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THE EFFECTS OF THE AFFORDABLE CARE ACT MEDICAID EXPANSION IN
REDUCING HEALTH DISPARITIES AMONG THE DISABLED POPULATION

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ABSTRACT

Since its inception in 2010, the Affordable Care Act (ACA) has aimed to increase access to affordable health insurance, and the law intended to do so through an expansion of the Medicaid program to previously unqualifying individuals, including members of the disabled population (KKF, 2019). The purpose of this research is to examine whether the ACA's Medicaid expansion was able to positively impact reductions in health disparities among individuals with disabilities ages 25-64 by improving access to health insurance and therefore increasing service utilization for 5 key services. Additional analyses were conducted to examine if there were regional differences in the effectiveness of the Medicaid expansion and if regional differences existed, whether they were related to state- and regional-level delays in the implementation of the Medicaid expansion.

The present study utilized secondary data from the Medical Expenditure Panel Survey (MEPS) from 2012-2016. Medicaid insurance status and utilization rates for 5 services were compared across 4 regions using aggregate United States data as a baseline, including dental check-ups, routine primary care check-ups, flu vaccinations, blood pressure screenings, and cholesterol screenings. A mixed-effects linear regression model was applied to examine the statistical significance of the findings at the $p < 0.05$ level. All analyses were conducted using Stata Version 15.0 Software. The results from this analysis suggest that the Medicaid expansion was able to positively impact and improve access to health insurance (10.0%) and increase rates of service utilization from 3.5% to 4.7% for all 5 services nationwide. The results also suggest that significant associations at the $p < 0.05$ level existed between regions and utilization rates. Of note, the Northeast region saw the greatest increases in service utilization for all 5 services (3.4% to 8.1%) while the South consistently lagged behind national averages (-0.7% to -2.8%). These

findings coincide with regional differences in the date of the program's implementation and support the notion that the timely adoption of the Medicaid expansion, as seen most prominently in the Northeast, led to increased access to insurance and service utilization among the disabled population.

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Chapter 1

Introduction

The Problem

In 2016, 61 million, or approximately 1 in 4, adults living in the United States reported having a disability (Centers for Disease Control and Prevention, 2018; Okoro, Hollis, Cyrus, & Griffin-Blake, 2016). This finding is a marked increase from 2000 U.S. Census data which estimated that during that time period, just under 50 million Americans, or 1 of every 5 people, reported having a disability (Centers for Disease Control and Prevention, 2018). While this finding rings alarms in the area of public health, at the time of the 2000 Census, it was expected that the number of people with disabling conditions would rapidly increase in the coming decades as the baby-boom generation begins to age and becomes more vulnerable to disabling conditions fueled by an increased susceptibility to injury and illnesses (Freedman, Martin, & Schoeni, 2004).

However, 2016 estimates of just over 26% percent of the U.S. adult population having a disability are modest in comparison to what is anticipated in future decades (Okoro, Hollis, Cyrus, & Griffin-Blake). Since the start of the 21st century, the number of individuals belonging to the United States' disabled population has experienced steady growth, in part, as mounting numbers of one of the country's largest population cohorts, the Baby Boomers, continue to age and emerge into late adulthood (Iezzoni, 2011; Iezzoni, Kurtz, & Roa, 2014). But unlike trends that have previously been recorded, it is expected that this population will experience exponential growth in the coming decades as increasing numbers of American youth are being diagnosed with disabling conditions. This trend is largely driven by lifestyle habits and

historically high rates of obesity and the disease's associated comorbidities that are currently plaguing the nation's children (Reichard, Stolze, & Fox, 2011).

Ultimately, the significant increase in the sheer number of people living with disabilities in the United States is anticipated to cause a strain on the healthcare system. Already, research has found that Americans with disabilities consume significantly more healthcare services than those without disabilities (Reichard, Gulley, Rasch, Chan, 2015). When the health of a significant portion of the population becomes compromised due to disabling conditions, a subsequent increase in the demand for health care services will follow (Agaraonnik, Campbell, Ressalam, & Iezzoni, 2019; Iezzoni, 2011; Reichard, Stolze, & Fox, 2011). Therefore, it is pertinent that the United States healthcare system be prepared to meet the diverse healthcare needs of the disabled population. In order to effectively manage a growing need for healthcare services among the disabled population, the healthcare system, including its providers, payors, facilities, services, and policies, must commit to providing more accessible, cost-efficient, culturally competent, and high-quality health care for individuals with disabilities.

Within the ever-growing population of the disabled, working-age people ages 25 to 64 especially face barriers to accessing timely, affordable, and high-quality healthcare. Of note, a 2018 report from the Centers for Disease Control and Prevention (CDC) cited some stark barriers to accessing health care services troubling the general population of working-age adults with disabilities. Specifically, the CDC noted that 1 in 3 adults with disabilities lack a usual health care provider (2018). The CDC also found that the same rate of individuals without a usual health care provider also reported unmet health care needs due to cost within the past year (Centers for Disease Control and Prevention, 2018). Similarly, a study conducted by Kennedy, Wood, and Frieden found that American adults with disabilities reported barriers in obtaining

basic and timely needed medical care; necessary cancer screenings and treatments; and specialty services like rehabilitation, medical equipment, or home care (2017). This same study, as well as 2 others, also found that increased amounts of healthcare expenditures are incurred as out-of-pocket costs for this population and that average healthcare expenditures were 5 to 6 times higher for individuals with disabilities than expenditures of their non-disabled counterparts (Kennedy, Wood, & Frieden, 2017; Mitra, Findley, Sambamoorthi, 2009; Pumkam, Probst, Bennett, Hardin, & Xirasagar, 2013).

Moreover, among the most commonly cited types of disability experienced by working-age individuals were mobility, cognition, independent living, hearing, vision, and self-care (Centers for Disease Control and Prevention, 2018). These 6 types of disability are unique from one another and lend themselves to a diverse set of challenges and life experiences throughout all domains of day-to-day life, including healthcare. For example, a study by Kramer and Schwartz sought to examine the barriers to patient-reported outcomes (PROs) measures for people with cognitive impairments (2017). Patient-reported outcomes occur when “the status of a patient’s health condition that comes directly from the patient, without interpretation of the patient’s response by a clinician or anyone else” (Kramer & Schwartz, 2017). The study indicated that although these PRO measures aimed to collect data to improve healthcare quality and hold healthcare providers accountable, respondents with cognitive impairments reported facing challenges understanding the surveys, evaluating their health status, and self-reporting their evaluation (2017). If these patients are unable to accurately assess and report their own health, there will be a dearth of valuable qualitative data on patient outcomes and care experience for this subgroup. And if a barrier to understanding PRO measures persists for individuals with

cognitive disabilities, potentially needed changes to the current healthcare system cannot be implemented and quality improvement efforts will not be achieved.

Additional studies found that individuals with mobility-related disabilities may face barriers to accessing physician offices and other health care facilities due to the location's external or internal inaccessibility (Iezzoni, 2011; Agaronnik, Campbell, Ressler, Iezzoni, 2019). In their 2019 study, Agaronnik, Campbell, Ressler, and Iezzoni interviewed physicians to gain their insights on the accessibility of medical diagnostic equipment. While there was consensus among physicians in the study about the merits of accessible diagnostic equipment, including scales, chair lifts, and height-adjustable examination tables, several physicians reported challenges to their abilities to invest in such equipment. Constraints related to physical space and lack of user-friendliness were noted, as well as additional financial constraints linked to the costs of purchasing new equipment and the costs of added time needed to effectively examine patients utilizing the new equipment. However, a lack of investment in equipment that is accessible for people with disabilities or a dearth of adherence to utilizing accessible equipment can come at a great cost to the patient and their overall health and self-esteem, as inaccessible equipment and facilities have often led patients to feel dehumanized or experience otherwise preventable medical complications (2019).

Ultimately, one's ability to access needed and high-quality primary, prevention, specialty, and treatment services in a timely and cost-efficient manner is essential to their ability to achieve optimal health and wellness. Yet, health disparities rooted in systemic, cultural, and environmental flaws continue to persist and create immense obstacles to obtaining needed services for individuals with disabilities, whose health and wellbeing consequently suffer. A more comprehensive report of health disparities adversely affecting members of the disabled

population will be discussed in greater detail in the second chapter of this paper, the literature review.

Significance

Historical Mistreatment of Individuals with Disabilities

The heightened prevalence of disability and its concomitant health disparities in the United States has a far-reaching impact on those in which disability immediately affects their loved ones, and society as a whole. A person's disability status has a wide array of implications on their housing, education, employment, economic positioning, social networks, independence, quality of life, and overall health. While the experience of living with a disability has drastically improved since the start of the 21st century, historically there were unprecedented levels of mistreatment and discrimination against people with disabilities. A seminal work titled *Disability at the Dawn of the 21st Century* by Braddock and Parish (2002) described the institutional history of disability. For centuries, disability was considered by society to be a mark of supernatural or demonological causes (Braddock, p. 17). The practice of institutionalism among members of the disabled community, namely those with intellectual and physical disabilities, has roots traceable as far back as the Middle Ages and emerged in the United States during colonial times (p. 19-25). For centuries, the conditions of these facilities were dismal, overcrowded, and closely resembled prisons, and the residents of such facilities were often treated abusively and immorally (p. 27). The operation of institutions for people with disabilities in the United States continued until the late 1980s, when the infamous Pennhurst and Willowbrook Institutions were forced to close their doors. For decades, such institutions housed people with developmental and physical disabilities and operated under the guise of being both educational and supportive

facilities. But what occurred within the confines of these institutions was far from educational and resulted in significant abuse and neglect of thousands of residents (Beitiks, 2012).

Occurring simultaneously with the practice of institutionalism in the 18th, 19th, and even 20th centuries were several other manifestations of society's discriminatory attitudes towards people with disabilities. For decades, the display of people with physical, developmental, and intellectual disabilities, who were considered "abnormal" and "grotesque", in so-called freak shows and circuses around the country was considered a source of entertainment and comedy (p. 37). Further, the eugenics movement in the United States, which sought to improve the genetic quality of the human population, linked people with disabilities to criminality, immoral behavior, and poverty (p. 38). The eugenics movement was also accompanied by extensive instances of medical professionals refusing to treat disabled patients thereby facilitating the death of individuals born with disabilities (p. 38). The eugenics movement sparked an era at the start of the twentieth century where social reformers sought segregation and prohibitions on marriages and procreation by people with disabilities (p. 39). The segregation of people with disabilities made them targets for unethical medical experiments in which institutional residents were subjected to tests with foods that had been laced with radioactive elements or exposed to hepatitis B without prior knowledge or informed consent. These illegal research practices occurred across the country from 1946 to 1973 (p. 42). These discriminatory and immoral practices exhibited against people with disabilities are but just a few examples of the maltreatment suffered by the disabled population. Unfortunately, there is a myriad of other shameful instances that have occurred over the course of history that depict injustices committed against members of this community. Braddock (2002) provides a more detailed history of disability, both in the United States and throughout the world.

Legislative Reform Efforts

Fortunately, the United States' dark history of marginalization and maltreatment against the disabled population paved the way for the disability rights movement, which has been marked with progressive legislative efforts to promote equality, advocate for the fullest extent of participation in society possible, and end the mistreatment of people with disabilities. One of the first pieces of modern-day legislation created to protect people with disabilities was the Rehabilitation Act of 1973, which prohibits employment discrimination against qualified individuals with disabilities. Additionally, the law requires affirmative action in hiring and stipulates that federal electronic and information technology must be accessible to all members of the public with disabilities (United States. Department of Health, Education, and Welfare. Office for Civil Rights, 1978).

Following the Rehabilitation Act of 1973, the Americans with Disabilities Act of 1990 (ADA) set forth a uniform definition for disability and extended several protections of the Rehabilitation Act to all employers, state and local governments, and any privately-owned business or facility open to the public. There are 5 main titles of the ADA: Employment, Public Services, Public Accommodation and Services, Telecommunication, and Miscellaneous Provisions. Each title imposes prohibitory measures on the discrimination of individuals with disabilities and, collectively, was anticipated to bring an end to the marginalization of individuals with disabilities throughout all realms of public life, including within the nation's healthcare system (Americans with Disabilities Act of 1990, 1990; Iezzoni, 2011; Pharr & Bungum, 2012). However, despite the implementation of the ADA and additional legislation during the passing decades, the health of individuals with disabilities continues to be compromised by a collection of health disparities (Gulley, Rasch, & Chan, 2014; Henning-Smith, McAlpine, Shippe, &

Priebe, 2013; Horner-Johnson, Dobbertin, Lee, Andresen, & the Expert Panel on Disability and Health Disparities, 2014). Ultimately, although the treatment of people with disabilities living in the United States has drastically improved in recent decades, more is needed to be done to promote equality and enhance the experience of living with a disability.

Since its inception in 2010, the Patient Protection and Affordable Care Act (ACA) has played an instrumental role in revolutionizing the nation's health care system and closing the gap between health equity and the American disabled population. Among the many aims of the ACA are reforms to the private insurance market, expansions of the existing Medicaid program, and improvements in the way medical decisions are made (Silvers, 2013). Arguably, the fundamental purpose of the ACA was to improve access to affordable health insurance; therefore, increasing opportunities for access to American people for needed health care services (Gostin, Hyman, & Jacobson, 2017). The legislation was able to increase rates of health insurance coverage through an expansion of the Medicaid program to individuals who previously did not qualify, including members of the disabled population. At its core, the ACA encourages states to expand Medicaid programs to individuals with income up to 138% of the federal poverty level and to individuals whose preexisting health conditions had acted as barriers to obtaining affordable and comprehensive health insurance (Hall, Shartzler, Kurth, & Thomas, 2017; Kaye, 2019). A recent literature review covering over 300 studies from the Kaiser Family Foundation estimates that states that expanded its Medicaid programs have experienced significant coverage gains and reductions in the uninsured rates among vulnerable populations; improved access to care, self-reported health, utilization of services, the affordability of care, and financial security among the low-income population; and economic savings (Kaiser Family Foundation, 2019).

Increasing eligibility to the Medicaid program for people with disabilities is significant given that they experience a wide array of health inequities in overall health, health risk behaviors, service utilization, and access to health care services (Gulley, Rasch, & Chan, 2014; Henning-Smith, McAlpine, Shippe, & Priebe, 2013; Horner-Johnson, Dobbertin, Lee, Andresen, & the Expert Panel on Disability and Health Disparities, 2014). To combat and mitigate the effect of health disparities experienced by this population, ACA directed reforms of the health care delivery system to address inefficiencies in patient care coordination; chronic disease management; access to primary care, dental care, and prescription medications; administrative simplification; and opportunities to obtain affordable health insurance (Blumenthal, Abrams, & Nuzum, 2015).

Purpose

Researchers across various disciplines in health services acknowledge the presence of health disparities adversely affecting members of vulnerable populations. Health disparities are particularly pronounced among the disabled population and have been linked with worse health outcomes, poorer access to healthcare services, and inequitable rates of service utilization rates (Gulley, Rasch, & Chan, 2014; Henning-Smith, McAlpine, Shippe, & Priebe, 2013; Horner-Johnson, Dobbertin, Lee, Andresen, & the Expert Panel on Disability and Health Disparities, 2014). While there is consensus that health disparities exist and are harming the disabled community, less is known about the efficacy of policy initiatives developed to reduce and eventually eliminate the presence of health disparities adversely affecting the disabled population.

In recent decades, governing bodies and concerned citizens alike recognized the importance of making the equitable treatment of individuals with disabilities a national priority.

Thus, the United States federal government, state and local governments, and a myriad of organizations and advocacy groups have made significant efforts to address and reduce health disparities among the disabled population through the support, adoption, and implementation of various bodies of legislation. The purpose of the current research is to examine the effects of one of the most comprehensive bodies of healthcare reform legislation in the history of the United States. The current research was guided by a principle question: What was the effect of the Medicaid expansion of the Affordable Care Act in reducing health disparities among individuals with disabilities ages 25-64? Specifically, did the expansion improve access to healthcare services and subsequently increase service utilization for 5 key health care services? A series of sub-questions were also developed to support the primary research question:

1. Are there regional differences in the effect of the Medicaid expansion in increasing access and service utilization among individuals with disabilities ages 25-64?
2. What is the impact of the adoption and implementation of the Medicaid expansion on regional access and service utilization?

Key Terms

For the purpose of clarity and uniformity, several terms integral to the purpose of this research were identified. The key terms are defined in the following sub-sections.

Health Disparity

Over the past few decades, many key health indicators have improved for the general United States population. However, compared to non-minorities, a disproportionately high rate of otherwise preventable health maladies including disease, death, and disability are still experienced by members of minority communities (Centers for Disease Control and Prevention,

2017). These preventable systematic differences in the “burden of disease, injury, violence, or opportunities to achieve optimal health” threatening the equality of socially, economically, and environmentally disadvantaged communities are known as health disparities (Healthy People, 2020). Although the term has previously been linked almost exclusively to differences in health rooted in race and ethnicity, there are a myriad of other dimensions in which health disparities exist in the present-day United States. The Healthy People 2020 Report recognizes race, ethnicity, sex, sexual identity, sexual orientation, age, socioeconomic status, geographic location, and disability all as factors that contribute to an individual’s ability to achieve and maintain optimal health (2020).

Disability

The term *disability* is complex and can take many shapes depending on the implications of the word’s use. To date, one of the most landmark pieces of disability legislation, the Americans with Disabilities Act of 1990, defines disability as a “physical or mental impairment that substantially limits one or more major life activities” (United States Department of Justice Civil Rights Division, n.d.). Alternative to the legal definition and medically speaking, the term disability refers to “any condition of the body or mind (impairment) that makes it more difficult for the person with the condition to do certain activities (activity limitation) and interact with the world around them (participation restrictions) (Centers for Disease Control and Prevention, 2019).

Disability can affect individuals throughout all domains of life and at varying degrees. Specifically, disability can affect an individual’s vision, hearing, learning, movement, thinking, mental health, remembering, communication, and social relationships (Centers for Disease Control and Prevention, 2019). Further the World Health Organization recognizes 3 dimensions

of disability: impairment in a person's body structure or function, or mental functioning; activity limitation; and participation restrictions in activities of daily living (2019). In an effort to provide a standard language for classifying body structure and function, activity limitation, participation levels, and environmental factors that impact an individual's ability to function, the World Health Organization developed the International Classification of Functioning, Disability, and Health (ICF). The ICF recognizes 8 main categories of disability: Mobility/Physical, Spinal Cord, Head Injuries, Vision, Hearing, Cognitive/Learning, Psychological, and Invisible (Centers for Disease Control and Prevention, 2002, & Centers for Disease Control and Prevention, 2019). It is also important to note, that disability can be short-term as well as long-term (Freedman, Martin, & Schoeni, 2004).

The term *disability* as measured by the Medical Expenditure Panel Survey, blends elements of each of the previously mentioned definitions into a composite metric to assess whether survey participants self-report having a disability. The coded variable ANYLIM (for 2012-2013 data) and ANYLMT (for 2014-2016 data) summarize whether a participant in the study reported experiencing any limitations with instrumental activities of daily living or activities of daily living as well as any other functional or activity limitations during any of the pertinent rounds. Limitations with instrumental activities of daily living (IADL) reference any applicable difficulties an individual may experience managing finances, medications, meal preparation, communication, shopping, and housework; whereas limitations with activities of daily living (ADL) pertain to basic self-care tasks related to bathing, dressing, ambulation, feeding, transferring, walking, and toileting. Lastly, in addition to questions regarding help with IADLs and ADLs, the national survey measures whether individuals are limited in their abilities to perform activities such as working, housework, and going to school (Medical Expenditure

Panel Survey, 2012-2016). The definition for disability laid out by the Medical Expenditure Panel Survey's governing body, the Agency for Healthcare Quality Research (AHRQ), will direct the research further summarized in this paper.

Working-Age Population

In general, the *working-age population* refers to a range of ages at which individuals typically participate in either paid or unpaid work (U.S. Bureau of Labor Statistics, 2012). In the United States, the working-age population is more specifically referred to as the civilian non-institutional working-age population. All individuals who are not on active duty in the military; not in institutions, such as prisons or mental institutions; and who are 16 years of age or older are considered to be among the United States working-age population (U.S. Bureau of Labor Statistics, 2012).

Due to current legislation and protections, such as the Individuals with Disabilities Education Act of 2004 (IDEA), the legal definition of the term *working-age population* was tailored to align more closely with the disabled population as well as the purpose of this study. The Individuals with Disabilities Education Act mandates that state and local governments are required to provide free and appropriate public education to eligible children with disabilities. The law also ensures that special education and related services will be provided to qualifying children with disabilities. Of note, Part B of the Individuals with Disabilities Education Act extends educational protections and services throughout the country to individuals with disabilities up until age 21 (U.S. Department of Education, n.d.; Zirkle 2010). To account for a transition period as individuals with disabilities phase-out of legal educational services and independently pursue employment, the term *working-age population*, as used in this study to include only members of the United States disabled population, refers to individuals ages 25-64.

Affordable Care Act

The Patient Protection and Affordable Care Act, known as the Affordable Care Act (ACA) or Obamacare, is a comprehensive piece of legislation designed to reform the United States healthcare system. The legislation has 3 primary goals: provide improved access to affordable health insurance, expand the Medicaid program to cover low-income adults and others who previously did not qualify for affordable and comprehensive coverage, and support innovative and efficient medical care delivery methods designed to lower the costs of health care. As determined by the United States Supreme Court, states are not required to opt into ACA directed reforms to healthcare. To date, 37 states, including the District of Columbia, have adopted the Medicaid expansion with coverage becoming effective as early as January 1, 2014 and as recent as January 1, 2020. For the remaining 14 states that have chosen not to implement the Medicaid expansion of the ACA, coverage gaps remain for people with disabilities (Kaiser Family Foundation, 2020). State Medicaid expansion decisions as of January 1, 2020 are listed in Table 1.

Sample Characteristics

The focus of this study was to examine the effects of the Medicaid expansion in reducing health disparities among the United States disabled population as a whole. The current study's resulting analysis does not account for individual differences in demographic characteristics, such as categorization of disability, gender, race, and income. Instead, the characteristics of gender, race, and income are briefly reported in the paper's introduction to provide relevant background and demographic information on the study's sample. Worth mentioning is the relatively similar sample sizes across each of the 5 years of included data, ranging from 34,655 in 2016 to 36,940 in 2013 (Table 2). Similarities between the 2012-2016 data are also present

among the sizes of each of the study's sub-populations including the disabled, the working-age disabled, and the working-age disabled insured through Medicaid samples (Table 2). Likewise, the demographic characteristics remained relatively consistent for sex, race, and income for all 5 years. Sample demographics are summarized in Table 3 and Table 4.

Organization of Study

The first chapter of this thesis is an introduction to the study. A discussion of the study's significance, purpose, research questions, key terms, and sample characteristics are included in this chapter. The second chapter synthesizes the current academic literature related to health disparities experienced by the disabled population. The literature review is separated into 6 key subsections: (1) social determinants of health; (2) health risk behaviors; (3) overall health; (4) service utilization; (5) preventive care; and (6) barriers to accessing care. Following a literature review, the third chapter discusses the design and methodology of the study. Included is a statement of the research questions, a background of the Medical Expenditure Panel Survey (MEPS), eligibility criteria for inclusion in the study, and concluding remarks of the research's methodology. Chapter 4 reveals the results of the study. This section includes a summary of the aggregate United States data analysis. Additional discussions were included for the regional analyses for the Northeast, Midwest, South, and West regions. Following the results section, chapter 5 includes a discussion and interpretation of the results with and without statistical significance. Lastly, the thesis ends with a discussion on the study's limitations, recommendations for future studies, and a few concluding remarks summarizing the study.

Chapter 2

Literature Review

Purpose

The purpose of this review of the literature is to describe prior research that has examined the relationship between health disparities and disability among United States adults. Upon completion of the review, it was clear that an abundance of research analyzing disparate trends in the quality of care, the costs of care, and the access to services for people with disabilities in the United States exists. This chapter aims to provide a detailed synopsis of previously documented health disparities experienced by members of the disabled population and focuses on 2 main questions: What specific health disparities do individuals with disabilities experience? And to what extent do these disparities in healthcare impact individuals with disabilities?

The results of this literature review will be discussed in the following 6 sections of the chapter. The first section of this chapter will provide a broad overview of the social determinants of health, as defined by the United States Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020. This section will also go into depth on the 5 subcategories of social determinants and how they interact to impact health outcomes (Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2010). In section 2, health risk behaviors and their ability to determine an individual's health will be discussed. In the third section, there will be a discussion on the overall health of people with disabilities which the literature indicates is generally poorer than the health of those without disabilities. The 4th section of this chapter details disparate trends in health care service utilization among the population of focus and such trends' impact on health outcomes. The fifth section will include a discussion about the utilization of preventive care measures

among the disabled population. The 6th section will discuss prior research on common barriers to accessing health care experienced by adults with disabilities. Lastly, the chapter will end with a discussion about current gaps in the literature.

Search Process

The review of the literature covered a 19-year timeframe from 2000 to 2019. The initial search strategy included the use of several electronic databases available publicly and through the Pennsylvania State University's whole comprehensive Library Database. Inclusion criteria for this review were: English-written, peer-reviewed articles published during the years 2000-2019 about adults residing in the United States who have a disability and experience disability-related health disparities. To remain consistent with the focus of the current literature review, keywords such as health disparities, disability, service utilization, access to healthcare, overall health, health status, and patient experience were used throughout the search process. After articles and related materials were selected and reviewed, their reference lists were searched for additional relevant articles that met the inclusion criteria and were not retrieved through the original search. This process was repeated several times until the topic was saturated with relevant literature. In the following sections, the results of each article included in this review of the literature are synthesized.

Social Determinants of Health

There is a wide range of biological, behavioral, social, and environmental factors that are known to influence health status (Office of Disease Prevention and Health Promotion, n.d.). Collectively, these factors are known as the social determinants of health. Leaders in the field of population health define the term *social determinants of health* as any condition in the social, physical, and economic environment in which people are born, live, work, and age (Secretary's

Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2010). The Healthy People 2020 report summarizes the social determinants of health into 5 main categories: economic stability, education, social and community context, health and health care, and neighborhood and built environment (2010).

Examples of social determinants include, but are not limited to: availability of resources to meet daily needs such as safe housing and groceries; access to quality education and employment opportunities; access to health care services; availability of community-based resources that allow and promote recreational and leisure-time activities; transportation options; public safety; social support; social norms and attitudes, such as discrimination and racism; exposure to crime, violence, and social disorder; socioeconomic conditions, residential segregation; language and literacy; access to mass media and emerging technologies; and culture. Together, when any of the aforementioned conditions interact, the conditions have the potential to positively or adversely shape and determine individual and population-level health outcomes including overall health, functioning, and quality of life outcomes and risks.

The authors of each article subsequently included in this review measured many of these environmental characteristics among the samples of their respective studies. Across the studies, when compared to adults without disabilities, adults with disabilities were found to fare poorly on nearly all social and economic measures indicative of high risk for poorer health outcomes. The following discussion about consequences resulting from the presence of adverse conditions that play a role in determining health will be sectioned in accordance with the 5 domains of social determinants outlined by the Healthy People 2020 report (Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2010).

Economic Stability

Economic stability refers to the relative degrees of employment, food security, housing security, and poverty levels an individual or population faces. After reviewing the literature, it is evident that individuals with disabilities tend to experience lower levels of economic stability than individuals without disabilities. Specifically, individuals with disabilities face lower rates of employment than people without disabilities (Krahn, Klein Walker, & Correa-De-Araujo, 2015). People with disabilities also tend to have lower incomes and face higher rates of poverty than those without disabilities experience (Pharr & Bungum, 2012). Moreover, a report from the National Council on Disability found that across the United States, 35.1 million residences house one or more people living with a disability (2010). The same report found that these households are more likely to be low-income and are nearly 2.5 times more likely to be extremely low-income compared to residences housing people without any disabilities (National Council on Disability, 2010).

Education

Education has been found to play an equally important role in the achievement and maintenance of positive health outcomes. Yet, despite education's importance, a higher percentage of people with disabilities do not graduate from high school or college than people without disabilities (Krahn, Klein Walker, & Correa-De-Araujo, 2015; Pharr & Bungum, 2012; Reichard, Stolze, & Fox, 2011). This finding distinctively conflicts with the positive association between higher education, employment outlook, and income. Countless studies have affirmed that educational attainment can lead to improved health and well-being, as well as reduce the risk of premature mortality (Kawachi, Adler, & Dow, 2010).

Social and Community Context

The third determinant, social and community context, relates to the degree of civic participation, discrimination, incarceration, and social cohesion individuals face within their own communities. It is important to consider civic participation and social cohesion because the 2 factors are positively associated with physical health, psychosocial well-being, and decreases in the rate mortality (Secretary's Advisory Committee on National Health Promotion and Disease Prevention Objectives for 2020, 2010). Yet, the literature suggests that the social and community contexts for individuals with disabilities are often unfavorable. A study detailing the population differences between people with and without disabilities found that significantly fewer adults with disabilities reported having a sufficient social and emotional support system, 2 factors that play a large role in the attainment and maintenance of health (Krahn, Klein Walker, & Correa-De-Araujo, 2015). Community factors, such as the stigmatizing social attitudes of peer groups, have also been found to negatively impact the health and well-being of people with disabilities (Iezzoni, 2011). These stigmatizing social attitudes have been found to fuel targeted and discriminatory violence that leads to individuals with disabilities being 1.5 times more likely to be victims of violent crime than others without disabilities (Krahn, Klein Walker, & Correa-De-Araujo, 2015).

Health and Health Care

An individual's ability to access comprehensive and quality health care services can play a role in attaining and maintaining health, preventing and managing disease, reducing unnecessary disability, and averting premature death. Yet, for a variety of reasons, oftentimes people with disabilities are unable to access health care. Barriers to accessing needed health services include high cost of care, inadequate insurance coverage, lack of availability of services, and lack of culturally competent care (Office of Disease Prevention and Health Promotion, n.d.).

The existence of these barriers to accessing healthcare can ultimately lead to unmet health needs, delays in receiving care, financial burdens, and preventable hospitalizations. An extensive discussion of the relationship between access to healthcare and health outcomes occurs in Overall Health and Barriers to Access subsections of this literature review.

Neighborhood and Built Environment

The last social determinant of health, neighborhood and built environment, refers to environmental conditions, such as quality of housing, rates of crime and violence, and access to resources that promote a healthy lifestyle. It is important for all individuals, regardless of disability status to have access to preventive and needed health care services (Horner-Johnson, 2014; Iezzoni, 2011; Krahn et al., 2015; Kroll et al., 2006; Merten et al., 2015; Pharr & Bungum, 2012; Reichard et al., 2011; Smith, 2008; Wolverson, 2012). However, persistent barriers throughout the health care system, such as inaccessible equipment and facilities, the lack of training of healthcare professionals to understand and address the needs of people with disabilities, and inadequate communication modalities, make it difficult for individuals with disabilities to obtain the care they may need and deserve (Iezzoni, 2011; Scheer, Kroll, Neri, & Beatty, 2003). Environmental barriers exist not only in healthcare, but also in housing, neighborhoods, and places of employment or recreation. Inaccessible environments make it increasingly difficult for people with disabilities to access resources that enable healthy lifestyles and contribute to a greater quality of life (Gray, Gould, & Bickenbach, 2003).

Ultimately, the presence or absence of certain health determinants, such as social constructs or environmental factors, can often act as barriers to accessing care and attaining optimal health; thus, creating a cycle of more chronic conditions, poorer health, and increasing limitations for adults with disabilities (Iezzoni, 2011; Krahn, Klein Walker, & Correa-De-

Araujo, 2015; Pharr & Bungum, 2012; Reichard, Stolze, & Fox, 2011; Henning-Smith, McAlpine, Shippee, & Priebe, 2013).

Health Risk Behaviors

Behavior plays an equally critical role in determining a person's health outcomes, and individuals with disabilities were found to have increased rates of certain behavioral risk factors for negatively impacting overall health (Iezzoni, 2011; Pharr & Bungum, 2012; Krahn et al., 2015). For example, members of this population are more likely to be physically inactive than their peers without disabilities (Iezzoni, 2011; Pharr & Bungum, 2012; Krahn et al., 2015). A more sedentary lifestyle could be due to environmental obstacles that make it increasingly difficult for people with disabilities to be physically active. During an interview with a woman who is deaf, it was revealed that the woman's disability made her afraid to jog in her neighborhood because she could not hear traffic sounds or the steps of other people (Iezzoni, 2011). Other common barriers that make it more difficult for people with disabilities to become or remain physically active are inaccessible equipment at local gyms or health clubs (Iezzoni, 2011).

Additional studies have also found that people with disabilities were more likely than the remaining population to utilize tobacco products (Iezzoni, 2011; Iezzoni, McCarthy, Davis, & Siebens, 2000, Pharr & Bungum, 2012; Krahn et al., 2015). Using data from the National Health Interview Survey, a team of researchers at the Mongan Institute for Health Policy at the Massachusetts General Hospital uncovered that individuals who used tobacco products and had a physical disability were 20% less likely than other smokers to be asked about their smoking histories by their physicians during annual check-ups. Upon examining this difference in the standard of care, anecdotal reports suggest that some physicians choose not to ask their disabled

patients about smoking under the belief that smoking brings consolation to the otherwise unhappy lives of their disabled patients. However, it is not uncommon for people with physical disabilities who have limited mobility to have decreased lung capacity and, therefore, an increased risk of developing respiratory infections that can be further complicated by tobacco use (Iezzoni, 2011; Iezzoni, McCarthy, Davis, & Siebens, 2000).

Such findings are particularly problematic because physical inactivity and tobacco use have been significantly linked to the deterioration of an individual's health via a myriad of chronic conditions, such as cardiovascular disease, certain cancers, obesity, osteoporosis, lipid disorders, depression, and anxiety. Yet, despite the behavioral health disparities unfavorably affecting members of this population, several studies have shown that people with disabilities were less likely than their nondisabled peers to binge drink (Iezzoni, 2011; Pharr & Bungum, 2012).

Overall Health

Currently in the United States, living with a disability often leads to compromised overall health, and its consequences have both physical and mental manifestations. Across multiple studies, when asked how they perceived their own physical or mental health, participants with disabilities reported having worse perceptions of their physical and mental health than their non-disabled counterparts (Henning-Smith et al., 2013; Horner-Johnson et. al, 2013; Gulley et al., 2014; Reichard et al., 2011). One potential reason for poor perceptions of physical and mental health could be due to members of this population having higher prevalence rates for a myriad of chronic conditions, such as diabetes, arthritis, asthma, cardiovascular disease, cancer, obesity, hypertension, hypercholesterolemia, and stroke (Iezzoni, 2011; Pharr & Bungum, 2012; Reichard et al., 2011). Multiple studies included in this review of the literature found that people with

disabilities consistently report greater rates of obesity, lack of physical activity, and smoking (Iezzoni, 2011; Iezzoni, McCarthy, Davis, & Siebens, 2000; Pharr & Bungum, 2012; Krahn et al., 2015). As a result of these conditions and health behaviors, these individuals have higher incidence rates of diabetes as well as higher prevalence rates of cardiovascular disease than those without disabilities (Krahn et al., 2015). The development of many of these chronic health conditions for people with disabilities may be partly attributed to inadequate or infrequent health screening and preventive measures (WHO, 2015). The link between chronic conditions and preventive care will be addressed in a subsequent section.

Further research has identified additional disparities within the disabled population and suggests an unequal distribution of chronic health conditions and poorer health status across certain racial and ethnic groups. The researchers of these studies posit that these additional health disparities result from the absence or presence of certain social determinants of health which adversely impact health and disproportionately affect many minority groups (Gulley et al., 2014; Horner-Johnson et al., 2013).

Service Utilization

Additional disparities between disabled and non-disabled adults can be seen with service utilization. Individuals with disabilities were found to have higher numbers of visits to emergency departments, primary care providers, specialty care providers, and non-medical doctor providers (Rasch, Gulley, & Chan 2013). One reason for a higher number of visits to physician offices and emergency departments could be from more chronic conditions and poorer health among the disabled population (Iezzoni, 2011; Krahn et al., 2015; Pharr & Bungum, 2012; Reichard et al., 2011). However, other studies have found that people with disabilities are more likely to delay or forego necessary health care services due to environmental, structural, and

process-related barriers interfering with their abilities to obtain and receive care (Henning-Smith et al., 2013; Horner-Johnson, 2014; Iezzoni, 2011; Krahn et al., 2015; Merten et al., 2015; Pharr and Bungum, 2012; Reichard et al., 2011; Scheer, Kroll, Neri, & Beatty, 2003; Smith, 2008).

In addition to findings that report disparities in service utilization that are harming the health of the general United States population of people with disabilities, health disparities that affect specific disability groups more than others also exist. For example, although people with cognitive disabilities are up to 5 times more likely to have diabetes than the general population they were found to receive less comprehensive management of their care (Balogh, Brownell, Ouellete-Kuntz, & Colantonio, 2010; Centers for Disease Control and Prevention, 2009; Krahn et al., 2015; Reichard, Stolze, & Fox, 2011). Moreover, while the majority of individuals with disabilities were found to have a usual source of care, individuals with visual and cognitive impairments were the least likely to have usual sources of care (Horner-Johnson et al., 2014; Reichard et al., 2011). It is recommended that individuals have a usual source of care because usual sources of care have been linked to better health outcomes, fewer disparities, and lower healthcare expenditures (De Maeseneer, De Prins, Gosset et al., 2003; Phillips, Proser, Green et al., 2004; Office of Disease Prevention and Health Promotion, n.d.; Starfield, 2004). Having a usual source of care fosters the development of meaningful patient-provider relationships and facilitates the integration of healthcare services across the patient, family, and community contexts. Usual sources of care have also been associated with greater patient trust in the provider, better communication between the patient and provider, an increased likelihood that patients will receive appropriate care, and lower mortality from all causes (Mainous, Baker, Love et al., 2001; Office of Disease Prevention and Health Promotion, n.d.; Starfield, Shi, Machinko, 2005).

Furthermore, while the general disabled population was found to more frequently utilize ambulatory services, disabled non-Hispanic whites utilized these services at much higher rates than disabled non-Hispanic blacks and Hispanics (Gulley et al., 2014). The exact reason for the discrepant use in service utilization among racial and ethnic groups remains unclear. However, research indicates that these inequities are likely occurring in response to the presence of unfavorable determinants of health previously discussed that are more likely to impact economically and socially disadvantaged minority communities (Braveman et al., 2011; Braveman, 2014).

Preventive Care Measures

Because adults with disabilities are more likely to engage in high-risk health behaviors and have more chronic conditions, it is imperative for these adults to receive preventive care to help mediate the onset of unnecessary and preventable chronic conditions (Iezzoni, 2011; Pharr & Bungum, 2012; Krahn et al., 2015; Reichard et al., 2011). The CDC reports that people, regardless of disability status, receive only half of physician-recommended preventive services. But for people with disabilities, the utilization rate is further reduced by as low as ten to fifteen percent (CDC, 2015).

The findings of this review further corroborate that adults with disabilities receive certain essential preventive care services at substantially lower rates than adults without disabilities receive these same services. For example, one study found that people with disabilities were less likely to be screened for high blood pressure, elevated cholesterol, or alcohol and tobacco usage (Kroll et al., 2006). Evidence from another study found that people with disabilities had a lower likelihood of receiving diagnostic tests used to detect a bacterium, *Helicobacter pylori*, which is associated with contributing to stomach cancer. As a result, rates of developing stomach cancer

were 50% higher in disabled persons (Wolverson, 2012). Throughout the literature, findings consistently suggest that adult women with disabilities less frequently receive important cancer screenings, most notably Papanicolaou tests and mammograms. Findings are concerning because participants in the studies who had a disability and did not receive these screenings were more likely to report having developed cancer than those without disabilities (Horner-Johnson, 2014; Iezzoni, 2011; Krahn et al., 2015; Merten et al., 2015; Pharr & Bungum, 2012; Reichard et al., 2011; Smith, 2008). Findings from several articles also suggest that members of the disabled population were also less likely to receive routine dental checkups (Horner-Johnson, 2014; Pharr & Bungum, 2012; Reichard et al., 2011). Evidence suggests that routine dental checkups and cleaning can result in clinical, biological, psychosocial, and economic benefits such as the removal of cavities, improved chewing abilities, reduction of harmful oral bacteria, improved quality of life, and lower indirect costs from time away from work and ancillary expenses. Additionally, regularly visiting the dentist can lower an individual's risk of developing dental issues like tooth decay and gum problems (Ismail & Bader, 2014). While these conditions may seem minor at first, they can lead to more serious conditions such as oral cancers and periodontal disease and obstruct the early detection of health problems such as hypertension, diabetes, kidney failure, and heart disease (Insight Ameritas, 2019).

The disparate utilization of preventive care services among people with disabilities may be due to a treatment-centric approach, rather than a preventative strategy that is commonly employed by healthcare professionals. In the United States, there is often an emphasis for primary care and specialty care providers to focus principally on the treatment of acute and chronic conditions after they have already manifested and developed, rather than focusing on health promotion and preventive measures that can reduce the incidence and prevalence rates of

the majority of chronic conditions. But the continued underutilization of primary prevention services for members of the United States population, regardless of disability status, should not be overlooked as this underutilization poses a significant health risk to all members of society (Kroll et al., 2006; Smeltzer, Avery, & Haynor, 2012).

Despite the existence of disparate use of preventive care measures, not all differences in the utilization of preventive care are adversely affecting people with disabilities; some differences are neutrally or even positively affecting members of this population. For example, individuals with and without disabilities were found to receive comparable rates of prostate-specific antigen screenings, digital rectal exams, and colonoscopies (Pharr & Bungum, 2012). Better yet, compared to non-disabled adults, individuals with disabilities more frequently received flu and pneumonia vaccinations and tests for human immunodeficiency virus (HIV) (Iezzoni, 2011; Pharr & Bungum, 2012, & Reichard et al., 2011).

The evidence detailed in this review suggests the vital need for the development and implementation of high-quality and effective interventions that can be used to eliminate disparities related to the receipt of preventive care services — as these measures are essential for maintaining good health and slowing the progression of chronic conditions for a vulnerable population (Horner-Johnson, 2014; Iezzoni, 2011; Krahn et al., 2015; Merten et al., 2015; Pharr & Bungum, 2012; Reichard et al., 2011; Smith, 2008; Wolverson, 2012).

Barriers to Access

Despite their need for more accessible health care services, individuals with disabilities frequently encounter barriers to accessing care. Numerous studies suggest that disabled adults are more likely to report unmet need or delayed care than adults without disabilities (Henning-Smith et al., 2013; Krahn et al., 2015). A potential reason for forgone or delayed care could be

due to barriers to access; such as a lack of transportation; inaccessible offices and equipment; limited health plan benefits, including physical therapy, durable medical equipment, mental health services, and health plan required referrals; lack of provider knowledge; and timeliness of scheduling and receipt of services (Iezzoni, 2011; Pharr and Bungum, 2012; Reichard et al., 2011; Scheer, Kroll, Neri, & Beatty, 2003).

In a study conducted by Scheer, Kroll, Neri, and Beatty (2003), participants were asked about existing barriers to accessing care in 5 service areas: primary care, specialty care, durable medical equipment, mental health services, and rehabilitation services. At the conclusion of the study, the researchers categorized barriers as being environmental, structural, or process-related. Of note, one of the most prevalent environmental barriers preventing people with disabilities from obtaining needed health care services was transportation. This finding could be due to public transportation not always being a viable option for people who use wheeled mobility devices or who have fatigue and energy limitations. However, it is relevant to mention that the ability to utilize public transportation does not necessarily guarantee access to health care because some participants indicated that they did not have access to providers or durable medical equipment vendors with offices that were close enough to public transportation (Scheer, Kroll, Neri, & Beatty, 2003).

Additionally, participants in the same study who used door-to-door paratransit or rideshare services said that their appointments and transportation services needed to be scheduled at least a week in advance, which is often a problem for those with more immediate medical needs. Additional concerns related to the costs of transportation services or the reliance of family members or friends to provide transportation were also reported. The same study also found that office accessibility, as it pertains to provider facilities, such as office parking, entry, and

restrooms; as well as diagnostic and examination equipment, such as exam tables, x-ray and mammography equipment, and scales; are additional environmental barriers often encountered by people with disabilities. Some participants admitted to delaying or avoiding care because of inaccessible health care settings being too stressful or physically draining to utilize (Scheer, Kroll, Neri, & Beatty, 2003).

The authors also identified structural barriers to obtaining care as hindering individuals with disabilities ability to receive care. Noted structural barriers acting as obstacles to receiving timely and accessible care included difficulties navigating complicated health plan required referrals and the imperfect understanding of health care benefits that limit what services are eligible for coverage and determine one's ability to procure quality, well-fitted, and durable medical equipment (Scheer, Kroll, Neri, & Beatty, 2003).

Health service delivery process barriers were also an issue for multiple reasons. First, participants in the study described problems with timeliness of services, or lack thereof, as it pertains to scheduling appointments. An inherent lack of provider knowledge and understanding about to how to treat disability-related health problems, how to distinguish between disability-related and non-disability-related health problems, and incorrect assumptions that people with disabilities do not require the full spectrum of health care services were also described as barriers to healthcare for people with disabilities (Iezzoni, 2011; Scheer, Kroll, Neri, & Beatty, 2003). In addition to inaccessible services and facilities, individuals with disabilities were found to have substantially higher total medical expenditures and were more likely to indicate concerns over cost-related barriers limiting their ability to receive needed services and prescriptions than their non-disabled peers (Henning-Smith et al., 2013; Reichard et al., 2011). In fact, adults with disabilities were 2.5 times more likely to report skipping or delaying needed health care because

of cost (Krahn et al., 2015). As discussed in the “Overall Health” section of this literature review, people with disabilities often require more health care for the management of their disabling conditions or increased risk of chronic conditions. Therefore, any environmental, structural, or process barriers that result in the failure or delay of receiving needed medical equipment, preventive care, or other services would likely harm the health of individuals with disabilities and contribute to the perpetuating cycle of poorer health and greater healthcare expenditures that many individuals and families are unable to surmount.

Gaps in the Existing Literature

The study of health disparities impacting individuals with disabilities is a developing field with a limited body of research. While there is a growing base of knowledge indicating the existence of specific health disparities and the extent to which they are experienced by individuals with disabilities, there is limited knowledge about the impact of these disparities. The majority of the studies included in this review were cross-sectional. Therefore, causal relationships between disability, overall health and access to health care services could not be determined. Future long-term longitudinal studies must be conducted to identify the impact of health disparities experienced by the disabled population and why they continue to persist. Although research that focused on health disparities affecting specific disability groups are included in this literature review, the primary focus of this chapter was to synthesize prior studies that took a more general approach and analyzed health disparities that affect the general United States' disabled population as a whole.

Lastly, minimal research has been published in regards to the efficacy of public health interventions designed to eliminate health disparities experienced by the disabled population. There is a consensus among researchers in the field who acknowledge that the inclusion of

people with disabilities is vitally important and should be an integral focus of future policy initiatives and coordinated efforts to prevent and manage harmful health disparities that are negatively affecting people with disabilities at disproportionate rates. Additional research is needed to better understand the successes and shortcomings of prior interventions as well as inform future intervening policies and programs.

Conclusions

Despite the adoption of legislation designed to address the marginalization of individuals with disabilities, health disparities among this population continue to persist. This review of the literature found that individuals with disabilities are affected by health disparities pertaining to health risk behaviors, overall health, service utilization, preventive care practice, and barriers to access. The area of service utilization proved to have the least consistent and conclusive results among studies which point to a greater need for more research on this topic. Further, the review found that there are additional racial and ethnic disparities between members of the disabled population as well as disparities in overall health and access to care between disability types, thus reinforcing the need for more research in this area.

As the number of people living with disabilities in the United States continues to climb, the need to address health disparities among this population becomes increasingly important. More research is needed to understand the underlying causes of health disparities among this population and the effectiveness of interventions aiming to eliminate them. By identifying the causes of health disparities affecting people with disabilities, public health interventions can be better designed to address the complex and unique needs of individuals with disabilities. With the application of evidence-based intervention strategies, health disparities experienced by individuals with disabilities can be eliminated.

Chapter 3

Methodology

Research Questions

Following a comprehensive review of the academic literature, it is clear that individuals with disabilities experience a wide array of health disparities and experience these disparities at varying degrees. However, what remains less apparent is the efficacy of policy interventions developed to mitigate health disparities experienced by the United States disabled population. The aforementioned gap in the academic literature guided the present research by shaping the principal research question: What was the effect of the Medicaid expansion of the Affordable Care Act in reducing health disparities among individuals with disabilities ages 25-64? Specifically, did it improve access to healthcare services and subsequently increasing service utilization for 5 key health care services? The following sub-questions were asked to support the primary research question.

1. Are there regional differences in the effect of the Medicaid expansion in increasing access and service utilization among individuals with disabilities ages 25-64?
2. What is the impact of the adoption and implementation of Medicaid expansion on regional effectiveness of access and service utilization?

Data Collection

The present study utilized Medical Expenditure Panel Survey (MEPS) data from the years 2012-2016. Developed in 1996, MEPS is a set of government-produced large-scale surveys of families and individuals, their medical providers, and employers across the United States. MEPS is administered by the United States Agency for Healthcare Research and Quality

(AHRQ), a subsidiary of the Department of Health and Human Services, and provides nationally representative data on a wide range of topics related to the United States healthcare system, including health care use, health care expenditures, sources of payment, and health insurance coverage for the United States civilian noninstitutionalized population (Agency for Healthcare Research and Quality, n.d.).

MEPS is comprised of 2 major components: The Household Component and the Insurance Component. The research analyzed 5 consecutive years of data from the MEPS Household Component. The Household Component provides additional data on respondents' health status, demographic and socio-economic characteristics, employment status, access to care, use of medical services, and satisfaction with care. Featuring 5 rounds of interviews conducted over the course of 2 full calendar years, the panel design of the survey provides data for analyzing person and family level changes in medical service utilization, health status, insurance coverage, and medical expenditures across time (Agency for Healthcare Research and Quality, n.d.). More information on MEPS is available on the Agency for Healthcare Research and Quality website: <https://www.meps.ahrq.gov/mepsweb/>.

Eligibility Criteria

For the purpose of the present research, key eligibility criteria were applied to determine the sample population. Eligibility was contingent on 3 criteria. First, the study was limited to a timeframe of 5 years of MEPS data: 2012, 2013, 2014, 2015, and 2016. This 5-year period was selected to account for changes in healthcare services utilization during both the pre- and post-implementation periods of the Affordable Care Act Medicaid expansion. Coverage under the Medicaid expansion became effective January 1, 2014. 25 of the 37 states (including the District of Columbia) to adopt the Medicaid expansion, did so at the start of the 2014 calendar year. An

additional twelve states adopted the Medicaid expansion shortly after the legislative body became effective sometime between April 1, 2014, and January 1, 2020. The remaining 14 states have yet to adopt and implement the expansion (Kaiser Family Foundation, 2020).

Second, to be included in the study, MEPS participants had to have been coded “yes” to a variable indicating an individual’s disability status which summarized whether an individual has any instrumental activities of daily living (IADL), activities of daily living (ADL), functional, activity, or sensory limitations at the time of the survey. Thirdly, all members of the sample had to be coded in MEPS as belonging to the working-age population, or more specifically, ages 25-64.

In addition to being a member of the United States working-age, disabled population, an individual’s enrollment in the Medicaid insurance program was also measured. Enrollment in Medicaid was determined by an individual indicating that they obtained medical insurance coverage through Medicaid during the year, for each respective year included in the study. The data were coded accordingly to account for each of these 4 criteria. Healthcare service utilization rates for Medicaid subscribers ages 25-64 with at least one disability were then compared to the service utilization rates of the total United States working-age disabled population, regardless of insurance status.

Research Method

The current study employed a quantitative approach using secondary data to examine the effects of the Affordable Care Act’s Medicaid expansion in reducing health disparities among individuals with disabilities ages 25-64 by improving access to healthcare services and subsequently increasing service utilization for 5 key health care services. Analysis was then expanded to examine if there were regional differences in the effect of the Medicaid expansion in

increasing access and service utilization among individuals with disabilities ages 25-64. The impact of the adoption and implementation of the Medicaid expansion on the regional of access and service utilization levels were also explored.

Reductions in health disparities were measured by comparing increases in utilization rates for 5 healthcare services: dental check-ups, primary care check-ups, flu vaccinations, blood pressure screenings, and cholesterol screenings. All analyses included in the study were completed using the Stata Version 15.0 Software.

The current study analyzed 2012 through 2016 data from the Household Component of the Medical Expenditure Panel Survey. The study's design involved comparing health care service utilization rates among Medicaid subscribers across the entire United States as well as within 4 major United States regions: The Northeast, West, South, and Midwest. Comparisons for service utilization rates were conducted for 5 health care services: dental check-ups, primary care check-ups, flu vaccinations, blood pressure screenings, and cholesterol screenings. To compare service utilization rates, variables were defined for the overall population ages 25-64 who identify as having a disability and the population ages 25-64 who identify as having a disability and obtaining insurance coverage through Medicaid. A raw sum indicating the total number of individuals using each of the 5 healthcare services was tabulated by year, region, and service type among people with disabilities ages 25-64 who are Medicaid subscribers. Once the number of people utilizing each of the 5 healthcare services was tabulated by year, region, service type, and insurance status, these preliminary frequencies for service utilization among disabled Medicaid subscribers were divided by the total number of people ages 25-64 who identify as having a disability, regardless of insurance status, to determine the rate of service utilization among the working age disabled population insured through Medicaid. I replicated

this same analysis for each region every year from 2012-2016 for all 5 health care services (Tables 5-9). After each analysis was completed, I compared the increases in service utilization by region over 5 years to see the effect of the Affordable Care Act's Medicaid expansion in reducing health disparities among the disabled population (Tables 11-15).

Following the initial analysis, a mixed-effects linear regression model was applied to the data to examine the statistical significance of the findings. Linear regression models are used to determine whether a set of independent variables, such as disability status and insurance status, are able to predict the outcome of a dependent variable, such as service utilization. The analysis specifies which independent variables are significant predictors of the dependent variable. The mixed-effects linear regression model was selected for its ability to control for both fixed and random effects within complex hierarchically structured data, like the data used in this study (Hajduk, 2017; Penn State Department of Statistics, nd; Statistical Solutions, 2013; UCLA: Statistical Consulting Group, n.d.). To run a mixed-effects linear regression model, service type and region were set as factors, or fixed effects, to ensure the model would recognize each variable independently as a level versus continuous values. Each of the 5 services examined were assigned a number, or level, 1 through 5 to distinguish the services from one another. This process was then repeated for each region (North, Midwest, South, West, and the United States) and the data were recoded accordingly (Figure 1). For simplicity in interpretation, the variable of survey year was kept as a random effect in order to analyze regional improvements in service utilization at the culmination of a 5-year pre- and post-implementation period of the Affordable Care Act Medicaid expansion and control for the potential correlation for same-year data across region and service type (Figure 1). Utilization rates for dental check-ups, primary care check-ups, flu vaccinations, blood pressure screenings, and cholesterol screenings among each of the 4

regions were then compared to utilization rates among a base region of aggregate United States data in order to examine the effects of the Medicaid expansion in reducing disparate health services utilization among the working-age disabled population. The statistical significance of the findings was tested at the $p < 0.05$ level and the results are summarized in the following chapter (Table 16).

Chapter 4

Results

The current study sought to examine the effect of the Affordable Care Act's Medicaid expansion in reducing health disparities among individuals with disabilities ages 25-64 by improving access to healthcare services and therefore increasing service utilization for 5 healthcare services: dental check-ups, primary care check-ups, flu vaccinations, blood pressure checks, and cholesterol checks. Additional analyses were conducted to examine if there were regional differences in the effect of the Medicaid program's expansion and if these regional differences existed, were they related to state- and regional-level delays in the adoption and implementation of the Medicaid expansion. In total, 5 years of national survey data compiled from the Medical Expenditure Panel Survey (MEPS) were examined from 2012 to 2016. Data were selected to include that 5-year span to account for both pre- and post-implementation effects of the Affordable Care Act's Medicaid program expansion. The results of the analysis are summarized below.

United States Analysis

Analyses began with an in-depth investigation of national-level data. Sample sizes for each year of global data ranged from 34,655 in 2016 to 36,940 in 2013 (Table 2). In total, 18,199 participants of the 2012 through 2016 Medical Expenditure Panel Surveys reported having a disability and belonging to the working-age population (Table 2 and Table 5) When the analysis was constricted to include only those with a disability age 25-64 who obtained insurance coverage through Medicaid 6,550 individuals, or 36% of overall individuals with disabilities ages 25-64, met the criteria (Table 2 and Table 5). The remaining two-thirds of survey participants were either enrolled in other private insurance, public insurance or lacked health

insurance entirely. At the start of the study in 2012, 1,140 members, or 29.4%, of this population reported obtaining insurance coverage through Medicaid. By the conclusion of analysis in 2016, 39.4% of individuals with disabilities belonging to the working-age disabled population reported obtaining insurance coverage through Medicaid (Table 5). The finding of a 10.0% (Table 10) increase in insurance through Medicaid for members of the disabled population from 2012 to 2016 could indicate that the Affordable Care Act was able to positively affect its core aim of improving access to affordable health insurance coverage and can likely be attributed to the program's expansion which was signed into law in early 2012 and has since been adopted by 37 states across the country (Kaiser Family Foundation, 2020).

In addition to noticeable growth in the Medicaid program for individuals with disabilities, service utilization rates also increased across the study throughout the United States. At the start of analysis in 2012, national service utilization rates for routine dental check-ups, at least one visit per year, were 11.2% (Table 5). By the studies culmination in 2016, service utilization rates for routine dental check-ups among individuals with disabilities insured through Medicaid reached 18.3% (Table 5). Similar increases in service utilization rates were seen across the remaining 4 services. Rates for routine primary care check-ups, at least one visit per year, grew from 25.3% in 2012 to 34.9% in 2016 (Table 5). Similarly, by 2016 utilization rates for flu vaccinations, blood pressure screenings, and cholesterol screenings grew from 13.5 % to 20.0%, 26.9% to 36.5%, and 21.7% to 29.9%, respectively (Table 5).

Also relevant to report were the cumulative increases in national service utilization rates that occurred between 2012 to 2016. The largest cumulative increases in national service utilization rates occurred among routine primary care-check-ups, blood pressure screenings, and dental check-ups. Between the years 2012 and 2016 these services correspondingly experienced

4.7%, 4.4%, and 4.3% increases in service utilization among the working-age disabled population insured through Medicaid. Additional increases in service utilization could be seen among the rates for flu vaccinations (3.5%) and cholesterol screenings (3.0%) (Tables 11-15).

National and Regional Level Comparisons

Valuable insights can be obtained from comparisons of national-level data with regional-level data. As seen in Figures 2-7, the greatest and most favorable deviation from national data in overall service utilization rates occurred in the Northeast. Aggregate United States data lagged considerably, by at least 9.1% and as great as 15.0%, behind overall service utilization rates in the Northeast (Table 5 and Table 6). Collective increases in service utilization rates from 2012 to 2016 were also lower for aggregate United States data than observed for data in the Northeast (Tables 11-15). Such findings allude to a greater positive effect of the Affordable Care Act's Medicaid expansion in improving access to healthcare services and increasing service utilization in the Northeast compared to the United States as a whole. Likewise, this finding would also suggest that overall service utilization rates and cumulative increases in service utilization rates from 2012 to 2016 were weaker in the other 3 regions and therefore weighing down national utilization rates.

In terms of both overall service utilization and cumulative percent increases in service utilization following the implementation of the Medicaid expansion, data were most similar between the United States, West, and Midwest. As presented in Figures 2-7, overall service utilization rates for these 3 areas closely hovered one another. In terms of cumulative increases from 2012 to 2016 in service utilization rates, averages for the United States were slightly lower, by as much as 3.3%, than cumulative increases in service utilization were for each of the 5 services examined in the West (Tables 11-15). When compared to the Midwest, national

cumulative increases in service utilization rates were somewhat comparable but varied by service type. For routine primary care check-ups and blood pressure screenings collective increases in national rates were slightly lower than the cumulative increases observed for Midwest rates. However, cumulative increases for national data were slightly higher than total increases in Midwest service utilization rates for dental check-ups, flu vaccinations, and cholesterol screenings (Tables 11-15).

When compared to the South, overall service utilization rates for the United States were consistently higher (Table 5 and Table 8). Variations between the United States and the South in overall service utilization rates at the culmination of the study ranged from 4.1% for cholesterol screenings to as high as 7.1% for blood pressure screenings. In addition to service utilization rates being markedly lower in the South compared to the United States as a whole, collective increases in service utilization rates for the South were also lower than collective increases seen in service utilization nationwide (Tables 11-15). Perhaps this finding has something to do with the higher concentration of non-Medicaid expansion states, which elected not to adopt and implement the legislation, seen in the South compared to the heavier concentration of Medicaid expansion states seen in other regions throughout the country.

Overall, these nationwide findings of increased service utilization rates for aggregate United States data support the argument that the Medicaid expansion of the Affordable Care Act positively impacted reductions in health disparities among individuals with disabilities ages 25-64. The Medicaid expansion was able to improve access to health care services and increase service utilization for the 5 main health services examined by 3.0% to 4.7% (Table 4). However, these findings also point to regional differences in the effects of the Medicaid expansion in increasing access and service utilization as seen by the variations in collective increases in

service utilization from 2012 to 2016. Regional differences in the effect of the Medicaid expansion in reducing health disparities as well as the impact of the legislation's nonuniform adoption and implementation across states will be discussed in greater detail in the following sub-sections.

Northeast Analysis

In sum, there were 3,027 individuals included in the sample who reported having a disability, belonging to the working-age population, and living in one of the 9 states comprising Northeast (Table 6). As outlined by the Medical Expenditure Panel Survey, the Agency for Healthcare Research and Quality defines the Northeast region of the United States as the following 9 states: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont. Of these 3,027 individuals, 1,443, or 47.7% on average, obtained health insurance coverage through Medicaid (Table 6). Between 2012 and 2016, Medicaid coverage for the disabled working-age population of the Northeast increased by nearly 12%, slightly higher than the national average of 10.0% for this same population (Table 10). A higher and steadily increasing percentage of Medicaid enrollees could be due to earlier implementation dates of the Medicaid expansion seen in the majority of Northeast states. In fact, the Northeast had the highest and earliest rates of adoption and implementation of the Affordable Care Act's Medicaid expansion compared to the other 3 regions (Table 1).

In addition to a general increase in Medicaid enrollment from 2012 to 2016, the states in the Northeast (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont) had the largest percentage of people with disabilities ages 25-64 enrolled in the Medicaid program - nearly half of all members of the working-age disabled population during the years following the Affordable Care Act's Medicaid expansion

(Table 6). Yet, not only did this region face increases in access to health insurance, but the Northeast also faced considerable collective increases in service utilization for each of the 5 healthcare services examined (Tables 11-15). The largest cumulative increases in service utilization in the Northeast from 2012 to 2016 can be seen among dental check-ups (8.1%), blood pressure checks (6.7%), and routine check-ups (6.2%). Additional, but less substantial, increases in service utilization occurring between 2012 and 2016 and coinciding with the expansion of the Medicaid program in this region could also be seen for flu vaccinations (5.8%) and cholesterol checks (3.4%). For each of the 5 healthcare services examined, overall utilization rates in the Northeast were consistently higher than the national averages. Over the 5-year period from 2012 to 2016, increases in service utilization rates consistently increased for dental check-ups and routine check-ups. Of note, there was only one significant decrease (-3.32%) in service utilization that occurred between 2015 and 2016 for cholesterol screenings. There were additional minor decreases in utilization rates for flu vaccinations (-0.3%) between 2014 and 2015 as well as a -0.2% decrease in blood pressure screenings from 2015 to 2016.

Overall, the Northeast consistently maintained significantly higher utilization rates, compared to national averages and other regional averages, for all 5 healthcare services during both the pre- and post-implementation periods of the Medicaid program's expansion (Tables 5-9). At the conclusion of 2016, the final year of analysis, service utilization rates were higher for dental check-ups (15.0%), routine check-ups (13.8%), flu vaccinations (9.1%), blood pressure screenings (12.37%), and cholesterol screenings (10.9%) than the national averages. The region also had the highest rates of Medicaid enrollees among the disabled community ages 25-64. Higher rates of service utilization could be due to a multitude of reasons including earlier

adoption and implementation of the Medicaid expansion and will be summarized at greater lengths in the discussion.

Midwest Analysis

The Medical Expenditure Panel Survey defines the United States' Midwest region as including Indiana, Illinois, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin. In total 3,772 members of the sample reported belonging to the cohort of people with disabilities ages 25-64 in the Midwest region of the United States (Table 7). At the time of participation in the survey, 35.5% of these individuals were enrolled in the Medicaid program (Table 7). Despite the number of people who reported having a disability declining from 2012 to 2016, the percentage of this same population who obtained insurance coverage through Medicaid increased from 28.3% in 2012 to 41.2% in 2016 (Table 7). This 12.9% increase in Medicaid enrollment among the disabled population is the highest among any other region included in the analysis, including the aggregate United States data (Table 10). However, although this region experienced the greatest growth in Medicaid enrolment among the disabled population, the total percentage of individuals in the sample living in the Midwest and who obtained coverage through Medicaid at the study's conclusion in 2016 was lower for this region (41.2%) compared to both the Northeast (52.2%) and the West (43.3%) and only slightly higher than the national rate (39.4%) (Tables 5-9).

In the Midwest, there were variations in service utilization rates for each of the 5 services examined (Tables 11-15). For example, there were favorable cumulative increases in utilization rates, above national averages, for routine primary care check-ups and blood pressure screenings. From 2012 to 2016, utilization rates for both primary care check-ups and blood pressure screenings increased by 6.8%. However, the cumulative service utilization rates from 2012 to

2016 for dental check-ups, flu vaccinations, and cholesterol screenings trail behind national rates, with the most pronounced variances present for dental check-ups (-2.2%) and flu vaccinations (-2.8%). In fact, while an initial increase in utilization was seen for each of these 3 services, utilization rates began decreasing around 2015 for flu vaccinations, dental check-ups, and cholesterol screenings. The results also revealed that service utilization rates for dental, primary care, flu vaccination, blood pressure screenings, and cholesterol screenings were considerably lower in the Midwest than rates were in the Northeast (Table 6 and Table 7). However, the utilization rates for the Midwest continuously hovered near national utilization rates (Figures 2-7). In addition, the Midwest, generally, had higher utilization rates than seen in the South for all 5 services and fairly similar rates with the West for services such as routine primary care check-ups, as well as blood pressure and cholesterol screenings (Tables 7-9).

South Analysis

The third region considered in this analysis is the South. Per the Medical Expenditure Panel Survey, the South region of the United States consists of Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia. The share of individuals within the sample who identified as having a disability was larger in the South than it was for any other region. 7,238 individuals living in the South, or approximately 40% of all members in the aggregate United States sample, reported having a disability and belonging to the working-age population. Of these 7,238 individuals, 2,201 (30.4%) obtained their health insurance through Medicaid (Table 8). Despite having a greater need for affordable health insurance due to pure volume of individuals with a disability, the South had the lowest rates of Medicaid enrollment following the program's expansion than any other region (Table 10).

Further, the Medicaid program had the smallest growth (4.65%) in the South from 2012 to 2016 compared to any other region (Table 10). Of particular interest was the finding that Medicaid enrolment following the expansion of the program and at the final year of analysis in 2016 lagged 8.2% behind the national average and a full 21% behind the rate seen within the Northeast (Tables 5, 6, and 8). Parallels between low Medicaid enrollment and stagnant growth of the program could potentially be drawn between the adoption and implementation dates, or lack thereof, of the Medicaid expansion throughout Southern states.

Similar to low rates of Medicaid enrollment following the program's expansion in 2014, utilization rates of dental, primary care, flu vaccination, blood pressure, and cholesterol services in the South region were, for the most part, significantly lower compared to the other 3 regions examined (Tables 5-9). The starkest differences in service utilization rates can be seen between the Northeast and South regions, with service utilization for routine primary care check-ups being 20% lower in the South than it was reported to be in the Northeast (Tables 6 and 8). Not only were significantly lower rates in service utilization observed in the South, but aggregate increases in service utilization rates in the region following the Medicaid expansion were nearly 1.0% to 3.0% lower than national rates (Tables 11-15). While increases in service utilization were less marked in the South than in other regions and remain lower than national averages, the region still experienced between 1.7% to 2.9% increases in service utilization for each of the 5 services from 2012 to 2016 (Tables 11-15).

West Analysis

The 4th and final defined region of the United States as outlined by the Medical Expenditure Panel Survey was the West region. In total, this region included the following thirteen states: Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New

Mexico, Oregon, Utah, Washington, and Wyoming. From 2012 to 2016, 1,566 of the 4,162 (~38%) total eligible participants identified as having a disability in this region, belonged to the working-age population and also obtaining health insurance through Medicaid (Table 9). At the start of the study in 2012, the enrollment rate for Medicaid in the West was 27.6% (Table 9). By 2016, enrollment rate for Medicaid among the working-age disabled population increased by 15.7%. Therefore, the West region experienced the greatest increases in Medicaid enrollment rates from 2012 to 2016 compared to any other region, a 5.7% deviation from Medicaid enrollment growth for the United States as a whole. However, these enrollment rates were still around 8.9% lower than rates observed in the Northeast, which had the highest enrollment rates for Medicaid of any of the 4 regions included in analysis (Table 11).

Overall, the West region experienced noticeable cumulative rises in service utilization rates (Tables 11-15). From 2012 to 2016, this region experienced increases in service utilization ranging from 5.5% for cholesterol screenings to 6.9% for flu vaccinations. In fact, the greatest cumulative increases in service utilization for flu vaccinations (6.9%), blood pressure screenings (6.5%), and cholesterol screenings (5.6%) were observed among the West region of the United States. Despite lagging behind the Northeast in overall utilization rates, cumulative percent increases for services in the West were consistently higher than national averages (0.9% to 3.3%).

Regression Analysis

Following the initial analysis, a mixed-effects linear regression model was applied to the data to examine the statistical significance of the findings. Utilization rates for dental check-ups, primary care check-ups, flu vaccinations, blood pressure screenings, and cholesterol screenings among each of the 4 regions were compared to utilization rates among a base region of aggregate

United States data to determine whether statistically significant relationships between disability, Medicaid enrollment, and service utilization existed. For this analysis the variable for survey year was kept as a random effect instead of a fixed effect in order to analyze regional improvements in service utilization at the culmination of a 5-year pre- and post-implementation period of the Affordable Care Act Medicaid expansion. This analysis also controls for the potential correlation for same-year data across region and service type. The statistical significance of the findings was tested at the $p < 0.05$ level.

The mixed-effects linear regression model showed statistically significant relationships between working-age individuals with disabilities, Medicaid enrollment, and service utilization for the Northeast and South regions. Statistically significant relationships existed between all 5 services within these 2 regions. P-values among the analysis for the Northeast and South were all equal to 0.00 with 2 exceptions: the relationships between disability, age, insurance status, dental check-ups (0.001) and flu vaccinations (0.009) in the South region. No statistically significant relationships were observed between the same variables and the West and Midwest regions, except for one relationship between working-age disability status, Medicaid enrollment, and utilization of cholesterol screening services in the Midwest (Table 16).

Chapter 5

Discussion

This chapter provides a discussion of the research findings as well as the interpretations and implications of those findings. The chapter is separated into 2 sections to include a discussion of the statistically significant findings and the findings that lacked statistical significance. This study sought to examine 3 questions. First and foremost, this study sought to determine the effects of the Medicaid expansion of the Affordable Care Act in reducing health disparities in service utilization for 5 key health care services among individuals with disabilities ages 25-64 from 2012 to 2016. Second, the researcher also examined whether there were regional differences in the impact of the Medicaid expansion in reducing health disparities among individuals with disabilities ages 25-64. Lastly, the impact of the adoption and implementation of Medicaid expansion on regional access and service utilization was also explored. Secondary data from the Household Component of the Medical Expenditure Panel Survey from the years 2012 to 2016 were used to accomplish the objective aims of this study.

At the conclusion of the analysis, statistically significant relationships between working-age disability status, Medicaid enrollment, and service utilization for all 5 services were seen among the Northeast and South regions at the $p < 0.05$ level. The greatest variations from overall service utilization rates for the United States were seen among the Northeast and South with the Northeast faring significantly more favorably and the South struggling to keep up with national rates. The analysis also revealed that no statistically significant relationships were observed for the same variables in the Midwest and West regions, with one exception for cholesterol screening in the Midwest. When compared, overall service utilization rates for aggregate United States data, the West, and the Midwest were fairly similar. In Figures 2-7, utilization rates for all

5 services among each of the 3 regions proved to be relatively comparable with only a few nonconformities. Cumulative increases in service utilization rates were higher in the West and variably higher in the Midwest than they were for the United States, however, these cumulative percent changes in service utilization from 2012 to 2016 did not prove to be significant.

Ultimately, these findings of statistical significance support the conclusion that the Medicaid Expansion of the Affordable Care Act had a positive impact on reducing health disparities among individuals with disabilities ages 25-64 throughout the Northeast region of the United States. The results of this study point to only a moderate impact of the national health care reform because it was able to slightly improve access to health care services and increase service utilization for the 5 main health services examined across the United States as a whole. Following the implementation of the Medicaid expansion, Medicaid enrollment increased by 10% among the United States population of working-age individuals with disabilities. Nationwide, service utilization rates increased 4.3%, 3.4%, 4.7%, 4.3%, and 3.0% for dental check-ups, flu vaccinations, primary care check-ups, blood pressure screenings, and cholesterol screenings correspondingly.

However, the complete findings of this study also point to regional differences in the positive impact of the Medicaid expansion in increasing access and service utilization. Statistically significant relationships between working-age disability status, Medicaid enrollment, and service utilization for all 5 services were only present in the Northeast and South regions and were not observed in the Midwest or West. The statistically significant relationships between working-age disability status, Medicaid enrollment, and service utilization for all 5 services in the Northeast and South suggest that the earlier and more uniform a region's implementation of the Medicaid expansion the greater the growth of service utilization rates

within that region. Therefore, the lower concentration of non-Medicaid expansion states in the South played a role in limiting access to affordable health insurance and healthcare services. On the other hand, nearly every state included in the Northeast adopted and implemented the legislation within the scope of this analysis. Overall, the statistically significant relationships observed in the Northeast and South link improved access to health care services and increased service utilization with access to health insurance through Medicaid for the working-age disabled population. Regional differences in the effect of the Medicaid expansion in reducing health disparities as well as the impact of the legislation's nonuniform adoption and implementation across states will be discussed in greater detail in the following sub-sections.

Results with Statistical Significance

Northeast Results

At the conclusion of the analysis, it is apparent that working-age individuals with disabilities living in the Northeast region of the United States who are enrolled in Medicaid have favorable and increased rates of healthcare services following the Medicaid expansion. This region, collectively, had not only the highest rate of implementation for the Medicaid expansion but also the earliest implementation of any other region. 6 out of 9 states (66.7%) comprising this region implemented the legislation at the start of the 2014 calendar year. 2 additional states, New Hampshire and Pennsylvania adopted the expansion on 8/1/2014 and 1/1/2015, respectively. Although out of the scope of the present research, the final state to adopt the expansion was Maine on 1/10/2019 with coverage retroactive to 7/2/2018. At the start of analysis in 2012, 40.9% of all working-age individuals with a disability reported enrollment in the Medicaid program. By the study's culmination in 2016, 52.2% of all members in the Northeast working-age disabled population were enrolled in Medicaid, therefore contributing to an 11.9% 5-year

regional growth of the program. Compared to other regions, states in the Northeast may have been more willing to adopt and implement the Medicaid expansion near, if not at the start of, the expansion's effective date of 1/1/2014 due to the partisan composition of the 9 Northeast states.

Research indicates that public opinion and political views closely affect public policy. In fact, how salient constituents perceive a given issue significantly effects of the impact of public opinion on policy (Burnstein, 2003). Historically, Northeast states tend to align most closely with liberal views and policies. In fact, during the years immediately following the enactment of the Affordable Care Act in March 2010, the majority of states in the Northeast had primarily Democratic legislative bodies (National Conference of State Legislatures, 2020). Due to the nature of the partisan composition of these states, support of the Medicaid expansion could have been more plausible in the Northeast as governing bodies of the states and their corresponding constituents may have viewed the progressive healthcare reform more favorably in comparison to more conservative states and regions. Similarly, the political opinions and perceptions that healthcare is a relevant item on the policy agenda of Northeasterners may have played a role in the adoption of the Affordable Care Act, the early implementation of the Medicaid expansion across the region, and the resulting positive impact the program's expansion had on healthcare service utilization rates.

Further, yearly service utilization rates for dental check-ups, routine primary care check-ups, flu vaccinations, blood pressure screenings, and cholesterol screenings were substantially higher in this region than any other region included in the study. With respect to utilization rates, by 2016 individuals with disabilities enrolled in Medicaid living in the Northeast utilized healthcare services 9.1% to 15.0% higher than national rates for their counterparts. Further, this region experienced accompanying 3.4% to 8.1% cumulative increases in service utilization rates

following the implementation of the Medicaid expansion. Increases in the rate of service utilization could be reflective of the regional-wide implementation of the Medicaid expansion. As mentioned, by 2016, over half of the working-age individuals with disabilities were obtained health insurance coverage through Medicaid. Perhaps access to affordable health insurance and subsequent enrollment into the Medicaid program granted improved access to healthcare services for people living in the Northeast.

In addition to improved access to health insurance, individual patterns in health services utilization and performance of health risk behaviors could also have contributed to improvements in service utilization following the enactment of the Affordable Care Act and higher service utilization rates as a whole in the Northeast. In the second chapter of this paper, the results of prior research were synthesized and suggested that individuals with disabilities were found to have greater numbers of visits to primary care providers, specialty care providers, and non-medical doctor providers (Rasch, Gulley, & Chan 2013). One reason for a higher number of visits to physician offices and emergency departments could be from more chronic conditions and poorer health among the disabled population (Iezzoni, 2011; Krahn et al., 2015; Pharr & Bungum, 2012; Reichard et al., 2011). Perhaps disabled individuals in the Northeast have worse health than members of the disabled communities in other regions throughout the United States and therefore utilize more healthcare services.

On the other hand, the results of other studies argue that people with disabilities are more likely to delay or forego necessary health care services due to environmental, structural, and process-related barriers interfering with their ability to obtain and receive care (Henning-Smith et al., 2013; Horner-Johnson, 2014; Iezzoni, 2011; Krahn et al., 2015; Merten et al., 2015; Pharr & Bungum, 2012; Reichard et al., 2011; Scheer, Kroll, Neri, & Beatty, 2003; Smith, 2008). If these

findings are substantiated, then, compared to other regions, individuals with disabilities living in the Northeast may experience fewer obstacles in obtaining healthcare services thanks to environmental, structural, and process-related efficiencies within the healthcare setting.

Ultimately, the rationale for the differences in the rates of service utilization reported by various studies could be due to differences in methodology, design, participant demographics, the environment's in which participants live, and the representativeness of each respective study's sample. However, statistically significant regional differences in service utilization could also be attributed to the earlier implementation of the Medicaid expansion across states in the Northeast. Further research on the topic could help pinpoint causality between regional variances in healthcare service utilization for members of the working-age disabled population.

South Results

The South region of the United States drastically differs from the Northeast region of the United States in terms of Medicaid enrollment, Medicaid program expansion, and service utilization among individuals with disabilities. At the beginning of 2012, 26.6% of working-age individuals with disabilities living in the South were enrolled in Medicaid. After 5 years, this rate increased by 4.7% to a total of 31.2% of disabled Southerners obtaining insurance coverage through Medicaid. The South had the lowest rates in Medicaid enrollment at the start and end of the analysis as well as the smallest percent increase in enrollment from 2012 to 2016. These findings are not necessarily shocking as many states in the South failed to adopt and implement the Medicaid expansion. In addition to the 9 out of 17 states comprising this region that elected to forego implementing the legislation entirely, one state implemented the expansion on 7/1/2016, likely barely making an effect on the analysis. Another state implemented the analysis in 2019, out of the scope of the current research's analysis. The other 6 states falling within the

geographic parameters of the South adopted the legislation at the start of the 2014 calendar year. Of note, 5 of the 6 states that implemented the Medicaid expansion at the start of the 2014 calendar year rank among the 25 least populated states (United States Census Bureau, 2018). Ultimately these findings suggest that the effects of the Medicaid expansion among states that adopted the legislation may have been dulled by the overwhelming presence of larger non-expansion states comprising the South. Just as Northeast states tend to have closer affiliations with Democratic legislative bodies, states in the South have traditionally more conservative ideologies. In the years following the enactment of the Affordable Care Act, governments in the South were overwhelmingly controlled by Republican leaders (National Conference of State Legislatures, 2020). This finding could contribute to a lack of support for and adoption of the Medicaid expansion compared to more liberal states. Likely, the lack of consistency and early implementation of the Medicaid expansion within Southern states contributed to the poorer utilization of dental, primary, vaccination, blood pressure, and cholesterol services.

Conversely to the rationale for the results in the Northeast, some researchers suggest that fewer visits to healthcare providers could be due to individuals being healthier and needing to utilize less healthcare services (Iezzoni, 2011; Krahn et al., 2015; Pharr & Bungum, 2012; Rasch, Gully, & Chan, 2013; Reichard et al., 2011). Perhaps individuals with disabilities and enrolled in Medicaid living in the South could be healthier than their Northeast counterparts and therefore need fewer visits to healthcare providers. However, a 2018 annual report from the United Health Foundation documenting the nation's health rankings refutes this argument. In the report, the least healthy states in the country are Louisiana, Mississippi, Alabama, Oklahoma, and Arkansas - all states belonging to the MEPS's South region. In fact, 15 of the 17 states included in the definition of the South ranked among the 25 least healthy states, with exceptions for Virginia and

the District of Columbia. Among the most challenged states in the country, higher prevalence of poverty, smoking, obesity, frequent mental distress, frequent physical distress, and low birthweight babies are present. Additional challenges with individual health behaviors, health outcomes, community and environmental obstacles, and issues with clinical care also plague the South region of the United States. All of these challenges contribute to an individual's health and can lead to the development of disabling conditions as well as exacerbate current disabilities. Likewise, important to note is the finding that 3 Northeast states, Massachusetts, Connecticut, and Vermont, ranked among the nation's top 5 healthiest states with the lowest prevalence of obesity and smoking, low levels of air pollution, low disparity in health status between different levels of socioeconomic status, and high numbers of primary care physicians at 187.6 per 100,000 population (United Health Foundation, 2018). Ultimately, the 2018 United Health Foundation report submits that the presence or absence of certain determinants of health in the Northeast enable members of this region's working-age disabled population to have notably better health and practice healthier behaviors than those of the South population.

A more likely explanation for lower levels of service utilization and less pronounced improvements to service utilization in the aftermath of the Medicaid expansion's implementation is that people from the South face significant barriers impeding their ability to obtain and receive care and are more likely to delay or forego necessary health care services due to environmental, structural, and process-related barriers in consequence (Henning-Smith et al., 2013; Horner-Johnson, 2014; Iezzoni, 2011; Krahn et al., 2015; Merten et al., 2015; Pharr and Bungum, 2012; Reichard et al., 2011; Scheer, Kroll, Neri, & Beatty, 2003; Smith, 2008). Barriers persisting throughout the health care system, such as inaccessible equipment and facilities, the lack of training of healthcare professionals to understand and address the needs of people with

disabilities, and inadequate communication modalities, make it difficult for individuals with disabilities to obtain the care they deserve (Iezzoni, 2011; Scheer, Kroll, Neri, & Beatty, 2003). Similarly, inaccessible environments make it increasingly difficult for people with disabilities to access resources that enable healthy lifestyles and contribute to a greater quality of life (Gray, Gould, & Bickenbach, 2003). Challenges relating to transportation; cost; inaccessible offices, providers, or medical equipment; difficulties navigating health plans; timeliness of services, as it pertains to scheduling appointments; and an inherent lack of provider knowledge and understanding were all barriers commonly cited by individuals with disabilities in the prior research (Henning-Smith et al., 2013; Iezzoni, 2011; Krahn et al., 2015; Reichard et al., 2011; Scheer et al., 2003). Essentially, any and all barriers that result in the failure or delay in receiving needed medical equipment, preventive care, or other services would likely harm the health of these individuals and contribute to the perpetuating cycle of poorer health and greater healthcare expenditures that many individuals with disabilities are unable to surmount. The prior literature on this topic supports the notion that there are likely great barriers to accessing care in the South region of the United States (Henning-Smith et al., 2013; Iezzoni, 2011; Krahn et al., 2015; Reichard et al., 2011; Scheer et al., 2003).

Results without Statistical Significance

Although the relationships between disability status, Medicaid enrollment, and service utilization were not found to be statistically significant within the Midwest and West regions of the United States, the observed patterns in service utilization and insurance status among these 2 regions justify further discussion. Among the Midwest and West, the highest increases in aggregate Medicaid enrollment from 2012 to 2016 were observed at 12.8% and 15.7% improvements, respectively. By 2016, Medicaid enrollment for working-age individuals with

disabilities was at 41.1% for the Midwest and 43.3% in the West, roughly 10% higher than the same rate observed in the South yet 10% lower than the rate observed in the Northeast.

Essentially, enrollment rates for Medicaid in both the Midwest and South hovered close to the average rate observed nationally. This pattern was further replicated throughout each of the 5 examined healthcare services. Analyses for the Midwest and West consistently and closely modeled national approximations for insurance enrollment and service utilization. This finding, therefore, suggests that despite the West and Midwest regions experiencing improvements in Medicaid enrollment and service utilization throughout the course of analysis, the effects of the increases were not substantial enough to produce statistically significant relationships.

Ultimately, these patterns could be due to state Medicaid expansion decisions as the consistency of early implementation of the program for both regions were less pronounced than seen among the Northeast and South.

Chapter 6

Conclusion

Limitations

Although this study produced certain statistically significant results, it is limited by several factors. What is believed to be the study's largest limitation is the lack of a state-level analysis. Due to the nature of how data are structured and deidentified in the Medical Expenditure Panel Survey, there was no option to conduct a state-level analysis comparing healthcare service utilization between Medicaid expansion states and non-expansion states. Instead, regional-level analyses were used as a proxy to state-level analysis to gauge the effect of the Affordable Care Act's Medicaid expansion. Had it been possible for state-level analysis to be conducted, the results of the study would have been more specific and pin-pointed to actual state Medicaid expansion decisions instead of generalized within regions.

Additionally, the regional analysis of this study may have altered the results because each of the 4 regions included in the study were different sizes. Specifically, the South was composed of 17 states (including the District of Columbia), the Northeast was composed of 9 states, the Midwest of twelve, and the West of thirteen (Medical Expenditure Panel Survey, 2012-2016). Further, the population sizes of each state, and therefore each region, differ from one another. As of 2016, the population of the United States was estimated to be approximately 323 million people. The populations of each region were estimated as follows: 56.1 million (Northeast), 68.1 million (Midwest), 123.5 million (South), and 77.3 million (West) (United States Census Bureau, 2019). Depending on whether a state implemented the Affordable Care Act's Medicaid expansion or not, population sizes for each state within a given region may have also skewed the

data towards supporting the efficacy or inefficacy of the Medicaid expansion in reducing health disparities among the disabled population.

The use of self-reporting measures for the 2012 through 2016 Medical Expenditure Panel Surveys may have affected the results of this study as participant recall and social desirability bias could impact the reliability of self-reported information. Lastly, a mixed-effects linear regression model was applied to the data. Due to the simplicity of analysis, the variable for year was set as a random effect when running this model. Therefore, the analysis does not distinguish between year-level changes in service utilization. Rather, the results examine aggregate changes in service utilization following a 5-year pre- and post-implementation period of the Affordable Care Act's Medicaid expansion. An analysis distinguishing between yearly increases in service utilization would be able to better measure the effects of the Affordable Care Act's Medicaid expansion in reducing health disparities among the disabled population.

Along with the aforementioned limitations, causality cannot be implied between the Affordable Care Act's Medicaid expansion and increases in service utilization among the working-age disabled population. As discussed in this paper's literature review, there are many factors in addition to policy interventions and affordable health insurance that contribute to one's ability to access and utilize healthcare services.

Recommendations for Future Research

It is recommended that future research be conducted to examine the effect of the Affordable Care Act's Medicaid expansion at the state-level. As determined by the United States Supreme Court, states were not required to opt into Affordable Care Act directed reforms to

healthcare. As of 2020, 37 states, including the District of Columbia, have adopted the Medicaid expansion. Coverage gaps remain for people with disabilities in the other 14 states that have chosen not to implement the Medicaid expansion of the ACA (Kaiser Family Foundation, 2020). As mentioned by comparing changes in service utilization among Medicaid-expansion and non-expansion states, the results are more specific and conclusive. Data from national surveys other than the Medial Expenditures Panel Survey may be better suited to accomplish this feat.

Another area that would be relevant for exploration is the effect of potential repeal measures states may implement to their current Medicaid programs and other Affordable Care Act directed reforms. Under the current Trump administration, there are national and state-level discussions of repeal taking place (Willison, & Singer, 2017). If repeal efforts are successful, millions of individuals will lose access to their current health insurance. Changes in access to health insurance will more than likely impact access to health care services, service utilization rates, and the overall health of United States citizens.

It would also be interesting to examine the effects of the Medicaid expansion among the various sub-groups of disability. As discussed in the introduction of this paper, 8 main categories of disability are recognized nationally: Mobility/Physical, Spinal Cord, Head Injuries, Vision, Hearing, Cognitive/Learning, Psychological, and Invisible (Centers for Disease Control and Prevention, 2002, & Centers for Disease Control and Prevention, 2019). Different disabilities can have different manifestations and pose different challenges to the people they affect. The factors impacting service utilization for someone with a mobility or physical disability may be utterly different from the factors impacting access to healthcare services and service utilization for someone with a cognitive disability.

Final Summary

Despite the adoption of legislation designed to address the marginalization of people with disabilities, health disparities among this population of over 60 million individuals continue to persist. The review of the current body of literature found that individuals with disabilities are affected by health disparities pertaining to health risk behaviors, overall health, service utilization, preventive care practice, and barriers to access. A gap in the current body of literature indicated that there was a need for more research to be conducted on the efficacy of public health interventions designed to eliminate health disparities, specifically related to service utilization as, among the disabled population.

3 research questions were posed to examine the Medicaid expansion's role in reducing health disparities among the United States population of disabled adults. The primary research question sought to investigate the impact of the Medicaid expansion of the Affordable Care Act in reducing health disparities among individuals with disabilities ages 25-64 by improving access to healthcare services and subsequently increasing service utilization for 5 key health care services? The following sub-questions were asked to support the primary research question: (1) Are there regional differences in the effect of the Medicaid expansion in increasing access and service utilization among individuals with disabilities ages 25-64? And (2) What is the impact of the adoption and implementation of Medicaid expansion on regional access and service utilization?

Following a thorough analysis of 5 years of national data from the Medical Expenditure Panel Survey, it was revealed that the Medicaid expansion of the Affordable Care Act was partially able to positively impact reductions in health disparities among individuals with disabilities ages 25-64. The results of this study point to moderate positive effect of the

Affordable Care Act's Medicaid expansion because the legislation was able to slightly improve access to health care services and increase service utilization for the 5 main health services examined across the United States as a whole. Following the implementation of the Medicaid expansion, Medicaid enrollment increased by 10% among the United States population of working-age individuals with disabilities. Nationwide, service utilization rates increased between 3.0% to 4.7% for dental check-ups, flu vaccinations, primary care check-ups, blood pressure screenings, and cholesterol screenings correspondingly.

The complete findings of this study also point to regional differences in the effect of the Medicaid expansion in increasing access and service utilization. Cumulative percent increases in service utilization among the Northeast, Midwest, South, and West varied by region and service type. Generally, increases in service utilization were higher in the Northeast, Midwest, and West than they were for the South. Statistically significant relationships between working-age disability status, Medicaid enrollment, and service utilization for all 5 services were only present in the Northeast and South regions and were not observed in the Midwest or West. The statistically significant relationships between working-age disability status, Medicaid enrollment, and service utilization for all 5 services in the Northeast and South suggest that the earlier and more uniform a region's implementation of the Medicaid expansion the greater the growth of service utilization rates within that region. Overall, the statistically significant relationships observed in the Northeast and South link improved access to health care services and increased service utilization with access to health insurance through Medicaid for the working-age disabled population.

The results of this study point to the positive impact of the Affordable Care Act in reducing health disparities among the disabled population. However, the results are limited by

the study's design which included a regional-level analysis as the closest proxy of a state-level analysis to compare healthcare service utilization between Medicaid expansion states and non-expansion states. Data were also limited by the lack of distinction between yearly changes in regional service utilization rates in the analysis of statistical significance. This study serves as a foundation to understanding the effects of the Affordable Care Act's Medicaid expansion in reducing health disparities among individuals with disabilities ages 25-64 by improving access to healthcare services and subsequently increasing service utilization for 5 key health care services. Further research should investigate additional areas such as the impacts of the legislation among Medicaid expansion states and non-expansion states as well as effects of the Medicaid expansion among the various sub-groups of disability. Additionally, given today's political climate, it would be prudent for researchers to examine the effects of potential repeal measures states may implement to their current Medicaid programs and other Affordable Care Act directed reforms.

Appendix A

Figures

Figure 1. Study Variables and Design

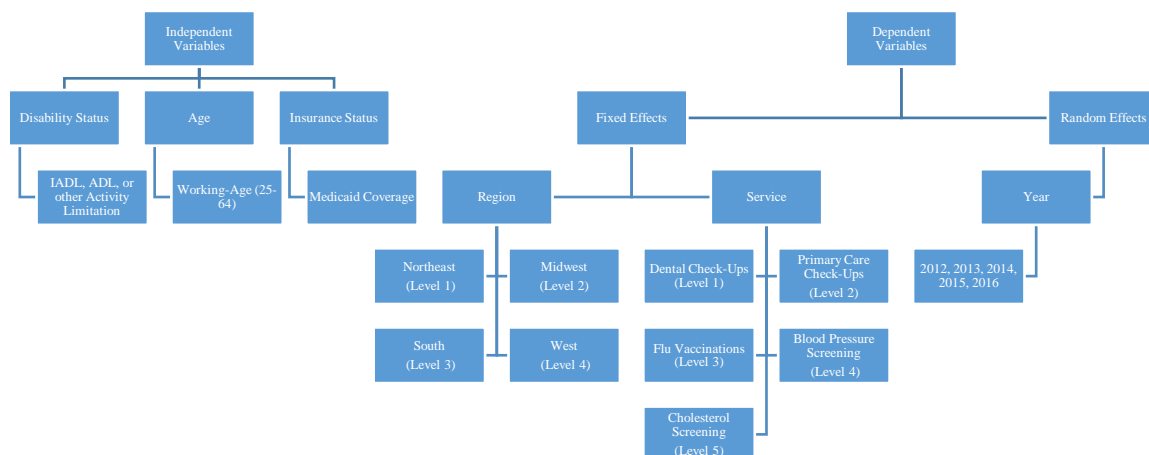


Figure 2. Medicaid Enrollment Rates by Region & Year

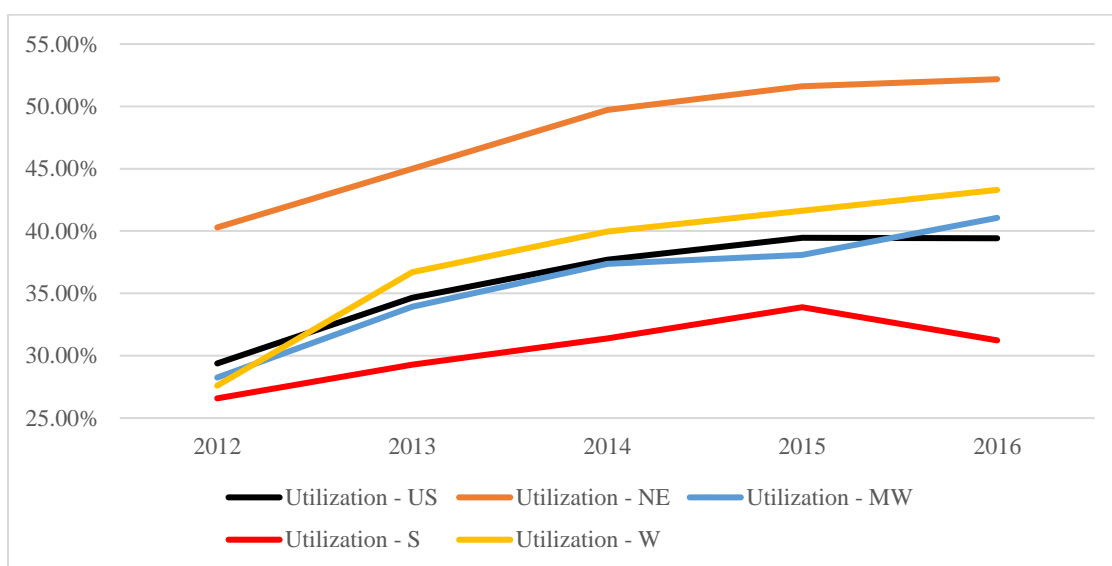


Figure 3. Dental Check-Up Utilization Rates by Region and Year

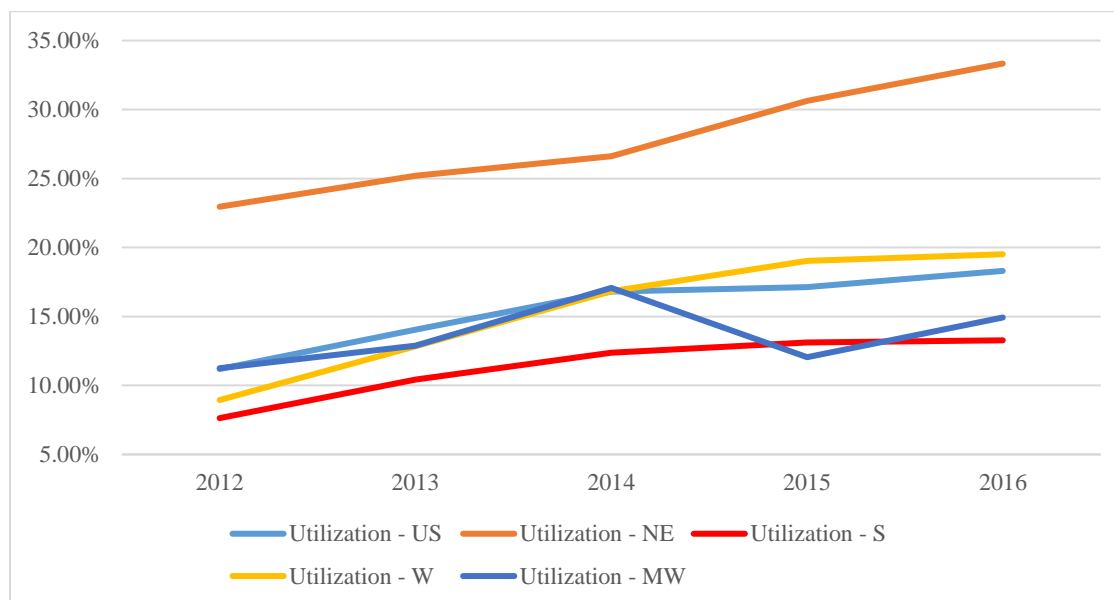


Figure 4. Flu Vaccination Utilization Rates by Region and Year

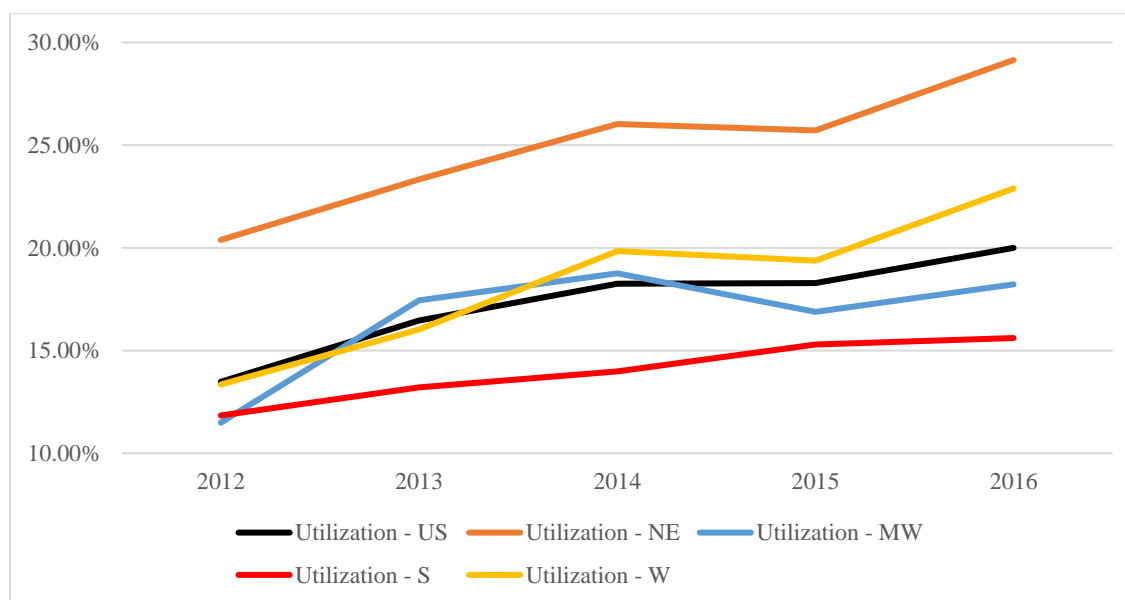


Figure 5. Routine Primary Care Check-Up Utilization Rates by Region and Year

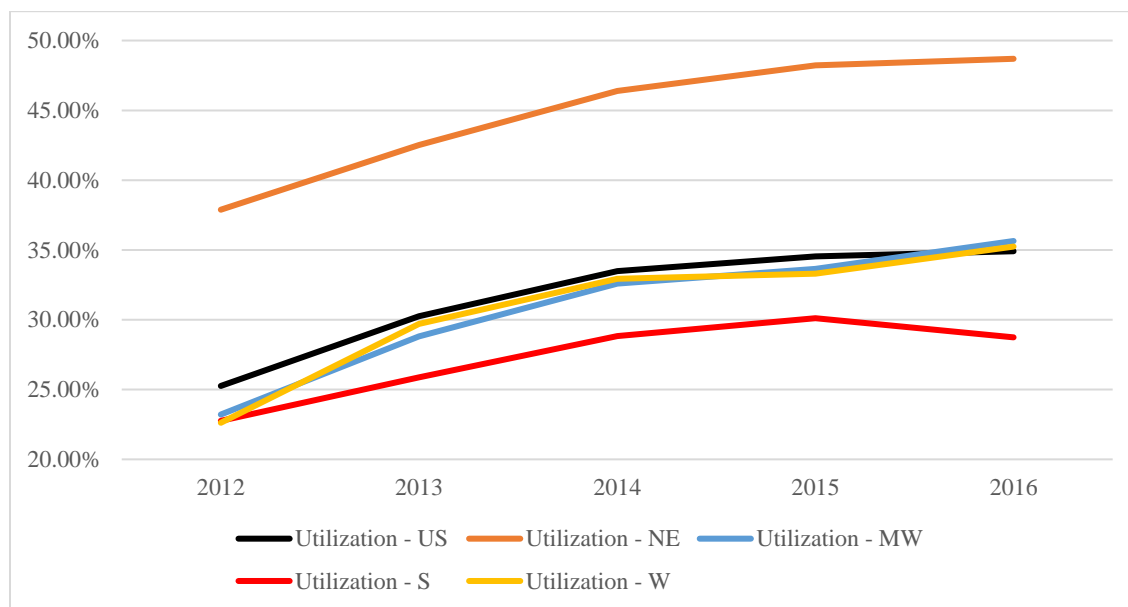


Figure 6. Blood Pressure Screening Utilization Rates by Region and Year

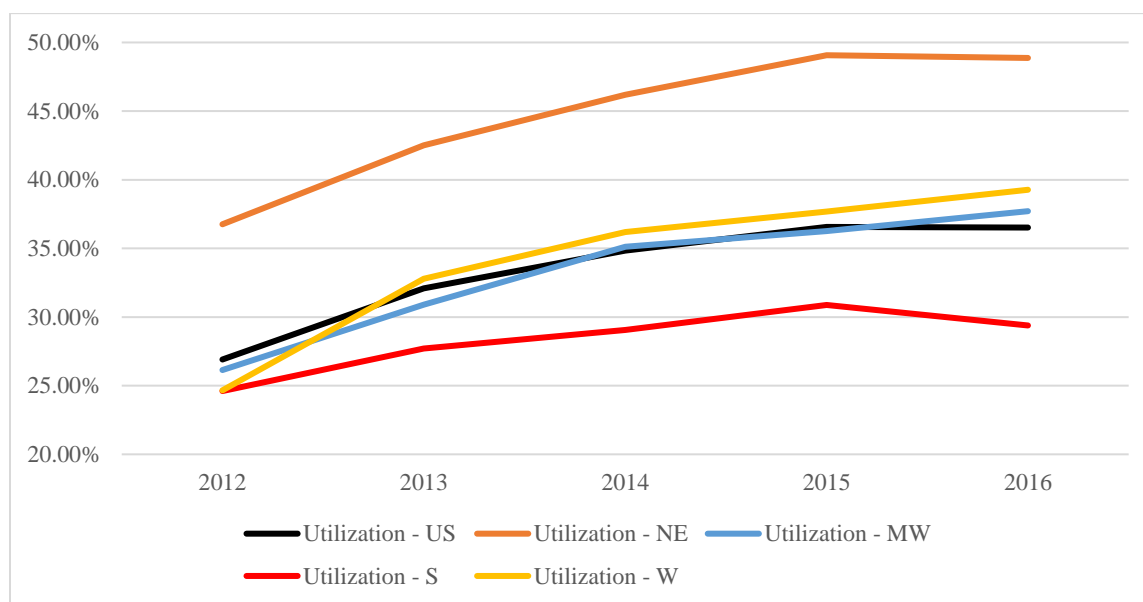
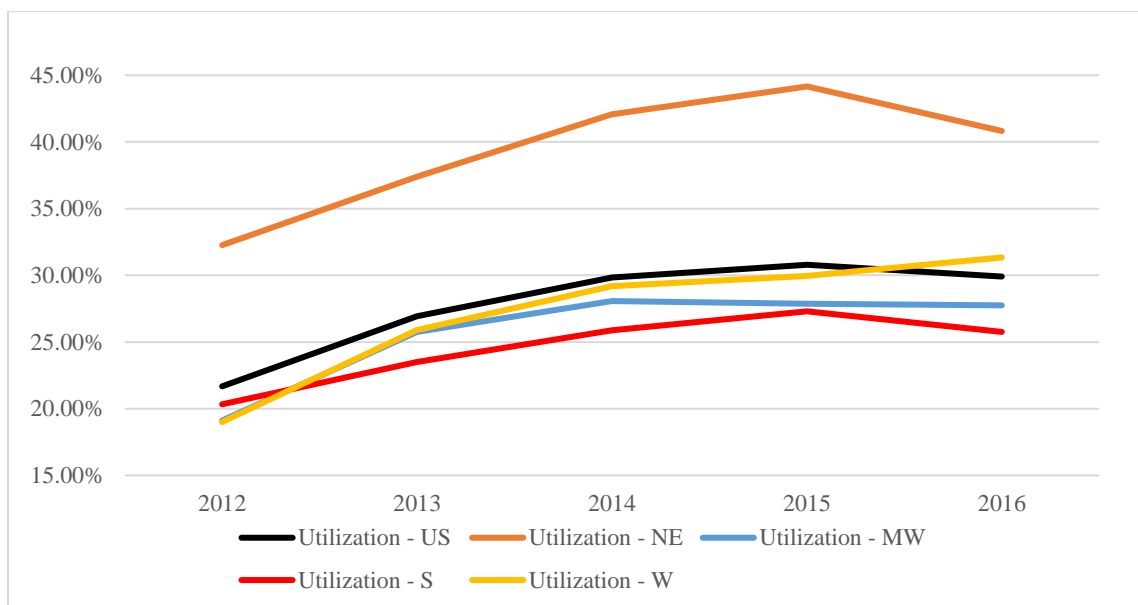


Figure 7. Cholesterol Screening Utilization Rates by Region and Year

Appendix B

Tables

Table 1. State Medicaid Expansion Decisions as of 1/1/2020

| Region | State | Implementation Date | Region | | |
|---------|--------------|-----------------------------|---------------|-----------------------|----------------------|
| West | Alaska | Implemented 9/1/2015 | South | Alabama | Not Adopted |
| | Arizona | Implemented 1/1/2014 | | Arkansas | Implemented 1/1/2014 |
| | California | Implemented 1/1/2014 | | Delaware | Implemented 1/1/2014 |
| | Colorado | Implemented 1/1/2014 | | District of Columbia | Implemented 1/1/2014 |
| | Hawaii | Implemented 1/1/2014 | | Florida | Not Adopted |
| | Idaho | Implemented 1/1/2020 | | Georgia | Not Adopted |
| | Montana | Implemented 1/1/2016 | | Kentucky | Implemented 1/1/2014 |
| | Nevada | Implemented 1/1/2014 | | Louisiana | Implemented 7/1/2016 |
| | New Mexico | Implemented 1/1/2014 | | Maryland | Implemented 1/1/2014 |
| | Oregon | Implemented 1/1/2014 | | Mississippi | Not Adopted |
| | Utah | Implemented 1/1/2020 | | North Carolina | Not Adopted |
| | Washington | Implemented 1/1/2014 | | Oklahoma | Not Adopted |
| Wyoming | Not Adopted | South Carolina | Not Adopted | | |
| Midwest | Indiana | Implemented 2/1/2015 | Tennessee | Not Adopted | |
| | Illinois | Implemented 1/1/2014 | Texas | Not Adopted | |
| | Iowa | Implemented 1/1/2014 | Virginia | Implemented 1/1/2019 | |
| | Kansas | Not Adopted | West Virginia | Implemented 1/1/2014 | |
| | Michigan | Implemented 4/1/2014 | Connecticut | Implemented 1/1/2014 | |
| | Minnesota | Implemented 1/1/2014 | Maine | Implemented 1/10/2019 | |
| | Missouri | Not Adopted | Massachusetts | Implemented 1/1/2014 | |
| | Nebraska | Adopted but Not Implemented | New Hampshire | Implemented 8/5/2014 | |
| | North Dakota | Implemented 1/1/2014 | New Jersey | Implemented 1/1/2014 | |
| | Ohio | Implemented 1/1/2014 | New York | Implemented 1/1/2014 | |
| | South Dakota | Not Adopted | Pennsylvania | Implemented 1/1/2015 | |
| | Wisconsin | Not Adopted | Rhode Island | Implemented 1/1/2014 | |
| | | | Vermont | Implemented 1/1/2014 | |

Table 2. Demographic Information for MEPS Survey Population by Year

| Demographic | Sub-Category | 2012 | 2013 | 2014 | 2015 | 2016 | Average |
|-------------------|--------------------------|-------|-------|-------|-------|-------|---------|
| Disability Status | Disabled | 6253 | 6490 | 6387 | 6695 | 6566 | 6478.2 |
| | Non-Disabled | 29606 | 30450 | 28488 | 28732 | 28089 | 29073 |
| Age | Working-Age Disabled | 3567 | 3680 | 3543 | 3621 | 3475 | 3577.2 |
| | Working-Age Non-Disabled | 32292 | 33260 | 31332 | 31806 | 31180 | 31974 |
| Insurance Status | Medicaid | 1055 | 1275 | 1336 | 1429 | 1370 | 1293 |
| | Non-Medicaid | 34804 | 35665 | 33539 | 3398 | 33285 | 28138.2 |
| | Total Sample Size | 35859 | 36940 | 34875 | 35427 | 34655 | 35551.2 |

Table 3. Demographic Information for MEPS Working-Age Disabled Population by Year

| | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | |
|--------|--------------------------|-------|------|-------|------|-------|------|-------|------|-------|------|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Age | Working-Age Disabled | 3567 | | 3680 | | 3543 | | 3621 | | 3475 | |
| | Working-Age Non-Disabled | 32292 | | 33260 | | 31332 | | 31806 | | 31180 | |
| Sex | Male | 1546 | 43.3 | 1585 | 43.1 | 1462 | 41.3 | 1474 | 40.7 | 1436 | 41.3 |
| | Female | 2021 | 56.7 | 2095 | 56.9 | 2081 | 58.7 | 2147 | 59.3 | 2039 | 58.7 |
| Race | White | 2393 | 67.1 | 2388 | 64.9 | 2328 | 65.7 | 2395 | 66.1 | 2342 | 67.4 |
| | Black | 896 | 25.1 | 989 | 26.9 | 934 | 26.4 | 921 | 25.4 | 838 | 24.1 |
| | American Indian | 50 | 1.4 | 48 | 1.3 | 33 | 0.9 | 41 | 1.1 | 45 | 1.3 |
| | Asian | 146 | 4.1 | 171 | 4.7 | 131 | 3.7 | 125 | 3.5 | 127 | 3.7 |
| | Multiple Races | 82 | 2.3 | 84 | 2.3 | 117 | 3.3 | 139 | 3.8 | 123 | 3.5 |
| Income | Poor | 944 | 26.5 | 1142 | 31.0 | 1065 | 30.1 | 1045 | 28.9 | 1014 | 29.2 |
| | Near Poor | 303 | 8.5 | 296 | 8.0 | 284 | 8.0 | 261 | 7.2 | 246 | 7.1 |
| | Low Income | 596 | 19.7 | 622 | 16.9 | 613 | 17.3 | 621 | 17.2 | 598 | 17.2 |
| | Middle Income | 933 | 26.2 | 911 | 24.8 | 908 | 25.6 | 908 | 25.1 | 883 | 25.4 |
| | High Income | 791 | 22.2 | 709 | 19.3 | 673 | 19.0 | 786 | 21.7 | 734 | 21.1 |

Table 4. Demographic Information for MEPS Working-Age Disabled Sample Insured through Medicaid by Year

| | | 2012 | | 2013 | | 2014 | | 2015 | | 2016 | |
|---------------|-----------------|-------|------|-------|------|-------|------|-------|------|-------|------|
| | | Freq. | % | Freq. | % | Freq. | % | Freq. | % | Freq. | % |
| Insur. Status | Medicaid | 1055 | | 3680 | | 3543 | | 3621 | | 3475 | |
| | Non-Medicaid | 34804 | | 33260 | | 31332 | | 31806 | | 31180 | |
| Sex | Male | 402 | 38.1 | 1585 | | 1462 | 36.2 | 1474 | 34.8 | 1436 | 35.7 |
| | Female | 653 | 61.9 | 2095 | | 2081 | 63.8 | 2147 | 65.2 | 2039 | 64.3 |
| Race | White | 626 | 59.3 | 2388 | 54.2 | 2328 | 57.0 | 2395 | 59.1 | 2342 | 60.0 |
| | Black | 354 | 33.6 | 989 | 36.1 | 934 | 34.2 | 921 | 32.5 | 838 | 30.6 |
| | American Indian | 19 | 1.8 | 48 | 1.8 | 33 | 1.2 | 41 | 1.2 | 45 | 1.5 |
| | Asian | 33 | 3.1 | 171 | 4.3 | 131 | 3.1 | 125 | 2.9 | 127 | 3.2 |
| | Multiple Races | 23 | 2.2 | 84 | 3.6 | 117 | 4.4 | 139 | 4.3 | 123 | 4.7 |
| Income | Poor | 566 | 53.6 | 1142 | 54.7 | 1065 | 53.2 | 1045 | 52.2 | 1014 | 52.2 |
| | Near Poor | 148 | 14.0 | 296 | 12.7 | 284 | 11.7 | 261 | 10.1 | 246 | 11.0 |
| | Low Income | 189 | 17.9 | 622 | 17.9 | 613 | 18.9 | 621 | 20.0 | 598 | 18.4 |
| | Middle Income | 126 | 11.9 | 911 | 12.4 | 908 | 13.5 | 908 | 13.5 | 883 | 15.1 |
| | High Income | 726 | 2.5 | 709 | 2.4 | 673 | 2.8 | 786 | 4.2 | 734 | 3.3 |

Table 5. Frequency & Percentage of Service Utilization by Year in the United States

| Year | Disability & Working-Age Population | Disability, Working-Age, & Medicaid Coverage | Dental Check-Ups | Routine Check-Ups | Flu-Shots | Blood Pressure | Cholesterol |
|------------------|-------------------------------------|--|------------------|-------------------|-----------|----------------|-------------|
| 2012 | 3880 | 1140 | 434 | 980 | 523 | 1044 | 841 |
| Utilization Rate | | 29.38% | 11.19% | 25.26% | 13.48% | 26.91% | 21.68% |
| 2013 | 3680 | 1275 | 517 | 1113 | 606 | 1181 | 991 |
| Utilization Rate | | 34.65% | 14.05% | 30.24% | 16.47% | 32.09% | 26.93% |
| 2014 | 3543 | 1336 | 595 | 1186 | 647 | 1234 | 1057 |
| Utilization Rate | | 37.71% | 16.79% | 33.47% | 18.26% | 34.83% | 29.83% |
| 2015 | 3621 | 1429 | 620 | 1251 | 662 | 1324 | 1115 |
| Utilization Rate | | 39.46% | 17.12% | 34.55% | 18.28% | 36.56% | 30.79% |

| | | | | | | | |
|------------------|------|--------|--------|--------|--------|--------|--------|
| 2016 | 3475 | 1370 | 636 | 1213 | 695 | 1269 | 1039 |
| Utilization Rate | | 39.42% | 18.30% | 34.91% | 20.00% | 36.52% | 29.90% |

Note: The percentage is expressed as a percent of total participants reporting having a disability between the ages 25-64 who are enrolled in the Medicaid program or use the healthcare service

Table 6. Frequency & Percentage of Service Utilization by Year in the Northeast

| Year | Disability & Working-Age Population | Disability, Working-Age, & Medicaid Coverage | Dental Check-Ups (at least 1x/year) | Routine Check-Ups (at least 1x/2 years) | Flu-Shots | Blood Pressure | Cholesterol |
|------------------|-------------------------------------|--|-------------------------------------|---|-----------|----------------|-------------|
| 2012 | 623 | 251 | 143 | 236 | 127 | 229 | 201 |
| Utilization Rate | | 40.29% | 22.95% | 37.88% | 20.39% | 36.76% | 32.26% |
| 2013 | 647 | 291 | 163 | 275 | 151 | 275 | 242 |
| Utilization Rate | | 44.98% | 25.19% | 42.50% | 23.34% | 42.50% | 37.40% |
| 2014 | 593 | 297 | 160 | 275 | 152 | 275 | 251 |
| Utilization Rate | | 50.08% | 26.98% | 46.37% | 25.63% | 46.37% | 42.33% |
| 2015 | 591 | 305 | 181 | 285 | 152 | 290 | 261 |
| Utilization Rate | | 51.61% | 30.63% | 48.22% | 25.72% | 49.07% | 44.16% |
| 2016 | 573 | 299 | 191 | 279 | 167 | 280 | 234 |
| Utilization Rate | | 52.18% | 33.33% | 48.69% | 29.14% | 48.87% | 40.84% |

Note: The percentage is expressed as a percent of total participants reporting having a disability between the ages 25-64 who are enrolled in the Medicaid program or use the healthcare service

Table 7. Frequency & Percentage of Service Utilization by Year in the Midwest

| Year | Disability & Working-Age Population | Disability, Working-Age, & Medicaid Coverage | Dental Check-Ups (at least 1x/year) | Routine Check-Ups (at least 1x/2 years) | Flu-Shots | Blood Pressure | Cholesterol |
|------------------|-------------------------------------|--|-------------------------------------|---|-----------|----------------|-------------|
| 2012 | 853 | 241 | 96 | 198 | 98 | 223 | 163 |
| Utilization Rate | | 28.25% | 11.25% | 23.21% | 11.49% | 26.14% | 19.11% |
| 2013 | 722 | 245 | 93 | 208 | 126 | 223 | 186 |
| Utilization Rate | | 33.93% | 12.88% | 28.81% | 17.45% | 30.89% | 25.76% |
| 2014 | 709 | 265 | 121 | 231 | 133 | 249 | 199 |
| Utilization Rate | | 37.38% | 17.07% | 32.58% | 18.76% | 35.12% | 28.07% |
| 2015 | 764 | 291 | 92 | 257 | 129 | 277 | 213 |
| Utilization Rate | | 38.09% | 12.04% | 33.64% | 16.88% | 36.26% | 27.88% |
| 2016 | 724 | 298 | 108 | 258 | 132 | 273 | 201 |
| Utilization Rate | | 41.16% | 14.92% | 35.64% | 18.23% | 37.71% | 27.76% |

Note: The percentage is expressed as a percent of total participants reporting having a disability between the ages 25-64 who are enrolled in the Medicaid program or use the healthcare service

Table 8. Frequency & Percentage of Service Utilization by Year in the South

| Year | Disability & Working-Age Population | Disability, Working-Age, & Medicaid Coverage | Dental Check-Ups (at least 1x/year) | Routine Check-Ups (at least 1x/2 years) | Flu-Shots | Blood Pressure | Cholesterol |
|------------------|-------------------------------------|--|-------------------------------------|---|-----------|----------------|-------------|
| 2012 | 1520 | 404 | 116 | 346 | 180 | 374 | 309 |
| Utilization Rate | | 26.58% | 7.63% | 22.76% | 11.84% | 24.61% | 20.33% |
| 2013 | 1469 | 430 | 153 | 380 | 194 | 407 | 345 |
| Utilization Rate | | 29.27% | 10.42% | 25.87% | 13.21% | 27.71% | 23.49% |
| 2014 | 1415 | 444 | 175 | 408 | 198 | 411 | 366 |
| Utilization Rate | | 31.38% | 12.37% | 28.83% | 13.99% | 29.05% | 25.87% |
| 2015 | 1425 | 483 | 187 | 429 | 218 | 440 | 389 |
| Utilization Rate | | 33.89% | 13.12% | 30.11% | 15.30% | 30.88% | 27.30% |
| 2016 | 1409 | 440 | 187 | 405 | 220 | 414 | 363 |
| Utilization Rate | | 31.23% | 13.27% | 28.74% | 15.61% | 29.38% | 25.76% |

Note: The percentage is expressed as a percent of total participants reporting having a disability between the ages 25-64 who are enrolled in the Medicaid program or use the healthcare service

Table 9. Frequency & Percentage of Service Utilization by Year in the West

| Year | Disability & Working-Age Population | Disability, Working-Age, & Medicaid Coverage | Dental Check-Ups (at least 1x/year) | Routine Check-Ups (at least 1x/2 years) | Flu-Shots | Blood Pressure | Cholesterol |
|------------------|-------------------------------------|--|-------------------------------------|---|-----------|----------------|-------------|
| 2012 | 884 | 244 | 79 | 200 | 118 | 218 | 168 |
| Utilization Rate | | 27.60% | 8.94% | 22.62% | 13.35% | 24.66% | 19.00% |
| 2013 | 842 | 309 | 108 | 250 | 135 | 276 | 218 |
| Utilization Rate | | 36.70% | 12.83% | 29.69% | 16.03% | 32.78% | 25.89% |
| 2014 | 826 | 330 | 139 | 272 | 164 | 299 | 241 |
| Utilization Rate | | 39.95% | 16.83% | 32.93% | 19.85% | 36.20% | 29.18% |
| 2015 | 841 | 350 | 160 | 280 | 163 | 317 | 252 |
| Utilization Rate | | 41.62% | 19.02% | 33.29% | 19.38% | 37.69% | 29.96% |
| 2016 | 769 | 333 | 150 | 271 | 176 | 302 | 241 |
| Utilization Rate | | 43.30% | 19.51% | 35.24% | 22.89% | 39.27% | 31.34% |

Note: The percentage is expressed as a percent of total participants reporting having a disability between the ages 25-64 who are enrolled in the Medicaid program or use the healthcare service

Table 10. Percent of Medicaid Enrollment among the Total Disabled Population by Year & Region and Percent Changes in Enrollment by Year & Region

| Year | US Util. | US % Change | NE Util. | % Change NE | MW Util. | % Change MW | S Util. | % Change S | W Util. | % Change W |
|------|----------|-------------|----------|-------------|----------|-------------|---------|------------|---------|------------|
|------|----------|-------------|----------|-------------|----------|-------------|---------|------------|---------|------------|

| | | | | | | | | | | |
|-------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 2012 | 29.4% | | 40.3% | | 28.3% | | 28.2% | | 27.6% | |
| 2013 | 34.7% | 5.3% | 45.0% | 4.7% | 33.9% | 5.6% | 33.9% | 5.7% | 36.7% | 9.1% |
| 2014 | 37.7% | 3.0% | 49.7% | 4.7% | 37.4% | 3.5% | 37.4% | 3.5% | 40.0% | 3.3% |
| 2015 | 39.5% | 1.8% | 51.6% | 1.9% | 38.1% | 0.7% | 38.1% | 0.7% | 41.6% | 1.6% |
| 2016 | 39.4% | -0.1% | 52.2% | 0.6% | 41.1% | 3.0% | 41.2% | 3.1% | 43.3% | 1.7% |
| Total % Change | | 10.0% | | 11.9% | | 12.8% | | 13.0% | | 15.7% |

Table 11. Dental Check-Up Utilization Rates & Percent Changes in Utilization by Year and Region

| Year | US Util. | US % Change | NE Util. | % Change NE | MW Util. | % Change MW | S Util. | % Change S | W Util. | % Change W |
|----------------|----------|----------------|-------------|-------------------|-------------|-------------------|---------|------------------|---------|------------------|
| 2012 | 11.2% | | 23.0% | | 11.3% | | 7.6% | | 8.9% | |
| 2013 | 14.1% | 2.9% | 25.1% | 2.2% | 12.9% | 1.6% | 10.4% | 2.8% | 12.8% | 3.9% |
| 2014 | 16.8% | 2.7% | 26.6% | 1.4% | 17.1% | 4.1% | 12.4% | 2.0% | 16.8% | 4.0% |
| 2015 | 17.1% | 0.3% | 30.6% | 4.0% | 12.0% | -5.0% | 13.1% | 0.8% | 19.0% | 2.2% |
| 2016 | 18.3% | 1.2% | 33.3% | 2.7% | 14.9% | 2.9% | 13.3% | 0.2% | 19.5% | 0.5% |
| Total % Change | | 4.25% | | 8.14% | | 2.04% | | 2.85% | | 6.68% |

Table 12. Primary Care Utilization Rates & Percent Changes in Utilization by Year and Region

| Year | US Util. | US % Change | NE Util. | % Change NE | MW Util. | % Change MW | S Util. | % Change S | W Util. | % Change W |
|----------------|-------------|----------------|-------------|-------------------|-------------|-------------------|---------|------------------|---------|------------------|
| 2012 | 25.3% | | 37.9% | | 23.2% | | 22.8% | | 22.6% | |
| 2013 | 30.2% | 5.0% | 42.5% | 4.6% | 28.8% | 5.6% | 25.9% | 3.1% | 29.7% | 7.1% |
| 2014 | 33.5% | 3.2% | 46.4% | 3.9% | 32.6% | 3.8% | 28.8% | 3.0% | 32.9% | 3.2% |
| 2015 | 34.6% | 1.1% | 48.2% | 1.8% | 33.6% | 1.1% | 30.1% | 1.3% | 33.3% | 0.4% |
| 2016 | 34.9% | 0.34% | 48.7% | 0.5% | 35.6% | 2.0% | 28.7% | -1.4% | 35.2% | 2.0% |
| Total % Change | | 4.7% | | 6.2% | | 6.8% | | 2.9% | | 5.6% |

Table 13. Flu Vaccinations Utilization Rates & Percent Changes in Utilization by Year and Region

| Year | US Util. | US % Change | NE Util. | % Change NE | MW Util. | % Change MW | S Util. | % Change S | W Util. | % Change W |
|------|-------------|----------------|-------------|-------------------|-------------|-------------------|---------|------------------|---------|------------------|
| 2012 | 13.5% | | 20.4% | | 11.5% | | 11.8% | | 13.4% | |
| 2013 | 16.5% | 3.0% | 23.3% | 3.0% | 17.5% | 6.0% | 13.2% | 1.4% | 16.0% | 2.7% |
| 2014 | 18.3% | 1.8% | 26.0% | 2.7% | 18.8% | 1.3% | 14.0% | 0.8% | 19.9% | 3.8% |
| 2015 | 18.3% | 0.0% | 25.7% | -0.3% | 16.9% | -1.9% | 15.3% | 1.3% | 19.4% | -0.5% |
| 2016 | 20.0% | 1.7% | 29.1% | 3.4% | 18.2% | 1.4% | 15.6% | 0.3% | 22.9% | 3.5% |

| | | | | | |
|----------------|------|------|------|------|------|
| Total % Change | 3.5% | 5.8% | 0.8% | 2.4% | 6.9% |
|----------------|------|------|------|------|------|

Table 14. Blood Pressure Utilization Rates & Percent Changes in Utilization by Year and Region

| Year | US Util. | US % Change | NE Util. | % Change NE | MW Util. | % Change MW | S Util. | % Change S | W Util. | % Change W |
|----------------|----------|-------------|----------|-------------|----------|-------------|---------|------------|---------|------------|
| 2012 | 26.9% | | 36.8% | | 26.1% | | 24.6% | | 24.7% | |
| 2013 | 32.2% | 5.2% | 42.5% | 5.8% | 30.9% | 4.8% | 27.7% | 3.1% | 32.8% | 8.1% |
| 2014 | 34.8% | 2.7% | 46.2% | 3.7% | 35.1% | 4.2% | 29.1% | 1.3% | 36.2% | 3.4% |
| 2015 | 36.6% | 1.7% | 49.1% | 2.9% | 36.3% | 1.1% | 30.9% | 1.8% | 37.7% | 1.5% |
| 2016 | 36.5% | -0.1% | 48.9% | -0.2% | 37.7% | 1.5% | 29.4% | -1.5% | 39.3% | 1.6% |
| Total % Change | | 4.43% | | 6.4% | | 6.8% | | 1.8% | | 6.45% |

Table 15. Cholesterol Utilization Rates & Percent Changes in Utilization by Year and Region

| Year | US Util. | US % Change | NE Util. | % Change NE | MW Util. | % Change MW | S Util. | % Change S | W Util. | % Change W |
|----------------|----------|-------------|----------|-------------|----------|-------------|---------|------------|---------|------------|
| 2012 | 21.7% | | 32.3% | | 19.1% | | 20.3% | | 19.0% | |
| 2013 | 26.9% | 5.3% | 37.4% | 5.1% | 25.8% | 6.6% | 23.5% | 3.2% | 25.9% | 6.9% |
| 2014 | 29.8% | 2.9% | 42.1% | 4.7% | 28.1% | 2.3% | 25.9% | 2.4% | 29.2% | 3.3% |
| 2015 | 30.8% | 1.0% | 44.2% | 2.1% | 27.9% | -0.2% | 27.3% | 1.4% | 30.0% | 0.8% |
| 2016 | 29.9% | -0.9% | 40.8% | -3.3% | 27.8% | -0.1% | 25.8% | -1.5% | 31.3% | 1.4% |
| Total % Change | | 3.0% | | 3.4% | | 2.0% | | 2.3% | | 5.6% |

Table 16. Regression of Regional Service Utilization to United States Service Utilization

| Region & Service Type | Standard Error | P-Value |
|----------------------------|----------------|---------|
| Northeast-Dental | .0087142 | 0.000 |
| Northeast-Routine Check-Up | .0087142 | 0.000 |
| Northeast-Flu Vaccination | .0087142 | 0.000 |
| Northeast-Blood Pressure | .0087142 | 0.000 |
| Northeast-Cholesterol | .0076204 | 0.000 |
| Midwest-Dental | .0094519 | 0.117 |
| Midwest -Routine Check-Up | .0094519 | 0.572 |
| Midwest -Flu Vaccination | .0094519 | 0.703 |
| Midwest-Blood Pressure | .0094519 | 0.818 |
| Midwest-Cholesterol | .0073214 | 0.018 |
| South-Dental | .0105675 | 0.001 |
| South-Routine Check-Up | .0105675 | 0.000 |
| South-Flu Vaccination | .0105675 | 0.009 |

| | | |
|--|----------|-------|
| South-Blood Pressure | .0105675 | 0.000 |
| South-Cholesterol | .0076204 | 0.000 |
| West-Dental | .0119558 | 0.565 |
| West-Routine Check-Up | .0119558 | 0.880 |
| West-Flu Vaccination | .0119558 | 0.142 |
| West-Blood Pressure | .0119558 | 0.213 |
| West-Cholesterol | .0086409 | 0.533 |
| <p><i>Note:</i> Random-effects parameters applied for year * Regression analysis is comparing all regional-service utilization rates to national-service utilization rates.</p> | | |

Appendix C

STATA Input

```
clear
set more off
capture log cl

/* Downloading 2012 MEPS Survey Data */

copy "https://meps.ahrq.gov/mepsweb/data_files/pufs/h155ssp.zip" "h155ssp.zip"
unzipfile "h155ssp.zip"
import sasxport5 "h155.ssp", clear

/* Examining 2012 MEPS Survey Data. Running tabulations for insurance, disability, and
regional variables. */

    browse
    count
    tab mcdev12
    tab anylim12
    tab region12

/* Generating variables for sub-populations among the United States */

    *Disability & Working-Age*
    gen USAdisability_working = (anylim12==1 & age12x>=25 & age12x<=64)
    tab USAdisability_working

    *Disability & Working-Age & Medicaid Coverage*
    gen USAdisability_all = (USAdisability_working==1 & mcdev12==1)
    tab USAdisability_all

/* Running tabulations for demographic characteristics among the Disability & Working-Age
population and Disability & Working-Age & Medicaid Coverage population */

    tab racev1x if USAdisability_working==1
    tab sex if USAdisability_working==1
    tab povcat12 if USAdisability_working==1

    tab racev1x if USAdisability_all==1
    tab sex if USAdisability_all==1
    tab povcat12 if USAdisability_all==1
```

/* Creating a variable for USA Dental Check-Ups in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab dentck53 if (USAdisability_all==1)
generate USAdental_checkup = dentck53
  replace USAdental_checkup = . if dentck53<1
tab USAdental_checkup if (USAdisability_all==1)
```

/* Creating a variable for USA Routine Check-Ups Assessing Overall Health in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab check53 if (USAdisability_all==1)
generate USAdr_checkup = check53
  replace USAdr_checkup = . if check53<1
tab USAdr_check if USAdisability_all==1
```

/* Creating a variable for USA Flu Vaccinations in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab flusht53 if (USAdisability_all==1)
generate USAflu_shot = flusht53
  replace USAflu_shot = . if flusht53<1
tab USAflu_shot if USAdisability_all==1
```

/* Creating a variable for USA Blood Pressure Screening in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab bpchek53 if (USAdisability_all==1)
generate USAbp = bpchek53
  replace USAbp = . if bpchek53<1
tab USAbp if (USAdisability_all==1)
```

/* Creating a variable for USA Cholesterol Screening in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab cholck53 if (USAdisability_all==1)
generate USAcholesterol = cholck53
  replace USAcholesterol = . if cholck53<1
tab USAcholesterol if (USAdisability_all==1)
```

/* Generating variables for sub-populations among the Northeast Region in 2012 */

```
*Disability & Working-Age Population in the Northeast*
gen NEdisability_working = (anylim12==1 & age12x>=25 & age12x<=64 &
region12==1)
tab NEdisability_working
```

```

*Disability & Working-Age & Medicaid Insurance Population in the Northeast*
gen NEdisability_all = (NEdisability_working==1 & mcdev12==1)
tab NEdisability_all

```

```

/* Creating variables for regional service utilization within the Northeast in 2012. Replacing
missing variables and excluding any missing variables from counts*/

```

```

*Dental Check-Ups*
tab dentck53 if (NEdisability_all==1)
generate NEdental_checkup = dentck53
    replace NEdental_checkup = . if dentck53<1
tab NEdental_checkup if (NEdisability_all==1)

```

```

*Routine Check-Ups Assessing Overall Health*
tab check53 if (NEdisability_all==1)
generate NEdr_checkup = check53
    replace NEdr_checkup = . if check53<1
tab NEdr_check if NEdisability_all==1

```

```

*Flu Vaccinations*
tab flusht53 if (NEdisability_all==1)
generate NEflu_shot = flusht53
    replace NEflu_shot = . if flusht53<1
tab NEflu_shot if NEdisability_all==1

```

```

*Blood Pressure Screenings*
tab bpchek53 if (NEdisability_all==1)
generate NEbp = bpchek53
    replace NEbp = . if bpchek53<1
tab NEbp if (NEdisability_all==1)

```

```

*Cholesterol Screenings*
tab cholck53 if (NEdisability_all==1)
generate NEcholesterol = cholck53
    replace NEcholesterol = . if cholck53<1
tab NEcholesterol if (NEdisability_all==1)

```

```

/* Generating variables for sub-populations among the Midwest Region in 2012 */

```

```

*Disability & Working-Age in the Midwest*
gen MWdisability_working = (anylim12==1 & age12x>=25 & age12x<=64 &
region12==2)
tab MWdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the Midwest*
gen MWdisability_all = (MWdisability_working==1 & mcdev12==1)

```



```
tab MWdisability_all
```

```
/* Creating variables for regional service utilization within the Midwest in 2012. Replacing
missing variables and excluding any missing variables from counts*/
```

```
*Dental Check-Ups*
```

```
tab dentck53 if (MWdisability_all==1)
generate MWdental_checkup = dentck53
    replace MWdental_checkup = . if dentck53<1
tab MWdental_checkup if (MWdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health*
```

```
tab check53 if (MWdisability_all==1)
generate MWdr_checkup = check53
    replace MWdr_checkup = . if check53<1
tab MWdr_check if MWdisability_all==1
```

```
*Flu Vaccinations*
```

```
tab flusht53 if (MWdisability_all==1)
generate MWflu_shot = flusht53
    replace MWflu_shot = . if flusht53<1
tab MWflu_shot if MWdisability_all==1
```

```
*Blood Pressure Screenings*
```

```
tab bpchek53 if (MWdisability_all==1)
generate MWbp = bpchek53
    replace MWbp = . if bpchek53<1
tab MWbp if (MWdisability_all==1)
```

```
*Cholesterol Screenings*
```

```
tab cholck53 if (MWdisability_all==1)
generate MWcholesterol = cholck53
    replace MWcholesterol = . if cholck53<1
tab MWcholesterol if (MWdisability_all==1)
```

```
/* Generating variables for sub-populations among the South Region in 2012 */
```

```
*Disability & Working-Age Population in the South*
```

```
gen Sdisability_working = (anylim12==1 & age12x>=25 & age12x<=64 & region12==3)
tab Sdisability_working
```

```
*Disability & Working-Age & Medicaid Insurance Population in the South*
```

```
gen Sdisability_all = (Sdisability_working==1 & mcdev12==1)
tab Sdisability_all
```

/* Creating variables for regional service utilization within the South in 2012. Replacing missing variables and excluding any missing variables from counts*/

Dental Check-Ups

```
tab dentck53 if (Sdisability_all==1)
generate Sdental_checkup = dentck53
    replace Sdental_checkup = . if dentck53<1
tab Sdental_checkup if (Sdisability_all==1)
```

Routine Check-Ups Assessing Overall Health

```
tab check53 if (Sdisability_all==1)
generate Sdr_checkup = check53
    replace Sdr_checkup = . if check53<1
tab Sdr_check if Sdisability_all==1
```

Flu Vaccinations

```
tab flusht53 if (Sdisability_all==1)
generate Sflu_shot = flusht53
    replace Sflu_shot = . if flusht53<1
tab Sflu_shot if Sdisability_all==1
```

Blood Pressure Screenings

```
tab bpchek53 if (Sdisability_all==1)
generate Sbp = bpchek53
    replace Sbp = . if bpchek53<1
tab Sbp if (Sdisability_all==1)
```

Cholesterol Screenings

```
tab cholck53 if (Sdisability_all==1)
generate Scholesterol = cholck53
    replace Scholesterol = . if cholck53<1
tab Scholesterol if (Sdisability_all==1)
```

/* Generating variables for sub-populations among the West Region in 2012 */

Disability & Working-Age in the West

```
gen Wdisability_working = (anylim12==1 & age12x>=25 & age12x<=64 &
region12==4)
tab Wdisability_working
```

Disability & Working-Age & Medicaid Insurance Population in the West

```
gen Wdisability_all = (Wdisability_working==1 & mcdev12==1)
tab Wdisability_all
```

```
/* Creating variables for regional service utilization within the West in 2012. Replacing missing
variables and excluding any missing variables from counts*/
```

```
*Dental Check-Ups*
```

```
tab dentck53 if (Wdisability_all==1)
generate Wdental_checkup = dentck53
    replace Wdental_checkup = . if dentck53<1
tab Wdental_checkup if (Wdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health
```

```
tab check53 if (Wdisability_all==1)
generate Wdr_checkup = check53
    replace Wdr_checkup = . if check53<1
tab Wdr_check if Wdisability_all==1
```

```
*Flu Vaccinations*
```

```
tab flusht53 if (Wdisability_all==1)
generate Wflu_shot = flusht53
    replace Wflu_shot = . if flusht53<1
tab Wflu_shot if Wdisability_all==1
```

```
*Blood Pressure Screenings*
```

```
tab bpchek53 if (Wdisability_all==1)
generate Wbp = bpchek53
    replace Wbp = . if bpchek53<1
tab Wbp if (Wdisability_all==1)
```

```
*Cholesterol Screenings*
```

```
tab cholck53 if (Wdisability_all==1)
generate Wcholesterol = cholck53
    replace Wcholesterol = . if cholck53<1
tab Wcholesterol if (Wdisability_all==1)
```

```
clear
set more off
capture log cl
```

```
/* Downloading 2013 MEPS Survey Data */
```

```
copy "https://meps.ahrq.gov/mepsweb/data_files/pufs/h163ssp.zip" "h163ssp.zip"
unzipfile "h163ssp.zip"
import sasxport5 "h163.ssp", clear
```

```
/* Examining 2013 MEPS Survey Data. Running tabulations for insurance, disability, and
regional variables. */
```

```

browse
count
tab mcdev13
tab anylmt13
tab region13

/* Generating variables for sub-populations among the United States */

*Disability & Working-Age*
gen USAdisability_working = (anylmt13==1 & age13x>=25 & age13x<=64)
tab USAdisability_working

*Disability & Working-Age & Medicaid Coverage*
gen USAdisability_all = (USAdisability_working==1 & mcdev13==1)
tab USAdisability_all

/* Running tabulations for demographic characteristics among the Disability & Working-Age
population and Disability & Working-Age & Medicaid Coverage population */

*Disability & Working-Age Population*
tab racev1x if USAdisability_working==1
tab sex if USAdisability_working==1
tab povcat13 if USAdisability_working==1

*Disability & Working-Age & Medicaid Coverage Population*
tab racev1x if USAdisability_all==1
tab sex if USAdisability_all==1
tab povcat13 if USAdisability_all==1

/* Creating a variable for USA Dental Check-Ups in 2012. Replacing missing variables and
excluding any missing variables from counts*/

tab dentck53 if (USAdisability_all==1)
generate USAdental_checkup = dentck53
    replace USAdental_checkup = . if dentck53<1
tab USAdental_checkup if (USAdisability_all==1)

/* Creating a variable for USA Routine Check-Ups Assessing Overall Health in 2012. Replacing
missing variables and excluding any missing variables from counts*/

tab check53 if (USAdisability_all==1)
generate USAdr_checkup = check53
    replace USAdr_checkup = . if check53<1
tab USAdr_check if USAdisability_all==1

```

/* Creating a variable for USA Flu Vaccinations in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab flusht53 if (USAdisability_all==1)
generate USAflu_shot = flusht53
    replace USAflu_shot = . if flusht53<1
tab USAflu_shot if USAdisability_all==1
```

/* Creating a variable for USA Blood Pressure Screening in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab bpchek53 if (USAdisability_all==1)
generate USAbp = bpchek53
    replace USAbp = . if bpchek53<1
tab USAbp if (USAdisability_all==1)
```

/* Creating a variable for USA Cholesterol Screening in 2012. Replacing missing variables and excluding any missing variables from counts*/

```
tab cholck53 if (USAdisability_all==1)
generate USAcholesterol = cholck53
    replace USAcholesterol = . if cholck53<1
tab USAcholesterol if (USAdisability_all==1)
```

/* Generating variables for sub-populations among the Northeast Region in 2013 */

```
*Disability & Working-Age Population in the Northeast*
gen NEdisability_working = (anylmt13==1 & age13x>=25 & age13x<=64 &
region13==1)
tab NEdisability_working
```

```
*Disability & Working-Age & Medicaid Insurance Population in the Northeast*
gen NEdisability_all = (NEdisability_working==1 & mcdev13==1)
tab NEdisability_all
```

/* Creating variables for regional service utilization within the Northeast in 2013. Replacing missing variables and excluding any missing variables from counts*/

```
*Dental Check-Ups*
tab dentck53 if (NEdisability_all==1)
generate NEdental_checkup = dentck53
    replace NEdental_checkup = . if dentck53<1
tab NEdental_checkup if (NEdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health*
tab check53 if (NEdisability_all==1)
generate NEdr_checkup = check53
```

```

    replace NEdr_checkup = . if check53<1
  tab NEdr_check if NEdisability_all==1

```

Flu Vaccinations

```

  tab flusht53 if (NEdisability_all==1)
  generate NEflu_shot = flusht53
    replace NEflu_shot = . if flusht53<1
  tab NEflu_shot if NEdisability_all==1

```

Blood Pressure Screenings

```

  tab bpchek53 if (NEdisability_all==1)
  generate NEbp = bpchek53
    replace NEbp = . if bpchek53<1
  tab NEbp if (NEdisability_all==1)

```

Cholesterol Screenings

```

  tab cholck53 if (NEdisability_all==1)
  generate NEcholesterol = cholck53
    replace NEcholesterol = . if cholck53<1
  tab NEcholesterol if (NEdisability_all==1)

```

/ Generating variables for sub-populations among the Midwest Region in 2013 */*

Disability & Working-Age in the Midwest

```

  gen MWdisability_working = (anymt13==1 & age13x>=25 & age13x<=64 &
  region13==2)
  tab MWdisability_working

```

Disability & Working-Age & Medicaid Insurance Population in the Midwest

```

  gen MWdisability_all = (MWdisability_working==1 & mcdev13==1)
  tab MWdisability_all

```

/ Creating variables for regional service utilization within the Midwest in 2013. Replacing missing variables and excluding any missing variables from counts*/*

Dental Check-Ups

```

  tab dentck53 if (MWdisability_all==1)
  generate MWdental_checkup = dentck53
    replace MWdental_checkup = . if dentck53<1
  tab MWdental_checkup if (MWdisability_all==1)

```

Routine Check-Ups Assessing Overall Health

```

  tab check53 if (MWdisability_all==1)
  generate MWdr_checkup = check53
    replace MWdr_checkup = . if check53<1
  tab MWdr_check if MWdisability_all==1

```

```

*Flu Vaccinations*
tab flusht53 if (MWdisability_all==1)
generate MWflu_shot = flusht53
    replace MWflu_shot = . if flusht53<1
tab MWflu_shot if MWdisability_all==1

```

```

*Blood Pressure Screenings*
tab bpchek53 if (MWdisability_all==1)
generate MWbp = bpchek53
    replace MWbp = . if bpchek53<1
tab MWbp if (MWdisability_all==1)

```

```

*Cholesterol Screenings*
tab cholck53 if (MWdisability_all==1)
generate MWcholesterol = cholck53
    replace MWcholesterol = . if cholck53<1
tab MWcholesterol if (MWdisability_all==1)

```

/* Generating variables for sub-populations among the South Region in 2013 */

```

*Disability & Working-Age Population in the South*
gen Sdisability_working = (anylmt13==1 & age13x>=25 & age13x<=64 & region13==3)
tab Sdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the South*
gen Sdisability_all = (Sdisability_working==1 & mcdev13==1)
tab Sdisability_all

```

/* Creating variables for regional service utilization within the South in 2013. Replacing missing variables and excluding any missing variables from counts*/

```

*Dental Check-Ups*
tab dentck53 if (Sdisability_all==1)
generate Sdental_checkup = dentck53
    replace Sdental_checkup = . if dentck53<1
tab Sdental_checkup if (Sdisability_all==1)

```

```

*Routine Check-Ups Assessing Overall Health*
tab check53 if (Sdisability_all==1)
generate Sdr_checkup = check53
    replace Sdr_checkup = . if check53<1
tab Sdr_check if Sdisability_all==1

```

```

*Flu Vaccinations*
tab flusht53 if (Sdisability_all==1)

```

```

generate Sflu_shot = flusht53
      replace Sflu_shot = . if flusht53<1
tab Sflu_shot if Sdisability_all==1

```

```

*Blood Pressure Screenings*
tab bpchek53 if (Sdisability_all==1)
generate Sbp = bpchek53
      replace Sbp = . if bpchek53<1
tab Sbp if (Sdisability_all==1)

```

```

*Cholesterol Screenings*
tab cholck53 if (Sdisability_all==1)
generate Scholesterol = cholck53
      replace Scholesterol = . if cholck53<1
tab Scholesterol if (Sdisability_all==1)

```

/* Generating variables for sub-populations among the West Region in 2013 */

```

*Disability & Working-Age in the West*
gen Wdisability_working = (anymt13==1 & age13x>=25 & age13x<=64 &
region13==4)
tab Wdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the West*
gen Wdisability_all = (Wdisability_working==1 & mcdev13==1)
tab Wdisability_all

```

/* Creating variables for regional service utilization within the West in 2012. Replacing missing variables and excluding any missing variables from counts*/

```

*Dental Check-Ups*
tab dentck53 if (Wdisability_all==1)
generate Wdental_checkup = dentck53
      replace Wdental_checkup = . if dentck53<1
tab Wdental_checkup if (Wdisability_all==1)

```

```

*Routine Check-Ups Assessing Overall Health
tab check53 if (Wdisability_all==1)
generate Wdr_checkup = check53
      replace Wdr_checkup = . if check53<1
tab Wdr_check if Wdisability_all==1

```

```

*Flu Vaccinations*
tab flusht53 if (Wdisability_all==1)
generate Wflu_shot = flusht53
      replace Wflu_shot = . if flusht53<1

```



```

tab Wflu_shot if Wdisability_all==1

*Blood Pressure Screenings*
tab bpck53 if (Wdisability_all==1)
generate Wbp = bpck53
    replace Wbp = . if bpck53<1
tab Wbp if (Wdisability_all==1)

*Cholesterol Screenings*
tab cholck53 if (Wdisability_all==1)
generate Wcholesterol = cholck53
    replace Wcholesterol = . if cholck53<1
tab Wcholesterol if (Wdisability_all==1)

clear
set more off
capture log cl

/* Downloading 2014 MEPS Survey Data */

copy "https://meps.ahrq.gov/mepsweb/data_files/pufs/h171ssp.zip" "h171ssp.zip"
unzipfile "h171ssp.zip"
import sasxport5 "h171.ssp", clear

/* Examining 2014 MEPS Survey Data. Running tabulations for insurance, disability, and
regional variables. */

    browse
    count
    tab mcdev14
    tab anylmt14
    tab region14

/* Generating variables for sub-populations among the United States */

*Disability & Working-Age*
gen USAdisability_working = (anylmt14==1 & age14x>=25 & age14x<=64)
tab USAdisability_working

*Disability & Working-Age & Medicaid Coverage*
gen USAdisability_all = (USAdisability_working==1 & mcdev14==1)
tab USAdisability_all

/* Running tabulations for demographic characteristics among the Disability & Working-Age
population and Disability & Working-Age & Medicaid Coverage population */

```

```

tab racev1x if USAdisability_working==1
tab sex if USAdisability_working==1
tab povcat14 if USAdisability_working==1

```

```

tab racev1x if USAdisability_all==1
tab sex if USAdisability_all==1
tab povcat14 if USAdisability_all==1

```

/* Creating a variable for USA Dental Check-Ups in 2014. Replacing missing variables and excluding any missing variables from counts*/

```

tab dentck53 if (USAdisability_all==1)
generate USAdental_checkup = dentck53
    replace USAdental_checkup = . if dentck53<1
tab USAdental_checkup if (USAdisability_all==1)

```

/* Creating a variable for USA Routine Check-Ups Assessing Overall Health in 2014. Replacing missing variables and excluding any missing variables from counts*/

```

tab check53 if (USAdisability_all==1)
generate USAdr_checkup = check53
    replace USAdr_checkup = . if check53<1
tab USAdr_check if USAdisability_all==1

```

/* Creating a variable for USA Flu Vaccinations in 2014. Replacing missing variables and excluding any missing variables from counts*/

```

tab flusht53 if (USAdisability_all==1)
generate USAflu_shot = flusht53
    replace USAflu_shot = . if flusht53<1
tab USAflu_shot if USAdisability_all==1

```

/* Creating a variable for USA Blood Pressure Screening in 2014. Replacing missing variables and excluding any missing variables from counts*/

```

tab bpchek53 if (USAdisability_all==1)
generate USAbp = bpchek53
    replace USAbp = . if bpchek53<1
tab USAbp if (USAdisability_all==1)

```

/* Creating a variable for USA Cholesterol Screening in 2014. Replacing missing variables and excluding any missing variables from counts*/

```

tab cholck53 if (USAdisability_all==1)
generate USAcholesterol = cholck53
    replace USAcholesterol = . if cholck53<1

```

```
tab USAcholesterol if (USAdisability_all==1)
```

```
/* Generating variables for sub-populations among the Northeast Region in 2014 */
```

```
*Disability & Working-Age Population in the Northeast*
```

```
gen NEdisability_working = (anylmt14==1 & age14x>=25 & age14x<=64 &
region14==1)
```

```
tab NEdisability_working
```

```
*Disability & Working-Age & Medicaid Insurance Population in the Northeast*
```

```
gen NEdisability_all = (NEdisability_working==1 & mcdev14==1)
```

```
tab NEdisability_all
```

```
/* Creating variables for regional service utilization within the Northeast in 2014. Replacing
missing variables and excluding any missing variables from counts*/
```

```
*Dental Check-Ups*
```

```
tab dentck53 if (NEdisability_all==1)
```

```
generate NEdental_checkup = dentck53
```

```
replace NEdental_checkup = . if dentck53<1
```

```
tab NEdental_checkup if (NEdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health*
```

```
tab check53 if (NEdisability_all==1)
```

```
generate NEdr_checkup = check53
```

```
replace NEdr_checkup = . if check53<1
```

```
tab NEdr_check if NEdisability_all==1
```

```
*Flu Vaccinations*
```

```
tab flusht53 if (NEdisability_all==1)
```

```
generate NEflu_shot = flusht53
```

```
replace NEflu_shot = . if flusht53<1
```

```
tab NEflu_shot if NEdisability_all==1
```

```
*Blood Pressure Screenings*
```

```
tab bpchek53 if (NEdisability_all==1)
```

```
generate NEbp = bpchek53
```

```
replace NEbp = . if bpchek53<1
```

```
tab NEbp if (NEdisability_all==1)
```

```
*Cholesterol Screenings*
```

```
tab cholck53 if (NEdisability_all==1)
```

```
generate NEcholesterol = cholck53
```

```
replace NEcholesterol = . if cholck53<1
```

```
tab NEcholesterol if (NEdisability_all==1)
```

/* Generating variables for sub-populations among the Midwest Region in 2014 */

Disability & Working-Age in the Midwest

gen MWdisability_working = (anylmt14==1 & age14x>=25 & age14x<=64 & region14==2)

tab MWdisability_working

Disability & Working-Age & Medicaid Insurance Population in the Midwest

gen MWdisability_all = (MWdisability_working==1 & mcdev14==1)

tab MWdisability_all

/* Creating variables for regional service utilization within the Midwest in 2014. Replacing missing variables and excluding any missing variables from counts*/

Dental Check-Ups

tab dentck53 if (MWdisability_all==1)

generate MWdental_checkup = dentck53

replace MWdental_checkup = . if dentck53<1

tab MWdental_checkup if (MWdisability_all==1)

Routine Check-Ups Assessing Overall Health

tab check53 if (MWdisability_all==1)

generate MWdr_checkup = check53

replace MWdr_checkup = . if check53<1

tab MWdr_check if MWdisability_all==1

Flu Vaccinations

tab flusht53 if (MWdisability_all==1)

generate MWflu_shot = flusht53

replace MWflu_shot = . if flusht53<1

tab MWflu_shot if MWdisability_all==1

Blood Pressure Screenings

tab bpchek53 if (MWdisability_all==1)

generate MWbp = bpchek53

replace MWbp = . if bpchek53<1

tab MWbp if (MWdisability_all==1)

Cholesterol Screenings

tab cholck53 if (MWdisability_all==1)

generate MWcholesterol = cholck53

replace MWcholesterol = . if cholck53<1

tab MWcholesterol if (MWdisability_all==1)

/* Generating variables for sub-populations among the South Region in 2014 */

```

*Disability & Working-Age Population in the South*
gen Sdisability_working = (anylmt14==1 & age14x>=25 & age14x<=64 & region14==3)
tab Sdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the South*
gen Sdisability_all = (Sdisability_working==1 & mcdev14==1)
tab Sdisability_all

```

/* Creating variables for regional service utilization within the South in 2014. Replacing missing variables and excluding any missing variables from counts*/

```

*Dental Check-Ups*
tab dentck53 if (Sdisability_all==1)
generate Sdental_checkup = dentck53
    replace Sdental_checkup = . if dentck53<1
tab Sdental_checkup if (Sdisability_all==1)

```

```

*Routine Check-Ups Assessing Overall Health*
tab check53 if (Sdisability_all==1)
generate Sdr_checkup = check53
    replace Sdr_checkup = . if check53<1
tab Sdr_check if (Sdisability_all==1)

```

```

*Flu Vaccinations*
tab flusht53 if (Sdisability_all==1)
generate Sflu_shot = flusht53
    replace Sflu_shot = . if flusht53<1
tab Sflu_shot if (Sdisability_all==1)

```

```

*Blood Pressure Screenings*
tab bpchek53 if (Sdisability_all==1)
generate Sbp = bpchek53
    replace Sbp = . if bpchek53<1
tab Sbp if (Sdisability_all==1)

```

```

*Cholesterol Screenings*
tab cholck53 if (Sdisability_all==1)
generate Scholesterol = cholck53
    replace Scholesterol = . if cholck53<1
tab Scholesterol if (Sdisability_all==1)

```

/* Generating variables for sub-populations among the West Region in 2014 */

```

*Disability & Working-Age in the West*

```

```
gen Wdisability_working = (anymt14==1 & age14x>=25 & age14x<=64 &
region14==4)
tab Wdisability_working
```

```
*Disability & Working-Age & Medicaid Insurance Population in the West*
gen Wdisability_all = (Wdisability_working==1 & mcdev14==1)
tab Wdisability_all
```

/* Creating variables for regional service utilization within the West in 2014. Replacing missing variables and excluding any missing variables from counts*/

```
*Dental Check-Ups*
tab dentck53 if (Wdisability_all==1)
generate Wdental_checkup = dentck53
replace Wdental_checkup = . if dentck53<1
tab Wdental_checkup if (Wdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health
tab check53 if (Wdisability_all==1)
generate Wdr_checkup = check53
replace Wdr_checkup = . if check53<1
tab Wdr_check if Wdisability_all==1
```

```
*Flu Vaccinations*
tab flusht53 if (Wdisability_all==1)
generate Wflu_shot = flusht53
replace Wflu_shot = . if flusht53<1
tab Wflu_shot if Wdisability_all==1
```

```
*Blood Pressure Screenings*
tab bpchek53 if (Wdisability_all==1)
generate Wbp = bpchek53
replace Wbp = . if bpchek53<1
tab Wbp if (Wdisability_all==1)
```

```
*Cholesterol Screenings*
tab cholck53 if (Wdisability_all==1)
generate Wcholesterol = cholck53
replace Wcholesterol = . if cholck53<1
tab Wcholesterol if (Wdisability_all==1)
```

```
clear
set more off
capture log cl
```

```
/* Downloading 2015 MEPS Survey Data */
```

```
copy "https://meps.ahrq.gov/mepsweb/data_files/pufs/h181ssp.zip" "h181ssp.zip"
unzipfile "h181ssp.zip"
import sasxport5 "h181.ssp", clear
```

```
/* Examining 2015 MEPS Survey Data. Running tabulations for insurance, disability, and regional variables. */
```

```
  browse
  count
  tab mcdev15
  tab anylmt15
  tab region15
```

```
/* Generating variables for sub-populations among the United States */
```

```
  *Disability & Working-Age*
```

```
  gen USAdisability_working = (anylmt15==1 & age15x>=25 & age15x<=64)
  tab USAdisability_working
```

```
  *Disability & Working-Age & Medicaid Coverage*
```

```
  gen USAdisability_all = (USAdisability_working==1 & mcdev15==1)
  tab USAdisability_all
```

```
/* Running tabulations for demographic characteristics among the Disability & Working-Age population and Disability & Working-Age & Medicaid Coverage population */
```

```
  tab racev1x if USAdisability_working==1
  tab sex if USAdisability_working==1
  tab povcat15 if USAdisability_working==1
```

```
  tab racev1x if USAdisability_all==1
  tab sex if USAdisability_all==1
  tab povcat15 if USAdisability_all==1
```

```
/* Creating a variable for USA Dental Check-Ups in 2015. Replacing missing variables and excluding any missing variables from counts*/
```

```
  tab dentck53 if (USAdisability_all==1)
  generate USAdental_checkup = dentck53
  replace USAdental_checkup = . if dentck53<1
  tab USAdental_checkup if (USAdisability_all==1)
```

```
/* Creating a variable for USA Routine Check-Ups Assessing Overall Health in 2015. Replacing missing variables and excluding any missing variables from counts*/
```

```

tab check53 if (USAdisability_all==1)
generate USAdr_checkup = check53
    replace USAdr_checkup = . if check53<1
tab USAdr_check if USAdisability_all==1

```

/* Creating a variable for USA Flu Vaccinations in 2015. Replacing missing variables and excluding any missing variables from counts*/

```

tab flusht53 if (USAdisability_all==1)
generate USAflu_shot = flusht53
    replace USAflu_shot = . if flusht53<1
tab USAflu_shot if USAdisability_all==1

```

/* Creating a variable for USA Blood Pressure Screening in 2015. Replacing missing variables and excluding any missing variables from counts*/

```

tab bpchek53 if (USAdisability_all==1)
generate USAbp = bpchek53
    replace USAbp = . if bpchek53<1
tab USAbp if (USAdisability_all==1)

```

/* Creating a variable for USA Cholesterol Screening in 2015. Replacing missing variables and excluding any missing variables from counts*/

```

tab cholck53 if (USAdisability_all==1)
generate USAcholesterol = cholck53
    replace USAcholesterol = . if cholck53<1
tab USAcholesterol if (USAdisability_all==1)

```

/* Generating variables for sub-populations among the Northeast Region in 2015 */

```

*Disability & Working-Age Population in the Northeast*
gen NEdisability_working = (anylmt15==1 & age15x>=25 & age15x<=64 &
region15==1)
tab NEdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the Northeast*
gen NEdisability_all = (NEdisability_working==1 & mcdev15==1)
tab NEdisability_all

```

/* Creating variables for regional service utilization within the Northeast in 2012. Replacing missing variables and excluding any missing variables from counts*/

```

*Dental Check-Ups*
tab dentck53 if (NEdisability_all==1)

```



```

generate NEdental_checkup = dentck53
    replace NEdental_checkup = . if dentck53<1
tab NEdental_checkup if (NEdisability_all==1)

```

```

*Routine Check-Ups Assessing Overall Health*
tab check53 if (NEdisability_all==1)
generate NEdr_checkup = check53
    replace NEdr_checkup = . if check53<1
tab NEdr_check if NEdisability_all==1

```

```

*Flu Vaccinations*
tab flusht53 if (NEdisability_all==1)
generate NEflu_shot = flusht53
    replace NEflu_shot = . if flusht53<1
tab NEflu_shot if NEdisability_all==1

```

```

*Blood Pressure Screenings*
tab bpchek53 if (NEdisability_all==1)
generate NEbp = bpchek53
    replace NEbp = . if bpchek53<1
tab NEbp if (NEdisability_all==1)

```

```

*Cholesterol Screenings*
tab cholck53 if (NEdisability_all==1)
generate NEcholesterol = cholck53
    replace NEcholesterol = . if cholck53<1
tab NEcholesterol if (NEdisability_all==1)

```

/* Generating variables for sub-populations among the Midwest Region in 2015 */

```

*Disability & Working-Age in the Midwest*
gen MWdisability_working = (anylmt15==1 & age15x>=25 & age15x<=64 &
region15==2)
tab MWdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the Midwest*
gen MWdisability_all = (MWdisability_working==1 & mcdev15==1)
tab MWdisability_all

```

/* Creating variables for regional service utilization within the Midwest in 2015. Replacing missing variables and excluding any missing variables from counts*/

```

*Dental Check-Ups*
tab dentck53 if (MWdisability_all==1)
generate MWdental_checkup = dentck53
    replace MWdental_checkup = . if dentck53<1

```

```
tab MWdental_checkup if (MWdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health*
```

```
tab check53 if (MWdisability_all==1)
```

```
generate MWdr_checkup = check53
```

```
replace MWdr_checkup = . if check53<1
```

```
tab MWdr_check if MWdisability_all==1
```

```
*Flu Vaccinations*
```

```
tab flusht53 if (MWdisability_all==1)
```

```
generate MWflu_shot = flusht53
```

```
replace MWflu_shot = . if flusht53<1
```

```
tab MWflu_shot if MWdisability_all==1
```

```
*Blood Pressure Screenings*
```

```
tab bpck53 if (MWdisability_all==1)
```

```
generate MWbp = bpck53
```

```
replace MWbp = . if bpck53<1
```

```
tab MWbp if (MWdisability_all==1)
```

```
*Cholesterol Screenings*
```

```
tab cholck53 if (MWdisability_all==1)
```

```
generate MWcholesterol = cholck53
```

```
replace MWcholesterol = . if cholck53<1
```

```
tab MWcholesterol if (MWdisability_all==1)
```

```
/* Generating variables for sub-populations among the South Region in 2015 */
```

```
*Disability & Working-Age Population in the South*
```

```
gen Sdisability_working = (anymt15==1 & age15x>=25 & age15x<=64 & region15==3)
```

```
tab Sdisability_working
```

```
*Disability & Working-Age & Medicaid Insurance Population in the South*
```

```
gen Sdisability_all = (Sdisability_working==1 & mcdev15==1)
```

```
tab Sdisability_all
```

```
/* Creating variables for regional service utilization within the South in 2015. Replacing missing variables and excluding any missing variables from counts*/
```

```
*Dental Check-Ups*
```

```
tab dentck53 if (Sdisability_all==1)
```

```
generate Sdental_checkup = dentck53
```

```
replace Sdental_checkup = . if dentck53<1
```

```
tab Sdental_checkup if (Sdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health*
```

```

tab check53 if (Sdisability_all==1)
generate Sdr_checkup = check53
    replace Sdr_checkup = . if check53<1
tab Sdr_check if Sdisability_all==1

```

Flu Vaccinations

```

tab flusht53 if (Sdisability_all==1)
generate Sflu_shot = flusht53
    replace Sflu_shot = . if flusht53<1
tab Sflu_shot if Sdisability_all==1

```

Blood Pressure Screenings

```

tab bpchek53 if (Sdisability_all==1)
generate Sbp = bpchek53
    replace Sbp = . if bpchek53<1
tab Sbp if (Sdisability_all==1)

```

Cholesterol Screenings

```

tab cholck53 if (Sdisability_all==1)
generate Scholesterol = cholck53
    replace Scholesterol = . if cholck53<1
tab Scholesterol if (Sdisability_all==1)

```

/ Generating variables for sub-populations among the West Region in 2015 */*

Disability & Working-Age in the West

```

gen Wdisability_working = (anylmt15==1 & age15x>=25 & age15x<=64 &
region15==4)
tab Wdisability_working

```

Disability & Working-Age & Medicaid Insurance Population in the West

```

gen Wdisability_all = (Wdisability_working==1 & mcdev15==1)
tab Wdisability_all

```

/ Creating variables for regional service utilization within the West in 2015. Replacing missing variables and excluding any missing variables from counts*/*

Dental Check-Ups

```

tab dentck53 if (Wdisability_all==1)
generate Wdental_checkup = dentck53
    replace Wdental_checkup = . if dentck53<1
tab Wdental_checkup if (Wdisability_all==1)

```

**Routine Check-Ups Assessing Overall Health*

```

tab check53 if (Wdisability_all==1)
generate Wdr_checkup = check53

```

```

        replace Wdr_checkup = . if check53<1
tab Wdr_check if Wdisability_all==1

*Flu Vaccinations*
tab flusht53 if (Wdisability_all==1)
generate Wflu_shot = flusht53
        replace Wflu_shot = . if flusht53<1
tab Wflu_shot if Wdisability_all==1

*Blood Pressure Screenings*
tab bpchek53 if (Wdisability_all==1)
generate Wbp = bpchek53
        replace Wbp = . if bpchek53<1
tab Wbp if (Wdisability_all==1)

*Cholesterol Screenings*
tab cholck53 if (Wdisability_all==1)
generate Wcholesterol = cholck53
        replace Wcholesterol = . if cholck53<1
tab Wcholesterol if (Wdisability_all==1)

clear
set more off
capture log cl

/* Downloading 2016 MEPS Survey Data */

copy "https://meps.ahrq.gov/mepsweb/data_files/pufs/h192ssp.zip" "h192ssp.zip"
unzipfile "h192ssp.zip"
import sasxport5 "h192.ssp", clear

/* Examining 2016 MEPS Survey Data. Running tabulations for insurance, disability, and
regional variables. */

        browse
        count
        tab mcdev16
        tab anylmt16
        tab region16

/* Generating variables for sub-populations among the United States */

*Disability & Working-Age*
gen USAdisability_working = (anylmt16==1 & age16x>=25 & age16x<=64)
tab USAdisability_working

```

```

*Disability & Working-Age & Medicaid Coverage*
gen USAdisability_all = (USAdisability_working==1 & mcdev16==1)
tab USAdisability_all

```

```

/* Running tabulations for demographic characteristics among the Disability & Working-Age
population and Disability & Working-Age & Medicaid Coverage population */

```

```

tab racev1x if USAdisability_working==1
tab sex if USAdisability_working==1
tab povcat16 if USAdisability_working==1

```

```

tab racev1x if USAdisability_all==1
tab sex if USAdisability_all==1
tab povcat16 if USAdisability_all==1

```

```

/* Creating a variable for USA Dental Check-Ups in 2016. Replacing missing variables and
excluding any missing variables from counts*/

```

```

tab dentck53 if (USAdisability_all==1)
generate USAdental_checkup = dentck53
    replace USAdental_checkup = . if dentck53<1
tab USAdental_checkup if (USAdisability_all==1)

```

```

/* Creating a variable for USA Routine Check-Ups Assessing Overall Health in 2016. Replacing
missing variables and excluding any missing variables from counts*/

```

```

tab check53 if (USAdisability_all==1)
generate USAdr_checkup = check53
    replace USAdr_checkup = . if check53<1
tab USAdr_checkup if USAdisability_all==1

```

```

/* Creating a variable for USA Flu Vaccinations in 2016. Replacing missing variables and
excluding any missing variables from counts*/

```

```

tab flusht53 if (USAdisability_all==1)
generate USAflu_shot = flusht53
    replace USAflu_shot = . if flusht53<1
tab USAflu_shot if USAdisability_all==1

```

```

/* Creating a variable for USA Blood Pressure Screening in 2016. Replacing missing variables
and excluding any missing variables from counts*/

```

```

tab bpchek53 if (USAdisability_all==1)
generate USAbp = bpchek53
    replace USAbp = . if bpchek53<1
tab USAbp if (USAdisability_all==1)

```

/* Creating a variable for USA Cholesterol Screening in 2016. Replacing missing variables and excluding any missing variables from counts*/

```
tab cholck53 if (USAdisability_all==1)
generate USAcholesterol = cholck53
    replace USAcholesterol = . if cholck53<1
tab USAcholesterol if (USAdisability_all==1)
```

/* Generating variables for sub-populations among the Northeast Region in 2016 */

```
*Disability & Working-Age Population in the Northeast*
gen NEdisability_working = (anylmt16==1 & age16x>=25 & age16x<=64 & region1
6==1)
tab NEdisability_working
```

```
*Disability & Working-Age & Medicaid Insurance Population in the Northeast*
gen NEdisability_all = (NEdisability_working==1 & mcdev16==1)
tab NEdisability_all
```

/* Creating variables for regional service utilization within the Northeast in 2016. Replacing missing variables and excluding any missing variables from counts*/

```
*Dental Check-Ups*
tab dentck53 if (NEdisability_all==1)
generate NEdental_checkup = dentck53
    replace NEdental_checkup = . if dentck53<1
tab NEdental_checkup if (NEdisability_all==1)
```

```
*Routine Check-Ups Assessing Overall Health*
tab check53 if (NEdisability_all==1)
generate NEdr_checkup = check53
    replace NEdr_checkup = . if check53<1
tab NEdr_check if NEdisability_all==1
```

```
*Flu Vaccinations*
tab flusht53 if (NEdisability_all==1)
generate NEflu_shot = flusht53
    replace NEflu_shot = . if flusht53<1
tab NEflu_shot if NEdisability_all==1
```

```
*Blood Pressure Screenings*
tab bpchek53 if (NEdisability_all==1)
generate NEbp = bpchek53
    replace NEbp = . if bpchek53<1
tab NEbp if (NEdisability_all==1)
```

```

*Cholesterol Screenings*
tab cholck53 if (NEdisability_all==1)
generate NEcholesterol = cholck53
    replace NEcholesterol = . if cholck53<1
tab NEcholesterol if (NEdisability_all==1)

```

/* Generating variables for sub-populations among the Midwest Region in 2016 */

```

*Disability & Working-Age in the Midwest*
gen MWdisability_working = (anylmt16==1 & age16x>=25 & age16x<=64 &
region16==2)
tab MWdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the Midwest*
gen MWdisability_all = (MWdisability_working==1 & mcdev16==1)
tab MWdisability_all

```

/* Creating variables for regional service utilization within the Midwest in 2016. Replacing missing variables and excluding any missing variables from counts*/

```

*Dental Check-Ups*
tab dentck53 if (MWdisability_all==1)
generate MWdental_checkup = dentck53
    replace MWdental_checkup = . if dentck53<1
tab MWdental_checkup if (MWdisability_all==1)

```

```

*Routine Check-Ups Assessing Overall Health*
tab check53 if (MWdisability_all==1)
generate MWdr_checkup = check53
    replace MWdr_checkup = . if check53<1
tab MWdr_check if MWdisability_all==1

```

```

*Flu Vaccinations*
tab flusht53 if (MWdisability_all==1)
generate MWflu_shot = flusht53
    replace MWflu_shot = . if flusht53<1
tab MWflu_shot if MWdisability_all==1

```

```

*Blood Pressure Screenings*
tab bpchek53 if (MWdisability_all==1)
generate MWbp = bpchek53
    replace MWbp = . if bpchek53<1
tab MWbp if (MWdisability_all==1)

```

```

*Cholesterol Screenings*
tab cholck53 if (MWdisability_all==1)

```

```

generate MWcholesterol = cholck53
      replace MWcholesterol = . if cholck53<1
tab MWcholesterol if (MWdisability_all==1)

```

/* Generating variables for sub-populations among the South Region in 2016 */

```

*Disability & Working-Age Population in the South*
gen Sdisability_working = (anylmt16==1 & age16x>=25 & age16x<=64 & region16==3)
tab Sdisability_working

```

```

*Disability & Working-Age & Medicaid Insurance Population in the South*
gen Sdisability_all = (Sdisability_working==1 & mcdev16==1)
tab Sdisability_all

```

/* Creating variables for regional service utilization within the South in 2016. Replacing missing variables and excluding any missing variables from counts*/

```

*Dental Check-Ups*
tab dentck53 if (Sdisability_all==1)
generate Sdental_checkup = dentck53
      replace Sdental_checkup = . if dentck53<1
tab Sdental_checkup if (Sdisability_all==1)

```

```

*Routine Check-Ups Assessing Overall Health*
tab check53 if (Sdisability_all==1)
generate Sdr_checkup = check53
      replace Sdr_checkup = . if check53<1
tab Sdr_check if Sdisability_all==1

```

```

*Flu Vaccinations*
tab flusht53 if (Sdisability_all==1)
generate Sflu_shot = flusht53
      replace Sflu_shot = . if flusht53<1
tab Sflu_shot if Sdisability_all==1

```

```

*Blood Pressure Screenings*
tab bpchek53 if (Sdisability_all==1)
generate Sbp = bpchek53
      replace Sbp = . if bpchek53<1
tab Sbp if (Sdisability_all==1)

```

```

*Cholesterol Screenings*
tab cholck53 if (Sdisability_all==1)
generate Scholesterol = cholck53
      replace Scholesterol = . if cholck53<1
tab Scholesterol if (Sdisability_all==1)

```


/* Generating variables for sub-populations among the West Region in 2016 */

Disability & Working-Age in the West

gen Wdisability_working = (anylmt16==1 & age16x>=25 & age16x<=64 &
region16==4)

tab Wdisability_working

Disability & Working-Age & Medicaid Insurance Population in the West

gen Wdisability_all = (Wdisability_working==1 & mcdev16==1)

tab Wdisability_all

/* Creating variables for regional service utilization within the West in 2016. Replacing missing variables and excluding any missing variables from counts*/

Dental Check-Ups

tab dentck53 if (Wdisability_all==1)

generate Wdental_checkup = dentck53

replace Wdental_checkup = . if dentck53<1

tab Wdental_checkup if (Wdisability_all==1)

*Routine Check-Ups Assessing Overall Health

tab check53 if (Wdisability_all==1)

generate Wdr_checkup = check53

replace Wdr_checkup = . if check53<1

tab Wdr_check if Wdisability_all==1

Flu Vaccinations

tab flusht53 if (Wdisability_all==1)

generate Wflu_shot = flusht53

replace Wflu_shot = . if flusht53<1

tab Wflu_shot if Wdisability_all==1

Blood Pressure Screenings

tab bpchek53 if (Wdisability_all==1)

generate Wbp = bpchek53

replace Wbp = . if bpchek53<1

tab Wbp if (Wdisability_all==1)

Cholesterol Screenings

tab cholck53 if (Wdisability_all==1)

generate Wcholesterol = cholck53

replace Wcholesterol = . if cholck53<1

tab Wcholesterol if (Wdisability_all==1)

/*Tabulations and respective counts for service utilization rates for each service, each region, and each year were downloaded to Excel and reformatted. Data were reformatted, cleaned, and coded in preparation for running additional analyses. */

/*Data were redownloaded to Stata to run Mixed Effects Linear Regression Model */

clear

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log using "X:/Downloads/Thesis/Data_edited.xlsx", text replace

use "X:/Downloads/Thesis/Data_edited.xlsx", replace

/*Running Mixed Effects Linear Regression Model */

mixed UtilizationRate Region ib(first).ServiceType b(first).Region#b(first).ServiceType,
||Year

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ACADEMIC VITA

Katherine Lunney
klunney5059@gmail.com

Education

The Pennsylvania State University | Schreyer Honors College | College of Health and Human Development

Bachelor of Science in Health Policy and Administration
Minor in Rehabilitation and Human Services
Graduation: May 2020

Member, College of Health and Human Development Honor Society
Protégé, College of Health and Human Development Mentoring Program

Professional Experience

State College Area School District | State College, PA

Job Coach

January 2019 – May 2020

- Train, assist, and supervise young adults with diverse intellectual and developmental disabilities to successfully perform job responsibilities and develop strong employment skills
- Evaluate students' daily job and behavioral performance to report to the SCASD Transition Coordinator

NYU Langone Health System | New York, NY

Revenue Cycle Operations Intern

May 2019 – May August 2019

- Provided ongoing analysis of revenue and expenses for the department in preparation for the Fiscal Year 2020 Budget Proposal
- Prepared analyses of various payors and processes to improve current accounts receivable practices and ensure the timely collection of payments
- Researched, identified, and proposed best practices for employee engagement and presented proposal to senior leadership
- Managed fourteen projects efficiently and independently while building relationships with management and staff

Cantina Feliz | Fort Washington, PA

Hostess and Food Runner

March 2014 – January 2019

- Managed in-person and telephone guest inquiries, customer service requests and reservation bookings to ensure guest satisfaction
- Selected by management to develop, organize, and simplify food runner workflow
- Onboarded new employees on restaurant processes and policies during a three-shift training period

Stable Tables | Flourtown, PA

Administrative Assistant

May 2016 – August 2018

- Managed all social media accounts, including Facebook and Instagram, for the execution of marketing strategies and the development of the company's brand
- Managed company website and successfully spearheaded the first blog campaign to improve customer engagement and strengthen customer relationships
- Reviewed monthly banking statements to support and manage the finances of the business

Leadership Experience

Office of Health Promotion and Wellness | University Park, PA

HealthWorks Peer Educator and Team Leader

January 2018 – May 2020

- Selected to lead Stress team of twenty students in addition to updating program script and coordinating and presenting over thirty workshops a semester for 500+ students
- Facilitate informational and interactive workshops on various health topics, including Sleep and Nutrition
- Develop and implement health promotion initiatives targeting the elimination of health disparities among students including establishing minority health resources and mindfulness programs

LifeLink PSU | University Park, PA

Peer Mentor

August 2016 – May 2020

- Mentor young adults with diverse disabilities by assisting students with academic, enrichment, vocational, social, and independent living skills while accumulating over 300 volunteer hours
- Tailor instruction methods towards individual needs of ten students in order to maximize mentee engagement, academic achievement, and social development

Epsilon Sigma Alpha | University Park, PA

Vice President of Philanthropy

January 2018 – January 2019

- Planned, coordinated, and promoted 10 events which generated \$75,000+ for various organizations including St. Jude Children's Research Hospital, the Four Diamonds Foundation, and the State College Area Food Bank
- Created a tool to document and ensure chapter philanthropy requirements for over 150 members