

2023

CHRONIC ILLNESS AMONG PRIVATE AND PUBLIC HEALTH INSURANCE HOLDERS IN ADULTS OF POVERTY STATUS

Zoe Rina Cute
University of Rhode Island, zoec200@gmail.com

Follow this and additional works at: <https://digitalcommons.uri.edu/theses>

Recommended Citation

Cute, Zoe Rina, "CHRONIC ILLNESS AMONG PRIVATE AND PUBLIC HEALTH INSURANCE HOLDERS IN ADULTS OF POVERTY STATUS" (2023). *Open Access Master's Theses*. Paper 2384.
<https://digitalcommons.uri.edu/theses/2384>

This Thesis is brought to you for free and open access by DigitalCommons@URI. It has been accepted for inclusion in Open Access Master's Theses by an authorized administrator of DigitalCommons@URI. For more information, please contact digitalcommons-group@uri.edu.

CHRONIC ILLNESS AMONG PRIVATE AND PUBLIC HEALTH INSURANCE
HOLDERS IN ADULTS OF POVERTY STATUS

BY ZOE CUTE

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF MASTER OF SCIENCE
IN
HUMAN DEVELOPMENT AND FAMILY SCIENCE

UNIVERSITY OF RHODE ISLAND

2023

MASTER OF SCIENCE IN HUMAN DEVELOPMENT AND FAMILY SCIENCE

THESIS

OF

ZOE CUTE

APPROVED:

Thesis Committee:

Major Professor Sue K. Adams

Steven A. Cohen

Jing Jian Xiao

Brenton DeBoef

DEAN OF THE GRADUATE SCHOOL

UNIVERSITY OF RHODE ISLAND

2023

ABSTRACT

When discussing chronic illnesses, it is important to consider how factors such as socioeconomic status (SES) and health insurance impact the presence of chronic illness in the lives of adults. Most prior research on this topic addresses the association between health insurance type and an individual's access to healthcare services, but fails to directly address the association between health insurance type and chronic illness outcomes. Therefore, the purpose of the current study is to explore associations among poverty status, health insurance type, and chronic illness outcomes of adults in early midlife. An exploratory hypothesis was tested using a Mann-Whitney test and independent samples t-test, while the primary hypotheses were tested using chi-square tests of association and a logistic regression model. Results indicated that public health insurance and living in poverty were predictors of chronic illnesses in adults. Sex assigned at birth, education level, and race were also significant predictors of chronic illness outcomes. Specific findings regarding race indicated that Black individuals are 38% more likely to have chronic illnesses, American Indian individuals were 44% more likely to have chronic illnesses, and Other races were 50.1% less likely to have chronic illnesses. Implications include implementing a system that allows professionals to reflect on their personal biases and expand health insurance coverage to meet the needs of diverse population groups. Areas for future research include assessing the impact of poverty and health insurance on the quality of life for individuals with a chronic illness, conducting longitudinal studies on the impacts of childhood well-being on chronic illness outcomes later in life, and studying protective factors for the health of diverse population groups.

ACKNOWLEDGEMENTS

First and foremost, I would like to acknowledge my major professor Dr. Sue K. Adams for all of the time she has put in to support me and guide me ever since the early stages of the thesis process. This project would not be where it is without her extensive research experience and prior knowledge of this topic. I would also like to acknowledge my committee members Dr. Steven A. Cohen and Dr. Jing Jian Xiao for taking the time to provide meaningful feedback on this project through the lens of their professional backgrounds. Additionally, I want to recognize the important role Dr. Cohen played in deciding on the best methods to analyze and interpret the study's data. Lastly, I would like to thank all of the professors and faculty members I have worked alongside or taken a class with in the Department of Human Development and Family Science at the University of Rhode Island for providing me with the knowledge, skills, and confidence to be able to express my research interests through a thesis.

PREFACE

This thesis was prepared according to the University of Rhode Island Graduate School Manuscript Thesis Format. Upon submitting this thesis to the graduate school, the manuscript may be submitted for publication. However, this thesis will remain in the Manuscript Thesis Format unless it is going to be published in an academic journal that has different formatting guidelines.

TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGEMENTS.....	iii
PREFACE.....	iv
TABLE OF CONTENTS.....	v
LIST OF TABLES.....	vi
LIST OF FIGURES.....	vii
CHAPTER 1.....	1
Introduction 1	
CHAPTER 2.....	3
Review of Literature 3	
CHAPTER 3.....	14
Methodology 14	
CHAPTER 4.....	20
Findings 20	
CHAPTER 5.....	33
Conclusion 32	

LIST OF TABLES

Table 1. Descriptive Statistics of Demographic and Primary Study Variables.....	22
Table 2. Chronic Illness Multimorbidities.....	24
Table 3. Chronic Illness Counts.....	25
Table 4. Chi-Square Results Examining Associations Between Demographic and Primary Study Variables on Chronic Illness Multimorbidities	27
Table 5. Backward Elimination Logistic Regression Results Examining Effects of Independent Variables and Significant Demographic Variables on Chronic Illness Outcomes.....	31

LIST OF FIGURES

Figure 1. Error Bar Chart Distribution of Chronic Illness Multimorbidities Among Individuals of Poverty Status and Non-Poverty Status.....	29
--	----

CHAPTER 1

INTRODUCTION

The presence of chronic illness in the United States among adults is a widespread issue that goes far beyond an individual feeling physically sick. The Centers for Disease Control and Prevention (CDC) (2022) states that six in ten American adults live with one chronic illness, while four in ten American adults have two or more. Chronic illnesses are also the leading cause of death and disability, and they are the main factor driving the US' \$4.1 trillion dollars in health care costs each year (CDC, 2022). Adults experiencing chronic illness are at a higher risk of biological and physical challenges and are more likely to have difficulty achieving their desired goals due to social isolation, disabilities, persistent pain, anxiety, depression, and general psychological adversities (Maslow et al., 2011; Van Wilder et al., 2021).

In terms of why people develop chronic illnesses, it is important to keep in mind that these reasons are complex, but two that are worth noting are poverty status and healthcare utilization based on an individual's form of health insurance. For individuals in poverty, their health is put in jeopardy because they may not be able to afford basic necessities, and this may produce high stress levels (Cunningham, 2018). As a result, individuals in this population may resort to unhealthy coping behaviors such as smoking, drinking alcohol, or using other substances that put individuals at a high risk of developing a chronic illness (Cunningham 2018; U.S. Department of Health and Human Services [U.S. HHS], n.d.). Furthermore, an individual's type of health insurance has been a key indicator for healthcare utilization. Across multiple studies, individuals with

public health insurance such as Medicaid or Medicare experience frequent visits to the emergency room, receive less care from high-volume hospitals, have more hospital readmissions after already being treated for a condition, and have less access to outpatient care (Allen et al., 2021; Nabi et al., 2021; Renshaw et al., 2021).

Taking these matters associated with chronic illness, poverty status, and health insurance into account, the aim of the present study is to examine the impacts of health insurance type on chronic illness outcomes in adults of poverty status. Although much research on this topic has been conducted in pediatric and older adult populations, it does not account for the ways in which these complex issues apply to adults. There is also a gap in research regarding the differences in health insurance type across individuals living in poverty. Finally, most prior research addresses the association between health insurance type and an individual's access to healthcare services, but fails to directly address the association between health insurance type and chronic illness outcomes. Therefore, the purpose of the current study is to explore associations among poverty status, health insurance type and chronic illness outcomes among adults in early midlife. This study will examine if 1) adults living in poverty with public health insurance will have an increased likelihood of chronic illness, and 2) adults living in poverty with private health insurance will have a decreased likelihood of chronic illness. Furthermore, this study will aim to determine if there are differences in chronic illness multimorbidities based on an individual's poverty status.

CHAPTER 2

REVIEW OF THE LITERATURE

Chronic Illness

According to the CDC (2022), “chronic illness” refers to conditions that persist for at least one year and require consistent medical attention or constrains activities of daily living or both. Six in ten American adults live with one chronic illness, while four in ten American adults have two or more (CDC, 2022). Chronic illnesses also tend to progress slowly, and the presence of their symptoms usually fluctuate with flare-ups occurring from time to time (Ambrosio et al., 2015; Rhode Island Department of Health, 2023). Chronic illnesses are the leading cause of death and disability, and they are the main factor driving the United States’ \$4.1 trillion dollars in health care costs each year (CDC, 2022). There are a variety of illnesses that can be classified as chronic or long-term, but the CDC (2022) highlights heart disease and stroke, cancer, and diabetes as three categories of major chronic illnesses. These three illnesses are highlighted because heart disease, stroke, and cancer are in the top five leading causes of death in the U.S., and diabetes has one of the highest rates of morbidity in the U.S. affecting over 37 million people (CDC, 2021; CDC 2022).

When considering some of the most prominent factors influencing the development of chronic illnesses, it is vital to consider the influence of obesity. Healthy People 2030, an initiative managed by the U.S. HHS, identified one of their main objectives as reducing overweight and obesity by helping people eat nutritious foods and stay physically active. Statistics brought forth by this initiative state that about two in five

adults and one in five children and adolescents are obese, with many others overweight (U.S. HHS, n.d.). These statistics are important to keep in mind because overweight and obesity put individuals at a serious risk for health problems such as type II diabetes, heart disease, stroke, some types of cancer, high blood pressure, high cholesterol, and asthma. The initiative also mentions that there are certain racial and ethnic groups that are more likely to have obesity, which increases their risk of developing chronic illnesses. Children and adolescents who are obese are also more likely to be obese in adulthood. This is why the initiative wants to work towards preventing and reducing overweight and obesity in the early stages of life because this can prevent serious health problems arising in later life stages (U.S. HHS, n.d.).

Chronic health issues also put individuals at a higher risk of suffering from mental health challenges. For example, the National Institute of Mental Health (NIMH) (2021) mentions that one of the most common mental health challenges paired with a chronic illness is depression. Those who have a chronic illness and depression often experience symptoms of both conditions more severely and have increased difficulties adapting to life with their chronic illness. Despite healthcare costs being higher for individuals receiving treatment for both conditions, a collaborative care approach that focuses on physical and mental health improves an individual's overall health and helps them manage both conditions alongside each other (NIMH, 2021). Moreover, those who have a mental health disorder in addition to a chronic illness have significantly higher health care costs and utilization of services. Hospitalizations and emergency room visitations are also higher in individuals with a mental health disorder and a chronic illness compared to those with only a chronic illness (Sporinova et al., 2019).

From a research and applied standpoint, issues with measuring and defining chronic illness exist. Some studies have revealed that multimorbidity, a term frequently used to describe an individual who has more than one type of chronic or non-chronic illness, does not have a definition and method of measurement that is consistent across all sectors of professionals and researchers who use this term (Ho et al., 2021; Johnston et al., 2019). Prior to these previous two articles being written, Goodman and colleagues (2013) also recognized that there were issues with measuring chronic illness due to lack of consistency with definitions, diagnostic classification systems, data systems, and methods of data collection.

Socioeconomic Status and Healthcare Utilization

Chronic illness is often considered within the context of being a medical issue, yet it influences all aspects of an adult's life. Multiple studies reveal that those with a chronic illness have challenges associated with achieving their desired education level, career, or income (Maslow et al., 2011). Additionally, those who have a chronic illness are more prone to social isolation, disabilities, persistent pain, anxiety, depression, and general psychological adversities (Van Wilder et al., 2021). It is important to keep in mind that the reasons for chronic illness development are complex, but two worth noting are low socioeconomic status (SES) and healthcare utilization. Globally, individuals of low SES populations have higher rates of smoking and high blood pressure, which are two risk factors for developing a chronic illness. Also, these individuals may be more prone to chronic illness due to their community's economic development, social policies, and health policies that do not favor their ability to prevent and treat health issues (Di Cesare et al., 2013; Van Wilder et al., 2021). Concerning the topic of healthcare utilization, those

who have more than one chronic illness are often older in age and from communities with high poverty rates. Moreover, these individuals are frequently hospitalized, visiting their general practitioners, and taking multiple prescription medications, incurring higher expenses compared to those who may have one chronic illness (Cassell et al., 2018).

To grasp the complexity of the chronic illness experience, low SES is a major factor that contributes to chronic illness diagnoses and management, and can be assessed through the lens of a society, community, neighborhood, or individual. To measure SES, researchers take into account a person's education, income, employment status, poverty status, and family size and relationships (American Psychological Association [APA], 2015). Overall, there are many types of chronic illnesses that are more prevalent in individuals who are of low SES, and this population has higher rates of multimorbidity (Mair & Jani, 2020).

Another influential factor in chronic illness diagnoses is chronic stress. This results in long-term issues for the heart and blood vessels due to consistent increases in heart rate, stress hormones, and blood pressure. Increased levels of stress hormone also increase inflammation and decrease immune response (APA, 2018). Among young adults of low SES, molecular analyses have revealed that there are inequalities related to immune, inflammatory, ribosomal, and metabolic pathways, which put them at a higher risk of developing a chronic illness as they age (Shanahan et al., 2022). Other factors accounting for disparities in chronic illness diagnoses among low SES populations include education level, access to and use of health services, unstable housing, lack of access to healthy foods, and high rates of violence (Pathirana & Jackson, 2018; U.S. HHS, n.d.). For individuals living in poverty, their health is put in jeopardy because they

may not be able to afford basic necessities, and this may produce high stress levels (Cunningham, 2018). As a result, individuals under stress may resort to unhealthy coping behaviors such as smoking, drinking alcohol, or using other substances, and these behaviors undoubtedly influence the development of a chronic illness (Cunningham, 2018; U.S. HHS, n.d.).

It is also worth understanding how low SES impacts health and chronic illness in the context of the family unit. Currie and Goodman (2020) discuss how the SES of parents has an effect on the health of their children. Determinants of health such as medical care, food, and housing all play a role in the health status of children. Thus, families of low income may have more constraints when it comes to buying high quality medical care, food, and safe homes and neighborhoods. Additionally, children from low SES families tend to have had a lower health status at birth. The authors explain that this lower health status may not be a result of genetics but rather the adverse environmental conditions that low SES families are typically exposed to during the time of birth or pregnancy, which in some cases may activate certain genes (Currie & Goodman, 2020). Also, Roubinov and colleagues (2018) lay out some of the specific negative health outcomes of low SES families. Lower SES relates to increased rates of mortality and morbidity, injuries, respiratory and general illnesses, asthma, obesity, infections, and functional impairment as a result of chronic illnesses during childhood and adolescence. These outcomes may also be the case for families who live in neighborhoods that may be unsafe or provide little access to resources that will help them stay in good health (Roubinov et al., 2018).

In conjunction with low SES, it is important to account for the influence of health insurance on an individual's ability to treat and prevent chronic illness. Health insurance in the United States is split into two categories: private or public. Private health insurance is obtained through an individual's employer or union, purchased through a private health insurance company, while public health insurance includes programs that are funded by federal, state, and local governments (United States Census Bureau [USCB], 2021). There are a few key public and private health insurance types that meet the needs of various population demographics. Medicare is a federally funded program that covers health care services for individuals aged 65 and older or those who are under the age of 65 and have a permanent disability. Medicaid is a joint federal and state funded program that covers the healthcare services of individuals who are of low SES, and this includes children, pregnant women, adults, individuals with disabilities, and those who are aged 65 and older. The State Children's Health Insurance Program (CHIP) provides healthcare coverage for low-income children and pregnant women who are part of families with an annual income above Medicaid eligibility but do not have health insurance. For military service members, veterans, and their dependents, health insurance is provided by the Department of Defense and includes programs such as TRICARE and the Department of Veterans Affairs (Congressional Research Service, 2022).

A recent report from the USCB on health insurance utilization in 2021 provides a snapshot of how many people are using each type of health insurance. Private health insurance was used more than public, with 66% of people using private and 35.7% of people using public. Among the subtypes of health insurance, employer and union-based was most commonly used, covering 54.3% of the population for either most of or all of

2021. Following employer and union-based health insurance was Medicaid at 18.9%, Medicare at 18.4%, direct-purchase coverage at 10.2%, and TRICARE at 2.5%. The subtypes of health insurance that covered the least amount of the population in 2021 were VA and CHAMPVA at 1.0%. Also, 7.9% of full-time, year round workers and 22.6% less than full-time, year round workers had public health insurance (USCB, 2022).

Since the US has numerous forms of health insurance, it is worth exploring how their differences impact chronic illness outcomes in adults. However, a search through scholarly article databases reveals that most prior research has specifically focused on COVID-19 and age brackets other than adulthood. On the other hand, some articles focused on topics related to specific health conditions and how an individual's health insurance type may influence their experience with being treated for it. For example, Renshaw and colleagues (2021) studied individuals who received a ventral hernia repair procedure and examined how their health insurance type impacted their visits to the emergency room and other clinical outcomes. Findings suggested that individuals with public and self-pay health insurance had more emergency room visits, post-operative complications, and hospital readmissions following the surgery (Renshaw et al., 2021).

Other researchers have also highlighted the association between health insurance type and access to quality health care. Among a sample of adults with varying cancer diagnoses, those who were either uninsured or were being covered by Medicare and Medicaid were not as likely to receive care from high-volume hospitals. These hospitals are known for providing a higher quality of care because evidence shows that they have lower rates of complications, hospital readmissions, prolonged hospital stays, and lower median costs (Nabi et al., 2021). Furthermore, Allen and colleagues (2021) explored

differences in the utilization of healthcare services between individuals who have Medicaid and Marketplace insurance, which is a type of private insurance. Compared to those with Marketplace insurance, individuals covered by Medicaid had less outpatient visits and prescriptions and more emergency department visits. The researchers attribute these results to Medicaid users having limited access to outpatient care, longer wait times for appointments, and fewer physicians whose services accept Medicaid coverage. Also, the lack of access to outpatient care decreases the likelihood of patients who are on Medicaid receiving prescription medications that could help their condition (Allen et al., 2021). Despite these articles not directly addressing the topic of how different types of health insurance affect chronic illness outcomes, they can be used as an indicator of how the health of individuals across insurance types may be affected due to the types of healthcare services they can access.

Young and Middle Adulthood

As with every developmental period, young and middle aged adults have characteristics specific to their stage of development that may be affected by the diagnosis of chronic illnesses. Thus, understanding how chronic illness impacts this age group requires some basic knowledge of developmental tasks. In young adulthood, individuals still may experience a level of uncertainty when it comes to making decisions related to work, relationships, family, lifestyles, and ideologies that are connected to their personal identities. This is also a time in which individuals build a new sense of autonomy and agency as they move away from receiving strict guidance from their parents or guardians (Newman & Newman, 2018). In middle adulthood, individuals are often balancing many roles such as maintaining a career, strengthening their relationships

with loved ones, and managing the household. Through their various roles in life, they also tend to formally or informally educate and care for the generations above and below them. The various roles and responsibilities of middle adulthood are typically the main sources of stress in this part of the lifespan (Newman & Newman, 2018).

Unfortunately, existing literature does not adequately address the impacts of chronic illness in middle adulthood. Therefore, it is most appropriate to make inferences based on the experiences of individuals between the childhood and emerging adulthood age brackets. Emerging adulthood is typically the first time in an individual's life where they have to make decisions about their future, develop a sense of social autonomy, and continue to form a sense of identity (Gunning, 2022). However, those who experience a chronic illness at this point have to work towards accepting that their life will not follow a typically normal trajectory. For children and adolescents, a school setting is where many of the biopsychosocial needs are being met, yet children with chronic illnesses are absent more regularly than children who are healthy. Therefore, children and adolescents in this situation are at risk of not developing to their greatest capacity since they are missing out on multiple opportunities to learn and foster social relationships with their peers (Andrade Biaggi Leite et al., 2022). This prior research on the experiences of children, adolescents, and emerging adults with chronic illness reveals how life events and characteristics of middle adulthood will be similarly affected.

Developmental Theories

Researching the intersection of chronic illness, poverty status, and health insurance type in adult populations for this study also reinforces the applicability of Urie Bronfenbrenner's ecological systems theory and Erik Erikson's eight stages of

psychosocial development to topics in the health and human development fields. Bronfenbrenner's theory explains how human development takes place in a set of systems that include cultural, social, economic, and political elements, and the interactions between these systems can either foster or hinder an individual's development (Cornell University, 2022). Health insurance, chronic illness, and poverty status are essentially three systems that can impact an adult. Erikson's theory accounts for growth across the lifespan, individuals' ability to contribute to their own psychological development, and the role of culture in an individual's growth (Newman & Newman, 2018). Thus, Bronfenbrenner's and Erikson's frameworks can be used as tools to understand how new and existing policies can work together to promote human health and well-being according to the typical developmental trajectory of adults (Cornell University, 2022; Newman & Newman, 2018).

Current Study and Hypotheses

Based on the literature reviewed above, the current study will aim to fill in the research gap about the impacts of health insurance type on chronic illness outcomes in adults living in poverty. Although prior research touches on aspects of the effects of chronic illness, low SES, and health insurance type on an individual's lifestyle, health, and utilization of healthcare services, it fails to directly address how these issues apply to adults. Additionally, prior research does not account for any diversity of health insurance types in low SES populations. Lastly, most prior research addresses the association between health insurance type and an individual's access to healthcare services, but it fails to directly address the association between health insurance type and chronic illness outcomes. The current study aims to address these research gaps and provide implications

for human services professionals, healthcare professionals, and policymakers regarding improvements that can be made to ensure adults from all backgrounds can achieve positive health and developmental outcomes.

The purpose of the current study is to explore associations among income level, health insurance type and chronic illness outcomes in adults in early midlife. This study will examine if: 1) adults living in poverty with public health insurance will have an increased likelihood of chronic illness, and 2) along with whether adults living in poverty with private health insurance will have a decreased likelihood of chronic illness. Furthermore, this study will aim to determine if there are differences in chronic illness multimorbidities based on an individual's poverty status. It is hypothesized that:

Exploratory Hypothesis: There will be a statistically significant and negative association between poverty status and the number of chronic illnesses that adults report.

Hypothesis 1: Adults who live in poverty and utilize public health insurance will have an increased likelihood of chronic illness.

Hypothesis 2: Adults who live in poverty and utilize private health insurance will have a decreased likelihood of chronic illness.

CHAPTER 3

METHODOLOGY

Dataset

The present study was conducted using a dataset from the National Longitudinal Study of Adolescent to Adult Health (Add Health). This is a study of a nationally representative sample of over 20,000 adolescents who were in grades seven through twelve during the 1994-1995 school year. Participants were studied over the course of five data collection waves, with the most recent wave being from 2016-2018 (Harris & Udry, 2019). Add Health combined survey data on participants' social, economic, psychological, and physical well-being and accounted for participants' family, neighborhood, community, school, friendship, peer group, and romantic relationship contexts (Harris & Udry, 2019). Below is a statement from the Add Health website acknowledging the use of their dataset for this project.

This research uses data from Add Health, funded by grant P01 HD31921 (Harris) from the *Eunice Kennedy Shriver* National Institute of Child Health and Human Development (NICHD), with cooperative funding from 23 other federal agencies and foundations. Add Health is currently directed by Robert A. Hummer and funded by the National Institute on Aging cooperative agreements U01 AG071448 (Hummer) and U01AG071450 (Aiello and Hummer) at the University of North Carolina at Chapel Hill. Add Health was designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris at the University of North Carolina at Chapel Hill (Harris & Udry, 2019, Acknowledgement section).

For this study, data from the Wave V Mixed-Mode Survey was used. The data was collected between 2016 and 2018, meaning that the respondents who were part of the original Wave I cohort were now between 33 and 43 years old. Wave V collected data on social, environmental, economic, behavioral, and health circumstances of respondents. New questions related to retrospective child health and SES were also added to this wave. All respondents from Wave I who were still alive were eligible to participate in Wave V, which resulted in 19,828 participants. When surveys were distributed, the sample was split into three stratified random samples (Inter-university Consortium for Political and Social Research, 2022). Since this study was conducted using the Public-Use version of this dataset, the entire Wave V sample was not used. This dataset includes one-half of the core sample and one-half of the oversample of African-American adolescents who had a parent with a college degree. These participants were chosen at random, and the final sample size came out to 4,196 (Add Health, 2021).

Variable Descriptions

Demographics: Demographic variables were assessed during preliminary data analyses to find out if any of them needed to be controlled prior to secondary analyses. Age was determined through a survey item asking about the respondents' birth year. Race or ethnic origin was determined using multiple survey items asking if respondents were White, Black or African American, Hispanic, Asian, Pacific Islander, American Indian or Alaska Native, or some other race or origin. Other demographic variables that were used in preliminary analyses included Sex Assigned at Birth, Native U.S. Citizenship, Education Level, and Marital Status.

Health Insurance Type: The present study used Health Insurance Type as an independent variable. Respondents were asked “Which of the following best describes your current health insurance situation?” Response choices included *I get insurance through work (1), I get insurance through a union (2), I am covered by my spouse’s or partner’s insurance (4), I am covered because I am active duty military (6), I buy private insurance myself (7), I buy insurance through a Health Insurance Marketplace or Exchange (Affordable Care Act or Obamacare) (8), I am on Medicaid (9), I am on Medicare (10), I get care through the Department of Veterans Affairs (11), I am covered through TRI-CARE, CHAMPUS, CHAMP-VA or any other military healthcare plan (12), I am covered through the Indian Health Service (13), I do not know what my health insurance is (14), and I have no health insurance (15)*. An item identifying whether or not an individual had both private and public health insurance was not included in the questionnaire. Individuals with missing insurance and those who responded with (14) or (15) were excluded from analyses since this study only focuses on adults who have health insurance and know which type they have. Prior to data analyses, the other 13 options were recoded into *private health insurance (1)* or *public health insurance (2)*. The Health Insurance Glossary from the USCB (2021) was used to determine which health insurance types classify as private or public.

Poverty Status: The present study used Poverty Status as an independent variable. Respondents were asked “First, in the last calendar year, how much income did you receive from personal earnings before taxes? Include wages or salaries, tips, bonuses, overtime pay, and income from self-employment.” Response choices included *less than \$5,000 (1), \$5,000-\$9,999 (2), \$10,000-\$14,999 (3), \$15,000-\$19,999 (4),*

\$20,000-\$24,999 (5), \$25,000-\$29,999 (6), \$30,000-\$39,999 (7), \$40,000-\$49,999 (8), \$50,000-\$74,999 (9), \$75,000-\$99,999 (10), \$100,000-\$149,999 (11), \$150,000-\$199,999 (12), and \$200,000 or more (13). The federal poverty line for a single-person household was used to determine poverty status. The federal poverty line is set by the U.S. HHS and is primarily used to determine an individual or family's eligibility for certain programs (Office of the Assistant Secretary for Planning and Evaluation, n.d.). Therefore, participants whose incomes were lower than the federal poverty line for a single-person household were recoded into *poverty status (1)*, and those whose incomes were higher than it were recoded into *non-poverty status (2)*.

Chronic Illness: The present study used chronic illness as the dependent variable. This variable was analyzed using multiple survey items where respondents were asked about chronic illnesses they have been diagnosed with. Respondents were asked "Has a doctor, nurse, or other health provider ever told you that you have or had cancer or lymphoma or leukemia, high blood cholesterol or triglycerides or lipids, high blood pressure or hypertension [female: When you were not pregnant], high blood sugar or diabetes [female: When you were not pregnant], heart attack or have you had heart surgery for clogged coronary arteries (including bypass, angioplasty, or stent), asthma, chronic bronchitis or emphysema, hepatitis B or C, chronic kidney disease or failure, blood clot in the lung or a deep vein of the leg (excluding varicose veins), a stroke, mini-stroke, or have you had surgery for clogged neck arteries (including endarterectomy, bypass, angioplasty, or stent), heart failure, or sleep apnea?" For each chronic illness, response choices included *no (0)* or *yes (1)*. This variable was recoded two different ways depending on the type of analysis being performed. First, the chronic illnesses selected

from the dataset were recoded into a chronic illness count to determine the number of chronic illnesses each person had. This version of the variable was used in the preliminary, bivariate, and exploratory analyses. Next, the chronic illnesses selected from the dataset were recoded into one dichotomous variable in which *no* (0) represented participants who did not have any chronic illnesses and *yes* (1) represented participants who had one or more chronic illnesses. This version of the variable was used in the preliminary and multivariate data analyses.

Data Analyses

Statistical Package for the Social Sciences (SPSS 28) was used to analyze the data. Before conducting any analyses, IRB approval was obtained, and missing data was assessed. To determine the appropriate procedure for utilizing missing data, a frequency table was generated in SPSS to determine the number of missing data points for each variable. Since the sample size for this wave of the study was quite large, and each variable had relatively small numbers of missing data, a decision was made to implement the case deletion method, meaning that all missing data was excluded from analyses. All missing data were given a value of 888, and these values were removed from analyses through the creation of a filter variable. In total, 883 cases were removed, and this number does include those who selected option (14) or (15) for the survey item on health insurance. After completing this process, the sample size was reduced to 4,067. Case deletion is the most commonly used approach for handling missing data if there is no concrete explanation as to why the data is missing, and it generally produces unbiased results (Kang, 2013).

Primary study variables were recoded according to the descriptions above. Preliminary data analyses were run for demographic and primary study variables. These included univariate analyses such as frequency distributions for nominal and ordinal variables as well as descriptive statistics, including the mean, standard deviation, and range for interval and ratio variables. Second, bivariate analyses were conducted by using chi-square tests to identify associations between the demographic and independent variables and the dependent variable. Demographic variables that were significantly associated with the dependent variable were controlled for in subsequent analyses. Following bivariate analyses, the exploratory hypothesis was tested using a series of statistical procedures. Using the chronic illness count and poverty status variables, a Mann-Whitney test was conducted to determine if there was an association between poverty status and the number of chronic illnesses one is diagnosed with. Next, an error bar chart was created to visually display this relationship by placing poverty status on the X-axis and the 95% confidence intervals for the chronic illness counts on the Y-axis. The final analysis performed to test the exploratory hypothesis was an independent samples t-test to determine differences in the mean number of chronic illnesses across both levels of poverty status. Lastly, multivariate analyses were conducted to test the study's main hypothesis. Automated backward elimination logistic regression models were used to assess which demographic and primary study variables significantly predicted the presence of chronic illness in adults. The first model assessed the significance of health insurance, while the second model assessed the significance of poverty status. This regression model was selected because the dependent variable is dichotomous and is being compared across multiple independent variables.

CHAPTER 4

FINDINGS

Univariate Analyses

Frequency distributions and descriptive statistics were generated to obtain information about the demographics of the study's participants. The mean birth year of participants was 1979, which equates to 37, 38, or 39 years-old depending on when they completed the Add Health survey. Over half of the participants were female (57.1%). White was the highest reported race at 67.8%, followed by Black at 21.7%, and a majority of participants were native U.S. citizens (n = 3,816). In regards to education level, most participants either completed their Bachelor's degree (n = 875), received their high school diploma (n = 513), or completed some college (n = 482). Only 0.5% of participants completed some Post-Baccalaureate professional education, and about 2% completed a Doctoral degree (1.8%) or completed some graduate training beyond a Master's degree (2.0%). There were 2,430 married participants, and a small percentage of separated (3.0%) and widowed (0.4% individuals). A full overview of these results can be found in Table 1.

Additionally, frequency distributions and descriptive statistics were generated to obtain information about how participants responded to the primary study variables. A majority of participants had private health insurance (75.4%), and about 15% had public health insurance (14.5%). As for poverty status, 3,365 participants classified as non-poverty status, while 760 participants classified as poverty status. These results are also laid out in Table 1. When assessing how many chronic illnesses participants were

diagnosed with, over half of them reported that they did not have any chronic illnesses (58.9%), 27.3% reported having one chronic illness, and 8.1% reported having two chronic illnesses. In general, 60.6% of participants did not have any chronic illnesses, and 39.4% had one or more chronic illnesses. Table 2 provides a full overview of these results. The chronic illnesses that were reported the most were high blood cholesterol, triglycerides or lipids (n = 804), high blood pressure or hypertension (n = 732), and asthma, chronic bronchitis, or emphysema (n = 665). The descriptive statistics of each chronic illness are laid out further in Table 3.

Table 1*Descriptive Statistics of Demographic and Primary Study Variables*

Variable	n	%	M	SD	Range
Birth Year			1979	1.78	7.00
Sex Assigned at Birth					
Male (1)	1802	42.9			
Female (2)	2394	57.1			
Race (0 = not marked; 1 = marked)					
White (1)	2844	67.8			
Black (1)	910	21.7			
Hispanic (1)	406	9.7			
Asian (1)	156	3.7			
Pacific Islander (1)	38	0.9			
American Indian (1)	121	2.9			
Other (1)	26	0.6			
Native U.S. Citizen (0 = yes; 1 = no)	3816	90.9			
Education Level					
Some High School or Lower (2)	184	4.4			
High School Diploma (3)	513	12.2			
GED (4)	129	3.1			
Some Vocational/Technical Training (After High School) (5)	114	2.7			
Some Community College (6)	368	8.8			
Completed Vocational/Technical Training (After High School) (7)	263	6.3			
Associate or Junior College Degree (8)	427	10.2			
Some College (9)	482	11.5			

Completed College (Bachelor's Degree) (10)	875	20.9			
Some Graduate School (11)	154	3.7			
Completed a Master's Degree (12)	386	9.2			
Some Graduate Training Beyond a Master's Degree (13)	85	2.0			
Completed a Doctoral Degree (14)	76	1.8			
Some Post-Baccalaureate Professional Education (15)	20	0.5			
Completed a Post-Baccalaureate Professional Degree (16)	115	2.7			
Marital Status					
Married (1)	2430	57.9			
Widowed (2)	16	0.4			
Divorced (3)	464	11.1			
Separated (4)	124	3.0			
Never Married (5)	1155	27.5			
Poverty					
Poverty Status (1)	760	18.1			
Non-Poverty Status (2)	3365	80.2			
Health Insurance					
Private (1)	3162	75.4			
Public (2)	608	14.5			

Table 2*Chronic Illness Multimorbidities*

Number of Chronic Illnesses	n	%
Zero	2470	58.9
One	1146	27.3
Two	338	8.1
Three	81	1.9
Four	23	0.5
Five	2	0.0
Six	5	0.1
Seven	2	0.0
Presence of Chronic Illness	n	%
No (0)	2427	60.6
Yes (1)	1577	39.4

Table 3*Chronic Illness Counts*

Variable	n	%
Cancer, Lymphoma, Leukemia	85	2.0
High Blood Cholesterol, Triglycerides, Lipids	804	19.2
High Blood Pressure, Hypertension	732	17.4
High Blood Sugar, Diabetes	248	5.9
Heart Attack, Heart Surgery for Clogged Coronary Arteries	28	0.7
Asthma, Chronic Bronchitis, Emphysema	665	15.8
Hepatitis B or C	33	0.8
Chronic Kidney Disease or Failure	28	0.7
Blood Clot in the Lung or Deep Vein of the Leg	64	1.5
Stroke, Mini-Stroke, Surgery for Clogged Neck Arteries	41	1.0
Heart Failure	22	0.5
Sleep Apnea	322	7.7

Bivariate Analyses

Chi-square tests were used to examine the associations among the demographic variables and independent variables on chronic illness outcomes in the study's participants. The results of the chi-square tests for the demographic variables showed a significant association between sex assigned at birth ($\chi^2_{(df=7)} = 21.3; p < .05$), Black ($\chi^2_{(df=14)} = 36.3; p < .05$), American Indian ($\chi^2_{(df=14)} = 31.2; p < .05$), and education level ($\chi^2_{(df=105)} = 147.4; p < .05$) and chronic illness outcomes. Therefore, these demographic variables were controlled for in the multivariate analysis. To clarify the results even further, the *Cramer's V*² value was used to determine how much of the variance in chronic illness outcomes was accounted for by these variables. Sex assigned at birth and education level accounted for 0.5% (*Cramer's V*² = .005) of the variance in chronic illness multimorbidities, indicating extremely weak associations. Black and American Indian accounted for less than 0.5% (*Cramer's V*² = .004) of the variance in chronic illness multimorbidities, also indicating extremely weak associations. All of the numerical results for the demographic variables are displayed in Table 4.

The results of the chi-square tests for the independent variables showed a significant association between health insurance ($\chi^2_{(df=14)} = 91.9; p < .05$), poverty status ($\chi^2_{(df=91)} = 60.5; p < .05$), and chronic illness outcomes. Similar to the demographic variables, the *Cramer's V*² value was used to determine how much of the variance in chronic illness outcomes was accounted for by these variables. Health insurance accounted for about 1% (*Cramer's V*² = .011) of the variance in chronic illness multimorbidities, indicating extremely weak associations. Poverty status accounted for slightly more than 0.5% (*Cramer's V*² = .006) of the variance in chronic illness

multimorbidities, also indicating an extremely weak association. The numerical results for the independent variables are also displayed in Table 4.

Table 4

Chi-Square Results Examining Associations Between Demographic and Independent Variables on Chronic Illness Multimorbidities

Predictor	Value	df	Asymptotic Significance
Birth Year	54.1	49	.285
Sex Assigned at Birth	21.3	7	.003
Race			
White	22.3	14	.073
Black	36.3	14	< .001
Hispanic	23.6	14	.052
Asian	3.6	14	.997
Pacific Islander	2.6	14	1.000
American Indian	31.2	14	.005
Other	3.6	14	.997
Native US Citizen	14.8	21	.831
Education Level	147.4	105	.004
Marital Status	48.4	35	.066
Poverty Status	60.5	91	< .001
Health Insurance	91.9	14	< .001

Exploratory Analysis

Using the chronic illness count and poverty status variables, a Mann-Whitney test was conducted to determine differences in chronic illness multimorbidities across poverty status types. The results indicated that there was a significant difference between the number of chronic illnesses among adults of poverty status and adults of non-poverty status ($p < .05$). Adults of poverty status had a higher number of chronic illnesses than adults of non-poverty status with mean ranks of 2161.15 and 1967.24, respectively ($Z = -4.71$).

Furthermore, an error bar chart was created to visually display differences in chronic illness multimorbidities across poverty status types. Since the error bars did not overlap, the chart was indicative of a significant difference between the number of chronic illnesses among adults of poverty status and adults of non-poverty status, which is aligned with the results of the Mann-Whitney test. The error bar chart can be found in Figure 1.

To further confirm the results of the Mann-Whitney test and the visual representation of the data displayed in the error bar chart, an independent samples t-test was conducted to determine differences in chronic illness multimorbidities across both levels of poverty status. The results of the independent t-test showed a significant difference between the number of chronic illnesses among adults of poverty status and adults of non-poverty status ($t_{(df=4002)} = 6.52; p < .05$). Although both groups had relatively low chronic illness multimorbidities, adults of poverty status reported statistically significant higher numbers of chronic illnesses ($\bar{x} = .72$) than adults of non-poverty status ($\bar{x} = .51$), a mean difference of .22.

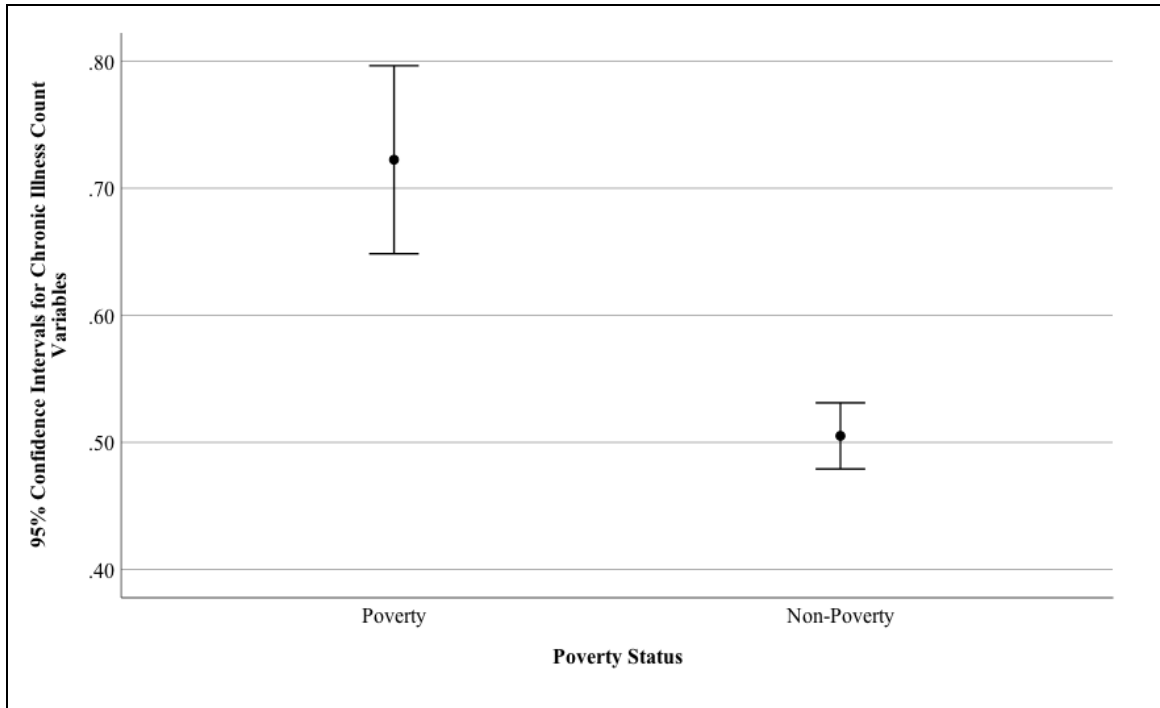


Figure 1. Error Bar Chart Distribution of Chronic Illness Multimorbidities Among Individuals of Poverty Status and Non-Poverty Status

Multivariate Analysis

Two automated backward elimination logistic regression models were used to analyze the relationship between health insurance, poverty status, and chronic illness outcomes. The first model examined the effects of health insurance type on chronic illness outcomes. The results of this model revealed that health insurance type was a significant predictor of chronic illness outcomes ($p < .05$). More specifically, the odds ratio showed that individuals who had public health insurance were 49.5% more likely to have chronic illnesses than those who had private health insurance. The second model examined the effects of poverty status on chronic illness outcomes. The results of this model revealed that poverty status was a significant predictor of chronic illness outcomes ($p < .05$). More specifically, the odds ratio showed that individuals of non-poverty status were 26.9% less likely to have chronic illnesses than individuals of poverty status.

Demographic variables that were controlled for in this analysis were also assessed for significance. Examining both models, the results showed that sex assigned at birth, Black, American Indian, Other, which refers to races not listed in the Add Health survey, and education level were significant predictors of chronic illness outcomes ($p < .05$). The odds ratios of these variables display more specific information about their significance. Females are 26.6% less likely to have chronic illnesses than males ($Exp(B) = .734$). In regards to race, Black individuals are 38% more likely to have chronic illnesses than the races that were not significant ($Exp(B) = 1.384$), American Indian individuals were 44% more likely to have chronic illnesses than the races that were not significant ($Exp(B) = 1.447$), and those who responded with Other were 50.1% less likely to have chronic illnesses than the races that were not significant ($Exp(B) = .499$). Lastly, for every

increase in education level, there is a 4.2% decrease in the odds of individuals having chronic illnesses ($Exp(B) = .958$). A full display of these results can be found in Table 5.

Table 5

Backward Elimination Logistic Regression Results Examining Effects of Independent Variables and Significant Demographic Variables on Chronic Illness Outcomes

Model 1: Health Insurance			
Predictor	Sig.	$Exp(B)$	95% CI for $Exp(B)$
Sex Assigned at Birth	< .001	.733	[.638, .841]
Race (Black)	< .001	1.382	[1.174, 1.628]
Race (American Indian)	.048	1.464	[1.003, 2.138]
Race (Other)	< .001	.494	[.331, .736]
Education Level	< .001	.958	[.938, .979]
Health Insurance	< .001	1.495	[1.238, 1.805]
Model 2: Poverty Status			
Predictor	Sig.	$Exp(B)$	95% CI for $Exp(B)$
Sex Assigned at Birth	< .001	.734	[.645, .836]
Race (Black)	< .001	1.384	[1.188, 1.612]
Race (American Indian)	.039	1.447	[1.018, 2.055]
Race (Other)	< .001	.499	[.344, .724]
Poverty Status	< .001	.731	[.620, .863]

CHAPTER 5

CONCLUSION

The purpose of this study was to explore associations among poverty status, health insurance type, and chronic illnesses outcomes in adults in early midlife. This study examined if adults who live in poverty and utilize public health insurance will have an increased likelihood of chronic illness. Furthermore, this study aimed to determine if adults who live in poverty and utilize private health insurance will have a decreased likelihood of chronic illness. The exploratory hypothesis stated that there would be a statistically significant and negative association between poverty status and the number of chronic illnesses that adults report. Results indicated that health insurance and poverty status were associated with and predictors of chronic illness outcomes. Five demographic variables, sex assigned at birth, Black, American Indian, Other races, and education level were also predictors of chronic illness.

Interpretations of the Hypotheses

The results of the bivariate and multivariate analyses prove both hypotheses. Specifically, adults who live in poverty and utilize public health insurance have an increased likelihood of chronic illness, and adults who live in poverty and utilize private health insurance have a decreased likelihood of chronic illness. Although there is a lack of literature addressing the direct connections between health insurance type and chronic illness outcomes, these results, accompanied by the information addressed in the literature review, can shed light on why these results are significant. When discussing the factors that impact health status, researchers and professionals in the health and human

services fields take lifestyle habits such as eating, exercising, and sleeping into account. Although an adult's habits have a direct influence on their health, an outside factor such as health insurance produces more helpful or unhelpful impacts. In general, if a health condition is addressed in a timely manner, it may not progress into a condition of great severity. However, if an individual does not have widespread access to healthcare services, or the healthcare services they have access to are of low quality, their minor condition could progress into a condition that poses severe risks to their health.

Referencing the literature review, it is known that individuals with public health insurance such as Medicaid or Medicare experience frequent visits to the emergency room, receive less care from high-volume hospitals, have more hospital readmissions after already being treated for a condition, and have less access to outpatient care (Allen et al., 2021; Nabi et al., 2021; Renshaw et al., 2021). Since humans are not prone to physical adversity, whether that is due to illness or injury, having health insurance to access healthcare services is a necessity. Thus, adults who have a form of public health insurance are more likely to develop a chronic illness if they are not receiving proper care due to poor service not only while they are receiving care. The time to seek out services and wait for appointments from providers who accept their insurance may also impact the development of chronic illnesses.

Since both hypotheses focus on poverty status, it is also necessary to consider the predictive role of poverty status on chronic illness. As mentioned in the previous paragraph, habits such as eating healthy, exercising, and establishing a proper sleep routine contribute to positive physical health outcomes. Poverty status, however, creates multiple barriers for an individual to maintain these habits, which further contributes to

the development of persistent or chronic health issues. While reviewing the literature related to poverty and low SES, education level, access to and use of health services, unstable housing, lack of access to healthy foods, and high rates of violence are identified as factors that put individuals in these circumstances at a higher risk of chronic illness (Pathirana & Jackson, 2018; U.S. HHS, n.d.). They also may not be able to afford basic necessities, which produces high stress levels, particularly chronic stress, and unhealthy coping behaviors such as smoking, drinking alcohol, or using other substances. (Cunningham, 2018; U.S. HHS, n.d.; Shanahan et al., 2022). All in all, financial stability helps adults to maintain a healthy lifestyle and prevent chronic disease, and an individual of poverty status may experience negative long-term outcomes. Access to all natural or organic foods, gym memberships, and safe living areas with adequate outdoor spaces all contribute to the overall health and well-being of adults, yet adults of poverty status often cannot afford such means of living. Again, adults are largely responsible for the choices they make in regards to their health, but if adults living in poverty cannot access or afford the resources needed to keep them healthy, their risk for chronic illness and other health issues will ultimately increase.

As displayed in the results, sex assigned at birth is also a significant predictive factor of chronic illness outcomes. More specifically, females have less chronic illness multimorbidities than males. One reason this may be the case could be a result of the natural biological differences between males and females in the areas of growth, metabolism, reproductive cycles, sex hormones, and aging processes (Manandhar et al., 2018). However, examining health differences among the sexes can actually be quite complex. Crimmins and colleagues (2019) point out that males are more likely to have

lethal illnesses such as heart disease, stroke, and diabetes, while females are more likely to have severe, but not necessarily fatal, conditions such as arthritis and depression. The researchers also mention that not only do males and females differ in the types of chronic illnesses they develop, but also the outcomes associated with their conditions. For instance, males may be more vulnerable to negative effects on mortality in relation to some of the illnesses previously mentioned, but women generally have more health problems and will develop a disability or diminishment of functioning because of them (Crimmins et al., 2019; Nusselder et al., 2019). Since the chronic illnesses included in the present study have great potential to be fatal and more severe, this may be a reason as to why the results indicate females as having less chronic illnesses. It is also worth considering whether or not sampling bias impacts the significance of sex assigned at birth on chronic illness multimorbidities. Over half of the study's participants are female, and they have historically been more likely to respond to mail and web surveys compared to men (Becker, 2022). Even though it cannot be confirmed whether or not this directly affects the significance of the variable, there is a likelihood that the higher response rate from females contributes to the data analysis concluding that females have less chronic illnesses than males.

Along with sex assigned at birth, race is another significant predictive factor of chronic illness outcomes. More specifically, the results reflect Black and American Indian racial identities as significant predictors of chronic illness outcomes, and these results are consistent with current negative trends in health outcomes of minority populations. The CDC (2021) presents a number of staggering statistics pointing to the impacts of racism in the United States on health outcomes in communities of color.

Racial and ethnic minority groups experience higher rates of illness and death as a result of numerous health conditions such as diabetes, hypertension, obesity, asthma, and heart disease compared to White individuals. Also, the life expectancy of non-Hispanic, Black Americans is four years lower than White Americans (CDC, 2021). The emergence of the COVID-19 pandemic also revealed how serious these racial disparities are in Black populations. Even at the beginning of the pandemic, researchers were already discovering that COVID-19 disproportionately affects Black individuals (Hooper et al., 2020). One of the reasons is related to the prevalence of the aforementioned diseases in these populations, and the other reason is related to SES. Since Black individuals are also more likely to be of low SES, they are more likely to live in crowded urban areas, making it more difficult to social distance from those in their community (Hooper et al., 2020). In contrast to the second reason, another study on Black populations of higher SES reveals that even though Black individuals of high SES may have access to better healthcare services and resources that would help them stay in good health, they are still discriminated against when receiving healthcare treatment (Colen et al., 2018).

Similarly, the results conclude that American Indian individuals are more likely to have chronic illnesses compared to their non-American Indian counterparts. As a disclaimer, the term American Indian will be used to stay consistent with Add Health's language while recognizing that the term Indigenous is a more culturally appropriate term for this population. These results are in strong alignment with previously existing literature on the health of American Indians. The Indian Health Service (IHS) (2019) proposes that factors such as inadequate education, poverty, discrimination in how health services are delivered, and cultural differences contribute to discrepancies in health

outcomes of this population. Also, the leading causes of death in this population are heart disease, malignant neoplasm, unintentional injuries, and diabetes, and their life expectancy is five and a half years less than any other race population in the United States (IHS, 2019). In most cases, there are major disparities in the quality of healthcare in American Indian populations across all dimensions of quality, which include structure, process, and outcomes (Lewis & Myhra, 2018). Furthermore, American Indian individuals are not receiving adequate preventative healthcare services across all stages of the lifespan. American Indian children have the lowest rates of well-visits in the United States. Less than 30% of American Indian children have received a developmental check-up, 10% have had their vision checked, and 8% have had their hearing screened. Additionally, these children have the highest obesity rates compared to any other racial group, yet they receive the least amount of advice about physical activity compared to their non-Hispanic White counterparts (Lewis & Myhra, 2018).

Lastly, the results reveal that adults who have higher levels of education are less likely to develop chronic illnesses. It may not seem as though education has a strong connection to chronic illness outcomes, but there are a few factors to consider in a person's decision to further their education, as well as their ability to successfully complete each level. One major characteristic of one's ability to successfully achieve a higher level of education is their ability to comprehend, retain, and use information. Throughout an individual's educational experience, there are opportunities to learn about practices that set an individual up for living a life in good health. Depending upon the type and level of education a person reaches, they may gain more knowledge of healthy lifestyle practices overtime. Therefore, individuals who are able to build upon their

knowledge of health and retain it over the years may take more of an initiative to better their habits. Knowledge, skills, reasoning, and effectiveness are also characteristics associated with education that can help an individual develop a healthy lifestyle (Zajacova & Lawrence, 2018). Furthermore, individuals who achieve higher levels of education may have increased levels of motivation to learn new information and may take it upon themselves to seek out resources that will guide them in the management of their health. In most cases, the higher level of education a person has, the greater their access to higher paying jobs will be. As a result, a higher level of education can be associated with obtaining access to resources such as safe neighborhoods and nutritious foods (Zajacova & Lawrence, 2018). Despite education not seeming to have a direct effect on chronic illness outcomes, it should be recognized as an influential avenue for an individual's ability to obtain physical resources and build cognitive skills that contribute to living a lifestyle aiming to prevent chronic illness and other health issues.

Connection Between Results and Developmental Theories

Referring back to the literature review, the results of this study were also intended to be interpreted through the lens of two commonly used developmental theories. It has previously been mentioned that Urie Bronfenbrenner's ecological systems theory explains how human development takes place in a set of systems that include cultural, social, economic, and political elements, and the interactions between these systems can either foster or hinder an individual's development (Cornell University, 2022). After examining the results, this theory is a useful tool for examining chronic illness outcomes, but it has a weak connection to some of the key findings. In addition to the significance of the primary study variables, sex assigned at birth and race were also considered to be

significant. Considering that these are biological characteristics, a theory that primarily focuses on environmental attributes may not be the strongest connection to all of the results. However, Bronfenbrenner's theory can be used as a framework for developing resources and implementing policies that support the needs of minority populations and both sexes to support not only their physical health outcomes, but also their overall development so they can thrive in the communities they live in. In connection with the primary study variables, such policies and resources may be related to reducing the impacts of poverty, improving health insurance policies, and creating easier access to higher quality and levels of education so that the prevalence of chronic illness can be decreased across all backgrounds.

Additionally, the literature review previously mentioned that Erik Erikson's eight stages of psychosocial development account for growth across the lifespan, individuals' ability to contribute to their own psychological development, and the role of culture in an individual's growth (Newman & Newman, 2018). Similar to Bronfenbrenner's theory, Erikson's framework does not necessarily have a direct connection to the outcome of this study, but it can be connected to how professionals in human services and medical fields as well as policymakers support adults according to their appropriate developmental stage. Since the age range of the participants in this study covers the end of early adulthood and the beginning of middle adulthood, Erikson's psychosocial crises of intimacy versus isolation and generativity versus stagnation can be used as a frame of reference. Understanding how race and sex assigned at birth impact the health of adults, with poverty status, health insurance, and education level playing a role, can be helpful information for professionals who have an influence on the way adults move through

these psychosocial crises. This means that Erikson's criteria should be used as a tool to help individuals as they explore intimate relationships, which can be explained by intimacy versus isolation, and achieve their desired goals while giving back to younger generations in their life, which can be explained by generativity versus stagnation (Newman & Newman, 2018).

Study Limitations

While this study makes a contribution to the literature by clarifying some of the major contributing factors to chronic illness outcomes in adults, there are a few limitations that need to be addressed. First, there could have been a more accurate measure for the method in which poverty was measured for this study. Despite the federal poverty level for a single-person household being used as a guide, some of the income brackets had a mix of incomes that either met these federal poverty guidelines or did not. Also, this survey item did not take into account if the respondent had other people in their household who contributed income that other household members could utilize. Even though there is a survey item asking for the yearly income of a participant's entire household, there was not a way to determine the household size of each participant in the survey. The survey item measuring household yearly income in addition to a statistical formula calculating the household size of each participant could have been a more accurate measure of poverty status.

Another limitation of this study is that Add Health did not include any survey items that allowed participants to indicate if they had both private and public health insurance. This is connected to the first limitation regarding household size. It is possible that some participants who had public health insurance were also covered under the

private health insurance of a spouse or family member. Additionally, someone may have both types of insurance to ensure that regularly scheduled and unplanned medical procedures and appointments can be fully covered. Although assessing individuals with two insurance types was not the focal point of the study, it could have been a beneficial asset to the analysis as a way of filling in more gaps in the literature.

Based on the types of chronic illnesses that were most reported, a further limitation is that the Add Health survey did not measure obesity as its own chronic disease. Referring to the *Chronic Illness Counts* table, the chronic illnesses that were reported the most, in the following order, were high blood cholesterol, triglycerides, or lipids, high blood pressure or hypertension, asthma, chronic bronchitis, or emphysema, sleep apnea, and high blood sugar or diabetes. The U.S. HHS National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK) (2018) also lists type II diabetes, high blood pressure, sleep apnea, and metabolic disorders, which includes high blood cholesterol, triglycerides, and lipids, as health risks of being overweight or obese. If a survey item measuring obesity according to the time participants were taking the survey was included, then it could have potentially explained why these chronic illnesses were the most reported.

The final limitation to be addressed is that there is a weak connection between private health insurance and being in poverty. When introducing the topic of health insurance in the literature review, it was previously explained that public health insurances such as Medicare, Medicaid, and CHIP are meant to serve individuals who are of low SES. On the other hand, private health insurance is obtained through an individual's employer or union, purchased through a private health insurance company, or

provided by TRICARE (USCB, 2021). Based on this description alone, it can be inferred that adults of poverty status will most likely have public health insurance. Thus, examining the effects of private health insurance on chronic illness outcomes in the context of poverty may not have been the most accurate.

Future Directions and Implications

All of the study's results can be taken into consideration when determining how this information may be used to improve the overall health of adults through professionals and policymakers in the health and human services field. Focusing on the additional findings related to the role of genetically inherent characteristics, specifically sex assigned at birth and race, the first step in making genuine change is for health and human services workers to examine their personal biases towards different people groups and how that may affect their ability to deliver different types of care and support services. An exercise that could be implemented for professionals who work in settings that provide support for some aspect of an individual's overall well-being is to implement a regular bias check-in. Workers would have to fill out a document consisting of questions that would prompt them to reflect on how their biases may be holding them back from providing the best possible care to their patients or clients. The recipient of this document does not have to view the responses, but the mandate of completing such a document would promote consistency in allowing employees to reflect on how their biases may be affecting their work.

Another step towards making a difference in the way diverse groups of people are supported in health and human services is by increasing more opportunities for members of various communities in the United States, health and human services professionals,

and health insurance policymakers to discuss improvements that can be made to health insurance policies so that all sexes and minority groups can have their health needs better supported through expanded, more flexible health insurance coverage. It is necessary for anyone who works in any area related to human services to understand that health insurance has a significant role in helping prevent and treat the health concerns that are unique to each population.

Lastly, the results of this study continue to emphasize the need for future research to be completed on the topics addressed. It may be meaningful to research how health insurance and poverty status influence the quality of life of adults with chronic illnesses as a way of further highlighting the effects of these variables. This could be done using quantitative research methods, but there may also be great benefit from gathering qualitative research on this topic in order to receive more details as to how these factors are actually impacting the ways adults live with their chronic illnesses. Furthermore, this research should be expanded to other developmental stages. It would be interesting to see how a longitudinal study examining the health and environmental factors of infants or young children influence chronic illness development in middle or older adulthood.

Referring back to the discussion on the relationships among race, sex assigned at birth, and chronic illness outcomes, a new area of research in this area should focus on protective factors of minority populations in regards to their chronic illness and overall health outcomes. Although it is important that health and human service professionals understand the disparities in the health of these populations, they should have the same understanding of their protective factors. Extensive research in this area can aid professionals in their ability to encourage individuals of differing backgrounds in their

strengths as they move through the challenges associated with their health. Therefore, as more research related to the factors affecting individuals' overall health and chronic illness outcomes becomes readily available, health and human services professionals across the United States will be better prepared to help individuals navigate life with a chronic illness with confidence in their abilities and assurance that they will receive proper and equitable care.

BIBLIOGRAPHY

Add Health. (2021, September 01). *Wave V Public Use data release*.

<https://addhealth.cpc.unc.edu/news/wave-v-public-use-data-release/>

Allen, H., Gordon, S.H., Lee, D., Bhanja, A., & Sommers, B.D. (2021). Comparison of utilization, costs, and quality of Medicaid vs subsidized private health insurance for low-income adults. *JAMA Network Open*, 4(1).

<https://doi.org/10.1001/jamanetworkopen.2020.32669>

Ambrosio, L., Senosiain García, J.M., Riverol Fernández, M., Anaut Bravo, S., Díaz De Cerio Ayesa, S., Ursúa Sesma, M.E., Caparrós, N. & Portillo, M.C. (2015). Living with chronic illness in adults: A concept analysis. *Journal of Clinical Nursing*, 24, 2357-2367. <https://doi.org/10.1111/jocn.12827>

American Psychological Association. (2015). *Measuring socioeconomic status and subjective social status*.

<https://www.apa.org/pi/ses/resources/class/measuring-status>

Andrade Biaggi Leite, A.C., Rodrigues, A.L., Andrade Alvarenga, W., Polita, N.B., Machado Silva-Rodrigues, F., Bolis, L.O., Meherali, S., & Nascimento, L.C. (2022). School reintegration of children and adolescents with chronic illness from the mothers' perspective: A qualitative study. *Child: Care, Health and Development*, 49(1), 181-188. <https://doi.org/10.1111/cch.13031>

Bronfenbrenner Center for Translational Research. (2022). *Urie Bronfenbrenner*. Cornell University. <https://bctr.cornell.edu/about-us/urie-bronfenbrenner>

- Becker, R. (2022). Gender and survey participation. An event history analysis of the gender effects of survey participation in a probability-based multi-wave panel study with a sequential mixed-mode design. *Methods, Data, Analyses*, 16(1), 3-32. <https://doi.org/10.12758/mda.2021.08>
- Cassell, A., Edwards, D., Harshfield, A., Rhodes, K., Brimicombe, J., Payne, R., & Griffin, S. (2018). The epidemiology of multimorbidity in primary care: A retrospective cohort study. *British Journal of General Practice*, 245-251. <https://doi.org/10.3399/bjgp18X695465>
- Centers for Disease Control and Prevention. (2022). *Diabetes*. <https://www.cdc.gov/diabetes/basics/diabetes.html>
- Centers for Disease Control and Prevention. (2022). *Heart disease*. <https://www.cdc.gov/heartdisease/about.htm>
- Centers for Disease Control and Prevention. (2022). *National Center for Chronic Disease Prevention and Health Promotion*. <https://www.cdc.gov/chronicdisease/index.htm>
- Centers for Disease Control and Prevention. (2021). *Racism and health*. <https://www.cdc.gov/minorityhealth/racism-disparities/index.html>
- Centers for Disease Control and Prevention. (2021). *Smoking & tobacco use*. https://www.cdc.gov/tobacco/basic_information/health_effects/cancer/index.htm#:~:text=Cancer%20refers%20to%20diseases%20in,body%20get%20rid%20of%20toxins
- Colen, C.G., Ramey, D.M., Cooksey, E.C., & Williams, D.R. (2018). Racial disparities in health among nonpoor African Americans and Hispanics: The role of acute and

- chronic discrimination. *Social Science & Medicine*, 199, 167-180.
<https://doi.org/10.1016/j.socscimed.2017.04.051>
- Congressional Research Service. (2022). *U.S. healthcare coverage and spending*.
<https://crsreports.congress.gov/product/pdf/IF/IF10830>
- Crimmins, E.M., Shim, H., Zhang, Y.S., & Kim, J.K. (2019). Differences between men and women in mortality and the health dimensions of the morbidity process. *Clin Chem*, 65(1), 135-145. <https://doi.org/10.1373/clinchem.2018.288332>
- Cunningham, P.J. (2018, September 27). Why even healthy low-income people have greater health risks than higher-income people. *The Commonwealth Fund*.
<https://www.commonwealthfund.org/blog/2018/healthy-low-income-people-greater-health-risks>
- Currie, J., & Goodman, J. (2020). Parental socioeconomic status, child health, and human capital. In S. Bradley & C. Green (Eds.), *The economics of education: A comprehensive overview* (2nd ed., pp. 239-248). Academic Press.
<https://doi.org/10.1016/B978-0-12-815391-8.00018-5>
- Di Cesare, M., Khang, Y.H., Asaria, P., Blakely, T., Cowan, M.J., Farzadfar, F., Guerrero, R., Ikeda, N., Kyobutungi, C., Msyamboza, K.P., Oum, S., Lynch, J.W., Marmot, M.G., & Ezzati, M. (2013). Inequalities in non-communicable diseases and effective responses. *The Lancet*, 381(9866), 585-597.
[https://doi.org/10.1016/S0140-6736\(12\)61851-0](https://doi.org/10.1016/S0140-6736(12)61851-0)
- Goodman, R.A., Posner, S.F., Huang, E.S., Parekh, A.K., & Koh, H.K. (2013). Defining and measuring chronic conditions: Imperatives for research, policy, program, and practice. *Preventing Chronic Disease*, 10. <http://dx.doi.org/10.5888/pcd10.120239>

- Gunning, J.N. (2022). "But you don't look sick:" Memorable messages of emerging adulthood autoimmune disease. *Journal of Social and Personal Relationships*.
<https://doi-org.uri.idm.oclc.org/10.1177/02654075221137548>
- Harris, Kathleen Mullan, and Udry, J. Richard. National Longitudinal Study of Adolescent to Adult Health (Add Health), 1994-2018 [Public Use]. Carolina Population Center, University of North Carolina-Chapel Hill [distributor], Inter-university Consortium for Political and Social Research [distributor], 2022-08-09. <https://doi.org/10.3886/ICPSR21600.v25>
- Ho, I.S, Azcoaga-Lorenzo, A., Akbari, A., Black, C., Davies, J., Hodgins, P., Khunti, K., Kadam, U., Lyons, R.A., McCowan, C., Mercer, S., Nirantharakumar, K., & Guthrie, B. (2021). Examining variation in the measurement of multimorbidity in research: A systematic review of 566 studies. *The Lancet Public Health*, 6(8), 587-597. [https://doi.org/10.1016/S2468-2667\(21\)00107-9](https://doi.org/10.1016/S2468-2667(21)00107-9)
- Hooper, M.W., Nápoles, A.M., & Pérez-Stable, E.J. (2020). COVID-19 and racial/ethnic disparities. *JAMA*, 323(24), 2466-2467. <https://doi.org/10.1001/jama.2020.8598>
- Indian Health Service. (2019, October). *Disparities*.
<https://www.ihs.gov/newsroom/factsheets/disparities/>
- Inter-university Consortium for Political and Social Research. (2022, August 09). *National Longitudinal Study of Adolescent to Adult Health (Add Health), 1994-2018 [Public Use] (ICPSR 21600)*.
<https://www.icpsr.umich.edu/web/ICPSR/studies/21600/summary>
- Johnston, M.C., Crilly, M., Black, C., Prescott, G.J., & Mercer, S.W. (2019). Defining and measuring multimorbidity: A systematic review of systematic reviews.

European Journal of Public Health, 29(1), 182-189.

<https://doi.org/10.1093/eurpub/cky098>

Kang, H. (2013). The prevention and handling of missing data. *Korean Journal of Anesthesiology*, 64(5), 402-406. <https://doi.org/10.4097/kjae.2013.64.5.402>

Lewis, M.E., & Myhra, L.L. (2018). Integrated care with Indigenous populations: Considering the role of health care systems in health disparities. *Journal of Health Care for the Poor and Underserved*, 29(3), 1083-1107.

<https://doi.org/10.1353/hpu.2018.0081>

Mair, F.S., & Jani, B.D. (2020). Emerging trends and future research on the role of socioeconomic status in chronic illness and multimorbidity. *The Lancet Public Health*, 5(3), 128-129. [https://doi.org/10.1016/S2468-2667\(20\)30001-3](https://doi.org/10.1016/S2468-2667(20)30001-3)

Manandhar, M., Hawkes, S., Buse, K., Nostrati, E., & Magar, V. (2018). Gender, health, and the 2030 agenda for sustainable development. *Bulletin World Health Organization*, 96(9), 644-653. <https://doi.org/10.2471/BLT.18.211607>

Maslow, G.R., Haydon, A., McRee, A.L., Ford, C.A., & Halpern, C.T. (2011). Growing up with a chronic illness: Social success, educational/vocational distress. *Journal of Adolescent Health*, 49(2), 206-212.

<https://doi.org/10.1016/j.jadohealth.2010.12.001>

Nabi, J., Tully, K.H., Cole, A.P., Marchese, M., Cone, E.B., Melnitchouk, N., Kibel, A.S., & Trinh, Q.D. (2021). Access denied: The relationship between patient insurance status and access to high-volume hospitals. *Cancer*, 127(4), 577-585.

<https://doi.org/10.1002/cncr.33237>

- National Institute of Diabetes and Digestive and Kidney Diseases. (2018). *Health risks of overweight and obesity*.
<https://www.niddk.nih.gov/health-information/weight-management/adult-overweight-obesity/health-risks>
- National Institute of Mental Health. (2021). *Chronic illness and mental health: Recognizing and treating depression*.
<https://www.nimh.nih.gov/health/publications/chronic-illness-mental-health>
- Newman, B.M., & Newman, P.R. (2018). *Development through life: A psychosocial approach* (13th ed.). Cengage Learning.
- Nusselder, W.J., Wapperom, D., Looman, C.W.N., Yokota, R.T.C., van Oyen, H., Jagger, C., Robine, J.M., & Cambois, E.M. (2019). Contribution of chronic conditions to disability in men and women in France, *European Journal of Public Health*, 29(1), 99–104. <https://doi.org/10.1093/eurpub/cky138>
- Office of the Assistant Secretary for Planning and Evaluation. (n.d.). *Frequently asked questions related to the poverty guidelines and poverty*.
<https://aspe.hhs.gov/topics/poverty-economic-mobility/poverty-guidelines/frequently-asked-questions-related-poverty-guidelines-poverty>
- Pathirana, T.I., & Jackson, C.A. (2018). Socioeconomic status and multimorbidity: A systematic review and meta-analysis. *Australia and New Zealand Journal of Public Health*, 42(2), 186-194. <https://doi.org/10.1111/1753-6405.12762>
- Renshaw, S., Kenawy, D., Azap, R., Gupta, A., Poulouse, B., & Collins, C. (2022). Impact of insurance type in postoperative emergency department utilization and clinical

outcomes following ventral hernia repair (VHR). *Surgical Endoscopy*, 36, 9416-9423. <https://doi.org/10.1007/s00464-022-09287-7>

Rhode Island Department of Health. (2023). *Chronic conditions*. <https://health.ri.gov/chronicconditions/>

Roubinov, D.S., Hagan, M.J., Boyce, W.T., Adler, N.E., & Bush, N.R. (2018). Family socioeconomic status, cortisol, and physical health in early childhood: The role of advantageous neighborhood characteristics. *Psychosom Med*, 80(5), 492-501. <https://doi.org/10.1097/PSY.0000000000000585>

Shanahan, M.J., Cole, S.W., Ravi, S., & Harris, K.M. (2022). Socioeconomic inequalities in molecular risk for chronic diseases observed in young adulthood. *PNAS*, 119(43). <https://doi.org/10.1073/pnas.2103088119>

Sporinova, B., Manns, B., Tonelli, M., Hemmelgarn, B., MacMaster, F., Mitchell, N., Au, F., Ma, Z., Weaver, R., & Quinn, A. (2019). Association of mental health disorders with health care utilization and costs among adults with chronic disease. *JAMA Network Open*, 2(8). <https://doi.org/10.1001/jamanetworkopen.2019.9910>

United States Census Bureau. (2022). *Health insurance coverage in the United States: 2021*. <https://www.census.gov/library/publications/2022/demo/p60-278.html>

United States Census Bureau. (2021). *Health insurance glossary*. <https://www.census.gov/topics/health/health-insurance/about/glossary.html>

U.S. Department of Health and Human Services. (n.d.). *Healthy People 2030*. <https://health.gov/healthypeople/objectives-and-data/browse-objectives/overweight-and-obesity>

U.S. Department of Health and Human Services. (n.d.). *Healthy People 2030*.

<https://health.gov/healthypeople/priority-areas/social-determinants-health/literature-summaries/poverty>

Van Wilder, L., Pype, P., Mertens, F., Rammant, E., Clays, E., Devleeschauwer, B.,

Boeckxstaens, P., & De Smedt, D. (2021). Living with a chronic disease: Insights from patients with a low socioeconomic status. *BMC Family Practice*, 22(233).

<https://doi.org/10.1186/s12875-021-01578-7>

Zajacova, A., & Lawrence, E.M. (2018). The relationship between education and health:

Reducing disparities through a contextual approach. *Annual Review Public*

Health, 39, 273-289. <https://doi.org/10.1146/annurev-publhealth-031816-044628>.