (Stapleton et al. 2006). While these programs provide access to vital disability-related supports (which many private insurers do not offer), such as wheelchairs, hospital visits, medications, substance abuse treatment, mental health counseling, and attendant care, they provide small

amounts of cash transfers and can drive some recipients into poverty. Those who can bypass the benefits poverty trap face other demand-side barriers when attempting to navigate the labor market. For instance, lack of employer demand for (potential) workers with disabilities is evident by the fact that most people with disabilities are excluded from the workforce even before landing an interview (Ameri et al. 2018).

Limitation type may also shape LMD (Pettinicchio and Maroto 2017; Brault 2010). For instance, the division between physical and cognitive disability plays a large part in shaping labor market experiences. Most of the literature on the LMD of those with disabilities, however, primarily focuses on those with physical disabilities or conflates physical and cognitive disabilities. This conflation is somewhat surprising given that studies that stratify by disability type consistently find that people with cognitive disabilities face substantially more LMD when compared to those with physical or sensory disabilities (Brault 2010; Maroto and Pettinicchio 2014b). However, literature on the labor market and economic inequalities of those with disabilities from an intersectional perspective rarely addresses disability type, alongside race/ethnicity and gender, as an axis of intersectionality. Thus, to advance traditional conceptualizations, this dissertation will examine LMD for all possible limitation combinations (63) that can be constructed with the 2017 American Community Survey (ASA) data (See Chapter 4).

In addition to limitation type, an individual's race/ethnicity and gender may work in tandem with their disability status to shape LMD. For instance, statistics show that only 24% of Non-Hispanic (NH) Blacks with disabilities ages 16 to 64 were employed in 2017, compared with 36% of similar NH whites (Brooks 2019c). One study found a 4.7 percentage point employment gap between men and women with disabilities ages 18 to 64 (39.3% vs. 34.6%)

(Lauer and Houtenville 2018). The employment gap between women with and without disabilities, however, is slightly smaller (37.6%), than that between men with and without disabilities (43.2 %), suggesting that disability may have a stronger (more negative) association with men's LMD (Pettinicchio and Maroto 2017).

The substantial LMD faced by many women with disabilities and disabled people of color may be exacerbated among those with multiple marginalized statuses. For instance, recent work on poverty and disability suggests that multiply marginalized individuals with disabilities have higher levels of poverty, lower levels of income, and are more dependent upon government assistance programs compared to their more privileged counterparts with disabilities (Maroto et al. 2019). In fact, disabled women of color were the most likely to experience these inequalities (Maroto et al. 2019). Studies also suggest that women with disabilities who are working in low-status jobs have, on average, worse mental and physical health than men with disabilities and women without disabilities (Brown and Moloney 2019; Brown et al. 2017).

While a growing body of literature indicates the importance of intersectionality to the study of the economic and labor market inequalities of those with disabilities, more attention must be given to why intersectionality is so essential. That is, what further insights can be gained from examining the LMD of those with disabilities through an intersectional lens? This dissertation seeks to answer the "so what" question of intersectionality by examining the intersectional connections between race/ethnicity, gender, and disability status and type on LMD. Within this broader framework, the proposed research has two primary objectives. First, taking an intersectional approach, chapters three and four will examine whether individual characteristics (e.g., educational attainment, marital status), receipt of government assistance through targeted disability policies (e.g., SSI, SSDI), and state-level policies and characteristics

help explain employment disparities among those with disabilities. Second, using Sullivan-based Life Tables, chapter five will estimate the number of years during the typical working life span (ages 18-64) that people with disabilities can expect to be employed, given their gender and disability type, to determine how disabled people's LMD shapes the number of years they spend working. To theoretically ground these two objectives, and the resulting findings, I will use the conceptual frameworks of intersectionality, Disablement Process (DP) and Cumulative Inequality (CI) theory. In doing so, this dissertation will seek to answer the overarching question: What are the factors related to the intersectional connections between race/ethnicity, gender, disability type and combination, and LMD?

## THEORETICAL FRAMEWORK

Multiple measures of labor market participation (employment and unemployment rates, earnings, occupation, and industry type), suggest that individuals with disabilities experience substantial LMD These disadvantages can be traced back to both the historical oppression of those with disabilities and the accumulation of disadvantages that many people with disabilities experience throughout the life course. Thus, before examining the barriers that directly impact the LMD of individuals with disabilities, it is important to examine the context surrounding these barriers. In doing so, this literature review will be divided into three primary sections: (1) disability; (2) Cumulative Inequality Theory; and (3) disabled LMD.

### *Disability*

In 2019, 10.3% of adults ages 18-64 living in the U.S. reported having a disability (Paul et al. 2020). This percentage has remained stable over the past five years (Houtenville et al. 2015; Lauer and Houtenville 2017; Lauer and Houtenville 2019). But what does having a disability mean exactly and what are its implications for the labor market? Over the past few

decades, various definitions of disability have made their way into mainstream society. While some scholars and medical professionals define disability as a medical abnormality in need of a cure, others see disability status as a marker of identity (Egner 2017; Smart and Smart 2006; Llewellyn and Hogan 2000; Barns and Oliver 1993). Legal definitions, such as that found in the 1990 Americans with Disabilities Act (ADA) define disability as, "a physical or mental impairment that substantially limits one or more major life activities" (DeLeire 2000: 22). While these definitions may seem harmless—even pointless—in the everyday lives of people with disabilities, other definitions affect their ability to participate in certain aspects of society.

For instance, the Social Security Administration (SSA) defines disability as the "inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or which has lasted or can be expected to last for a continuous period of not less than 12 months" (SSA 2015a; Autor and Duggan 2006). While many physical or mental limitations do not technically prevent those with disabilities from participating in paid employment, the SSA's definition has labeled people with disabilities as somehow incapable of working.

This link between disability and the inability to work has roots in the historical oppression and marginalization of those labeled as physically or mentally "different." In fact, for much of history, individuals with disabilities were seen as a blemish on society. Prior to the 18th century, disability was understood through the lens of religion, where it was seen as either a sign of immorality or as a punishment for sin (Egner 2017). With the rise of the industrial revolution, views on disability shifted from punishment to crime. Specifically, the industrial revolution linked human value with an individual's ability to participate in paid labor. Because individuals with disabilities were seen as incapable of working, they were viewed as a burden to society

(Egner 2017). Thus, disability was no longer considered to be a punishment from God, but a characteristic that was associated with unproductiveness.

Because disability was regarded as a failure of the individual to perform socially acceptable activities (Egner 2017)—such as paid employment—society turned to the medical community during the early 20th century to cure individuals with disabilities of their shortcomings (Egner 2017). The medical model arose from the understanding of disability as illness. Scholars who subscribe to the medical model view disability as an individual problem, a deficiency that must be overcome, and an abnormality that should be cured (Egner 2017; Smart and Smart 2006; Llewellyn and Hogan 2000; Barns and Oliver 1993).

In the 1970s and 80s, views on disability began to shift again, this time from illness to social construction (Krahn and Fox 2014). Thus, the social model arose, separating impairment from disability. The social model suggests that disability is a social construction created by physical and social barriers that prevent individuals with impairments from fully participating in society (Shakespeare 2006). Thus, the social model of disability asserts that society must change to fit the individual, rather than the individual changing to fit into society.

In an attempt to "bring the body back" into analyses of disability, scholars, from both the medical field and the social sciences, have proposed several versions of models that combine elements of the medical and social models of disability, labeled under the umbrella term of biopsychosocial models (Hughes and Paterson 1997; Engle 1980; Petasis 2019; Shakespeare et al. 2017). These models frame illness—and disability—as processes, encompassing elements of both biology and society (Nagi 1976; Verbrugge and Jette 1994; Jette 2009; Engle 1980; Petasis 2019; Shakespeare et al. 2017). Notably, however, the origins of these models are still under much debate, and, as a result, the variations of these biopsychosocial models have vastly

different understandings of both what disability means and how it should be ameliorated. For instance, sociologist Saad Nagi first proposed that disability is both contextual and the by-product of an individual's mind/body limitations and social expectations, suggesting that "While paralysis affecting the upper limbs, and therefore the function of reaching and use of hands and fingers, may become disabling to a surgeon, the same physical limitations may not influence a teacher in performing his [sic] role" (1976:441). The first formal biopsychosocial model, however, was proposed by George Engel in 1977. Engel's model was primarily used to describe how illnesses are influenced by both biological and human factors (Engle 1981; Petasis 2019; Shakespeare et al. 2017).

Because Nagi's assertions were rooted within the social sciences and Engel's model was based upon his expertise in the medical field, the more recent variations of the biopsychosocial model are vastly different from one another. The frameworks of these more recent models heavily depend upon what they view as the original model. For instance, one of the variations of the biopsychosocial model was proposed by Gordon Waddell and Mansel Aylward, who both worked in the medical field. Their version of the biopsychosocial model (BPS), which was loosely based off of Engle's work, suggested that disability is a condition that can be overcome by positive attitudes, mental and physical healing, and rehabilitation (Shakespeare et al. 2017). Thus, the BPS, similar to the medical model, views disability as a defect that can, and should, be overcome by the individual (Shakespeare et al. 2017).

Placing more of an emphasis on the social and environmental factors that create disabilities, models based off of Nagi's work, such as the World Health Organization's International Classification of Functioning, Disability and Health (ICF) and Verbrugge and Jette's (1994) Disablement Process (DP), proposed that while impairments are often rooted in

biology, disability is shaped by the interaction between those impairments and the social world (Verbrugge and Jette 1994; Barnes 2011).

This dissertation will use the DP to conceptualize disability. Specifically, Verbrugge and Jette (1994) divide the DP into four stages. The first stage of this process begins with a disease, injury, or biological abnormality, such as down syndrome, cancer, obesity, or a work-related injury. Pathology becomes impairment when it leads to some biological dysfunction or significant structural abnormality. Put another way, impairment is a symptom of pathology. Impairments become functional limitations if they restrict the individual from performing physical or mental actions. More specifically, an individual is considered to have a functional limitation if she has any difficulty performing any of five basic physical and mental actions without assistance, including difficulty with mobility, seeing, hearing, communicating, and thinking/remembering (Verbrugge and Jette 1994). Notably, these categories are somewhat limited in scope given that they do not cover limitations related to most non-physical impairments, such as mental health issues, substance use disorder, and chronic pain.

Activity limitations, known as disabilities in the DP's original articulation, occur when an individual experiences difficulty performing a given activity due to the combination of functional limitations and environmental restrictions. Thus, unlike the functional limitations stage, which makes no reference to social or environmental factors, activity limitations are by-products of the relationship between body and society, a concept which is also found in the social model (Shakespeare 2006; Verbrugge and Jette 1994). There are two types of activity limitations: activities of daily living (ADLs), including abilities to independently eat, toilet, transfer (get in and out of bed/chair), dress, and bathe; and instrumental activities of daily living (IADLs), which typically include the ability to independently prepare one's own meals, do light housework,

manage money, use the telephone, and shop. While it is important to note that these ADLs and IADLs may not capture all the complex ways that functional limitations can interact with the environment (e.g., someone with a mobility limitation may have difficulty getting in and out of some beds but not others), they do capture some of the basic self-care and independent living tasks that those with disabilities may not be able to carry out by themselves (Verbrugge and Jette 1994). Again, however, most of these tasks within these categories of disability assume a physically disabled individual, restricting our capabilities to identify those with mental disabilities and substance use disorders.

One critical aspect of the disablement process to note is its incorporation of environmental and social factors that increase—or reduce—the risk of impairments, functional limitations, and activity limitations. Specifically, certain biological, demographic, social, behavioral, psychological, or environmental factors can vary the risk of functional or activity limitations (Verbrugge and Jette 1994). For instance, studies suggest that those with lower levels of education (demographic factor) are more likely to be in low-control/high-demand jobs (environmental factor) that are associated with poor health, which, in turn, can lead to later onset disability (Karasek and Theorell 1992). In addition to risk factors, there are other elements that can reduce the probability of developing functional or activity limitations. These range from medical and policy interventions to personal modifications an individual can make to his or her environment (Verbrugge and Jette 1994). For instance, an individual born with mobility limitations may build an accessible house, purchase wheelchairs, and hire personal care attendants to help with tasks that she cannot do independently.

Because current conceptualizations of disability frame it as a relationship between an individual's limitations and social and environmental expectations, disabled people's LMD can

be interpreted as a product of the policy barriers, demand-side factors, and individual-level characteristics that restrict those with limitations from both finding and maintaining gainful employment. Thus, in a strictly theoretical sense, work-limiting disability is created when people with disabilities are prevented from participating in—or pushed out of—paid employment because of disability-specific barriers, such as government assistance programs that disincentivize work, disability-specific workplace discrimination, physically and socially inaccessible working environments, and barriers to human capital accumulation through schooling (Ameri et al. 2018; Stapleton et al. 2006; Crooks 2007). This process, however, appears to be cyclical to the extent that because people with disabilities are often excluded from the labor market, those without disabilities do not have the opportunity to see them as valuable and capable workers. In doing so, non-disabled workers often both create and maintain the structures that keep people with disabilities from working, reinforcing the link between disability and non-employment. The factors affecting disabled people's LMD accumulate throughout the life course, as described in the next section.

*Cumulative Inequality Theory and LMD*

Cumulative Inequality (CI) theory can provide insight into how having a disability can increase an individual's risk of experiencing certain barriers—regardless of disability onset—which, in turn, result in an increased risk of LMD (Ferraro and Shippee 2009). For instance, CI theory contends that "Social systems generate inequality, which is manifested over the life course." (Ferraro and Shippee 2009: Axiom 1). That is, CI theory points to the fact that inequality is not the direct result of an individual's disadvantage (i.e., disability), but rather, an individual's disadvantage is the catalyst that begins a chain of events, circumstances, and experiences that accumulate over the life course, resulting in inequality (i.e., LMD). This chain

of events plays out differently for those who experience disability onset prior to their working years (early-onset disabilities) and those who develop disabilities while working (later-onset disabilities). For instance, those with early-onset disabilities typically encounter labor market barriers due to their disability status, which results in their LMD. Alternatively, certain characteristics associated with low-status jobs, such as lack of social support, low intellectual discretion, physically demanding workloads, hazardous working environments, and greater work intensity may increase an individual's risk of developing disabilities in adulthood, which, in turn, increases LMD (Karasek et al. 1981; Marmot et al. 1991; Theorell and Karasek 1996; Nixon et al. 2011; Benach et al. 2014). Non-work-related factors, such as high levels of stress accumulation, obesity, risky health behaviors, and pre-existing conditions, may also increase the risk of poor health, adult-onset disability, and LMD (Pearlin et al. 2005; Dupre 2008; Thoits 2010).

More specifically, several axioms and sub-axioms of CI theory can help to illuminate why those with disabilities experience higher levels of LMD than those without disabilities. For instance, regardless of disability onset, CI theory points to how disabled people's LMD may be rooted in childhood experiences. That is, according to Ferraro and Shippee (2009), "Childhood conditions are important to adulthood, especially when differences in experience or status emerge early" (Ferraro and Shippee 2009: Axiom 1-A). The process that early life experiences influence LMD in adulthood plays out differently for those who experience disability onset prior to their working years and those who develop disabilities during their working years.

For instance, those with early-onset disabilities are more likely to be tracked into either special education or lower-tracked classes where they do not receive the education and training needed to prepare them for the labor market (Powell 2003). As a result, these individuals are

already at a disadvantage when it comes to finding and maintaining employment. Notably, however, not all individuals with early-onset disabilities are placed on these lower educational tracks. Indeed, studies indicate that parents with high levels of SES are able to use their money, knowledge, and power to ensure that their disabled children receive the education needed to prepare them for life after high school (Stanford et al. 2011). Thus, as noted by Ferraro and Shippee (2009), "family lineage is critical to status differentiation early in the life course" (Axiom 1-C). That is, family background plays an essential role in shaping the LMD of those with early-onset disabilities

Alternatively, adverse childhood conditions may increase an individual's risk of developing disabilities in adulthood, which can lead to LMD. For instance, children who come from abusive homes or experience parental substance use are more likely to develop mental and physical disabilities as adults, which may negatively affect their employment trajectories (Metzler et al. 2017). Further, children from socially disadvantaged families, such as those with low levels of SES, are often placed on educational trajectories which often do not prepare them sufficiently for the transition to post-secondary life (Jenkins and Rigg 2004). Because these individuals are underprepared for the labor market, they are often segregated into low-status, precarious, low-wage work arrangements. These jobs often lead to poor health outcomes through mechanisms such as unhealthy working environments and low SES, resulting in an increased risk of developing disabilities (Verbrugge and Jette 1994). In other words, a selection effect occurs where workers with low levels of education are more likely to develop disabilities in adulthood (Jenkins and Rigg 2004). Thus, family lineage may shape the LMD of those with later-onset disabilities (Ferraro and Shippee 2009: Axiom 1-C).

Because people with disabilities, regardless of onset, are more likely not to receive the education and training needed to adequately navigate the labor market, they are more vulnerable to certain barriers which directly affect their risk of LMD (Jenkins and Rigg 2004; Stanford et al. 2011). Thus, as noted by Ferraro and Shippee, "Inequality may diffuse across life domains" (axiom 2-B). In other words, their lower levels of educational attainment and higher levels of adverse childhood conditions increase people with disabilities' risk of LMD through multiple mechanisms. For instance, those who are either unable to find employment or are forced out of work due to disability and poor health often have no other option but to apply for disability-specific government assistance. The work disincentives of these programs, however, make it difficult to enter or re-enter paid employment (Stapleton et al. 2006).

In addition to the work disincentives of some government assistance programs, disability specific discrimination within the hiring process (Ameri et al. 2018) may limit the type of jobs that are available to people with disabilities. As a result, these individuals are often segregated into low-status and precarious jobs (Maroto and Pettinicchio 2014b), which may reduce their working years—and increase their LMD—through mechanisms such as job instability, an increased risk of poor health, and early, involuntary employment exits (see Chapter 5 for a more detailed discussion).

In addition to highlighting how disadvantages can accumulate over a disabled individual's life to shape their risk of LMD, CI theory can also help to explain why some people with disabilities experience disproportionately more LMD than others. Specifically, a growing body of research suggests that women with disabilities and disabled people of color experience a greater risk of certain labor market inequalities than their more privileged counterparts, including lower employment rates, less earnings, and an increased risk of experiencing workplace

discrimination (Pettinicchio and Maroto 2017; Brooks 2019c; Shaw et al. 2012). While traditional theories of how disadvantages/advantages accumulate over the life course might explain these higher levels of LMD as the consequence of having multiple marginalized identities, CI theory may draw a different conclusion.

That is, according to CI theory, resource mobilization and human agency, which are byproducts of an individual's access to resources, have a hand in shaping the outcomes of their trajectories (Ferraro and Shippee 2009: Axiom 3-A). Rather than passively watching their disadvantages accumulate into inequalities, some individuals within CI theory are able to be active subjects that co-create their ultimate destinies. Applying this logic to the LMD of those with disabilities suggests that some individuals with disabilities may be able to minimize the effects of disability-specific labor market barriers through "resource mobilization and human agency" (Ferraro and Shippee 2009: p 335). Thus, this dissertation will examine how certain factors which may either increase or decrease an individual's access to resources, such as educational attainment and receipt of government assistance, can partly explain the disparities in LMD.

*Intersectionality*

While CI theory provides insight into how the disadvantages that people with disabilities experience throughout the life course may result in LMD, intersectionality suggests that some people with disabilities may experience more disadvantages than their more privileged disabled counterparts, leading to disparities in LMD among the disabled population. Specifically, intersectionality—first coined by Black feminist scholars—points to how an individual's multiple status-based characteristics, such as their race/ethnicity, class, gender, disability status, sexuality, immigration status, and other identities, must be taken into account to fully understand

their experiences of the social world (Else-Quest and Hyde 2016; Crenshaw 1989). Thus, in contrast to previous research on the labor and economic inequalities of those with disabilities that frames disability as a "master status," (Barnartt 2013), intersectional scholars contend that it is the combination of an individual's multiple statuses that shapes their experiences, interactions, and outcomes (Else-Quest and Hyde 2016). Using the metaphor of a one thousand piece puzzle, one or two pieces of this puzzle simply do not provide enough information to see the whole picture. Instead, researchers must examine all the pieces and figure out how they fit together, to complete the puzzle.

One current example of intersectionality within the disability community is the paradigm shift away from a disability rights approach towards a Disability Justice model, which centers the voices and experiences of the most marginalized disabled people (Piepzna-Samarasinha 2018). While a rights-based framework has made tremendous gains for people with disabilities (Pettinicchio 2019), this framework has been widely criticized for its centering of a white, heterosexual, cisgender, male perspective (Piepzna-Samarasinha 2018). Indeed, prominent Black and queer disabled activists, such as Imani Barbarin and Eli Clare (Barbarin 2021; Clare 2017), have discussed how their experiences have been both questioned and dismissed in white and heterosexual disabled activist circles. Thus, a Disability Justice approach, rooted in the principles of intersectionality, must be taken to understand the complexities of how disability status intersects with multiple other statuses to create an actual inclusive society, rather than the mere illusion of inclusion.

One way that intersectionality can support this goal is through the analysis of both inequality and privilege (Else-Quest and Hyde 2016). While early intersectional work primarily focused on the experiences of those who were most marginalized, specifically Black women

(Crenshaw 1989), more recent research has suggested a broader focus, recommending that scholars study both down and up (Else-Quest and Hyde 2016). As noted by Else-Quest and Hyde, doing so will provide better insights into how power and prejudice operate within society. Also, as I show in later chapters, the most marginalized group may change with context, as when disabled Black men have lower employment probabilities than their female counterparts (Chapter 3).

Indeed, this criticism of early intersectional work plays into another central tenet of intersectionality: disadvantages and marginalization come from society rather than specific statuses. That is, a status-based characteristic, such as disability, does not inherently translate into disadvantage. Instead, society creates and maintains ableist structures that foster disadvantages among people with disabilities. Systems of oppression, such as racism, sexism, and ableism, overlap within a given context, such as the labor market, to create more disadvantages for individuals who possess multiple marginalized statuses (Crenshaw 1989). For instance, because studies indicate that employers are reluctant to hire Black people and those with disabilities, Black disabled people may be at a greater disadvantage when it comes to the hiring process (Bertrand and Mullainathan 2004; Ameri et al. 2018).

Recent research on the labor and economic inequalities of those with disabilities has shifted towards this intersectional approach. Early work within this line of research demonstrates how those with disabilities who have multiple marginalized statuses experience a greater degree of discrimination in the workplace, finding that those with multiple marginalized statuses are more likely to file ADA workplace harassment charges than their more privileged counterparts (Shaw et al. 2012). Expanding upon this early research, work by Pettinicchio and Maroto (2017) and Maroto et al. (2019) indicates that marginalization may depend on context. Specifically, their

research finds that while women with disabilities have lower employment rates and earnings than both men with disabilities and women without disabilities, disability status has a stronger (more negative) association with men's labor market outcomes (Pettinicchio and Maroto 2017). This is indicated by a wider disability employment gap between men with and without disabilities than between women with and without disabilities. The researchers attribute this larger gap to dominant notions of masculinity that tie men's worth to their ability to participate in paid employment (Pettinicchio and Maroto 2017). In the same vein, Brown (2017) and colleagues examined the extent to which certain characteristics associated with low-status and precarious employment, specifically lack of job autonomy and job creativity, explain the higher levels of depression among women with physical disabilities. Their findings indicate that these characteristics explain more of the variation in depressive symptoms among women with disabilities than both their male counterparts and women without disabilities (Brown et al. 2017; Brown and Moloney 2019).

While this growing body of research points to the significance of an intersectional approach to the study of the economic and employment inequalities among those with disabilities, more attention must be given to examining why such an approach is so essential. Thus, to expand on prior research, my dissertation will examine the intersectional connections between race/ethnicity, gender, disability type and combination, and LMD. Doing so will both further highlight the importance of taking an intersectional approach to the study of the labor market inequalities of those with disabilities and indicate an urgent need to create public disability policy that is rooted in the principles of intersectionality to ensure a more fair and inclusive society.

## CONTEXTUALIZING DISABLED LMD

In 2018, only 33.3% of U.S. adults aged 16–64 with disabilities were employed, compared with 76.9% of those without disabilities—a gap of 43.6 percentage points (BLS 2019a). The employment rate of individuals with disabilities, however, varies by disability type. For instance, while 52.9% of those ages 18–64 with hearing limitations were employed in 2018, the employment rate for those with ADL limitations was only 16% (Lauer and Houtenville 2018). These statistics, however, mask the fact that studies show most people with disabilities desire paid employment (Ali et al. 2011; Livermore 2011; Schur 2003). In fact, one recent study found that 68.4% of those with disabilities were "striving to work" (Sundar et al. 2018).

Even when those with disabilities can find paid employment, they are often relegated into low-wage, low-skilled occupations, what some scholars refer to as occupational segregation (BLS 2014; Maroto and Pettinicchio 2014b). Individuals with disabilities are more likely to work in service occupations, production, transportation, and material moving occupations, but less likely to be employed in management and professional occupations than those without a disability (BLS 2014). Men with disabilities, disabled people of color, and those with disabilities who have low levels of education are especially vulnerable to high levels of occupational segregation (BLS 2017; BLS 2014). People with cognitive disabilities are also more likely to experience occupational segregation compared to people with physical and sensory disabilities (Maroto and Pettinicchio 2014b). While those who start working with disabilities experience high levels of occupational segregation (Kumin and Schoenbrodt 2016), most of the association between disability and occupational segregation may be due to the fact that workers in these low-status jobs are more likely to develop adult-onset disabilities. In other words, non-disabled people's occupational segregation likely leads to disability.

Explanations for these substantial labor market inequalities experienced by those with disabilities are often divided into three categories: policy barriers, demand-side factors, and individual-level characteristics. While studies typically focus on one of these factors, more recent research has suggested that multiple categories must be taken into account when examining the relationship between disability and labor market disadvantage (Livermore 2011; Jones 2008; Maroto and Pettinicchio 2014b; Schur 2003). This dissertation will focus on individual-level characteristics (e.g., race/ethnicity, gender, educational attainment), and policy factors measured at the individual level (e.g., receipt of government assistance, such as SSI and SSDI) and U.S. state level (e.g., whether the individual resides in a state that offers a Medicaid Buy-In program). Demand-side factors are not included because the data used for the research do not contain this information.

*Policy Factors: SSI/SSDI*

The network of social safety net programs targeted toward individuals with disabilities may contribute to their risk of LMD by forcing many of those with disabilities to choose between work and life-sustaining services and supports. These programs are built upon the historical understanding of disability as deficit. During the rise of the industrial revolution, an individual's value to society became linked with her capacity to perform paid labor. Because individuals with disabilities were seen as helpless, childlike dependents, disability became linked with the inability to work—rendering individuals with disabilities worthless in terms of the labor market and society in general (Egner 2016). To compensate for this exclusion from paid employment, the U.S. government created a social safety net for persons with disabilities. This social safety net, which is partly comprised of the two primary disability-related government assistance programs—SSDI and SSI—was created in the mid 20th century on the historical notion that

individuals with disabilities were unable to work. In addition, SSI was also created to federalize the various state programs that served those with developmental disabilities in an effort to provide consistency among these programs (Berkowitz 2000).

Currently, over half of all working-age individuals with disabilities rely on some form of SSI or SSDI for income support. These programs, however, serve two different populations. For instance, SSI is a means-tested cash transfer program intended for individuals with disabilities who have limited resources. Most individuals receiving benefits from SSI have a developmental (or early life) disability and are required to maintain their assets and incomes below a certain threshold in order to continue receiving benefits. Beneficiaries receiving SSI are automatically enrolled in Medicare and are eligible for other means-tested programs, such as the Supplemental Nutrition Assistance Program (SNAP) and Temporary Assistance for Needy Families (TANF) (Lindner et al. 2016). For individuals who experience disability onset in adulthood (later-life disability), SSDI provides cash assistance to those who are unable to continue working. Individuals receiving SSDI can only make at or below a certain amount, known as the SGA (substantial gainful activity), which is extremely low ($1,130 per month in 2016) (SSA 2016a). Similar to SSI, SSDI recipients are also eligible for multiple other government assistance programs, such as Medicare (Lindner et al. 2016; Morton 2014). Medicare and Medicaid pay for vital equipment and services, including wheelchairs, hospital visits, medications, substance abuse treatment, mental health counseling, and attendant care.

The income, assets, and earnings limits imposed by these programs force many people with disabilities to choose between financial independence/employment and the benefits and services they need to survive (Stapleton et al. 2006). While some may be able to find gainful employment, many of these workers are employed in low-wage/low-skilled jobs with few, if any,

benefits (Maroto and Pettinicchio 2014b). Thus, while a good job with health insurance may be able to compensate for the loss of benefits, many individuals with disabilities do not have access to these types of jobs, leaving them vulnerable to becoming dependent on benefits. Indeed, some scholars argue that the U.S. disability benefits system is a "poverty trap", pointing to how SSI/SSDI limits the work and earnings potential of people with disabilities (Stapleton et al. 2006).

The first part of this poverty trap relates to how the Social Security Administration (SSA) defines disability. The SSA considers an individual to be disabled if she has an "inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment" (SSA 2015a). This definition of disability maintains that the inability to work is essential in order to receive benefits. Thus, the application process associated with these programs imposes an obligation of non-employment on its applicants. This obligation, however, has little to do with an individual's actual physical or mental impairments. Rather, applicants must prove that they meet the SSA's definition of disability by not participating in paid employment in order to receive vital disability-related services and supports (Dorfman 2015). In fact, while empirical evidence shows that 40% of individuals with disabilities aged 18–64 on SSI/SSDI have work-related goals, less than half of those work-oriented beneficiaries (approximately 45%) are employed (Livermore 2011).

Once on benefits, individuals must adhere to the strict income, assets, and earnings limits to maintain their eligibility status—the second dimension of the poverty trap. These restrictions essentially require beneficiaries to live in or near poverty to receive government support. This requirement may partly explain why individuals with disabilities are more likely to live in poverty than those without disabilities (Maroto et al. 2019). Individuals who cannot meet these

requirements may not only lose their cash benefits if they fall off the SSDI "earnings cliff"—or have income/assets over the maximum amount for SSI—but they also place their other supports in jeopardy.

This leads to the third dimension of the poverty trap: the interaction between SSI/SSDI and other government assistance programs. Those who do not follow the SSA's financial restrictions may lose supports and services that may be vital to their ability to participate in their communities, such as medication, funding for wheelchairs, hospital visits, medications, substance abuse treatment, mental health counseling, and attendant care. Evidence suggests that these three dimensions of the poverty trap can impact an individual's decision in terms of the labor market. In fact, while 45% of work-oriented beneficiaries were employed in 2004, only 10% of them made enough money to have their benefits suspended or terminated (Livermore 2011).

While many SSI/SSDI recipients do not participate in the labor market, some may find alternative methods to keep their earnings at a minimum (Savin 2019; Olney and Lyle 2011; Olney 2007). In fact, despite their weak attachment to the paid labor force, individuals with disabilities, especially those receiving SSDI, perform similar or higher amounts of unpaid labor/non-market work than those without disabilities (Shandra et al. 2017; Shandra 2016; Shandra 2017). Specifically, Shandra's (2016) findings suggest that those receiving SSDI alone have labor input values that are roughly 1% of the U.S.'s GDP, a GDP equal to that of industries such as farming, education, and nursing facilities. This unpaid labor comes in various forms, including care work (Shandra et al. 2017), housework (Shandra 2016), and informal and formal volunteering (Shandra 2017). Thus, it is important to recognize that the labor of individuals with

disabilities, especially those who must follow the income, assets, and earnings restrictions of SSI/SSDI, is not always paid.

In sum, the restrictions placed upon individuals receiving SSI/SSDI increases their risk of living in poverty if they need government funds for disability-related services and supports. Despite a potential desire to engage in paid employment, these individuals may choose various alternative paths, including unemployment, unpaid labor, or low-status jobs, out of fear of losing needed benefits and services (Stapleton et al. 2006; Olney 2007). Government assistance programs are not the only barriers to gainful employment that individuals with disabilities may face, however. Indeed, those who can avoid the poverty trap face numerous other obstacles to their labor market participation, as explained next.

*Demand-Side Factors*

Persons with disabilities often face high levels of labor market discrimination while finding and maintaining a job. This discrimination may occur even before the interview process begins. In fact, when application materials (résumés and cover letters) indicated that an applicant had either a physical or sensory disability, employers were 23% less likely to express interest (Ameri et al. 2018). This lower level of employer interest actually decreases as applicant experience increases—experienced applicants with disabilities were 34% less likely to gain employer interest than similarly qualified applicants without disabilities.

Employer misconceptions about (potential) workers with disabilities may serve as one explanation for why those with disabilities are less likely to obtain employer interest. Many of these misconceptions are rooted in the belief that people with disabilities are helpless, childlike dependents. For instance, U.S.-based studies suggest that many employers believe workers with disabilities are incapable of performing the work required for the job, are less productive than

those without disabilities, take longer to learn and complete tasks, require expensive accommodations, will not get along with customers, clients, and co-workers, and will have to take numerous sick days (Chan et al. 2010; Kaye et al. 2011). Employers may also fear that hiring workers with disabilities could translate into a higher cost for accommodations and health insurance and an increased chance of litigation (Chan et al. 2010; Kaye et al. 2011).

These negative attitudes also manifest in the daily workplace experiences of workers with disabilities. For instance, some employers may engage in resistance strategies to discourage workers with disabilities from requesting accommodations. Research suggests that this type of indirect denial of accommodations may be disproportionately experienced by women with disabilities, disabled people of color, and those with disabilities who work in low-status occupations (Harlan and Robert 1998). Workers with disabilities also may experience other forms of workplace discrimination, such as isolation, prejudice and false assumptions, and workplace harassment (Robert and Harlan 2006). These negative attitudes may lead to hostile work environments for workers with disabilities and partly explain their lower levels of job satisfaction, promotion, and job security (Brooks 2019b; Robert and Harlan 2002; Schur et al. 2009). While demand-side barriers play a significant role in shaping disabled people's LMD, many national surveys, including the American Community Survey, do not address these factors within their questionnaires. Thus, I will be unable to directly account for these barriers in my analyses.

*Individual-level Characteristics*

People with disabilities inhabit multiple identities at once, including gender, race/ethnicity, socioeconomic status, age, timing of disability onset, impairment type, and various other statuses. Recent research on disability and employment inequalities suggests that

these statuses intertwine with disability, forming interlocking systems of oppression (Crenshaw 1989; Hill Collins1990; Maroto et al. 2019; Brown and Moloney 2019; Shaw et al. 2012). These interlocking systems of oppression, in turn, may help explain why some individuals with disabilities experience more LMD than others.

For instance, human capital plays a significant role in the ability of any individual to obtain a good job. This is especially true for individuals with disabilities who often see gains in education and work experience pay off more in the labor market than their non-disabled counterparts (Maroto and Pettinicchio 2014b; Jones et al. 2006; Kidd et al. 2000). For instance, most individuals who enter employment with disabilities do not obtain the education necessary to successfully navigate the labor market (Stanford et al. 2011). Among those who develop disabilities during their working years, a selection effect may occur where those with lower levels of education are more likely to develop adult-onset disabilities through work-related causes, declines in health, obesity, substance abuse, accidents or injuries, or general wear and tear (Kelley-Moore and Ferraro 2003; Jenkins and Rigg 2004). While their more educated counterparts have the money, knowledge, and power to mitigate these adverse health outcomes, those with lower levels of education often do not, resulting in a higher likelihood of disabilities as they age (Link and Phelan 2010; Verbrugge and Jette 1994; Ferraro and Shippee 2009). After developing disabilities, these individuals may have difficulty finding jobs to match their current level of ability because of their lack of education and training (see chapter 5; Jones 2011). Thus, from an individual standpoint, the lower education experienced by many people with disabilities is a major barrier to their labor market participation.

In addition to human capital, an individual's race/ethnicity and immigration status shapes disabled people's LMD. For instance, similar to those without disabilities, individuals with

disabilities who identify as non-Hispanic white, Asian, or Hispanic tend to have higher employment rates than those who identify with other racial/ethnic categories (Sevak et al. 2015). Foreign-born individuals with disabilities have higher employment rates and earn more than individuals with disabilities born in the U.S. (40.8% vs. 35.9%t) (Xiang et al. 2010). This finding may be contributed to the fact that foreign-born individuals are less likely to have access to SSI/SSDI, which may provide further evidence for the work disincentives of disability-related government benefits.

Gender also appears to play an essential role in complicating the relationship between disability and employment. Indeed, studies from the U.S. and the United Kingdom point to the fact that women with disabilities face more LMD than both men with disabilities and women without disabilities (Pettinicchio and Maroto 2017; Jones et al. 2006; Randolph and Andresen 2004). Pettinicchio and Maroto (2017) offer an in-depth explanation for these findings. Their study on the interaction between gender and disability in the labor market indicates that while women with disabilities have the lowest employment rates and earnings, disability status has a stronger association with men in terms of labor market disadvantages. That is, the employment and earnings gaps are larger between men with and without disabilities than between women with and without disabilities. The authors contribute this larger employment gap to men's traditionally stronger labor force attachment (Pettinicchio and Maroto 2017). That is, studies suggest that dominant notions of masculinity may result in a stronger (more negative) association with men's employment outcomes when compared to women (Maroto et al 2019; Pettinicchio and Maroto 2017). The greater association between LMD and disability among men may also be explained by the fact that men, especially men with disabilities, are more likely to work in physically demanding jobs, such as construction and factory work (BLS 2017). This could be

due, in part, to the fact that because these jobs may have high physical demands, men who begin these jobs without disabilities may develop work-related disabilities over time.

Disability type may also factor into disabled LMD. According to 2018 data from the American Community Survey, 53% of adults ages 18 to 64 with hearing disability reported paid employment, followed by 45% of people with vision limitations, 29% of those with cognitive disability, 26% of individuals with mobility disability, 18% of those with IADL disability, and 16% of those with ADL disability (Lauer et al. 2019a). Further, although those with cognitive disability are more likely than those without disabilities to experience low earnings and high levels of occupational segregation (Maroto and Pettinicchio 2014b; Kumin and Schoenbrodt 2016), those with hearing disability have employment and earnings outcomes similar to that of their counterparts without disability (Garberoglio et al. 2019). These disparities in labor-market outcomes may be directly related to disability type-specific employment barriers (see chapter 4 for full discussion).

Timing of disability onset also appears to be a critical individual-level factor in the relationship between disability and employment. Some studies find that individuals who develop disabilities in adulthood have lower age-specific employment rates than those who experience early-onset before age 22 (Jenkins and Rigg 2004; Loprest and Maag 2007). In addition, one study from the United Kingdom found that after accounting for factors such as industry and occupation type, men who develop later-onset disabilities through a work-related injury have significantly lower earnings than those with early-onset disabilities (Jones 2011). This study provides a twofold explanation for why people with later-onset disability may be at a higher risk of LMD than those with early-onset disability. On the one hand, individuals with early-onset disabilities may face less risk of LMD because they have more time to adapt and choose careers

that fit their abilities. On the other hand, people who acquire their disabilities later in life may have more challenges adapting to their disabilities, and as a result, experience more labor market inequalities (Jones 2011; Jones 2008).

Studies suggest that health may also be a factor in the association between disability and LMD. Those who have poor health experience more labor market disadvantages in terms of both employment and wage disparities (Jones 2011; Jones et al. 2006; Schur 2003; Baldwin and Johnson 1994). Many of these studies, however, do not control for timing of disability onset, and thus, cannot say whether the poor health of these individuals is a cause or consequence of their LMD.

Recently, scholars of disability and labor market inequalities have begun to examine how having multiple marginal identities can influence economic and labor-market outcomes. These U.S.-based studies contend that individuals with disabilities who possess other marginalized identities, such as being a woman or person of color, experience disproportionately greater LMD. For instance, individuals with multiple marginalized identities (i.e., older women of color with behavioral disabilities) are more likely to file ADA employment harassment charges than individuals with disabilities with more privileged statuses (i.e., non-Hispanic whites with physical disabilities), suggesting that these individuals may experience more workplace discrimination (Shaw et al. 2013). Further, recent work on the economic outcomes of people with disabilities finds that disabled women of color aged 18 and older have the highest levels of poverty, the lowest levels of income, and are the most likely to rely on government assistance when compared to people with disabilities from other race/ethnicity-gender groups (Maroto et al. 2019). Thus, the intersection of disability and other marginal identities produces labor market inequalities for—and among—those with disabilities.

*State-Level Policies and Characteristics*

While studies have shown that federal policy, demand-side, and individual factors are associated with the LMD of those with disabilities, only a handful of studies address how state-level characteristics and policies shape disabled persons' labor market outcomes. This lack of attention to state factors is surprising for two reasons. First, research has consistently shown that the employment rate among people with disabilities varies substantially by state (Paul et al. 2020; Lauer and Houtenville 2019; Lauer et al. 2020). For instance, while the average employment rate for persons with disabilities ages 18–64 in 2019 was approximately 39%, this rate varies by state, ranging from 57% in North Dakota to 31% in West Virginia (Paul et al. 2020). Second, one study on state variation in disability prevalence rates indicate that states with poor economic and labor market conditions have high levels of disability, suggesting that work and economic conditions are associated with the amount of disability in each state (Montez et al. 2017). This provides evidence that certain states may have disabled populations with high rates of adult-onset disabilities, which, in turn, may suggest that for most people with disabilities, LMD impacts their risk of developing disabilities in their working years.

Despite substantial theoretical evidence that state characteristics matter in the association between employment and disability, research has only been able to identify a few characteristics that are correlated with the labor market outcomes of those with disabilities. For instance, while one study tested multiple policy and economic factors, it found that only a handful of state characteristics were associated with the low employment rates of people with disabilities, including the state poverty rate, state unemployment rate, the percentage of blue-collar jobs in each state, the population densities in each state, state concentrations of physicians, state crime rates, and if the state had an SSI supplement (Sevak et al. 2018). Most of these variables,

however, were only weakly associated with employment among those with disabilities. Other research indicates that states that had ADA-like laws before the implementation of the ADA had higher employment rates and earnings for those with disabilities than states that had no such laws (Thompkins 2015; Maroto and Pettinicchio 2014a). This gap in employment and earnings between states with these laws and those that did not persist years after the ADA's passage (Maroto and Pettinicchio 2014a; Thompkins 2015). Further, some evidence suggests that the presence of a state Medicaid Buy-In Program (MBI) increases employment among those with disabilities (Ireys et al. 2009).

Expanding on this research, my dissertation will control for several key state-level policies and characteristics. First, to capture the overall economic environment of each state, I account for the state unemployment rate and state percentages of individuals ages 16 and over who are not in the labor force. I also control for several state factors that have been shown to directly affect the employment of those with disabilities, including the state percentage of individuals with disabilities 18-64 who receive SSI and SSDI, if the state has a Medicaid Buy-In (MBI) program, the presence of a state SSI supplement, and whether or not the state had ADA-like laws prior to 1990 (Thompkins 2015; Maroto and Pettinicchio 2014a; Sevak et al. 2018; Ireys et al. 2009). See Table 2.1 for a list of variables and sources.

In sum, disabled people's LMD is shaped by individual-level characteristics, demand-side factors, and policy factors operating at the individual level (e.g., receipt of government assistance) and state level (e.g., MBIs). Yet, recent evidence indicates that not all individuals with disabilities experience the same levels of LMD (Shaw et al. 2012; Pettinicchio and Maroto 2017; Maroto et al. 2019; Brown et al. 2017; Brown and Moloney 2019). In doing so, these studies point to the intersectional connections between race/ethnicity, gender, disability status,

and the labor market and economic outcomes of those with disabilities. Expanding upon this prior work, this dissertation examines the factors related to these intersectional connections, answering the "so what" question for this emerging line of research.

To achieve this objective, the remainder of this dissertation is divided into five chapters. Chapter 2 describes the data and methods for each of the three empirical chapters and lays out guiding questions for each of these analyses. Chapter 3 examines if racial/ethnic and gendered disparities in employment probabilities among those with disabilities can be partly explained by similar disparities in individual characteristics, government assistance receipt, and state-level policies and economic conditions. Chapter 4 tests whether the association between LMD and disability varies by both number and type of limitation combination. Chapter 5 estimates the number of years individuals spend in paid employment given their disability status, gender, and disability type. Chapter 6 concludes by summarizing key findings, discussing limitations of the data, and highlighting this dissertation's key contributions to the literature.

# Chapter 2: Data and Methods

PURPOSE

Recent evidence suggests that the labor market and economic outcomes of individuals with disabilities are simultaneously raced and gendered (Maroto et al. 2019). To examine the factors related to the intersectional connections between race/ethnicity, gender, disability status, limitation type, and LMD, I use data from the American Community Survey (ACS) in all three empirical chapters. In addition, depending on the chapter, I incorporate data on state-level policies and characteristics from various sources (Chapters 3 and 4) and mortality data from the SSA (Chapter 5).

To expand upon the extant literature on the labor market disadvantages of those with disabilities, this dissertation will examine for whom, and under what circumstances, these disadvantages occur within a U.S.-based context. Within this broader framework, this research has two primary objectives. First, taking an intersectional approach, chapters 3 and 4 will examine how status-based characteristics, specifically race/ethnicity, gender, and limitation type and combination, both separately and together, shape the LMD of those with disabilities. These chapters also examine how accounting for certain individual-level characteristics and policy factors operating at both the individual and state levels may explain the LMD among those with disabilities. Second, using Sullivan-based Life Tables, chapter 5 will estimate the number of years that persons with disabilities can expect to be employed, given their gender and disability type. To theoretically ground these two objectives and the resulting findings, I will use the theoretical frameworks of intersectionality, Disablement Process (DP), and Cumulative Inequality (CI) theory. In doing so, this dissertation will seek to answer the overarching question:

What are the factors related to the intersectional connections between race/ethnicity, gender, disability status, limitation type, and LMD?

## DATA

This dissertation primarily uses data from the 2017 ACS. Specifically, the 2017 ACS contains data from a nationally representative sample of 4,828,334 individuals, 677,201 of whom identify as having a disability. The ACS also contains measures related to economic outcomes, such as employment and earned income, as well as various other measures that have been shown to be associated with these measures.

The ACS is well-suited for this dissertation because of its large numbers of people with disabilities, allowing researchers to study the employment and economic trend among various disabled sub-populations, such as women with disabilities, disabled people of color, and those with multiple limitation combinations (Erickson 2012). The ACS is also unique to the extent that it includes those living in group quarters (GQs) (i.e., college residence halls, residential treatment centers, skilled nursing facilities, group homes, military barracks, correctional facilities, and workers' dormitories) in its sample. Including these GQs is especially important for studying the population of people with disabilities, given that those with the most significant disabilities may live in these types of institutional settings (Erickson 2012).

Due to the ACS's hot-deck imputation method for predicting missing disability data, there are no missing data in the analyses for the three empirical chapters (Brault et al. 2009). While, on average, only 2.6%of the ACS sample have some form of nonresponse on the disability items, the imputation method allows these respondents to be included in analyses rather than dropped (Brault et al. 2009). Although studies have suggested that this method may produce biased estimates in certain cases (Siordia and Young 2013), others provide substantial evidence that the

ACS disability questions—and the hot-deck imputation method—adequately identifies the population of individuals with "a mental or physical impairment that substantially limits at least one major life activity" (Miller and DeMaio 2006:2; Altman et al. 2017).

*Sampling Frame*

The ACS collects data from two separate samples: housing unit (HU) addresses and residents of GQ facilities (Torrieri 2014). The ACS sampling frame, a list of all units from which the sample is selected, comes from the Census Bureau's official inventory of all known HUs, GQs, and selected non-residential units, known as the Master Address File (MAF) (Babbie 2013; Torrieri 2014). The MAF has information on mailing addresses, physical descriptions, residential or commercial status, latitude and longitude coordinates, geocodes, and background information for each sample unit.

*Study Sample*

The sample for this dissertation includes all working-age individuals in the ACS. To account for post-secondary education and the potential for early employment exit, the samples for chapters 3 and 4 were further limited to adults aged 25—61 (Maroto and Pettinicchio 2014b). The sample for chapter 5 was limited to those aged 20—64. I also excluded all non-U.S.-born respondents from all three samples, given that the employment trajectories of native-born and non-native-born respondents with disabilities may differ substantially (Xiang et al. 2010).

RESEARCH QUESTIONS

To expand on the knowledge of the labor market disadvantages of those with disabilities, this dissertation was guided by two broad questions: (1) How do race/ethnicity, gender, disability status, limitation type, individual characteristics, government assistance receipt, and state-level characteristics intertwine with the labor market to shape LMD? and (2) How many years can

persons with and without disabilities expect to spend in paid employment, given their gender and disability type? To answer these questions, this dissertation presents three empirical chapters, each with its own specific set of questions.

Chapter 3 explores how employment probabilities among those with disabilities vary jointly by race/ethnicity and gender with the following questions: (1) Does the framework of intersectionality further our understanding of the labor-market outcomes of those with disabilities? (2) How might labor market outcomes be jointly shaped by race/ethnicity, gender, and disability status? and (3) how can potential disparities among the race/ethnicity-gender-disability groups be explained by individual characteristics, receipt of government assistance, and U.S. state policies and characteristics?

To examine how the number and type of limitations jointly shape employment probabilities, chapter 4 centers around the following questions: (1) How do certain combinations of limitations predict an individual's risk of LMD? (2) How might the number and type of limitations jointly shape the association between multiple limitations and LMD? and (3) How can potential disparities in LMD among the limitation combinations be statistically accounted for by individual characteristics, receipt of government assistance, and U.S. state policies and characteristics?

Finally, chapter 5 examines how disability status, gender, and disability type simultaneously shape the number of years people spend employed, with the following questions. (1) How many years do people with disabilities spend employed compared to their counterparts without disabilities? (2) How do those patterns differ by gender? And (3) How do those patterns vary by disability type?

## MEASURES

### *Predictor Variables*

Disability status and disability type serve as the primary predictor variables in this dissertation. The ACS' disability questions were originally modeled after the Washington Group disability questions and the World Health Organization's (WHO) International Classification of Functioning, Disability, and Health (ICF) framework (Madans et al. 2011). To ensure that respondent interpretations matched with the questions' intended interpretations (Miller and DeMaio 2006), several versions of these disability questions went through numerous cognitive testing, revisions, and re-testing. This extensive testing and revision process produced the 2008 six-item disability question sequence designed to capture the population with "a mental or physical impairment that substantially limits at least one major life activity" (Miller and DeMaio 2006: 2).

Notably, the first four questions in this sequence were designed to capture functional limitations while the latter two address disability (Verbrugge and Jette 1994). Specifically, the ACS asks about four functional limitations, including (1) serious difficulty hearing; (2) blind or serious difficulty seeing even when wearing glasses; (3) serious difficulty concentrating, remembering, or making decisions; and (4) serious difficulty walking or climbing stairs. Disability was measured with two questions. Activities of Daily Living (ADL) difficulties were captured with the question, "do you have difficulty dressing or bathing?" Instrumental Activities of Daily Living (IADL) difficulties were identified with the question "Because of a physical, mental, or emotional condition, does this person have difficulty doing errands alone such as visiting a doctor's office or shopping?" (Erickson 2012).

While these six Washington Group disability questions offer researchers a way to identify the population of people with disabilities, these questions have several important limitations worth noting. First, because they do not measure severity, these questions often fail to capture those with moderate or mild disabilities (Sabariego et al. 2015). Second, because this six-question sequence only directly addresses some functional and activity limitations, it may not capture certain sup-populations of people with disabilities, such as those with mental health disabilities, chronic pain, substance abuse disorder, some intellectual disabilities, and service-connected disabilities (Holder 2016; Havercamp et al. 2019; King et al. 2019; Washington Group on Disability Statistics 2018; Sabariego et al. 2015; London et al. Forthcoming). Third, there may be a vast heterogeneity within these six limitation groups in terms of disability type (Havercamp et al. 2019). For instance, the cognitive disability category may include those with Alzheimer's disease, intellectual disabilities, autism spectrum disorder (ASD), attention deficit hyperactivity disorder (ADHD), depression, and anxiety (Havercamp et al. 2019). Finally, because these questions do not measure timing of disability onset, researchers cannot distinguish between those who develop disabilities prior to their working years and those who experience disability onset during their working years. This lack of information about timing of disability onset is a major limitation of this research, given that it is impossible to determine for whom disability is a prior cause of LMD and for whom LMD is a prior cause of disability (Havercamp et al. 2019). Given these limitations, it appears that the ACS disability questions are actually measuring reported disability, which will be referred to as disability for the remainder of this dissertation.

Specifically, I refer to all six types as "disability." Similar to previous work, all six questions were combined into one overall binary indicator for disability status (any disability =

1; no disability = 0), with those answering at least one of the six limitation questions in the affirmative coded as having a disability (Maroto et al. 2019). Six separate binary indicators were also created to capture disability type. For instance, to create the measure for those with hearing disabilities, I coded those who responded in the affirmative to the hearing difficulties question as one (1) and all other respondents as zero (0).

Chapter 3 also includes race/ethnicity and gender as predictor variables. Gender is a dichotomous measure with one (1) as female and zero (0) as male. Race/ethnicity was captured with a four-category variable representing Non-Hispanic (NH) white, NH Black, Hispanic, and NH other.

*Outcome Variable*

Employment status was the primary outcome variable for this dissertation. Employment status is a binary indicator (Employed = 1; Not employed = 0). Those who reported that they were either "employed, at work" or "employed, with a job but not at work" were coded as employed, and those who reported that they were unemployed or not in the labor force were coded as not employed. This measure includes those who are employed both full and part-time. While a three-category measure of labor force participation (which would distinguish categories for employment, unemployment, and not in the labor force) might be informative, the sample sizes of unemployed adults for some disability sub-samples, such as NH black women (see chapter 3) and various limitation combinations (see Chapter 4), are too small to obtain robust estimates. This binary measure of employment has been used in other studies that examine the association between employment and disability (e.g., Pettinicchio and Maroto 2017; Brucker et al. 2016)

*Employment-Related Variables*

As noted in chapter 1, various policy barriers, individual-level factors, and state-specific characteristics play a role in shaping the LMD of those with disabilities. I account for several of these factors in my dissertation. For instance, I included several individual characteristics in the analyses of this dissertation, including age, educational attainment, and marital status. Age was measured continuously in all three analyses, ranging from 25 to 61 in chapters 3 and 4 and 20 to 64 in chapter 5. Educational attainment was measured on a continuous scale (1-24 years). Marital status was a binary indicator with one (1) as currently married and zero (0) as widowed, divorced, separated, or never married. Marital status is a key individual-level variable in chapter 3, given the different effects that it could potentially have on the LMD of women and men with disabilities (see Chapter 3).

Because receipt of government assistance has been shown to create work disincentives for individuals with disabilities (Stapleton et al. 2006), this analysis includes four dichotomous measures of government benefit receipt during the survey year: (1) Supplemental Security Income, (2) Social Security income, (3) Public assistance income, and (4) Survivor benefits or disability pensions. Two of these programs directly relate to the labor-market outcomes of those with disabilities. SSI is a means-tested cash transfer program intended for individuals with disabilities who have limited resources and no work history. SSI takes an individual's income into account when making an eligibility determination. Specifically, recipients will have their benefits reduced by $1 for every $2 they earn after their first $85—limiting their ability to earn income if they want to maintain their eligibility (Livermore 2011). SSDI is primarily a public workers' compensation program. Individuals who receive SSDI must have a significant work

history and have exited the labor force due to disability. If recipients make above a certain amount of income in any given month, their benefits are suspended. This income restriction—known as the SGA—is extremely low, in 2016, the SGA was $1,130 per month, making it nearly impossible for SSDI recipients to return to the labor force (SSA 2016; Livermore 2011). Other programs might impact disabled individual's labor market outcomes as well. For instance, SSI offers pathways to other public assistance programs, such as SNAP and TANF. As a result, individuals may be even more reluctant to apply for paid employment for fear of losing these combined benefits and services (Lindner et al. 2016). Finally, those on survivor benefits or disability pensions may not report paid employment because these programs often serve as pathways to other government assistance programs, such as Medicaid, which has income and asset restrictions. For the analyses in this dissertation, these government assistance measures were created into four separate dichotomous indicators, with one as those who were receiving assistance from that specific program and zero representing those who were not.

Chapters 3 and 4 also include several state-level factors in their analyses. These state policies and characteristics have been shown to be associated with the lower employment rates of those with disabilities (see Chapter 1 for justifications for each variable). These state policies and characteristics include the unemployment rate for each state, state percentages of individuals ages 16 and over who are not in the labor force, the state percentage of individuals with disabilities 18-64 who receive SSI and SSDI, if the state has a Medicaid Buy-In (MBI) program, the presence of a state SSI supplement, and whether or not the state had ADA-like laws prior to 1990. See Table 2.1 for a list of variables and sources.

## ANALYSES

To examine the factors related to the intersectional connections between race/ethnicity, gender, disability status, limitation type, and LMD, I used data from the 2017 ACS. Logistic regression and Sullivan-based Life Tables were used to analyze the data. Statistical significance for all analyses was assessed at alpha = .05, .01, and .001 levels. Descriptive statistics were estimated for all variables. The Karlson–Holm–Breen (KHB) method was used to identify which of the individual, policy, and state-level factors had the strongest association with the employment probabilities in chapter 4. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used to determine model of best fit in chapters 3 and 4. All analyses were conducted using Stata 16.1 and were adjusted using appropriate sample weights and standard errors.

In chapter 5, I used Sullivan-based Life Tables to estimate the amount of time persons with disabilities spend in paid employment between the ages of 20 and 64. These period-based lifetables use cross-sectional data to estimate the age-specific probabilities of death and of employment for a particular calendar year. In doing so, this analysis will be based off of two underlying assumptions. First, because period-based lifetables are calculated using data from a given year X, they assume that age-specific mortality and employment rates from year X remain the same over the lifetime of the hypothetical cohort. Second, such an assumption is reasonable as long as there are no significant changes in those age-specific rates during the hypothetical cohort's lifetime (assumption 2). Importantly, while age-specific death and employment rates have both declined over the past century, these declines have halted in recent years.

## DISTRIBUTION OF VARIABLES BY RACE/ETHNICITY, GENDER, AND DISABILITY TYPE

Descriptive statistics for the 2017 ACS disability sub-sample stratified by race/ethnicity, gender, and disability type are presented in Table 2.2. According to this table, 12% of the overall sample (235,536 individuals) reported at least one of the six ACS' disabilities. Among those with disabilities, 19% reported hearing limitations, 18% reported vision limitations, 49% reported mobility limitations, 45% reported cognitive limitations, 19% reported ADL disabilities, and 37% reported IADL limitations. Notably, however, 48% of those with disabilities in this sample reported having more than one disability. Roughly half (48%) of those with disabilities identified as female, however these percentages vary by disability type. Specifically, 37% of those with hearing limitations, 50% of those with vision limitations, 53% of those with mobility limitations, 47% of those with cognitive limitations, 50% of those with ADL disabilities, and 52% of those with IADL disabilities identified as female.

In terms of race/ethnicity, 70% of those with disabilities identify as NH white, 16% as NH Black, 9% as Hispanic, and 5% as NH other. Again, however, these percentages vary by disability type. For instance, 77% of those with hearing limitations identify as NH white, 9% as NH Black, 8% as Hispanic, and 6% as NH other. Among those with vision limitations, 65% identify as NH white, 18% as NH Black, 11% as Hispanic, and 6% as NH other. Further, 69% of individuals who report mobility limitations identify as NH white, 18% as NH Black, 8% as Hispanic, and 5% as NH other. Similarly, 69% of those with cognitive limitations identify as NH white, 16% as NH Black, 10% as Hispanic, and 6% as NH other. Among those with ADL limitations, 67% identify as NH white, 18% as NH Black, 9% as Hispanic, and 5% as NH other.

Finally, 70% of those with IADL disabilities identify as NH white, 16% as NH Back, 9% as Hispanic, and 5% as NH other.

In sum, Table 2.2 indicates that persons with disabilities are far from a homogeneous group. This dissertation seeks to expand on prior research by presenting three analyses that examine the factors related to the intersectional connections between race/ethnicity, gender, disability status, limitation type, and LMD.

# Chapter 3: Does the Association Between Labor Market Disadvantage and Disability Vary Jointly by Race/Ethnicity and Gender?

Abstract: Recent work highlights the importance of intersectionality to the study of the economic and labor market inequalities of those with disabilities. Yet, little attention has been given to examining the factors related to these intersectional connections. The current chapter expands on previous research by (1) examining how race/ethnicity, gender, and disability status work in tandem to shape employment probabilities among working-aged adults with disabilities and (2) whether potential disparities among these groups can be explained by individual factors, government assistance receipt, and state policies and characteristics. This chapter uses data from the 2017 American Community Survey (ACS) to estimate a series of logistic regression models predicting employment from 16 race/ethnicity-gender-disability groups. Results indicate that interactive models reveal aspects of the association between disability status, other status-based characteristics, and LMD that additive models simply cannot capture. Findings also provide evidence for a "spillover effect" where the disadvantages or advantages an individual acquires from the combination of their status-based characteristics spill over to affect their employment probabilities. This spillover effect may result from the multiplicative effects of race/ethnicity, gender, and disability status on institutions, including education, employment, and government assistance, intertwining to create and maintain hierarchies of disadvantage, leading to overlapping institutions of oppression.

**Does the Association Between LMD and Disability Jointly Vary by Race/Ethnicity and Gender?**

People with disabilities constitute one of the largest minority groups in the U.S. with 10.2% of Americans aged 18 to 64 reporting some type of physical or mental limitation (Lauer and Houtenville 2019). Disability prevalence rates are especially high among women, racial minorities, and those with multiple marginalized statuses (Warner and Brown 2011). According to 2010 age-adjusted disability rates, 19.8% of women and 23.2% of non-Hispanic (NH) Black people report a disability (Brault 2012).

Despite the diversity within this population, some literature frames disability as a "master status," dominating over all other statuses (Barnartt 2013). While recent work has called the "disability as an all-encompassing experience" paradigm into question (Conejo 2013; Caldwell 2010; Frederick and Shifrer 2019), the majority of the work on disability still constructs a raceless, genderless, heteronormative disabled subject, the normate with a disability to borrow from Garland-Thomson (2005). Thus, the question still remains as to whether, and how, other status-based characteristics matter in the lives of those with disabilities.

Answering this question requires a deep and complex understanding of how disability, as a status-based characteristic, interacts with an individual's other statuses to shape their experiences. That is, people with disabilities inhabit multiple other statuses, such as race/ethnicity and gender. These intersecting statuses come together shaping everything from their educational trajectories to their labor-market outcomes (Erevelles and Miner 2010; Pettinicchio and Maroto 2017). For instance, recent work reveals how race/ethnicity, education, and gender interact with disability status to create hierarchies of economic and labor market inequalities (Brown and Moloney 2019; Maroto et al. 2019). These hierarchies reveal that, even

among people with disabilities, those with multiple marginalized statuses face more disadvantages in society.

This chapter builds on previous work pointing to the intersectional effects of race/ethnicity and gender on poverty and government assistance receipt among persons with disabilities by examining whether similar intersectional effects are present among disabled people's employment outcomes. Moving beyond an empirical test of this intersectional paradigm, this chapter also expands on previous literature by examining whether the intersectional effects experienced in one aspect of an individual's life (i.e., education or government assistance) intertwine with the labor market to shape racial/ethnic and gendered employment disparities. In other words, can the disadvantages or advantages produced by intersectional effects in one life domain shape experiences and outcomes in others? In doing so, this chapter will address the following questions: How might labor market outcomes be jointly shaped by race/ethnicity, gender, and disability status? And how can potential disparities among the race/ethnicity-gender-disability groups be explained by individual characteristics, receipt of government assistance, and U S state policies/characteristics?

To capture the nature of intersectionality, this chapter interacts race/ethnicity, gender, and disability status to create 16 race/ethnicity-gender-disability groups. I then use a series of logistic regression models to examine how these three statuses intersect to shape employment. Doing so helps shed additional light on how an intersectional framework furthers our understanding of labor-market outcomes among people with disabilities. First claimed by Black feminist scholars, intersectionality points to how multiple statuses come together to shape individuals' experiences (Crenshaw 1989). From this perspective, researchers must consider individuals' multiple statuses to fully capture their multiple layers of oppression and privilege. Building off of this

foundational work, the current chapter will apply the key principles of intersectionality to the study of the labor market inequalities of those with disabilities. In doing so, this chapter highlights the complex ways in which race/ethnicity, gender, disability status, and employment simultaneously shape each other, and how the multiplicative effects of these statuses can create disadvantages in certain areas of an individual's life that may potentially spillover to impact their employment probabilities.

## RACIAL/ETHNIC AND GENDERED EMPLOYMENT DISPARITIES AMONG PERSONS WITH DISABILITIES

Research on the employment disadvantages of persons with disabilities expands on the broader sociological stratification literature by asserting that disability is an axis of inequality, like race/ethnicity, gender, and other status-based characteristics (Mauldin et al. 2020; Brown and Moloney 2019; Maroto et al. 2019; Shandra 2018). According to data from the U.S. Bureau of Labor Statistics (BLS), 33.6% of adults with disabilities ages 16 to 64 were employed in 2019, compared with 77.3% of adults without disabilities (BLS 2021). This substantial gap in labor force participation alludes to disability-related barriers that substantially limit the employment potential of disabled people.

Policy factors, such as disability-related social safety net programs (specifically SSI and SSDI), force some with disabilities to forgo gainful employment in lieu of needed disability-related government benefits and services. While these programs provide access to vital disability-related supports (which many private insurers do not offer), such as wheelchairs, hospital visits, medications, substance abuse treatment, mental health counseling, and attendant care, they also provide small amounts of cash transfers which can drive some with disabilities

into a “poverty trap” in order to receive life-sustaining supports and services (Stapleton et al. 2006).

Those who bypass the work disincentives created by these programs face other barriers related to employer demand for disabled employees. Specifically, research by Ameri and colleagues (2018) found that when application materials (resumes and cover letters) indicated that the applicant had a disability, employers were 23% less likely to express interest. This discrimination is the product of false attitudes and assumptions held by employers that workers with disabilities are incapable of performing the work required for the job, are less productive than those without disabilities, take longer to learn and complete tasks, require expensive accommodations, will not get along with customers, clients, and co-workers, and will have to take numerous sick days (Chan et al. 2010).

Studies indicate that race/ethnicity shapes how these barriers affect labor market outcomes. Recent statistics show that only 23% of Non-Hispanic (NH) Black people with disabilities ages 21–65 were employed in 2017, compared with 36% of similar white people (Brooks 2019c). Underlying this 13-percentage point gap are racial/ethnic and ableist structures working in tandem to create compounding labor market disadvantages for NH Black people with disabilities. The multiplicative effects of these two systems of oppression have direct consequences for employment outcomes. For instance, while Vocational Rehabilitation (VR) programs offer individuals with disabilities assistance with finding employment, NH white participants have higher rates of earnings than NH Black participants after program exit. In fact, research indicates that the black-white disability earnings gap increases after receiving VR services (Mwachofi 2009). This increase may occur because, on average, VR counselors devote more time and resources to NH white consumers than their NH Black counterparts (Mwachofi

2009), indicating the effects of systemic racism even in an agency designed to reduce the barriers created by ableism.

Gender and disability have a more complicated association within labor market contexts. Recent statistics show a 4.7-percentage point employment gap between U.S. men and women with disabilities ages 18–64 (39.3% vs. 34.6%) (Lauer and Houtenville 2018). The employment gap between women with and without disabilities, however, is slightly smaller (37.6%) than between men with and without disabilities (43.2 %). The complex association between gender, disability, and employment may be partly explained by the different ways that disability-related employment barriers affect women and men with disabilities. For instance, while recipients of SSI are more likely to be women with disabilities, men with disabilities represent the majority of SSDI recipients (Caplan 2014). Disabled men's higher rates of SSDI receipt may be due to the fact that because men are more likely to work in physically demanding occupations than women (BLS 2017) they may be more vulnerable to developing adult-onset disabilities. After becoming disabled, these men may not be able to return to their previous jobs, due to the mismatch between their new limitations and the physical demands of these jobs, resulting in a greater likelihood of SSDI receipt. On the other hand, women with disabilities' higher rates of receipt of SSI—a means-tested program—may indicate their weaker attachment to the labor market, increasing their vulnerability to falling into the benefits poverty trap. Women with disabilities' weaker attachment to the labor market may also be due to their greater likelihood of having parental and other caregiving responsibilities (Pettinicchio and Maroto 2017; Shandra and Penner 2017).

Studies that account for how race/ethnicity and gender affect the labor market experiences of those with disabilities advance our understanding of how membership in other

social categories may shape disabled people's employment outcomes (Brooks 2019c; Mwachofi 2009; Lauer and Houtenville 2018; Caplan 2014; Pettinicchio and Maroto 2017; London et al. Forthcoming). This line of research, however, tends to cite explanations such as 'double jeopardy' or 'triple disadvantage' for the lower employment rates and earnings of multiple marginalized people with disabilities. Yet, the literature on the gendered employment inequalities among people with disabilities suggests that having a more privileged status (such as being male) does not necessarily translate into less LMD (Pettinicchio and Maroto 2017). To fully capture the nuances behind how multiple statuses may operate within an individual to shape their labor-market outcomes, researchers must account for the various ways that these statuses intersect.

## AN INTERSECTIONAL APPROACH TO DISABILITY

Intersectionality points to how various status-based characteristics work in tandem to shape an individual's experiences of power, prejudice, and privilege. First coined by Black feminist scholar Kimberlé Crenshaw to identify the invisibility of Black women in the workplace (Crenshaw 1989), intersectionality calls upon scholars to think of various statuses (i.e., race/ethnicity, gender, disability status, sexuality, etc.) as pieces of a puzzle. While the individual pieces contain some information about the puzzle, scholars must put the pieces together and understand how one piece affects the meaning of another to fully grasp the whole picture. In this same vein, intersectionality suggests that it is not enough to study one aspect of an individual's identity, but rather, an individual's membership in multiple categories must be taken into account to better address how these categories shape their experiences within social institutions, their relationships, and their social identity.

Scholars who study disability as an axis of inequality have adopted an intersectional approach to highlight how membership in certain other marginalized categories complicates the experience of living with a disability (Mauldin et al. 2020; Frederick and Shifrer 2019; Maroto et al. 2019). These studies point to how an individual's other status-based characteristics merge with their disabilities, creating various multiplicative effects. For instance, women with disabilities experience a specific type of gendered ableism, which denies some disabled women access to traditional female roles, leaving them in a state of "rolelessness" in society (Schur 2003). These narratives have implications for a disabled woman's educational, economic, and labor-market outcomes (Arms et al. 2008; Parish 2009; Pettinicchio and Maroto 2017).

Less attention, however, has been paid to how this gendered ableism affects men with disabilities. The handful of studies that address the intersection of disability and masculinity point to how male scripts portraying the ideal man as strong, independent, and autonomous come into direct conflict with social constructions of disability as weak, child-like, and dependent (Shuttleworth et al. 2012). These two conflicting roles that men with disabilities must simultaneously inhabit may explain why they experience more labor market and economic disadvantages than their female counterparts (Pettinicchio and Maroto 2017). That is, studies suggest that dominant notions of masculinity may result in a stronger (more negative) association with men's employment outcomes when compared to women (Maroto et al 2019). The stronger association between disability status and LMD among men could partly result from their greater likelihood of working in physically demanding jobs, such as construction and factory work (BLS 2017). That is, because men are more likely to work in these hazardous working environments, they may be more likely to develop disabilities while working, and ultimately exit employment due to these disabilities (See chapter 5).

Although the compounding effects of gender and disability have been well documented, much of this research has been conducted on predominantly white samples, paying little attention to how race/ethnicity might impact these relationships. This reduction of the experience of gender and disability to a white, western perspective is problematic, given that race/ethnicity plays a substantial role in the lives of people with disabilities, shaping everything from their educational trajectories to their labor-market outcomes (Frederick and Shifrer 2019). In fact, studies document that, due to the intersection of racism and ableism, NH Black people experience disability very differently than their white counterparts (Erevelles and Miner 2010; Frederick and Shifrer 2019).

Despite overwhelming evidence that intersectionality is imperative to the study of disability, some research that addresses disability's intersection with other marginalized statuses consider at most one other status-based characteristic. These studies examine how labor-market outcomes vary depending on an individual's disability status and their race/ethnicity, gender, or immigration status (Sevak et al. 2015; Xiang et al. 2010). As a result, most of these studies arrive at the same conclusion—those with disabilities who possess other marginalized statuses experience greater labor market disadvantage.

Other studies contradict this theoretical paradigm, indicating that those with the most marginalized statuses do not always experience the greatest disadvantages (see Pettinicchio and Maroto 2017 for example). An intersectional perspective may help to explain these contradictory findings. For instance, labor market studies that examine the intersection of gender and disability consistently find that women with disabilities have the lowest employment rates, compared to both men with disabilities and people without disabilities (Randolph and Andresen 2004). However, evidence indicates a larger gap in employment probabilities between men with and

without disabilities than between women with and without disabilities (Sevak et al. 2015). While an additive approach, which takes the effects of membership in one category and adds the effects of membership in another, may not be able to explain these two seemingly contradictory findings, Pettinicchio and Maroto (2017) use an intersectional framework to explain how the interaction between masculinity and disability may play a role in shaping the labor market outcomes of men with disabilities. Specifically, they point to the fact that, because traditionally men have a stronger attachment to the labor market than women, having a disability, which is associated with the inability to work, may have a stronger dampening effect on men's employment rates. Occupational type may also play a role in this stronger association where men's greater likelihood of working in occupations with high physical demands could result in their greater risk of developing adult-onset disabilities, which could lead to higher rates of employment exit (BLS 2017).

While research has captured many of the nuances within the relationship between gender, disability, and the labor market, scant attention has been paid to how race/ethnicity may also affect employment outcomes among those with disabilities. The handful of studies that address the multiplicative effects of race/ethnicity and disability, from an intersectional perspective, tend to focus on compounding systems of oppression, such as ableism, racism, and xenophobia. For instance, studies find that Hispanics with disabilities who are more assimilated into U.S. society have better labor-market outcomes than those that are not (Velcoff et al. 2010). Thus, while there is evidence to suggest that intersectionality does matter, more attention must be paid to how race/ethnicity, gender, and disability status work in tandem to create employment disparities among individuals with disabilities. As a result, the first aim of this study will be to address the following question:

*How do race/ethnicity, gender, and disability status work together to jointly shape employment probabilities?*

## OVERLAPPING INSTITUTIONS OF OPPRESSION

The potential joint effects that race/ethnicity and gender may have on the LMD of those with disabilities does not occur within a vacuum. Rather, in theory, the multiplicative effects of race/ethnicity, gender, and disability status on multiple institutions, such as employment, education, and government assistance, may intertwine with one another, creating what I call overlapping institutions of oppression. In other words, the intersectional effects that individuals experience in one area of their lives can "spillover" into others, reinforcing existing systems of social stratification. That is, spillover effects occur when inequalities experienced in one axiom of disadvantage (i.e., low levels of education) can exacerbate inequalities in others (i.e., high levels of LMD). For instance, evidence indicates substantial racial/ethnic and gendered disparities among disabled people's educational outcomes (Sanford et al. 2011; Blackorby and Wagner 1996). In fact, according to data from the U.S. Department of Education, 74% of white students with disabilities graduated in 2015 with a regular high school diploma, compared to only 62% of NH Black students with disabilities (U.S. Department of Education, Office of Special Education Programs, Individuals with Disabilities Education Act (IDEA) 2017). Further, studies indicate that female students with disabilities are less likely to receive special education services than their male counterparts despite similar levels of need (Arms et al. 2008).

Further, a selection effect may occur among those with adult-onset disabilities, where workers with low levels of education are more likely to develop disabilities in adulthood (Jenkins and Rigg 2004; see chapter 1). That is, people who experience adverse childhood conditions, such as mental, physical, or sexual abuse, parental substance use, or low levels of childhood SES

are more likely to receive insufficient levels of education and training, work in low-status and precarious jobs, and live below the poverty level than those who do not experience such adverse conditions (Metzler et al. 2017). These conditions increase their chances of developing adult-onset mental and physical disabilities through mechanisms such as unhealthy working environments, obesity, risky health behaviors, substance abuse, and pre-existing conditions. In other words, children who experience adverse conditions are often placed on educational trajectories that often result in negative outcomes in adulthood, which can lead to adult-onset disabilities and further LMD (Jenkins and Rigg 2004). Yet, little attention has been given to examining how these educational disparities may "spillover" to affect employment.

In addition to education, marital status has also been shown to be associated with disabled persons' LMD, with studies indicating that married people with disabilities are more likely to be employed than their non-married counterparts (Sevak et al. 2015). Marital status may have different effects on the LMD of women and men with disabilities. For instance, because of their weaker attachment to the labor market, the extra income gained from marriage may reduce disabled women's probabilities of employment. Additionally, because married women with disabilities are more likely to have children than those who are not married, they may choose to forgo work in order to raise their families (Crooks 2007). Indeed, studies indicate that disabled mothers find it too difficult to navigate disability-related workplace barriers and disabled motherhood at the same time, leading to their employment exits (Crooks 2007). Simultaneously, marriage may further reinforce stereotypical notions of the male breadwinner among men with disabilities, potentially increasing their employment probabilities (Pettinicchio and Maroto 2017). Again, however, little is known about how these theoretical differences may affect the employment of those with disabilities.

A spillover effect may also occur with government assistance receipt. Specifically, studies have shown that persons with disabilities who have other marginalized statuses are more vulnerable to government assistance dependency than their more privileged disabled counterparts (Caplan 2014; Maroto et al. 2019). Yet, little attention has been given to how this greater reliance on government assistance affects other aspects of a disabled individual's life. This lack of knowledge is especially concerning given the link between government assistance and employment among individuals with disabilities (Stapleton et al. 2006). The potential link between government assistance dependency, employment, and intersectionality, however, may be bidirectional. That is, studies indicate that the low levels of employment among individuals with disabilities can be both a cause and consequence of their high rates of government assistance receipt. For instance, while the income and asset limits of certain government assistance programs, specifically SSI, may prevent some who experience disability onset in childhood from entering employment, restrictions imposed by other programs, such as SSDI, may create substantial barriers to employment re-entry for those who develop disabilities while working (Livermore 2011). However, literature has yet to examine whether the connections between government assistance and employment are stronger among multiply marginalized disabled people.

Finally, studies have continued to document the fact that employment probabilities among those with disabilities vary substantially by U.S. state (Paul et al. 2020; Lauer and Houtenville 2019; Lauer et al. 2020). For instance, while the average employment rate for persons with disabilities ages 18–64 in 2019 was approximately 39%, this rate varies by state, ranging from 57% in North Dakota to 31% in West Virginia (Paul et al. 2020). Several state-level policies and characteristics have been shown to be associated with the lower employment

rates of those with disabilities, including the state poverty rate, state unemployment rate, and if the state had an SSI supplement (Sevak et al. 2018). Yet, more attention must be given to determining if these state characteristics have a greater impact on the LMD of multiply marginalized individuals with disabilities. This leads to the following:

> *To what extent can potential disparities among the race/ethnicity-gender-disability groups be explained by individual characteristics, receipt of government assistance, and U.S. state policies and characteristics?*

Expanding on prior research, this chapter examines how the multiplicative effects of race/ethnicity, gender, and disability status on individual characteristics, receipt of government assistance, U.S. state policies and characteristics, and employment simultaneously shape one another, reinforcing existing systems of social stratification. In doing so, this chapter has two primary objectives. First, it examines how race/ethnicity, gender, and disability status work in tandem to shape employment probabilities and how an intersectional approach can provide insight into certain nuances of disabled persons LMD. Second, it investigates whether accounting for individual characteristics, receipt of government assistance, and U.S. state policies and characteristics explains the disparities among 16 race/ethnicity-gender-disability groups, suggesting potential spillover effects.

## METHODS

### *Data*

To examine how the likelihood of being employed varies by race/ethnicity, gender, and disability status, this chapter analyzes data from the 2017 1-year public use file of the American Community Survey (ACS). The ACS is the best available dataset for this analysis because of its

large numbers of persons with disabilities, which is necessary for robust estimates from models that include multiple intersecting statuses alongside disability.

The analytic sample for this study includes respondents aged 25–61 to capture those who have already completed their education, at least through a bachelor's degree, and account for early retirement (Maroto and Pettinicchio 2014b). Due to varying levels of access to government assistance programs, the employment trajectories of native-born and non-native-born respondents with disabilities may differ substantially (Xiang et al. 2010). As a result, the sample is further limited to native-born respondents. Once these restrictions are taken into account, the final sample for this analysis contained 1,895,629 individuals.

*Outcome Variable*

Employment status is measured dichotomously, where one represents those who report active employment and zero for those who are either unemployed or not in the labor force. This measure includes those who are working both full and part time. While a three-category measure of labor force participation (which would include categories for employment, unemployment, and not in labor force) would provide a more detailed analysis of the data, the sample sizes of unemployed adults for some race/ethnicity-gender-disability groups are too small to obtain robust estimates.

*Predictor Variables*

In 2008, the ACS implemented a six-item disability question sequence in an attempt to more fully capture the population of individuals with physical and mental limitations (Brault et al. 2009). Specifically, to capture those with sensory disabilities, respondents were asked if they were either "deaf or [...] have serious difficulty hearing "or "have serious difficulty seeing even when wearing glasses." Respondents were also asked if they had difficulty with "walking or

climbing stairs," "concentrating, remembering, or making decisions," "dressing or bathing," or "doing errands alone such as visiting a doctor's office or shopping." While these categories do not formally capture those with mental health limitations, substance use disorders, and chronic pain, these individuals may likely report ADL or IADL limitations if their limitations are significant enough to impact their ability to work. Notably, this six-disability question sequence has been critiqued for its bias towards those with the most significant disabilities, its inability to capture certain sup-populations of people with disabilities, and its lack of capacity to identify the heterogeneity within limitation categories (Sabariego et al. 2015; Holder 2016; Havercamp et al. 2019; King et al. 2019; Washington Group on Disability Statistics 2018: see Chapters 2 and 6 for more details).

These questions were combined into one overall binary indicator of disability, with those answering at least one of the six questions in the affirmative coded as having a disability (Maroto et al. 2019; Montez et al. 2017). While I refer to the combination of all six measures as disability, several of these measures—including difficulties with hearing, vision, mobility, and cognition—are considered to be functional limitations according to The Disablement Process (Verbrugge and Jette 1994). Gender is a dichotomous variable with one (1) as female and zero (0) as male. Race/ethnicity is coded into a four-category variable, representing those who identify as either NH white (NHW), NH Black (NHB), Hispanic, or NH other (NHO). In the main analysis, I include the three independent variables (disability, gender, race/ethnicity) and all possible 2-way and 3-way interactions among them. These interactions reflect 16 race/ethnicity-gender-disability groups (Maroto et al. 2019), thereby examining the multiplicative effects of various status-based characteristics.

*Individual Characteristics*

This study examined several individual characteristics related to the employment outcomes of those with disabilities. Age was measured continuously on a scale from 25 to 61. Educational attainment was also measured continuously (1-24 years). Marital status was a single dichotomous indicator with one (1) as currently married and zero (0) representing those who reported being widowed, divorced, separated, or never married.

*Receipt of Government Assistance*

Receipt of government assistance has been shown to create work disincentives for people with disabilities (Stapleton et al. 2006). Thus, the following analysis includes four dichotomous measures of government benefit receipt during the survey year: (1) Supplemental Security Income (SSI), (2) Social Security income, (3) Public assistance income, and (4) Survivor benefits or disability pensions. Accounting for these factors should reduce the possible employment disparities among the race/ethnicity-gender-disability groups.

*State-Level Policies and Characteristics*

This chapter also accounts for several state policies and characteristics in its analysis. These state policies and characteristics have been shown to be associated with the lower employment rates of those with disabilities (see Chapter 1 for justifications for each variable). Specifically, these state characteristics include the unemployment rate for each state, state percentages of individuals ages 16 and over who are not in the labor force, the state percentage of individuals with disabilities 18-64 who receive SSI and SSDI, if the state has a MBI program, the presence of a state SSI supplement, and whether the state had ADA-like laws prior to 1990. See Table 2.1 for a list of variables and sources. In supplemental analyses, I replaced these policies and characteristics with state fixed effects to ensure that all state-level factors were taken into account.

*Analysis*

The analysis begins by examining the characteristics of the sample by disability status. Next, to determine how race/ethnicity, gender, and disability status combine to shape employment outcomes, this analysis is divided into two parts. First, to determine whether an additive or intersectional approach best explains employment across the 16 race/ethnicity-gender-disability groups, I estimated two separate models. Model 1, the additive model, predicts the log-odds of employment from disability status, controlling for gender, race/ethnicity, and age. Model 2, the first interactive model, adds the two-way interactions for race/ethnicity and disability, gender and disability, and race/ethnicity and gender, as well as the three-way interaction terms for race/ethnicity, gender, and disability. Next, to examine how any potential differences in employment probabilities among the race/ethnicity-gender-disability groups can be explained by individual characteristics, receipt of government assistance, and U.S. state policies and characteristics, Model 3 includes the individual-level factors of educational attainment and marital status, Model 4 accounts for receipt of government assistance, and Model 5 controls for state policies and characteristics. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used to determine which of these models best fits the data.

This chapter used single-level models that clustered the errors by states. When data has units nested within other units, as when individuals are nested within states, researchers can either use (a) multilevel models or (b) single-level models with errors clustered at the higher level. The method depends on the aim of the study. If a study's aim is to partition the variation in a given outcome variable into the part attributable to states and the part attributable to individuals, and estimate those sources of variation as model parameters, then researchers would use multilevel models. However, if a study's aim is to treat the state-level clustering as a

nuisance factor to be incorporated into the standard errors, but not a model parameter to be estimated, then researchers would use single-level models and clustering errors. For this chapter, single-level models with errors clustered at the state level are appropriate.

All models were estimated with Stata 16.1 and were adjusted using appropriate sample weights and standard errors. Sensitivity analyses were conducted, which used state-level clustering for each model (See Table 3.5).

## RESULTS

### *Descriptive Statistics*

Table 3.1 provides key demographic information by disability status. As shown in this table, approximately 12% of adults ages 25 to 61 reported at least one of the six ACS disabilities. As expected, disability prevalence varies by race/ethnicity and gender. For instance, people with disabilities are more likely than their non-disabled counterparts to identify as NH Black (15.6% vs. 10.1%) or as NH other (5.3% vs. 4.8%), but they are less likely to identify as Hispanic (9% vs. 9.3%) than those without disabilities. People with disabilities are slightly less likely to identify as female (48.4% vs. 50.7%).

People with and without disabilities also vary on measures of social participation and other individual characteristics. For example, Table 3.1 shows that those with disabilities are substantially less likely to be employed than individuals without disabilities (35.1% vs. 81.0%). Those with disabilities also have lower levels of educational attainment and lower marriage rates. They are also more likely to receive government assistance of any type. These percentages are consistent with previous research (Shandra 2018; Maroto et al. 2019; Pettinicchio and Maroto 2017).

People with and without disabilities have slight variations on state-level policies and characteristics. People with disabilities are less likely to live in states without an MBI program or

an SSI supplement than their counterparts without disabilities. They are also more likely to live in states with slightly higher SSDI participation rates. Interestingly, however, people with disabilities are less likely to live in states that implemented ADA-like laws prior to 1990.

*Additive versus Interactive Models*

To assess whether an intersectional analysis provides a deeper understanding of how race/ethnicity, gender, and disability status interact with the labor market to shape employment, I estimated both an additive and an interactive model. As shown in Table 3.2, Model 1, the additive model predicts the log-odds of employment from disability status, gender, and race/ethnicity, while controlling for age. Compared to those without disabilities, the odds of employment were 87% lower for people with disabilities [$e^{-2.028}$ - 1] *100, net of gender, race/ethnicity, and age. All coefficients in this model are significant at $p < 0.001$.

Model 2, which is the interactive model, adds all two and three-way interaction terms for race/ethnicity, gender, and disability. Adding these interactions in Model 2, changes the interpretation of the coefficients, so that race/ethnicity, gender, and disability must be simultaneously taken into account. For instance, according to the disability coefficient, NHW men with disabilities have 90% lower odds of employment than their counterparts without disabilities [exp (-2.273) – 1]. The interaction between disability and gender suggests that having a disability is associated with 57% smaller odds of employment for NHW women than NHW men. Further, the interaction between disability and race/ethnicity indicates that, when compared to NHW men, the presence of a disability is associated with 17% smaller odds of employment for NHB men and 23% smaller odds for NHO men. Finally, the interactions between disability, race/ethnicity, and gender suggests that, when compared to NHW adults with disabilities, NHB adults with disabilities have 31% lower odds of employment.

Model 2 provides some evidence that this intersectional model improves our understanding of the association between race/ethnicity, gender, disability, and LMD. First, the significant two-way interactions lend merit to the argument for intersectional approaches over additive ones. Notably, while the interaction terms for Disability*Non-Hispanic Other and Disability*Non-Hispanic Other*Female are not significant in the main analysis, they slightly increase in significance in the supplemental state cluster analyses **(**See Table 3.5). Second, both the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) for Model 2 are smaller than in Model 1. This indicates that Model 2 fits the data better than Model 1; that the model that predicts employment using an intersectional perspective fits the data better than one that predicts employment from an additive perspective. Thus, for further evidence of the usefulness of intersectionality, we must examine the predicted employment probabilities of each group.

While these models provide similar estimates of the odds of employment, they give two different perspectives on how race/ethnicity, gender, and disability status operate within labor market contexts. These perspectives are shown when estimating predicted employment probabilities (PEPs) for each race/ethnicity-gender-disability group.

*How are Employment Probabilities Simultaneously Raced and Gendered?*

Table 3.3 and Figure 3.1 displays the PEPs from the additive and interactive models. Model 1—the additive model—assumes that the employment "effects" of disability status, gender, and race/ethnicity are additive (e.g., the effects of membership in one category simply adds to the effects of membership in another). Results indicate a substantial gap in PEPs between women and men with disabilities, where women with disabilities have PEPs that are ten percentage points lower than their male counterparts (31% vs. 41%). PEPs also vary by race/ethnicity and ethnicity. Specifically, among those with disabilities, NH Whites have the

highest PEPs (39%), followed by NH others (34%), Hispanics (33%), and finally NH Blacks (28%).

Adding the two and three-way interaction terms in Model 2, the interactive model, produces PEPs for 16 race/ethnicity-gender-disability groups. Unlike the additive model, Model 2 suggests that an individual's race/ethnicity, gender, and disability status must be simultaneously taken into account to accurately estimate their employment probabilities. According to results reported in Table 3.3 and Figure 3.1, employment probabilities among those with disabilities vary jointly by race/ethnicity and gender. Specifically, while NH White women, Hispanic women, Hispanic men, and NH other men with disabilities have similar employment probabilities—ranging from 37% to 35%, PEPs among those with disabilities from other race/ethnicity-gender groups vary more substantially. For instance, NH White men and NH other women with disabilities have the highest PEPs among those with disabilities (43% and 39%, respectively), while NH Black women and men with disabilities have the lowest (31% vs. 25%, respectively).

Examining employment probabilities among those with disabilities from an intersectional perspective also reveals that the gender PEPs gap indicated by the additive model varies by race/ethnicity. For instance, while NH white women with disabilities have PEPs that are six percentage points lower than disabled NH white men, this gender gap flips for NH Blacks with disabilities. NH Black women with disabilities have PEPs that are six percentage points higher than their male counterparts. Gender disparities in PEPs among Hispanics and NH other people with disabilities are slightly smaller, with Hispanic women's PEPs only one percentage point lower than their male counterparts. PEPs among NH other women are two percentage points higher than those for NH other men. Racial/ethnic disparities among individuals with disabilities also vary by gender. For instance, among women with disabilities, there is a eight percentage

point gap between NH Black and NH other women (31% vs. 39%, respectively). This racial gap in PEPs increases to 18 percentage points among men with disabilities (NH white men = 43% vs. NH Black men = 25%).

*How are Employment Probabilities Shaped by Individual Characteristics*?

Accounting for the individual characteristics of education and marriage in Model 3 increases PEPs among those with disabilities. These increases, however, vary by race/ethnicity-gender group. For instance, NH white and other women with disabilities experience the smallest increases in PEPs (4 percentage points). In contrast, Hispanic and NH Black men with disabilities experience the largest, with PEPs among these groups increasing by 8-9 percentage points. PEPs among all other race/ethnicity-gender groups increase by 6-7 percentage points.

Regardless of these increases, disparities in PEPs remain (see Figure 3.2). Once again, NH white women, Hispanic women, NH other women, and NH other men with disabilities have similar employment probabilities, ranging from 41% to 43%. NH white and Hispanic men with disabilities have the highest PEPs (49% and 45%, respectively), while NH Black women and men with disabilities still have the lowest (38% and 33%, respectively).

Racial/ethnic disparities among women and men with disabilities decrease slightly after accounting for individual characteristics. For instance, among women with disabilities, differences in PEPs between NH Black and other women with disabilities decreases from 8 percentage points to 5 percentage points. Racial/ethnic differences among NH Black and white men with disabilities have a slightly smaller decline (18 percentage points to 16 percentage points).

Interestingly, while the gender disparities among some racial/ethnic groups decrease, others increase. For instance, the gender gap among NH Black women and men with disabilities declines from 6 to 5 percentage points (favoring women). The gap increases for NH whites from

6 percentage points to 8 percentage points (favoring men). Hispanic women and men experienced the largest increase in this gender gap, while the gap is nearly nonexistent among NH other individuals with disabilities.

*How are Employment Probabilities Shaped by Receipt of Government Assistance?*

Controlling for government assistance in Model 4 further increases employment probabilities among those with disabilities. While increases in PEPs range from 11 percentage points among Hispanic men with disabilities to 17 percentage points for NH Black women with disabilities, PEPs increase by approximately 13 percentage points for most race/ethnicity-gender groups (see Figure 3.2). Taking these increases into account, women with disabilities from all racial/ethnic categories and NH other men with disabilities have similar employment probabilities, ranging between 54% and 56%. NH white men (62%) and Hispanic men (58%) with disabilities have the highest PEPs among those with disabilities, while NH Black men with disabilities have the lowest (46%).

Despite these increases, racial/ethnic and gendered disparities in PEPs among those with disabilities remain. For instance, while there is a substantially smaller racial gap in employment probabilities among women with disabilities (3 percentage points), there is still a 16-percentage point gap between NH Black and NH white men with disabilities. Notably, however, the smaller racial gap among women with disabilities is primarily due to the large 17 percentage point increase in PEPs among NH Black women with disabilities, placing their employment probabilities above those of NH disabled white women. This increase in NH Black women's PEPs also increases their employment probabilities relative to their male counterparts from 5 to 8 percentage points. All other gender gaps within the other racial categories remain approximately the same as in Model 4.

*How are Employment Probabilities Shaped by State Policies and Characteristics?*

Unlike the individual characteristics and receipt of government assistance, Model 5 indicates that including various state-level characteristics does little to reduce disparities in PEPs. In fact, adding state characteristics in Model 5 increases PEPs for Hispanic women, NHO women, NHB men, Hispanic men, and NHO men by 1 percentage point. Thus, these specific state-level factors explained very little of the racial/ethnic and gendered disparities in employment among individuals with disabilities. Similar results were obtained when accounting for state fixed effects in Model 5 of Table 3.4.

## DISCUSSION

Building from prior intersectional research, studies indicate that the economic and labor-market outcomes of individuals with disabilities are simultaneously raced and gendered (Shaw et al. 2012; Maroto et al. 2019). Expanding on this line of research, this chapter sought to determine why an intersectional approach is essential to the study of the LMD of those with disabilities. In answering this question, findings indicate that the multiplicative effects of race/ethnicity, gender, and disability status on employment, education, and government assistance intertwine with one another, creating *overlapping institutions of oppression*.

More specifically, results from this research support several key conclusions. First, this chapter found evidence that the gender gap in employment among those with disabilities (Pettinicchio and Maroto 2017; Sevak et al. 2015) varies by race/ethnicity. In fact, while NH white men have employment probabilities that are eight percentage points higher than their female counterparts, this gender gap flips for NH Black people with disabilities, where NH Black women with disabilities have employment probabilities that are five percentage points higher than NH Black men with disabilities. This flip may be explained through an intersectional perspective. Specifically, because men have a stronger attachment to the labor market, disability

has a greater (more negative) association with men's employment rates (Pettinicchio and Maroto 2017), making them the more disadvantaged group in this context. More specifically, Black men with disabilities' greater LMD within this context could be explained by non-disabled Black men's higher likelihood of working in low-status and precarious occupations, which could result in an increased risk of developing adult-onset disabilities. After disability onset, these men may be pushed out of their jobs and may not be able to return to work because of their lack of education and training (Meade et al.2004). In other words, the multiplicative effects of being male, Black, and disabled have a greater impact on employment than any other combination of statuses examined in this chapter.

Second, as expected, employment probabilities among those with disabilities are simultaneously raced and gendered, which aligns with prior research (Pettinicchio and Maroto 2017; Maroto et al. 2019). Specifically, examining disabled persons' LMD from an intersectional perspective reveals that several race/ethnicity gender groups examined in this chapter have similar employment probabilities, even before accounting for employment-related characteristics. These probabilities, however, vary more substantially for the most and least marginalized people with disabilities. That is, while the most marginalized individuals with disabilities, specifically NH Black women and men, have the lowest employment probabilities among those with disabilities, those with the most privilege—NH white men—have the highest. These findings point to a kind of "spillover effect," where the disadvantages an individual experiences from the combination of their status-based characteristics exacerbates their employment disadvantages.

This spillover effect is likely the result of two competing mechanisms. First, research indicates that those with disabilities who have other marginalized statuses, specifically women with disabilities and disabled people of color, are more likely to experience certain barriers that

are directly related to employment, such as lower levels of education (Sanford et al. 2011; Blackorby and Wagner 1996), greater dependency on government assistance (Maroto et al. 2019), and discrimination (Shaw et al. 2012) than their more privileged counterparts. These disadvantages may affect how they interact with the labor market, reducing their chances of employment. Simultaneously, those with disabilities who hold more privilege in society (i.e., white men with disabilities) can use their money, knowledge, resources, and power to minimize the effects of disability-specific employment barriers, increasing their chances of finding and maintaining gainful employment.

Third, this chapter finds evidence that this spillover effect may be the result of overlapping institutions of oppression. While prior intersectional research indicates how certain systems of oppression, such as racism, sexism, and ableism, overlap to shape an individual's experience of social institutions (Crenshaw 1989), this chapter suggests that the multiplicative effects of race/ethnicity, gender, and disability status on such institutions, including education, employment, and government assistance, intertwine with one another to both create and maintain hierarchies of disadvantage (Maroto et al. 2019). This process plays out most prominently when examining the employment probabilities among NH Black women with disabilities. Specifically, after accounting for individual characteristics and government assistance receipt, employment probabilities among disabled NH Black women increase by 24 percentage points (31% to 55%), placing their employment probabilities above those of their NH white female counterparts. This substantial increase suggests that disabled NH Black women's lower levels of education, lower marriage rates, higher likelihood of government assistance receipt (Maroto et al. 2019) directly connects to their lower employment probabilities. The connection between higher levels of government assistance receipt and lower employment probabilities may be bidirectional to the

extent that the low employment probabilities among NH Black women with disabilities can be both a cause and a consequence of their high levels of government assistance receipt.

Thus, the multiplicative effects of race/ethnicity, gender, and disability on education, employment, and government assistance simultaneously spill over onto one another, creating multiple pathways through which the effects of intersectionality can flow. That is, the interplay between intersecting status-based characteristics, education, employment, and government assistance receipt highlighted in this chapter demonstrate how the intersectional effects experienced in one life domain can leak into others. Thus, if we think of intersectionality as an escalator, race/ethnicity, gender, and disability do not step on only intending to visit one floor. Instead, they will press all the buttons on the escalator, ensuring that their experiences on one floor shape their experiences on others.

In addition to these key theoretical and empirical findings, it is important to note that, contrary to expectations, the specific state policies and characteristics examined in this chapter have only a weak—if any—association with the racial/ethnic and gendered disparities in employment among individuals with disabilities. This is in line with other research that indicates that only a few state-level policy variables are strongly associated with lower employment rates among those with disabilities (Sevak et al. 2018). This lack of evidence for the importance of policy context makes sense when considering the motivations of both employers and potential employees with disabilities. For instance, literature suggest that employers are unlikely to hire disabled people due to their false beliefs and assumptions about workers with disabilities (Chan et al. 2010). Most employers may also be reluctant to hire people with disabilities out of fear of a greater vulnerability to litigation (Maroto and Pettinicchio 2015). Thus, literature suggests that state context plays little to no role in their decision to hire—or not hire—people with disabilities. Simultaneously, as noted by Sevak et al. (2018), individuals with disabilities are more likely to

consider more of their own individual factors, such as their level of education and need for government assistance, when making the decision to potentially enter employment. Thus, from both an employer and potential employee perspective, state-level characteristics (at least those considered in this chapter) may matter less than individual characteristics and government assistance.

## POLICY IMPLICATIONS

Findings from this chapter speak to the ways in which new disability legislation must consider the effects of racism, sexism, and other systems of oppression to create more inclusive disability policy. Although legislation, such as the ADA, may have bolstered the employment potential for some with disabilities, these policies did little to advance the equity of those with more marginalized identities. This lack of protection of those with multiple marginalized statuses under anti-discrimination laws is a common issue in the U.S. legal system (Crenshaw 1989) and is one of many examples of how those who are the most marginalized are rendered invisible in society (Caldwell 2010). This invisibility is compounded by the fact that, to date, disability-specific legislation does not address the barriers related to the systematic racism and sexism experienced by disabled people of color and women with disabilities, which are tied to their labor-market outcomes. Thus, these policies provide downstream solutions to upstream problems. Until policymakers center the experiences of the most marginalized individuals with disabilities, we will continue to see racial and gendered disparities in employment.

One example of how disability policy can create a more inclusive and equal society is through reforming the network of disability-related government assistance programs. Currently, these programs, specifically SSI and SSDI, are designed to provide assistance to those with an "inability to engage in any substantial gainful activity by reason of any medically determinable

physical or mental impairment" (SSA 2015a; Autor and Duggan 2006). As a result, many people with disabilities choose to forgo gainful employment to access these programs and the disability-related supports and services they provide. Without access to these programs, many people with disabilities, especially those with multiple marginalized statuses, would likely not be able to live independently in the community and likely would be segregated into congregate care facilities where they are more vulnerable to abuse, neglect, and illness (Mauldin et al. 2020).

Thus, disability-related government assistance programs must be reformed to ensure the health, economic, and social well-being of persons with disabilities, especially those from multiple marginalized communities. Specifically, SSI/SSDI should be redesigned from programs meant to support those with disabilities who "cannot work" to federal subsidies intended to offset the extra costs associated with living with disabilities (Goodman et al. 2020). In doing so, financial and material supports from these programs should be allocated based on an individual's physical and/or mental disabilities, as well as any social and cultural barriers they may experience. Within this reconfigured government assistance system, NH Black women with disabilities may receive more supports and services than their NH white counterparts with similar disabilities to counteract the multiplicative effects of racism, sexism, and ableism.

## LIMITATIONS

Despite this study's important contributions to research on intersectionality and disability, it has a few shortcomings. For instance, because of data limitations, this analysis does not contain measures for sexuality, gender identity, and smaller racial/ethnic groups, which are fundamental to the study of intersectionality and disability (Maroto et al. 2019; Mereish 2012; Caldwell 2010). Further, because of its cross-sectional design, the ACS does not contain detailed information about respondents' background characteristics, such as work histories and health records (Montez et al. 2017). Further, although timing of disability onset has been shown to

impact the risk of LMD among those with disabilities, with studies finding that people who experience disability onset in adulthood are at a greater risk of LMD than those who experience onset in childhood (Loprest and Maag 2007), the ACS does not contain such information. The lack of information about disability onset and work histories is especially problematic given that most people with disabilities develop their disabilities as a result of their low-status and precarious jobs (Sundar et al. 2018). Thus, timing of disability onset and occupation prior to disability onset (if applicable) are key variables missing from this analysis. The absence of this information prevents the ability to draw any causal conclusions from the findings. While other national surveys—such as the National Health Interview Survey (NHIS) and the Health and Retirement Study (HRS)—do ask respondents to report when their disability occurred, after restricting the samples to the appropriate age limit, the sample sizes would be too small for a race/ethnicity, gender, and disability intersectional analysis. Moreover, states are not the best measure of local labor market conditions. Rather, to better capture how geography may impact the LMD of those with disabilities, we would need data at the county level. Lastly, because both educational attainment and receipt of government assistance can be both a cause and consequence of joblessness among individuals with disabilities, researchers must be careful not to draw any causal conclusions from the analysis.

Finally, I could have eliminated all individuals with current or prior military service from this analysis. Because individuals with service-connected disabilities have access to an alternative network of social safety net programs, which do not disincentivize work, they may have a different relationship to LMD than non-veterans (London et al. Forthcoming). As a result, these individuals could be excluded in sensitivity analyses (or analyzed separately) to glean additional insights.

In addition to these limitations, it is worth noting that some scholars have questioned the use of quantitative methods for intersectional research. These scholars cite arguments such as the hypothesis driven nature of quantitative research and its inability to identify nuances as evidence for its inadequacy as an intersectional method (Else-Quest and Hyde 2016; 2010). My findings, however, directly contradict these claims. Specifically, this chapter provides evidence that the intersectional effects on one aspect of an individual's life spillover onto others. Many qualitative studies would not have been able to identify such an effect, given that most only focus on one social situation at a time, such as a particular workplace. Thus, my quantitative approach provided insights into the consequences of intersectionality that many qualitative studies could not.

## CONCLUSION

The current political and cultural moment calls upon informed citizens to both educate and examine the micro and macro effects of various systems of oppression, such as racism, sexism, and ableism. Intersectionality asserts that to truly understand how these systems of oppression operate, it is imperative to examine how they work alongside each other to create both disadvantage and advantage. Similar to other studies, this chapter found that employment probabilities are both raced and gendered. The analysis, however, moves beyond traditional additive approaches to reveal that the multiplicative effects of race/ethnicity, gender, and disability status on employment, education, and government assistance intertwine with one another, creating overlapping institutions of oppression. That is, the intersectional effects that individuals experience in one area of their lives can "spillover" into others, reinforcing existing systems of social stratification. Thus, employment disparities among those with disabilities are the by-product of barriers operating on multiple levels and across the life course. This chapter provides further evidence of the fact that in order to create a more fair and just society we must

center those with the most marginalized identities, for true equality only will be achievable when all individuals, regardless of race/ethnicity, gender, disability, or any other status-based characteristics, have equal access to society and its social institutions.

# Chapter 4: Work-Limitations or Limitations of Work? Does the Association Between Disability and Labor Market Disadvantage Vary by the Number and Type of Limitations?

**Abstract:** Substantial disparities in employment outcomes among persons with and without disabilities have resulted in a growing body of research which has sought to identify the various explanations behind these disparities. Yet, little attention has been given to determining how the presence of multiple limitations shapes the labor market disadvantages (LMD) of those with disabilities, despite the fact that approximately half of the disabled population reports more than one limitation. This chapter examines the association between employment and multiple limitations through the theoretical framework of Verbrugge and Jette's Disablement Process. Specifically, using data from the 2017 American Community Survey (ACS), this chapter estimated a series of logistic regression models predicting the odds of employment from 63 combinations of limitations, adjusting for individual characteristics, receipt of government assistance, and several state-level policies and characteristics. Findings indicate that there is an inverse but imperfect association between the probability of employment and the number of limitations. The types of limitations partially shape this association. Individual characteristics and government assistance appear to explain some of this association as well, but to varying degrees based on limitation combination. Findings from this chapter expands our understanding of the LMD of those with disabilities by identifying the complex ways in which multiple limitations are linked to disabled persons' LMD.

**Work Limitations or Limitations of Work? Does the Association Between Labor Market Disadvantage and Disability Vary by Number and Type of Limitations?**

In 2019, approximately 10% of the U.S. working-age population—adults aged 18 to 64—reported some type of physical or mental limitation (Lauer et al. 2020). While research on the intersection of employment and disability often frames this population as a heterogeneous group, other work has drawn attention to how limitation type shapes both employment outcomes and the labor market experiences of those with disabilities (Brault 2012; Pettinicchio and Maroto 2017; Shaw et al. 2012). Indeed, 2019 data on limitation-type prevalence rates among adults with disabilities indicate that 46.5% reported mobility limitations, 43.7% reported cognitive limitations, 19.2% reported hearing limitations, 19.1% reported vision limitations, 36.1% reported IADL limitations, and 17.3% reported ADL limitations (Lauer et al. 2020). Hidden behind these percentages is a substantial amount of overlap within these categories, (Stevens et al. 2016), the implications of which are rarely discussed within the literature on the labor market inequalities of those with disabilities. Data indicate that 40% of adults ages 18 to 64 with disabilities report more than one limitation (Stevens et al. 2016). Nativity status, race/ethnicity, ethnicity, veteran status, and SES are all associated with the presence of multiple limitations (Moore et al. 2020). The probability of reporting multiple limitations also increases with age (Moore et al. 2020).

The amount of overlap across limitation types suggests that for many people, disability—or rather becoming disabled—may entail a process rather than a singular event (Verbrugge and Jette 1994). Co-occurring limitations may result from age-related conditions, such as when a woman with osteoporosis develops upper and lower body mobility limitations due to the progressive weakening of the bone (Verbrugge and Jette 1994), or from the long-term effects of disability onset in childhood, such as when the stress from a lifetime of discrimination

experienced by those with childhood physical limitations accumulates over time, resulting in later-life mental illnesses (Krahn et al. 2006; Thoits 2010). While the risk of developing co-occurring limitations seems to go hand and hand with disability, literature addressing employment and disability rarely acknowledges this possibility, unintentionally suggesting that only one limitation can affect an individual at a time. In doing so, this research ignores the potential implications of having multiple limitations. The few studies that do address the association between having multiple limitations on labor-market outcomes simply mention this association in passing, indicating that those with multiple limitations have worse employment and economic outcomes than their counterparts without co-occurring conditions, providing little nuance (Garberoglio et al. 2019; Lund and Cmar 2019; Giesen and Cavenaugh 2013; Coffey et al. 2014; Henry et al. 2007; Kadijk et al. 2018; Reichard et al. 2019; Druss et al. 2000; Lillie et al. 2013).

To both theoretically and empirically advance this line of research, this chapter uses data from the 2017 American Community Survey (ACS) to cross-sectionally examine how various limitation combinations are associated with labor market disadvantages (LMD) and the extent to which individual, policy, and state-level factors can account for the potential differences among various limitation combinations. In doing so, this chapter will address the following questions: How do certain combinations of limitations predict an individual's risk of LMD? How might the number and type of limitations jointly shape the association between multiple limitations and LMD? Moreover, how can potential disparities among the limitation combinations be statistically accounted for by individual characteristics, receipt of government assistance, and U.S. state policies and characteristics?

Specifically, to provide a richer picture of how certain combinations of limitations operate within the labor market, this chapter will compare the employment probabilities of all possible combinations of the six limitations asked about in the 2017 ACS (63 limitation combinations). It will then progressively adjust for individual characteristics (e.g., race/ethnicity, gender, age, education, marital status), receipt of government assistance, and state characteristics and policies to assess whether any potential patterns may be due to these factors.

## DISABILITY AS PROCESS

Sociological theories that frame disability as a process may explain the high prevalence of multiple limitations. While traditional theories of impairment frame disability as either a result of an individual's biology, or as the by-product of physical, social, and environmental barriers created by society (Smart and Smart 2006; Llewellyn and Hogan 2000; Barns and Oliver 1993), drawing from previous work on biopsychosocial understandings of illness and disability (Nagi 1976; Engle 1980; Petasis 2019; Shakespeare et al. 2017), Verbrugge and Jette (1994) combine these two theories to suggest that disability is both contextual and the by-product of an individual's mind/body limitations and social expectations. Thus, because disability is rooted in impairments, many of those who report disabilities may also report one or more co-occurring limitations.

The correlation between disability and co-occurring limitations becomes evident when examining the potential bi-directional nature of limitations and disability within the context of Verbrugge and Jette's (1994) Disablement Process (DP). Verbrugge and Jette divide the DP into four stages, from pathology to disability (Verbrugge & Jette 1994). The first stage of this process begins with a disease, injury, or biological abnormality, such as down syndrome, cancer, obesity, or a work-related injury. Pathology becomes impairment when it leads to some biological

dysfunction or significant structural abnormality. Put another way, impairment is a symptom of pathology. According to Verbrugge and Jette (1994), impairments become functional limitations if they restrict the individual from performing physical or mental actions. More specifically, an individual is considered to have a functional limitation if she has difficulty performing any of five basic physical and mental actions without assistance, including difficulty with mobility, seeing, hearing, communicating, and thinking/remembering (Verbrugge and Jette 1994).

Finally, disability occurs when individuals experience difficulty performing a given activity due to the combination of functional limitations and environmental restrictions. Thus, unlike functional limitations, which make no reference to social or environmental factors in its assessment of restrictions in performance, disability is a by-product of the relationship between body and society (Verbrugge and Jette 1994). This chapter will focus on two types of activities that capture disability: activities of ADLs, including abilities to independently eat, toilet, transfer (get in and out of bed/chair), dress, and bathe, and IADLs, which includes the ability to independently prepare own meals, do light housework, manage money, use the telephone, and shop.

A critical aspect of the disablement process to note is its incorporation of environmental and social factors that either increase or reduce the risk of impairments, functional limitations, and ADL/IADL limitations. Specifically, certain biological, demographic, social, behavioral, psychological, or environmental factors can increase or reduce the risk of disability (Verbrugge and Jette 1994). For instance, studies suggest that those with lower levels of education (demographic factor) are more likely to be in low-control/high-demand jobs (environmental factor), which are associated with poor health (Karasek and Theorell 1992). These poor health

outcomes may increase an individual's risk of developing functional limitations, which could turn into ADL/IADL disability (Verbrugge and Jette 1994).

While the DP may appear linear, many individuals, especially those with multiple limitations and disabilities, may experience disablement as an ongoing and cyclical process (Verbrugge and Jette 1994; Dixon-Ibarra and Horner-Johnson 2014; Krahn et al. 2006). For instance, having one limitation can increase the risk of comorbidities and co-occurring limitations, such as when the stress from the social isolation, stigma, and discrimination of being disabled accumulates over time, resulting in an increased risk of additional mental and physical limitations (Thoits 2010; Meyer 2007). Further, those with limitations, regardless of the timing of onset, are more likely to have poor health and lack access to appropriate medical care than those without limitations (Altman and Bernstein 2008). This poor health and lack of access to healthcare places people with limitations at a high risk of developing co-occurring limitations (Krahn et al. 2006; Dixon-Ibarra and Horner-Johnson 2014). More complex impairments, such as cerebral palsy or autism, could manifest as multiple functional limitations and ADL and IADL limitations (Turk and Fortuna 2019). Impairments that occur due to aging or poor health may also accumulate over time due to lack of access to financial, social, and health resources, leading to a greater risk of developing multiple limitations and disabilities (Link and Phelan 2010; Verbrugge and Jette 1994).

Despite the numerous pathways that may result in co-occurring limitations and/or disabilities, little attention has been given to examining how having multiple limitations and/or disabilities may be associated with LMD. Studies that address the labor-market outcomes of those with multiple limitations often suggest that those individuals are at a greater risk of LMD than those who report having only one limitation, but offer little theoretical or empirical

explanations for their findings (Stevens et al. 2016; Garberoglio et al. 2019; Lund and Cmar 2019; Giesen and Cavenaugh 2013; Coffey et al. 2014; Henry et al. 2007; Kadijk et al. 2018; Reichard et al. 2019; Druss et al. 2000; Lillie et al. 2013). Further, literature on the labor-market inequalities of those with disabilities has only recently begun to recognize biopsychosocial models, such as the DP, as theoretical frameworks, leaving a lack of knowledge of how these models may operate within labor market contexts. This exclusion of theories that frame disability as a process may also partly account for the lack of attention to the labor-market outcomes of those with multiple limitations and/or disabilities. As a result, this chapter will seek to address the following question: *How do particular combinations of limitations predict an individual's risk of LMD?*

For ease of exposition, the remainder of this chapter will use the term "limitations" to refer to both limitations and disabilities. The term "disability" will be used only when it is substantively necessary to distinguish disabilities from limitations.

## WHY MIGHT THE ASSOCIATION BETWEEN LIMITATIONS AND LMD VARY BY LIMITATION TYPE?

Various aspects of LMD, including employment rates, earnings, and treatment in the workplace, vary substantially by limitation type (Brault 2012; Pettinicchio and Maroto 2017; Shaw et al. 2012). For instance, while those with cognitive limitations are more likely to experience low earnings and high levels of occupational segregation (Maroto and Pettinicchio 2014b; Kumin and Schoenbrodt 2016), those with hearing limitations have employment and earnings outcomes similar to that of their counterparts without limitations (Garberoglio et al. 2019). Employment rates vary substantially across limitation type. Specifically, in 2018, 53% of those ages 18 to 64 with hearing limitations were working for pay, followed by 45% of people

with vision limitations, 29% of those with cognitive limitations, 26% of individuals with mobility limitations, 18% of those with IADL limitations, and 16% of those with ADL limitations (Lauer et al. 2019a). These disparities in labor-market outcomes may be directly related to limitation-specific employment barriers.

However, studies that address the potential explanations behind these disparities suggest that it may not necessarily be the specific employment barriers, but rather how—and the degree to which—people with certain types of limitations experience these barriers. Several factors may explain the substantial variation in employment rates among individuals with different types of limitations. For instance, while employer bias may affect the majority of those with limitations, regardless of type, evidence suggests that negative attitudes and false assumptions regarding workers with limitations held by employers, colleagues, and customers, may have a greater impact on those with cognitive limitations, mental illnesses, and other types of social and emotional limitations (such as Autism) compared with their counterparts with physical limitations (Russinova et al. 2011; Anderson et al. 2020; Henry et al. 2007; Kocman et al. 2017). Indeed, studies indicate that employers express that they would prefer hiring people with physical limitations over those with cognitive limitations (Kocman et al. 2017).

This preference for workers with physical limitations over those with cognitive limitations may be linked with the perceived need for accommodations and modifications to the work environment based on limitation type. For instance, employers may believe that those with hearing and vision limitations may not require the same level of work accommodations as those with other types of limitations, making their integration into the workplace seem more manageable. These individuals' barriers may already be mitigated by the use of external supports, such as hearing-aides, white canes, or service animals, placing the responsibility of providing

accommodations onto the individual rather than the employer (Capella-McDonnall and Crudden 2009). Those who require accommodations from their employers, such as interpretation services or assistive technology, are often given the bare minimum of what they need to keep costs down (Perkins-Dock et al. 2015; Benito et al. 2016; Punch 2016). Alternatively, those with mobility limitations may require modifications to the physical environment, such as ramps, elevators, and changes to their workspaces, which many employers may be unwilling or unable to make (Krause 2018; Crooks 2007). Those with cognitive limitations or ADL/IADL limitations may need more complex accommodations, ranging from job modifications to personal assistance. As a result, these individuals may be perceived as less employable to a potential employer (Anderson et al. 2020).

Limitations themselves may play a role in shaping labor-market outcomes (Anderson et al. 2020; Kumin and Schoenbrodt 2016). For instance, individuals who cannot hide their limitations—such as those with mobility limitations—may experience a greater degree of discrimination during the hiring process than those who can choose the point at which they disclose their limitation (Krause 2018; Anderson et al. 2020). Simultaneously, some people with cognitive limitations may not have the ability—or the training—needed for professional or management jobs, pigeonholing them into the five F's, food, filth, flowers, factories, and filing (Kumin and Schoenbrodt 2016; Maroto and Pettinicchio 2014b). However, these jobs are precarious and often temporary, leaving many of those with cognitive limitations with weak attachments to the labor market. Others with more complex limitations may find that their limitations prevent them from specific jobs, leaving them vulnerable to more blue-collar or service jobs that may be less willing to accommodate their needs (Anderson et al. 2020). Further, those with significant chronic pain may not be able to participate in "typical" paid employment

due to the interaction between their pain and the structures created by a labor-market designed for non-disabled workers (Kiesel 2017). Thus, limitation type plays an integral part in shaping labor-market outcomes.

While limitation-specific research on the labor-market inequalities of those with limitations points to several explanations for the substantial variation in employment outcomes by limitation type, these studies often do not consider how having multiple limitations may impact LMD. This oversight is somewhat surprising given that estimates suggest that roughly half of those with limitations report having two or more of them (Stevens et al. 2016; King et al. 2018; Henry et al. 2007). The handful of studies that recognize the potential labor-market effects of having multiple limitations consistently find that those who report two or more limitations often have higher levels of LMD when compared to those who report having only one limitation (Stevens et al. 2016; Garberoglio et al. 2019; Lund and Cmar 2019; Giesen and Cavenaugh 2013; Coffey et al. 2014; Henry et al. 2007; Kadijk et al. 2018; Reichard et al. 2019; Druss et al. 2000; Lillie et al. 2013).

Literature, however, is mixed on which combinations of limitations result in the greatest risk of LMD. While some studies find that those who have co-occurring physical limitations experience the lowest levels of employment (Giesen and Cavenaugh 2013; Henry et al. 2007), other studies indicate that those with cognitive or mental limitations are the least likely to be employed (Lillie et al. 2013; Kadijk et al. 2018). Research also suggests that the number of limitations may also affect employment outcomes, with studies finding that those with three or more limitations are less likely to be employed than those reporting only one or two limitations (Kadijk et al. 2018).

Despite the emphasis on number and type of limitation combinations, this literature rarely takes other factors, such as demographics, educational attainment, and receipt of government assistance, into account when examining the relationship between employment and multiple limitations. While one study by Henry et al. (2007) did find that gender, age, and education level did not affect their results, these findings directly contradict numerous other studies that indicate that all three factors are critical predictors of employment among those with limitations (Stapleton et al. 2006; Pettinicchio and Maroto 2017; Sevak et al. 2015).

More recent work, however, suggests that the lower levels of employment among individuals with multiple limitations may not result from the number or combination of physical or cognitive limitations, but rather how these limitations interact with the social environment to create disability. Specifically, research points to the fact that those with limitations and ADL/IADL disabilities have higher levels of LMD than those who only report limitations (Brucker et al. 2016). This makes sense in light of the fact that, by definition, those with ADL/IADL disabilities "experience difficulty doing activities in any domain of life" (Verbrugge and Jette 1994: 4), whereas those with only limitations (also known as functional limitations) only experience difficulty in performing certain actions.

The lack of research on those with multiple limitations renders these individuals practically invisible within the literature. To expand on prior research, this chapter will address the following:

*How might number and type of limitations jointly shape the association between multiple limitations and LMD?*

## HOW IS THE ASSOCIATION BETWEEN LMD AND LIMITATION TYPE SHAPED BY OTHER CHARACTERISTICS?

Regardless of limitation type, people with limitations experience some of the same barriers to employment. For instance, studies consistently indicate that individual characteristics, such as race/ethnicity, gender, age, timing of limitation onset, and severity of impairment, all play a substantial role in shaping employment, with women, people of color, older individuals, those who experience limitation onset later in life, and those with more significant limitations having lower employment rates than their more privileged counterparts (Garberoglio et al. 2019; Perkins-Dock et al. 2015; Benito et al. 2016; Emmett and Francis 2016; Capella-McDonnall 2005; Lund and Cmar 2019; Giesen and Cavenaugh 2013; Darensbourg 2013; Meade et al. 2004; Arango-Lasprillaa 2009; Sipersteina et al. 2014). Human capital variables, specifically higher levels of educational attainment and prior work experience, are also associated with better employment outcomes (Sipersteina et al. 2014; Capella-McDonnall and Crudden 2009; Lund and Cmar 2019; Garberoglio et al. 2019; Meade et al. 2004).

This literature also cites various structural, environmental, social, and policy factors that can impact employment rates. For instance, multiple studies from across limitation type note that negative attitudes and false assumptions held by (potential) employers create major employment barriers among those with limitations, regardless of limitation type (Crooks 2007; Purc-Stephenson 2017; Kocman et al. 2017; Coffey et al. 2014). Receipt of government assistance, specifically SSI, SSDI, and Medicaid, also reduces the chances of competitive employment across limitation type (Ellenkamp et al. 2015; Crooks 2007; Purc-Stephenson 2017; Giesen and Cavenaugh 2013; Darensbourg 2013).

While evidence suggests that individual, structural, and policy barriers may explain some of the labor-market inequalities among those with various types of limitations, little is known about how these factors affect employment probabilities of those with multiple limitations. To extend previous research, this chapter will address the following:

> *How can potential disparities among the limitation type groups be statistically accounted for by individual characteristics, receipt of government assistance, and U.S. state policies and characteristics?*

## METHODS

### *Data*

To examine how various combinations of limitations are associated with the likelihood of being employed, net of policy factors, individual characteristics, and state-level policies and conditions, this chapter analyzes data from the 2017 1-year public use file of the ACS. The ACS is the best available dataset for this analysis because of its large numbers of persons with limitations, which is necessary for robust estimates from models that include multiple limitation combinations.

### *Sample*

This study's analytic sample includes respondents aged 25–61 years to capture those who have already completed their education, at least through a bachelor's degree, and account for early retirement (Maroto and Pettinicchio 2014b). Due to varying levels of access to government assistance programs, the employment trajectories of native-born and non-native-born respondents with limitations may differ substantially (Xiang et al. 2010). As a result, the sample

is further limited to native-born respondents. Once these restrictions are taken into account, the final sample for this analysis contained 1,895,629 individuals.

*Outcome Variable*

To capture the degree to which individuals with various limitation combinations experience LMD, this chapter used a binary measure of employment (employed = 1; not employed or unemployed = 0). While, ideally, this analysis would involve a three-category measure of employment status, including categories for employed, unemployed, and not in the labor force, the sample sizes of unemployed adults for some limitation combinations are too small to obtain robust estimates. This binary measure has been used in several other studies that examine the association between employment and disability (Maroto and Pettinicchio 2014b; Brucker et al. 2016).

*Predictor Variables*

In 2008, the ACS implemented a six-item disability question sequence in an attempt to more fully capture the population of individuals with limitations (Brault et al. 2009). Specifically, to capture those with sensory limitations, respondents were asked if they were either "deaf or [...] have serious difficulty hearing" (hearing limitation) or "have serious difficulty seeing even when wearing glasses" (vision limitation). Respondents were also asked if they had difficulty with "walking or climbing stairs," (mobility limitation) "concentrating, remembering, or making decisions," (cognitive limitation) "dressing or bathing," (ADL disability) or "doing errands alone such as visiting a doctor's office or shopping" (IADL disability). While, according to the Disablement Process, some of these measures assess functional limitations and others assess disability, I will be referring to the combination of these measures as limitations in the remainder of the chapter. While these categories do not formally

capture those with mental health limitations, substance use disorders, and chronic pain, these individuals may likely report ADL or IADL limitations if their limitations are significant enough to impact their ability to work. Notably, this six-disability question sequence has been critiqued for its bias towards those with the most significant disabilities, its inability to capture certain sub-populations of people with disabilities, and its lack of capacity to identify the heterogeneity within limitation categories (Sabariego et al. 2015; Holder 2016; Havercamp et al. 2019; King et al. 2019; Washington Group on Disability Statistics 2018: see chapters 2 and 6 for more details).

All six limitation types were combined in all possible configurations, producing 63 limitation combinations. Specifically, this analysis included six limitation combinations where people have exactly one limitation, 15 combinations where people have exactly two limitations, 20 types where people have exactly three limitations, 15 types where people have exactly four limitations, six types where people have exactly five limitations, and one type where people have all six limitations. I also included a seventh category for those with no limitations.

*Individual Characteristics*

Several individual characteristics were included in this analysis. Gender is a dichotomous variable with one (1) as female and zero (0) as male. Race/ethnicity is coded into a four-category variable, representing those who identify as either non-Hispanic white (NHW) (Reference), non-Hispanic Black (NHB), Hispanic, or non-Hispanic other (NHO). Age was measured continuously on a scale from 25 to 61. Educational attainment was also measured continuously (1-24 years). Marital status was a single dichotomous indicator with one as currently married and zero representing those who reported being widowed, divorced, separated, or never married.

*Receipt of Government Assistance*

To capture how government assistance receipt may impact the employment probabilities of those with multiple limitations, this chapter controlled for four dichotomous measures of government benefit receipt: (1) Supplemental Security Income (SSI), (2) Social Security income, (3) Public assistance income, and (4) Survivor benefits or disability pensions. Accounting for these factors may affect the possible employment disparities among the limitation combination groups.

*State-Level Policies and Characteristics*

This chapter also accounts for several state policies and labor market characteristics in its analysis, including the unemployment rate for each state, state percentages of individuals ages 16 and over who are not in the labor force, the state percentage of individuals with disabilities 18-64 who receive SSI and SSDI, if the state has a MBI program, the presence of a state SSI supplement, and whether the state had ADA-like laws prior to 1990. See Table 2.1 for a list of variables and sources. In supplemental analyses, I replaced these policies and characteristics with state fixed effects to ensure that all state-level factors were taken into account.

*Analysis*

First, characteristics of the sample were examined by limitation status and type. Next, to assess how having multiple limitations are associated with the probability of employment, 63 limitation combinations were created to serve as the basis for a series of logistic regression models, predicting employment probabilities from each combination of limitations. Model 1 only includes the 63 limitation combinations. Model 2 adds the individual characteristics of gender, race/ethnicity, educational attainment, and marital status. Model 3 accounts for receipt of government assistance, and Model 4 controls for state policies and characteristics. The Karlson–Holm–Breen (KHB) method was used to identify which of the individual, policy, and state-level

factors had the greatest impact on the employment probabilities of the 63 limitation types (Kohler et al. 2011). The KHB method is used in formal mediation analyses to determine how much of a given association can be explained by each (set of) potential mediators. Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) were used to determine which of these models best fits the data.

This chapter used single-level models that clustered the errors by states. When data has units nested within other units, as when individuals are nested within states, researchers can either use (a) multilevel models or (b) single-level models with errors clustered at the higher level. The method depends on the aim of the study. If a study's aim is to partition the variation in a given outcome variable into the part attributable to states and the part attributable to individuals, and estimate those sources of variation as model parameters, then researchers would use multilevel models. However, if a study's aim is to treat the state-level clustering as a nuisance factor to be incorporated into the standard errors, but not a model parameter to be estimated, then researchers would use single-level models and clustering errors. For this chapter, a single-level model with errors clustered at the state level is appropriate.

All models were estimated with Stata 16.1 and adjusted using appropriate sample weights and standard errors. Sensitivity analyses, which used state-level clustering for each model, were conducted, (See Table 4.6).

## RESULTS

### *Descriptive Statistics*

Table 4.1 presents key demographic information for the entire sample by limitation status and type. As shown in this table, approximately 12% of the sample reported at least one of the six types of limitations. Among those who reported a limitation, 19% had a hearing limitation, 18% reported difficulties seeing even when wearing glasses, 49% said that they had a mobility

impairment, 45% reported a cognitive limitation, 19% said that they had difficulty with ADLs, and 37% reported IADL limitations. Overall, 35% of individuals with limitations reported working for pay. However, there is a distinct hierarchy of employment by limitation type. Specifically, individuals with hearing difficulties have the highest employment rates (54%), followed by those with vision limitations (42%), mobility limitations (24%), cognitive limitations (24%), IADL limitations (17%), and ADL limitations (15%).

Table 4.1 also reveals racial/ethnic and gendered differences among the six limitation types. For instance, 18% of those with vision, mobility, or ADL limitations, 16% of those with cognitive or IADL limitations, and 9% of those with hearing difficulties identify as NH black. Hispanic ethnicity was more equally distributed among the six limitation groups, ranging from 11% for those with vision limitations to 8% for mobility limitations. Those who identify as belonging to other racial categories comprised approximately 5% to 6% of each limitation type. While 48% of individuals with limitations identified as female, percentages vary by limitation type, ranging from 37% of those with hearing limitations to 53% of those with mobility limitations.

People with limitations, regardless of limitation type, were, on average, older, less likely to be married, and have lower levels of educational attainment than those without limitations. More specifically, the average age ranges from 51 years for those with mobility limitations to 45 years for those with cognitive limitations, which may suggest that the majority of this sample developed their disabilities during their working years. Marriage rates range from 28% among those with cognitive limitations to 51% among individuals with hearing limitations. Those with ADL limitations have the lowest levels of education (less than 15 years), while those with hearing limitations had the highest (more than 16 years). People with hearing limitations were the least likely to receive government assistance, while those with ADL limitations had the

highest rates. There were no substantial differences for state characteristics among the six limitation groups.

Table 4.2 gives the number and percentages of each limitation combination. According to this table, as the number of limitations increases, the number of individuals who fall into a specific limitation number category tends to decrease. Specifically, approximately 52% of people with limitations reported exactly one limitation, 23% reported exactly two, 14% reported exactly three, 8% reported exactly four, 2% reported exactly five, and 1% reported exactly six. In terms of limitation type,16% of those who had limitations reported only a mobility limitation, while 0.57% reported only an ADL limitation. Further, while most of those who reported an ADL or IADL limitation with exactly one other limitation made up less than 1% of those with limitations, there are a few notable exceptions. For instance, approximately 8% reported that they had both a cognitive limitation and an IADL limitation. In addition, those who reported having either an ADL or IADL limitation combined with a mobility limitation comprised a large proportion of those with exactly two limitations. Specifically, those with IADL limitations and mobility limitations made up 4% of those with limitations, while those with ADLs comprised 1.8%.

Interestingly, those with ADL/IADL/mobility limitations made up the largest proportion of those with exactly three limitations (3.1%), followed by those with ADL/IADL/cognitive limitations (1.5%). All the rest of the categories in this group have proportions under 1%. A similar pattern emerges among those with exactly four limitations, where those with cognitive/mobility/ADL/IADL limitations comprise the largest majority of this group (5.2%). The remainder of the limitation groups in the four-limitation category have proportions under 1%. The percentages of individuals who fall into the six categories of those with exactly five limitations are roughly the same ranging from 1.2% for those with

ADL/vision/mobility/cognitive/IADL limitations to 0.1% for those with ADL/vision/hearing/cognitive/IADL limitations.

*How do particular combinations of limitations predict an individual's risk of LMD?*

Table 4.3 provides results from a series of logistic regression models predicting the log-odds of employment for all 63 limitation combinations. As shown in this table, Model 1, which only includes the limitation combinations, indicates that 62 out of 63 combinations are significantly associated with lower odds of employment (at the $p<0.05$ level) compared with the reference group (people with no limitations). The one exception is the combination of hearing/vision/ADL/IADL limitations. However, the magnitude of the log-odds was large, indicating that the lack of statistical significance is likely due to the small number of persons in this combination (n=13, which is the smallest of all 63 combinations). In addition, supplemental analyses, which uses state clustering, indicates that this limitation combination is statistically significant. There is substantial variation in the odds of employment among the limitation combinations when compared to the odds of employment among those without limitations. Specifically, the odds of employment for people with hearing/vision/mobility/IADL limitations are 98.5% [100*(exp (-4.18)-1)] lower than the odds of those without limitations, while those who only report hearing limitations have odds of employment that are only 34% lower than those of people with no limitations.

Models 2 through 4 progressively account for individual characteristics, government assistance, and state policies and characteristics (Table 4.3). Looking across all three models, it becomes clear that controlling for individual characteristics and government assistance may reduce some of the association between employment and some of those who report ADL limitations and one to three other limitations to non-significance, suggesting that these factors help to explain the association. State clustering, however, indicates that while the statistical

significance of most of these limitation combinations is reduced when accounting for these factors, only the combination of hearing/vision/ADL limitations is reduced to non-significance (see Table 4.6).

*How might number and type of limitations jointly shape the association between multiple limitations and LMD?*

To examine how the probability of employment varies by number and type of limitations, I estimated employment probabilities (PEPs) for each of the 63 limitation combinations from the model coefficients in Table 4.3. I also estimated the PEPs for those with no limitations. These PEPs indicate an individual's chances of employment based on their limitation combination. Model 1 of Table 4.4 and Figure 4.1 display the PEPs for each limitation combination with no covariates. When analyzing the PEPs of all 63 limitation combinations as a group, a limitation employment hierarchy emerges, which is jointly shaped by number and type of limitations.

More specifically, there is evidence of an inverse association between number of limitations and the probability of employment. For example, the ten lowest PEPs categories only include those who have three or more limitations, while five out of the six single limitation combinations are ranked among the ten highest PEPs in the employment hierarchy. However, there are multiple exceptions to this pattern. For instance, those with all six limitations have higher PEPs (24%) than the PEPs of many of those with four or more limitations.

These deviations point to additional factors, such as limitation type, that might also play a role in shaping employment probabilities. Indeed, certain limitations—or combinations of limitations—appear to reduce the chances of employment, while others seem to increase these chances. For instance, persons with only IADL limitations have a substantially lower PEP (30%) than do people with any of the other single limitation combinations (ranging from 37% to 69%).

They also have a lower PEP than many people with two or three limitation types, such as hearing/vision (57%), vision/cognitive (35%), vision/ADL (44%), and hearing/vision/ADL (41%). Mobility limitations also disproportionately reduce the chances of employment. The presence of both mobility and IADL limitations has a substantial (negative) association with employment outcomes, with those who have both experiencing the lowest PEPs within the employment hierarchy. For example, while most individuals with two limitations have PEPs at or above 18%, those with the combination of mobility/IADL limitations have PEPs of only 15%.

Other limitations are associated with relatively higher employment probabilities. For instance, those who have a hearing limitation within their combinations—and do not have mobility or IADL limitations—have PEPs above 25%. Those with the combination of hearing/vision limitations have the third-highest PEPs out of the 63 limitation combinations (57%), suggesting that having a vision limitation may also be associated with higher employment probabilities.

Thus, evidence suggests that the employment probabilities of those with limitations are jointly shaped by number and limitation type. However, these two factors do not appear to directly correspond with an individual's placement within the employment hierarchy, suggesting that other variables may be at play. To identify some of these factors and to examine the extent to which they shape employment, this analysis also accounted for certain individual characteristics, receipt of government assistance, and state policies and characteristics.

*How can potential disparities among limitation type groups be explained by individual characteristics, receipt of government assistance, and U.S. state policies and characteristics?*

Models 2 through 4 in Table 4.4 show how PEPs for each limitation combination shift when adding individual characteristics, receipt of government assistance, and state

characteristics. These results are graphically depicted in Figure 4.2. In general, these findings indicate that the PEPs for all limitation combinations substantially increase when accounting for individual characteristics and government assistance receipt, while the state-level factors I included in the models explain very little of this association.

Accounting for the individual characteristics of age, gender, race/ethnicity, education, and marriage increases the PEPs for all limitation combinations in Model 2. The KHB method clearly indicates education drives these increases, suggesting that disparities in employment probabilities among the limitation combinations can partly be explained by educational differences between these groups. While PEPs increase by eight percentage points, on average, these increases range from 1.2 percentage points among those with hearing limitations, to 11.2 percentage points for those with vision/cognitive/ADL limitations. Because increases in PEPs vary by limitation combination, the employment hierarchy shifts. That is, certain limitation combinations fall within this hierarchy while others rise. Most notably, while those with only cognitive limitations had the fifth highest PEPs before accounting for individual characteristics, they decrease to the eleventh highest after controlling for these factors. Simultaneously, those who report all six limitations increase from 25th to 21st in the employment hierarchy. Taken together, these results suggest that individual characteristics partly explain the negative association between employment and the limitation combinations. However, the degree to which these factors act as explanations varies by limitation type.

PEPs for all limitation combinations further increase when adding government assistance in Model 3. The KHB method indicates that SSI and SSDI explain a large portion of these increases, pointing to their pivotal role in shaping the employment probabilities of those with limitations. In fact, accounting for government assistance in Model 3 increases PEPs to an even

greater extent compared to the individual characteristics in Model 2, with an average percentage point increase of 15.4% (between Model 2 and 3). These increases vary substantially by limitation combination, ranging from 4 percentage points among those with only hearing limitations to 28 percentage points among those with hearing/cognitive/ADL/IADL limitations. Further, the ordering of the employment hierarchy shifts again after accounting for government assistance. For instance, while those with vision/cognitive/ADL limitations had the sixth highest PEPs in Model 1 (41%), they have the second-highest PEPs (71%) in Model 3. Likewise, those with only IADL limitations fall from 18th to 27th within the employment hierarchy. These results indicate that receipt of government assistance is associated with lower employment probabilities of those with limitations, although the strength of this association varies by limitation combination.

PEPs shift slightly when adding state policies and characteristics in Model 4. In fact, some PEPs decrease from Model 3. For example, while the employment probabilities of those with hearing/vision/cognitive/IADL limitations increase by 1.8 percentage points, the PEPs of those with hearing/IADL limitations decrease by 0.9 percentage points. As a result of these slight differences in PEPs, some limitation combinations shift positions within the employment hierarchy, yet to a much lesser extent when compared to Models 2 and 3. For instance, the PEPs of those with only cognitive limitations decrease in this hierarchy from 13th to 14th. These shifts are primarily the result of the increases of the PEPs of other limitation combinations, indicating that, on average, accounting for state factors increases the PEPs of those with limitations. Notably, however, most limitation combinations do not change places within the employment hierarchy when comparing Models 3 and 4. Thus, the state-level characteristics I included in the models play a minor role in the employment outcomes of those with limitations, although to a

lesser extent than that of individual characteristics and government assistance receipt. Similar results were obtained when accounting for state fixed effects in Model 5 of Table 4.5.

While, in general, the PEPs of those with limitations increase when accounting for these external factors, the PEPs for those without limitations decrease. Specifically, employment probabilities among individuals without limitations decline by approximately 3 percentage points (between Models 1 and 4), placing their PEPs only 5 percentage points above the PEPs of those with hearing limitations (the limitation combination with the highest PEPs). The narrowing of this gap suggests that the differences in PEPs between those with hearing limitations and those with no limitations can be almost entirely explained by individual characteristics, government assistance, and state policies and characteristics.

## DISCUSSION

The growing body of literature which addresses the LMD of persons with limitations has recently taken a more holistic approach, examining how factors such as an individual's race/ethnicity, gender, age, educational attainment, the timing of onset, and various other individual characteristics shape labor-market outcomes (Pettinicchio and Maroto 2017; Jones et al. 2006; Sevak et al. 2015; Jones 2011; Jones 2008; Xiang et al. 2010; Shaw et al. 2012). While this literature has attempted to address the various labor-market effects of limitation type (Brault 2012; Jones 2011; Jones et al. 2006), little is known about the association between LMD and multiple limitations. While recent work indicates that employment probabilities decrease as number of limitations increases (Stevens et al. 2016), this study does not go in-depth to explain this inverse association. This gap in our knowledge leads to questions such as: How is employment shaped by having multiple limitations? Does type of limitations matter for employment outcomes? How do other individual-level characteristics, structural factors, and

state policies and characteristics jointly shape the employment probabilities of those with multiple limitations?

By answering such questions, this chapter examines how current conceptualizations, which frame the development of limitations as a process, may play out within labor market contexts (Verbrugge and Jette 1994). By framing the process of becoming disabled as a series of events leading to limitations and disabilities, scholars can begin to understand how an individual—regardless of the timing of primary limitation onset—can accumulate more limitations and disabilities over time. However, current conceptualizations within the employment and disability literature do not account for multiple limitations, denying an examination of a key variable in the labor market inequalities of those with limitations. Thus, this chapter advances the literature on the LMD of persons with multiple limitations by applying the theoretical framework of the Disablement Process to explore its real-world application in labor-market contexts. Unlike previous research, which only focuses on one or two factors to explain the lower employment rates of those with multiple limitations (Giesen and Cavenaugh 2013; Henry et al. 2007; Lillie et al. 2013; Kadijk et al. 2018), this theoretical approach allows for an examination of how multiple factors, including number of limitations, limitation type, individual characteristics, structural variables, and policy factors, work in tandem to predict the LMD of those with multiple limitations.

Findings from this analysis provide substantial evidence for several key conclusions. First, the presence of multiple limitations generally—but not always—increases LMD compared with persons who have just one limitation. Consistent with other research, this analysis found that when compared to people with only one limitation, those who report multiple limitations are, on average, less likely to be employed (Garberoglio et al. 2019; Lund and Cmar 2019; Giesen

and Cavenaugh 2013; Coffey et al. 2014; Henry et al. 2007; Kadijk et al. 2018; Reichard et al. 2019; Druss et al. 2000; Lillie et al. 2013). Individuals who report IADL limitations, however, are the exception to this rule. Even after accounting for all other related covariates, those with IADL limitations place 27th in the employment hierarchy, below many of those who report two or more limitations. In fact, persons with IADL limitations have employment probabilities that are lower than those who report all six limitations (50% vs. 52%). These surprisingly low employment probabilities could be due, in part, to the IADL category itself. Specifically, prior research suggests that the IADL question in the ACS may act as a "catch-all" for the most significant limitations, including severe mental illnesses, physical limitations, and social/cognitive limitations, such as Autism (Miller and DeMaio 2006). This category may also include those with chronic pain, substance abuse disorder, obesity, and other significant mental illnesses. Eliminating those with other limitations, such as those with significant mobility limitations, may further reduce membership in this category to those with the most significant mental limitations and chronic pain, who are more likely to experience LMD when compared to those with other types of limitations (Braden et al. 2008; Russinova et al. 2011).

Second, an individual's probability of employment is inversely correlated with number of limitations, although this correlation is weak. For instance, most of the limitation combinations that contain exactly four limitations have some of the lowest PEPs within the employment hierarchy, while most of the single limitation combinations have PEPs that are ranked among the ten highest. Other studies find similar results, indicating that those with three or more limitations are less likely to be employed than those reporting only one or two (Kadijk et al. 2018). The inverse association between employment and the number of limitations could result from potential employers perceiving that those with multiple limitations require more significant work

accommodations, making these individuals less valuable in the labor market (Kocman et al. 2017). Further, those with multiple limitations may only be able to do specific jobs due to how their limitations interact with the social environment (Verbrugge and Jette 1994). These jobs, however, may require skills that these individuals cannot access due to inadequate training and education, leading to a job/skills mismatch (Anderson et al. 2020). This mismatch may partly explain the LMD of those with multiple limitations.

There are multiple exceptions to this general trend, however. For example, those who report all six limitations have PEPs of approximately 24%, placing them in the middle of the employment hierarchy. Further, those with hearing/vision/mobility/IADL limitations (a four-limitation combination) have PEPs of approximately 6%, positioning them at the bottom of the hierarchy and below all six combinations with exactly five limitations. Differences in how individuals represent their limitations (i.e., misreporting of limitations) may explain this variation, although studies indicate that this type of response bias is extremely low on the ACS limitation questions (Miller and DeMaio 2006; Brault et al. 2009). These variations could also indicate that the employment hierarchy is shaped by multiple other factors.

One such factor may be limitation type. Specifically, regardless of the number of limitations, on average, those who have either a mobility or an IADL limitation within their combinations have the lowest employment probabilities, while those with a hearing or vision limitation have the highest. For instance, those who report an IADL limitation within their combination have PEPs that do not exceed 30%. In contrast, most limitation combinations that contain hearing limitations, except for those that also have a mobility or IADL limitation have employment probabilities that are above 25%. These findings coincide with the literature on employment and multiple limitation type, which suggest that an individual's LMD is reduced by

the presence of mobility and IADL limitations (Henry et al. 2007; Kadijk et al. 2018). This reduction in LMD may be explained by the fact that this combination may include those who have both mobility and mental health limitations (see discussion above on IADL limitations) which are both associated with substantially high LMD (Henry et al. 2007; Kadijk et al. 2018; Russinova et al. 2011). These high levels of LMD may, in turn, be the result of a combination of factors that are often associated with adverse employment outcomes, including visibility of impairments (Krause 2018; Anderson et al. 2020), a perceived need for expensive and complicated accommodations (Capella-McDonnall and Crudden 2009; Anderson et al. 2020), and a mismatch between the type of jobs an individual can do and their lack of qualifications for those jobs (Anderson et al. 2020).

Third, accounting for individual characteristics and government assistance receipt substantially increases employment probabilities for all limitation combinations and narrows the employment disparity between these individuals and those without limitations. When controlling for these factors, PEPs increase by 24 percentage points, on average. These increases vary substantially by limitation combination, however, with increases ranging from 5 percentage points among those with hearing limitations to 37 percentage points among those with vision/cognitive/ADL limitations. These results are supported by research that finds that both individual and policy factors play a large role in shaping labor-market outcomes of those with limitations (Stapleton et al. 2006; Pettinicchio and Maroto 2017; Sevak et al. 2015; Brooks 2019).

Further, the KHB method reveals that these increases are primarily driven by accounting for SSI and SSDI, indicating that the poverty trap created by these programs plays a substantial role in the LMD of those with limitation combinations. These increases in PEPs, however, vary

by limitation combination, suggesting that those with certain combinations who experience the largest increases, such as those with hearing/cognitive/ADL/IADL limitations, may be more vulnerable to the labor-market effects of this poverty trap than those with other limitation combinations.

## POLICY IMPLICATIONS

These variations point to a need for limitation-specific SSI/SSDI reduction policies. For instance, while those whose employment probabilities are less tied to government assistance, such as those with hearing limitations, may be more likely to transition off of benefits if they are offered a non-precarious work arrangement, those whose employment probabilities are more closely connected to government assistance may not be able to leave the SSI/SSDI rolls without a guarantee that their disability-related supports that they receive through these programs (which many private insurers do not offer), such as wheelchairs, hospital visits, medications, substance abuse treatment, mental health counseling, and attendant care, will remain in place even after entering the labor force. More research is needed to determine what limitation-specific measures should be put in place to ensure that those with limitations who want to work are able to do so.

## STUDY LIMITATIONS

While the ACS is the best available dataset for examining the association between LMD and multiple limitations, it is not without its disadvantages. First, the ACS does not contain information on limitation severity among the general population, although there is a way to measure this among veterans in the ACS with service-connected limitations. While this chapter indicates a (weak) negative association between number of reported limitations and employment, the data do not allow me to disentangle how much of this association is due to the severity of limitations. The ACS also does not provide information about timing of disability onset or employment histories. This lack of information is especially problematic given that most people

with disabilities develop their disabilities as a result of their low-status and precarious jobs (Sundar et al. 2018). Thus, timing of disability onset and occupation prior to disability onset (if applicable) are key variables missing from this analysis. Moreover, states are not the best measure of local labor-market conditions. Rather, to better capture how geography may impact the LMD of those with disabilities, we would need data at the county level.

Further, some of the limitation combinations categories have relatively small sample sizes. For instance, only 24 individuals reported a hearing/vision/ADL limitation, and 13 people said they had a hearing/vision/ADL/IADL limitation. Due to these small sample sizes, estimates for these limitation combinations may not be as robust as others. Finally, having specific disability diagnoses, in addition to limitation type, could have benefited this analysis as well. Pairing specific disability labels, such as cerebral palsy, autism, or intellectual disability, with various limitation combinations may have clarified some of the complex patterns discussed in the result section. The lack of information about specific disabilities also ignores the substantial variation within disability categories. For instance, those with mobility limitations could have a wide range of diagnoses, ranging from cerebral palsy to later-onset disabilities from obesity. Being able to more fully capture this variation may help to illuminate some of the variation in employment probabilities among those with multiple limitations.

## DIRECTIONS FOR FUTURE RESEARCH

Despite its limitations, this study offers multiple avenues for future research. For instance, because of the number of limitation combinations in this analysis, it may be advantageous for future research to use clustering techniques to identify a smaller set of combinations. While findings from this chapter provide new and important insights into how various limitations interact with the labor market, it is important to keep in mind that most of the limitation combinations have prevalence rates that are less than 1%. Thus, clustering techniques

would produce larger categories of individuals, simplifying the presentation of results and creating more policy-relevant categories. Further, combining multiple years of the ACS would allow researchers to determine whether the associations found in this chapter are similar across race/ethnicity-gender groups. Finally, I could have eliminated all individuals with current or prior military service from this analysis. Because individuals with service-connected disabilities have access to an alternative network of social safety net programs, which do not disincentivize work, they may have a different relationship to LMD than non-veterans (London et al. Forthcoming). As a result, these individuals could be excluded in sensitivity analyses (or analyzed separately) to glean additional insights.

## CONCLUSION

Recent estimates find that prevalence rates for those with multiple limitations are increasing (National Center for Education Statistics 2019). The fact that 40% of people with limitations have more than one limitation and disability (Stevens et al. 2016) is in line with recent models of disability, such as the disablement process, which frame disability as a result of multiple physical and mental health conditions working in tandem to shape an individual's ability to interact with their social environment. However, much of the research on the labor-market inequalities of those with limitations ignores the potential effects of multiple limitations on employment rates, earnings levels, and other critical labor-market characteristics.

This chapter sought to expand current knowledge on the LMD of those with limitations by determining whether the presence of multiple limitations plays a role in shaping employment probabilities. Findings from this chapter suggest that having multiple limitations is inversely related to employment outcomes of those with limitations, although the degree to which this is the case is heavily influenced by the number and type of limitations. For instance, while, in general, the more limitations an individual reports the greater their LMD, those who only report

an IADL limitation have employment probabilities that are substantially lower than many of those who report two or more limitations. A more-nuanced understanding of how multiple limitations operate within the labor market could lead to workplaces that can better accommodate their disabled employees by recognizing that many employees have invisible or intermittent needs. This recognition may also lead to a greater awareness of how disability can manifest, potentially leading to more people identifying as disabled. This, in turn, could potentially contribute to the de-stigmatization of disability in the workplace, increasing employment rates for this population.

# Chapter 5: Disabled Employment Longevities: How does Disability Status and Type Shape the Number of Years Women and Men Spend Employed?

**Abstract**: Although there is a growing body of literature on the barriers that persons with disabilities face when attempting to find and maintain competitive jobs, much less attention has been given to how long persons with disabilities spend in paid employment during their prime working years. Informed by Cumulative Inequality (CI) theory, this chapter examines how disability status, both separately and in tandem with other status-based characteristics, shapes peoples' Employment Longevities (ELs). Specifically, to capture disparities in lifetime years spent employed between people with and without disabilities, this chapter merges data on age-specific employment rates among persons with and without disabilities from the 2014-2019 American Community Survey with age-specific mortality rates from the Social Security Administration to estimate ELs using Sullivan-based Life Tables. I find that disability status reduces the lifetime number of employment years by approximately 20 years. The number of years that people with disabilities spend employed, however, varies by gender, such that women with disabilities spend 0.7 more years employed than their male counterparts (13.5 vs. 12.8 years). Disability type also shapes the number of years that persons with disabilities are employed, where men with ADL disabilities spend the fewest years employed (5.5 years), while men with hearing disabilities spend the most (19.6 years). Findings from this chapter shed light on the employment lifetimes of persons with disabilities and indicates an urgent need to enact legislation to ensure that persons with disabilities can remain employed over the life course.

**Disabled Employment Longevities: How does Disability Status and Type Shape the Number of Years Women and Men Spend Employed?**

In 2019, approximately 34% of persons with disabilities ages 16 to 64 were employed, compared with 77% of those without disabilities—a 43 percentage point gap (U.S. Bureau of Labor Statistics [BLS] 2020). While cross-sectional analyses consistently indicate that people with disabilities are less likely to be working for pay than their non-disabled counterparts, little attention has been given to examining the extent to which these disparities are the result of barriers that prevent many people with disabilities from entering employment, or factors that make it nearly impossible for workers with disabilities to maintain employment. That is, is disabled employment a social phenomenon in which only a few participate, or is it a common—but brief—stage in the lives of many disabled adults? The first step in answering this fundamental question is estimating the length of time persons with disabilities actually spend employed.

Sociological theories on how disadvantages/advantages accumulate over the life course, such as Cumulative Inequality (CI) theory (Ferraro and Shippee 2009), can also help to illuminate how the accumulation of disadvantages that are commonly experienced by people with disabilities, such as inadequate education and training, disability-specific employment discrimination, precarious work arrangements, low levels of SES, dependency on government assistance, and poor health may work in tandem to reduce the amount of time adults with disabilities spend employed (Loprest and Maag 2007; Haas 2006; Ameri et al. 2018; Maroto and Pettinicchio 2014b; Maroto et al. 2019; Brown et al. 2017). Such disadvantages may add up over time to limit the number of years that persons with disabilities spend in paid employment by delaying employment entries, creating unstable work histories, disrupting employment trajectories, and forcing early and involuntary employment exits (Sanford et al. 2011; Fournier et

al. 2010; Mitchell et al. 2006). In addition to disability status, the multiplicative effects of gender and disability type may further affect the number of years that persons with disabilities spend employed.

To estimate the amount of time persons with disabilities spend in paid employment between the ages of 20 and 64, this chapter uses Sullivan-based Life Tables to estimate how much of the four decades of typical "working life" in the U.S. is spent working with a disability. In doing so, this chapter will seek to answer three specific questions: (1) How many years do people with disabilities spend employed compared to their counterparts without disabilities? (2) How does the time that persons with disabilities spend employed vary by gender? And (3) How does the time that persons with disabilities spend employed vary by type of disability?

The Sullivan-based Life Table method is key to capturing how disability status shapes the number of lifetime years an individual spends employed. While this method is primarily used to estimate disability-free life expectancy—the average number of years an individual can expect to live without a disability—it can also be expanded to estimate the portion of an individual's life they spend in other activities as well, such as employment. While longitudinal data can provide similar information, these data take decades to collect and typically contain small numbers of individuals with disabilities relative to larger cross-sectional databases, such as the American Community Survey (ACS). The Sullivan method circumvents these issues by pairing life expectancy data from period life tables with age-specific prevalence estimates of a particular outcome from cross-sectional data (Imai and Soneji 2007; see Farina et al. 2021 for example). Specifically, in this analysis, I will merge data on age-specific employment rates among disabled and non-disabled adults aged 20 to 64 from the 2015-2019 ACS with age-specific mortality data on those individuals from the Social Security Administration. Using the merged data with

Sullivan-based lifetables, this chapter estimates employment longevities (ELs) for four gender-disability groups: women with disabilities, women without disabilities, men with disabilities, and men without disabilities. Next, because employment outcomes vary by disability type (Pettinicchio and Maroto 2017), this chapter will also compare the gender-specific ELs for the six types included in the ACS. Results from this chapter will provide new and policy-relevant insight into the ELs among people with disabilities.

## DISABLED EMPLOYMENT PATHWAYS

Cumulative Inequality (CI) theory may explain why persons with disabilities spend fewer years employed than those without disabilities. Specifically, CI theory points to the fact that disadvantages do not directly originate from an individual's status-based characteristics, such as their race/ethnicity, gender, or disability status. Rather, possessing certain disadvantaged statuses increases an individuals' exposure to the risk of certain negative life outcomes, such as poor health, low SES, and unemployment (Ferraro and Shippee 2009; Axiom 2). Thus, according to CI theory, persons with disabilities may spend fewer years in paid employment because their disability status increases their exposure to certain factors that may limit the number of years that they are available to work.

More specifically, all workers, but especially those with disabilities, face factors such as barriers to employment entry, non-employment responsibilities (i.e., caregiving for children and aging family members), job instability, poor health, unexpected events, government policies that disincentivize work, and the inability to accumulate wealth that may limit the number of years they spend in paid employment (Alfageme et al. 2012; Williamson and Mcnamara 2003; Livermore 2011; Fournier et al. 2010; Ameri et al. 2018). That is, rather than following a standard and continuous employment trajectory, people enter employment at various ages, may

experience either temporary or extended absences from work, and sometimes permanently exit the labor market either earlier or later than the current retirement age of 66. Thus, examining the number of years disabled persons spend employed requires understanding how disabled persons' disadvantages accumulate over the life course to affect when they enter the labor force, how they cycle in and out of employment, and when they permanently terminate employment.

*Employment Entries*

Factors affecting the amount of time persons with disabilities spend employed may start to accumulate in childhood. Ferraro and Shippee (Axiom 1-A) note that early childhood conditions may shape later-life outcomes, such as the amount of time persons with disabilities spend in paid employment (Ferraro and Shippee 2009; Axiom 1-A). For instance, those who develop disabilities in childhood are often tracked into special education classes where they receive inadequate education and training, leaving them underprepared for the labor market (Loprest and Maag 2007). This lack of preparation may drive many young adults with disabilities on to government assistance, specifically SSI, which disincentivize work through imposing strict income and asset limits (Caplan 2014; Livermore 2011). Those who can bypass the work disincentives of SSI face numerous barriers to employment entry in the form of employer bias against workers with disabilities (Ameri et al. 2018). The combination of these factors may substantially delay the employment entries of those with early-onset disabilities.

Indeed, empirical evidence points to the fact that those who enter the labor force with disabilities begin employment at much later ages than their non-disabled counterparts. Disparities in age at employment entry are present across gender and disability type. For instance, studies find that six years after leaving high school, those with intellectual, mobility, and vision disabilities are less likely to be employed than their same-age non-disabled peers

(Sanford et al. 2011). Other research indicates that women with disabilities are substantially less likely to be working for pay three to five years after leaving high school than otherwise similar men (Blackorby and Wagner 1996). While these delays in employment entry are problematic in themselves, they also decrease the number of potential years that persons with disabilities can spend employed. Thus, even before entering the labor market, those with disabilities are placed at a disadvantage.

*Years Spent (Not) Employed*

Once employed, workers with disabilities may be at greater risk of experiencing various factors that temporarily disrupt their employment trajectories. Specifically, while many workers may need to take time away from paid employment to attend to non-work-related responsibilities, such as caring for children or other family members, continuing education, recovering from an illness or injury, or other personal matters (Alfageme et al. 2012), disability may exacerbate the need for these temporary absences. Workers with disabilities are more likely to experience certain obstacles that interrupt their employment, such as occupational segregation and poor health, due, in part, to their lack of appropriate education and training (Maroto and Pettinicchio 2014b; Brown et al. 2017; Loprest and Maag 2007). As Ferraro and Shippee (2009; Axiom 2-B) point out, inequalities diffuse across multiple aspects of an individual's life (Ferraro and Shippee 2009; Axiom 2-B). Thus, the disadvantages they experienced in childhood may manifest into multiple markers of LMD in adulthood that increases the need for temporary absences from paid employment.

For instance, disabled workers' greater vulnerability to occupational segregation may indirectly reduce the years that they are available to work by increasing their likelihood of these temporary employment absences. Workers who enter the labor market with disabilities and those

who develop disabilities after gaining employment are more likely to be pigeonholed into precarious, low-wage, non-unionized jobs than their counterparts without disabilities (Haas 2006; Kumin and Schoenbrodt 2016; Maroto and Pettinicchio 2014b; Kaye 2009). This occupational segregation may limit the number of years that persons with disabilities spend employed through several mechanisms. Because these jobs are often temporary and have high turnover rates, workers in these unstable work arrangements often experience frequent job changes (Fournier et al. 2010). This chronic job instability may be especially problematic for those with disabilities, who often cannot find alternative employment as quickly as their non-disabled counterparts (Ameri et al. 2018). Disabled workers' greater difficulty transitioning from job to job may result in more extended periods of unemployment, limiting their working years.

Another mechanism through which these precarious work arrangements may limit the number of years disabled persons spend in paid employment is the increased risk of poor health and disability. Certain characteristics associated with these low-status jobs, such as lack of social support, low intellectual discretion, physically demanding workloads, hazardous working environments, and greater work intensity, are also associated with poor mental and physical health and disability (Karasek et al. 1981; Marmot et al. 1991; Theorell and Karasek 1996; Nixon et al. 2011; Benach et al. 2014). Non-work-related factors, such as high levels of stress accumulation, obesity, risky health behaviors, and pre-existing conditions, may also increase the risk of poor health and disability (Pearlin et al. 2005; Dupre 2008; Thoits 2010). While their more privileged counterparts have the money, knowledge, and power to mitigate these adverse health outcomes, workers in low-status occupations often do not, resulting in the potential for the accumulation of these health conditions and disabilities over time (Link and Phelan 2010; Verbrugge and Jette 1994; Ferraro and Shippee 2009). More specifically, because of their lower

levels of education and wealth, workers in precarious low-wage jobs may not be able to obtain access to resources needed to minimize their risk of poor health, such as healthy food (and time to prepare this food), time and spaces to exercise (such as neighborhoods and gyms), and healthy working environments (Link and Phelan 2010). Thus, these individuals may not have the resources to create and afford healthy lifestyles, increasing their chances of poor health and disability onset and progression (Verbrugge and Jette 1994). These declines may require workers with disabilities to either take temporary absences from employment, find jobs that can better accommodate their abilities, or as discussed in the next section, permanently exit employment.

*Employment exits*

Factors such as chronic job instability, poor health and disability, lack of education and training, and other employment-related barriers may accumulate over the course of disabled working lives, making employment re-entry—or simply navigating the labor market—increasingly impossible. Ferraro and Shippee (2009; Axiom 3-B p. 335) suggest that some individuals may encounter "turning points […] during the life course when major change occurs in how the person responds to a risk" (Ferraro and Shippee 2009; Axiom 3-B p. 335). Workers with disabilities may encounter such a turning point where their temporary employment absences become early permanent employment exits (Ferraro and Shippee 2009; Axiom 3-B). Indeed, while all workers, especially minority workers and those in precarious employment, are at an elevated risk of these early exits (Hayward et al. 1989), workers with disabilities appear to be more likely to exit employment earlier than their counterparts without disabilities (Roehrig et al. 2013; Lidal et al. 2009; Benner et al. 2017; Tombom et al. 2014; Mitchell et al. 2006).

Explanations behind employment exits may differ between those who begin working with disabilities and those who develop disabilities while working. For instance, those who start

working with disabilities may experience declines in health and/or increases in disability as exacerbators (Verbrugge and Jette 1994), turning their physical and/or mental limitations into work-limiting disabilities. Specifically, the complex accommodation needs of those with disabilities who experience further declines in mental and physical functioning may become unsustainable for many employers over an average working lifespan. As a result, these employers may decide that the value these disabled workers have as employees are not worth the cost of accommodating them, cutting their jobs to save cost (Kocman et al. 2017).

Unlike those who start working with disabilities, whose jobs likely already accommodate their disability, workers who develop disabilities while employed may not be able to carry out the tasks required for their jobs after onset (Jones 2011). Studies indicate that these workers are more likely to have lower levels of education than those without disabilities due to a selection effect where those with less education are more likely to develop disabilities in adulthood (Jenkins and Rigg 2004). Their lower levels of education and lack of training may create a mismatch between the jobs they know how to do and those they are physically and mentally capable of performing. That is, while those who enter employment with disabilities have a lifetime to develop the skills and techniques needed to navigate the labor market with a disability, those who develop disabilities do not, which may often result in their early employment exits (Jones 2011). Studies examining how employment probabilities change after disability onset supports this theory, finding that employment probabilities among those with lower levels of education initially increase but then dramatically decrease after disability onset, suggesting that those who experience onset while working may continue to work until a point at which they can no longer do so (Williamson and Mcnamara 2003).

Gender may also play a role in shaping employment exits among workers with disabilities. Men with disabilities may be particularly vulnerable to the effects that occupational segregation has on reducing the number of years spent employed, given their greater likelihood of working in production, transportation, and material moving occupations than women with disabilities and workers without disabilities (BLS 2017). Women with disabilities may experience other barriers that link to their ability to remain in paid employment. For example, regardless of disability status, women are more likely to take temporary absences from paid employment to take care of children, grandchildren, aging parents, and other family members (Gerson and Jacobs 2004; Alfageme et al. 2012). These absences may be prolonged by disability, given that women with disabilities report that they often have difficulties trying to simultaneously work in an ableist labor market and raise a family (Crooks 2007; Shandra and Penner 2017). Further, because of their weaker attachment to the labor market (Pettinicchio and Maroto 2017), women with disabilities may be more vulnerable to the work disincentives created by disability-specific government assistance programs.

Disability type may also partially affect the number of years that persons with disabilities are employed. For instance, studies indicate that workers with cognitive disabilities are often pigeonholed into the five F's: food, filth, flowers, factories, and filing (Cumin and Schoenbrodt 2016). Because these jobs are often low-wage and temporary, those with cognitive disabilities may be even more vulnerable to the chronic job instability and health effects of occupational segregation than workers with other types of disabilities, increasing their risk of early employment exit. Workers with mobility, ADL, and IADL disabilities may require modifications to the work environment and/or other complex work accommodations (Anderson et al. 2020; Krause 2018; Crooks 2007). While the need for physical modifications and accommodations

may increase as these workers age and their functioning declines, many employers may be unwilling or unable to make further changes (Krause 2018; Crooks 2007). As a result, these workers may be pushed out of employment at earlier ages due to the combination of declines in functioning and inaccessibility.

While the cumulative effects of disability status, the timing of disability onset, gender, and disability type may affect an individual's risk of early employment exit, the workplace itself may also drive many workers with disabilities out of paid employment. While working, people with disabilities often report harassment and bullying in the workplace (Robert and Harlan 2006; Nielsen et al. 2017), lack of opportunities for advancement (Schur et al. 2009), and low levels of job satisfaction (Brooks 2019). Taken together, the evidence reviewed strongly suggests that persons with disabilities will spend fewer years employed than persons without disabilities.

## ASSOCIATION BETWEEN DISABILITY AND YEARS SPENT EMPLOYED

Empirical research indicates that disability may indeed truncate the number of years that people spend in paid employment. Specifically, while the probability of employment decreases as age increases for all workers, these probabilities decrease more for those with disabilities (Roehrig et al. 2013; Mitchell et al. 2006). A study by Mitchell and colleagues (2006) found that between the ages of 20 and 60 years, employment rates declined by 35 percentage points among individuals without disabilities, while rates among those with disabilities declined by 50 percentage points. Studies point to chronic conditions, severity of physical and mental limitations, pain, disability-specific workplace discrimination, job type, and low levels of education as leading explanations for the lower employment rates among older adults with disabilities (Robroek et al. 2013; Holman 2019; Mitchell et al. 2006; Nielsen et al. 2017; Benner et al. 2017; Tombom et al. 2014; Williamson and Mcnamara 2003).

The majority of this research, however, is conducted using either small limitation-specific samples or focuses on age-specific prevalence estimates of employment. For instance, to examine how patterns of disabled persons' employment may change throughout the life course, several studies tracked a cohort of individuals with disabilities over the course of their adult lives, finding that employment rates within these cohorts decreased substantially with age (Benner et al. 2017; Tombom et al. 2014). These studies, however, use relatively small samples (under 100 individuals) of those who primarily begin working with disabilities (cerebral palsy or spina bifida), producing findings that are not generalizable to the population of persons with disabilities. Although one study did track the employment rates of 165 individuals who experienced traumatic spinal cord injury in adulthood, results may only apply to those with SCI from the specific age cohort due to employment-specific cohort effects (Lidal et al. 2009). Alternatively, some studies use larger and more diverse samples in terms of disability type and onset (Mitchell et al. 2006; Roehrig et al. 2013). These studies, however, focus primarily on comparing the association between employment and age among workers with and without disabilities, rather than estimating the number of years they spend employed.

AIMS

This chapter will examine how disability status is associated with the number of years people are employed during ages 20 to 64, what I refer to here as ELs. The analysis will also assess how ELs of persons with disabilities differ across gender and disability type. Findings from this chapter will provide a more complete and intersectional understanding of disabled persons' employment longevities, a topic that is essential to further understanding the extent to which people with disabilities experience labor market disadvantages.

## METHODS

### *Data*

To estimate the number of years that people with and without disabilities are employed during ages 20-64, this analysis merged data from two data sources. The first is the 2015 to 2019 years of the ACS. The ACS is the best available dataset for examining the various aspects of disabled persons' employment statuses because of its large numbers of individuals with disabilities. Age-specific mortality rates were obtained from the Social Security Administration (SSA: Maleh and Bosley 2020). These data contain the only published set of complete, single-year life tables for working-aged adults with disabilities (they also contain lifetables for their peers without disabilities). The SSA created the life tables using data from the 2020 reports of the Board of Trustees of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds (Trustees Reports) (Maleh and Bosley 2020).

### *Sample*

To capture the working-age population, this chapter focuses on adults aged 20 to 64. Due to varying levels of access to government assistance programs and other factors, the employment trajectories of native-born and non-native-born respondents with disabilities may differ substantially (Xiang et al. 2010). As a result, the sample focuses on native-born respondents. Once these restrictions were taken into account, the final sample contained 7,594,126 individuals. Because mortality estimates were stratified by both gender and disability status, separate analyses were conducted for women with disabilities (483,046 individuals in the ACS), men with disabilities (515,650 individuals in the ACS), women without disabilities (3,438,383 individuals in the ACS), and men without disabilities (3,343,884 individuals in the ACS).

*Variables*

Employment

To estimate the number of years that people spend employed, this chapter used a binary measure of employment (employed = 1; unemployed or not in the labor force = 0). While those who are unemployed are technically part of the labor force, because these individuals are not currently working, they were considered to be 'not employed' for the purposes of this analysis. This binary measure has been used in several other studies that examine the association between employment and disability (e.g., Brucker et al. 2016).

Disability

The ACS captures disability with a six-item sequence (Brault et al. 2009). This sequence includes questions regarding an individual's difficulties with the following: "hearing" (hearing limitation), "seeing even when wearing glasses" (vision limitation), "walking or climbing stairs," (mobility limitation), "concentrating, remembering, or making decisions," (cognitive limitation) "dressing or bathing," (ADL disability), and "doing errands alone such as visiting a doctor's office or shopping" (IADL disability). While these categories do not formally capture those with mental health limitations, substance use disorders, and chronic pain, these individuals may likely report ADL or IADL limitations if their limitations are significant enough to impact their ability to work. Notably, this six-disability question sequence has been critiqued for its bias towards those with the most significant disabilities, its inability to capture certain sub-populations of people with disabilities, and its lack of capacity to identify the heterogeneity within limitation categories (Sabariego et al. 2015; Holder 2016; Havercamp et al. 2019; King et al. 2019; Washington Group on Disability Statistics 2018: see Chapters 2 and 6 for more details).

These six items were both combined into one overall global measure of disability (at least one disability = 1; no disability = 0) and, in addition, analyzed separately in subsequent analyses. While, according to the DP, some of these measures assess functional limitations and others assess disability (Verbrugge and Jette 1994), for ease of exposition, I will refer to the combination of these measures as "disability" and the six separate measures as "disability types" in the remainder of the chapter.

Individual Characteristics

Gender is provided in the ACS as a dichotomous variable with one (1) as female and zero (0) as male. When estimating 1-year age specific employment probabilities, I also control for race/ethnicity, which is coded into a four-category variable, representing those who identify as non-Hispanic white (NHW), non-Hispanic Black (NHB), Hispanic, or non-Hispanic other (NHO).

*Analysis*

The analysis first estimated age-specific employment probabilities using the following equation:

$$\text{In(odds of employment)} = b0 + \text{age20x} + \ldots \text{age63x}$$

This model estimated the age-specific ln-odds of employment for each 1-year age group for adults aged 20 to 64, using those aged 64 as the reference group. Separate models were estimated for the four demographic subgroups mentioned above: women with disabilities, men with disabilities, women without disabilities, and men without disabilities. All models were estimated with Stata 16.1 and adjusted using appropriate sample weights and standard errors. Using the model results for each disability-gender group, I converted the predicted log-odds of employment into the predicted probabilities of employment (PEPs) for each 1-year age interval.

For each gender-disability group, I merged the age-specific probabilities of employment with age-specific probabilities of death obtained from the SSA. This merged dataset contains the information needed to estimate ELs using the Sullivan-based Life Table Method (Jagger 2001). The method consists of three main steps. First, I used the age-specific probabilities of death to create a lifetable. The main lifetable quantity of interest is the number of person-years lived within each 1-year age interval (i.e., lifetable column Lx). Next, I multiplied the number of person-years lived in each interval by the probability of employment in that interval to obtain the number of person-years employed in that interval. Third, I summed the person-years employed across all ages and divided by the sum by the number of persons alive at age 20. That provides the expected ELs of a given gender-disability group.

To assess how disabled persons' ELs vary by disability type, this analysis was replicated for 12 gender-disability type groups (women with hearing disabilities, women with vision disabilities, women with mobility disabilities, women with cognitive disabilities, women with ADL disabilities, women with IADL disabilities, men with hearing disabilities, men with vision disabilities, men with mobility disabilities, men with cognitive disabilities, men with ADL disabilities, and men with IADL disabilities).

RESULTS

The first objective of this study was to examine if the presence of a disability is associated with the number of years an individual spends employed. Table 5.1 shows ELs at each age for persons with and without disabilities, stratified by gender. Figure 5.1 displays ELs at age 20. As shown in this figure, ELs at age 20 vary substantially by disability status. Among men, ELs at age 20 range from 12.8 years for men with disabilities to 35.5 years for men without disabilities—a 22.7-year gap. The gap in ELs at age 20 between women with and without

disabilities is 19.8 years, with ELs at age 20 of 13.5 years among women with disabilities and 33.3 years for women without disabilities. While people with disabilities spend substantially fewer years employed than those without disabilities, women and men spend roughly the same amount of time employed, regardless of their disability status. Specifically, while women and men with disabilities tend to remain employed for approximately the same length of time (13.5 vs. 12.8 years, respectively), men without disabilities remain at work approximately two years longer than their female counterparts (35.5 vs. 33.3 years).

When examining ELs by limitation type, similar patterns emerge among women and men (Table 5.2). As shown in Figure 5.2, among disabled women, those with hearing disabilities remain employed the longest (18.3 years), followed by those with vision disabilities (16.7 years). Women with cognitive disabilities (10.3 years) and mobility disabilities (9.3 years) spend less time employed than those with sensory disabilities. In comparison, women with ADL and IADL disabilities spend only 5.6 and 7.3 years employed, respectively. This disability type hierarchy persists among men with disabilities—ranging from 19.5 years for those with hearing disabilities to 5.5 years for those with ADL disabilities (Figure 5.2). These findings suggest that limitation type substantially shapes the number of years workers with disabilities spend employed.

## DISCUSSION

Evidence suggests that race/ethnicity and gender may play a role in shaping the number of years individuals spend in paid employment, with studies indicating that women and Black adults spend fewer years in paid employment than their male and white counterparts (Hayward et al. 1989; Choi et al. 2017; Brown and Warner 2008; Lahey 2018; Lahelma et al. 2012). But, what about persons with disabilities? Do persons with disabilities spend fewer years employed during the prime working ages than those without disabilities? Further, does disability intertwine

with other status-based characteristics, such as gender and disability type, to shape the number of years that people spend employed? By beginning to answer these questions, this chapter sought to compare the ELs between persons with and without disabilities and how time spent employed is further shaped by gender and disability type.

Results from this analysis provide sufficient evidence for several key conclusions. First, as expected, persons with disabilities spend fewer years employed than their non-disabled counterparts. In fact, the limited length of time those with disabilities spend working is quite startling. During the 45 years in between ages 20 and 65, women with disabilities spend only 14 years employed, while women without disabilities are employed for approximately 33 years. This finding is consistent with cross-sectional and longitudinal research that finds that the age-specific probability of employment is lower for those with disabilities (Roehrig et al. 2013; Lidal et al. 2009; Benner et al. 2017; Tombom et al. 2014; Mitchell et al. 2006) but extends that work by estimating the cumulative toll across the adult life course.

This substantial disparity in the number of years employed between those with and without disabilities is likely the result of various barriers that accumulate over the course of disabled persons' lives (see Maroto and Pettinicchio 2014 for a review of these barriers). For instance, certain disadvantages they experience in childhood, such as adverse childhood experiences and inadequate levels of education and training, may lead to certain LMD that directly limit the amount of time that disabled persons spend employed, such as delayed employment entries, precarious and unstable work arrangements, poor health, occupational segregation, limited opportunities for job mobility, and early employment exits (Sanford et al. 2011; Loprest and Maag 2007; Fournier et al. 2010; Maroto and Pettinicchio 2014b; Brown et al. 2017; Ferraro and Shippee 2009). These disadvantages may simultaneously explain why those

who enter the labor market with disabilities are less likely to remain employed as they age (Benner et al. 2017; Tombom et al. 2014) and why those who develop disabilities while employed may experience rapid declines in employment probabilities after disability onset (Williamson and Mcnamara 2003).

Disabled workers' greater vulnerability to occupational segregation may partly explain why they spend fewer years employed than those without disabilities. Studies indicate that persons with disabilities are more likely to work in precarious, low-wage, non-unionized jobs than their counterparts without disabilities (Maroto and Pettinicchio 2014b; Kaye 2009). These jobs may reduce the number of years that people spend employed through several mechanisms. For instance, because these jobs are associated with adverse physical and mental health outcomes (Karasek et al. 1981; Marmot et al. 1991; Theorell and Karasek 1996; Nixon et al. 2011; Benach et al. 2014), they increase workers' chances of disability (Verbrugge and Jette 1994). Such declines in physical and mental functioning may make it nearly impossible for these workers to perform the tasks required for these jobs, forcing them out of employment and onto disability-specific government assistance (Robroek et al. 2013).

Further, while workers without disabilities on low-status precarious career trajectories may experience high job turnover, resulting in frequent job changes throughout their working lives (Fournier et al. 2010), those with disabilities in similar situations may not be able to find alternative employment as quickly as their non-disabled counterparts. This lack of job mobility may be due to several factors, including ableist hiring practices (Ameri et al. 2018), lack of training and education needed for job mobility (Loprest and Maag 2007), and a mismatch between available jobs and an individual's physical and mental abilities (Anderson et al. 2020). Thus, job loss could substantially limit the number of years disabled workers spend in paid

employment. Other factors that might reduce the amount of time disabled workers spend employed include harassment and bullying in the workplace (Robert and Harlan 2006; Nielsen et al. 2017), lack of opportunities for advancement (Schur et al. 2009), and low levels of job satisfaction (Brooks 2019).

Second, contrary to expectations, men with disabilities spend less time employed than their female counterparts, although these differences are relatively small. Specifically, women with disabilities spend 0.7 years longer in paid employment than men with disabilities. This gender gap may be explained by the fact that disability has a stronger (more negative) association with men's employment outcomes (Pettinicchio and Maroto 2017). Further evidence for disability's stronger association with men's working years is found in the fact that the disability gap in the number of years employed is larger among men than women (22.7 years vs. 19.8 years). Disabled men's more abbreviated time employed could partly result from their greater likelihood of working in physically demanding jobs, such as construction and factory work (BLS 2017). In fact, men with disabilities are more likely to work in production, transportation, and material moving occupations than both women with disabilities and workers without disabilities (BLS 2017). Thus, declines in health and or physical and mental functioning—experienced by both those who start working with disabilities and those who develop disabilities while working—may have more impact on disabled men's abilities to remain at work.

Third, as expected, ELs vary substantially by disability type. Among women with disabilities, ELs at age 20 range between 18.3 years for women with hearing disabilities to 5.6 years for women with ADL disabilities. Disabled men's ELs at age 20 range between 19.6 years for men with hearing disabilities to 5.5 years for men with ADL disabilities. These variations are

in line with other research, which finds that labor force participation among persons with disabilities varies jointly by age and disability type, with older workers whose disabilities impact their ability to independently perform activities of daily living least likely to work (Roehrig et al. 2013).

These substantial differences in ELs by disability type may be due to the combination of several factors. For instance, because workers who begin working with certain types of disabilities enter work at later ages than their non-disabled counterparts, they are already at a disadvantage when it comes to the number of years worked. Specifically, those with intellectual, mobility, and vision disabilities are less likely to be employed six years after leaving high school than those without disabilities, reducing the number of life years that they are available to work (Sanford et al. 2011). Once employed, workers with certain types of disabilities, specifically those with mobility, cognitive, ADL, and IADL disabilities, are more likely than those with other types of disabilities to experience certain labor-market barriers and outcomes that may further reduce their working years, including occupational segregation, high job turnover, lack of opportunities for advancement, and workplace harassment and bullying (Maroto and Pettinicchio 2014b; Schur et al. 2009; Robert and Harlan 2006;). Moreover, workers with more complex disabilities, such as those with ADL and IADL disabilities, may be more likely to experience declines in both health and functioning (Altman and Bernstein 2008). These declines, combined with their low levels of educational attainment and high levels of occupational segregation, may create a situation in which the jobs that disabled workers are trained to do are no longer within their physical or mental capabilities. This mismatch between training and capabilities may especially affect those who develop ADL or IADL disabilities while working because these workers may not have/been trained for jobs that can accommodate their new disabilities. Thus, as

biopsychosocial model scholars suggest, the interaction between the working environment and declines in workers' physical and mental limitations may create work disability (Verbrugge and Jette 1994).

## POLICY IMPLICATIONS

Although findings from this chapter do not directly speak to specific policy recommendations, they provide several key points that should be considered. For instance, increasing the number of years that persons with disabilities spend employed may require major changes to the network of disability-specific government assistance programs. Because these programs were designed in the 1950s, they often equate disability with the inability to work. However, while advancements in technologies, accommodations, medicine, and society have changed how our culture conceptualizes disability, the SSA still views disabled beneficiaries as unable to participate in paid employment (Autor at al. 2011). Thus, the rules and regulations of these programs, which are explicitly intended to determine who is disabled 'enough' to receive benefits, often keep people from attempting to either enter or return to employment (Stapleton et al. 2006). Thus, increasing the amount of time persons with disabilities spend employed would require reforming these programs in several keyways, including eliminating income and asset limits, offering rehabilitation and further job training to those who want it, and ensuring that beneficiaries achieve certain outcomes related to independent living, including employment.

In addition, to transfer the responsibility of providing accommodations from employers, especially those with small businesses, the federal government could provide an accommodation stipend to all workers with disabilities. This stipend could potentially be based on an individual's accommodation needs, increase in age and decline in functioning, and follow the worker as they move from job to job. This stipend could ensure that all workers with disabilities will have

appropriate and equal access to the workplace by providing funding for such items as modifications to workspaces, assistive technology, attendant care, and various other workplace supports. Alleviating employers' need to provide accommodations may also increase their willingness to hire workers with disabilities.

## LIMITATIONS

Despite this chapter's substantial contributions to the literature on the labor market inequalities of those with disabilities, it is not without its limitations. First, the mortality data used in this analysis were taken from the SSA. As a result, these data were based on estimates from the population of individuals with disabilities who receive government assistance. Because the SSA defines disability as an "inability to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment" (SSA 2015a), the population identified by the SSA's mortality data may not necessarily be the same as the one identified in the ACS (Burkhauser et al. 2014). For instance, the SSA data may only include a few of those with service-connected disabilities, whereas the ACS data may include a larger population (London et al. Forthcoming). Regardless of this mismatch, these data are the only disability-specific risk of death estimates and thus were used in this analysis.

Second, due to the cross-sectional design of the ACS, this analysis was unable to be stratified by timing of disability onset. Thus, these results may simultaneously underestimate the time that workers who begin working with disabilities spend employed, while overestimating the working years of those who develop disabilities while working. Finally, while ideally this analysis would have included the eight race/ethnicity-gender-disability groups from chapter 3, this was not possible because the SSA mortality data did not stratify by race or ethnicity.

In addition, while not a direct limitation of this study, scholars who want to expand on the findings above should be mindful of the fact that individuals with service-connected disabilities have access to an alternative network of social safety net programs, which do not disincentivize work. As a result, these individuals may have a different relationship to LMD than non-veterans (London et al. Forthcoming). While it is beyond the scope of this chapter—and the dissertation as a whole—to examine the association between disability, veteran status, and number of years employed, future research should consider segregating analyses by military service (current or former) to account for the effects of this alternative source of disability-related government assistance.

## CONCLUSION

Research suggests that persons who experience certain disadvantages throughout the life course spend fewer years employed than their more privileged counterparts (Hayward et al. 1989; Choi et al. 2017; Robroek et al. 2013; Brown and Warner 2008; Lahey 2018). This is one of the many failures of the U.S capitalist system, given that those who spend less time in paid employment are often the same workers who may need to work to maintain resources for daily survival (Fournier et al. 2010). Many workers with disabilities fall into this category. That is, this chapter found that workers with disabilities spend only 13 years employed. However, the time that disabled workers spend working varies by gender and limitation type. To put this into perspective, if I started working on my first day of sociology 101—approximately ten years prior to the publication of this dissertation—I would have already worked for the majority of the average ELs for my gender-disability group. While only working for another 3.5 years at some point before the age of 64, would sound like a dream come true to some, due to the extra cost of living with a disability (Goodman et al. 2020), exiting the labor force before age 40 would mean

that I would live my remaining years in abject poverty, which many people with disabilities often do (Maroto et al. 2019). Findings from this chapter underscore an urgent need to enact legislation to ensure that persons with disabilities can remain employed over the life course.

# CHAPTER 6: CONCLUSIONS, LIMITATIONS, AND CONTRIBUTIONS

This dissertation examined the intersectional connections between race/ethnicity, gender, disability type and combination, and LMD. Specifically, informed by the theoretical frameworks of intersectionality, cumulative inequality, and the disablement process, this dissertation sought to determine how disability status, race/ethnicity, gender, and disability type and combination, both separately and together, shape employment probabilities and the amount of time spent employed during the prime working years.

## SUMMARY OF CHAPTERS

### *Does the Association Between LMD and Disability Vary Jointly by Race/Ethnicity and Gender?*

To examine how disability status, race/ethnicity, and gender work in tandem to shape an individual's risk of LMD, this chapter used a series of additive and interactive models to examine the following: 1) How employment probabilities (PEPs) among persons with disabilities vary by race/ethnicity and gender; 2) Disparities in PEPs among 16 race/ethnicity-gender-disability groups; and 3) How much of the variation between these groups can be explained by individual, policy, and state-level characteristics. Findings from this chapter reveal that intersectionality is essential to understanding the LMD of those with disabilities.

Specifically, results indicate that interactive models reveal aspects of the association between disability status, other status-based characteristics, and LMD that additive models simply cannot capture. For instance, while there is an 8-percentage point gap in PEPs between NH Black women and men with disabilities, favoring Black women (55% vs. 47%), this gender gap flips for NH whites with disabilities, where NH white men's PEPs are eight percentage points higher than otherwise similar women (62% vs**.** 54%). Analyses from this chapter also

found that racial/ethnic and gendered disparities in PEPs among those with disabilities are substantially reduced when accounting for differences in individual characteristics—specifically educational attainment and marital status—and receipt of government assistance.

Cumulative inequality theory may be able to shed light on why intersectionality plays a substantial role in the LMD of those with disabilities. For instance, while all persons with disabilities experience some form of the policy, structural, and individual-level barriers discussed in chapter 1, evidence suggests that these barriers have a greater impact on the LMD of those with multiple marginalized statuses when compared with their more privileged counterparts (Brooks 2019b; Pettinicchio and Maroto 2017). CI theory offers a twofold explanation for why this might be the case. First, multiply marginalized individuals with disabilities accumulate more disadvantages over the life course, resulting in their greater risk of LMD. Specifically, women with disabilities and disabled people of color are more likely to experience certain barriers that are directly related to their low levels of employment, such as lower levels of education (Sanford et al. 2011; Loprest and Maag 2007), greater dependency on government assistance (Maroto et al. 2019), and workplace discrimination (Shaw et al. 2012). Simultaneously, those with disabilities who hold more privilege in society (i.e., white men with disabilities) can use their money, knowledge, resources, and power to minimize their risk of LMD (Ferraro and Shippee 2009). In other words, while multiply marginalized disabled individuals travel down the escalator, those with more privileged statuses simultaneously travel up.

However, while some findings from this chapter directly support this theoretical framework, others do not. For instance, even after accounting for all other employment-related factors, NH Black men with disabilities have substantially lower PEPs than their female counterparts. This finding highlights the importance of context and intersectionality in addition

to cumulative inequality theory. Specifically, while we might expect that NH Black women with disabilities to have the lowest employment probabilities based on their gender and race/ethnicity-based disadvantages, studies indicate that, because men have a stronger attachment to the labor market, disability has a greater (more negative) association with men's employment rates (Pettinicchio and Maroto 2017), making them the more disadvantage group in this context. More specifically, Black men with disabilities' greater LMD within this context could be explained by non-disabled Black men's higher likelihood of working in low-status and precarious occupations (Meade et al. 2004), which could result in an increased risk of developing adult-onset disabilities. After disability onset, these men may be pushed out of their jobs and may not be able to return to work because of their lack of education and training. In other words, the multiplicative effects of being male, Black, and disabled have a greater impact on employment than any other combination of statuses examined in this chapter.

Findings from this chapter also indicate that the multiplicative effects of race/ethnicity, gender, and disability status on multiple institutions, such as employment, education, and government assistance, may intertwine with one another, creating overlapping institutions of oppression. That is, the intersectional effects that individuals with disabilities experience within these institutions spillover onto one another to both create and maintain hierarchies of disadvantage (Maroto et al. 2019).

*Does the Association Between Disability and Labor Market Disadvantage Vary by the Number and Type of Limitations?*

Chapter 4 sought to examine how having multiple limitations shapes the risk of LMD. Using data from the 2017 ACS, this chapter analyzed a series of logistic regression models predicting the odds of employment from 63 limitation combinations, adjusting for individual

characteristics, receipt of government assistance, and several state-level policies and characteristics. Results indicate that PEPs vary substantially by the number and type of limitation combination. For instance, there appears to be an inverse—but imperfect—association between number of limitations and LMD, where those who report more limitations have lower PEPs. Further, those who have certain limitations within their combinations, particularly those with IADL limitations and mobility limitations, have substantially lower PEPs than those who do not. Findings also indicate the degree to which individual characteristics and government assistance explain some of the association between multiple limitations and LMD varies depending on an individual's number and type of limitations.

Explanations for why LMD may vary by number and type of limitation combination may lie in how different limitations interact with the social and work environment—a key tenet of the disablement process (Verbrugge and Jette 1994). For instance, studies indicate that those with hearing limitations experience fewer barriers to labor force participation than those with other types of limitations (Perkins-Dock et al. 2015; Benito et al. 2016; Punch 2016), resulting in employment rates that are similar to those without disabilities (Garberoglio et al. 2019). Simultaneously, those with other types of limitations, specifically those with mobility, cognitive, ADL, and IADL limitations, not only experience substantially more barriers to employment but may also require more accommodations while working (Anderson et al. 2020; Kumin and Schoenbrodt 2016; Krause 2018; Crooks 2007; Henry 2007). This greater need for accommodations, along with more workplace bias against these individuals, may make employers less willing to hire these workers. Those with more significant disabilities may also be pigeonholed into precarious, non-unionized work, which is often temporary (Maroto and

Pettinicchio 2014b), possibly resulting in these individuals spending more time looking for work than actually employed (Chapter 5).

Chapter 4 expands on this line of research by suggesting that the presence of multiple limitations—especially significant limitations—may magnify these limitation-specific employment barriers. More theoretically speaking, my findings suggest that those with multiple and significant limitations may accumulate more barriers that impact their ability to participate in paid employment, such as low levels of education, poor mental and physical health, and greater reliance on government assistance, which may, in turn, create significant barriers to employment.

*Disabled Employment Longevities: How does Disability Status, Gender, and Disability Type Shape the Amount of Time People Spend Employed?*

Chapter 5 examines how disability status, gender, and disability type operate in tandem to shape the number of years persons spend in paid employment. Specifically, combining age-specific disability prevalence data from the 2014-2019 ACS with age-specific mortality rates from the Social Security Administration (SSA), this chapter used Sullivan-based Life Tables to estimate the number of years an individual can expect to be employed given their disability status, gender, and disability type. Results indicate that people with disabilities spend only 13 years employed between ages 20 and 65, while those without disabilities spend approximately 34 years employed. The number of years workers with disabilities are employed varies by gender, although these differences are small (13.4 years for women vs. 12.7 years for men). Disability type plays a substantial role in shaping the amount of time those with disabilities spend in paid employment, with employment longevities at age 20 ranging from 19.5 years among men with hearing disabilities to 5.5 years among men with ADL limitations.

One explanation for why workers with disabilities spend so few years employed may lie in the accumulation of disadvantages that they experience throughout their lives. These disadvantages, however, may play out differently for those who begin working with disabilities and those who develop disabilities while working. For instance, research suggests that those who start working with disabilities, especially those with more significant disabilities, are more likely to start working at later ages, be in low-status precarious jobs, and permanently leave the labor force earlier than those without disabilities (Sanford et al. 2011; Maroto and Pettinicchio 2014b; Benner et al. 2017; Tombom et al. 2014). Because of their lower levels of education, these individuals may also have a harder time re-entering employment after a temporary absence, further reducing the number of years they spend employed. Likewise, those who develop disabilities while working may have similar levels of education to those with early-onset disabilities (Loprest and Maag 2007), resulting in the same type of occupational segregation (Haas 2006). Because such jobs are associated with poor mental and physical health (Theorell and Karasek 1996), these individuals may be at a higher risk of developing disabilities. Once disabled, these individuals may not be able to carry out the tasks required for the jobs that they are trained for, leading to a mismatch between the jobs that they know how to do and the jobs that they can do. This mismatch may create a kind of work disability where the interaction between the work environment and their physical and mental limitations limits their ability to participate in paid employment, potentially forcing them out of work soon after disability onset (Williamson and Mcnamara 2003; Verbrugge and Jette 1994).

## LIMITATIONS AND FUTURE DIRECTIONS

Despite its substantial contributions to the literature on the labor-market inequalities of persons with disabilities, this dissertation has several limitations. First, despite its large numbers

of people with disabilities, the ACS still lacks sufficient sample sizes to study smaller disabled sub-populations. As a result, the three analyses in this dissertation were focused in their scope. For instance, while an employment-related analysis would ideally include a three-category measure of labor force participation (employed, unemployed, and not in the labor force), the sample sizes for various sub-groups (i.e., NH Black women with disabilities) were too small to construct such a measure. Several of the limitation combinations in chapter 4 were also subject to this issue, limiting the three analyses to a binary measure of employment used in previous research (Brucker et al. 2016; Pettinicchio and Maroto 2017).

Despite these sample size issues, the ACS is one of the largest national sources of disability data in the U.S. The 2017 ACS contains data from a nationally representative sample of 4,828,334 individuals, 677,201 of which report at least one of the six disabilities. Other national datasets, which contain more information about disability type and onset, such as the National Health Interview Survey (NHIS), contain smaller numbers of respondents with disabilities, which makes it nearly impossible to conduct analyses—especially employment-related analyses—on these smaller sub-groups (Pettinicchio and Maroto 2017; London and Landes 2016; Landes 2017a; Landes 2017b; Dixon-Ibarra and Horner-Johnson 2012; Harris et al. 2003).

Second, the ACS does not contain information about the timing of disability onset, a key factor in the association between LMD and disability. Indeed, research suggests that those who start working with disabilities have higher employment rates than those who develop disabilities while working (Loprest and Maag 2007). Lack of such information is especially unfortunate, given that evidence suggests that those who start working with disabilities may remain in paid employment longer than those who develop disabilities while working (Jones 2011).

Nonetheless, research examining the prevalence of adult-onset disability within the disabled working-age population finds that 19% of adults aged 18 and older with disabilities experience onset before age 20 (LaPlante 2014), making up a small, but substantial, minority. Thus, the findings of this dissertation may primarily apply to those who experience disability onset in adulthood. However, the degree to which this is the case is unknown.

Notably, only a handful of national surveys address disability onset, all of which would be inappropriate for this dissertation. For instance, while the Health and Retirement Survey (HRS) contains a full battery of disability questions, including questions related to onset, its respondents are primarily those who have already exited employment or are on the verge of doing so. While the Panel Study of Income Dynamics (PSID) also has information on disability onset, its disability questions are somewhat limited—only defining disability as ADL, IADL, mental, and work limitations, reducing its capacity to capture the entire population of individuals with disabilities (Livermore and She 2007).

Third, the ACS disability questions also cannot capture severity of limitation. As a result, these questions often exclude those with moderate or mild disabilities (Sabariego et al. 2015). In fact, one study by Sabariego and colleagues (2015) found that "22% of persons with severe disabilities, 71% of persons with moderate disabilities and almost all persons reporting mild disabilities" (p 10341) were not captured by this six-question sequence. As a result, those who have more significant disabilities may be overestimated in the three analyses above, while those with less significant disabilities may not be as represented. Those whose disabilities are mitigated by some type of technology or human-based assistance may also not report a disability on the ACS. As a result, findings from this dissertation may only apply to those with more significant disabilities.

Forth, because this six-question sequence only directly addresses some functional and activity limitations, it may not capture certain sub-populations of people with disabilities (Holder 2016; Havercamp et al. 2019; King et al. 2019; Washington Group on Disability Statistics 2018; Sabariego et al. 2015). That is, while disability is a broad category, encompassing those with substance abuse disorders, chronic illnesses, those who identify as Neurodivergent, those with developmental disabilities, and those who develop their disabilities from poor health, injuries, childhood trauma, or obesity, the ACS disability questions cannot identify all of these individuals, unless their disabilities are significant enough to impact ADLs or IADLs. Thus, findings from this research are likely limited to those whose disabilities are identified by the ACS.

Fifth, the ACS disability questions also lack the ability to identify the vast heterogeneity within limitation groups (Havercamp et al. 2019). For instance, the cognitive disability category may include those with Alzheimer's disease, intellectual disabilities, autism spectrum disorder (ASD), ADHD, depression, and anxiety (Havercamp et al. 2019). Alternatively, those with mobility limitations may have diagnoses or health conditions ranging from cerebral palsy to work-related injuries, and even obesity. Thus, various impairments, limitations, and disabilities within each of these categories may have different implications for LMD. However, it is not possible to identify specific disabilities with the ACS data (Havercamp et al. 2019). This limitation is especially unfortunate in chapter four where matching specific disabilities to limitation combinations may provide insight into the employment disparities among these groups.

Sixth, because the ACS lacks variables related to health, I could not account for how an individual's health may impact the association between disability and LMD. Accounting for

health may help to explain some of the variations in PEPs among the limitation combinations (Chapter 4) and why those with disabilities spend less time employed than those without disabilities (Chapter 5). Future research should attempt to pair health data with the ACS to examine how health might shape the associations established in this dissertation.

Seventh, because of the cross-sectional design of the ACS, I was unable to establish any causal relationships in this dissertation. Indeed, while these three analyses provide evidence of a negative association between disability and employment, which varies by race/ethnicity-gender groups and limitation type and combinations, the directionality of this association remains unknown and may be dependent upon an individual's circumstances. For instance, those with early-onset disabilities may be more likely to experience substantial barriers to employment entry, reducing their employment rates overall (Sanford et al. 2011). Those who develop disabilities while working may quickly leave the workforce after disability onset (Williamson and Mcnamara 2003). More robust longitudinal data is needed to determine a causal relationship between employment and disability. As noted above, however, these data do not currently exist.

Eighth, while some of the ACS disability questions can be easily linked with specific impairments (i.e., hearing limitations), others cannot. For instance, those who report IADL disabilities may have significant physical limitations, mental illnesses, cognitive limitations, or fall under the category of neurodivergent. However, research has yet to identify those who are more likely to respond in the affirmative to these more complex ACS disability questions (Erickson 2012). As a result, it is somewhat difficult to pinpoint why specific limitation types may shape an individual's risk of LMD. This is evident in chapter 4, where I find that those who report only IADL limitations have lower PEPs than those who report all six ACS limitations, after accounting for individual factors, government assistance, and state-level policies and

characteristics. While I do offer some explanation for why this might be the case, these explanations are only conjectures without knowing specific impairment types. Future research may benefit from studies that link the ACS disability questions to specific impairments and mental illnesses.

Ninth, the ACS also does not provide information about employment histories. This lack of information is especially unfortunate given that most people with disabilities develop their disabilities as a result of their low-status and precarious jobs (Sundar et al. 2018). Thus, occupation prior to disability onset (if applicable) is a key variable missing from this analysis.

Tenth, in chapters 3 and 4, geographic labor market conditions would have been better measured with county-level data, rather than state data. However, the 2017 1-year public-use file of the ACS does not provide county-level information on respondents. Thus, county-level data would not match the data from the ACS.

Eleventh, my analyses were unable to cover all aspects of LMD. Specifically, while this dissertation primarily focused on employment, the term LMD is intended to cover multiple aspects of individuals' labor market experiences, including earnings, occupational segregation, and workplace experiences. Indeed, some research that examines both employment and earnings find that the employment patterns among individuals with disabilities do not necessarily mirror those for earnings (Pettinicchio and Maroto 2017). More research is needed to determine whether the findings of this dissertation extend to other markers of LMD.

Finally, I could have eliminated all individuals with current or prior military service from this analysis. Because individuals with service-connected disabilities have access to an alternative network of social safety net programs, which do not disincentivize work, they may have a different relationship to LMD than non-veterans (London et al. Forthcoming). As a result,

these individuals could be excluded in sensitivity analyses (or analyzed separately) to glean additional insights.

## CONTRIBUTIONS

This dissertation makes several important and meaningful contributions to the literature on the labor market inequalities of persons with disabilities. That is, by examining how disability status works in tandem with other status-based characteristics, specifically race/ethnicity, gender, and disability type and combination, the three analyses of this dissertation indicate the importance of intersectionality for the study of disabled people's LMD, a perspective that has only recently emerged within this line of research (Maroto et al. 2018). This dissertation also expands intersectionality, moving beyond its traditional conceptualizations to include disability type. Beyond the case for intersectionality, this dissertation makes several other theoretical, methodological, and empirical contributions.

First, this dissertation applies theories from medical sociology to the employment inequalities of those with disabilities. For instance, cumulative inequality theory, which is primarily used to examine how early-life circumstances influence later-life health, was used in this dissertation to explain how an individual's disadvantages can accumulate over the life course resulting in a disproportionately higher risk of LMD for certain sub-populations of those with disabilities. A prime example of this is found in chapter 4, where the potential accumulation of limitations throughout an individual's life—a key tenet in the disablement process—may result in lower employment probabilities. Chapter 3 also suggests that people with disabilities who have other marginalized identities may accumulate more disadvantages than their more privileged counterparts, leading to a greater risk of LMD. This is also seen in chapter 5, where multiple risk factors, such as low levels of education and training, poor health, employer bias against

(potential) workers with disabilities, disability-workplace discrimination, and work disincentives created by disability-specific government assistance programs, may work together to limit the number of years that disabled workers spend employed. These risk factors create a mismatch between the jobs that these workers know how to do, the jobs that they can do, and the jobs that they can obtain, creating, in a sense, work disability. That is, these factors create social, physical, and attitudinal barriers that make it increasingly difficult for those with disabilities to continue to work, reducing the number of years that people with disabilities can spend in paid employment.

In addition to these theoretical advancements, this dissertation makes several key methodological contributions. For instance, in chapter 3, I compare additive and interactive models to examine whether the LMD of those with disabilities can better explain an intersectional approach. Indeed, results from this chapter indicate that interactive models reveal certain aspects of the association between employment, disability, and other status-based characteristics, which additive models cannot capture. Chapter 5 also makes a substantial methodological contribution by applying the Sullivan-based Life Table method—typically used to estimate the number of years that individuals can expect to live without disabilities—to examine how many years that people can expect to work with disabilities. In doing so, this is the first analysis of its kind to use the Sullivan method to determine the number of years that persons with disabilities spend in paid employment.

Finally, in terms of empirical contributions, this dissertation provides substantial evidence to indicate that not all people with disabilities experience the same risk of LMD. Indeed, the three results chapters of this dissertation point to how certain other status-based characteristics, including race/ethnicity, gender, and disability type and combination, work—both separately and together—to shape both employment probabilities and the amount of time

spent employed. In doing so, this dissertation strongly suggests that it is crucial to take other status-based characteristics into account when researching the labor market inequalities of those with disabilities.

# APPENDIX: TABLES AND FIGURES

**Table 2.1. State Policies and Characteristics**

| Category | Variable Name | Source |
|---|---|---|
| Labor market and economic environment | Unemployment rate | U.S Burden of Labor Statistics |
| | Percent not in labor force | Social Explorer--American Community Survey |
| Government Assistance | Percent receiving SSI | Social Security SSI Annual Statistical Report, 2017 (Report by Social Security Administration) |
| | Percent receiving SSDI | Social Security Annual Statistical Report on the Social Security Disability Insurance Program, 2017 (Report by Social Security Administration) |
| | State Medicaid Buy-In program | Kaiser Family Foundation |
| | State SSI Supplement | State Assistance Programs for SSI Recipients (Report by Social Security Administration) |
| Other | | |
| % Living in pre-ADA state | If the state had ADA-like laws prior to 1990 | Thompkins 2015 |

**Table 2.2. Descriptive Statistics by Disability Type, Race/Ethnicity, and Gender**

| | Disability n = 235,536 (12%) | | Hearing n = 44,141 (19%)[1] | | Vision n = 42,041 (18%)[1] | | Mobility n = 114,476 (49%)[1] | | Cognitive n = 105,910 (45%)[1] | | ADL n = 44,094 (19%)[1] | | IADL n = 88,114 (37%)[1] | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE |
| Female | 48% | 0.001 | 37% | 0.002 | 50% | 0.002 | 53% | 0.001 | 47% | 0.002 | 50% | 0.002 | 52% | 0.002 |
| *Race/ethnicity* | | | | | | | | | | | | | | |
| NH White | 70% | 0.001 | 77% | 0.002 | 65% | 0.002 | 69% | 0.001 | 69% | 0.001 | 67% | 0.002 | 70% | 0.002 |
| NH Black | 16% | 0.001 | 9% | 0.001 | 18% | 0.002 | 18% | 0.001 | 16% | 0.001 | 18% | 0.002 | 16% | 0.001 |
| Hispanic | 9% | 0.001 | 8% | 0.001 | 11% | 0.002 | 8% | 0.001 | 10% | 0.001 | 9% | 0.001 | 9% | 0.001 |
| Other | 5% | 0.000 | 6% | 0.001 | 6% | 0.001 | 5% | 0.001 | 6% | 0.001 | 5% | 0.001 | 5% | 0.001 |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.
NOTE: Weighted descriptive statistics presented as percentages and standard errors unless otherwise specified.
[1] The percentage of persons who reported a specific type of disability, among the N=235,536 persons who reported at least one disability

**Table 3.1: Descriptive Statistics by Disability Status**

| | Disability n = 235,536 (12%) | | No Disability n = 1,660,093 (88%) | |
|---|---|---|---|---|
| | Estimate | SE | Estimate | SE |
| Employment | 35.1% | 0.001 | 81.0% | 0.0003 |
| Female | 48.4% | 0.001 | 50.7% | 0.0004 |
| *Race/ethnicity* | | | | |
| NH White | 70.2% | 0.001 | 75.8% | 0.0003 |
| NH Black | 15.6% | 0.001 | 10.1% | 0.0002 |
| Hispanic | 9.0% | 0.001 | 9.3% | 0.0002 |
| Other | 5.3% | 0.000 | 4.8% | 0.0002 |
| **Individual-level characteristics** | | | | |
| Age in years (average) | 47.67 | 0.022 | 43.31 | 0.0085 |
| Education in years (average) | 15.9 | 0.008 | 17.9 | 0.0022 |
| Married | 39.3% | 0.001 | 59.7% | 0.0004 |
| **Policy variables** | | | | |
| SSI | 19.1% | 0.001 | 1.2% | 0.0001 |
| SSDI | 22.5% | 0.001 | 1.7% | 0.0001 |
| Public assistance income | 4.9% | 0.000 | 1.2% | 0.0001 |
| Survivor benefits or disability pensions | 9.3% | 0.001 | 3.4% | 0.0001 |
| **State-level policies/characteristics** | | | | |
| Percent of adults unemployed | 3.6% | 0.001 | 3.6% | 0.0004 |
| Percent of adults not in labor force | 25.7% | 0.007 | 25.2% | 0.0024 |
| Percent of adults receiving SSI | 23.7% | 0.010 | 23.6% | 0.0000 |
| Percent of adults receiving SSDI | 45.4% | 0.003 | 44.9% | 0.0049 |
| State offers a Medicaid Buy-In | 82.9% | 0.013 | 85.2% | 0.0003 |
| State offers an SSI supplement | 90.6% | 0.001 | 92.7% | 0.0002 |
| % Living in pre-ADA state | 92.8% | 0.001 | 95.0% | 0.0002 |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.
NOTE: Weighted descriptive statistics presented as percentages and standard errors unless otherwise specified.

**TABLE 3.2: Results from Logistic Models Predicting Employment**

| | Model 1 | | Model 2 | | Model 5 | | Model 4 | | Model 5 | |
|---|---|---|---|---|---|---|---|---|---|---|
| | b | SE | b | SE | b | SE | b | SE | b | SE |
| Disability | -2.028*** | 0.009 | -2.273*** | 0.015 | -2.059*** | 0.016 | -1.467*** | 0.018 | -1.458*** | 0.018 |
| Female | -.441*** | 0.007 | -.699*** | 0.008 | -.809*** | 0.008 | -.843*** | 0.009 | -.844*** | 0.009 |
| Race/Ethnicity | | | | | | | | | | |
| Non-Hispanic Black | -.478*** | 0.008 | -.987*** | 0.012 | -.788*** | 0.013 | -.783*** | 0.014 | -.746*** | 0.014 |
| Hispanic | -.260*** | 0.012 | -.355*** | 0.019 | -.110*** | 0.021 | -.154*** | 0.021 | -.084*** | 0.021 |
| Non-Hispanic Other | -.222*** | 0.014 | -.465*** | 0.025 | -.470*** | 0.025 | -.501*** | 0.024 | -.455*** | 0.024 |
| **Interaction Terms** | | | | | | | | | | |
| Disability*Female | | | .452*** | 0.019 | .470*** | 0.019 | .467*** | 0.021 | .467*** | 0.021 |
| Disability*Non-Hispanic Black | | | .157*** | 0.028 | .088** | 0.029 | 0.04 | 0.030 | 0.032 | 0.030 |
| Disability*Hispanic | | | 0.063 | 0.041 | -0.068 | 0.043 | -0.077 | 0.048 | -0.09 | 0.048 |
| Disability*Non-Hispanic Other | | | .204*** | 0.051 | .196*** | 0.051 | .111* | 0.056 | 0.094 | 0.056 |
| Non-Hispanic Black*Female | | | .934*** | 0.020 | .944*** | 0.020 | 1.050*** | 0.021 | 1.053*** | 0.021 |
| Hispanic*Female | | | .138*** | 0.021 | .122*** | 0.024 | .182*** | 0.025 | .184*** | 0.025 |
| Non-Hispanic Other*Female | | | .370*** | 0.031 | .391*** | 0.032 | .434*** | 0.033 | .437*** | 0.033 |
| Disability*Non-Hispanic Black*Female | | | -.372*** | 0.043 | -.392*** | 0.043 | -.294*** | 0.050 | -.297*** | 0.050 |
| Disability*Hispanic*Female | | | 0.066 | 0.063 | 0.104 | 0.065 | 0.105 | 0.073 | 0.094 | 0.074 |
| Disability*Non-Hispanic Other*Female | | | -0.033 | 0.068 | -0.032 | 0.071 | 0.026 | 0.072 | 0.029 | 0.073 |
| **Individual Characteristics** | | | | | | | | | | |
| Age | -.012*** | 0.0003 | -.013*** | 0.000 | -.013*** | 0.000 | -.001*** | 0.000 | -.002*** | 0.000 |
| Education | | | | | .155*** | 0.001 | .143*** | 0.001 | .142*** | 0.001 |
| Marital status | | | | | .251*** | 0.006 | .094*** | 0.006 | .091*** | 0.006 |
| **Government Assistances** | | | | | | | | | | |
| SSI | | | | | | | -2.461*** | 0.023 | -2.471*** | 0.023 |
| SSDI | | | | | | | -2.472*** | 0.021 | -2.478*** | 0.021 |
| Public assistance income | | | | | | | -1.251*** | 0.033 | -1.261*** | 0.033 |
| Survivor benefits or disability pensions | | | | | | | -1.506*** | 0.017 | -1.498*** | 0.017 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| State | | | | | | | | | .001*** | 0.000 |
| **State-level policies/characteristics** | | | | | | | | | | |
| State unemployment | | | | | | | | | -0.078*** | 0.010 |
| State Not in labor force | | | | | | | | | -0.037*** | 0.002 |
| % SSI | | | | | | | | | -0.001 | 0.001 |
| % SSDI | | | | | | | | | 0.008*** | 0.001 |
| Medicaid Buy-In | | | | | | | | | 0.04*** | 0.010 |
| State SSI supplement | | | | | | | | | -0.04** | 0.013 |
| ADA | | | | | | | | | -0.05** | 0.019 |
| Intercept | 2.364*** | 0.014 | 2.524*** | 0.015 | -.287*** | 0.027 | -.304*** | 0.028 | 0.64*** | 0.064 |
| | | | ✅ | | ✅ | | ✅ | | ✅ | |
| AIC | 1902381 | | 1882215 | | 1803074 | | 1670701 | | 1665565 | |
| BIC | 1902431 | | 1882414 | | 1803310 | | 1670988 | | 1665546 | |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.

NOTES:

a Results from logistic models predicting the probability of employment from disability status. Model 1 is the additive model, which tests for the main effects of race/ethnicity and gender on disability. Model 2 adds the two and three-way interaction terms for race/ethnicity, gender, and disability status. Model 3 accounts for education and marital status. Model 4 adds receipt of government assistance. Model 5 includes various state policies/characteristics.

b AIC (Akaike information criterion) and BIC (Bayesian information criterion) determines model of best fit. Smaller values for the models that include the race/ethnicity gender disability interaction terms (indicated by a checkmark) compared to models that include only main effects of race/ethnicity, gender, and disability indicate that the interaction model is a better fit to the data.

c*p < .05; **p < .01; ***p < .001

**Table 3.3. Average Marginal Probabilities of Employment**

| | Model 1 | Model 2 | Model 3 | Model 4 | Model 5 |
|---|---|---|---|---|---|
| Additive Effects | | | | | |
| Disability | | | | | |
| Gender | | | | | |
| Women | 0.31 | -- | -- | -- | -- |
| Men | 0.41 | -- | -- | -- | -- |
| Race/Ethnicity | | -- | -- | -- | |
| Non-Hispanic white | 0.389 | | | | -- |
| Non-Hispanic Black | 0.284 | -- | -- | -- | -- |
| Hispanic | 0.33 | -- | -- | -- | -- |
| Non-Hispanic other | 0.338 | -- | -- | -- | -- |
| No Disability | | | | | |
| Gender | | | | | |
| Women | 0.848 | -- | -- | -- | -- |
| Men | 0.783 | -- | -- | -- | -- |
| Race/Ethnicity | | -- | -- | -- | -- |
| Non-Hispanic white | 0.831 | | | | |
| Non-Hispanic Black | 0.755 | -- | -- | -- | -- |
| Hispanic | 0.792 | -- | -- | -- | -- |
| Non-Hispanic other | 0.798 | -- | -- | -- | -- |
| Interaction Effects | | | | | |
| Disability | | | | | |
| Non-Hispanic White Women | -- | 0.370 | 0.412 | 0.544 | 0.543 |
| Non-Hispanic Black Women | -- | 0.311 | 0.379 | 0.547 | 0.552 |
| Hispanic Women | -- | 0.350 | 0.423 | 0.556 | 0.566 |
| Non-Hispanic Other Women | -- | 0.388 | 0.432 | 0.559 | 0.566 |
| Non-Hispanic White Men | -- | 0.429 | 0.492 | 0.623 | 0.623 |
| Non-Hispanic Black Men | -- | 0.248 | 0.332 | 0.463 | 0.469 |
| Hispanic Men | -- | 0.360 | 0.450 | 0.575 | 0.587 |
| Non-Hispanic Other Men | -- | 0.367 | 0.427 | 0.541 | 0.547 |
| No Disability | | | | | |
| Non-Hispanic White Women | -- | 0.783 | 0.759 | 0.737 | 0.734 |
| Non-Hispanic Black Women | -- | 0.774 | 0.785 | 0.777 | 0.780 |
| Hispanic Women | -- | 0.744 | 0.761 | 0.741 | 0.750 |
| Non-Hispanic Other Women | -- | 0.766 | 0.745 | 0.726 | 0.731 |
| Non-Hispanic White Men | -- | 0.879 | 0.872 | 0.846 | 0.844 |
| Non-Hispanic Black Men | -- | 0.730 | 0.763 | 0.746 | 0.749 |
| Hispanic Men | -- | 0.836 | 0.859 | 0.830 | 0.835 |
| Non-Hispanic Other Men | -- | 0.820 | 0.813 | 0.787 | 0.791 |

SOURCE: 2017 American Community Survey (ACS), adults aged 25—61, N = 1,895,629.

NOTES:
[a] This table contains predicted probabilities, which predicts the odds of employment if the entire population fell into the specific race/ethnicity-gender-disability category. These predicted probabilities were calculated from the three-way interactions between race/ethnicity, gender, and disability (see Table 2).

**TABLE 3.4. Results from Logistic Models Predicting Employment with State Fixed Effects**

| | Model 5b | |
|---|---|---|
| | b | SE |
| Disability | -1.461*** | 0.02 |
| Female | -.845*** | 0.01 |
| Race/Ethnicity | | |
| Non-Hispanic Black | -.750*** | 0.01 |
| Hispanic | -.070** | 0.02 |
| Non-Hispanic Other | -.465*** | 0.02 |
| **Interaction Terms** | | |
| Disability*Female | .467*** | 0.02 |
| Disability*Non-Hispanic Black | 0.032 | 0.03 |
| Disability*Hispanic | -0.087 | 0.05 |
| Disability*Non-Hispanic Other | 0.096 | 0.06 |
| Non-Hispanic Black*Female | 1.052*** | 0.02 |
| Hispanic*Female | .184*** | 0.02 |
| Non-Hispanic Other*Female | .439*** | 0.03 |
| Disability*Non-Hispanic Black*Female | -.298*** | 0.05 |
| Disability*Hispanic*Female | 0.091 | 0.07 |
| Disability*Non-Hispanic Other*Female | 0.023 | 0.07 |
| **Individual Characteristics** | | |
| Age | -.002*** | 0.00 |
| Education | .143*** | 0.00 |
| Marital status | .089*** | 0.01 |
| **Government Assistances** | | |
| SSI | -2.472*** | 0.02 |
| SSDI | -2.480*** | 0.02 |
| Public assistance income | -1.260*** | 0.03 |
| Survivor benefits or disability pensions | -1.500*** | 0.02 |
| State | | |
| **State-level policies/characteristics** | | |
| State unemployment | | |
| State Not in labor force | | |
| % SSI | | |
| % SSDI | | |
| Medicaid Buy-In | | |
| State SSI supplement | | |
| ADA | | |

| | | |
|---|---|---|
| State variables | | |
| Alabama | -.286*** | 0.07 |
| Alaska | -.239* | 0.10 |
| Arizona | -.280*** | 0.07 |
| Arkansas | -0.123 | 0.07 |
| California | -.243*** | 0.07 |
| Colorado | -0.068 | 0.07 |
| Connecticut | -0.008 | 0.08 |
| Delaware | -0.151 | 0.09 |
| Washington DC | 0.022 | 0.10 |
| Florida | -.229*** | 0.07 |
| Georgia | -.161* | 0.07 |
| Hawaii | 0.075 | 0.08 |
| Idaho | -.166* | 0.08 |
| Illinois | -0.096 | 0.07 |
| Indiana | 0.001 | 0.07 |
| Iowa | .341*** | 0.08 |
| Kansas | 0.124 | 0.07 |
| Kentucky | -.191** | 0.07 |
| Louisiana | -.212** | 0.07 |
| Maine | 0.11 | 0.08 |
| Maryland | .161* | 0.07 |
| Massachusetts | 0.097 | 0.07 |
| Michigan | -0.12 | 0.07 |
| Minnesota | .328*** | 0.07 |
| Mississippi | -.255*** | 0.07 |
| Missouri | 0.034 | 0.07 |
| Montana | 0.05 | 0.09 |
| Nebraska | .412*** | 0.08 |
| Nevada | -.148* | 0.07 |
| New Hampshire | .265** | 0.08 |
| New Jersey | -0.021 | 0.07 |
| New Mexico | -.394*** | 0.08 |
| New York | -0.099 | 0.07 |
| North Carolina | -0.072 | 0.07 |
| North Dakota | .258** | 0.09 |
| Ohio | 0.045 | 0.07 |
| Oklahoma | -.193* | 0.08 |
| Oregon | -.172* | 0.07 |
| Pennsylvania | -0.003 | 0.07 |
| Rhode Island | .151* | 0.08 |
| South Carolina | -0.096 | 0.07 |
| South Dakota | .323** | 0.11 |
| Tennessee | -0.072 | 0.07 |

| | | |
|---|---|---|
| Texas | -.160* | 0.07 |
| Utah | -0.14 | 0.08 |
| Vermont | .197* | 0.09 |
| Virginia | 0.045 | 0.07 |
| Washington | -0.111 | 0.07 |
| West Virginia | -.426*** | 0.07 |
| Wisconsin | .286*** | 0.07 |
| Wyoming | -- | -- |
| Intercept | -.203** | 0.06 |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.

NOTES:

a Results from logistic models predicting the probability of employment from disability status, two and three-way interaction terms for race/ethnicity, gender, and disability status, education, marital status, government assistance, and state dummy variables.

b *p < .05; **p < .01; ***p < .001

**TABLE 3.5. Results from Logistic Models Predicting Employment Clustered by State**

| | Model 1b | | Model 2b | | Model 3b | | Model 4b | | Model 5b | | Model 6b | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Disability | -2.033*** | 0.024 | -2.309*** | 0.028 | -2.070*** | 0.027 | -1.502*** | 0.027 | -1.493*** | 0.026 | -1.496*** | 0.026 |
| Female | -.383*** | 0.019 | -.668*** | 0.026 | -.782*** | 0.028 | -.819*** | 0.030 | -.821*** | 0.029 | -.821*** | 0.029 |
| Race/Ethnicity | | | | | | | | | | | | |
| Non-Hispanic Black | -.620*** | 0.045 | -1.254*** | 0.046 | -1.020*** | 0.046 | -1.041*** | 0.050 | -1.003*** | 0.047 | -1.012*** | 0.047 |
| Hispanic | -.308*** | 0.040 | -.514*** | 0.054 | -.275*** | 0.045 | -.320*** | 0.047 | -.231*** | 0.043 | -.218*** | 0.042 |
| Non-Hispanic Other | -.320*** | 0.087 | -.614*** | 0.117 | -.589*** | 0.095 | -.627*** | 0.098 | -.553*** | 0.095 | -.560*** | 0.100 |
| **Interaction Terms** | | | | | | | | | | | | |
| Disability*Female | | | .472*** | 0.021 | .485*** | 0.023 | .487*** | 0.025 | .488*** | 0.025 | .489*** | 0.025 |
| Disability*Non-Hispanic Black | | | .303*** | 0.036 | .230*** | 0.036 | .135** | 0.041 | .124** | 0.044 | .126** | 0.044 |
| Disability*Hispanic | | | .187*** | 0.039 | .063 | 0.037 | -.032 | 0.040 | -0.051 | 0.039 | -0.049 | 0.039 |
| Disability*Non-Hispanic Other | | | .309*** | 0.069 | .292*** | 0.060 | .182** | 0.058 | .162** | 0.060 | .164** | 0.061 |
| Non-Hispanic Black*Female | | | 1.184*** | 0.029 | 1.185*** | 0.028 | 1.327*** | 0.028 | 1.333*** | 0.028 | 1.331*** | 0.028 |
| Hispanic*Female | | | .315*** | 0.035 | .297*** | 0.037 | .365*** | 0.046 | .365*** | 0.046 | .365*** | 0.046 |
| Non-Hispanic Other*Female | | | .461*** | 0.051 | .482*** | 0.050 | .534*** | 0.054 | .535*** | 0.053 | .537*** | 0.054 |
| Disability*Non-Hispanic Black*Female | | | -.518*** | 0.047 | -.537*** | 0.049 | -.425*** | 0.049 | -.426*** | 0.050 | -.426*** | 0.050 |
| Disability*Hispanic*Female | | | -0.034 | 0.039 | .006 | 0.040 | .061 | 0.039 | 0.054 | 0.039 | 0.052 | 0.039 |
| Disability*Non-Hispanic Other*Female | | | -.194** | 0.060 | -.194** | 0.062 | -.103 | 0.068 | -0.105 | 0.068 | -0.109 | 0.068 |
| **Individual Characteristics** | | | | | | | | | | | | |
| Age | -.011*** | 0.001 | -.011*** | 0.001 | -.012*** | 0.001 | -.001 | 0.001 | -0.001 | 0.001 | -0.001 | 0.001 |
| Education | | | 2.449*** | 0.048 | .154*** | 0.003 | .144*** | 0.003 | .143*** | 0.002 | .144*** | 0.003 |
| Marital status | | | | | .304*** | 0.012 | .151*** | 0.013 | .148*** | 0.012 | .146*** | 0.012 |
| **Government Assistances** | | | | | | | | | | | | |
| Supplementary Security Income (SSI) | | | | | | | -2.355*** | 0.052 | -2.364*** | 0.053 | -2.363*** | 0.054 |
| Social Security income | | | | | | | -2.361*** | 0.047 | -2.371*** | 0.044 | -2.373*** | 0.044 |
| Public assistance income | | | | | | | -1.159*** | 0.099 | -1.168*** | 0.093 | -1.167*** | 0.092 |
| Retirement income | | | | | | | -1.445*** | 0.036 | -1.438*** | 0.034 | -1.439*** | 0.034 |
| State | | | | | | | | | .001* | 0.001 | | |

| | | | | |
|---|---|---|---|---|
| **State-level policies/characteristics** | | | | |
| State unemployment | -.061** | 0.022 | | |
| State Not in labor force | -.040*** | 0.004 | | |
| % SSI | 0.001 | 0.002 | | |
| % SSDI | .010*** | 0.002 | | |
| Medicaid Buy-In | 0.039 | 0.023 | | |
| State SSI supplement | -0.01 | 0.021 | | |
| ADA | -.088** | 0.032 | | |
| State variables | | | | |
| Alabama | | | -.197*** | 0.009 |
| Alaska | | | -.349*** | 0.027 |
| Arizona | | | -.298*** | 0.009 |
| Arkansas | | | -.081*** | 0.005 |
| California | | | -.198*** | 0.011 |
| Colorado | | | -.027*** | 0.003 |
| Connecticut | | | .083*** | 0.006 |
| Delaware | | | 0.007 | 0.009 |
| Washington DC | | | .175*** | 0.017 |
| Florida | | | -.157*** | 0.007 |
| Georgia | | | -.102*** | 0.012 |
| Hawaii | | | .128** | 0.045 |
| Idaho | | | -.053*** | 0.002 |
| Illinois | | | .019** | 0.006 |
| Indiana | | | .100*** | 0.004 |
| Iowa | | | .414*** | 0.005 |
| Kansas | | | .158*** | 0.002 |
| Kentucky | | | -.148*** | 0.005 |
| Louisiana | | | -.116*** | 0.011 |
| Maine | | | .087*** | 0.004 |
| Maryland | | | .242*** | 0.012 |
| Massachusetts | | | .152*** | 0.002 |
| Michigan | | | -.040*** | 0.005 |
| Minnesota | | | .377*** | 0.003 |
| Mississippi | | | -.128*** | 0.015 |
| Missouri | | | .070*** | 0.004 |
| Montana | | | -0.004 | 0.003 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Nebraska | | | | | | | | | | | .464*** | 0.003 |
| Nevada | | | | | | | | | | | -.073*** | 0.007 |
| New Hampshire | | | | | | | | | | | .320*** | 0.005 |
| New Jersey | | | | | | | | | | | .057*** | 0.006 |
| New Mexico | | | | | | | | | | | -.319*** | 0.021 |
| New York | | | | | | | | | | | .021*** | 0.005 |
| North Carolina | | | | | | | | | | | -0.001 | 0.008 |
| North Dakota | | | | | | | | | | | .230*** | 0.002 |
| Ohio | | | | | | | | | | | .091*** | 0.005 |
| Oklahoma | | | | | | | | | | | -.150*** | 0.010 |
| Oregon | | | | | | | | | | | -.116*** | 0.001 |
| Pennsylvania | | | | | | | | | | | .116*** | 0.005 |
| Rhode Island | | | | | | | | | | | .203*** | 0.003 |
| South Carolina | | | | | | | | | | | -0.013 | 0.010 |
| South Dakota | | | | | | | | | | | .328*** | 0.005 |
| Tennessee | | | | | | | | | | | -.041*** | 0.006 |
| Texas | | | | | | | | | | | -.106*** | 0.009 |
| Utah | | | | | | | | | | | -.149*** | 0.003 |
| Vermont | | | | | | | | | | | .209*** | 0.005 |
| Virginia | | | | | | | | | | | .075*** | 0.008 |
| Washington | | | | | | | | | | | -.093*** | 0.003 |
| West Virginia | | | | | | | | | | | -.306*** | 0.005 |
| Wisconsin | | | | | | | | | | | .322*** | 0.004 |
| Wyoming | | | | | | | | | | | -- | -- |
| Intercept | 2.268*** | 0.0491 | 2.449*** | 0.048 | -.386*** | 0.065 | -.429*** | 0.068 | .366* | 0.181 | -.409*** | 0.057 |

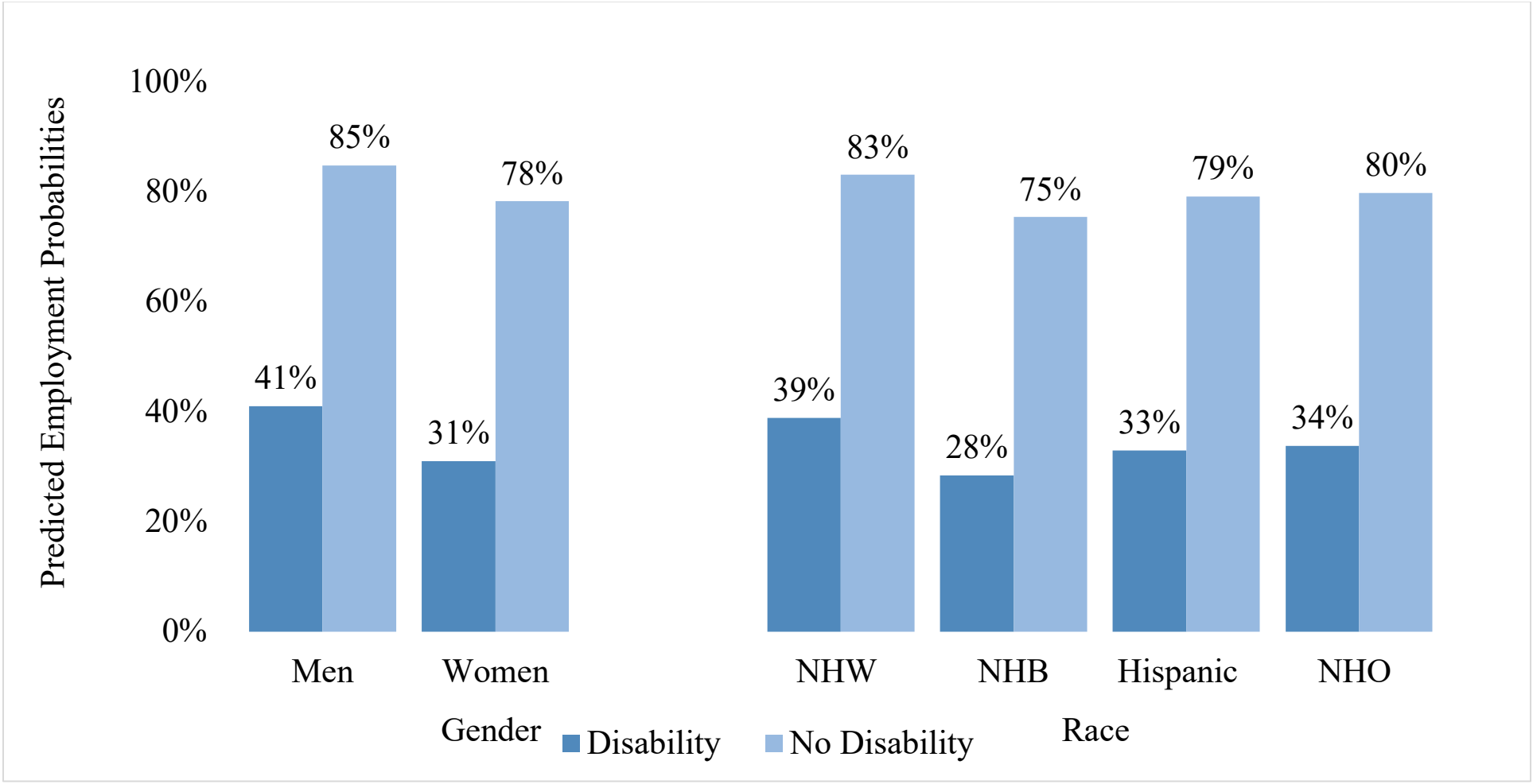
SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.

NOTES:

a Results from logistic models predicting the probability of employment from disability status. Model 1b is the additive model, which tests for the main effects of race/ethnicity and gender on disability. Model 2b adds the two and three-way interaction terms for race/ethnicity, gender, and disability status. Model 3b accounts for education and marital status. Model 4b adds receipt of government assistance. Model 5b includes various state policies/characteristics. Model 6b adds state dummy variables.

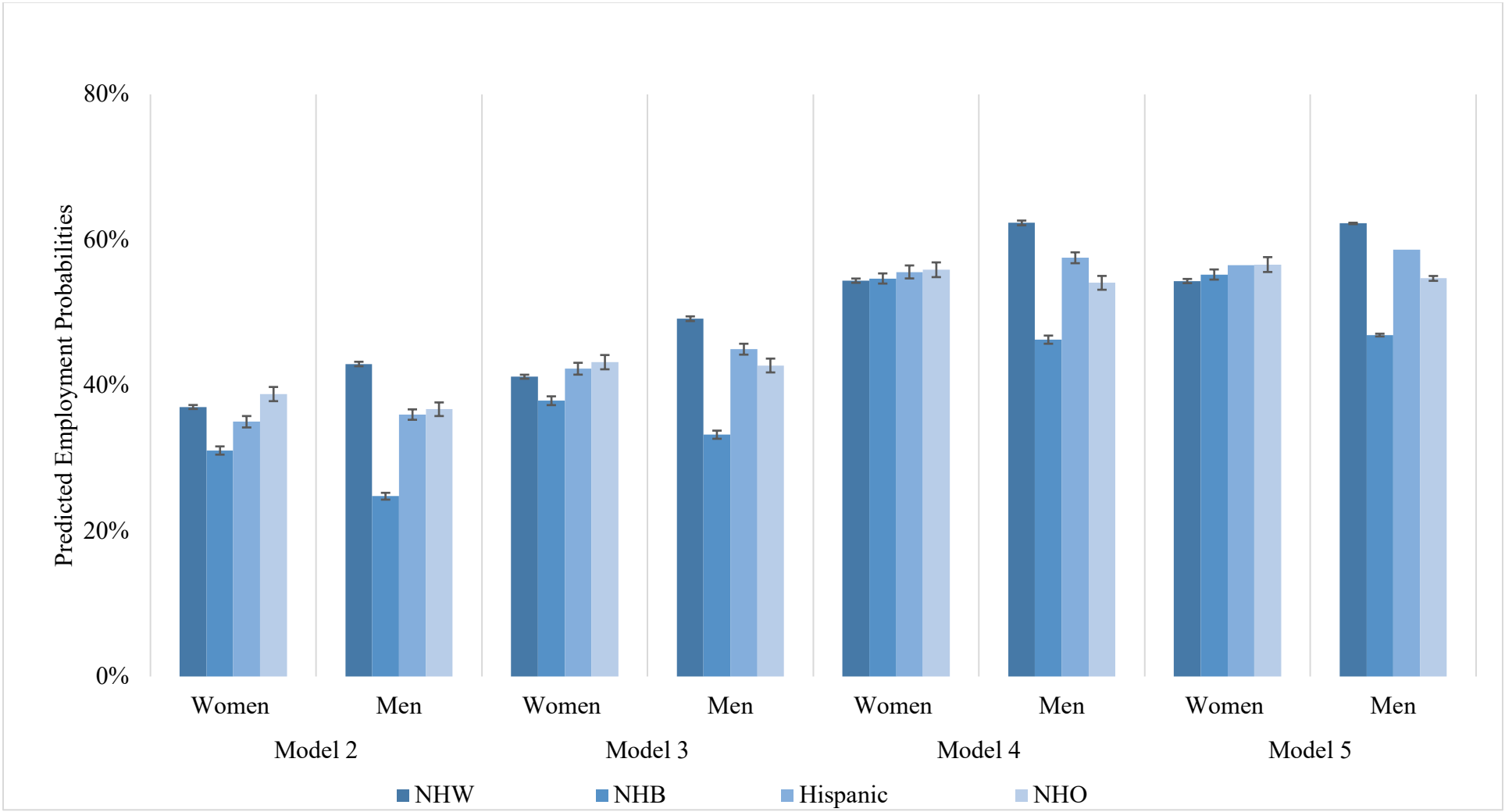
c*p < .05; **p < .01; ***p < .001

**Figure 3.1. Employment Probabilities by Gender and Race (Model 1)**




SOURCE: 2017 American Community Survey (ACS), adults aged 25—61, N = 1,895,629.
NOTES:
[a] Predicted probabilities of employment by gender and race/ethnicity.

**Figure 3.2. Predicted Employment Probabilities for People with Disabilities by Race/Ethnicity-Gender Group (Models 2--5)**




SOURCE: 2017 American Community Survey (ACS), adults aged 25—61, N = 1,895,629.
NOTES: [a] Predicted probabilities of employment for people with disabilities by race/ethnicity-gender Group. Model 2 controls for age. Model 3 accounts for individual characteristics, Model 4 for receipt of SSI/SSDI, and Model 5 for state characteristics.

**Table 4.1. Descriptive Statistics by Limitations Type**

| | Limitations n = 235,536 (12%) | | Hearing n = 44,141 (19%) | | Vision n = 42,041 (18%) | | Mobility n = 114,476 (49%) | | Cognitive n = 105,910 (45%) | | ADL n = 44,094 (19%) | | IADL n = 88,114 (37%) | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE | Estimate | SE |
| Employment | 35% | 0.001 | 54% | 0.002 | 42% | 0.002 | 24% | 0.001 | 24% | 0.001 | 15% | 0.002 | 17% | 0.001 |
| *Race/Ethnicity* | | | | | | | | | | | | | | |
| NH White | 70% | 0.001 | 77% | 0.002 | 65% | 0.002 | 69% | 0.001 | 69% | 0.001 | 67% | 0.002 | 70% | 0.002 |
| NH Black | 16% | 0.001 | 9% | 0.001 | 18% | 0.002 | 18% | 0.001 | 16% | 0.001 | 18% | 0.002 | 16% | 0.001 |
| Hispanic | 9% | 0.001 | 8% | 0.001 | 11% | 0.002 | 8% | 0.001 | 10% | 0.001 | 9% | 0.001 | 9% | 0.001 |
| Other | 5% | 0.000 | 6% | 0.001 | 6% | 0.001 | 5% | 0.001 | 6% | 0.001 | 5% | 0.001 | 5% | 0.001 |
| Female | 48% | 0.001 | 37% | 0.002 | 50% | 0.002 | 53% | 0.001 | 47% | 0.002 | 50% | 0.002 | 52% | 0.002 |
| **Individual-level characteristics** | | | | | | | | | | | | | | |
| Age (average) | 48 | 0.022 | 50 | 0.048 | 48 | 0.051 | 51 | 0.026 | 45 | 0.034 | 49 | 0.047 | 47 | 0.036 |
| Education (average) | 16 | 0.008 | 16 | 0.018 | 16 | 0.019 | 16 | 0.011 | 15 | 0.013 | 15 | 0.023 | 15 | 0.015 |
| Married | 39% | 0.001 | 51% | 0.002 | 40% | 0.002 | 40% | 0.001 | 28% | 0.001 | 33% | 0.002 | 32% | 0.002 |
| **Policy variables** | | | | | | | | | | | | | | |
| SSI | 19% | 0.001 | 12% | 0.002 | 16% | 0.002 | 22% | 0.001 | 25% | 0.001 | 30% | 0.002 | 29% | 0.002 |
| SSDI | 22% | 0.001 | 15% | 0.002 | 18% | 0.002 | 30% | 0.001 | 26% | 0.001 | 36% | 0.002 | 33% | 0.002 |
| Public assistance income | 5% | 0.000 | 3% | 0.001 | 4% | 0.001 | 5% | 0.001 | 7% | 0.001 | 6% | 0.001 | 6% | 0.001 |
| Survivor benefits or disability pensions | 9% | 0.001 | 10% | 0.001 | 7% | 0.001 | 12% | 0.001 | 8% | 0.001 | 11% | 0.002 | 10% | 0.096 |
| **State-level policies/characteristics** | | | | | | | | | | | | | | |
| State unemployment | 4% | 0.001 | 4% | 0.003 | 4% | 0.002 | 4% | 0.001 | 4% | 0.001 | 4% | 0.002 | 4% | 0.002 |
| State Not in labor force | 26% | 0.007 | 26% | 0.015 | 26% | 0.016 | 26% | 0.009 | 26% | 0.010 | 26% | 0.015 | 26% | 0.011 |
| % SSI | 24% | 0.010 | 23% | 0.020 | 24% | 0.020 | 24% | 0.010 | 24% | 0.010 | 24% | 0.020 | 24% | 0.010 |
| % SSDI | 45% | 0.003 | 45% | 0.030 | 45% | 0.030 | 46% | 0.018 | 45% | 0.019 | 46% | 0.029 | 46% | 0.021 |
| Medicaid Buy-Is | 83% | 0.013 | 83% | 0.002 | 82% | 0.002 | 82% | 0.001 | 83% | 0.001 | 83% | 0.002 | 83% | 0.001 |
| State SSI supplement | 91% | 0.001 | 91% | 0.001 | 89% | 0.001 | 90% | 0.001 | 91% | 0.001 | 90% | 0.001 | 91% | 0.001 |
| % Living in pre-ADA state | 93% | 0.001 | 93% | 0.001 | 92% | 0.001 | 92% | 0.001 | 93% | 0.001 | 92% | 0.001 | 93% | 0.001 |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.
NOTE: Weighted descriptive statistics presented as percentages and standard errors unless otherwise specified.

**Table 4.2. Number Percentage of People by Limitation Combination**

| Limitation Combination | % of People with Limitations[1] | Number of Individuals |
|---|---|---|
| **One Type of Limitation** | | |
| Hearing | 10.07% | 23,714 |
| Vision | 7.50% | 17,662 |
| Mobility | 16.38% | 38,581 |
| Cognitive | 14.09% | 33,177 |
| ADL | 0.57% | 1,337 |
| IADL | 3.85% | 9,075 |
| **Two Types of Limitations** | | |
| Hearing Vision | 0.89% | 2,093 |
| Hearing Mobility | 1.18% | 2,772 |
| Hearing Cognitive | 1.10% | 2,580 |
| Hearing ADL | 0.04% | 85 |
| Hearing IADL | 0.16% | 377 |
| Vision Mobility | 1.12% | 2,644 |
| Vision Cognitive | 1.02% | 2,410 |
| Vision ADL | 0.04% | 85 |
| Vision IADL | 0.51% | 1,205 |
| Mobility Cognitive | 3.40% | 8,003 |
| Mobility ADL | 1.76% | 4,157 |
| Mobility IADL | 4.00% | 9,420 |
| Cognitive ADL | 0.15% | 350 |
| Cognitive IADL | 7.56% | 17,816 |
| ADL IADL | 0.31% | 726 |
| **Three Types of Limitations** | | |
| Hearing Vision Mobility | 0.28% | 661 |
| Hearing Vision Cognitive | 0.32% | 758 |
| Hearing Vision ADL | 0.01% | 24 |
| Hearing Vision IADL | 0.06% | 143 |
| Hearing Mobility Cognitive | 0.53% | 1250 |
| Hearing Mobility ADL | 0.14% | 322 |
| Hearing Mobility IADL | 0.25% | 584 |
| Hearing Cognitive ADL | 0.02% | 54 |
| Hearing Cognitive IADL | 0.51% | 1207 |
| Hearing ADL IADL | 0.01% | 32 |
| Vision Mobility Cognitive | 0.61% | 1425 |
| Vision Mobility ADL | 0.14% | 323 |
| Vision Mobility IADL | 0.44% | 1041 |
| Vision Cognitive ADL | 0.03% | 67 |
| Vision Cognitive ADL | 0.57% | 1353 |
| Vision ADL IADL | 0.03% | 65 |
| Mobility Cognitive ADL | 0.62% | 1462 |

| | | |
|---|---|---|
| Mobility Cognitive IADL | 3.06% | 7212 |
| Mobility ADL IADL | 4.37% | 10295 |
| Cognitive ADL IADL | 1.50% | 3541 |
| **Four Types of Limitations** | | |
| Hearing Vision Mobility Cognitive | 0.30% | 717 |
| Hearing Vision Mobility ADL | 0.04% | 86 |
| Hearing Vision Mobility IADL | 0.10% | 233 |
| Hearing Vision Cognitive ADL | 0.01% | 22 |
| Hearing Vision Cognitive IADL | 0.15% | 357 |
| Hearing Vision ADL IADL | 0.01% | 13 |
| Hearing Mobility Cognitive ADL | 0.08% | 184 |
| Hearing Mobility Cognitive IADL | 0.41% | 970 |
| Hearing Mobility ADL IADL | 0.24% | 558 |
| Hearing Cognitive ADL IADL | 0.11% | 268 |
| Vision Mobility Cognitive ADL | 0.12% | 271 |
| Vision Mobility Cognitive IADL | 0.58% | 1,355 |
| Vision Mobility ADL IADL | 0.46% | 1,088 |
| Vision Cognitive ADL IADL | 0.15% | 357 |
| Cognitive Mobility ADL IADL | 5.15% | 12120 |
| **Five Types of Limitations** | | |
| Hearing Vision Mobility Cognitive ADL | 0.06% | 146 |
| Hearing Vision Mobility Cognitive IADL | 0.27% | 647 |
| Hearing Vision Mobility ADL IADL | 0.10% | 225 |
| Hearing Vision ADL Cognitive ADL | 0.05% | 107 |
| Hearing ADL Mobility Cognitive IADL | 0.54% | 1266 |
| ADL Vision Mobility Cognitive IADL | 1.18% | 2772 |
| **Six Types of Limitations** | | |
| Hearing Vision Mobility Cognitive ADL IADL | 0.72% | 1,686 |

SOURCE: 2017 American Community Survey (ACS), adults with limitations age 25-61, N = 235,536.

NOTE: Weighted descriptive statistics presented as percentages and standard errors unless otherwise specified.

[1] Percentages were estimated from the sample of those who reported limitations.

**TABLE 4.3. Results from Logistic Regression Models Predicting Employment Status from Limitations Combinations, U.S. Adults 25-61 Years, 2017**

| | Model 1 | | Model 2 | | Model 3 | | Model 4 | |
|---|---|---|---|---|---|---|---|---|
| | b | SE | b | SE | b | SE | b | SE |
| **Limitations Combination (reference = no limitations)** | | | | | | | | |
| **One Type of Limitations** | | | | | | | | |
| Hearing | -.415*** | 0.023 | -.372*** | 0.024 | -.165*** | 0.026 | -.161*** | 0.026 |
| Vision | -.804*** | 0.025 | -.642*** | 0.026 | -.434*** | 0.027 | -.423*** | 0.027 |
| Mobility | -1.892*** | 0.018 | -1.627*** | 0.018 | -1.121*** | 0.022 | -1.113*** | 0.022 |
| Cognitive | -1.801*** | 0.020 | -1.666*** | 0.020 | -1.217*** | 0.022 | -1.223*** | 0.022 |
| ADL | -1.351*** | 0.093 | -1.215*** | 0.097 | -.833*** | 0.107 | -.842*** | 0.106 |
| IADL | -2.200*** | 0.037 | -1.991*** | 0.039 | -1.480*** | 0.046 | -1.487*** | 0.047 |
| **Two Types of Limitations** | | | | | | | | |
| Hearing Vision | -.996*** | 0.083 | -.840*** | 0.085 | -.547*** | 0.088 | -.537*** | 0.089 |
| Hearing Mobility | -1.805*** | 0.065 | -1.628*** | 0.066 | -1.019*** | 0.076 | -.999*** | 0.077 |
| Hearing Cognitive | -1.800*** | 0.068 | -1.689*** | 0.070 | -1.207*** | 0.076 | -1.201*** | 0.076 |
| Hearing ADL | -2.110*** | 0.439 | -2.064*** | 0.403 | -1.618*** | 0.397 | -1.667*** | 0.396 |
| Hearing IADL | -1.939*** | 0.178 | -1.617*** | 0.188 | -.737** | 0.247 | -.750** | 0.247 |
| Vision Mobility | -2.198*** | 0.070 | -1.799*** | 0.077 | -1.285*** | 0.084 | -1.263*** | 0.084 |
| Vision Cognitive | -1.967*** | 0.068 | -1.702*** | 0.073 | -1.328*** | 0.083 | -1.322*** | 0.083 |
| Vision ADL | -1.568*** | 0.395 | -1.233** | 0.385 | -0.734 | 0.501 | -0.688 | 0.510 |
| Vision IADL | -2.687*** | 0.112 | -2.521*** | 0.107 | -1.693*** | 0.128 | -1.704*** | 0.132 |
| Mobility Cognitive | -2.888*** | 0.046 | -2.593*** | 0.047 | -1.933*** | 0.053 | -1.929*** | 0.054 |
| Mobility ADL | -2.472*** | 0.064 | -2.250*** | 0.067 | -1.493*** | 0.067 | -1.485*** | 0.067 |
| Mobility IADL | -3.134*** | 0.048 | -2.862*** | 0.049 | -2.122*** | 0.055 | -2.116*** | 0.055 |
| Cognitive ADL | -2.483*** | 0.209 | -2.206*** | 0.229 | -1.473*** | 0.305 | -1.439*** | 0.306 |
| Cognitive IADL | -2.831*** | 0.029 | -2.585*** | 0.031 | -1.734*** | 0.041 | -1.742*** | 0.041 |
| ADL IADL | -2.704*** | 0.173 | -2.465*** | 0.192 | -1.768*** | 0.207 | -1.769*** | 0.208 |
| **Three Types of Limitations** | | | | | | | | |
| Hearing Vision Mobility | -2.566*** | 0.134 | -2.225*** | 0.140 | -1.657*** | 0.186 | -1.618*** | 0.188 |
| Hearing Vision Cognitive | -1.997*** | 0.139 | -1.684*** | 0.145 | -1.315*** | 0.166 | -1.293*** | 0.166 |
| Hearing Vision ADL | -1.684* | 0.755 | -1.352 | 0.784 | -0.977 | 0.677 | -1.015 | 0.724 |
| Hearing Vision IADL | -2.169*** | 0.297 | -1.912*** | 0.281 | -.913*** | 0.252 | -.891*** | 0.251 |
| Hearing Mobility Cognitive | -2.365*** | 0.115 | -2.141*** | 0.123 | -1.543*** | 0.140 | -1.534*** | 0.141 |
| Hearing Mobility ADL | -2.560*** | 0.236 | -2.423*** | 0.263 | -1.660*** | 0.272 | -1.621*** | 0.286 |
| Hearing Mobility IADL | -2.985*** | 0.179 | -2.751*** | 0.179 | -1.799*** | 0.235 | -1.779*** | 0.236 |
| Hearing Cognitive ADL | -2.358*** | 0.515 | -1.957*** | 0.505 | -1.322 | 0.738 | -1.382 | 0.711 |
| Hearing Cognitive IADL | -2.444*** | 0.117 | -2.193*** | 0.128 | -1.267*** | 0.183 | -1.266*** | 0.179 |
| Hearing ADL IADL | -3.509*** | 0.781 | -3.003*** | 0.694 | -1.976* | 0.915 | -1.981* | 0.900 |
| Vision Mobility Cognitive | -2.674*** | 0.098 | -2.273*** | 0.106 | -1.727*** | 0.129 | -1.698*** | 0.127 |
| Vision Mobility ADL | -2.783*** | 0.274 | -2.438*** | 0.270 | -1.470*** | 0.322 | -1.469*** | 0.307 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Vision Mobility IADL | -3.233*** | 0.138 | -2.855*** | 0.147 | -1.952*** | 0.148 | -1.953*** | 0.147 |
| Vision Cognitive ADL | -1.980*** | 0.423 | -1.371** | 0.457 | -0.327 | 0.479 | -0.329 | 0.479 |
| Vision Cognitive ADL | -3.088*** | 0.115 | -2.809*** | 0.120 | -2.050*** | 0.141 | -2.041*** | 0.142 |
| Vision ADL IADL | -2.332*** | 0.488 | -1.975*** | 0.500 | -0.884 | 0.456 | -.895* | 0.442 |
| Mobility Cognitive ADL | -2.992*** | 0.121 | -2.695*** | 0.123 | -1.898*** | 0.130 | -1.897*** | 0.131 |
| Mobility Cognitive IADL | -3.491*** | 0.074 | -3.215*** | 0.076 | -2.409*** | 0.088 | -2.404*** | 0.088 |
| Mobility ADL IADL | -3.331*** | 0.046 | -3.113*** | 0.049 | -2.310*** | 0.058 | -2.302*** | 0.059 |
| Cognitive ADL IADL | -3.298*** | 0.088 | -2.896*** | 0.095 | -1.650*** | 0.122 | -1.657*** | 0.120 |
| **Four Types of Limitations** | | | | | | | | |
| Hearing Vision Mobility Cognitive | -2.802*** | 0.153 | -2.501*** | 0.146 | -2.043*** | 0.166 | -2.012*** | 0.166 |
| Hearing Vision Mobility ADL | -2.323*** | 0.376 | -2.063*** | 0.407 | -1.268** | 0.471 | -1.228** | 0.474 |
| Hearing Vision Mobility IADL | -4.180*** | 0.296 | -3.918*** | 0.298 | -3.231*** | 0.376 | -3.169*** | 0.371 |
| Hearing Vision Cognitive ADL | -2.967*** | 0.897 | -2.593** | 0.908 | -1.377 | 0.877 | -1.297 | 0.905 |
| Hearing Vision Cognitive IADL | -2.970*** | 0.269 | -2.628*** | 0.274 | -1.889*** | 0.295 | -1.879*** | 0.296 |
| Hearing Vision ADL IADL | -1.931 | 1.016 | -1.574 | 0.973 | -1.392 | 1.093 | -1.413 | 1.070 |
| Hearing Mobility Cognitive ADL | -3.550*** | 0.349 | -3.247*** | 0.370 | -2.583*** | 0.433 | -2.547*** | 0.394 |
| Hearing Mobility Cognitive IADL | -3.226*** | 0.175 | -2.933*** | 0.182 | -2.113*** | 0.215 | -2.119*** | 0.213 |
| Hearing Mobility ADL IADL | -3.117*** | 0.217 | -2.939*** | 0.216 | -2.093*** | 0.244 | -2.093*** | 0.248 |
| Hearing Cognitive ADL IADL | -2.780*** | 0.260 | -2.474*** | 0.258 | -1.209** | 0.375 | -1.248*** | 0.373 |
| Vision Mobility Cognitive ADL | -2.967*** | 0.236 | -2.523*** | 0.266 | -1.666*** | 0.260 | -1.656*** | 0.262 |
| Vision Mobility Cognitive IADL | -3.464*** | 0.141 | -3.040*** | 0.145 | -2.207*** | 0.165 | -2.185*** | 0.165 |
| Vision Mobility ADL IADL | -3.812*** | 0.173 | -3.535*** | 0.173 | -2.698*** | 0.179 | -2.672*** | 0.184 |
| Vision Cognitive ADL IADL | -3.863*** | 0.324 | -3.500*** | 0.329 | -2.447*** | 0.422 | -2.468*** | 0.420 |
| Cognitive Mobility ADL IADL | -3.924*** | 0.057 | -3.598*** | 0.057 | -2.699*** | 0.061 | -2.698*** | 0.062 |
| **Five Types of Limitations** | | | | | | | | |
| Hearing Vision Hearing Vision Mobility Cognitive ADL | -2.898*** | 0.312 | -2.651*** | 0.316 | -2.226*** | 0.359 | -2.226*** | 0.366 |
| Hearing Vision Mobility Cognitive IADL | -3.246*** | 0.199 | -2.919*** | 0.212 | -2.341*** | 0.262 | -2.300*** | 0.259 |
| Hearing Vision Mobility ADL IADL | -3.477*** | 0.254 | -3.166*** | 0.258 | -2.381*** | 0.285 | -2.407*** | 0.281 |
| Hearing Vision ADL Cognitive ADL | -3.630*** | 0.519 | -3.159*** | 0.556 | -1.802* | 0.708 | -1.816** | 0.682 |
| Hearing ADL Mobility Cognitive IADL | -3.624*** | 0.176 | -3.301*** | 0.187 | -2.290*** | 0.219 | -2.281*** | 0.220 |
| ADL Vision Mobility Cognitive IADL | -4.013*** | 0.115 | -3.616*** | 0.116 | -2.748*** | 0.133 | -2.744*** | 0.134 |
| **Six Types of Limitations** | | | | | | | | |
| Hearing Vision Mobility Cognitive ADL IADL | -2.499*** | 0.098 | -2.161*** | 0.093 | -1.384*** | 0.104 | -1.366*** | 0.103 |
| **Individual Characteristics** | | | | | | | | |
| Age | | | -.012*** | 0.000 | -.001*** | 0.000 | -.002*** | 0.000 |
| Female | | | -.537*** | 0.007 | -.557*** | 0.008 | -.557*** | 0.008 |
| Non-Hispanic Black | | | -.283*** | 0.008 | -.220*** | 0.009 | -.193*** | 0.009 |
| Hispanic | | | -.006*** | 0.001 | -.007*** | 0.001 | -.003* | 0.001 |
| Non-Hispanic Other | | | -.214*** | 0.014 | -.230*** | 0.014 | -.194*** | 0.014 |
| Education | | | .152*** | 0.001 | .142*** | 0.001 | .140*** | 0.001 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Marital status | | | .206*** | 0.006 | -.068*** | 0.006 | .064*** | 0.006 |
| **Government Assistances** | | | | | | | | |
| SSI | | | | | -2.340*** | 0.024 | -2.349*** | 0.024 |
| SSDI | | | | | -2.350*** | 0.021 | -2.356*** | 0.021 |
| Public assistance income | | | | | -1.198*** | 0.034 | -1.205*** | 0.034 |
| Survivor benefits or disability pensions | | | | | -1.485*** | 0.016 | -1.477*** | 0.016 |
| State | | | | | | | .001*** | 0.000 |
| **State-level policies/characteristics** | | | | | | | | |
| State unemployment | | | | | | | -.078*** | 0.010 |
| State Not in labor force | | | | | | | -.037*** | 0.002 |
| % SSI | | | | | | | -0.001 | 0.001 |
| % SSDI | | | | | | | .008*** | 0.001 |
| Medicaid Buy-In | | | | | | | .039*** | 0.010 |
| State SSI supplement | | | | | | | -.040** | 0.013 |
| ADA | | | | | | | -.055** | 0.019 |
| Intercept | 1.486*** | 0.004 | .392*** | 0.025 | -.452*** | 0.026 | .516*** | 0.066 |
| AIC | 1875420 | | 1781096 | | 1668853 | | 1663181 | |
| BIC | 1876217 | | 1781980 | | 1669787 | | 1664215 | |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.
NOTES:
a Results from logistic models predicting the probability of employment from 63 combinations of limitation types. Model 1 only accounts for the 63 limitation combinations, Model 2 adds gender, race/ethnicity (non-Hispanic whites as ref), age, education, and marital status, Model 3 accounts for receipt of government assistance, and Model 4 includes various state policies/characteristics.
b AIC (Akaike information criterion) and BIC (Bayesian information criterion) determines model of best fit. Smaller values indicate
c*p < .05; **p < .01; ***p < .001

**Table 4.4. Probabilities of Employment by Limitation Combination**

| Limitation Combination | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| No Limitations | 81.5% | 80.8% | 78.6% | 78.5% |
| Hearing | 69.1% | 70.3% | 73.9% | 74.0% |
| Vision | 61.4% | 65.4% | 69.8% | 70.0% |
| Mobility | 37.0% | 45.2% | 57.4% | 57.6% |
| Cognitive | 39.0% | 44.3% | 55.4% | 55.4% |
| ADL | 48.9% | 53.6% | 62.7% | 62.6% |
| IADL | 30.0% | 37.0% | 49.6% | 49.6% |
| Hearing Vision | 57.0% | 61.5% | 67.8% | 68.0% |
| Hearing Mobility | 38.4% | 44.7% | 59.1% | 59.5% |
| Hearing Cognitive | 38.5% | 43.3% | 55.3% | 55.5% |
| Hearing ADL | 31.7% | 35.3% | 46.6% | 45.7% |
| Hearing IADL | 35.4% | 44.9% | 64.4% | 64.3% |
| Vision Mobility | 30.0% | 41.0% | 53.7% | 54.2% |
| Vision Cognitive | 34.8% | 43.1% | 52.8% | 53.0% |
| Vision ADL | 43.8% | 53.2% | 64.5% | 65.4% |
| Vision IADL | 21.0% | 26.5% | 45.0% | 44.9% |
| Mobility Cognitive | 18.0% | 25.3% | 40.0% | 40.2% |
| Mobility ADL | 24.7% | 31.6% | 49.3% | 49.6% |
| Mobility IADL | 14.7% | 20.8% | 36.0% | 36.4% |
| Cognitive ADL | 24.5% | 32.5% | 49.7% | 50.5% |
| Cognitive IADL | 18.9% | 25.5% | 44.3% | 44.2% |
| ADL IADL | 20.7% | 27.5% | 43.4% | 43.5% |
| Hearing Vision Mobility | 23.0% | 32.1% | 45.8% | 46.8% |
| Hearing Vision Cognitive | 34.1% | 43.4% | 53.0% | 53.6% |
| Hearing Vision ADL | 41.1% | 50.7% | 59.9% | 59.2% |
| Hearing Vision IADL | 30.5% | 38.5% | 61.1% | 61.6% |
| Hearing Mobility Cognitive | 26.7% | 33.8% | 48.2% | 48.5% |
| Hearing Mobility ADL | 23.1% | 28.3% | 45.7% | 46.7% |
| Hearing Mobility IADL | 16.5% | 22.5% | 42.7% | 43.3% |
| Hearing Cognitive ADL | 26.8% | 37.6% | 52.9% | 51.7% |
| Hearing Cognitive IADL | 25.2% | 32.7% | 54.0% | 54.2% |
| Hearing ADL IADL | 10.6% | 18.7% | 39.0% | 39.1% |
| Vision Mobility Cognitive | 21.2% | 31.1% | 44.3% | 45.1% |
| Vision Mobility ADL | 19.5% | 28.0% | 49.8% | 49.9% |
| Vision Mobility IADL | 13.4% | 20.9% | 39.5% | 39.7% |
| Vision Cognitive ADL | 34.5% | 50.2% | 71.4% | 71.4% |
| Vision Cognitive ADL | 15.2% | 21.6% | 37.5% | 37.8% |
| Vision ADL IADL | 27.3% | 37.2% | 61.7% | 61.5% |
| Mobility Cognitive ADL | 16.5% | 23.5% | 40.6% | 40.8% |
| Mobility Cognitive IADL | 10.8% | 15.9% | 30.3% | 30.6% |
| Mobility ADL IADL | 12.4% | 17.2% | 32.2% | 32.6% |
| Cognitive ADL IADL | 12.7% | 20.3% | 45.9% | 45.9% |
| Hearing Vision Mobility Cognitive | 19.2% | 26.8% | 37.6% | 38.4% |

| | | | | |
|---|---|---|---|---|
| Hearing Vision Mobility ADL | 27.4% | 35.4% | 54.0% | 54.9% |
| Hearing Vision Mobility IADL | 5.7% | 8.7% | 16.9% | 17.9% |
| Hearing Vision Cognitive ADL | 16.8% | 25.2% | 51.7% | 53.5% |
| Hearing Vision Cognitive IADL | 16.7% | 24.6% | 40.8% | 41.2% |
| Hearing Vision ADL IADL | 35.6% | 45.8% | 51.4% | 51.1% |
| Hearing Mobility Cognitive ADL | 10.2% | 15.4% | 27.0% | 27.9% |
| Hearing Mobility Cognitive IADL | 13.5% | 19.7% | 36.2% | 36.2% |
| Hearing Mobility ADL IADL | 14.8% | 19.6% | 36.6% | 36.7% |
| Hearing Cognitive ADL IADL | 19.5% | 27.3% | 55.2% | 54.5% |
| Vision Mobility Cognitive ADL | 16.8% | 26.4% | 45.6% | 45.9% |
| Vision Mobility Cognitive IADL | 11.0% | 18.2% | 34.3% | 34.9% |
| Vision Mobility ADL IADL | 8.1% | 12.2% | 25.0% | 25.7% |
| Vision Cognitive ADL IADL | 7.7% | 12.5% | 29.6% | 29.4% |
| Cognitive Mobility ADL IADL | 7.3% | 11.6% | 25.0% | 25.2% |
| Hearing Vision Mobility Cognitive ADL | 17.8% | 24.2% | 33.9% | 34.1% |
| Hearing Vision Mobility Cognitive IADL | 13.3% | 19.9% | 31.6% | 32.6% |
| Hearing Vision Mobility ADL IADL | 10.9% | 16.5% | 30.8% | 30.5% |
| Hearing Vision ADL Cognitive ADL | 9.5% | 16.5% | 42.7% | 42.5% |
| Hearing ADL Mobility Cognitive IADL | 9.5% | 14.8% | 32.6% | 33.0% |
| ADL Vision Mobility Cognitive IADL | 6.7% | 11.4% | 24.2% | 24.4% |
| Hearing Vision Mobility Cognitive ADL IADL | 24.2% | 33.4% | 51.6% | 52.1% |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.
NOTE: Weighted descriptive statistics presented as percentages and standard errors unless otherwise specified.

**TABLE 4.5. Results from Logistic Models Predicting Employment with State Fixed Effects**

| | Model 4 | |
|---|---|---|
| | b | SE |
| Hearing | -.164*** | 0.026 |
| Vision | -.425*** | 0.027 |
| Mobility | -1.115*** | 0.023 |
| Cognitive | -1.226*** | 0.022 |
| ADL | -.840*** | 0.107 |
| IADL | -1.489*** | 0.047 |
| Hearing Vision | -.541*** | 0.088 |
| Hearing Mobility | -1.007*** | 0.077 |
| Hearing Cognitive | -1.207*** | 0.076 |
| Hearing ADL | -1.655*** | 0.397 |
| Hearing IADL | -.759** | 0.247 |
| Vision Mobility | -1.265*** | 0.084 |
| Vision Cognitive | -1.325*** | 0.083 |
| Vision ADL | -0.693 | 0.512 |
| Vision IADL | -1.708*** | 0.131 |
| Mobility Cognitive | -1.930*** | 0.054 |
| Mobility ADL | -1.484*** | 0.067 |
| Mobility IADL | -2.116*** | 0.056 |
| Cognitive ADL | -1.433*** | 0.307 |
| Cognitive IADL | -1.743*** | 0.041 |
| ADL IADL | -1.767*** | 0.208 |
| Hearing Vision Mobility | -1.623*** | 0.188 |
| Hearing Vision Cognitive | -1.293*** | 0.166 |
| Hearing Vision ADL | -1.04 | 0.719 |
| Hearing Vision IADL | -.888*** | 0.252 |
| Hearing Mobility Cognitive | -1.540*** | 0.141 |
| Hearing Mobility ADL | -1.644*** | 0.271 |
| Hearing Mobility IADL | -1.777*** | 0.236 |
| Hearing Cognitive ADL | -1.386* | 0.702 |
| Hearing Cognitive IADL | -1.268*** | 0.179 |
| Hearing ADL IADL | -1.972* | 0.919 |
| Vision Mobility Cognitive | -1.696*** | 0.127 |
| Vision Mobility ADL | -1.478*** | 0.302 |
| Vision Mobility IADL | -1.954*** | 0.147 |
| Vision Cognitive ADL | -0.318 | 0.480 |
| Vision Cognitive ADL | -2.039*** | 0.140 |
| Vision ADL IADL | -.889* | 0.444 |
| Mobility Cognitive ADL | -1.898*** | 0.131 |
| Mobility Cognitive IADL | -2.408*** | 0.088 |
| Mobility ADL IADL | -2.302*** | 0.060 |
| Cognitive ADL IADL | -1.661*** | 0.121 |
| Hearing Vision Mobility Cognitive | -2.014*** | 0.166 |
| Hearing Vision Mobility ADL | -1.231** | 0.468 |
| Hearing Vision Mobility IADL | -3.183*** | 0.372 |
| Hearing Vision Cognitive ADL | -1.282 | 0.899 |
| Hearing Vision Cognitive IADL | -1.878*** | 0.297 |

| | | |
|---|---|---|
| Hearing Vision ADL IADL | -1.382 | 1.075 |
| Hearing Mobility Cognitive ADL | -2.592*** | 0.414 |
| Hearing Mobility Cognitive IADL | -2.123*** | 0.213 |
| Hearing Mobility ADL IADL | -2.087*** | 0.246 |
| Hearing Cognitive ADL IADL | -1.253*** | 0.374 |
| Vision Mobility Cognitive ADL | -1.652*** | 0.265 |
| Vision Mobility Cognitive IADL | -2.189*** | 0.166 |
| Vision Mobility ADL IADL | -2.673*** | 0.185 |
| Vision Cognitive ADL IADL | -2.461*** | 0.416 |
| Cognitive Mobility ADL IADL | -2.699*** | 0.062 |
| Hearing Vision Hearing Vision Mobility Cognitive ADL | -2.232*** | 0.364 |
| Hearing Vision Mobility Cognitive IADL | -2.307*** | 0.256 |
| Hearing Vision Mobility ADL IADL | -2.422*** | 0.281 |
| Hearing Vision ADL Cognitive ADL | -1.804** | 0.685 |
| Hearing ADL Mobility Cognitive IADL | -2.282*** | 0.220 |
| ADL Vision Mobility Cognitive IADL | -2.743*** | 0.134 |
| Hearing Vision Mobility Cognitive ADL IADL | -1.364*** | 0.104 |
| **Individual Characteristics** | | |
| Age | -.002*** | 0.000 |
| Female | -.558*** | 0.008 |
| Non-Hispanic Black | -.199*** | 0.009 |
| Hispanic | -0.002 | 0.001 |
| Non-Hispanic Other | -.204*** | 0.014 |
| Education | .141*** | 0.001 |
| Marital status | .061*** | 0.006 |
| **Government Assistances** | | |
| Supplementary Security Income (SSI) | -2.350*** | 0.024 |
| Social Security income | -2.358*** | 0.021 |
| Public assistance income | -1.204*** | 0.033 |
| Retirement income | -1.479*** | 0.017 |
| State | -.256*** | 0.072 |
| **State-level policies/characteristics** | | |
| State unemployment | | |
| State Not in labor force | | |
| % SSI | | |
| % SSDI | | |
| Medicaid Buy-In | | |
| State SSI supplement | | |
| ADA | | |
| State variables | | |
| Alabama | -.227* | 0.100 |
| Alaska | -.250*** | 0.070 |
| Arizona | -0.098 | 0.067 |
| Arkansas | -.211** | 0.069 |
| California | -0.041 | 0.071 |
| Colorado | 0.011 | 0.074 |
| Connecticut | -0.126 | 0.091 |
| Delaware | 0.035 | 0.094 |

| | | |
|---|---|---|
| Washington DC | -.197** | 0.065 |
| Florida | -0.13 | 0.070 |
| Georgia | 0.092 | 0.079 |
| Hawaii | -0.146 | 0.081 |
| Idaho | -0.068 | 0.068 |
| Illinois | 0.03 | 0.072 |
| Indiana | .369*** | 0.079 |
| Iowa | .150* | 0.073 |
| Kansas | -.164* | 0.071 |
| Kentucky | -.195** | 0.070 |
| Louisiana | 0.137 | 0.082 |
| Maine | .193** | 0.069 |
| Maryland | 0.116 | 0.070 |
| Massachusetts | -0.09 | 0.067 |
| Michigan | .350*** | 0.074 |
| Minnesota | -.218** | 0.073 |
| Mississippi | 0.065 | 0.070 |
| Missouri | 0.063 | 0.087 |
| Montana | .427*** | 0.082 |
| Nebraska | -0.126 | 0.071 |
| Nevada | .278*** | 0.081 |
| New Hampshire | 0.011 | 0.072 |
| New Jersey | -.367*** | 0.076 |
| New Mexico | -0.07 | 0.068 |
| New York | -0.04 | 0.067 |
| North Carolina | .298** | 0.096 |
| North Dakota | 0.072 | 0.069 |
| Ohio | -.168* | 0.077 |
| Oklahoma | -.149* | 0.069 |
| Oregon | 0.024 | 0.069 |
| Pennsylvania | .179* | 0.075 |
| Rhode Island | -0.068 | 0.069 |
| South Carolina | .333** | 0.107 |
| South Dakota | -0.05 | 0.069 |
| Tennessee | -.131* | 0.066 |
| Texas | -0.122 | 0.075 |
| Utah | .203* | 0.090 |
| Vermont | 0.07 | 0.068 |
| Virginia | -0.086 | 0.065 |
| Washington | -.399*** | 0.068 |
| West Virginia | .312*** | 0.067 |
| Wisconsin | -- | -- |
| Wyoming | -.342*** | 0.064 |
| Intercept | | |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.

NOTES:

a Results from logistic models predicting the probability of employment from 63 combinations of limitation types. Model 5 accounts for the 63 limitation combinations, gender, race/ethnicity (non-Hispanic whites as

ref), and age, education, marital status, receipt of government assistance, various state policies/characteristics, and state dummy variables.
b*p < .05; **p < .01; ***p < .001

**TABLE 4.6. Results from Logistic Models Predicting Employment Clustered by State**

| | Model 1b | | Model 2b | | Model 3b | | Model 4b | | Model 5b | |
|---|---|---|---|---|---|---|---|---|---|---|
| | b | SE | b | SE | b | SE | b | SE | b | SE |
| Hearing | -.389*** | 0.030 | -.332*** | 0.028 | -.158*** | 0.029 | -.152*** | 0.026 | -.154*** | 0.026 |
| Vision | -.780*** | 0.025 | -.598*** | 0.024 | -.441*** | 0.027 | -.427*** | 0.028 | -.429*** | 0.027 |
| Mobility | -1.866*** | 0.043 | -1.580*** | 0.038 | -1.097*** | 0.028 | -1.088*** | 0.025 | -1.090*** | 0.025 |
| Cognitive | -1.873*** | 0.022 | -1.706*** | 0.018 | -1.316*** | 0.017 | -1.325*** | 0.018 | -1.326*** | 0.018 |
| ADL | -1.450*** | 0.066 | -1.298*** | 0.070 | -.887*** | 0.078 | -.897*** | 0.077 | -.897*** | 0.078 |
| IADL | -2.233*** | 0.049 | -1.990*** | 0.045 | -1.487*** | 0.046 | -1.494*** | 0.046 | -1.495*** | 0.046 |
| Hearing Vision | -.920*** | 0.059 | -.753*** | 0.069 | -.541*** | 0.072 | -.529*** | 0.076 | -.534*** | 0.076 |
| Hearing Mobility | -1.870*** | 0.060 | -1.681*** | 0.061 | -1.087*** | 0.061 | -1.067*** | 0.059 | -1.075*** | 0.059 |
| Hearing Cognitive | -1.923*** | 0.070 | -1.752*** | 0.073 | -1.364*** | 0.081 | -1.353*** | 0.078 | -1.355*** | 0.079 |
| Hearing ADL | -2.913*** | 0.397 | -2.772*** | 0.385 | -2.282*** | 0.386 | -2.341*** | 0.393 | -2.332*** | 0.388 |
| Hearing IADL | -1.865*** | 0.185 | -1.503*** | 0.217 | -.615 | 0.357 | -0.615 | 0.349 | -0.62 | 0.348 |
| Vision Mobility | -2.155*** | 0.059 | -1.735*** | 0.059 | -1.285*** | 0.071 | -1.266*** | 0.069 | -1.268*** | 0.068 |
| Vision Cognitive | -2.077*** | 0.063 | -1.773*** | 0.069 | -1.516*** | 0.076 | -1.509*** | 0.073 | -1.509*** | 0.073 |
| Vision ADL | -1.711*** | 0.256 | -1.437*** | 0.280 | -1.027** | 0.347 | -1.009** | 0.367 | -1.016** | 0.371 |
| Vision IADL | -2.637*** | 0.122 | -2.441*** | 0.128 | -1.618*** | 0.134 | -1.618*** | 0.132 | -1.623*** | 0.132 |
| Mobility Cognitive | -2.894*** | 0.056 | -2.577*** | 0.050 | -1.952*** | 0.046 | -1.950*** | 0.045 | -1.951*** | 0.044 |
| Mobility ADL | -2.522*** | 0.050 | -2.270*** | 0.050 | -1.550*** | 0.046 | -1.542*** | 0.046 | -1.543*** | 0.045 |
| Mobility IADL | -3.088*** | 0.052 | -2.803*** | 0.052 | -2.097*** | 0.047 | -2.089*** | 0.047 | -2.090*** | 0.047 |
| Cognitive ADL | -2.497*** | 0.231 | -2.203*** | 0.219 | -1.572*** | 0.236 | -1.542*** | 0.238 | -1.536*** | 0.237 |
| Cognitive IADL | -2.815*** | 0.054 | -2.521*** | 0.057 | -1.729*** | 0.077 | -1.739*** | 0.077 | -1.738*** | 0.077 |
| ADL IADL | -2.865*** | 0.168 | -2.559*** | 0.182 | -1.871*** | 0.174 | -1.873*** | 0.176 | -1.874*** | 0.176 |
| Hearing Vision Mobility | -2.536*** | 0.115 | -2.224*** | 0.130 | -1.795*** | 0.177 | -1.753*** | 0.171 | -1.756*** | 0.170 |
| Hearing Vision Cognitive | -2.037*** | 0.133 | -1.715*** | 0.130 | -1.493*** | 0.148 | -1.461*** | 0.144 | -1.465*** | 0.146 |
| Hearing Vision ADL | -1.284** | 0.491 | -.931 | 0.482 | -.349 | 0.568 | -0.345 | 0.587 | -0.364 | 0.591 |
| Hearing Vision IADL | -1.981*** | 0.157 | -1.634*** | 0.185 | -.660** | 0.248 | -.644* | 0.252 | -.644* | 0.252 |
| Hearing Mobility Cognitive | -2.472*** | 0.076 | -2.231*** | 0.078 | -1.706*** | 0.088 | -1.695*** | 0.086 | -1.699*** | 0.086 |
| Hearing Mobility ADL | -2.696*** | 0.215 | -2.511*** | 0.220 | -1.713*** | 0.252 | -1.691*** | 0.255 | -1.694*** | 0.254 |
| Hearing Mobility IADL | -3.040*** | 0.115 | -2.809*** | 0.108 | -1.971*** | 0.112 | -1.962*** | 0.108 | -1.961*** | 0.108 |
| Hearing Cognitive ADL | -2.144*** | 0.339 | -1.725*** | 0.351 | -1.183** | 0.391 | -1.238** | 0.378 | -1.247*** | 0.377 |
| Hearing Cognitive IADL | -2.303*** | 0.134 | -1.942*** | 0.149 | -1.034*** | 0.235 | -1.037*** | 0.232 | -1.040*** | 0.232 |
| Hearing ADL IADL | -3.397*** | 0.646 | -2.936*** | 0.584 | -2.236** | 0.693 | -2.241*** | 0.679 | -2.210** | 0.678 |
| Vision Mobility Cognitive | -2.773*** | 0.098 | -2.351*** | 0.100 | -1.953*** | 0.128 | -1.925*** | 0.129 | -1.926*** | 0.129 |
| Vision Mobility ADL | -2.736*** | 0.172 | -2.347*** | 0.164 | -1.506*** | 0.215 | -1.487*** | 0.216 | -1.489*** | 0.214 |
| Vision Mobility IADL | -3.272*** | 0.103 | -2.884*** | 0.106 | -2.087*** | 0.125 | -2.086*** | 0.128 | -2.087*** | 0.128 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Vision Cognitive ADL | -1.844*** | 0.320 | -1.343*** | 0.374 | -.803* | 0.386 | -.788* | 0.396 | -.776* | 0.395 |
| Vision Cognitive ADL | -2.955*** | 0.094 | -2.621*** | 0.096 | -1.845*** | 0.126 | -1.833*** | 0.122 | -1.831*** | 0.121 |
| Vision ADL IADL | -2.744*** | 0.406 | -2.379*** | 0.445 | -1.393** | 0.453 | -1.361** | 0.455 | -1.367** | 0.452 |
| Mobility Cognitive ADL | -3.010*** | 0.125 | -2.644*** | 0.121 | -1.880*** | 0.118 | -1.882*** | 0.115 | -1.888*** | 0.115 |
| Mobility Cognitive IADL | -3.503*** | 0.051 | -3.201*** | 0.050 | -2.399*** | 0.052 | -2.399*** | 0.050 | -2.403*** | 0.050 |
| Mobility ADL IADL | -3.380*** | 0.060 | -3.143*** | 0.058 | -2.336*** | 0.054 | -2.327*** | 0.053 | -2.328*** | 0.053 |
| Cognitive ADL IADL | -3.252*** | 0.185 | -2.727*** | 0.191 | -1.419*** | 0.240 | -1.435*** | 0.234 | -1.437*** | 0.234 |
| Hearing Vision Mobility Cognitive | -3.016*** | 0.131 | -2.636*** | 0.135 | -2.288*** | 0.138 | -2.250*** | 0.138 | -2.258*** | 0.139 |
| Hearing Vision Mobility ADL | -2.343*** | 0.280 | -2.117*** | 0.327 | -1.518** | 0.582 | -1.474* | 0.573 | -1.477** | 0.566 |
| Hearing Vision Mobility IADL | -3.763*** | 0.227 | -3.463*** | 0.220 | -2.710*** | 0.238 | -2.672*** | 0.242 | -2.687*** | 0.240 |
| Hearing Vision Cognitive ADL | -2.955*** | 0.557 | -2.522*** | 0.539 | -1.509* | 0.734 | -1.522* | 0.769 | -1.490* | 0.749 |
| Hearing Vision Cognitive IADL | -3.091*** | 0.158 | -2.733*** | 0.168 | -2.097*** | 0.228 | -2.088*** | 0.229 | -2.089*** | 0.229 |
| Hearing Vision ADL IADL | -2.262** | 0.853 | -2.291** | 0.861 | -1.787* | 0.908 | -1.756* | 0.867 | -1.772* | 0.884 |
| Hearing Mobility Cognitive ADL | -3.448*** | 0.284 | -3.126*** | 0.274 | -2.450*** | 0.284 | -2.459*** | 0.286 | -2.466*** | 0.289 |
| Hearing Mobility Cognitive IADL | -3.457*** | 0.136 | -3.154*** | 0.148 | -2.356*** | 0.186 | -2.361*** | 0.185 | -2.364*** | 0.184 |
| Hearing Mobility ADL IADL | -3.361*** | 0.217 | -3.140*** | 0.211 | -2.259*** | 0.218 | -2.248*** | 0.219 | -2.251*** | 0.218 |
| Hearing Cognitive ADL IADL | -2.999*** | 0.328 | -2.626*** | 0.346 | -1.686** | 0.524 | -1.740*** | 0.523 | -1.759*** | 0.534 |
| Vision Mobility Cognitive ADL | -2.819*** | 0.218 | -2.306*** | 0.243 | -1.536*** | 0.265 | -1.522*** | 0.264 | -1.528*** | 0.263 |
| Vision Mobility Cognitive IADL | -3.347*** | 0.165 | -2.916*** | 0.160 | -2.096*** | 0.192 | -2.073*** | 0.184 | -2.078*** | 0.183 |
| Vision Mobility ADL IADL | -3.667*** | 0.157 | -3.356*** | 0.149 | -2.483*** | 0.172 | -2.461*** | 0.173 | -2.467*** | 0.173 |
| Vision Cognitive ADL IADL | -3.608*** | 0.268 | -3.123*** | 0.276 | -1.957*** | 0.430 | -1.955*** | 0.420 | -1.953*** | 0.422 |
| Cognitive Mobility ADL IADL | -3.850*** | 0.088 | -3.465*** | 0.090 | -2.596*** | 0.107 | -2.596*** | 0.108 | -2.600*** | 0.108 |
| Hearing Vision Mobility Cognitive ADL | -2.803*** | 0.265 | -2.509*** | 0.274 | -1.942*** | 0.290 | -1.922*** | 0.290 | -1.937*** | 0.290 |
| Hearing Vision Mobility Cognitive IADL | -3.261*** | 0.156 | -2.908*** | 0.169 | -2.310*** | 0.201 | -2.270*** | 0.203 | -2.268*** | 0.202 |
| Hearing Vision Mobility ADL IADL | -3.576*** | 0.246 | -3.196*** | 0.254 | -2.414*** | 0.289 | -2.424*** | 0.283 | -2.440*** | 0.283 |
| Hearing Vision ADL Cognitive IADL | -3.429*** | 0.574 | -2.732*** | 0.526 | -1.130 | 0.675 | -1.168 | 0.674 | -1.149 | 0.675 |
| Hearing ADL Mobility Cognitive IADL | -3.689*** | 0.136 | -3.307*** | 0.150 | -2.381*** | 0.184 | -2.376*** | 0.185 | -2.377*** | 0.186 |
| ADL Vision Mobility Cognitive IADL | -3.858*** | 0.147 | -3.404*** | 0.149 | -2.531*** | 0.170 | -2.531*** | 0.172 | -2.534*** | 0.172 |
| Hearing Vision Mobility Cognitive ADL IADL | -2.780*** | 0.121 | -2.376*** | 0.131 | -1.702*** | 0.161 | -1.679*** | 0.156 | -1.676*** | 0.155 |
| **Individual Characteristics** | | | | | | | | | | |
| Age | | | -.011*** | 0.001 | .000 | 0.001 | -0.001 | 0.001 | -0.001 | 0.001 |
| Female | | | -.484*** | 0.020 | -.503*** | 0.024 | -.504*** | 0.023 | -.504*** | 0.023 |
| Non-Hispanic Black | | | -.396*** | 0.042 | -.351*** | 0.045 | -.322*** | 0.042 | -.336*** | 0.042 |
| Hispanic | | | -.010*** | 0.003 | -.011*** | 0.003 | -.007* | 0.003 | -.006* | 0.003 |
| Non-Hispanic Other | | | -.285*** | 0.070 | -.302*** | 0.071 | -.238*** | 0.067 | -.245*** | 0.070 |
| Education | | | .151*** | 0.003 | .144*** | 0.003 | .142*** | 0.002 | .143*** | 0.002 |
| Marital status | | | .256*** | 0.012 | .124*** | 0.013 | .118*** | 0.011 | .116*** | 0.011 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| **Government Assistances** | -.520*** | 0.068 | | | | | | |
| Supplementary Security Income (SSI) | | | -2.209*** | 0.052 | -2.217*** | 0.054 | -2.216*** | 0.054 |
| Social Security income | | | -2.215*** | 0.048 | -2.226*** | 0.044 | -2.227*** | 0.044 |
| Public assistance income | | | -1.095*** | 0.102 | -1.099*** | 0.094 | -1.098*** | 0.044 |
| Retirement income | | | -1.421*** | 0.035 | -1.413*** | 0.034 | -1.415*** | 0.094 |
| State | | | -.610*** | 0.068 | .001* | 0.001 | | |
| **State-level policies/characteristics** | | | | | | | | |
| State unemployment | | | | | -.063** | 0.020 | | |
| State Not in labor force | | | | | -.039*** | 0.004 | | |
| % SSI | | | | | 0.001 | 0.002 | | |
| % SSDI | | | | | .011*** | 0.002 | | |
| Medicaid Buy-In | | | | | 0.042 | 0.023 | | |
| State SSI supplement | | | | | -0.012 | 0.023 | | |
| ADA | | | | | -.094** | 0.034 | | |
| Alabama | | | | | | | -.170*** | 0.010 |
| Alaska | | | | | | | -.372*** | 0.025 |
| Arizona | | | | | | | -.280*** | 0.005 |
| Arkansas | | | | | | | -.056*** | 0.005 |
| California | | | | | | | -.181*** | 0.005 |
| Colorado | | | | | | | -.008* | 0.003 |
| Connecticut | | | | | | | .095*** | 0.006 |
| Delaware | | | | | | | .033*** | 0.010 |
| Washington DC | | | | | | | .236*** | 0.019 |
| Florida | | | | | | | -.138*** | 0.007 |
| Georgia | | | | | | | -.077*** | 0.012 |
| Hawaii | | | | | | | .145*** | 0.042 |
| Idaho | | | | | | | -.043*** | 0.003 |
| Illinois | | | | | | | .039*** | 0.006 |
| Indiana | | | | | | | .126*** | 0.004 |
| Iowa | | | | | | | .437*** | 0.005 |
| Kansas | | | | | | | .174*** | 0.002 |
| Kentucky | | | | | | | -.125*** | 0.004 |
| Louisiana | | | | | | | -.096*** | 0.012 |
| Maine | | | | | | | .103*** | 0.004 |
| Maryland | | | | | | | .269*** | 0.013 |
| Massachusetts | | | | | | | .164*** | 0.003 |
| Michigan | | | | | | | -.018*** | 0.005 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Minnesota | | | | | | | | | .389*** | 0.004 |
| Mississippi | | | | | | | | | -.082*** | 0.015 |
| Missouri | | | | | | | | | .093*** | 0.004 |
| Montana | | | | | | | | | 0.003 | 0.003 |
| Nebraska | | | | | | | | | .476*** | 0.003 |
| Nevada | | | | | | | | | -.052*** | 0.006 |
| New Hampshire | | | | | | | | | .332*** | 0.005 |
| New Jersey | | | | | | | | | .079*** | 0.006 |
| New Mexico | | | | | | | | | -.302*** | 0.019 |
| New York | | | | | | | | | .042*** | 0.006 |
| North Carolina | | | | | | | | | .025** | 0.009 |
| North Dakota | | | | | | | | | .253*** | 0.002 |
| Ohio | | | | | | | | | .114*** | 0.005 |
| Oklahoma | | | | | | | | | -.138*** | 0.009 |
| Oregon | | | | | | | | | -.095*** | 0.002 |
| Pennsylvania | | | | | | | | | .137*** | 0.005 |
| Rhode Island | | | | | | | | | .224*** | 0.003 |
| South Carolina | | | | | | | | | 0.015 | 0.011 |
| South Dakota | | | | | | | | | .339*** | 0.006 |
| Tennessee | | | | | | | | | -.018** | 0.006 |
| Texas | | | | | | | | | -.090*** | 0.006 |
| Utah | | | | | | | | | -.137*** | 0.003 |
| Vermont | | | | | | | | | .219*** | 0.004 |
| Virginia | | | | | | | | | .093*** | 0.009 |
| Washington | | | | | | | | | -.077*** | 0.002 |
| West Virginia | | | | | | | | | -.283*** | 0.005 |
| Wisconsin | | | | | | | | | .336*** | 0.004 |
| Wyoming | | | | | | | | | -- | -- |
| Intercept | 1.451*** | 0.030 | -.520*** | 0.068 | -.610*** | 0.068 | 0.197 | 0.180 | -.574*** | 0.061 |

SOURCE: 2017 American Community Survey (ACS), adults aged 25-61, N = 1,895,629.

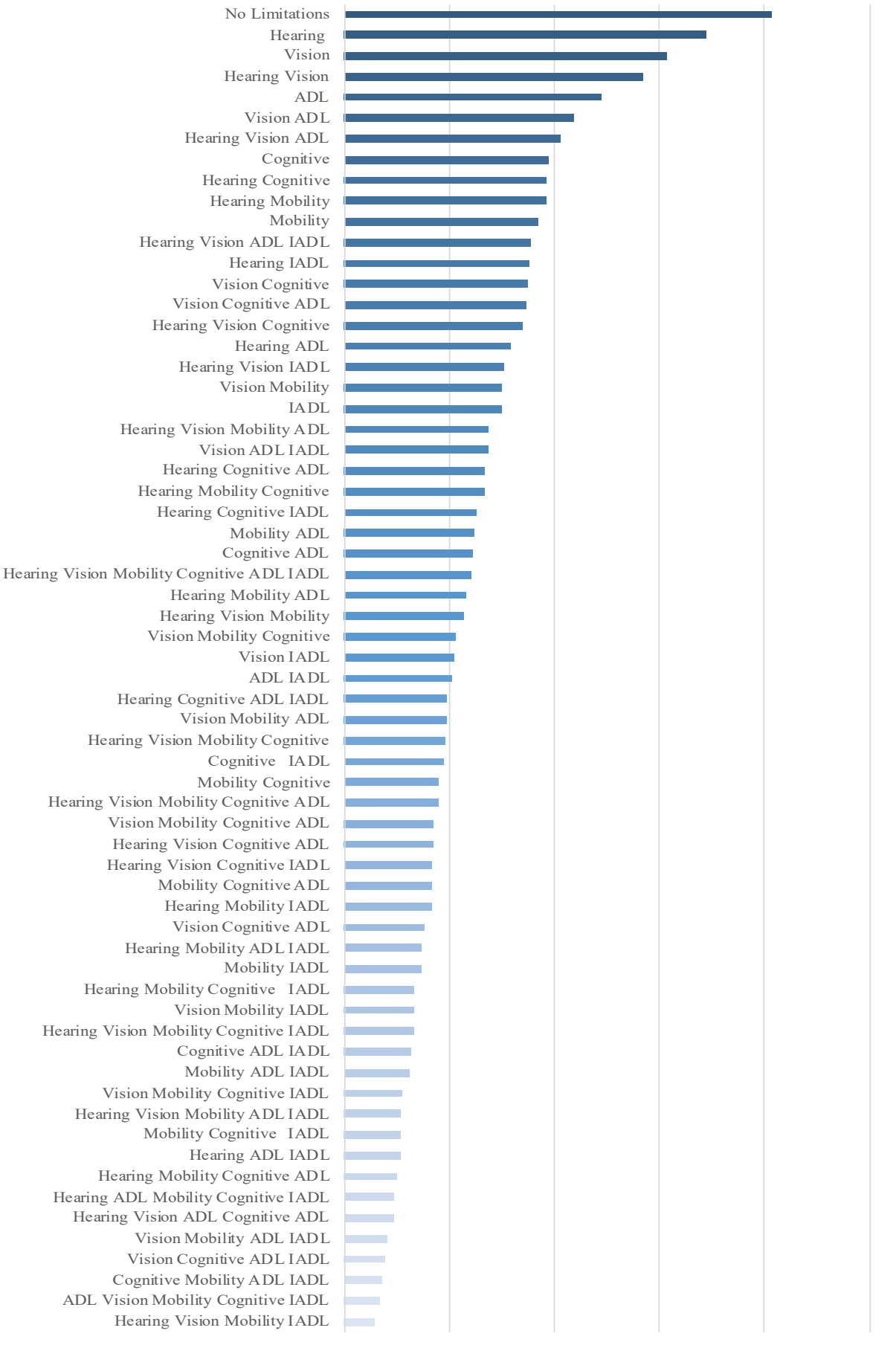
NOTES:

a Results from logistic models predicting the probability of employment from 63 combinations of limitation types. Model 1b only accounts for the 63 limitation combinations, Model 2b adds gender, race/ethnicity (non-Hispanic whites as ref), age, education, and marital status. Model 3b accounts for receipt of government assistance. Model 4b includes various state policies/characteristics. Model 5b adds state dummy variables.

b *p < .05; **p < .01; ***p < .001

**Figure 4.1. Predicted Employment Probabilities by Limitation Combinations**

**Figure 4.1.** Predicted Employment Probabilities by Limitation Combinations



## Figure 4.2. Predicted Employment Probabilities by Limitation Combinations with Controls

**Figure 4.2.** Predicted Employment Probabilities by Limitation Combinations with Controls

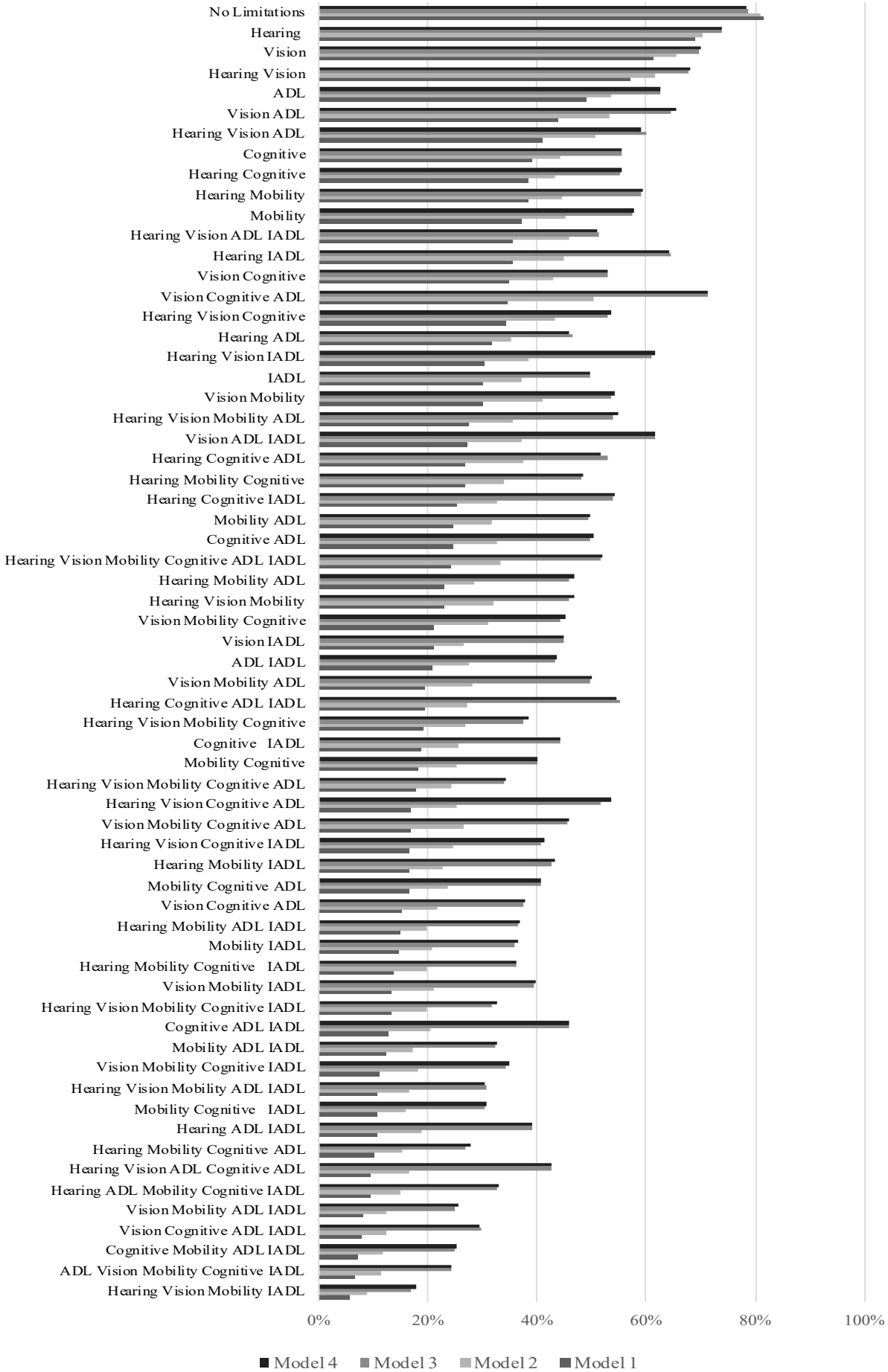


**Table 5.1. Employment Longevities (ELs) by Disability Status and Gender for Adults Ages 20-64: United States, 2014-2019**

| | Disability | | No Disability | |
|---|---|---|---|---|
| Age | Women | Men | Women | Men |
| 20 | 13.5 | 12.8 | 33.3 | 35.3 |
| 21 | 13.1 | 12.4 | 32.7 | 34.7 |
| 22 | 12.6 | 12.1 | 32.0 | 34.1 |
| 23 | 12.1 | 11.7 | 31.3 | 33.4 |
| 24 | 11.7 | 11.3 | 30.6 | 32.6 |
| 25 | 11.2 | 10.9 | 29.8 | 31.8 |
| 26 | 10.7 | 10.5 | 29.0 | 31.0 |
| 27 | 10.3 | 10.2 | 28.2 | 30.2 |
| 28 | 9.9 | 9.8 | 27.4 | 29.4 |
| 29 | 9.4 | 9.4 | 26.6 | 28.5 |
| 30 | 9.0 | 9.0 | 25.8 | 27.7 |
| 31 | 8.7 | 8.7 | 25.1 | 26.9 |
| 32 | 8.3 | 8.3 | 24.3 | 26.0 |
| 33 | 7.9 | 8.0 | 23.5 | 25.2 |
| 34 | 7.6 | 7.6 | 22.7 | 24.4 |
| 35 | 7.2 | 7.3 | 21.9 | 23.5 |
| 36 | 6.9 | 6.9 | 21.2 | 22.7 |
| 37 | 6.5 | 6.6 | 20.4 | 21.8 |
| 38 | 6.2 | 6.3 | 19.6 | 21.0 |
| 39 | 5.9 | 6.0 | 18.8 | 20.2 |
| 40 | 5.6 | 5.7 | 18.1 | 19.3 |
| 41 | 5.3 | 5.4 | 17.3 | 18.5 |
| 42 | 5.0 | 5.1 | 16.5 | 17.6 |
| 43 | 4.7 | 4.8 | 15.7 | 16.8 |
| 44 | 4.4 | 4.5 | 14.9 | 15.9 |
| 45 | 4.1 | 4.2 | 14.1 | 15.1 |
| 46 | 3.8 | 3.9 | 13.3 | 14.2 |
| 47 | 3.6 | 3.7 | 12.5 | 13.4 |
| 48 | 3.3 | 3.4 | 11.7 | 12.6 |
| 49 | 3.1 | 3.1 | 10.9 | 11.7 |
| 50 | 2.8 | 2.9 | 10.1 | 10.9 |
| 51 | 2.6 | 2.6 | 9.4 | 10.1 |
| 52 | 2.3 | 2.4 | 8.6 | 9.2 |
| 53 | 2.1 | 2.1 | 7.8 | 8.4 |
| 54 | 1.9 | 1.9 | 7.0 | 7.6 |
| 55 | 1.6 | 1.7 | 6.3 | 6.8 |
| 56 | 1.4 | 1.5 | 5.5 | 6.0 |
| 57 | 1.2 | 1.3 | 4.8 | 5.2 |
| 58 | 1.1 | 1.1 | 4.1 | 4.5 |
| 59 | 0.9 | 0.9 | 3.4 | 3.7 |
| 60 | 0.7 | 0.7 | 2.7 | 3.0 |
| 61 | 0.5 | 0.5 | 2.1 | 2.3 |

| | | | | |
|---|---|---|---|---|
| 62 | 0.4 | 0.4 | 1.5 | 1.6 |
| 63 | 0.2 | 0.2 | 0.9 | 1.0 |
| 64 | 0.1 | 0.1 | 0.4 | 0.5 |

SOURCES: Employment estimates from 2014-2019 American Community Survey (ACS), adults aged 20-64, N = 7,594,126; Mortally estimates from 2020 reports of the Board of Trustees of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds (Trustees Reports)

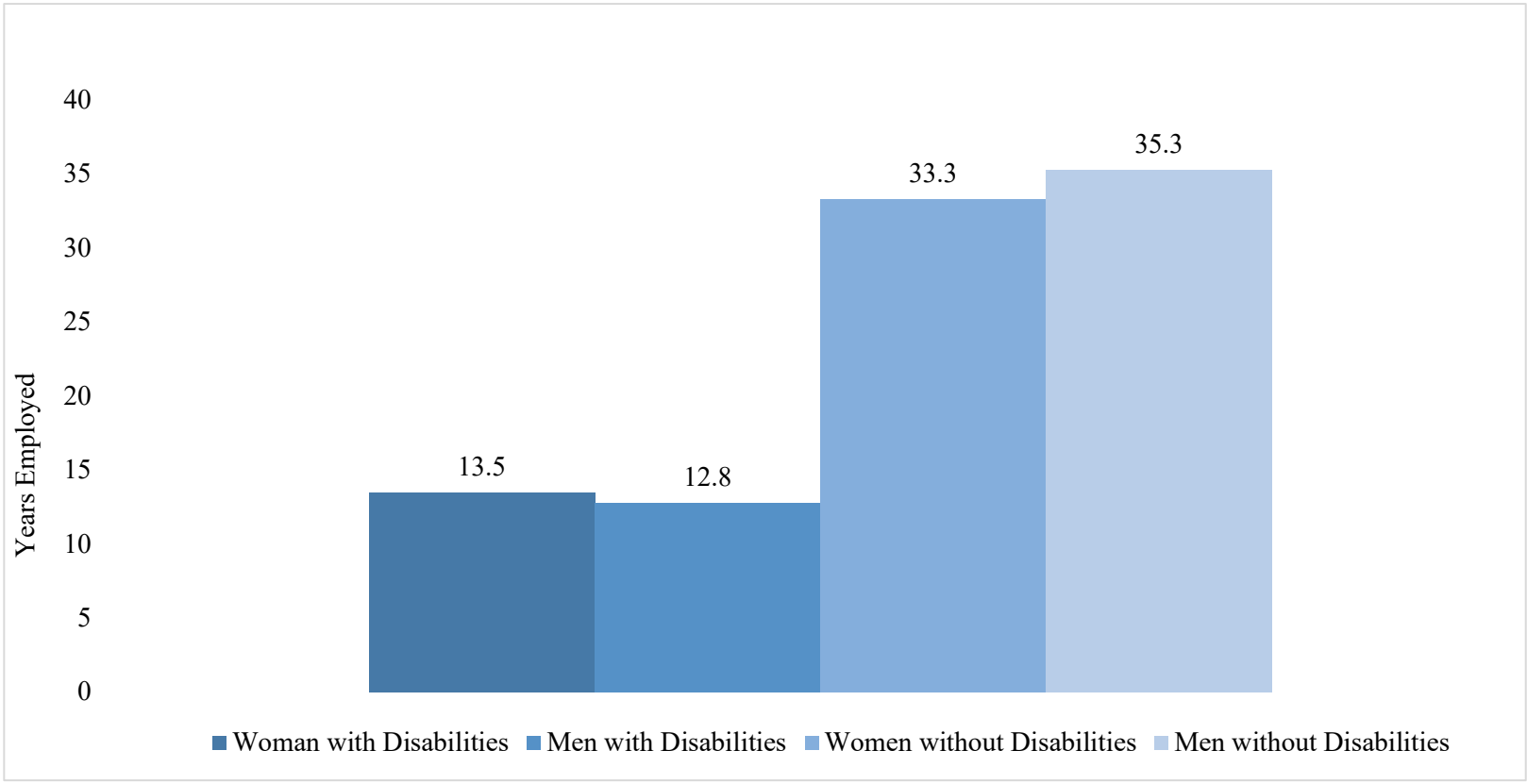
**Table 5.2. Employment Longevities (EMs) by Limitation Type and Gender for Adults Ages 20-64: United States, 2014-2019**

| | Heading Limitations | | Vision Limitations | | Mobility Limitations | | Cognitive Limitations | | ADL Limitations | | IADL Limitations | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Age | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men | Women | Men |
| 20 | 18.3 | 19.6 | 16.7 | 15.1 | 9.3 | 8.5 | 10.3 | 9.0 | 5.6 | 5.5 | 7.3 | 6.5 |
| 21 | 17.8 | 19.2 | 16.2 | 14.7 | 9.0 | 8.2 | 9.9 | 8.7 | 5.4 | 5.4 | 7.0 | 6.3 |
| 22 | 17.4 | 18.6 | 15.7 | 14.3 | 8.7 | 8.0 | 9.4 | 8.4 | 5.3 | 5.3 | 6.7 | 6.1 |
| 23 | 16.8 | 18.1 | 15.1 | 13.8 | 8.4 | 7.7 | 9.0 | 8.1 | 5.1 | 5.1 | 6.4 | 5.9 |
| 24 | 16.2 | 17.5 | 14.6 | 13.3 | 8.1 | 7.5 | 8.6 | 7.8 | 4.9 | 4.9 | 6.1 | 5.6 |
| 25 | 15.7 | 17.0 | 14.0 | 12.8 | 7.8 | 7.2 | 8.2 | 7.5 | 4.7 | 4.7 | 5.8 | 5.4 |
| 26 | 15.1 | 16.4 | 13.5 | 12.3 | 7.6 | 7.0 | 7.8 | 7.1 | 4.6 | 4.6 | 5.5 | 5.1 |
| 27 | 14.6 | 15.8 | 12.9 | 11.8 | 7.3 | 6.7 | 7.4 | 6.8 | 4.4 | 4.4 | 5.2 | 4.9 |
| 28 | 14.1 | 15.3 | 12.4 | 11.3 | 7.0 | 6.5 | 7.0 | 6.5 | 4.2 | 4.2 | 4.9 | 4.7 |
| 29 | 13.5 | 14.7 | 11.9 | 10.9 | 6.8 | 6.2 | 6.7 | 6.2 | 4.0 | 4.0 | 4.7 | 4.5 |
| 30 | 13.0 | 14.2 | 11.4 | 10.4 | 6.5 | 6.0 | 6.3 | 5.9 | 3.9 | 3.9 | 4.4 | 4.2 |
| 31 | 12.6 | 13.7 | 10.9 | 10.0 | 6.3 | 5.7 | 6.0 | 5.6 | 3.7 | 3.7 | 4.2 | 4.0 |
| 32 | 12.0 | 13.1 | 10.4 | 9.6 | 6.0 | 5.5 | 5.7 | 5.3 | 3.5 | 3.6 | 4.0 | 3.8 |
| 33 | 11.6 | 12.6 | 10.0 | 9.2 | 5.8 | 5.2 | 5.4 | 5.1 | 3.4 | 3.4 | 3.7 | 3.6 |
| 34 | 11.1 | 12.1 | 9.5 | 8.7 | 5.6 | 5.0 | 5.1 | 4.8 | 3.2 | 3.2 | 3.5 | 3.4 |
| 35 | 10.7 | 11.6 | 9.0 | 8.3 | 5.3 | 4.8 | 4.8 | 4.5 | 3.1 | 3.1 | 3.3 | 3.2 |
| 36 | 10.2 | 11.1 | 8.6 | 7.9 | 5.1 | 4.6 | 4.5 | 4.3 | 2.9 | 2.9 | 3.1 | 3.0 |
| 37 | 9.7 | 10.6 | 8.2 | 7.5 | 4.9 | 4.3 | 4.2 | 4.0 | 2.8 | 2.7 | 3.0 | 2.8 |
| 38 | 9.3 | 10.1 | 7.8 | 7.1 | 4.7 | 4.1 | 4.0 | 3.8 | 2.6 | 2.6 | 2.8 | 2.7 |
| 39 | 8.8 | 9.6 | 7.4 | 6.7 | 4.5 | 3.9 | 3.7 | 3.6 | 2.5 | 2.4 | 2.6 | 2.5 |
| 40 | 8.4 | 9.1 | 7.0 | 6.4 | 4.2 | 3.7 | 3.5 | 3.3 | 2.3 | 2.3 | 2.4 | 2.3 |
| 41 | 7.9 | 8.6 | 6.6 | 6.0 | 4.0 | 3.5 | 3.3 | 3.1 | 2.2 | 2.2 | 2.3 | 2.2 |
| 42 | 7.5 | 8.2 | 6.2 | 5.7 | 3.8 | 3.3 | 3.0 | 2.9 | 2.1 | 2.0 | 2.1 | 2.0 |
| 43 | 7.0 | 7.7 | 5.8 | 5.3 | 3.6 | 3.1 | 2.8 | 2.7 | 1.9 | 1.9 | 2.0 | 1.9 |
| 44 | 6.6 | 7.2 | 5.4 | 5.0 | 3.4 | 2.9 | 2.6 | 2.5 | 1.8 | 1.8 | 1.8 | 1.8 |
| 45 | 6.2 | 6.8 | 5.1 | 4.7 | 3.2 | 2.7 | 2.4 | 2.3 | 1.7 | 1.6 | 1.7 | 1.6 |
| 46 | 5.8 | 6.3 | 4.7 | 4.3 | 3.0 | 2.5 | 2.2 | 2.2 | 1.6 | 1.5 | 1.6 | 1.5 |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 47 | 5.4 | 5.9 | 4.4 | 4.0 | 2.8 | 2.4 | 2.1 | 2.0 | 1.4 | 1.4 | 1.4 | 1.4 |
| 48 | 5.0 | 5.4 | 4.0 | 3.7 | 2.6 | 2.2 | 1.9 | 1.8 | 1.3 | 1.3 | 1.3 | 1.3 |
| 49 | 4.7 | 5.0 | 3.7 | 3.4 | 2.4 | 2.0 | 1.7 | 1.7 | 1.2 | 1.2 | 1.2 | 1.2 |
| 50 | 4.3 | 4.6 | 3.4 | 3.1 | 2.2 | 1.8 | 1.6 | 1.5 | 1.1 | 1.1 | 1.1 | 1.1 |
| 51 | 3.9 | 4.2 | 3.1 | 2.8 | 2.0 | 1.7 | 1.4 | 1.4 | 1.0 | 1.0 | 1.0 | 0.9 |
| 52 | 3.5 | 3.8 | 2.8 | 2.5 | 1.8 | 1.5 | 1.3 | 1.2 | 0.9 | 0.9 | 0.9 | 0.8 |
| 53 | 3.2 | 3.4 | 2.5 | 2.3 | 1.7 | 1.4 | 1.1 | 1.1 | 0.8 | 0.8 | 0.8 | 0.7 |
| 54 | 2.8 | 3.0 | 2.2 | 2.0 | 1.5 | 1.2 | 1.0 | 1.0 | 0.7 | 0.7 | 0.7 | 0.7 |
| 55 | 2.5 | 2.7 | 1.9 | 1.8 | 1.3 | 1.1 | 0.9 | 0.8 | 0.6 | 0.6 | 0.6 | 0.6 |
| 56 | 2.2 | 2.3 | 1.7 | 1.5 | 1.2 | 0.9 | 0.7 | 0.7 | 0.5 | 0.5 | 0.5 | 0.5 |
| 57 | 1.9 | 2.0 | 1.4 | 1.3 | 1.0 | 0.8 | 0.6 | 0.6 | 0.5 | 0.4 | 0.5 | 0.4 |
| 58 | 1.6 | 1.7 | 1.2 | 1.1 | 0.8 | 0.7 | 0.5 | 0.5 | 0.4 | 0.4 | 0.4 | 0.4 |
| 59 | 1.3 | 1.4 | 1.0 | 0.9 | 0.7 | 0.6 | 0.4 | 0.4 | 0.3 | 0.3 | 0.3 | 0.3 |
| 60 | 1.0 | 1.1 | 0.8 | 0.7 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 |
| 61 | 0.8 | 0.8 | 0.6 | 0.5 | 0.4 | 0.3 | 0.3 | 0.3 | 0.2 | 0.2 | 0.2 | 0.2 |
| 62 | 0.6 | 0.6 | 0.4 | 0.4 | 0.3 | 0.2 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 |
| 63 | 0.3 | 0.4 | 0.3 | 15.1 | 0.2 | 0.2 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 | 0.1 |
| 64 | 0.2 | 0.2 | 0.1 | 14.7 | 0.1 | 0.1 | 0.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |

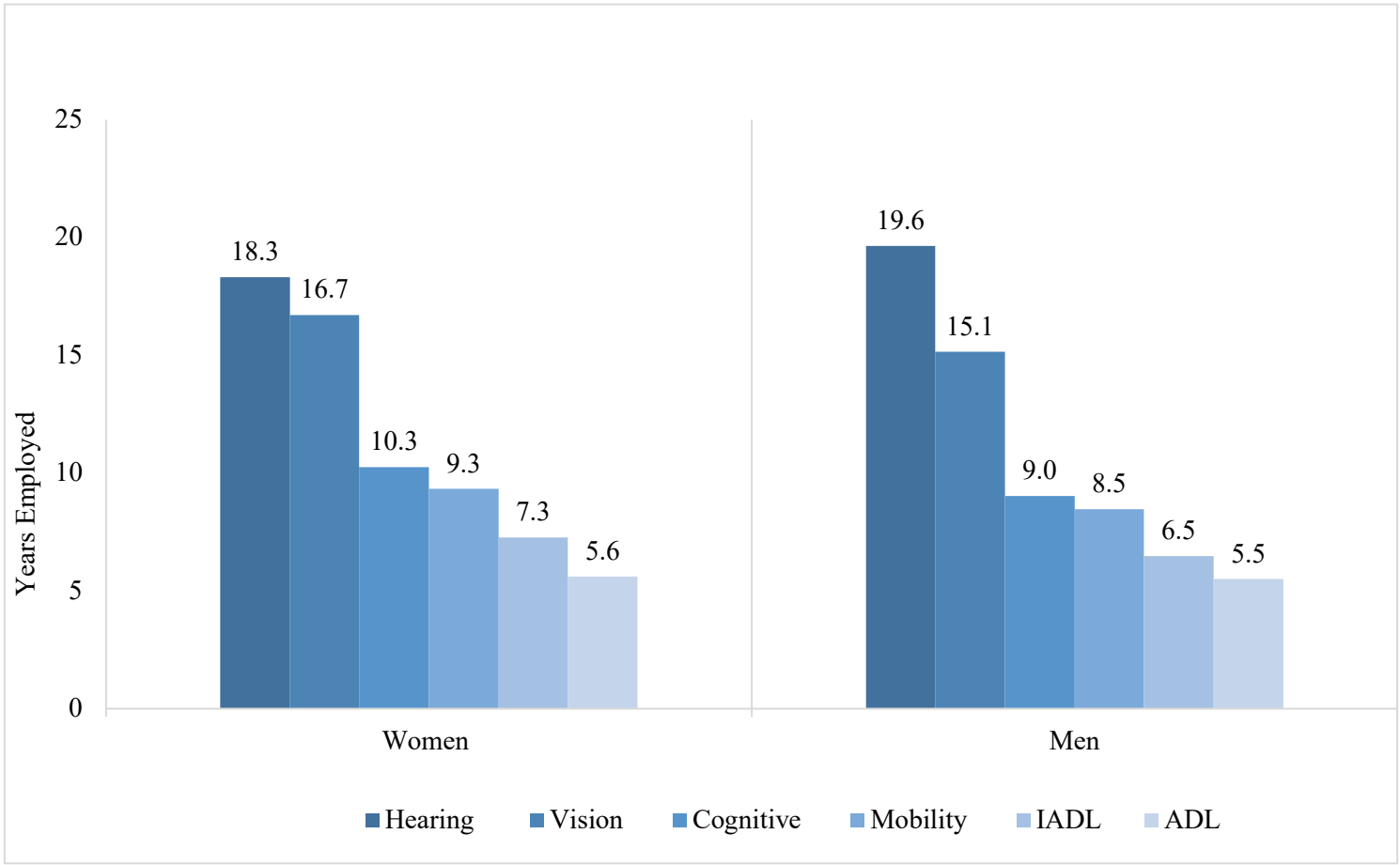
SOURCES: Employment estimates from 2014-2019 American Community Survey (ACS), adults aged 20-64, N = 7,594,126; Mortally estimates from 2020 reports of the Board of Trustees of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds (Trustees Reports)

**Figure 5.1. Employment Longevities (ELs) at age 20**




SOURCES: Employment estimates from 2014-2019 American Community Survey (ACS), adults aged 20-64, N = 7,594,126; Mortally estimates from 2020 reports of the Board of Trustees of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds (Trustees Reports)

**Figure 5.2. Employment Longevities by Gender Disability Type (ELs) at age 20**




SOURCES: Employment estimates from 2014-2019 American Community Survey (ACS), adults aged 20-64, N = 7,594,126; Mortally estimates from 2020 reports of the Board of Trustees of the Old-Age and Survivors Insurance and Disability Insurance Trust Funds (Trustees Reports)

## Lifetable for Women with Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 20 | 1326 | 5 | 0.00377074 | 0.00376364 | 100000 | 377 | 99811 | 3562661 | 35.6 | 0.4363526 | 43553 | 1350448 | 13.5 |
| 1 | 1 | 21 | 1321 | 14 | 0.01059803 | 0.01054217 | 99623 | 1056 | 99095 | 3462849 | 34.8 | 0.4743964 | 47010 | 1306895 | 13.1 |
| 1 | 1 | 22 | 2553 | 21 | 0.00822562 | 0.00819193 | 98567 | 811 | 98162 | 3363754 | 34.1 | 0.4743082 | 46559 | 1259884 | 12.6 |
| 1 | 1 | 23 | 3749 | 29 | 0.0077354 | 0.00770559 | 97756 | 756 | 97378 | 3265592 | 33.4 | 0.490743 | 47788 | 1213325 | 12.1 |
| 1 | 1 | 24 | 5089 | 39 | 0.00766359 | 0.00763433 | 97000 | 743 | 96628 | 3168214 | 32.7 | 0.48681 | 47040 | 1165538 | 11.7 |
| 1 | 1 | 25 | 6559 | 55 | 0.00838542 | 0.00835041 | 96257 | 807 | 95853 | 3071586 | 31.9 | 0.4740668 | 45441 | 1118498 | 11.2 |
| 1 | 1 | 26 | 7794 | 66 | 0.00846805 | 0.00843235 | 95450 | 808 | 95046 | 2975732 | 31.2 | 0.4584071 | 43570 | 1073057 | 10.7 |
| 1 | 1 | 27 | 8771 | 74 | 0.00843689 | 0.00840145 | 94641 | 798 | 94242 | 2880687 | 30.4 | 0.4539879 | 42785 | 1029488 | 10.3 |
| 1 | 1 | 28 | 9793 | 87 | 0.0088839 | 0.00884461 | 93843 | 834 | 93426 | 2786445 | 29.7 | 0.447083 | 41769 | 986703 | 9.9 |
| 1 | 1 | 29 | 10872 | 100 | 0.00919794 | 0.00915583 | 93009 | 855 | 92581 | 2693019 | 29.0 | 0.4422838 | 40947 | 944934 | 9.4 |
| 1 | 1 | 30 | 12048 | 122 | 0.01012616 | 0.01007515 | 92154 | 933 | 91687 | 2600437 | 28.2 | 0.4213786 | 38635 | 903986 | 9.0 |
| 1 | 1 | 31 | 13356 | 148 | 0.01108116 | 0.0110201 | 91221 | 1011 | 90715 | 2508750 | 27.5 | 0.4160021 | 37738 | 865351 | 8.7 |
| 1 | 1 | 32 | 14798 | 170 | 0.01148804 | 0.01142243 | 90210 | 1036 | 89692 | 2418035 | 26.8 | 0.4053396 | 36356 | 827614 | 8.3 |
| 1 | 1 | 33 | 16360 | 193 | 0.01179707 | 0.01172789 | 89173 | 1052 | 88647 | 2328343 | 26.1 | 0.4034681 | 35766 | 791258 | 7.9 |
| 1 | 1 | 34 | 18060 | 218 | 0.01207087 | 0.01199846 | 88121 | 1064 | 87590 | 2239696 | 25.4 | 0.3960989 | 34694 | 755492 | 7.6 |
| 1 | 1 | 35 | 19885 | 241 | 0.01211969 | 0.01204669 | 87058 | 1055 | 86530 | 2152107 | 24.7 | 0.3898406 | 33733 | 720798 | 7.2 |
| 1 | 1 | 36 | 21879 | 260 | 0.01188354 | 0.01181335 | 86003 | 1022 | 85492 | 2065576 | 24.0 | 0.3908403 | 33414 | 687065 | 6.9 |
| 1 | 1 | 37 | 24043 | 293 | 0.0121865 | 0.01211269 | 84981 | 1036 | 84463 | 1980085 | 23.3 | 0.3798988 | 32087 | 653651 | 6.5 |
| 1 | 1 | 38 | 26329 | 326 | 0.01238178 | 0.0123056 | 83945 | 1039 | 83425 | 1895622 | 22.6 | 0.3850322 | 32121 | 621564 | 6.2 |
| 1 | 1 | 39 | 28742 | 354 | 0.01231647 | 0.01224109 | 82906 | 1021 | 82395 | 1812197 | 21.9 | 0.3837809 | 31622 | 589442 | 5.9 |
| 1 | 1 | 40 | 31321 | 386 | 0.012324 | 0.01224852 | 81884 | 1009 | 81380 | 1729802 | 21.1 | 0.3722634 | 30295 | 557821 | 5.6 |
| 1 | 1 | 41 | 34153 | 429 | 0.01256112 | 0.01248272 | 80875 | 1016 | 80367 | 1648422 | 20.4 | 0.371056 | 29821 | 527526 | 5.3 |
| 1 | 1 | 42 | 37226 | 474 | 0.01273304 | 0.01265248 | 79859 | 1017 | 79351 | 1568055 | 19.6 | 0.370362 | 29389 | 497705 | 5.0 |
| 1 | 1 | 43 | 40425 | 523 | 0.01293754 | 0.01285439 | 78843 | 1020 | 78333 | 1488704 | 18.9 | 0.3693938 | 28936 | 468317 | 4.7 |
| 1 | 1 | 44 | 43789 | 581 | 0.01326817 | 0.01318073 | 77823 | 1033 | 77306 | 1410371 | 18.1 | 0.3577334 | 27655 | 439381 | 4.4 |
| 1 | 1 | 45 | 47345 | 630 | 0.01330658 | 0.01321863 | 76790 | 1022 | 76279 | 1333065 | 17.4 | 0.354792 | 27063 | 411726 | 4.1 |
| 1 | 1 | 46 | 51080 | 676 | 0.01323414 | 0.01314715 | 75768 | 1003 | 75267 | 1256786 | 16.6 | 0.352195 | 26509 | 384663 | 3.8 |
| 1 | 1 | 47 | 54988 | 744 | 0.01353022 | 0.01343931 | 74765 | 1012 | 74260 | 1181519 | 15.8 | 0.3605465 | 26774 | 358154 | 3.6 |
| 1 | 1 | 48 | 59063 | 823 | 0.01393427 | 0.01383786 | 73754 | 1028 | 73240 | 1107259 | 15.0 | 0.3545827 | 25970 | 331380 | 3.3 |
| 1 | 1 | 49 | 63280 | 904 | 0.01428571 | 0.0141844 | 72726 | 1039 | 72207 | 1034019 | 14.2 | 0.354638 | 25607 | 305411 | 3.1 |
| 1 | 1 | 50 | 67600 | 958 | 0.0141716 | 0.01407189 | 71687 | 1016 | 71179 | 961813 | 13.4 | 0.3425867 | 24385 | 279803 | 2.8 |
| 1 | 1 | 51 | 73186 | 1,038 | 0.01418304 | 0.01408317 | 70671 | 1002 | 70170 | 890633 | 12.6 | 0.3386065 | 23760 | 255418 | 2.6 |
| 1 | 1 | 52 | 80176 | 1,157 | 0.01443075 | 0.01432737 | 69669 | 1005 | 69166 | 820463 | 11.8 | 0.3327315 | 23014 | 231658 | 2.3 |
| 1 | 1 | 53 | 86952 | 1,273 | 0.01464026 | 0.01453387 | 68664 | 1005 | 68161 | 751297 | 10.9 | 0.3268193 | 22276 | 208644 | 2.1 |
| 1 | 1 | 54 | 93365 | 1,394 | 0.01493065 | 0.01482001 | 67658 | 1010 | 67153 | 683136 | 10.1 | 0.3261421 | 21901 | 186368 | 1.9 |
| 1 | 1 | 55 | 99837 | 1,474 | 0.01476407 | 0.01465588 | 66648 | 984 | 66156 | 615983 | 9.2 | 0.3123637 | 20665 | 164467 | 1.6 |
| 1 | 1 | 56 | 107865 | 1,656 | 0.01535252 | 0.01523557 | 65664 | 1008 | 65160 | 549827 | 8.4 | 0.2995742 | 19520 | 143802 | 1.4 |
| 1 | 1 | 57 | 117582 | 1,878 | 0.01597183 | 0.01584529 | 64656 | 1033 | 64140 | 484667 | 7.5 | 0.2952658 | 18938 | 124282 | 1.2 |
| 1 | 1 | 58 | 127019 | 2,045 | 0.01609995 | 0.01597138 | 63623 | 1024 | 63111 | 420527 | 6.6 | 0.289639 | 18279 | 105343 | 1.1 |
| 1 | 1 | 59 | 136109 | 2,208 | 0.01622229 | 0.01609177 | 62599 | 1015 | 62091 | 357416 | 5.7 | 0.2842713 | 17651 | 87064 | 0.9 |
| 1 | 1 | 60 | 145451 | 2,324 | 0.01597789 | 0.01585125 | 61584 | 984 | 61092 | 295324 | 4.8 | 0.269671 | 16475 | 69413 | 0.7 |
| 1 | 1 | 61 | 154236 | 2,542 | 0.01648124 | 0.01634653 | 60600 | 999 | 60100 | 234233 | 3.9 | 0.2570675 | 15450 | 52939 | 0.5 |
| 1 | 1 | 62 | 162481 | 2,788 | 0.01715893 | 0.01701297 | 59601 | 1023 | 59089 | 174133 | 2.9 | 0.2336006 | 13803 | 37489 | 0.4 |
| 1 | 1 | 63 | 170786 | 3,061 | 0.01792301 | 0.01776382 | 58578 | 1050 | 58053 | 115043 | 2.0 | 0.2132357 | 12379 | 23685 | 0.2 |
| 1 | 1 | 64 | 178459 | 3,338 | 0.01870458 | 0.01853127 | 57528 | 1076 | 56990 | 56990 | 1.0 | 0.1983922 | 11306 | 11306 | 0.1 |

## Lifetable for Men with Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 20 | 1930 | 9 | 0.00466321 | 0.00465236 | 100000 | 466 | 99767 | 3440313 | 34.4 | 0.3354677 | 33469 | 1278448 | 12.8 |
| 0 | 1 | 21 | 1921 | 24 | 0.01249349 | 0.01241593 | 99534 | 1244 | 98912 | 3340547 | 33.6 | 0.37025 | 36622 | 1244980 | 12.4 |
| 0 | 1 | 22 | 3710 | 36 | 0.0097035 | 0.00965665 | 98290 | 954 | 97813 | 3241635 | 33.0 | 0.3872797 | 37881 | 1208357 | 12.1 |
| 0 | 1 | 23 | 5435 | 48 | 0.00883165 | 0.00879282 | 97336 | 860 | 96907 | 3143821 | 32.3 | 0.4010306 | 38863 | 1170476 | 11.7 |
| 0 | 1 | 24 | 7337 | 65 | 0.00885921 | 0.00882014 | 96477 | 855 | 96049 | 3046915 | 31.6 | 0.4091664 | 39300 | 1131614 | 11.3 |
| 0 | 1 | 25 | 9379 | 84 | 0.00895618 | 0.00891625 | 95622 | 856 | 95194 | 2950865 | 30.9 | 0.4035926 | 38420 | 1092314 | 10.9 |
| 0 | 1 | 26 | 10857 | 97 | 0.00893433 | 0.00889459 | 94766 | 847 | 94342 | 2855672 | 30.1 | 0.4038861 | 38104 | 1053894 | 10.5 |
| 0 | 1 | 27 | 11760 | 104 | 0.00884354 | 0.00880461 | 93919 | 831 | 93504 | 2761329 | 29.4 | 0.4057952 | 37943 | 1015791 | 10.2 |
| 0 | 1 | 28 | 12704 | 113 | 0.00889484 | 0.00885545 | 93088 | 828 | 92674 | 2667826 | 28.7 | 0.4026916 | 37319 | 977847 | 9.8 |
| 0 | 1 | 29 | 13698 | 125 | 0.00912542 | 0.00908397 | 92260 | 842 | 91839 | 2575151 | 27.9 | 0.4042096 | 37122 | 940528 | 9.4 |
| 0 | 1 | 30 | 14760 | 152 | 0.0102981 | 0.01024535 | 91418 | 941 | 90948 | 2483312 | 27.2 | 0.4106333 | 37346 | 903406 | 9.0 |
| 0 | 1 | 31 | 15911 | 176 | 0.01106153 | 0.01100069 | 90477 | 1001 | 89977 | 2392364 | 26.4 | 0.3943652 | 35484 | 866059 | 8.7 |
| 0 | 1 | 32 | 17164 | 192 | 0.0111862 | 0.01112399 | 89476 | 1001 | 88976 | 2302387 | 25.7 | 0.3960425 | 35238 | 830576 | 8.3 |
| 0 | 1 | 33 | 18498 | 213 | 0.01151476 | 0.01144884 | 88475 | 1019 | 87966 | 2213412 | 25.0 | 0.387574 | 34093 | 795338 | 8.0 |
| 0 | 1 | 34 | 19909 | 242 | 0.01215531 | 0.01208188 | 87457 | 1063 | 86925 | 2125446 | 24.3 | 0.3853934 | 33500 | 761244 | 7.6 |
| 0 | 1 | 35 | 21380 | 265 | 0.01239476 | 0.01231842 | 86393 | 1071 | 85858 | 2038521 | 23.6 | 0.3839964 | 32969 | 727744 | 7.3 |
| 0 | 1 | 36 | 22924 | 295 | 0.01286861 | 0.01278634 | 85323 | 1098 | 84774 | 1952663 | 22.9 | 0.3869246 | 32801 | 694775 | 6.9 |
| 0 | 1 | 37 | 24550 | 328 | 0.01336049 | 0.01327183 | 84225 | 1125 | 83662 | 1867889 | 22.2 | 0.3879413 | 32456 | 661974 | 6.6 |
| 0 | 1 | 38 | 26257 | 362 | 0.0137868 | 0.01369241 | 83099 | 1146 | 82527 | 1784227 | 21.5 | 0.3743492 | 30894 | 629518 | 6.3 |
| 0 | 1 | 39 | 28063 | 406 | 0.01446745 | 0.01436355 | 81954 | 1186 | 81361 | 1701700 | 20.8 | 0.3812251 | 31017 | 598624 | 6.0 |
| 0 | 1 | 40 | 29981 | 446 | 0.01487609 | 0.01476626 | 80768 | 1202 | 80167 | 1620339 | 20.1 | 0.3646856 | 29236 | 567607 | 5.7 |
| 0 | 1 | 41 | 32069 | 480 | 0.01496773 | 0.01485654 | 79567 | 1191 | 78971 | 1540172 | 19.4 | 0.3614222 | 28542 | 538371 | 5.4 |
| 0 | 1 | 42 | 34370 | 531 | 0.01544952 | 0.01533109 | 78376 | 1211 | 77770 | 1461201 | 18.6 | 0.3833961 | 29817 | 509829 | 5.1 |
| 0 | 1 | 43 | 36806 | 588 | 0.01597566 | 0.01584906 | 77165 | 1233 | 76548 | 1383431 | 17.9 | 0.3752366 | 28724 | 480013 | 4.8 |
| 0 | 1 | 44 | 39414 | 652 | 0.01654235 | 0.01640664 | 75932 | 1256 | 75304 | 1306882 | 17.2 | 0.3963928 | 29850 | 451289 | 4.5 |
| 0 | 1 | 45 | 42167 | 709 | 0.0168141 | 0.01667392 | 74676 | 1256 | 74048 | 1231578 | 16.5 | 0.3846959 | 28486 | 421439 | 4.2 |
| 0 | 1 | 46 | 45041 | 752 | 0.0166959 | 0.01655768 | 73420 | 1226 | 72807 | 1157530 | 15.8 | 0.3785765 | 27563 | 392953 | 3.9 |
| 0 | 1 | 47 | 48062 | 854 | 0.01776872 | 0.01761224 | 72194 | 1283 | 71553 | 1084723 | 15.0 | 0.3773054 | 26997 | 365390 | 3.7 |
| 0 | 1 | 48 | 51250 | 951 | 0.0185561 | 0.01838552 | 70912 | 1316 | 70254 | 1013170 | 14.3 | 0.3752345 | 26362 | 338392 | 3.4 |
| 0 | 1 | 49 | 54566 | 1043 | 0.01911447 | 0.01893351 | 69596 | 1330 | 68931 | 942916 | 13.5 | 0.3722947 | 25663 | 312031 | 3.1 |
| 0 | 1 | 50 | 57980 | 1115 | 0.01923077 | 0.01904762 | 68266 | 1313 | 67609 | 873985 | 12.8 | 0.3721108 | 25158 | 286368 | 2.9 |
| 0 | 1 | 51 | 62562 | 1206 | 0.01927688 | 0.01909285 | 66953 | 1291 | 66307 | 806376 | 12.0 | 0.3639246 | 24131 | 261210 | 2.6 |
| 0 | 1 | 52 | 68499 | 1385 | 0.02021927 | 0.02001691 | 65662 | 1328 | 64998 | 740069 | 11.3 | 0.3678715 | 23911 | 237079 | 2.4 |
| 0 | 1 | 53 | 74316 | 1568 | 0.02109909 | 0.02087883 | 64334 | 1357 | 63656 | 675071 | 10.5 | 0.3620643 | 23047 | 213168 | 2.1 |
| 0 | 1 | 54 | 79797 | 1719 | 0.02154216 | 0.0213126 | 62977 | 1357 | 62299 | 611415 | 9.7 | 0.3510579 | 21870 | 190121 | 1.9 |
| 0 | 1 | 55 | 85428 | 1842 | 0.02156202 | 0.02133204 | 61620 | 1329 | 60956 | 549116 | 8.9 | 0.3427884 | 20895 | 168250 | 1.7 |
| 0 | 1 | 56 | 92928 | 2080 | 0.02238292 | 0.02213519 | 60292 | 1350 | 59617 | 488160 | 8.1 | 0.3349911 | 19971 | 147355 | 1.5 |
| 0 | 1 | 57 | 102397 | 2355 | 0.02299872 | 0.02273726 | 58942 | 1356 | 58264 | 428543 | 7.3 | 0.331521 | 19316 | 127384 | 1.3 |
| 0 | 1 | 58 | 111618 | 2611 | 0.02339228 | 0.02312185 | 57587 | 1347 | 56913 | 370279 | 6.4 | 0.3293161 | 18742 | 108068 | 1.1 |
| 0 | 1 | 59 | 120513 | 2872 | 0.02383145 | 0.02355083 | 56240 | 1340 | 55569 | 313365 | 5.6 | 0.3232602 | 17963 | 89326 | 0.9 |
| 0 | 1 | 60 | 129744 | 3148 | 0.02426316 | 0.02397234 | 54899 | 1332 | 54233 | 257796 | 4.7 | 0.3105578 | 16843 | 71362 | 0.7 |
| 0 | 1 | 61 | 138927 | 3462 | 0.02491956 | 0.02461289 | 53567 | 1335 | 52900 | 203563 | 3.8 | 0.3082606 | 16307 | 54520 | 0.5 |
| 0 | 1 | 62 | 148031 | 3811 | 0.02574461 | 0.02541743 | 52232 | 1345 | 51560 | 150663 | 2.9 | 0.2767299 | 14268 | 38213 | 0.4 |
| 0 | 1 | 63 | 157232 | 4136 | 0.02630508 | 0.02596359 | 50888 | 1339 | 50218 | 99103 | 1.9 | 0.2487516 | 12492 | 23945 | 0.2 |
| 0 | 1 | 64 | 165567 | 4441 | 0.02682298 | 0.026468 | 49549 | 1329 | 48885 | 48885 | 1.0 | 0.2342835 | 11453 | 11453 | 0.1 |

## Lifetable for Women without Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 0 | 20 | 1000000 | 391 | 0.000391 | 0.000390924 | 100000 | 39 | 99980 | 4419024 | 44.2 | 0.6077668 | 60765 | 3331446 | 33.3 |
| 1 | 0 | 21 | 998279 | 429 | 0.00042974 | 0.000429647 | 99961 | 43 | 99939 | 4319044 | 43.2 | 0.6630176 | 66262 | 3270681 | 32.7 |
| 1 | 0 | 22 | 996591 | 465 | 0.000466591 | 0.000466482 | 99918 | 47 | 99895 | 4219104 | 42.2 | 0.711608 | 71086 | 3204420 | 32.0 |
| 1 | 0 | 23 | 994885 | 492 | 0.00049453 | 0.000494407 | 99871 | 49 | 99847 | 4119209 | 41.2 | 0.7607932 | 75963 | 3133334 | 31.3 |
| 1 | 0 | 24 | 992983 | 514 | 0.000517632 | 0.000517498 | 99822 | 52 | 99796 | 4019363 | 40.3 | 0.7784734 | 77689 | 3057371 | 30.6 |
| 1 | 0 | 25 | 990883 | 527 | 0.000531849 | 0.000531707 | 99770 | 53 | 99744 | 3919567 | 39.3 | 0.7869871 | 78497 | 2979682 | 29.8 |
| 1 | 0 | 26 | 988887 | 548 | 0.000554158 | 0.000554005 | 99717 | 55 | 99690 | 3819823 | 38.3 | 0.7940618 | 79160 | 2901185 | 29.0 |
| 1 | 0 | 27 | 987019 | 577 | 0.000584589 | 0.000584418 | 99662 | 58 | 99633 | 3720133 | 37.3 | 0.796607 | 79368 | 2822026 | 28.2 |
| 1 | 0 | 28 | 985021 | 609 | 0.000618261 | 0.00061807 | 99604 | 62 | 99573 | 3620501 | 36.3 | 0.7933458 | 78996 | 2742658 | 27.4 |
| 1 | 0 | 29 | 982885 | 646 | 0.000657249 | 0.000657033 | 99542 | 65 | 99509 | 3520928 | 35.4 | 0.7922465 | 78836 | 2663662 | 26.6 |
| 1 | 0 | 30 | 980593 | 676 | 0.000689379 | 0.000689141 | 99477 | 69 | 99442 | 3421418 | 34.4 | 0.7855833 | 78120 | 2584826 | 25.8 |
| 1 | 0 | 31 | 978103 | 699 | 0.000714649 | 0.000714393 | 99408 | 71 | 99373 | 3321976 | 33.4 | 0.78781 | 78287 | 2506706 | 25.1 |
| 1 | 0 | 32 | 975416 | 720 | 0.000738147 | 0.000737874 | 99337 | 73 | 99300 | 3222603 | 32.4 | 0.7848353 | 77934 | 2428419 | 24.3 |
| 1 | 0 | 33 | 972562 | 731 | 0.000751623 | 0.000751341 | 99264 | 75 | 99226 | 3123303 | 31.5 | 0.7859011 | 77982 | 2350484 | 23.5 |
| 1 | 0 | 34 | 969528 | 733 | 0.000756038 | 0.000755752 | 99189 | 75 | 99152 | 3024077 | 30.5 | 0.7821577 | 77552 | 2272502 | 22.7 |
| 1 | 0 | 35 | 966320 | 739 | 0.000764757 | 0.000764465 | 99114 | 76 | 99076 | 2924925 | 29.5 | 0.7841063 | 77686 | 2194950 | 21.9 |
| 1 | 0 | 36 | 962908 | 754 | 0.000783045 | 0.000782738 | 99038 | 78 | 99000 | 2825849 | 28.5 | 0.7859838 | 77812 | 2117264 | 21.2 |
| 1 | 0 | 37 | 959280 | 751 | 0.000782879 | 0.000782572 | 98961 | 77 | 98922 | 2726849 | 27.6 | 0.7860735 | 77760 | 2039452 | 20.4 |
| 1 | 0 | 38 | 955487 | 746 | 0.000780754 | 0.000780449 | 98883 | 77 | 98845 | 2627927 | 26.6 | 0.7892342 | 78012 | 1961692 | 19.6 |
| 1 | 0 | 39 | 951538 | 748 | 0.000786096 | 0.000785787 | 98806 | 78 | 98767 | 2529082 | 25.6 | 0.7924889 | 78272 | 1883680 | 18.8 |
| 1 | 0 | 40 | 947388 | 751 | 0.000792706 | 0.000792392 | 98728 | 78 | 98689 | 2430315 | 24.6 | 0.7944227 | 78401 | 1805408 | 18.1 |
| 1 | 0 | 41 | 942922 | 753 | 0.000798581 | 0.000798263 | 98650 | 79 | 98611 | 2331626 | 23.6 | 0.8016897 | 79055 | 1727007 | 17.3 |
| 1 | 0 | 42 | 938144 | 762 | 0.000812242 | 0.000811912 | 98571 | 80 | 98531 | 2233015 | 22.7 | 0.8021033 | 79032 | 1647952 | 16.5 |
| 1 | 0 | 43 | 933168 | 776 | 0.000831576 | 0.00083123 | 98491 | 82 | 98450 | 2134484 | 21.7 | 0.8074418 | 79493 | 1568920 | 15.7 |
| 1 | 0 | 44 | 927950 | 793 | 0.000854572 | 0.000854207 | 98409 | 84 | 98367 | 2036033 | 20.7 | 0.8071838 | 79401 | 1489427 | 14.9 |
| 1 | 0 | 45 | 922466 | 828 | 0.000897594 | 0.000897191 | 98325 | 88 | 98281 | 1937666 | 19.7 | 0.807691 | 79381 | 1410026 | 14.1 |
| 1 | 0 | 46 | 916681 | 880 | 0.000959985 | 0.000959524 | 98237 | 94 | 98190 | 1839385 | 18.7 | 0.8104046 | 79574 | 1330645 | 13.3 |
| 1 | 0 | 47 | 910577 | 933 | 0.001024625 | 0.0010241 | 98143 | 101 | 98092 | 1741195 | 17.7 | 0.8094487 | 79401 | 1251072 | 12.5 |
| 1 | 0 | 48 | 904188 | 1007 | 0.001113706 | 0.001113087 | 98042 | 109 | 97988 | 1643102 | 16.8 | 0.8052735 | 78907 | 1171671 | 11.7 |
| 1 | 0 | 49 | 897527 | 1100 | 0.00122559 | 0.001224839 | 97933 | 120 | 97873 | 1545115 | 15.8 | 0.8059478 | 78881 | 1092764 | 10.9 |
| 1 | 0 | 50 | 890632 | 1229 | 0.001379919 | 0.001378968 | 97813 | 135 | 97745 | 1447242 | 14.8 | 0.8031752 | 78507 | 1013883 | 10.1 |
| 1 | 0 | 51 | 882309 | 1334 | 0.001511942 | 0.0015108 | 97678 | 148 | 97604 | 1349496 | 13.8 | 0.8014102 | 78221 | 935377 | 9.4 |
| 1 | 0 | 52 | 872382 | 1414 | 0.00162085 | 0.001619537 | 97530 | 158 | 97451 | 1251892 | 12.8 | 0.7955033 | 77523 | 857156 | 8.6 |
| 1 | 0 | 53 | 862483 | 1508 | 0.00174844 | 0.001746913 | 97372 | 170 | 97287 | 1154441 | 11.9 | 0.7912294 | 76976 | 779633 | 7.8 |
| 1 | 0 | 54 | 852771 | 1602 | 0.001878582 | 0.001876819 | 97202 | 183 | 97111 | 1057154 | 10.9 | 0.7855608 | 76286 | 702656 | 7.0 |
| 1 | 0 | 55 | 842833 | 1765 | 0.002094128 | 0.002091937 | 97019 | 203 | 96918 | 960043 | 9.9 | 0.7688844 | 74519 | 626370 | 6.3 |
| 1 | 0 | 56 | 831101 | 1824 | 0.002194679 | 0.002192273 | 96816 | 212 | 96710 | 863125 | 8.9 | 0.7544504 | 72963 | 551852 | 5.5 |
| 1 | 0 | 57 | 817456 | 1786 | 0.002184827 | 0.002182443 | 96604 | 211 | 96498 | 766415 | 7.9 | 0.7376017 | 71177 | 478889 | 4.8 |
| 1 | 0 | 58 | 803947 | 1727 | 0.002148152 | 0.002145847 | 96393 | 207 | 96289 | 669917 | 6.9 | 0.7221146 | 69532 | 407711 | 4.1 |
| 1 | 0 | 59 | 790695 | 1628 | 0.002058948 | 0.002056831 | 96186 | 198 | 96087 | 573628 | 6.0 | 0.6992478 | 67188 | 338180 | 3.4 |
| 1 | 0 | 60 | 777190 | 1579 | 0.002031678 | 0.002029616 | 95988 | 195 | 95890 | 477541 | 5.0 | 0.6623589 | 63514 | 270991 | 2.7 |
| 1 | 0 | 61 | 764111 | 1484 | 0.001942126 | 0.001940242 | 95793 | 186 | 95700 | 381651 | 4.0 | 0.6307624 | 60364 | 207478 | 2.1 |
| 1 | 0 | 62 | 751400 | 1455 | 0.001936385 | 0.001934512 | 95607 | 185 | 95514 | 285952 | 3.0 | 0.5677786 | 54231 | 147114 | 1.5 |
| 1 | 0 | 63 | 738463 | 1519 | 0.002056975 | 0.002054862 | 95421 | 196 | 95323 | 190438 | 2.0 | 0.5110155 | 48712 | 92883 | 0.9 |
| 1 | 0 | 64 | 725951 | 1687 | 0.002323848 | 0.002321151 | 95225 | 221 | 95114 | 95114 | 1.0 | 0.464404 | 44172 | 44172 | 0.4 |

## Lifetable for Men without Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 0 | 20 | 1000000 | 1037 | 0.001037 | 0.001036463 | 100000 | 104 | 99948 | 4327857 | 43.3 | 0.6002254 | 59991 | 3531386 | 35.3 |
| 0 | 0 | 21 | 997028 | 1161 | 0.001164461 | 0.001163783 | 99896 | 116 | 99838 | 4227909 | 42.3 | 0.6543366 | 65328 | 3471394 | 34.7 |
| 0 | 0 | 22 | 994038 | 1263 | 0.001270575 | 0.001269769 | 99780 | 127 | 99717 | 4128071 | 41.4 | 0.7078064 | 70580 | 3406067 | 34.1 |
| 0 | 0 | 23 | 990986 | 1331 | 0.001343107 | 0.001342205 | 99653 | 134 | 99586 | 4028354 | 40.4 | 0.7619597 | 75881 | 3335486 | 33.4 |
| 0 | 0 | 24 | 987658 | 1371 | 0.001388132 | 0.00138717 | 99519 | 138 | 99450 | 3928768 | 39.5 | 0.7897254 | 78538 | 3259606 | 32.6 |
| 0 | 0 | 25 | 984083 | 1401 | 0.00142366 | 0.001422648 | 99381 | 141 | 99310 | 3829317 | 38.5 | 0.8090649 | 80349 | 3181067 | 31.8 |
| 0 | 0 | 26 | 980860 | 1438 | 0.00146606 | 0.001464987 | 99240 | 145 | 99167 | 3730007 | 37.6 | 0.8177231 | 81091 | 3100719 | 31.0 |
| 0 | 0 | 27 | 978024 | 1480 | 0.001513255 | 0.001512111 | 99094 | 150 | 99019 | 3630840 | 36.6 | 0.8315482 | 82339 | 3019628 | 30.2 |
| 0 | 0 | 28 | 975055 | 1522 | 0.001560938 | 0.00155972 | 98944 | 154 | 98867 | 3531821 | 35.7 | 0.8373366 | 82785 | 2937288 | 29.4 |
| 0 | 0 | 29 | 971955 | 1561 | 0.001606041 | 0.001604753 | 98790 | 159 | 98710 | 3432954 | 34.8 | 0.8435874 | 83271 | 2854503 | 28.5 |
| 0 | 0 | 30 | 968729 | 1582 | 0.001633068 | 0.001631735 | 98631 | 161 | 98551 | 3334243 | 33.8 | 0.8481525 | 83586 | 2771232 | 27.7 |
| 0 | 0 | 31 | 965347 | 1598 | 0.001655363 | 0.001653994 | 98470 | 163 | 98389 | 3235692 | 32.9 | 0.8509069 | 83720 | 2687646 | 26.9 |
| 0 | 0 | 32 | 961808 | 1617 | 0.001681209 | 0.001679797 | 98307 | 165 | 98224 | 3137304 | 31.9 | 0.8584881 | 84325 | 2603927 | 26.0 |
| 0 | 0 | 33 | 958153 | 1622 | 0.00169284 | 0.001691409 | 98142 | 166 | 98059 | 3039079 | 31.0 | 0.8571443 | 84050 | 2519602 | 25.2 |
| 0 | 0 | 34 | 954384 | 1615 | 0.001692191 | 0.00169076 | 97976 | 166 | 97893 | 2941021 | 30.0 | 0.8587394 | 84064 | 2435552 | 24.4 |
| 0 | 0 | 35 | 950521 | 1620 | 0.001704328 | 0.001702877 | 97810 | 167 | 97727 | 2843128 | 29.1 | 0.8565666 | 83709 | 2351487 | 23.5 |
| 0 | 0 | 36 | 946546 | 1616 | 0.00170726 | 0.001705804 | 97643 | 167 | 97560 | 2745401 | 28.1 | 0.8606675 | 83967 | 2267778 | 22.7 |
| 0 | 0 | 37 | 942473 | 1598 | 0.001695539 | 0.001694103 | 97476 | 165 | 97394 | 2647842 | 27.2 | 0.8654327 | 84288 | 2183812 | 21.8 |
| 0 | 0 | 38 | 938307 | 1563 | 0.001665766 | 0.00166438 | 97311 | 162 | 97230 | 2550448 | 26.2 | 0.8645471 | 84060 | 2099524 | 21.0 |
| 0 | 0 | 39 | 934045 | 1510 | 0.001616624 | 0.001615319 | 97149 | 157 | 97071 | 2453218 | 25.3 | 0.8678441 | 84242 | 2015464 | 20.2 |
| 0 | 0 | 40 | 929680 | 1469 | 0.001580114 | 0.001578866 | 96992 | 153 | 96915 | 2356147 | 24.3 | 0.8692138 | 84240 | 1931222 | 19.3 |
| 0 | 0 | 41 | 925123 | 1453 | 0.001570602 | 0.00156937 | 96839 | 152 | 96763 | 2259232 | 23.3 | 0.874921 | 84660 | 1846981 | 18.5 |
| 0 | 0 | 42 | 920346 | 1441 | 0.001565716 | 0.001564491 | 96687 | 151 | 96611 | 2162469 | 22.4 | 0.8753354 | 84567 | 1762322 | 17.6 |
| 0 | 0 | 43 | 915398 | 1450 | 0.00158401 | 0.001582757 | 96535 | 153 | 96459 | 2065858 | 21.4 | 0.8771891 | 84613 | 1677755 | 16.8 |
| 0 | 0 | 44 | 910233 | 1480 | 0.001625957 | 0.001624637 | 96382 | 157 | 96304 | 1969399 | 20.4 | 0.8790293 | 84654 | 1593142 | 15.9 |
| 0 | 0 | 45 | 904820 | 1536 | 0.001697575 | 0.001696136 | 96226 | 163 | 96144 | 1873095 | 19.5 | 0.8767648 | 84296 | 1508488 | 15.1 |
| 0 | 0 | 46 | 899152 | 1626 | 0.001808371 | 0.001806737 | 96062 | 174 | 95975 | 1776951 | 18.5 | 0.877025 | 84173 | 1424192 | 14.2 |
| 0 | 0 | 47 | 893176 | 1690 | 0.001892124 | 0.001890336 | 95889 | 181 | 95798 | 1680975 | 17.5 | 0.8805128 | 84351 | 1340019 | 13.4 |
| 0 | 0 | 48 | 886891 | 1797 | 0.002026179 | 0.002024128 | 95707 | 194 | 95610 | 1585177 | 16.6 | 0.8764488 | 83797 | 1255668 | 12.6 |
| 0 | 0 | 49 | 880302 | 1942 | 0.002206061 | 0.00220363 | 95513 | 211 | 95408 | 1489567 | 15.6 | 0.8781832 | 83786 | 1171870 | 11.7 |
| 0 | 0 | 50 | 873415 | 2124 | 0.002431834 | 0.00242888 | 95303 | 232 | 95187 | 1394159 | 14.6 | 0.8707892 | 82888 | 1088085 | 10.9 |
| 0 | 0 | 51 | 865103 | 2302 | 0.002660955 | 0.002657419 | 95071 | 253 | 94944 | 1298973 | 13.7 | 0.8675193 | 82366 | 1005197 | 10.1 |
| 0 | 0 | 52 | 855157 | 2417 | 0.002826382 | 0.002822393 | 94818 | 268 | 94684 | 1204028 | 12.7 | 0.8624192 | 81657 | 922831 | 9.2 |
| 0 | 0 | 53 | 845083 | 2551 | 0.003018638 | 0.003014089 | 94550 | 285 | 94407 | 1109344 | 11.7 | 0.8596657 | 81159 | 841174 | 8.4 |
| 0 | 0 | 54 | 835031 | 2734 | 0.00327413 | 0.003268779 | 94264 | 309 | 94110 | 1014937 | 10.8 | 0.8574191 | 80692 | 760016 | 7.6 |
| 0 | 0 | 55 | 824564 | 2967 | 0.003598265 | 0.003591803 | 93956 | 338 | 93787 | 920827 | 9.8 | 0.8399704 | 78778 | 679324 | 6.8 |
| 0 | 0 | 56 | 811900 | 3091 | 0.003807119 | 0.003799886 | 93618 | 356 | 93440 | 827040 | 8.8 | 0.8296945 | 77526 | 600546 | 6.0 |
| 0 | 0 | 57 | 796905 | 3155 | 0.003959067 | 0.003951245 | 93261 | 369 | 93077 | 733601 | 7.9 | 0.8156336 | 75916 | 523019 | 5.2 |
| 0 | 0 | 58 | 781831 | 3201 | 0.004094235 | 0.004085871 | 92892 | 380 | 92702 | 640524 | 6.9 | 0.8041157 | 74543 | 447103 | 4.5 |
| 0 | 0 | 59 | 766805 | 3221 | 0.004200546 | 0.004191743 | 92512 | 389 | 92317 | 547822 | 5.9 | 0.7883804 | 72781 | 372560 | 3.7 |
| 0 | 0 | 60 | 751200 | 3233 | 0.004303781 | 0.004294539 | 92123 | 396 | 91925 | 455505 | 4.9 | 0.7528469 | 69205 | 299779 | 3.0 |
| 0 | 0 | 61 | 735274 | 3238 | 0.0044038 | 0.004394125 | 91727 | 404 | 91525 | 363580 | 4.0 | 0.7250172 | 66357 | 230573 | 2.3 |
| 0 | 0 | 62 | 718984 | 3248 | 0.004517486 | 0.004507305 | 91323 | 413 | 91116 | 272055 | 3.0 | 0.6590281 | 60048 | 164216 | 1.6 |
| 0 | 0 | 63 | 702323 | 3344 | 0.004761342 | 0.004750034 | 90910 | 433 | 90694 | 180939 | 2.0 | 0.5987521 | 54303 | 104168 | 1.0 |
| 0 | 0 | 64 | 686181 | 3522 | 0.005132757 | 0.005119618 | 90477 | 464 | 90245 | 90245 | 1.0 | 0.5525493 | 49865 | 49865 | 0.5 |

## Lifetable for Women with Hearing Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 20 | 1326 | 5 | 0.003770739 | 0.003763643 | 100000 | 377 | 99811 | 3562661 | 35.6 | 0.4555813 | 45472 | 1830414 | 18.3 |
| 1 | 1 | 21 | 1321 | 14 | 0.010598032 | 0.010542169 | 99623 | 1056 | 99095 | 3462849 | 34.8 | 0.503536 | 49898 | 1784941 | 17.8 |
| 1 | 1 | 22 | 2553 | 21 | 0.008225617 | 0.008191925 | 98567 | 811 | 98162 | 3363754 | 34.1 | 0.5335024 | 52370 | 1735043 | 17.4 |
| 1 | 1 | 23 | 3749 | 29 | 0.007735396 | 0.007705593 | 97756 | 756 | 97378 | 3265592 | 33.4 | 0.6039977 | 58816 | 1682674 | 16.8 |
| 1 | 1 | 24 | 5089 | 39 | 0.007663588 | 0.007634335 | 97000 | 743 | 96628 | 3168214 | 32.7 | 0.5722197 | 55293 | 1623858 | 16.2 |
| 1 | 1 | 25 | 6559 | 55 | 0.008385425 | 0.008350414 | 96257 | 807 | 95853 | 3071586 | 31.9 | 0.5642848 | 54089 | 1568565 | 15.7 |
| 1 | 1 | 26 | 7794 | 66 | 0.008468052 | 0.00843235 | 95450 | 808 | 95046 | 2975732 | 31.2 | 0.5751657 | 54667 | 1514476 | 15.1 |
| 1 | 1 | 27 | 8771 | 74 | 0.008436894 | 0.008401453 | 94641 | 798 | 94242 | 2880687 | 30.4 | 0.5570531 | 52498 | 1459810 | 14.6 |
| 1 | 1 | 28 | 9793 | 87 | 0.008883897 | 0.008844609 | 93843 | 834 | 93426 | 2786445 | 29.7 | 0.5796472 | 54154 | 1407312 | 14.1 |
| 1 | 1 | 29 | 10872 | 100 | 0.00919794 | 0.009155832 | 93009 | 855 | 92581 | 2693019 | 29.0 | 0.5291032 | 48985 | 1353158 | 13.5 |
| 1 | 1 | 30 | 12048 | 122 | 0.010126162 | 0.010075151 | 92154 | 933 | 91687 | 2600437 | 28.2 | 0.5340549 | 48966 | 1304172 | 13.0 |
| 1 | 1 | 31 | 13356 | 148 | 0.011081162 | 0.011020104 | 91221 | 1011 | 90715 | 2508750 | 27.5 | 0.55932 | 50739 | 1255206 | 12.6 |
| 1 | 1 | 32 | 14798 | 170 | 0.011488039 | 0.011422428 | 90210 | 1036 | 89692 | 2418035 | 26.8 | 0.5282196 | 47377 | 1204468 | 12.0 |
| 1 | 1 | 33 | 16360 | 193 | 0.011797066 | 0.011727889 | 89173 | 1052 | 88647 | 2328343 | 26.1 | 0.5523485 | 48964 | 1157091 | 11.6 |
| 1 | 1 | 34 | 18060 | 218 | 0.012070875 | 0.011998459 | 88121 | 1064 | 87590 | 2239696 | 25.4 | 0.4914278 | 43044 | 1108127 | 11.1 |
| 1 | 1 | 35 | 19885 | 241 | 0.012119688 | 0.012046687 | 87058 | 1055 | 86530 | 2152107 | 24.7 | 0.5515526 | 47726 | 1065083 | 10.7 |
| 1 | 1 | 36 | 21879 | 260 | 0.011883541 | 0.011813349 | 86003 | 1022 | 85492 | 2065576 | 24.0 | 0.5308803 | 45386 | 1017357 | 10.2 |
| 1 | 1 | 37 | 24043 | 293 | 0.012186499 | 0.012112694 | 84981 | 1036 | 84463 | 1980085 | 23.3 | 0.5378748 | 45430 | 971971 | 9.7 |
| 1 | 1 | 38 | 26329 | 326 | 0.012381784 | 0.012305602 | 83945 | 1039 | 83425 | 1895622 | 22.6 | 0.5575425 | 46513 | 926541 | 9.3 |
| 1 | 1 | 39 | 28742 | 354 | 0.012316471 | 0.012241087 | 82906 | 1021 | 82395 | 1812197 | 21.9 | 0.5376508 | 44300 | 880027 | 8.8 |
| 1 | 1 | 40 | 31321 | 386 | 0.012324 | 0.012248524 | 81884 | 1009 | 81380 | 1729802 | 21.1 | 0.5250589 | 42729 | 835728 | 8.4 |
| 1 | 1 | 41 | 34153 | 429 | 0.012561122 | 0.012482724 | 80875 | 1016 | 80367 | 1648422 | 20.4 | 0.5708428 | 45877 | 792998 | 7.9 |
| 1 | 1 | 42 | 37226 | 474 | 0.012733036 | 0.012652484 | 79859 | 1017 | 79351 | 1568055 | 19.6 | 0.5643954 | 44785 | 747121 | 7.5 |
| 1 | 1 | 43 | 40425 | 523 | 0.012937539 | 0.012854387 | 78843 | 1020 | 78333 | 1488704 | 18.9 | 0.526208 | 41219 | 702336 | 7.0 |
| 1 | 1 | 44 | 43789 | 581 | 0.013268172 | 0.01318073 | 77823 | 1033 | 77306 | 1410371 | 18.1 | 0.4984733 | 38535 | 661117 | 6.6 |
| 1 | 1 | 45 | 47345 | 630 | 0.013306579 | 0.013218632 | 76790 | 1022 | 76279 | 1333065 | 17.4 | 0.5520481 | 42110 | 622582 | 6.2 |
| 1 | 1 | 46 | 51080 | 676 | 0.013234143 | 0.013147147 | 75768 | 1003 | 75267 | 1256786 | 16.6 | 0.5237797 | 39423 | 580472 | 5.8 |
| 1 | 1 | 47 | 54988 | 744 | 0.013530225 | 0.013439306 | 74765 | 1012 | 74260 | 1181519 | 15.8 | 0.5076841 | 37700 | 541049 | 5.4 |
| 1 | 1 | 48 | 59063 | 823 | 0.013934274 | 0.013837863 | 73754 | 1028 | 73240 | 1107259 | 15.0 | 0.5121028 | 37506 | 503348 | 5.0 |
| 1 | 1 | 49 | 63280 | 904 | 0.014285714 | 0.014184397 | 72726 | 1039 | 72207 | 1034019 | 14.2 | 0.5349081 | 38624 | 465842 | 4.7 |
| 1 | 1 | 50 | 67600 | 958 | 0.014171598 | 0.014071887 | 71687 | 1016 | 71179 | 961813 | 13.4 | 0.5293131 | 37676 | 427218 | 4.3 |
| 1 | 1 | 51 | 73186 | 1,038 | 0.01418304 | 0.014083169 | 70671 | 1002 | 70170 | 890633 | 12.6 | 0.5205128 | 36524 | 389542 | 3.9 |
| 1 | 1 | 52 | 80176 | 1,157 | 0.014430752 | 0.014327375 | 69669 | 1005 | 69166 | 820463 | 11.8 | 0.4917701 | 34014 | 353017 | 3.5 |
| 1 | 1 | 53 | 86952 | 1,273 | 0.014640261 | 0.014533871 | 68664 | 1005 | 68161 | 751297 | 10.9 | 0.5031735 | 34297 | 319004 | 3.2 |
| 1 | 1 | 54 | 93365 | 1,394 | 0.014930649 | 0.014820012 | 67658 | 1010 | 67153 | 683136 | 10.1 | 0.5003125 | 33598 | 284707 | 2.8 |
| 1 | 1 | 55 | 99837 | 1,474 | 0.014764065 | 0.014655875 | 66648 | 984 | 66156 | 615983 | 9.2 | 0.478571 | 31660 | 251109 | 2.5 |
| 1 | 1 | 56 | 107865 | 1,656 | 0.015352524 | 0.015235572 | 65664 | 1008 | 65160 | 549827 | 8.4 | 0.4629573 | 30166 | 219449 | 2.2 |
| 1 | 1 | 57 | 117582 | 1,878 | 0.015971832 | 0.015845293 | 64656 | 1033 | 64140 | 484667 | 7.5 | 0.4657537 | 29873 | 189282 | 1.9 |
| 1 | 1 | 58 | 127019 | 2,045 | 0.016099954 | 0.015971384 | 63623 | 1024 | 63111 | 420527 | 6.6 | 0.4524871 | 28557 | 159409 | 1.6 |
| 1 | 1 | 59 | 136109 | 2,208 | 0.016222292 | 0.01609177 | 62599 | 1015 | 62091 | 357416 | 5.7 | 0.4309885 | 26761 | 130852 | 1.3 |
| 1 | 1 | 60 | 145451 | 2,324 | 0.015977889 | 0.015851255 | 61584 | 984 | 61092 | 295324 | 4.8 | 0.4088197 | 24975 | 104091 | 1.0 |
| 1 | 1 | 61 | 154236 | 2,542 | 0.016481237 | 0.016346531 | 60600 | 999 | 60100 | 234233 | 3.9 | 0.393395 | 23643 | 79116 | 0.8 |
| 1 | 1 | 62 | 162481 | 2,788 | 0.017158929 | 0.017012967 | 59601 | 1023 | 59089 | 174133 | 2.9 | 0.3559279 | 21032 | 55473 | 0.6 |
| 1 | 1 | 63 | 170786 | 3,061 | 0.017923015 | 0.017763824 | 58578 | 1050 | 58053 | 115043 | 2.0 | 0.3123464 | 18133 | 34441 | 0.3 |
| 1 | 1 | 64 | 178459 | 3,338 | 0.018704576 | 0.018531267 | 57528 | 1076 | 56990 | 56990 | 1.0 | 0.2861663 | 16309 | 16309 | 0.2 |

## Lifetable for Women with Vision Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 20 | 1326 | 5 | 0.003770739 | 0.003763643 | 100000 | 377 | 99811 | 3562661 | 35.6 | 0.4922417 | 49131 | 1671491 | 16.7 |
| 1 | 1 | 21 | 1321 | 14 | 0.010598032 | 0.010542169 | 99623 | 1056 | 99095 | 3462849 | 34.8 | 0.5491516 | 54418 | 1622360 | 16.2 |
| 1 | 1 | 22 | 2553 | 21 | 0.008225617 | 0.008191925 | 98567 | 811 | 98162 | 3363754 | 34.1 | 0.5733971 | 56286 | 1567942 | 15.7 |
| 1 | 1 | 23 | 3749 | 29 | 0.007735396 | 0.007705593 | 97756 | 756 | 97378 | 3265592 | 33.4 | 0.5435214 | 52927 | 1511656 | 15.1 |
| 1 | 1 | 24 | 5089 | 39 | 0.007663588 | 0.007634335 | 97000 | 743 | 96628 | 3168214 | 32.7 | 0.5948189 | 57476 | 1458729 | 14.6 |
| 1 | 1 | 25 | 6559 | 55 | 0.008385425 | 0.008350414 | 96257 | 807 | 95853 | 3071586 | 31.9 | 0.5737314 | 54994 | 1401252 | 14.0 |
| 1 | 1 | 26 | 7794 | 66 | 0.008468052 | 0.00843235 | 95450 | 808 | 95046 | 2975732 | 31.2 | 0.5876031 | 55849 | 1346258 | 13.5 |
| 1 | 1 | 27 | 8771 | 74 | 0.008436894 | 0.008401453 | 94641 | 798 | 94242 | 2880687 | 30.4 | 0.5528842 | 52105 | 1290409 | 12.9 |
| 1 | 1 | 28 | 9793 | 87 | 0.008883897 | 0.008844609 | 93843 | 834 | 93426 | 2786445 | 29.7 | 0.5442792 | 50850 | 1238304 | 12.4 |
| 1 | 1 | 29 | 10872 | 100 | 0.00919794 | 0.009155832 | 93009 | 855 | 92581 | 2693019 | 29.0 | 0.5294385 | 49016 | 1187454 | 11.9 |
| 1 | 1 | 30 | 12048 | 122 | 0.010126162 | 0.010075151 | 92154 | 933 | 91687 | 2600437 | 28.2 | 0.5334523 | 48911 | 1138438 | 11.4 |
| 1 | 1 | 31 | 13356 | 148 | 0.011081162 | 0.011020104 | 91221 | 1011 | 90715 | 2508750 | 27.5 | 0.553591 | 50219 | 1089528 | 10.9 |
| 1 | 1 | 32 | 14798 | 170 | 0.011488039 | 0.011422428 | 90210 | 1036 | 89692 | 2418035 | 26.8 | 0.4846843 | 43472 | 1039308 | 10.4 |
| 1 | 1 | 33 | 16360 | 193 | 0.011797066 | 0.011727889 | 89173 | 1052 | 88647 | 2328343 | 26.1 | 0.5259613 | 46625 | 995836 | 10.0 |
| 1 | 1 | 34 | 18060 | 218 | 0.012070875 | 0.011998459 | 88121 | 1064 | 87590 | 2239696 | 25.4 | 0.5085486 | 44544 | 949211 | 9.5 |
| 1 | 1 | 35 | 19885 | 241 | 0.012119688 | 0.012046687 | 87058 | 1055 | 86530 | 2152107 | 24.7 | 0.5071761 | 43886 | 904668 | 9.0 |
| 1 | 1 | 36 | 21879 | 260 | 0.011883541 | 0.011813349 | 86003 | 1022 | 85492 | 2065576 | 24.0 | 0.4932243 | 42167 | 860782 | 8.6 |
| 1 | 1 | 37 | 24043 | 293 | 0.012186499 | 0.012112694 | 84981 | 1036 | 84463 | 1980085 | 23.3 | 0.4974247 | 42014 | 818615 | 8.2 |
| 1 | 1 | 38 | 26329 | 326 | 0.012381784 | 0.012305602 | 83945 | 1039 | 83425 | 1895622 | 22.6 | 0.470119 | 39220 | 776601 | 7.8 |
| 1 | 1 | 39 | 28742 | 354 | 0.012316471 | 0.012241087 | 82906 | 1021 | 82395 | 1812197 | 21.9 | 0.501387 | 41312 | 737382 | 7.4 |
| 1 | 1 | 40 | 31321 | 386 | 0.012324 | 0.012248524 | 81884 | 1009 | 81380 | 1729802 | 21.1 | 0.444763 | 36195 | 696070 | 7.0 |
| 1 | 1 | 41 | 34153 | 429 | 0.012561122 | 0.012482724 | 80875 | 1016 | 80367 | 1648422 | 20.4 | 0.481938 | 38732 | 659875 | 6.6 |
| 1 | 1 | 42 | 37226 | 474 | 0.012733036 | 0.012652484 | 79859 | 1017 | 79351 | 1568055 | 19.6 | 0.5057155 | 40129 | 621143 | 6.2 |
| 1 | 1 | 43 | 40425 | 523 | 0.012937539 | 0.012854387 | 78843 | 1020 | 78333 | 1488704 | 18.9 | 0.4922929 | 38563 | 581014 | 5.8 |
| 1 | 1 | 44 | 43789 | 581 | 0.013268172 | 0.01318073 | 77823 | 1033 | 77306 | 1410371 | 18.1 | 0.4549749 | 35172 | 542451 | 5.4 |
| 1 | 1 | 45 | 47345 | 630 | 0.013306579 | 0.013218632 | 76790 | 1022 | 76279 | 1333065 | 17.4 | 0.4668874 | 35614 | 507279 | 5.1 |
| 1 | 1 | 46 | 51080 | 676 | 0.013234143 | 0.013147147 | 75768 | 1003 | 75267 | 1256786 | 16.6 | 0.4543922 | 34201 | 471665 | 4.7 |
| 1 | 1 | 47 | 54988 | 744 | 0.013530225 | 0.013439306 | 74765 | 1012 | 74260 | 1181519 | 15.8 | 0.4740938 | 35206 | 437465 | 4.4 |
| 1 | 1 | 48 | 59063 | 823 | 0.013934274 | 0.013837863 | 73754 | 1028 | 73240 | 1107259 | 15.0 | 0.4566568 | 33446 | 402258 | 4.0 |
| 1 | 1 | 49 | 63280 | 904 | 0.014285714 | 0.014184397 | 72726 | 1039 | 72207 | 1034019 | 14.2 | 0.4447069 | 32111 | 368813 | 3.7 |
| 1 | 1 | 50 | 67600 | 958 | 0.014171598 | 0.014071887 | 71687 | 1016 | 71179 | 961813 | 13.4 | 0.4336781 | 30869 | 336702 | 3.4 |
| 1 | 1 | 51 | 73186 | 1,038 | 0.01418304 | 0.014083169 | 70671 | 1002 | 70170 | 890633 | 12.6 | 0.4217015 | 29591 | 305833 | 3.1 |
| 1 | 1 | 52 | 80176 | 1,157 | 0.014430752 | 0.014327375 | 69669 | 1005 | 69166 | 820463 | 11.8 | 0.4191284 | 28990 | 276242 | 2.8 |
| 1 | 1 | 53 | 86952 | 1,273 | 0.014640261 | 0.014533871 | 68664 | 1005 | 68161 | 751297 | 10.9 | 0.3932432 | 26804 | 247253 | 2.5 |
| 1 | 1 | 54 | 93365 | 1,394 | 0.014930649 | 0.014820012 | 67658 | 1010 | 67153 | 683136 | 10.1 | 0.3924248 | 26353 | 220449 | 2.2 |
| 1 | 1 | 55 | 99837 | 1,474 | 0.014764065 | 0.014655875 | 66648 | 984 | 66156 | 615983 | 9.2 | 0.3822424 | 25288 | 194096 | 1.9 |
| 1 | 1 | 56 | 107865 | 1,656 | 0.015352524 | 0.015235572 | 65664 | 1008 | 65160 | 549827 | 8.4 | 0.3692449 | 24060 | 168809 | 1.7 |
| 1 | 1 | 57 | 117582 | 1,878 | 0.015971832 | 0.015845293 | 64656 | 1033 | 64140 | 484667 | 7.5 | 0.3521759 | 22588 | 144749 | 1.4 |
| 1 | 1 | 58 | 127019 | 2,045 | 0.016099954 | 0.015971384 | 63623 | 1024 | 63111 | 420527 | 6.6 | 0.3477204 | 21945 | 122160 | 1.2 |
| 1 | 1 | 59 | 136109 | 2,208 | 0.016222292 | 0.01609177 | 62599 | 1015 | 62091 | 357416 | 5.7 | 0.3408526 | 21164 | 100215 | 1.0 |
| 1 | 1 | 60 | 145451 | 2,324 | 0.015977889 | 0.015851255 | 61584 | 984 | 61092 | 295324 | 4.8 | 0.3235643 | 19767 | 79051 | 0.8 |
| 1 | 1 | 61 | 154236 | 2,542 | 0.016481237 | 0.016346531 | 60600 | 999 | 60100 | 234233 | 3.9 | 0.2968387 | 17840 | 59284 | 0.6 |
| 1 | 1 | 62 | 162481 | 2,788 | 0.017158929 | 0.017012967 | 59601 | 1023 | 59089 | 174133 | 2.9 | 0.2603637 | 15385 | 41444 | 0.4 |
| 1 | 1 | 63 | 170786 | 3,061 | 0.017923015 | 0.017763824 | 58578 | 1050 | 58053 | 115043 | 2.0 | 0.2309147 | 13405 | 26059 | 0.3 |
| 1 | 1 | 64 | 178459 | 3,338 | 0.018704576 | 0.018531267 | 57528 | 1076 | 56990 | 56990 | 1.0 | 0.2220404 | 12654 | 12654 | 0.1 |

## Lifetable for Women with Mobility Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 20 | 1326 | 5 | 0.003770739 | 0.003763643 | 100000 | 377 | 99811 | 3562661 | 35.6 | 0.3177217 | 31712 | 933102 | 9.3 |
| 1 | 1 | 21 | 1321 | 14 | 0.010598032 | 0.010542169 | 99623 | 1056 | 99095 | 3462849 | 34.8 | 0.2817974 | 27925 | 901390 | 9.0 |
| 1 | 1 | 22 | 2553 | 21 | 0.008225617 | 0.008191925 | 98567 | 811 | 98162 | 3363754 | 34.1 | 0.293555 | 28816 | 873465 | 8.7 |
| 1 | 1 | 23 | 3749 | 29 | 0.007735396 | 0.007705593 | 97756 | 756 | 97378 | 3265592 | 33.4 | 0.3196402 | 31126 | 844649 | 8.4 |
| 1 | 1 | 24 | 5089 | 39 | 0.007663588 | 0.007634335 | 97000 | 743 | 96628 | 3168214 | 32.7 | 0.2952534 | 28530 | 813523 | 8.1 |
| 1 | 1 | 25 | 6559 | 55 | 0.008385425 | 0.008350414 | 96257 | 807 | 95853 | 3071586 | 31.9 | 0.263947 | 25300 | 784993 | 7.8 |
| 1 | 1 | 26 | 7794 | 66 | 0.008468052 | 0.00843235 | 95450 | 808 | 95046 | 2975732 | 31.2 | 0.2841622 | 27008 | 759693 | 7.6 |
| 1 | 1 | 27 | 8771 | 74 | 0.008436894 | 0.008401453 | 94641 | 798 | 94242 | 2880687 | 30.4 | 0.2980459 | 28088 | 732685 | 7.3 |
| 1 | 1 | 28 | 9793 | 87 | 0.008883897 | 0.008844609 | 93843 | 834 | 93426 | 2786445 | 29.7 | 0.2821882 | 26364 | 704596 | 7.0 |
| 1 | 1 | 29 | 10872 | 100 | 0.00919794 | 0.009155832 | 93009 | 855 | 92581 | 2693019 | 29.0 | 0.2677991 | 24793 | 678233 | 6.8 |
| 1 | 1 | 30 | 12048 | 122 | 0.010126162 | 0.010075151 | 92154 | 933 | 91687 | 2600437 | 28.2 | 0.2757398 | 25282 | 653439 | 6.5 |
| 1 | 1 | 31 | 13356 | 148 | 0.011081162 | 0.011020104 | 91221 | 1011 | 90715 | 2508750 | 27.5 | 0.2636438 | 23916 | 628158 | 6.3 |
| 1 | 1 | 32 | 14798 | 170 | 0.011488039 | 0.011422428 | 90210 | 1036 | 89692 | 2418035 | 26.8 | 0.2773329 | 24874 | 604241 | 6.0 |
| 1 | 1 | 33 | 16360 | 193 | 0.011797066 | 0.011727889 | 89173 | 1052 | 88647 | 2328343 | 26.1 | 0.268768 | 23826 | 579367 | 5.8 |
| 1 | 1 | 34 | 18060 | 218 | 0.012070875 | 0.011998459 | 88121 | 1064 | 87590 | 2239696 | 25.4 | 0.2438281 | 21357 | 555541 | 5.6 |
| 1 | 1 | 35 | 19885 | 241 | 0.012119688 | 0.012046687 | 87058 | 1055 | 86530 | 2152107 | 24.7 | 0.2552357 | 22086 | 534184 | 5.3 |
| 1 | 1 | 36 | 21879 | 260 | 0.011883541 | 0.011813349 | 86003 | 1022 | 85492 | 2065576 | 24.0 | 0.2582218 | 22076 | 512099 | 5.1 |
| 1 | 1 | 37 | 24043 | 293 | 0.012186499 | 0.012112694 | 84981 | 1036 | 84463 | 1980085 | 23.3 | 0.2589889 | 21875 | 490023 | 4.9 |
| 1 | 1 | 38 | 26329 | 326 | 0.012381784 | 0.012305602 | 83945 | 1039 | 83425 | 1895622 | 22.6 | 0.2654875 | 22148 | 468148 | 4.7 |
| 1 | 1 | 39 | 28742 | 354 | 0.012316471 | 0.012241087 | 82906 | 1021 | 82395 | 1812197 | 21.9 | 0.2707294 | 22307 | 446000 | 4.5 |
| 1 | 1 | 40 | 31321 | 386 | 0.012324 | 0.012248524 | 81884 | 1009 | 81380 | 1729802 | 21.1 | 0.261612 | 21290 | 423693 | 4.2 |
| 1 | 1 | 41 | 34153 | 429 | 0.012561122 | 0.012482724 | 80875 | 1016 | 80367 | 1648422 | 20.4 | 0.2676306 | 21509 | 402403 | 4.0 |
| 1 | 1 | 42 | 37226 | 474 | 0.012733036 | 0.012652484 | 79859 | 1017 | 79351 | 1568055 | 19.6 | 0.2676846 | 21241 | 380894 | 3.8 |
| 1 | 1 | 43 | 40425 | 523 | 0.012937539 | 0.012854387 | 78843 | 1020 | 78333 | 1488704 | 18.9 | 0.2672189 | 20932 | 359653 | 3.6 |
| 1 | 1 | 44 | 43789 | 581 | 0.013268172 | 0.01318073 | 77823 | 1033 | 77306 | 1410371 | 18.1 | 0.2611708 | 20190 | 338721 | 3.4 |
| 1 | 1 | 45 | 47345 | 630 | 0.013306579 | 0.013218632 | 76790 | 1022 | 76279 | 1333065 | 17.4 | 0.2567046 | 19581 | 318531 | 3.2 |
| 1 | 1 | 46 | 51080 | 676 | 0.013234143 | 0.013147147 | 75768 | 1003 | 75267 | 1256786 | 16.6 | 0.2615778 | 19688 | 298950 | 3.0 |
| 1 | 1 | 47 | 54988 | 744 | 0.013530225 | 0.013439306 | 74765 | 1012 | 74260 | 1181519 | 15.8 | 0.2638135 | 19591 | 279262 | 2.8 |
| 1 | 1 | 48 | 59063 | 823 | 0.013934274 | 0.013837863 | 73754 | 1028 | 73240 | 1107259 | 15.0 | 0.2738741 | 20059 | 259671 | 2.6 |
| 1 | 1 | 49 | 63280 | 904 | 0.014285714 | 0.014184397 | 72726 | 1039 | 72207 | 1034019 | 14.2 | 0.2607777 | 18830 | 239613 | 2.4 |
| 1 | 1 | 50 | 67600 | 958 | 0.014171598 | 0.014071887 | 71687 | 1016 | 71179 | 961813 | 13.4 | 0.2656317 | 18907 | 220783 | 2.2 |
| 1 | 1 | 51 | 73186 | 1,038 | 0.01418304 | 0.014083169 | 70671 | 1002 | 70170 | 890633 | 12.6 | 0.2563205 | 17986 | 201875 | 2.0 |
| 1 | 1 | 52 | 80176 | 1,157 | 0.014430752 | 0.014327375 | 69669 | 1005 | 69166 | 820463 | 11.8 | 0.2582751 | 17864 | 183889 | 1.8 |
| 1 | 1 | 53 | 86952 | 1,273 | 0.014640261 | 0.014533871 | 68664 | 1005 | 68161 | 751297 | 10.9 | 0.2551746 | 17393 | 166025 | 1.7 |
| 1 | 1 | 54 | 93365 | 1,394 | 0.014930649 | 0.014820012 | 67658 | 1010 | 67153 | 683136 | 10.1 | 0.2531659 | 17001 | 148632 | 1.5 |
| 1 | 1 | 55 | 99837 | 1,474 | 0.014764065 | 0.014655875 | 66648 | 984 | 66156 | 615983 | 9.2 | 0.2447685 | 16193 | 131631 | 1.3 |
| 1 | 1 | 56 | 107865 | 1,656 | 0.015352524 | 0.015235572 | 65664 | 1008 | 65160 | 549827 | 8.4 | 0.2385665 | 15545 | 115438 | 1.2 |
| 1 | 1 | 57 | 117582 | 1,878 | 0.015971832 | 0.015845293 | 64656 | 1033 | 64140 | 484667 | 7.5 | 0.2372821 | 15219 | 99893 | 1.0 |
| 1 | 1 | 58 | 127019 | 2,045 | 0.016099954 | 0.015971384 | 63623 | 1024 | 63111 | 420527 | 6.6 | 0.2314462 | 14607 | 84674 | 0.8 |
| 1 | 1 | 59 | 136109 | 2,208 | 0.016222292 | 0.01609177 | 62599 | 1015 | 62091 | 357416 | 5.7 | 0.2292401 | 14234 | 70067 | 0.7 |
| 1 | 1 | 60 | 145451 | 2,324 | 0.015977889 | 0.015851255 | 61584 | 984 | 61092 | 295324 | 4.8 | 0.2125796 | 12987 | 55834 | 0.6 |
| 1 | 1 | 61 | 154236 | 2,542 | 0.016481237 | 0.016346531 | 60600 | 999 | 60100 | 234233 | 3.9 | 0.2069651 | 12439 | 42847 | 0.4 |
| 1 | 1 | 62 | 162481 | 2,788 | 0.017158929 | 0.017012967 | 59601 | 1023 | 59089 | 174133 | 2.9 | 0.1907821 | 11273 | 30408 | 0.3 |
| 1 | 1 | 63 | 170786 | 3,061 | 0.017923015 | 0.017763824 | 58578 | 1050 | 58053 | 115043 | 2.0 | 0.1716761 | 9966 | 19135 | 0.2 |
| 1 | 1 | 64 | 178459 | 3,338 | 0.018704576 | 0.018531267 | 57528 | 1076 | 56990 | 56990 | 1.0 | 0.1608794 | 9169 | 9169 | 0.1 |

## Lifetable for Women with Cognitive Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 20 | 1326 | 5 | 0.003770739 | 0.003763643 | 100000 | 377 | 99811 | 3562661 | 35.6 | 0.3992785 | 39853 | 1025020 | 10.3 |
| 1 | 1 | 21 | 1321 | 14 | 0.010598032 | 0.010542169 | 99623 | 1056 | 99095 | 3462849 | 34.8 | 0.4282371 | 42436 | 985167 | 9.9 |
| 1 | 1 | 22 | 2553 | 21 | 0.008225617 | 0.008191925 | 98567 | 811 | 98162 | 3363754 | 34.1 | 0.4265639 | 41872 | 942731 | 9.4 |
| 1 | 1 | 23 | 3749 | 29 | 0.007735396 | 0.007705593 | 97756 | 756 | 97378 | 3265592 | 33.4 | 0.4317584 | 42044 | 900859 | 9.0 |
| 1 | 1 | 24 | 5089 | 39 | 0.007663588 | 0.007634335 | 97000 | 743 | 96628 | 3168214 | 32.7 | 0.431163 | 41663 | 858815 | 8.6 |
| 1 | 1 | 25 | 6559 | 55 | 0.008385425 | 0.008350414 | 96257 | 807 | 95853 | 3071586 | 31.9 | 0.416086 | 39883 | 817152 | 8.2 |
| 1 | 1 | 26 | 7794 | 66 | 0.008468052 | 0.00843235 | 95450 | 808 | 95046 | 2975732 | 31.2 | 0.3982176 | 37849 | 777269 | 7.8 |
| 1 | 1 | 27 | 8771 | 74 | 0.008436894 | 0.008401453 | 94641 | 798 | 94242 | 2880687 | 30.4 | 0.3965707 | 37374 | 739421 | 7.4 |
| 1 | 1 | 28 | 9793 | 87 | 0.008883897 | 0.008844609 | 93843 | 834 | 93426 | 2786445 | 29.7 | 0.3730451 | 34852 | 702047 | 7.0 |
| 1 | 1 | 29 | 10872 | 100 | 0.00919794 | 0.009155832 | 93009 | 855 | 92581 | 2693019 | 29.0 | 0.3882714 | 35947 | 667195 | 6.7 |
| 1 | 1 | 30 | 12048 | 122 | 0.010126162 | 0.010075151 | 92154 | 933 | 91687 | 2600437 | 28.2 | 0.3542202 | 32477 | 631248 | 6.3 |
| 1 | 1 | 31 | 13356 | 148 | 0.011081162 | 0.011020104 | 91221 | 1011 | 90715 | 2508750 | 27.5 | 0.3360747 | 30487 | 598771 | 6.0 |
| 1 | 1 | 32 | 14798 | 170 | 0.011488039 | 0.011422428 | 90210 | 1036 | 89692 | 2418035 | 26.8 | 0.3503833 | 31426 | 568283 | 5.7 |
| 1 | 1 | 33 | 16360 | 193 | 0.011797066 | 0.011727889 | 89173 | 1052 | 88647 | 2328343 | 26.1 | 0.318061 | 28195 | 536857 | 5.4 |
| 1 | 1 | 34 | 18060 | 218 | 0.012070875 | 0.011998459 | 88121 | 1064 | 87590 | 2239696 | 25.4 | 0.3398751 | 29770 | 508662 | 5.1 |
| 1 | 1 | 35 | 19885 | 241 | 0.012119688 | 0.012046687 | 87058 | 1055 | 86530 | 2152107 | 24.7 | 0.3198643 | 27678 | 478892 | 4.8 |
| 1 | 1 | 36 | 21879 | 260 | 0.011883541 | 0.011813349 | 86003 | 1022 | 85492 | 2065576 | 24.0 | 0.3105213 | 26547 | 451214 | 4.5 |
| 1 | 1 | 37 | 24043 | 293 | 0.012186499 | 0.012112694 | 84981 | 1036 | 84463 | 1980085 | 23.3 | 0.3018824 | 25498 | 424667 | 4.2 |
| 1 | 1 | 38 | 26329 | 326 | 0.012381784 | 0.012305602 | 83945 | 1039 | 83425 | 1895622 | 22.6 | 0.3062991 | 25553 | 399170 | 4.0 |
| 1 | 1 | 39 | 28742 | 354 | 0.012316471 | 0.012241087 | 82906 | 1021 | 82395 | 1812197 | 21.9 | 0.2976293 | 24523 | 373617 | 3.7 |
| 1 | 1 | 40 | 31321 | 386 | 0.012324 | 0.012248524 | 81884 | 1009 | 81380 | 1729802 | 21.1 | 0.2838271 | 23098 | 349093 | 3.5 |
| 1 | 1 | 41 | 34153 | 429 | 0.012561122 | 0.012482724 | 80875 | 1016 | 80367 | 1648422 | 20.4 | 0.2710006 | 21780 | 325996 | 3.3 |
| 1 | 1 | 42 | 37226 | 474 | 0.012733036 | 0.012652484 | 79859 | 1017 | 79351 | 1568055 | 19.6 | 0.2707594 | 21485 | 304216 | 3.0 |
| 1 | 1 | 43 | 40425 | 523 | 0.012937539 | 0.012854387 | 78843 | 1020 | 78333 | 1488704 | 18.9 | 0.2611543 | 20457 | 282731 | 2.8 |
| 1 | 1 | 44 | 43789 | 581 | 0.013268172 | 0.01318073 | 77823 | 1033 | 77306 | 1410371 | 18.1 | 0.2471502 | 19106 | 262274 | 2.6 |
| 1 | 1 | 45 | 47345 | 630 | 0.013306579 | 0.013218632 | 76790 | 1022 | 76279 | 1333065 | 17.4 | 0.2450228 | 18690 | 243168 | 2.4 |
| 1 | 1 | 46 | 51080 | 676 | 0.013234143 | 0.013147147 | 75768 | 1003 | 75267 | 1256786 | 16.6 | 0.2342655 | 17632 | 224478 | 2.2 |
| 1 | 1 | 47 | 54988 | 744 | 0.013530225 | 0.013439306 | 74765 | 1012 | 74260 | 1181519 | 15.8 | 0.2462519 | 18287 | 206845 | 2.1 |
| 1 | 1 | 48 | 59063 | 823 | 0.013934274 | 0.013837863 | 73754 | 1028 | 73240 | 1107259 | 15.0 | 0.2268174 | 16612 | 188559 | 1.9 |
| 1 | 1 | 49 | 63280 | 904 | 0.014285714 | 0.014184397 | 72726 | 1039 | 72207 | 1034019 | 14.2 | 0.2252271 | 16263 | 171947 | 1.7 |
| 1 | 1 | 50 | 67600 | 958 | 0.014171598 | 0.014071887 | 71687 | 1016 | 71179 | 961813 | 13.4 | 0.2100278 | 14950 | 155684 | 1.6 |
| 1 | 1 | 51 | 73186 | 1,038 | 0.01418304 | 0.014083169 | 70671 | 1002 | 70170 | 890633 | 12.6 | 0.2103093 | 14757 | 140734 | 1.4 |
| 1 | 1 | 52 | 80176 | 1,157 | 0.014430752 | 0.014327375 | 69669 | 1005 | 69166 | 820463 | 11.8 | 0.2001689 | 13845 | 125977 | 1.3 |
| 1 | 1 | 53 | 86952 | 1,273 | 0.014640261 | 0.014533871 | 68664 | 1005 | 68161 | 751297 | 10.9 | 0.191806 | 13074 | 112132 | 1.1 |
| 1 | 1 | 54 | 93365 | 1,394 | 0.014930649 | 0.014820012 | 67658 | 1010 | 67153 | 683136 | 10.1 | 0.1877652 | 12609 | 99058 | 1.0 |
| 1 | 1 | 55 | 99837 | 1,474 | 0.014764065 | 0.014655875 | 66648 | 984 | 66156 | 615983 | 9.2 | 0.17777 | 11761 | 86449 | 0.9 |
| 1 | 1 | 56 | 107865 | 1,656 | 0.015352524 | 0.015235572 | 65664 | 1008 | 65160 | 549827 | 8.4 | 0.1640906 | 10692 | 74688 | 0.7 |
| 1 | 1 | 57 | 117582 | 1,878 | 0.015971832 | 0.015845293 | 64656 | 1033 | 64140 | 484667 | 7.5 | 0.1532228 | 9828 | 63996 | 0.6 |
| 1 | 1 | 58 | 127019 | 2,045 | 0.016099954 | 0.015971384 | 63623 | 1024 | 63111 | 420527 | 6.6 | 0.1512007 | 9542 | 54169 | 0.5 |
| 1 | 1 | 59 | 136109 | 2,208 | 0.016222292 | 0.01609177 | 62599 | 1015 | 62091 | 357416 | 5.7 | 0.1507451 | 9360 | 44626 | 0.4 |
| 1 | 1 | 60 | 145451 | 2,324 | 0.015977889 | 0.015851255 | 61584 | 984 | 61092 | 295324 | 4.8 | 0.1409268 | 8609 | 35266 | 0.4 |
| 1 | 1 | 61 | 154236 | 2,542 | 0.016481237 | 0.016346531 | 60600 | 999 | 60100 | 234233 | 3.9 | 0.1328333 | 7983 | 26657 | 0.3 |
| 1 | 1 | 62 | 162481 | 2,788 | 0.017158929 | 0.017012967 | 59601 | 1023 | 59089 | 174133 | 2.9 | 0.117634 | 6951 | 18673 | 0.2 |
| 1 | 1 | 63 | 170786 | 3,061 | 0.017923015 | 0.017763824 | 58578 | 1050 | 58053 | 115043 | 2.0 | 0.1092967 | 6345 | 11723 | 0.1 |
| 1 | 1 | 64 | 178459 | 3,338 | 0.018704576 | 0.018531267 | 57528 | 1076 | 56990 | 56990 | 1.0 | 0.0943582 | 5377 | 5377 | 0.1 |

## Lifetable for Women with ADL Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 20 | 1326 | 5 | 0.003770739 | 0.003763643 | 100000 | 377 | 99811 | 3562661 | 35.6 | 0.1596761 | 15938 | 560914 | 5.6 |
| 1 | 1 | 21 | 1321 | 14 | 0.010598032 | 0.010542169 | 99623 | 1056 | 99095 | 3462849 | 34.8 | 0.1521671 | 15079 | 544977 | 5.4 |
| 1 | 1 | 22 | 2553 | 21 | 0.008225617 | 0.008191925 | 98567 | 811 | 98162 | 3363754 | 34.1 | 0.1698958 | 16677 | 529898 | 5.3 |
| 1 | 1 | 23 | 3749 | 29 | 0.007735396 | 0.007705593 | 97756 | 756 | 97378 | 3265592 | 33.4 | 0.1921151 | 18708 | 513220 | 5.1 |
| 1 | 1 | 24 | 5089 | 39 | 0.007663588 | 0.007634335 | 97000 | 743 | 96628 | 3168214 | 32.7 | 0.2065626 | 19960 | 494513 | 4.9 |
| 1 | 1 | 25 | 6559 | 55 | 0.008385425 | 0.008350414 | 96257 | 807 | 95853 | 3071586 | 31.9 | 0.1863976 | 17867 | 474553 | 4.7 |
| 1 | 1 | 26 | 7794 | 66 | 0.008468052 | 0.00843235 | 95450 | 808 | 95046 | 2975732 | 31.2 | 0.1711495 | 16267 | 456686 | 4.6 |
| 1 | 1 | 27 | 8771 | 74 | 0.008436894 | 0.008401453 | 94641 | 798 | 94242 | 2880687 | 30.4 | 0.1915945 | 18056 | 440419 | 4.4 |
| 1 | 1 | 28 | 9793 | 87 | 0.008883897 | 0.008844609 | 93843 | 834 | 93426 | 2786445 | 29.7 | 0.1893287 | 17688 | 422363 | 4.2 |
| 1 | 1 | 29 | 10872 | 100 | 0.00919794 | 0.009155832 | 93009 | 855 | 92581 | 2693019 | 29.0 | 0.1905885 | 17645 | 404674 | 4.0 |
| 1 | 1 | 30 | 12048 | 122 | 0.010126162 | 0.010075151 | 92154 | 933 | 91687 | 2600437 | 28.2 | 0.1851359 | 16975 | 387030 | 3.9 |
| 1 | 1 | 31 | 13356 | 148 | 0.011081162 | 0.011020104 | 91221 | 1011 | 90715 | 2508750 | 27.5 | 0.1773479 | 16088 | 370055 | 3.7 |
| 1 | 1 | 32 | 14798 | 170 | 0.011488039 | 0.011422428 | 90210 | 1036 | 89692 | 2418035 | 26.8 | 0.1797402 | 16121 | 353967 | 3.5 |
| 1 | 1 | 33 | 16360 | 193 | 0.011797066 | 0.011727889 | 89173 | 1052 | 88647 | 2328343 | 26.1 | 0.1968036 | 17446 | 337846 | 3.4 |
| 1 | 1 | 34 | 18060 | 218 | 0.012070875 | 0.011998459 | 88121 | 1064 | 87590 | 2239696 | 25.4 | 0.1734913 | 15196 | 320399 | 3.2 |
| 1 | 1 | 35 | 19885 | 241 | 0.012119688 | 0.012046687 | 87058 | 1055 | 86530 | 2152107 | 24.7 | 0.1935352 | 16747 | 305203 | 3.1 |
| 1 | 1 | 36 | 21879 | 260 | 0.011883541 | 0.011813349 | 86003 | 1022 | 85492 | 2065576 | 24.0 | 0.15384 | 13152 | 288457 | 2.9 |
| 1 | 1 | 37 | 24043 | 293 | 0.012186499 | 0.012112694 | 84981 | 1036 | 84463 | 1980085 | 23.3 | 0.1763884 | 14898 | 275305 | 2.8 |
| 1 | 1 | 38 | 26329 | 326 | 0.012381784 | 0.012305602 | 83945 | 1039 | 83425 | 1895622 | 22.6 | 0.1616062 | 13482 | 260407 | 2.6 |
| 1 | 1 | 39 | 28742 | 354 | 0.012316471 | 0.012241087 | 82906 | 1021 | 82395 | 1812197 | 21.9 | 0.1680834 | 13849 | 246925 | 2.5 |
| 1 | 1 | 40 | 31321 | 386 | 0.012324 | 0.012248524 | 81884 | 1009 | 81380 | 1729802 | 21.1 | 0.1694408 | 13789 | 233075 | 2.3 |
| 1 | 1 | 41 | 34153 | 429 | 0.012561122 | 0.012482724 | 80875 | 1016 | 80367 | 1648422 | 20.4 | 0.170555 | 13707 | 219286 | 2.2 |
| 1 | 1 | 42 | 37226 | 474 | 0.012733036 | 0.012652484 | 79859 | 1017 | 79351 | 1568055 | 19.6 | 0.190016 | 15078 | 205579 | 2.1 |
| 1 | 1 | 43 | 40425 | 523 | 0.012937539 | 0.012854387 | 78843 | 1020 | 78333 | 1488704 | 18.9 | 0.1486645 | 11645 | 190501 | 1.9 |
| 1 | 1 | 44 | 43789 | 581 | 0.013268172 | 0.01318073 | 77823 | 1033 | 77306 | 1410371 | 18.1 | 0.1497406 | 11576 | 178856 | 1.8 |
| 1 | 1 | 45 | 47345 | 630 | 0.013306579 | 0.013218632 | 76790 | 1022 | 76279 | 1333065 | 17.4 | 0.152863 | 11660 | 167280 | 1.7 |
| 1 | 1 | 46 | 51080 | 676 | 0.013234143 | 0.013147147 | 75768 | 1003 | 75267 | 1256786 | 16.6 | 0.1509491 | 11361 | 155620 | 1.6 |
| 1 | 1 | 47 | 54988 | 744 | 0.013530225 | 0.013439306 | 74765 | 1012 | 74260 | 1181519 | 15.8 | 0.1755939 | 13040 | 144258 | 1.4 |
| 1 | 1 | 48 | 59063 | 823 | 0.013934274 | 0.013837863 | 73754 | 1028 | 73240 | 1107259 | 15.0 | 0.160066 | 11723 | 131219 | 1.3 |
| 1 | 1 | 49 | 63280 | 904 | 0.014285714 | 0.014184397 | 72726 | 1039 | 72207 | 1034019 | 14.2 | 0.1478459 | 10675 | 119496 | 1.2 |
| 1 | 1 | 50 | 67600 | 958 | 0.014171598 | 0.014071887 | 71687 | 1016 | 71179 | 961813 | 13.4 | 0.1449395 | 10317 | 108820 | 1.1 |
| 1 | 1 | 51 | 73186 | 1,038 | 0.01418304 | 0.014083169 | 70671 | 1002 | 70170 | 890633 | 12.6 | 0.1505915 | 10567 | 98503 | 1.0 |
| 1 | 1 | 52 | 80176 | 1,157 | 0.014430752 | 0.014327375 | 69669 | 1005 | 69166 | 820463 | 11.8 | 0.130621 | 9035 | 87936 | 0.9 |
| 1 | 1 | 53 | 86952 | 1,273 | 0.014640261 | 0.014533871 | 68664 | 1005 | 68161 | 751297 | 10.9 | 0.1333751 | 9091 | 78902 | 0.8 |
| 1 | 1 | 54 | 93365 | 1,394 | 0.014930649 | 0.014820012 | 67658 | 1010 | 67153 | 683136 | 10.1 | 0.1254467 | 8424 | 69811 | 0.7 |
| 1 | 1 | 55 | 99837 | 1,474 | 0.014764065 | 0.014655875 | 66648 | 984 | 66156 | 615983 | 9.2 | 0.1227683 | 8122 | 61387 | 0.6 |
| 1 | 1 | 56 | 107865 | 1,656 | 0.015352524 | 0.015235572 | 65664 | 1008 | 65160 | 549827 | 8.4 | 0.1115882 | 7271 | 53265 | 0.5 |
| 1 | 1 | 57 | 117582 | 1,878 | 0.015971832 | 0.015845293 | 64656 | 1033 | 64140 | 484667 | 7.5 | 0.1070129 | 6864 | 45994 | 0.5 |
| 1 | 1 | 58 | 127019 | 2,045 | 0.016099954 | 0.015971384 | 63623 | 1024 | 63111 | 420527 | 6.6 | 0.1148857 | 7251 | 39130 | 0.4 |
| 1 | 1 | 59 | 136109 | 2,208 | 0.016222292 | 0.01609177 | 62599 | 1015 | 62091 | 357416 | 5.7 | 0.1067517 | 6628 | 31879 | 0.3 |
| 1 | 1 | 60 | 145451 | 2,324 | 0.015977889 | 0.015851255 | 61584 | 984 | 61092 | 295324 | 4.8 | 0.0991927 | 6060 | 25251 | 0.3 |
| 1 | 1 | 61 | 154236 | 2,542 | 0.016481237 | 0.016346531 | 60600 | 999 | 60100 | 234233 | 3.9 | 0.0915807 | 5504 | 19191 | 0.2 |
| 1 | 1 | 62 | 162481 | 2,788 | 0.017158929 | 0.017012967 | 59601 | 1023 | 59089 | 174133 | 2.9 | 0.0857555 | 5067 | 13687 | 0.1 |
| 1 | 1 | 63 | 170786 | 3,061 | 0.017923015 | 0.017763824 | 58578 | 1050 | 58053 | 115043 | 2.0 | 0.0798368 | 4635 | 8620 | 0.1 |
| 1 | 1 | 64 | 178459 | 3,338 | 0.018704576 | 0.018531267 | 57528 | 1076 | 56990 | 56990 | 1.0 | 0.0699275 | 3985 | 3985 | 0.0 |

## Lifetable for Women with IADL Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | 20 | 1326 | 5 | 0.003770739 | 0.003763643 | 100000 | 377 | 99811 | 3562661 | 35.6 | 0.2706224 | 27011 | 725985 | 7.3 |
| 1 | 1 | 21 | 1321 | 14 | 0.010598032 | 0.010542169 | 99623 | 1056 | 99095 | 3462849 | 34.8 | 0.310714 | 30790 | 698974 | 7.0 |
| 1 | 1 | 22 | 2553 | 21 | 0.008225617 | 0.008191925 | 98567 | 811 | 98162 | 3363754 | 34.1 | 0.3020951 | 29654 | 668184 | 6.7 |
| 1 | 1 | 23 | 3749 | 29 | 0.007735396 | 0.007705593 | 97756 | 756 | 97378 | 3265592 | 33.4 | 0.3422023 | 33323 | 638530 | 6.4 |
| 1 | 1 | 24 | 5089 | 39 | 0.007663588 | 0.007634335 | 97000 | 743 | 96628 | 3168214 | 32.7 | 0.3101721 | 29971 | 605207 | 6.1 |
| 1 | 1 | 25 | 6559 | 55 | 0.008385425 | 0.008350414 | 96257 | 807 | 95853 | 3071586 | 31.9 | 0.3091677 | 29635 | 575235 | 5.8 |
| 1 | 1 | 26 | 7794 | 66 | 0.008468052 | 0.00843235 | 95450 | 808 | 95046 | 2975732 | 31.2 | 0.2675235 | 25427 | 545600 | 5.5 |
| 1 | 1 | 27 | 8771 | 74 | 0.008436894 | 0.008401453 | 94641 | 798 | 94242 | 2880687 | 30.4 | 0.2787644 | 26271 | 520173 | 5.2 |
| 1 | 1 | 28 | 9793 | 87 | 0.008883897 | 0.008844609 | 93843 | 834 | 93426 | 2786445 | 29.7 | 0.2750416 | 25696 | 493902 | 4.9 |
| 1 | 1 | 29 | 10872 | 100 | 0.00919794 | 0.009155832 | 93009 | 855 | 92581 | 2693019 | 29.0 | 0.2805368 | 25973 | 468206 | 4.7 |
| 1 | 1 | 30 | 12048 | 122 | 0.010126162 | 0.010075151 | 92154 | 933 | 91687 | 2600437 | 28.2 | 0.2622273 | 24043 | 442234 | 4.4 |
| 1 | 1 | 31 | 13356 | 148 | 0.011081162 | 0.011020104 | 91221 | 1011 | 90715 | 2508750 | 27.5 | 0.2380557 | 21595 | 418191 | 4.2 |
| 1 | 1 | 32 | 14798 | 170 | 0.011488039 | 0.011422428 | 90210 | 1036 | 89692 | 2418035 | 26.8 | 0.2435015 | 21840 | 396595 | 4.0 |
| 1 | 1 | 33 | 16360 | 193 | 0.011797066 | 0.011727889 | 89173 | 1052 | 88647 | 2328343 | 26.1 | 0.2462493 | 21829 | 374755 | 3.7 |
| 1 | 1 | 34 | 18060 | 218 | 0.012070875 | 0.011998459 | 88121 | 1064 | 87590 | 2239696 | 25.4 | 0.2317652 | 20300 | 352926 | 3.5 |
| 1 | 1 | 35 | 19885 | 241 | 0.012119688 | 0.012046687 | 87058 | 1055 | 86530 | 2152107 | 24.7 | 0.2243097 | 19410 | 332626 | 3.3 |
| 1 | 1 | 36 | 21879 | 260 | 0.011883541 | 0.011813349 | 86003 | 1022 | 85492 | 2065576 | 24.0 | 0.2098779 | 17943 | 313216 | 3.1 |
| 1 | 1 | 37 | 24043 | 293 | 0.012186499 | 0.012112694 | 84981 | 1036 | 84463 | 1980085 | 23.3 | 0.210799 | 17805 | 295274 | 3.0 |
| 1 | 1 | 38 | 26329 | 326 | 0.012381784 | 0.012305602 | 83945 | 1039 | 83425 | 1895622 | 22.6 | 0.208863 | 17424 | 277469 | 2.8 |
| 1 | 1 | 39 | 28742 | 354 | 0.012316471 | 0.012241087 | 82906 | 1021 | 82395 | 1812197 | 21.9 | 0.2122011 | 17484 | 260044 | 2.6 |
| 1 | 1 | 40 | 31321 | 386 | 0.012324 | 0.012248524 | 81884 | 1009 | 81380 | 1729802 | 21.1 | 0.1957212 | 15928 | 242560 | 2.4 |
| 1 | 1 | 41 | 34153 | 429 | 0.012561122 | 0.012482724 | 80875 | 1016 | 80367 | 1648422 | 20.4 | 0.1778922 | 14297 | 226632 | 2.3 |
| 1 | 1 | 42 | 37226 | 474 | 0.012733036 | 0.012652484 | 79859 | 1017 | 79351 | 1568055 | 19.6 | 0.1951561 | 15486 | 212336 | 2.1 |
| 1 | 1 | 43 | 40425 | 523 | 0.012937539 | 0.012854387 | 78843 | 1020 | 78333 | 1488704 | 18.9 | 0.1831475 | 14346 | 196850 | 2.0 |
| 1 | 1 | 44 | 43789 | 581 | 0.013268172 | 0.01318073 | 77823 | 1033 | 77306 | 1410371 | 18.1 | 0.1677862 | 12971 | 182503 | 1.8 |
| 1 | 1 | 45 | 47345 | 630 | 0.013306579 | 0.013218632 | 76790 | 1022 | 76279 | 1333065 | 17.4 | 0.1606298 | 12253 | 169532 | 1.7 |
| 1 | 1 | 46 | 51080 | 676 | 0.013234143 | 0.013147147 | 75768 | 1003 | 75267 | 1256786 | 16.6 | 0.163916 | 12337 | 157280 | 1.6 |
| 1 | 1 | 47 | 54988 | 744 | 0.013530225 | 0.013439306 | 74765 | 1012 | 74260 | 1181519 | 15.8 | 0.1689143 | 12544 | 144942 | 1.4 |
| 1 | 1 | 48 | 59063 | 823 | 0.013934274 | 0.013837863 | 73754 | 1028 | 73240 | 1107259 | 15.0 | 0.1594012 | 11675 | 132399 | 1.3 |
| 1 | 1 | 49 | 63280 | 904 | 0.014285714 | 0.014184397 | 72726 | 1039 | 72207 | 1034019 | 14.2 | 0.1544166 | 11150 | 120724 | 1.2 |
| 1 | 1 | 50 | 67600 | 958 | 0.014171598 | 0.014071887 | 71687 | 1016 | 71179 | 961813 | 13.4 | 0.1403855 | 9993 | 109574 | 1.1 |
| 1 | 1 | 51 | 73186 | 1,038 | 0.01418304 | 0.014083169 | 70671 | 1002 | 70170 | 890633 | 12.6 | 0.1426492 | 10010 | 99582 | 1.0 |
| 1 | 1 | 52 | 80176 | 1,157 | 0.014430752 | 0.014327375 | 69669 | 1005 | 69166 | 820463 | 11.8 | 0.1413076 | 9774 | 89572 | 0.9 |
| 1 | 1 | 53 | 86952 | 1,273 | 0.014640261 | 0.014533871 | 68664 | 1005 | 68161 | 751297 | 10.9 | 0.1317246 | 8978 | 79798 | 0.8 |
| 1 | 1 | 54 | 93365 | 1,394 | 0.014930649 | 0.014820012 | 67658 | 1010 | 67153 | 683136 | 10.1 | 0.1349055 | 9059 | 70820 | 0.7 |
| 1 | 1 | 55 | 99837 | 1,474 | 0.014764065 | 0.014655875 | 66648 | 984 | 66156 | 615983 | 9.2 | 0.1248976 | 8263 | 61761 | 0.6 |
| 1 | 1 | 56 | 107865 | 1,656 | 0.015352524 | 0.015235572 | 65664 | 1008 | 65160 | 549827 | 8.4 | 0.1162593 | 7575 | 53498 | 0.5 |
| 1 | 1 | 57 | 117582 | 1,878 | 0.015971832 | 0.015845293 | 64656 | 1033 | 64140 | 484667 | 7.5 | 0.1116698 | 7162 | 45922 | 0.5 |
| 1 | 1 | 58 | 127019 | 2,045 | 0.016099954 | 0.015971384 | 63623 | 1024 | 63111 | 420527 | 6.6 | 0.1112771 | 7023 | 38760 | 0.4 |
| 1 | 1 | 59 | 136109 | 2,208 | 0.016222292 | 0.01609177 | 62599 | 1015 | 62091 | 357416 | 5.7 | 0.1110383 | 6895 | 31737 | 0.3 |
| 1 | 1 | 60 | 145451 | 2,324 | 0.015977889 | 0.015851255 | 61584 | 984 | 61092 | 295324 | 4.8 | 0.0983057 | 6006 | 24843 | 0.2 |
| 1 | 1 | 61 | 154236 | 2,542 | 0.016481237 | 0.016346531 | 60600 | 999 | 60100 | 234233 | 3.9 | 0.0869124 | 5223 | 18837 | 0.2 |
| 1 | 1 | 62 | 162481 | 2,788 | 0.017158929 | 0.017012967 | 59601 | 1023 | 59089 | 174133 | 2.9 | 0.0813778 | 4809 | 13613 | 0.1 |
| 1 | 1 | 63 | 170786 | 3,061 | 0.017923015 | 0.017763824 | 58578 | 1050 | 58053 | 115043 | 2.0 | 0.080628 | 4681 | 8805 | 0.1 |
| 1 | 1 | 64 | 178459 | 3,338 | 0.018704576 | 0.018531267 | 57528 | 1076 | 56990 | 56990 | 1.0 | 0.0723668 | 4124 | 4124 | 0.0 |

## Lifetable for Men with Hearing Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 20 | 1930 | 9 | 0.004663212 | 0.004652365 | 100000 | 466 | 99767 | 3440313 | 34.4 | 0.4814543 | 48033 | 1963333 | 19.6 |
| 0 | 1 | 21 | 1921 | 24 | 0.012493493 | 0.012415934 | 99534 | 1244 | 98912 | 3340547 | 33.6 | 0.5231682 | 51748 | 1915299 | 19.2 |
| 0 | 1 | 22 | 3710 | 36 | 0.009703504 | 0.009656652 | 98290 | 954 | 97813 | 3241635 | 33.0 | 0.5705583 | 55808 | 1863552 | 18.6 |
| 0 | 1 | 23 | 5435 | 48 | 0.008831647 | 0.008792819 | 97336 | 860 | 96907 | 3143821 | 32.3 | 0.5612143 | 54385 | 1807744 | 18.1 |
| 0 | 1 | 24 | 7337 | 65 | 0.008859207 | 0.008820137 | 96477 | 855 | 96049 | 3046915 | 31.6 | 0.5929707 | 56954 | 1753358 | 17.5 |
| 0 | 1 | 25 | 9379 | 84 | 0.008956179 | 0.008916251 | 95622 | 856 | 95194 | 2950865 | 30.9 | 0.5823649 | 55438 | 1696404 | 17.0 |
| 0 | 1 | 26 | 10857 | 97 | 0.008934328 | 0.008894594 | 94766 | 847 | 94342 | 2855672 | 30.1 | 0.594553 | 56092 | 1640966 | 16.4 |
| 0 | 1 | 27 | 11760 | 104 | 0.008843537 | 0.008804605 | 93919 | 831 | 93504 | 2761329 | 29.4 | 0.6003958 | 56139 | 1584875 | 15.8 |
| 0 | 1 | 28 | 12704 | 113 | 0.008894836 | 0.008855452 | 93088 | 828 | 92674 | 2667826 | 28.7 | 0.5870217 | 54402 | 1528736 | 15.3 |
| 0 | 1 | 29 | 13698 | 125 | 0.00912542 | 0.009083972 | 92260 | 842 | 91839 | 2575151 | 27.9 | 0.5657786 | 51961 | 1474334 | 14.7 |
| 0 | 1 | 30 | 14760 | 152 | 0.010298103 | 0.010245349 | 91418 | 941 | 90948 | 2483312 | 27.2 | 0.6159688 | 56021 | 1422373 | 14.2 |
| 0 | 1 | 31 | 15911 | 176 | 0.01106153 | 0.011000688 | 90477 | 1001 | 89977 | 2392364 | 26.4 | 0.6066991 | 54589 | 1366352 | 13.7 |
| 0 | 1 | 32 | 17164 | 192 | 0.011186204 | 0.011123986 | 89476 | 1001 | 88976 | 2302387 | 25.7 | 0.6059438 | 53914 | 1311763 | 13.1 |
| 0 | 1 | 33 | 18498 | 213 | 0.011514758 | 0.011448843 | 88475 | 1019 | 87966 | 2213412 | 25.0 | 0.5941156 | 52262 | 1257849 | 12.6 |
| 0 | 1 | 34 | 19909 | 242 | 0.012155307 | 0.012081877 | 87457 | 1063 | 86925 | 2125446 | 24.3 | 0.5652237 | 49132 | 1205587 | 12.1 |
| 0 | 1 | 35 | 21380 | 265 | 0.012394761 | 0.01231842 | 86393 | 1071 | 85858 | 2038521 | 23.6 | 0.574195 | 49299 | 1156455 | 11.6 |
| 0 | 1 | 36 | 22924 | 295 | 0.012868609 | 0.012786338 | 85323 | 1098 | 84774 | 1952663 | 22.9 | 0.6008195 | 50934 | 1107156 | 11.1 |
| 0 | 1 | 37 | 24550 | 328 | 0.013360489 | 0.01327183 | 84225 | 1125 | 83662 | 1867889 | 22.2 | 0.5947654 | 49759 | 1056222 | 10.6 |
| 0 | 1 | 38 | 26257 | 362 | 0.0137868 | 0.013692412 | 83099 | 1146 | 82527 | 1784227 | 21.5 | 0.5808297 | 47934 | 1006463 | 10.1 |
| 0 | 1 | 39 | 28063 | 406 | 0.014467448 | 0.014363546 | 81954 | 1186 | 81361 | 1701700 | 20.8 | 0.6024409 | 49015 | 958529 | 9.6 |
| 0 | 1 | 40 | 29981 | 446 | 0.014876088 | 0.014766256 | 80768 | 1202 | 80167 | 1620339 | 20.1 | 0.5559806 | 44571 | 909514 | 9.1 |
| 0 | 1 | 41 | 32069 | 480 | 0.014967726 | 0.014856542 | 79567 | 1191 | 78971 | 1540172 | 19.4 | 0.595294 | 47011 | 864942 | 8.6 |
| 0 | 1 | 42 | 34370 | 531 | 0.01544952 | 0.015331091 | 78376 | 1211 | 77770 | 1461201 | 18.6 | 0.6095557 | 47405 | 817931 | 8.2 |
| 0 | 1 | 43 | 36806 | 588 | 0.015975656 | 0.015849057 | 77165 | 1233 | 76548 | 1383431 | 17.9 | 0.6080805 | 46548 | 770526 | 7.7 |
| 0 | 1 | 44 | 39414 | 652 | 0.016542345 | 0.016406643 | 75932 | 1256 | 75304 | 1306882 | 17.2 | 0.6178134 | 46524 | 723978 | 7.2 |
| 0 | 1 | 45 | 42167 | 709 | 0.016814096 | 0.016673918 | 74676 | 1256 | 74048 | 1231578 | 16.5 | 0.6341871 | 46960 | 677454 | 6.8 |
| 0 | 1 | 46 | 45041 | 752 | 0.016695899 | 0.016557677 | 73420 | 1226 | 72807 | 1157530 | 15.8 | 0.6067983 | 44179 | 630494 | 6.3 |
| 0 | 1 | 47 | 48062 | 854 | 0.017768715 | 0.017612242 | 72194 | 1283 | 71553 | 1084723 | 15.0 | 0.5966668 | 42693 | 586315 | 5.9 |
| 0 | 1 | 48 | 51250 | 951 | 0.018556098 | 0.018385516 | 70912 | 1316 | 70254 | 1013170 | 14.3 | 0.5948422 | 41790 | 543621 | 5.4 |
| 0 | 1 | 49 | 54566 | 1043 | 0.019114467 | 0.018933515 | 69596 | 1330 | 68931 | 942916 | 13.5 | 0.6178795 | 42591 | 501832 | 5.0 |
| 0 | 1 | 50 | 57980 | 1115 | 0.019230769 | 0.019047619 | 68266 | 1313 | 67609 | 873985 | 12.8 | 0.6009079 | 40627 | 459241 | 4.6 |
| 0 | 1 | 51 | 62562 | 1206 | 0.019276877 | 0.019092852 | 66953 | 1291 | 66307 | 806376 | 12.0 | 0.5775393 | 38295 | 418614 | 4.2 |
| 0 | 1 | 52 | 68499 | 1385 | 0.020219273 | 0.02001691 | 65662 | 1328 | 64998 | 740069 | 11.3 | 0.5904426 | 38378 | 380319 | 3.8 |
| 0 | 1 | 53 | 74316 | 1568 | 0.02109909 | 0.020878828 | 64334 | 1357 | 63656 | 675071 | 10.5 | 0.5936484 | 37789 | 341941 | 3.4 |
| 0 | 1 | 54 | 79797 | 1719 | 0.021542163 | 0.021312603 | 62977 | 1357 | 62299 | 611415 | 9.7 | 0.5655153 | 35231 | 304152 | 3.0 |
| 0 | 1 | 55 | 85428 | 1842 | 0.021562017 | 0.021332036 | 61620 | 1329 | 60956 | 549116 | 8.9 | 0.5658803 | 34494 | 268921 | 2.7 |
| 0 | 1 | 56 | 92928 | 2080 | 0.02238292 | 0.022135195 | 60292 | 1350 | 59617 | 488160 | 8.1 | 0.55172 | 32892 | 234427 | 2.3 |
| 0 | 1 | 57 | 102397 | 2355 | 0.022998721 | 0.022737257 | 58942 | 1356 | 58264 | 428543 | 7.3 | 0.5383928 | 31369 | 201535 | 2.0 |
| 0 | 1 | 58 | 111618 | 2611 | 0.023392284 | 0.023121848 | 57587 | 1347 | 56913 | 370279 | 6.4 | 0.5361112 | 30512 | 170166 | 1.7 |
| 0 | 1 | 59 | 120513 | 2872 | 0.023831454 | 0.023550829 | 56240 | 1340 | 55569 | 313365 | 5.6 | 0.5198173 | 28886 | 139654 | 1.4 |
| 0 | 1 | 60 | 129744 | 3148 | 0.024263164 | 0.023972342 | 54899 | 1332 | 54233 | 257796 | 4.7 | 0.4973186 | 26971 | 110768 | 1.1 |
| 0 | 1 | 61 | 138927 | 3462 | 0.024919562 | 0.024612891 | 53567 | 1335 | 52900 | 203563 | 3.8 | 0.4822976 | 25513 | 83797 | 0.8 |
| 0 | 1 | 62 | 148031 | 3811 | 0.025744608 | 0.025417427 | 52232 | 1345 | 51560 | 150663 | 2.9 | 0.4306361 | 22204 | 58284 | 0.6 |
| 0 | 1 | 63 | 157232 | 4136 | 0.026305078 | 0.025963591 | 50888 | 1339 | 50218 | 99103 | 1.9 | 0.3760871 | 18886 | 36080 | 0.4 |
| 0 | 1 | 64 | 165567 | 4441 | 0.026822978 | 0.026468003 | 49549 | 1329 | 48885 | 48885 | 1.0 | 0.3517164 | 17193 | 17193 | 0.2 |

## Lifetable for Men with Vision Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 1 | 20 | 1930 | 9 | 0.004663212 | 0.004652365 | 100000 | 466 | 99767 | 3440313 | 34.4 | 0.4271902 | 42619 | 1514506 | 15.1 |
| | 0 | 1 | 21 | 1921 | 24 | 0.012493493 | 0.012415934 | 99534 | 1244 | 98912 | 3340547 | 33.6 | 0.4640688 | 45902 | 1471887 | 14.7 |
| | 0 | 1 | 22 | 3710 | 36 | 0.009703504 | 0.009656652 | 98290 | 954 | 97813 | 3241635 | 33.0 | 0.4636348 | 45350 | 1425985 | 14.3 |
| | 0 | 1 | 23 | 5435 | 48 | 0.008831647 | 0.008792819 | 97336 | 860 | 96907 | 3143821 | 32.3 | 0.5333684 | 51687 | 1380635 | 13.8 |
| | 0 | 1 | 24 | 7337 | 65 | 0.008859207 | 0.008820137 | 96477 | 855 | 96049 | 3046915 | 31.6 | 0.517164 | 49673 | 1328948 | 13.3 |
| | 0 | 1 | 25 | 9379 | 84 | 0.008956179 | 0.008916251 | 95622 | 856 | 95194 | 2950865 | 30.9 | 0.5233391 | 49819 | 1279275 | 12.8 |
| | 0 | 1 | 26 | 10857 | 97 | 0.008934328 | 0.008894594 | 94766 | 847 | 94342 | 2855672 | 30.1 | 0.5139462 | 48487 | 1229457 | 12.3 |
| | 0 | 1 | 27 | 11760 | 104 | 0.008843537 | 0.008804605 | 93919 | 831 | 93504 | 2761329 | 29.4 | 0.5033161 | 47062 | 1180970 | 11.8 |
| | 0 | 1 | 28 | 12704 | 113 | 0.008894836 | 0.008855452 | 93088 | 828 | 92674 | 2667826 | 28.7 | 0.4819896 | 44668 | 1133908 | 11.3 |
| | 0 | 1 | 29 | 13698 | 125 | 0.00912542 | 0.009083972 | 92260 | 842 | 91839 | 2575151 | 27.9 | 0.4995692 | 45880 | 1089240 | 10.9 |
| | 0 | 1 | 30 | 14760 | 152 | 0.010298103 | 0.010245349 | 91418 | 941 | 90948 | 2483312 | 27.2 | 0.4868013 | 44273 | 1043359 | 10.4 |
| | 0 | 1 | 31 | 15911 | 176 | 0.01106153 | 0.011000688 | 90477 | 1001 | 89977 | 2392364 | 26.4 | 0.4625447 | 41618 | 999086 | 10.0 |
| | 0 | 1 | 32 | 17164 | 192 | 0.011186204 | 0.011123986 | 89476 | 1001 | 88976 | 2302387 | 25.7 | 0.4751023 | 42273 | 957468 | 9.6 |
| | 0 | 1 | 33 | 18498 | 213 | 0.011514758 | 0.011448843 | 88475 | 1019 | 87966 | 2213412 | 25.0 | 0.4782073 | 42066 | 915195 | 9.2 |
| | 0 | 1 | 34 | 19909 | 242 | 0.012155307 | 0.012081877 | 87457 | 1063 | 86925 | 2125446 | 24.3 | 0.4573197 | 39753 | 873129 | 8.7 |
| | 0 | 1 | 35 | 21380 | 265 | 0.012394761 | 0.01231842 | 86393 | 1071 | 85858 | 2038521 | 23.6 | 0.4860956 | 41735 | 833377 | 8.3 |
| | 0 | 1 | 36 | 22924 | 295 | 0.012868609 | 0.012786338 | 85323 | 1098 | 84774 | 1952663 | 22.9 | 0.470807 | 39912 | 791641 | 7.9 |
| | 0 | 1 | 37 | 24550 | 328 | 0.013360489 | 0.01327183 | 84225 | 1125 | 83662 | 1867889 | 22.2 | 0.4635135 | 38778 | 751729 | 7.5 |
| | 0 | 1 | 38 | 26257 | 362 | 0.0137868 | 0.013692412 | 83099 | 1146 | 82527 | 1784227 | 21.5 | 0.4618565 | 38115 | 712951 | 7.1 |
| | 0 | 1 | 39 | 28063 | 406 | 0.014467448 | 0.014363546 | 81954 | 1186 | 81361 | 1701700 | 20.8 | 0.4335101 | 35271 | 674836 | 6.7 |
| | 0 | 1 | 40 | 29981 | 446 | 0.014876088 | 0.014766256 | 80768 | 1202 | 80167 | 1620339 | 20.1 | 0.4351535 | 34885 | 639565 | 6.4 |
| | 0 | 1 | 41 | 32069 | 480 | 0.014967726 | 0.014856542 | 79567 | 1191 | 78971 | 1540172 | 19.4 | 0.4370805 | 34517 | 604680 | 6.0 |
| | 0 | 1 | 42 | 34370 | 531 | 0.01544952 | 0.015331091 | 78376 | 1211 | 77770 | 1461201 | 18.6 | 0.454327 | 35333 | 570163 | 5.7 |
| | 0 | 1 | 43 | 36806 | 588 | 0.015975656 | 0.015849057 | 77165 | 1233 | 76548 | 1383431 | 17.9 | 0.4522359 | 34618 | 534830 | 5.3 |
| | 0 | 1 | 44 | 39414 | 652 | 0.016542345 | 0.016406643 | 75932 | 1256 | 75304 | 1306882 | 17.2 | 0.4503183 | 33911 | 500212 | 5.0 |
| | 0 | 1 | 45 | 42167 | 709 | 0.016814096 | 0.016673918 | 74676 | 1256 | 74048 | 1231578 | 16.5 | 0.4646763 | 34408 | 466301 | 4.7 |
| | 0 | 1 | 46 | 45041 | 752 | 0.016695899 | 0.016557677 | 73420 | 1226 | 72807 | 1157530 | 15.8 | 0.4497994 | 32749 | 431893 | 4.3 |
| | 0 | 1 | 47 | 48062 | 854 | 0.017768715 | 0.017612242 | 72194 | 1283 | 71553 | 1084723 | 15.0 | 0.4489142 | 32121 | 399144 | 4.0 |
| | 0 | 1 | 48 | 51250 | 951 | 0.018556098 | 0.018385516 | 70912 | 1316 | 70254 | 1013170 | 14.3 | 0.4156817 | 29203 | 367023 | 3.7 |
| | 0 | 1 | 49 | 54566 | 1043 | 0.019114467 | 0.018933515 | 69596 | 1330 | 68931 | 942916 | 13.5 | 0.4167161 | 28725 | 337820 | 3.4 |
| | 0 | 1 | 50 | 57980 | 1115 | 0.019230769 | 0.019047619 | 68266 | 1313 | 67609 | 873985 | 12.8 | 0.429409 | 29032 | 309095 | 3.1 |
| | 0 | 1 | 51 | 62562 | 1206 | 0.019276877 | 0.019092852 | 66953 | 1291 | 66307 | 806376 | 12.0 | 0.4009131 | 26584 | 280063 | 2.8 |
| | 0 | 1 | 52 | 68499 | 1385 | 0.020219273 | 0.02001691 | 65662 | 1328 | 64998 | 740069 | 11.3 | 0.4071789 | 26466 | 253480 | 2.5 |
| | 0 | 1 | 53 | 74316 | 1568 | 0.02109909 | 0.020878828 | 64334 | 1357 | 63656 | 675071 | 10.5 | 0.3936508 | 25058 | 227014 | 2.3 |
| | 0 | 1 | 54 | 79797 | 1719 | 0.021542163 | 0.021312603 | 62977 | 1357 | 62299 | 611415 | 9.7 | 0.3943423 | 24567 | 201956 | 2.0 |
| | 0 | 1 | 55 | 85428 | 1842 | 0.021562017 | 0.021332036 | 61620 | 1329 | 60956 | 549116 | 8.9 | 0.3895468 | 23745 | 177389 | 1.8 |
| | 0 | 1 | 56 | 92928 | 2080 | 0.02238292 | 0.022135195 | 60292 | 1350 | 59617 | 488160 | 8.1 | 0.3728601 | 22229 | 153643 | 1.5 |
| | 0 | 1 | 57 | 102397 | 2355 | 0.022998721 | 0.022737257 | 58942 | 1356 | 58264 | 428543 | 7.3 | 0.3523727 | 20531 | 131415 | 1.3 |
| | 0 | 1 | 58 | 111618 | 2611 | 0.023392284 | 0.023121848 | 57587 | 1347 | 56913 | 370279 | 6.4 | 0.3558236 | 20251 | 110884 | 1.1 |
| | 0 | 1 | 59 | 120513 | 2872 | 0.023831454 | 0.023550829 | 56240 | 1340 | 55569 | 313365 | 5.6 | 0.3425945 | 19038 | 90633 | 0.9 |
| | 0 | 1 | 60 | 129744 | 3148 | 0.024263164 | 0.023972342 | 54899 | 1332 | 54233 | 257796 | 4.7 | 0.3221998 | 17474 | 71595 | 0.7 |
| | 0 | 1 | 61 | 138927 | 3462 | 0.024919562 | 0.024612891 | 53567 | 1335 | 52900 | 203563 | 3.8 | 0.3109288 | 16448 | 54121 | 0.5 |
| | 0 | 1 | 62 | 148031 | 3811 | 0.025744608 | 0.025417427 | 52232 | 1345 | 51560 | 150663 | 2.9 | 0.2742241 | 14139 | 37673 | 0.4 |
| | 0 | 1 | 63 | 157232 | 4136 | 0.026305078 | 0.025963591 | 50888 | 1339 | 50218 | 99103 | 1.9 | 0.2395363 | 12029 | 23534 | 0.2 |
| | 0 | 1 | 64 | 165567 | 4441 | 0.026822978 | 0.026468003 | 49549 | 1329 | 48885 | 48885 | 1.0 | 0.2353455 | 11505 | 11505 | 0.1 |

## Lifetable for Men with Mobility Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 20 | 1930 | 9 | 0.004663212 | 0.004652365 | 100000 | 466 | 99767 | 3440313 | 34.4 | 0.2379036 | 23735 | 846674 | 8.5 |
| 0 | 1 | 21 | 1921 | 24 | 0.012493493 | 0.012415934 | 99534 | 1244 | 98912 | 3340547 | 33.6 | 0.231243 | 22873 | 822939 | 8.2 |
| 0 | 1 | 22 | 3710 | 36 | 0.009703504 | 0.009656652 | 98290 | 954 | 97813 | 3241635 | 33.0 | 0.2670323 | 26119 | 800066 | 8.0 |
| 0 | 1 | 23 | 5435 | 48 | 0.008831647 | 0.008792819 | 97336 | 860 | 96907 | 3143821 | 32.3 | 0.2812539 | 27255 | 773947 | 7.7 |
| 0 | 1 | 24 | 7337 | 65 | 0.008859207 | 0.008820137 | 96477 | 855 | 96049 | 3046915 | 31.6 | 0.2632926 | 25289 | 746692 | 7.5 |
| 0 | 1 | 25 | 9379 | 84 | 0.008956179 | 0.008916251 | 95622 | 856 | 95194 | 2950865 | 30.9 | 0.2551243 | 24286 | 721403 | 7.2 |
| 0 | 1 | 26 | 10857 | 97 | 0.008934328 | 0.008894594 | 94766 | 847 | 94342 | 2855672 | 30.1 | 0.2556132 | 24115 | 697116 | 7.0 |
| 0 | 1 | 27 | 11760 | 104 | 0.008843537 | 0.008804605 | 93919 | 831 | 93504 | 2761329 | 29.4 | 0.2908223 | 27193 | 673001 | 6.7 |
| 0 | 1 | 28 | 12704 | 113 | 0.008894836 | 0.008855452 | 93088 | 828 | 92674 | 2667826 | 28.7 | 0.2824168 | 26173 | 645808 | 6.5 |
| 0 | 1 | 29 | 13698 | 125 | 0.00912542 | 0.009083972 | 92260 | 842 | 91839 | 2575151 | 27.9 | 0.2634785 | 24198 | 619636 | 6.2 |
| 0 | 1 | 30 | 14760 | 152 | 0.010298103 | 0.010245349 | 91418 | 941 | 90948 | 2483312 | 27.2 | 0.2675221 | 24331 | 595438 | 6.0 |
| 0 | 1 | 31 | 15911 | 176 | 0.01106153 | 0.011000688 | 90477 | 1001 | 89977 | 2392364 | 26.4 | 0.2641381 | 23766 | 571107 | 5.7 |
| 0 | 1 | 32 | 17164 | 192 | 0.011186204 | 0.011123986 | 89476 | 1001 | 88976 | 2302387 | 25.7 | 0.2734448 | 24330 | 547341 | 5.5 |
| 0 | 1 | 33 | 18498 | 213 | 0.011514758 | 0.011448843 | 88475 | 1019 | 87966 | 2213412 | 25.0 | 0.262892 | 23126 | 523011 | 5.2 |
| 0 | 1 | 34 | 19909 | 242 | 0.012155307 | 0.012081877 | 87457 | 1063 | 86925 | 2125446 | 24.3 | 0.2484049 | 21593 | 499886 | 5.0 |
| 0 | 1 | 35 | 21380 | 265 | 0.012394761 | 0.01231842 | 86393 | 1071 | 85858 | 2038521 | 23.6 | 0.2508757 | 21540 | 478293 | 4.8 |
| 0 | 1 | 36 | 22924 | 295 | 0.012868609 | 0.012786338 | 85323 | 1098 | 84774 | 1952663 | 22.9 | 0.2745172 | 23272 | 456753 | 4.6 |
| 0 | 1 | 37 | 24550 | 328 | 0.013360489 | 0.01327183 | 84225 | 1125 | 83662 | 1867889 | 22.2 | 0.2730972 | 22848 | 433481 | 4.3 |
| 0 | 1 | 38 | 26257 | 362 | 0.0137868 | 0.013692412 | 83099 | 1146 | 82527 | 1784227 | 21.5 | 0.2623069 | 21647 | 410634 | 4.1 |
| 0 | 1 | 39 | 28063 | 406 | 0.014467448 | 0.014363546 | 81954 | 1186 | 81361 | 1701700 | 20.8 | 0.2634465 | 21434 | 388986 | 3.9 |
| 0 | 1 | 40 | 29981 | 446 | 0.014876088 | 0.014766256 | 80768 | 1202 | 80167 | 1620339 | 20.1 | 0.2524712 | 20240 | 367552 | 3.7 |
| 0 | 1 | 41 | 32069 | 480 | 0.014967726 | 0.014856542 | 79567 | 1191 | 78971 | 1540172 | 19.4 | 0.2362812 | 18659 | 347312 | 3.5 |
| 0 | 1 | 42 | 34370 | 531 | 0.01544952 | 0.015331091 | 78376 | 1211 | 77770 | 1461201 | 18.6 | 0.2496756 | 19417 | 328653 | 3.3 |
| 0 | 1 | 43 | 36806 | 588 | 0.015975656 | 0.015849057 | 77165 | 1233 | 76548 | 1383431 | 17.9 | 0.2337499 | 17893 | 309235 | 3.1 |
| 0 | 1 | 44 | 39414 | 652 | 0.016542345 | 0.016406643 | 75932 | 1256 | 75304 | 1306882 | 17.2 | 0.2730209 | 20560 | 291342 | 2.9 |
| 0 | 1 | 45 | 42167 | 709 | 0.016814096 | 0.016673918 | 74676 | 1256 | 74048 | 1231578 | 16.5 | 0.2521746 | 18673 | 270783 | 2.7 |
| 0 | 1 | 46 | 45041 | 752 | 0.016695899 | 0.016557677 | 73420 | 1226 | 72807 | 1157530 | 15.8 | 0.2339938 | 17036 | 252110 | 2.5 |
| 0 | 1 | 47 | 48062 | 854 | 0.017768715 | 0.017612242 | 72194 | 1283 | 71553 | 1084723 | 15.0 | 0.2411497 | 17255 | 235073 | 2.4 |
| 0 | 1 | 48 | 51250 | 951 | 0.018556098 | 0.018385516 | 70912 | 1316 | 70254 | 1013170 | 14.3 | 0.2468284 | 17341 | 217818 | 2.2 |
| 0 | 1 | 49 | 54566 | 1043 | 0.019114467 | 0.018933515 | 69596 | 1330 | 68931 | 942916 | 13.5 | 0.2439923 | 16819 | 200477 | 2.0 |
| 0 | 1 | 50 | 57980 | 1115 | 0.019230769 | 0.019047619 | 68266 | 1313 | 67609 | 873985 | 12.8 | 0.242769 | 16413 | 183659 | 1.8 |
| 0 | 1 | 51 | 62562 | 1206 | 0.019276877 | 0.019092852 | 66953 | 1291 | 66307 | 806376 | 12.0 | 0.2273984 | 15078 | 167246 | 1.7 |
| 0 | 1 | 52 | 68499 | 1385 | 0.020219273 | 0.02001691 | 65662 | 1328 | 64998 | 740069 | 11.3 | 0.2381327 | 15478 | 152167 | 1.5 |
| 0 | 1 | 53 | 74316 | 1568 | 0.02109909 | 0.020878828 | 64334 | 1357 | 63656 | 675071 | 10.5 | 0.22946 | 14606 | 136689 | 1.4 |
| 0 | 1 | 54 | 79797 | 1719 | 0.021542163 | 0.021312603 | 62977 | 1357 | 62299 | 611415 | 9.7 | 0.2347734 | 14626 | 122083 | 1.2 |
| 0 | 1 | 55 | 85428 | 1842 | 0.021562017 | 0.021332036 | 61620 | 1329 | 60956 | 549116 | 8.9 | 0.2237598 | 13640 | 107457 | 1.1 |
| 0 | 1 | 56 | 92928 | 2080 | 0.02238292 | 0.022135195 | 60292 | 1350 | 59617 | 488160 | 8.1 | 0.2144544 | 12785 | 93817 | 0.9 |
| 0 | 1 | 57 | 102397 | 2355 | 0.022998721 | 0.022737257 | 58942 | 1356 | 58264 | 428543 | 7.3 | 0.2100422 | 12238 | 81032 | 0.8 |
| 0 | 1 | 58 | 111618 | 2611 | 0.023392284 | 0.023121848 | 57587 | 1347 | 56913 | 370279 | 6.4 | 0.209867 | 11944 | 68794 | 0.7 |
| 0 | 1 | 59 | 120513 | 2872 | 0.023831454 | 0.023550829 | 56240 | 1340 | 55569 | 313365 | 5.6 | 0.2039936 | 11336 | 56850 | 0.6 |
| 0 | 1 | 60 | 129744 | 3148 | 0.024263164 | 0.023972342 | 54899 | 1332 | 54233 | 257796 | 4.7 | 0.200709 | 10885 | 45514 | 0.5 |
| 0 | 1 | 61 | 138927 | 3462 | 0.024919562 | 0.024612891 | 53567 | 1335 | 52900 | 203563 | 3.8 | 0.2020942 | 10691 | 34629 | 0.3 |
| 0 | 1 | 62 | 148031 | 3811 | 0.025744608 | 0.025417427 | 52232 | 1345 | 51560 | 150663 | 2.9 | 0.1716275 | 8849 | 23938 | 0.2 |
| 0 | 1 | 63 | 157232 | 4136 | 0.026305078 | 0.025963591 | 50888 | 1339 | 50218 | 99103 | 1.9 | 0.1566205 | 7865 | 15089 | 0.2 |
| 0 | 1 | 64 | 165567 | 4441 | 0.026822978 | 0.026468003 | 49549 | 1329 | 48885 | 48885 | 1.0 | 0.1477713 | 7224 | 7224 | 0.1 |

## Lifetable for Men with Cognitive Disabilities

| # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1930 | 9 | 0.004663212 | 0.004652365 | 100000 | 466 | 99767 | 3440313 | 34.4 | 0.296415 | 29572 | 902699 | 9.0 |
| 1921 | 24 | 0.012493493 | 0.012415934 | 99534 | 1244 | 98912 | 3340547 | 33.6 | 0.3106363 | 30726 | 873127 | 8.7 |
| 3710 | 36 | 0.009703504 | 0.009656652 | 98290 | 954 | 97813 | 3241635 | 33.0 | 0.3286587 | 32147 | 842401 | 8.4 |
| 5435 | 48 | 0.008831647 | 0.008792819 | 97336 | 860 | 96907 | 3143821 | 32.3 | 0.3326987 | 32241 | 810254 | 8.1 |
| 7337 | 65 | 0.008859207 | 0.008820137 | 96477 | 855 | 96049 | 3046915 | 31.6 | 0.3417885 | 32829 | 778014 | 7.8 |
| 9379 | 84 | 0.008956179 | 0.008916251 | 95622 | 856 | 95194 | 2950865 | 30.9 | 0.3348304 | 31874 | 745185 | 7.5 |
| 10857 | 97 | 0.008934328 | 0.008894594 | 94766 | 847 | 94342 | 2855672 | 30.1 | 0.3326567 | 31384 | 713311 | 7.1 |
| 11760 | 104 | 0.008843537 | 0.008804605 | 93919 | 831 | 93504 | 2761329 | 29.4 | 0.3262343 | 30504 | 681928 | 6.8 |
| 12704 | 113 | 0.008894836 | 0.008855452 | 93088 | 828 | 92674 | 2667826 | 28.7 | 0.3218074 | 29823 | 651423 | 6.5 |
| 13698 | 125 | 0.00912542 | 0.009083972 | 92260 | 842 | 91839 | 2575151 | 27.9 | 0.3270433 | 30035 | 621600 | 6.2 |
| 14760 | 152 | 0.010298103 | 0.010245349 | 91418 | 941 | 90948 | 2483312 | 27.2 | 0.3308189 | 30087 | 591565 | 5.9 |
| 15911 | 176 | 0.01106153 | 0.011000688 | 90477 | 1001 | 89977 | 2392364 | 26.4 | 0.3087382 | 27779 | 561477 | 5.6 |
| 17164 | 192 | 0.011186204 | 0.011123986 | 89476 | 1001 | 88976 | 2302387 | 25.7 | 0.3096341 | 27550 | 533698 | 5.3 |
| 18498 | 213 | 0.011514758 | 0.011448843 | 88475 | 1019 | 87966 | 2213412 | 25.0 | 0.3081771 | 27109 | 506148 | 5.1 |
| 19909 | 242 | 0.012155307 | 0.012081877 | 87457 | 1063 | 86925 | 2125446 | 24.3 | 0.3014972 | 26208 | 479039 | 4.8 |
| 21380 | 265 | 0.012394761 | 0.01231842 | 86393 | 1071 | 85858 | 2038521 | 23.6 | 0.2931886 | 25173 | 452832 | 4.5 |
| 22924 | 295 | 0.012868609 | 0.012786338 | 85323 | 1098 | 84774 | 1952663 | 22.9 | 0.2899921 | 24584 | 427659 | 4.3 |
| 24550 | 328 | 0.013360489 | 0.01327183 | 84225 | 1125 | 83662 | 1867889 | 22.2 | 0.2856704 | 23900 | 403075 | 4.0 |
| 26257 | 362 | 0.0137868 | 0.013692412 | 83099 | 1146 | 82527 | 1784227 | 21.5 | 0.2787628 | 23005 | 379175 | 3.8 |
| 28063 | 406 | 0.014467448 | 0.014363546 | 81954 | 1186 | 81361 | 1701700 | 20.8 | 0.2734002 | 22244 | 356170 | 3.6 |
| 29981 | 446 | 0.014876088 | 0.014766256 | 80768 | 1202 | 80167 | 1620339 | 20.1 | 0.2522146 | 20219 | 333926 | 3.3 |
| 32069 | 480 | 0.014967726 | 0.014856542 | 79567 | 1191 | 78971 | 1540172 | 19.4 | 0.2509918 | 19821 | 313707 | 3.1 |
| 34370 | 531 | 0.01544952 | 0.015331091 | 78376 | 1211 | 77770 | 1461201 | 18.6 | 0.2645104 | 20571 | 293886 | 2.9 |
| 36806 | 588 | 0.015975656 | 0.015849057 | 77165 | 1233 | 76548 | 1383431 | 17.9 | 0.2431554 | 18613 | 273315 | 2.7 |
| 39414 | 652 | 0.016542345 | 0.016406643 | 75932 | 1256 | 75304 | 1306882 | 17.2 | 0.2626382 | 19778 | 254701 | 2.5 |
| 42167 | 709 | 0.016814096 | 0.016673918 | 74676 | 1256 | 74048 | 1231578 | 16.5 | 0.2465389 | 18256 | 234924 | 2.3 |
| 45041 | 752 | 0.016695899 | 0.016557677 | 73420 | 1226 | 72807 | 1157530 | 15.8 | 0.2464636 | 17944 | 216668 | 2.2 |
| 48062 | 854 | 0.017768715 | 0.017612242 | 72194 | 1283 | 71553 | 1084723 | 15.0 | 0.234229 | 16760 | 198724 | 2.0 |
| 51250 | 951 | 0.018556098 | 0.018385516 | 70912 | 1316 | 70254 | 1013170 | 14.3 | 0.2248949 | 15800 | 181964 | 1.8 |
| 54566 | 1043 | 0.019114467 | 0.018933515 | 69596 | 1330 | 68931 | 942916 | 13.5 | 0.2227232 | 15352 | 166164 | 1.7 |
| 57980 | 1115 | 0.019230769 | 0.019047619 | 68266 | 1313 | 67609 | 873985 | 12.8 | 0.2180142 | 14740 | 150812 | 1.5 |
| 62562 | 1206 | 0.019276877 | 0.019092852 | 66953 | 1291 | 66307 | 806376 | 12.0 | 0.2092378 | 13874 | 136072 | 1.4 |
| 68499 | 1385 | 0.020219273 | 0.02001691 | 65662 | 1328 | 64998 | 740069 | 11.3 | 0.2086712 | 13563 | 122198 | 1.2 |
| 74316 | 1568 | 0.02109909 | 0.020878828 | 64334 | 1357 | 63656 | 675071 | 10.5 | 0.1997925 | 12718 | 108635 | 1.1 |
| 79797 | 1719 | 0.021542163 | 0.021312603 | 62977 | 1357 | 62299 | 611415 | 9.7 | 0.1878031 | 11700 | 95917 | 1.0 |
| 85428 | 1842 | 0.021562017 | 0.021332036 | 61620 | 1329 | 60956 | 549116 | 8.9 | 0.1841143 | 11223 | 84217 | 0.8 |
| 92928 | 2080 | 0.02238292 | 0.022135195 | 60292 | 1350 | 59617 | 488160 | 8.1 | 0.177617 | 10589 | 72994 | 0.7 |
| 102397 | 2355 | 0.022998721 | 0.022737257 | 58942 | 1356 | 58264 | 428543 | 7.3 | 0.1768065 | 10302 | 62405 | 0.6 |
| 111618 | 2611 | 0.023392284 | 0.023121848 | 57587 | 1347 | 56913 | 370279 | 6.4 | 0.1763259 | 10035 | 52103 | 0.5 |
| 120513 | 2872 | 0.023831454 | 0.023550829 | 56240 | 1340 | 55569 | 313365 | 5.6 | 0.1560536 | 8672 | 42068 | 0.4 |
| 129744 | 3148 | 0.024263164 | 0.023972342 | 54899 | 1332 | 54233 | 257796 | 4.7 | 0.1544275 | 8375 | 33396 | 0.3 |
| 138927 | 3462 | 0.024919562 | 0.024612891 | 53567 | 1335 | 52900 | 203563 | 3.8 | 0.1474923 | 7802 | 25021 | 0.3 |
| 148031 | 3811 | 0.025744608 | 0.025417427 | 52232 | 1345 | 51560 | 150663 | 2.9 | 0.1296919 | 6687 | 17219 | 0.2 |
| 157232 | 4136 | 0.026305078 | 0.025963591 | 50888 | 1339 | 50218 | 99103 | 1.9 | 0.1104006 | 5544 | 10532 | 0.1 |
| 165567 | 4441 | 0.026822978 | 0.026468003 | 49549 | 1329 | 48885 | 48885 | 1.0 | 0.102032 | 4988 | 4988 | 0.0 |

## Lifetable for Men with ADL Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 20 | 1930 | 9 | 0.004663212 | 0.004652365 | 100000 | 466 | 99767 | 3440313 | 34.4 | 0.1267015 | 12641 | 549842 | 5.5 |
| 0 | 1 | 21 | 1921 | 24 | 0.012493493 | 0.012415934 | 99534 | 1244 | 98912 | 3340547 | 33.6 | 0.1211981 | 11988 | 537202 | 5.4 |
| 0 | 1 | 22 | 3710 | 36 | 0.009703504 | 0.009656652 | 98290 | 954 | 97813 | 3241635 | 33.0 | 0.1801242 | 17619 | 525214 | 5.3 |
| 0 | 1 | 23 | 5435 | 48 | 0.008831647 | 0.008792819 | 97336 | 860 | 96907 | 3143821 | 32.3 | 0.1871904 | 18140 | 507595 | 5.1 |
| 0 | 1 | 24 | 7337 | 65 | 0.008859207 | 0.008820137 | 96477 | 855 | 96049 | 3046915 | 31.6 | 0.1654076 | 15887 | 489455 | 4.9 |
| 0 | 1 | 25 | 9379 | 84 | 0.008956179 | 0.008916251 | 95622 | 856 | 95194 | 2950865 | 30.9 | 0.1762811 | 16781 | 473568 | 4.7 |
| 0 | 1 | 26 | 10857 | 97 | 0.008934328 | 0.008894594 | 94766 | 847 | 94342 | 2855672 | 30.1 | 0.1729255 | 16314 | 456787 | 4.6 |
| 0 | 1 | 27 | 11760 | 104 | 0.008843537 | 0.008804605 | 93919 | 831 | 93504 | 2761329 | 29.4 | 0.1889845 | 17671 | 440473 | 4.4 |
| 0 | 1 | 28 | 12704 | 113 | 0.008894836 | 0.008855452 | 93088 | 828 | 92674 | 2667826 | 28.7 | 0.1949952 | 18071 | 422802 | 4.2 |
| 0 | 1 | 29 | 13698 | 125 | 0.00912542 | 0.009083972 | 92260 | 842 | 91839 | 2575151 | 27.9 | 0.1756764 | 16134 | 404731 | 4.0 |
| 0 | 1 | 30 | 14760 | 152 | 0.010298103 | 0.010245349 | 91418 | 941 | 90948 | 2483312 | 27.2 | 0.1919493 | 17457 | 388597 | 3.9 |
| 0 | 1 | 31 | 15911 | 176 | 0.01106153 | 0.011000688 | 90477 | 1001 | 89977 | 2392364 | 26.4 | 0.1793089 | 16134 | 371140 | 3.7 |
| 0 | 1 | 32 | 17164 | 192 | 0.011186204 | 0.011123986 | 89476 | 1001 | 88976 | 2302387 | 25.7 | 0.1702188 | 15145 | 355006 | 3.6 |
| 0 | 1 | 33 | 18498 | 213 | 0.011514758 | 0.011448843 | 88475 | 1019 | 87966 | 2213412 | 25.0 | 0.1981638 | 17432 | 339861 | 3.4 |
| 0 | 1 | 34 | 19909 | 242 | 0.012155307 | 0.012081877 | 87457 | 1063 | 86925 | 2125446 | 24.3 | 0.1839454 | 15989 | 322429 | 3.2 |
| 0 | 1 | 35 | 21380 | 265 | 0.012394761 | 0.01231842 | 86393 | 1071 | 85858 | 2038521 | 23.6 | 0.1950248 | 16744 | 306439 | 3.1 |
| 0 | 1 | 36 | 22924 | 295 | 0.012868609 | 0.012786338 | 85323 | 1098 | 84774 | 1952663 | 22.9 | 0.1958819 | 16606 | 289695 | 2.9 |
| 0 | 1 | 37 | 24550 | 328 | 0.013360489 | 0.01327183 | 84225 | 1125 | 83662 | 1867889 | 22.2 | 0.179638 | 15029 | 273089 | 2.7 |
| 0 | 1 | 38 | 26257 | 362 | 0.0137868 | 0.013692412 | 83099 | 1146 | 82527 | 1784227 | 21.5 | 0.1855217 | 15310 | 258061 | 2.6 |
| 0 | 1 | 39 | 28063 | 406 | 0.014467448 | 0.014363546 | 81954 | 1186 | 81361 | 1701700 | 20.8 | 0.1800398 | 14648 | 242750 | 2.4 |
| 0 | 1 | 40 | 29981 | 446 | 0.014876088 | 0.014766256 | 80768 | 1202 | 80167 | 1620339 | 20.1 | 0.1610818 | 12913 | 228102 | 2.3 |
| 0 | 1 | 41 | 32069 | 480 | 0.014967726 | 0.014856542 | 79567 | 1191 | 78971 | 1540172 | 19.4 | 0.1644903 | 12990 | 215188 | 2.2 |
| 0 | 1 | 42 | 34370 | 531 | 0.01544952 | 0.015331091 | 78376 | 1211 | 77770 | 1461201 | 18.6 | 0.1822091 | 14170 | 202198 | 2.0 |
| 0 | 1 | 43 | 36806 | 588 | 0.015975656 | 0.015849057 | 77165 | 1233 | 76548 | 1383431 | 17.9 | 0.1547115 | 11843 | 188028 | 1.9 |
| 0 | 1 | 44 | 39414 | 652 | 0.016542345 | 0.016406643 | 75932 | 1256 | 75304 | 1306882 | 17.2 | 0.1518416 | 11434 | 176185 | 1.8 |
| 0 | 1 | 45 | 42167 | 709 | 0.016814096 | 0.016673918 | 74676 | 1256 | 74048 | 1231578 | 16.5 | 0.1583341 | 11724 | 164751 | 1.6 |
| 0 | 1 | 46 | 45041 | 752 | 0.016695899 | 0.016557677 | 73420 | 1226 | 72807 | 1157530 | 15.8 | 0.1647841 | 11997 | 153026 | 1.5 |
| 0 | 1 | 47 | 48062 | 854 | 0.017768715 | 0.017612242 | 72194 | 1283 | 71553 | 1084723 | 15.0 | 0.1600672 | 11453 | 141029 | 1.4 |
| 0 | 1 | 48 | 51250 | 951 | 0.018556098 | 0.018385516 | 70912 | 1316 | 70254 | 1013170 | 14.3 | 0.1469482 | 10324 | 129576 | 1.3 |
| 0 | 1 | 49 | 54566 | 1043 | 0.019114467 | 0.018933515 | 69596 | 1330 | 68931 | 942916 | 13.5 | 0.1643237 | 11327 | 119252 | 1.2 |
| 0 | 1 | 50 | 57980 | 1115 | 0.019230769 | 0.019047619 | 68266 | 1313 | 67609 | 873985 | 12.8 | 0.1476907 | 9985 | 107925 | 1.1 |
| 0 | 1 | 51 | 62562 | 1206 | 0.019276877 | 0.019092852 | 66953 | 1291 | 66307 | 806376 | 12.0 | 0.1487917 | 9866 | 97940 | 1.0 |
| 0 | 1 | 52 | 68499 | 1385 | 0.020219273 | 0.02001691 | 65662 | 1328 | 64998 | 740069 | 11.3 | 0.1517479 | 9863 | 88074 | 0.9 |
| 0 | 1 | 53 | 74316 | 1568 | 0.02109909 | 0.020878828 | 64334 | 1357 | 63656 | 675071 | 10.5 | 0.1426014 | 9077 | 78210 | 0.8 |
| 0 | 1 | 54 | 79797 | 1719 | 0.021542163 | 0.021312603 | 62977 | 1357 | 62299 | 611415 | 9.7 | 0.1411998 | 8797 | 69133 | 0.7 |
| 0 | 1 | 55 | 85428 | 1842 | 0.021562017 | 0.021332036 | 61620 | 1329 | 60956 | 549116 | 8.9 | 0.136573 | 8325 | 60336 | 0.6 |
| 0 | 1 | 56 | 92928 | 2080 | 0.02238292 | 0.022135195 | 60292 | 1350 | 59617 | 488160 | 8.1 | 0.1231109 | 7340 | 52011 | 0.5 |
| 0 | 1 | 57 | 102397 | 2355 | 0.022998721 | 0.022737257 | 58942 | 1356 | 58264 | 428543 | 7.3 | 0.1279365 | 7454 | 44672 | 0.4 |
| 0 | 1 | 58 | 111618 | 2611 | 0.023392284 | 0.023121848 | 57587 | 1347 | 56913 | 370279 | 6.4 | 0.1292739 | 7357 | 37218 | 0.4 |
| 0 | 1 | 59 | 120513 | 2872 | 0.023831454 | 0.023550829 | 56240 | 1340 | 55569 | 313365 | 5.6 | 0.1048507 | 5826 | 29860 | 0.3 |
| 0 | 1 | 60 | 129744 | 3148 | 0.024263164 | 0.023972342 | 54899 | 1332 | 54233 | 257796 | 4.7 | 0.104093 | 5645 | 24034 | 0.2 |
| 0 | 1 | 61 | 138927 | 3462 | 0.024919562 | 0.024612891 | 53567 | 1335 | 52900 | 203563 | 3.8 | 0.1126963 | 5962 | 18389 | 0.2 |
| 0 | 1 | 62 | 148031 | 3811 | 0.025744608 | 0.025417427 | 52232 | 1345 | 51560 | 150663 | 2.9 | 0.0908239 | 4683 | 12427 | 0.1 |
| 0 | 1 | 63 | 157232 | 4136 | 0.026305078 | 0.025963591 | 50888 | 1339 | 50218 | 99103 | 1.9 | 0.081158 | 4076 | 7744 | 0.1 |
| 0 | 1 | 64 | 165567 | 4441 | 0.026822978 | 0.026468003 | 49549 | 1329 | 48885 | 48885 | 1.0 | 0.0750451 | 3669 | 3669 | 0.0 |

## Lifetable for Men with IADL Disabilities

| Gender | Dis | age | # Individuals | # Deaths | q(x) | m(x) | l(x) | d(x) | L(x) | T(x) | e(x) | Ø(x) | L(x) *ø(x) | ∑L(x) *Ø(x) | Years left of employment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | 1 | 20 | 1930 | 9 | 0.004663212 | 0.004652365 | 100000 | 466 | 99767 | 3440313 | 34.4 | 0.1820215 | 18160 | 647681 | 6.5 |
| 0 | 1 | 21 | 1921 | 24 | 0.012493493 | 0.012415934 | 99534 | 1244 | 98912 | 3340547 | 33.6 | 0.2052798 | 20305 | 629521 | 6.3 |
| 0 | 1 | 22 | 3710 | 36 | 0.009703504 | 0.009656652 | 98290 | 954 | 97813 | 3241635 | 33.0 | 0.231367 | 22631 | 609216 | 6.1 |
| 0 | 1 | 23 | 5435 | 48 | 0.008831647 | 0.008792819 | 97336 | 860 | 96907 | 3143821 | 32.3 | 0.2505942 | 24284 | 586585 | 5.9 |
| 0 | 1 | 24 | 7337 | 65 | 0.008859207 | 0.008820137 | 96477 | 855 | 96049 | 3046915 | 31.6 | 0.2528564 | 24287 | 562301 | 5.6 |
| 0 | 1 | 25 | 9379 | 84 | 0.008956179 | 0.008916251 | 95622 | 856 | 95194 | 2950865 | 30.9 | 0.2474112 | 23552 | 538015 | 5.4 |
| 0 | 1 | 26 | 10857 | 97 | 0.008934328 | 0.008894594 | 94766 | 847 | 94342 | 2855672 | 30.1 | 0.2371936 | 22377 | 514463 | 5.1 |
| 0 | 1 | 27 | 11760 | 104 | 0.008843537 | 0.008804605 | 93919 | 831 | 93504 | 2761329 | 29.4 | 0.2515155 | 23518 | 492085 | 4.9 |
| 0 | 1 | 28 | 12704 | 113 | 0.008894836 | 0.008855452 | 93088 | 828 | 92674 | 2667826 | 28.7 | 0.2435659 | 22572 | 468567 | 4.7 |
| 0 | 1 | 29 | 13698 | 125 | 0.00912542 | 0.009083972 | 92260 | 842 | 91839 | 2575151 | 27.9 | 0.240102 | 22051 | 445995 | 4.5 |
| 0 | 1 | 30 | 14760 | 152 | 0.010298103 | 0.010245349 | 91418 | 941 | 90948 | 2483312 | 27.2 | 0.2402585 | 21851 | 423944 | 4.2 |
| 0 | 1 | 31 | 15911 | 176 | 0.01106153 | 0.011000688 | 90477 | 1001 | 89977 | 2392364 | 26.4 | 0.2305224 | 20742 | 402093 | 4.0 |
| 0 | 1 | 32 | 17164 | 192 | 0.011186204 | 0.011123986 | 89476 | 1001 | 88976 | 2302387 | 25.7 | 0.2270847 | 20205 | 381352 | 3.8 |
| 0 | 1 | 33 | 18498 | 213 | 0.011514758 | 0.011448843 | 88475 | 1019 | 87966 | 2213412 | 25.0 | 0.2196246 | 19319 | 361147 | 3.6 |
| 0 | 1 | 34 | 19909 | 242 | 0.012155307 | 0.012081877 | 87457 | 1063 | 86925 | 2125446 | 24.3 | 0.2303717 | 20025 | 341827 | 3.4 |
| 0 | 1 | 35 | 21380 | 265 | 0.012394761 | 0.01231842 | 86393 | 1071 | 85858 | 2038521 | 23.6 | 0.2105171 | 18075 | 321802 | 3.2 |
| 0 | 1 | 36 | 22924 | 295 | 0.012868609 | 0.012786338 | 85323 | 1098 | 84774 | 1952663 | 22.9 | 0.2278179 | 19313 | 303728 | 3.0 |
| 0 | 1 | 37 | 24550 | 328 | 0.013360489 | 0.01327183 | 84225 | 1125 | 83662 | 1867889 | 22.2 | 0.2092198 | 17504 | 284415 | 2.8 |
| 0 | 1 | 38 | 26257 | 362 | 0.0137868 | 0.013692412 | 83099 | 1146 | 82527 | 1784227 | 21.5 | 0.2134915 | 17619 | 266911 | 2.7 |
| 0 | 1 | 39 | 28063 | 406 | 0.014467448 | 0.014363546 | 81954 | 1186 | 81361 | 1701700 | 20.8 | 0.2091513 | 17017 | 249292 | 2.5 |
| 0 | 1 | 40 | 29981 | 446 | 0.014876088 | 0.014766256 | 80768 | 1202 | 80167 | 1620339 | 20.1 | 0.1768288 | 14176 | 232275 | 2.3 |
| 0 | 1 | 41 | 32069 | 480 | 0.014967726 | 0.014856542 | 79567 | 1191 | 78971 | 1540172 | 19.4 | 0.1726751 | 13636 | 218100 | 2.2 |
| 0 | 1 | 42 | 34370 | 531 | 0.01544952 | 0.015331091 | 78376 | 1211 | 77770 | 1461201 | 18.6 | 0.1849276 | 14382 | 204463 | 2.0 |
| 0 | 1 | 43 | 36806 | 588 | 0.015975656 | 0.015849057 | 77165 | 1233 | 76548 | 1383431 | 17.9 | 0.1650999 | 12638 | 190081 | 1.9 |
| 0 | 1 | 44 | 39414 | 652 | 0.016542345 | 0.016406643 | 75932 | 1256 | 75304 | 1306882 | 17.2 | 0.1839049 | 13849 | 177443 | 1.8 |
| 0 | 1 | 45 | 42167 | 709 | 0.016814096 | 0.016673918 | 74676 | 1256 | 74048 | 1231578 | 16.5 | 0.1630026 | 12070 | 163594 | 1.6 |
| 0 | 1 | 46 | 45041 | 752 | 0.016695899 | 0.016557677 | 73420 | 1226 | 72807 | 1157530 | 15.8 | 0.1624482 | 11827 | 151524 | 1.5 |
| 0 | 1 | 47 | 48062 | 854 | 0.017768715 | 0.017612242 | 72194 | 1283 | 71553 | 1084723 | 15.0 | 0.1709362 | 12231 | 139697 | 1.4 |
| 0 | 1 | 48 | 51250 | 951 | 0.018556098 | 0.018385516 | 70912 | 1316 | 70254 | 1013170 | 14.3 | 0.1586265 | 11144 | 127466 | 1.3 |
| 0 | 1 | 49 | 54566 | 1043 | 0.019114467 | 0.018933515 | 69596 | 1330 | 68931 | 942916 | 13.5 | 0.16132 | 11120 | 116322 | 1.2 |
| 0 | 1 | 50 | 57980 | 1115 | 0.019230769 | 0.019047619 | 68266 | 1313 | 67609 | 873985 | 12.8 | 0.1518723 | 10268 | 105202 | 1.1 |
| 0 | 1 | 51 | 62562 | 1206 | 0.019276877 | 0.019092852 | 66953 | 1291 | 66307 | 806376 | 12.0 | 0.1514128 | 10040 | 94934 | 0.9 |
| 0 | 1 | 52 | 68499 | 1385 | 0.020219273 | 0.02001691 | 65662 | 1328 | 64998 | 740069 | 11.3 | 0.1525671 | 9917 | 84894 | 0.8 |
| 0 | 1 | 53 | 74316 | 1568 | 0.02109909 | 0.020878828 | 64334 | 1357 | 63656 | 675071 | 10.5 | 0.1431773 | 9114 | 74978 | 0.7 |
| 0 | 1 | 54 | 79797 | 1719 | 0.021542163 | 0.021312603 | 62977 | 1357 | 62299 | 611415 | 9.7 | 0.1364357 | 8500 | 65864 | 0.7 |
| 0 | 1 | 55 | 85428 | 1842 | 0.021562017 | 0.021332036 | 61620 | 1329 | 60956 | 549116 | 8.9 | 0.1214717 | 7404 | 57364 | 0.6 |
| 0 | 1 | 56 | 92928 | 2080 | 0.02238292 | 0.022135195 | 60292 | 1350 | 59617 | 488160 | 8.1 | 0.1236677 | 7373 | 49959 | 0.5 |
| 0 | 1 | 57 | 102397 | 2355 | 0.022998721 | 0.022737257 | 58942 | 1356 | 58264 | 428543 | 7.3 | 0.1168982 | 6811 | 42587 | 0.4 |
| 0 | 1 | 58 | 111618 | 2611 | 0.023392284 | 0.023121848 | 57587 | 1347 | 56913 | 370279 | 6.4 | 0.1204847 | 6857 | 35776 | 0.4 |
| 0 | 1 | 59 | 120513 | 2872 | 0.023831454 | 0.023550829 | 56240 | 1340 | 55569 | 313365 | 5.6 | 0.1061034 | 5896 | 28918 | 0.3 |
| 0 | 1 | 60 | 129744 | 3148 | 0.024263164 | 0.023972342 | 54899 | 1332 | 54233 | 257796 | 4.7 | 0.1044523 | 5665 | 23022 | 0.2 |
| 0 | 1 | 61 | 138927 | 3462 | 0.024919562 | 0.024612891 | 53567 | 1335 | 52900 | 203563 | 3.8 | 0.106422 | 5630 | 17358 | 0.2 |
| 0 | 1 | 62 | 148031 | 3811 | 0.025744608 | 0.025417427 | 52232 | 1345 | 51560 | 150663 | 2.9 | 0.0873214 | 4502 | 11728 | 0.1 |
| 0 | 1 | 63 | 157232 | 4136 | 0.026305078 | 0.025963591 | 50888 | 1339 | 50218 | 99103 | 1.9 | 0.0782667 | 3930 | 7226 | 0.1 |
| 0 | 1 | 64 | 165567 | 4441 | 0.026822978 | 0.026468003 | 49549 | 1329 | 48885 | 48885 | 1.0 | 0.0674065 | 3295 | 3295 | 0.0 |

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# Jennifer Dennison Brooks

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## EDUCATION

Ph.D., Sociology, Syracuse University — August 2021

*Dissertation: The Case for Intersectionality: An Intersectional Look at Disability in the Labor Market*

CAS Disability Studies, Syracuse University — 2019

M.A., Sociology, Syracuse University — 2017

B.A., Sociology, Grinnell College (with honors; Phi Beta Kappa Society) — 2015

## RESEARCH INTERESTS

Labor market inequalities among people with disabilities; disability policy

## PUBLICATIONS

Peer-Reviewed Publications

Jennifer Karas Montez & **Jennifer D. Brooks**. (2021). "Educational Attainment and Adult Health." Chapter 6 in the 9th Edition of the Handbook of Aging and the Social Sciences, Edited by Kenneth F. Ferraro & Deborah Carr.

**Jennifer D. Brooks**. (2019). "Just a Little Respect: Differences in Job Satisfaction Among Individuals with and Without Disabilities." *Social Science Quarterly* 100(1):379-388.

Revise and Resubmit

**Jennifer D. Brooks**. "Race, Gender, and Disability." Invited chapter for 1st Edition of The Oxford Handbook on the Sociology of Disability, Edited by Robyn Lewis Brown, Michelle Lee Maroto, and David Pettinicchio.

Manuscripts in Progress

David Pettinicchio, Michelle Lee Maroto, and **Jennifer D. Brooks** "Disability as an Axis of Economic and Labor Market Inequality" (In Preparation)

**Jennifer D. Brooks**. "Does Disability Unite or Divide Families? How Disability Status Impacts African American Family Interactions" (In Preparation)

Andrew S. London, **Jennifer D. Brooks**, and Colleen M. Heflin. "Supplemental Nutrition Assistance Program (SNAP) Use and Service-Connected Disabilities Among Active-Duty Military Personnel, Veterans, And Reservists" (In Preparation)

## RESEARCH BRIEFS, POLICY BRIEFS, AND OP-EDS

2020 "Disability as an Axis of Inequality: A Pandemic Illustration." By Laura Mauldin, Brian Grossman, Alice Wong, Angel Miles, Sharon Barnartt, **Jennifer Brooks**, Angela Frederick, and Ashley Volion. Published in ASA Footnotes https://www.asanet.org/news-events/footnotes/may-jun-2020/research-policy/disability-axis-inequality-pandemic-illustration-disability-society

2020 "Workers with Disabilities May Remain Unemployed Long after the COVID-19 Pandemic." By **Jennifer Brooks**. Published in The Lerner Center for Public Health Promotion Research Brief Series, Maxwell School, Syracuse University https://lernercenter.syr.edu/2020/06/15/ib-30/

2019 "Having a Disability Reduces Chances of Employment for all Racial/Ethnic Groups." By **Jennifer Brooks**. Published in The Lerner Center for Public Health Promotion Research Brief Series, Maxwell School, Syracuse University https://lernercenter.syr.edu/2019/09/17/having-a-disability-reduces-chances-of-employment-for-all-racial-ethnic-groups/

2019 "A Tale of Two Statistics: Has the Number of Workers with Disabilities Increased?" By **Jennifer Brooks**. Published in The Lerner Center for Public Health Promotion Research Brief Series, Maxwell School, Syracuse University https://lernercenter.syr.edu/2019/05/07/sociology-ph-d-student-jennifer-d-brooks-publishes-data-slice-on-statstics-related-to-unemployment-among-adults-with-disabilities/

## RESEARCH EXPERIENCE

**Syracuse University** 2017—2018
Research Assistant, Jennifer Karas Montez

- Conducted literature review on the connection between job satisfaction and disability
- Analyzed secondary data to determine the relationship between job satisfaction and disability, finding that people with disabilities report lower levels of job satisfaction than those without disabilities, partly because they feel a lack of respect at work
- Published findings in a nationally recognized academic journal
- Presented findings at American Sociological Association Annual Meeting
- Won award from the American Sociological Association based on this research

**Syracuse University** 2015—2017
Research Assistant, Andrew S. London

- Conducted extensive literature review on relationship between service-connected disability and Supplemental Nutrition Assistance Program (SNAP) use
- Analyzed secondary data to determine whether people with service-connected disabilities have higher rates of SNAP used than veterans without disabilities
- Analyzed data on psycho-social factors and PTSD

**Grinnell College** 2014
Mentored Advanced Project

- Designed, conducted, and analyzed job satisfaction/work values survey
- Completed a paper examining the relationship between education level and job satisfaction with a cohort of liberal arts college alumni

**The World Institute on Disability** 2013
Research Intern

- Designed, conducted, and analyzed a survey of vocational rehabilitation counselors and case managers
- Researched, collected, and analyzed transition age youths in the Vocational Rehabilitation program
- Completed paper on the involvement of vocational rehabilitation in the transitioning process of youth with disabilities
- Presented findings to The World Institute on Disability

## PROFESSIONAL SERVICE

**American Sociological Association—Disability and Society Section** 2020
Graduates Student Chair/Social Media Director

- Created and maintained the section's various social media platforms, including Twitter and Instagram
- Assisted with developing strategies to grow section membership
- Increased current membership engagement by organizing virtual events and social media campaigns

**Syracuse University—Sociology Department** 2017—2019
Student Faculty Representative

- Designed, conducted, and analyzed multiple graduate student surveys on important departmental issues
- Advocated for the graduate student body during monthly faculty meetings
- Collaborated with graduate students and faculty to ensure that the graduate student body was fully represented during important departmental decision making

**Grinnell College** 2014—2015
Disability and Accessibility Task Force
- Developed a comprehensive response to issues related to disability and accessibility to better meet the needs of students, faculty, and staff with disabilities

**Grinnell College** 2012—2014
Grinnell College's Diversity and Inclusion Council: Appointed Student Representative
- Collaborated with 15 faculty, staff, and student representatives on campus climate and other diversity concerns from the directive of Grinnell College President.
- Researched, presented, and endorsed annual actionable recommendations to the President.

## DISABILITY ADVOCACY

**U.S. Department of Labor's (USDOL) Office of Disability Employment Policy (ODEP) COVID-19 policy response:**
Return to the Workplace: Inclusive Safety and Health Policies 2021
- Collaborated with other employment and disability experts to develop post-pandemic return-to-work policy recommendations to federal, state, and local officials

**Flying While Disabled: How airlines fail passengers three decades after the Air Carrier Access Act and how accessibility can be improved** 2019
- Discussed my experiences with air travel to inform both the general public and policymakers
- These experiences were documented in a report, which can be found at: https://stories.usatodaynetwork.com/flying-while-disabled/home/site/gannett.com

## HONORS AND AWARDS

Science, Technology, Engineering, and Mathematics (STEM) Graduate Fellowship 2018-2020
Syracuse University

Outstanding Graduate Student Paper, Disability and Society Section, 2017
American Sociological Association

## INVITED PRESENTATIONS

2020

"Race, Gender, and Disability: An Intersectional Labor Market Analysis" Presented at the Lurie Institute for Disability Policy, Brandeis University

## CONFERENCE PRESENTATIONS

ASA = American Sociological Association, SSSP = Society for the Study of Social Problems.

2020

"Race, Gender, a Disability, and Labor Market". Presented at the virtual ASA meetings

2019

"Limitations of Disadvantage: Examining the Association between Functional Limitations, ADL/IADL Disability, and Labor Market Inequality". Presented at the ASA meeting, August, New York, NY

"Labor Market Disadvantage at the Intersection of Functional Limitations and Disability". Presented at the SSSP meeting, August, New York, NY

2018

"Does Disability Unite or Divide Families? How Disability Status Impacts African American Family Interactions." Presented at the ASA meeting, Philadelphia, PA

"Why Does Accessibility Matter?" Presented at the SSSP meeting, Philadelphia, PA

2017

"Just a Little Respect: Differences in Job Satisfaction Among Individuals with and Without Disabilities". Presented at the ASA meeting, Montreal, QC Canada

2014

"Drawing the Line Between Impairment and Disability: The Theory of Able-Bodied Acceptance." Roundtable paper presented at ASA meeting, San Francisco, CA