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Impact of the Affordable Care Act on the HIV Care Continuum

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Abstract

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MPH, Kaplan University, 2013

BSN, Mountain State University, 2010

Dissertation Submitted in Partial Fulfillment

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Doctor of Philosophy

Public Health—Epidemiology

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Abstract

People living with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS; PLWHA) are at increased risk of insufficient medical care due to lack of insurance. Inadequate medical care for PLWHA contributes to increases in HIV transmission rates. The U.S. Surveillance Report noted that in 2015, over 1.2 million people were living with HIV infection, and there were approximately 50,000 new infections every year. The report further stated that about 675,000 people have died from HIV-related illnesses since its discovery in 1981. The implementation of the Affordable Care Act (ACA) in 2014 was intended to provide Americans, including people at risk of or living with HIV, options for health insurance coverage and better access to health care. It was also designed to allow people with existing health conditions such as HIV to reach for optimal health, irrespective of the severity of their condition. Andersen's behavioral model and economic theory provided the theoretical framework and conceptual foundation for this study's assessment of the impact of the ACA on the HIV care continuum. This quantitative study used secondary data with a retrospective correlational design. Data from the Health Resources Service Administration and the Behavioral Risk Factor Surveillance System were analyzed. Overall, chi-square tests indicated a steady increase in the number of PLWHA who achieved viral suppression ($\chi2$ $(1) = 105, p < .001$) between 2010 and 2015. Future research should include the general American population to assess the impact of the ACA. This study could lead to positive social change as PLWHA are made more aware of the benefits of comprehensive health care coverage and increase healthcare utilization, leading to improved health for those infected and less transmission of the virus.

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Dedication

This study is lovingly dedicated to my children, Unique, Jewel, Destiny, and Joshua Erugo. You are my loudest cheerleaders. You continued to cheer me on and propelled me to keep moving even when I thought I had reached my limit. You are truly my inspiration, and you showed your faith in me when you expressed that when you grow up, you would like to be just "like Mommy because she is getting her doctorate degree even with all the challenges she is facing." I thank you for believing in me; I thank you for constantly praying for me; I thank you for allowing me have some time to myself to complete my school work each time I requested it. I thank you for your support and unconditional love, and most of all, I thank you for sharing your world with me. I love you all more than words can ever express, and I believe in all of you to reach every goal you set for yourselves.

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Chapter 1: Introduction to the Study

Introduction

Over 1.2 million people are currently living with human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) in the United States. Unfortunately, according the Centers for Disease Control and Prevention (CDC, 2016b), about 1 in 8 of these people are unaware that they have HIV. HIV/AIDS is a serious disease that requires close medical attention. People living with HIV/AIDS (PLWHA) must receive antiretroviral treatment (ART) in order to achieve positive health outcomes (Ndou, Maputte, & Resenga, 2016). In the absence of treatment, HIV advances in stages, overwhelming and weakening the immune system over time. The four stages are primary infection, clinically asymptomatic**,** symptomatic infection, and finally progression from HIV to AIDS (Kaplan, 2014). Cox (2016) documented that delayed treatment very often increased medical costs.

Researchers at the CDC (2016b) reported that there were disparities in the prevalence of HIV in the United States based on age, noting that the highest prevalence occurred in the age bracket of 13-19 years, which accounted for a total of 15,738 infections constituting 36% of the total infected population. However, Boehme et al. (2012) noted that there were also disparities based on race, gender, and socioeconomic status (SES). According to the authors, African Americans have the highest prevalence of HIV compared to other races, making up 48% of the overall infected population. Boehme et al. also reported that 72% of the infected population consisted of men; the remaining 28% were women. Studies showed that 21% of individuals who were infected with HIV were not aware of their condition, while the majority of those who knew about their condition did not have access to HIV care (Boehme et al., 2012; Doshi, Li, Ladage, Pettit, & Taylor, 2016).

The HIV care continuum, which involves the diagnosis of HIV, provision of timely and reliable HIV care, access to ART, and retention in HIV care with the ultimate goal of achieving viral suppression, was established in 2013 to enhance care for PLWHA (Doshi, Malebranche, Bowleg, & Sangaramoorthy, 2013). According to the CDC (2016b), at the end of 2015, over 1.2 million people were living with HIV, and out of this number, approximately 13% were unaware of their positive status. Since the discovery of HIV, about 500,000 people have died as a result of the virus (CDC, 2016b). Significant progress has been achieved in the fight against HIV/AIDS over the past few decades. According to Doshi, Malebranche, Bowleg, and Sangaramoorthy (2013), over the last 20 years, substantial progress in HIV care has led to an increase in life expectancy, reduction of HIV transmission, and overall improvement in health and quality of life among PLWHA.

In the past, HIV/AIDS was believed to be an unmanageable and invariably fatal disease, but the improvement of HIV care has transformed it into a controllable chronic disease like high blood pressure and diabetes. The goal of the HIV care continuum is for PLWHA to remain in care so that their viral load becomes so low that it can no longer be detected, a condition termed *viral suppression*. However, there are still numerous barriers facing PLWHA and care providers in regard to HIV care (Kaplan, 2014). Consequently, a significant number of PLWHA are still not virally suppressed. Studies show that 75% of

PLWHA on ART in the United States are not virally suppressed (Doshi et al., 2013). The lack of viral suppression is a major problem because it is through sufficient viral suppression that PLWHA can achieve positive health outcomes and improved quality of life (Cox, 2016). In addition, viral suppression significantly reduces the likelihood of HIV transmission, thereby reducing the rate of HIV/AIDS (Cox, 2016).

According to the CDC's (2016c) HIV care continuum in the United States, of a total 87.0% diagnosed with HIV in 2014, 74.5% were linked to care, 56.5% were retained in care, and only 54.7% achieved viral suppression. This was a great improvement over the previous year's retention rate of only 37% (CDC, 2016c). The CDC care continuum also indicated that 13% of PLWHA were still undiagnosed. Thus, there are significant gaps between diagnosis and both linkage and retention, which ultimately result in increased health care costs because of delayed diagnosis and treatment (Cox, 2016).

According to Kates (2013), most HIV-infected patients with low income cannot afford insurance and therefore have a lower likelihood of achieving viral suppression compared to patients with high incomes. However, programs such as the Ryan White federal grant program have been introduced to address existing barriers to the accessibility and affordability of such HIV care (Kates, 2013). As this program is not insurance, PLWHA can access only limited services due to existing rules and regulations on the types of services offered in the program (Kates, 2013). In addition, the Ryan White program is a federal grant; thus, it is subject to uncertainty arising from policy makers, politicians, and fears of budget cuts (Kates, 2013). However, recent developments in the U.S. health care sector have led to significant improvements in the Ryan White program and the care for PLWHA (Kates, 2013). The Obama administration was committed to upholding strong and continuous funding for the Ryan White program by ensuring that PLWHA continued to have access to treatment without service gaps (The White House, 2015).

The implementation of the Affordable Care Act (ACA) was expected to improve the quality of care for PLWHA significantly, improve access to HIV care, and facilitate the retention of PLWHA in the HIV treatment continuum (Crowley & Kates, 2013). However, it is believed that the Ryan White program activities will not be minimized with the implementation of the ACA (Kates, 2013). Therefore, to ensure that the ACA improves access to HIV care and promotes positive health outcomes among PLWHA, there is a need to assess the impact of the ACA on accessibility, affordability, and retention in care among PLWHA (Crowley & Kates, 2013). As life expectancy increases among PLWHAs and medical coverage improves, the total utilization of health care resources among HIV patients can only be expected to increase (Greenberg, Purcell, Gordon, Barasky, & Del Rio, 2015). The major aim of providing optimal care and improving viral suppression among PLWHA is to reduce HIV-related morbidity and mortality (Greenberg et al., 2015) and reduce the HIV transmission rate.

At the time of enactment of the ACA, over 1.5 million cases of HIV/AIDS had been reported in the United States (Greenberg et al., 2015). In addition, approximately 500,000 PLWHA had died, mainly because ART was not available (Greenberg et al., 2015). By improving access to and affordability of HIV care, the ACA is expected to improve health outcomes among PLWHA by ensuring the achievement of virologic suppression, thus reducing the rate of HIV transmission and mortality (Blumenthal, Abrams, & Nuzum, 2015). According to Sood, Wagner, and Wu (2015), limited research has been conducted on the impact of expanded health insurance coverage on the prevalence of HIV transmission in the United States. Therefore, a need exists for the development of new investigations that are tailored specifically toward discovering the impact of the ACA on the HIV care continuum from linkage through retention with the ultimate goal of achieving viral suppression (Sood et al., 2015). The results of the present study may also add to the knowledge base of both practitioners and PLWHA regarding the impact of the ACA on the HIV care continuum in the United States (Crowley & Kates, 2013).

In this chapter, I provide background information on the ACA, the HIV/AIDS epidemic in the United States, and the impact of the ACA on the HIV care continuum. This chapter also contains the problem statement and a description of the study's purpose, significance, implications, limitations and delimitations, research questions, hypotheses, scope, assumptions, and the theoretical and conceptual models. Definitions of key terms used in this study and a comprehensive summary of the chapter are provided. Last, I explain how this study supports positive social change by examining the impact of the ACA on the components of the HIV care continuum. Positive social change may result from improved access to care, reduction in health care costs for HIV-positive individuals, and viral suppression.

Background

The HIV/AIDS Epidemic in the United States

Statistics from the CDC (2016b) indicate that there are approximately 1.2 million Americans infected with HIV. Of this population, 4% are aged between 13 and 26 years. In 2015, it was estimated that there were approximately 40,000 new cases of HIV in the United States (CDC, 2016b). The CDC (2016b) has also indicated that among HIV-infected individuals aged 13-26 years, only 40% are aware of their diagnosis. Infected individuals' lack of awareness of their HIV status presents a major problem in the fight against the HIV epidemic in the United States (CDC, 2016b).

The HIV epidemic in the United States has affected people disproportionately based on gender, race, and SES. For example, individuals from ethnic minority groups such as African Americans and Latinos face higher risks of contracting HIV compared to Whites (CDC, 2016b). African Americans and Latinos are 7 times more likely to be infected with HIV (Xia et al., 2017) when compared to Whites. With the availability of treatment for HIV/AIDS, health care institutions have directed their focus to identifying PLWHA, linking them to HIV care, and retaining them in HIV care (Xia et al., 2017). Although numerous efforts have been made to improve the treatment cascade for PLWHA, researchers have documented challenges and barriers that still exist in this effort. Fox and Rosen (2017) reported that incomplete engagement of PLWHA is common in the United States and accounts for the largest percentage of PLWHA who still have detectable viremia. After controlling for the socioecological barriers to treatment, Fox and Rosen noted that only 56% of PLWHA who are eligible for ARTs receive adequate HIV care. The lack of access to care for these PLWHA indicates the presence of disparities based on linkage to care and retention in the HIV care continuum (Kay, Batey, & Mugavero, 2016). A need for the present study existed so that a gap in the professional literature could be closed regarding the impact of the ACA on health care access and affordability of HIV care for HIV-infected individuals. Moreover, the results of this study may help to identify the impact of the ACA on HIV-infected patients in HIV/AIDS service organizations (ASOs), which ultimately may lead to the adoption of policies that will bring about positive social change.

The Affordable Care Act

The implementation of the ACA marked a turning point for public health policy in the United States. The ACA forms the basis for legal protections that were previously absent, including almost universally guaranteed access to affordable health insurance (Blumberg & Holahan, 2015). Implementation of the ACA was expected to reduce the number of uninsured Americans by 31 million people, facilitate insurance coverage for 94% of Americans, and increase the enrollment in Medicaid by 15 million people (Blumberg & Holahan, 2015). However, according to the National Center for Health Statistics (NCHS, 2017), 24.8 million Americans under the age of 65 are still without insurance coverage.

According to Silvers (as cited in Blumenthal et al., 2015), the ACA has three main objectives and five aims. The three objectives are as follows:

- to expand access to health insurance
- to guard individuals against illogical activities of insurance companies

- to reduce costs

The five aims of the ACA are to do the following (Silvers, as cited in Blumenthal et al., 2015):

- achieve near-universal coverage
- improve quality, fairness, efficiency, and health care value
- minimize wasteful spending and improve accountability in the health care sector
- improve primary health care access
- invest strategically in public health through expansion of community investments and clinical preventive care.

Currently, health care transactions in the United States involve the patient, the billing health care provider, and a third-party payer company that negotiates on behalf of the client regarding payment rates and out-of-pocket contributions (Kaplan, 2014). The patient is also required to pay a specific amount of health care costs directly to the care provider. Third-party payers include publicly funded programs as well as private insurance companies. Of the publicly funded programs, Medicaid offers insurance coverage to American citizens with low income, while Medicare focuses on providing coverage to citizens with qualifying disabilities and seniors (Lyon, Douglas, & Cooke, 2014). Some persons may be eligible to use both programs.

The insurance coverage of PLWHA is important because insurance is strongly linked to positive health outcomes. According to Blumenthal, Abrams, and Nuzum (2015), PLWHA who have insurance coverage have a higher likelihood of viral suppression, lower risk of transmission, and less frequent use of acute care services compared to uninsured individuals. However, among PLWHA who are insured, underinsurance remains a major problem (Blumenthal et al., 2015). For instance, to access coverage for prescription drugs under Medicare, one must use the Medicare Part D program at a specific premium rate (Blumenthal et al., 2015). The coverage plans involve large copayments, cost-sharing agreements, and deductibles that become costly for PLWHA with low income. In addition, most plans have coverage gaps, which are costly for PLWHA, as they are required to meet the additional cost of health care or a deductible after the insurer reaches a given allowance (Lyon et al., 2014).

The Impact of the ACA on HIV Care in the United States

The implementation of the ACA was expected to change the health care structure in the United States significantly, particularly affecting PLWHA. Although some of the impact of the ACA has been felt since its implementation in 2014, more significant effects are expected to become apparent in the near future. In relation to PLWHA, the most important change was improvement in access to HIV care through the expansion of Medicaid to include individuals who were below the federal poverty level of 138% (Sherer, 2012). The Kaiser Family Foundation conducted a study in five states on the effects of the ACA on health care of PLWHA and concluded that the ACA had enabled PLWHA to discover more comprehensive and affordable health insurance coverage (Kates, Dawson, Undem, & Perry, 2014). However, individuals are still expected to comply with other requirements such as pregnancy or having disabling or life-altering conditions. Among PLWHA, a positive HIV diagnosis confers eligibility based on a disabling condition, meaning that most PLWHA who have low income qualify. Of PLWHA who benefit from AIDS drug assistance programs (ADAPs), only 53% meet the current requirements for Medicaid enrollment, thus indicating a shift of dependence to ADAPs that has been caused by the expansion of Medicaid under the ACA (National Alliance of State and Territorial AIDS Directors, 2014). One of the requirements of the ACA is that individuals can be included in their parents' medical coverage plans up to the age of 26 years (Lyon et al., 2014). Before the implementation of the ACA, children's options for coverage under their parents' plans were dropped at ages 19 and 22 years (Lyon et al., 2014). Research has indicated that the majority of HIV infections occur between the ages of 19 and 25 years; therefore, the ACA provides an important source of coverage for PLWHA in this segment of the population (Lyon et al., 2014).

The implementation of the ACA in 2014 provided an avenue for uninsured, high-income PLWHA to access coverage through subsidized state health insurance exchanges. Under this program, families that earn between 100% and 400% of the FPL are subsidized on a sliding scale (Farnham et al., 2013). However, the exchanges in these insurance plans must meet specific criteria, such as providing coverage to individuals regardless of preexisting conditions (e.g., HIV/AIDS). In addition, there should be no lifetime or annual coverage caps in the insurance plans (Farnham et al., 2013). The prohibition of lifetime caps is specifically beneficial for PLWHA, whose lifetime costs may be in excess of $400,000 due to diagnosis in earlier years or diagnosis in the course of the disease (Farnham et al., 2013). Based on the ACA, insurance plans are required to offer full coverage for specific benefits, including substance abuse and mental health care, laboratory services, and prescription drugs, as well as emergency, inpatient, and outpatient services (Farnham et al., 2013).

The implementation of the ACA is also expected to impact HIV diagnoses significantly. Currently, approximately 13% of those infected with HIV (or 1 in 8) are unaware of their positive status (CDC, 2016b), and according to Wagner et al. (2014), approximately 50% of HIV transmissions are attributed to PLWHA who are not aware of their condition. The expansion of insurance coverage through the ACA was expected to increase diagnoses of HIV in the United States through early and routine HIV testing, to increase opportunities for early and timely linkage to HIV care for PLWHA, and to facilitate treatment of HIV (Crowley & Kates, 2013). With increased frequency of HIV testing, PLWHA would be able to access early treatment, thus reducing the rate of HIV transmissions and achieving positive health outcomes and extension of life expectancy (Wagner et al., 2014).

Several researchers anticipated that the implementation of the ACA would improve the quality of HIV care and access to HIV care for PLWHA (Crowley & Kates, 2013; Kates, 2013). However, some experts also argued that, despite the likelihood of improvement in HIV care, other HIV programs such as the Ryan White grant would continue to play a major role in the HIV care continuum by continuing to support those individuals who are not qualified to enroll under the ACA (Crowley & Kates, 2013). In addition, limited evidence has been reported of the impact of the ACA on linkage, access, and quality of HIV care (Crowley & Kates, 2013). Therefore, for the ACA to have a significant positive impact on the HIV care continuum, it is important to evaluate the actual effects that the ACA has had on health care utilization, coverage, and the cost of HIV care. The present study was aimed to assess the impact of health insurance coverage expansion on the prevalence of HIV transmission in the United States from testing and counseling to linkage and through to retention. The results of this study were expected to show a positive impact of the ACA on the HIV care continuum, which would further the adoption of the program by political authorities and practitioners in the United States for improved service.

Problem Statement

HIV infection continues to be a major public health issue in the United States. As of 2014, over 1.2 million people were still living with HIV infection, and even though the annual number was reported to have declined by 19% in 2015, approximately 44,073 new people were diagnosed with this virus (CDC, 2016b). Current data from the CDC indicate that, as of 2015, approximately 13% of HIV-infected individuals in the United States were unaware of their HIV status (CDC, 2016b). These statistics show that there is a need for developing strategies that are focused on decreasing the prevalence of HIV (CDC, 2016b). In spite of the strides that have been made with the HIV treatment cascade, this virus continues to present as a national epidemic across all age brackets, social classes, and races, especially among homosexuals and injection drug users (IDUs; CDC, 2016b). According to Siddiqi and Hall (2015), the highest rate of new HIV infections occurs among individuals aged between 20 and 24 years. Compared to other races, African Americans have the highest rate of new HIV infections with 44% (Siddiqi & Hall, 2015).

HIV-positive individuals are also less likely to be insured than their HIV-negative counterparts. Eligible persons rely on Medicaid, whereas those who are not Medicaid-eligible rely on emergency room services for their medical needs (Kates, 2013). Even though evidence has indicated that early initiation of ART improves quality of life for those with HIV and reduces the risk of HIV transmission, the CDC reported that 63% of HIV-infected individuals are not retained in care; the percentage of HIV-infected individuals who do not take ART and those who are not virally suppressed amount to 33% and 75%, respectively (Kates, 2013). Research on the HIV care continuum and the ACA has increased over the past few years (Hall et al., 2013). Most studies in this area have been focused on assessing the HIV care continuum, but only a few have examined factors affecting the HIV care continuum in the United States in association with the introduction of the ACA (Hall et al., 2013). It was the aim of this study to evaluate the impact of the implementation of the ACA on the HIV care continuum among HIV-positive individuals in the United States.

Purpose of the Study

The main purpose of this study was to assess the impact of the ACA on the HIV care continuum. However, to provide a broader context for the effects of the ACA on HIV-positive individuals using the Health Resources and Service Administration (HRSA) data set, I also examined trends in health care among a nationally representative sample from the CDC’s Behavioral Risk Factor Surveillance System (BRFSS) data set, as it relates to access to health care and out-of-pocket health care costs. This study was aimed at examining the impact of the ACA on health care access and affordability of HIV care among HIV-infected individuals in HIV/AIDS service organizations (ASOs). I chose a quantitative approach for this study. I also aimed at assessing any impact of the implementation of the ACA on out-of-pocket health care costs for HIV-positive individuals, which affect their care provision. Lastly, I used the HRSA data set to assess whether there had been any changes in access to HIV care, as measured by insurance coverage; out-of-pocket health care costs; and treatment outcome, as measured by achievement of viral suppression among PLWHA, since the implementation of the ACA. In a broader context, I also used BRFSS data sets in this study to examine similar impacts on the general public resulting from the introduction of the ACA with respect to access to health care and out-of-pocket health care costs. The independent variable in this study was introduction of the ACA, whereas the dependent variables were access to health care, out-of-pocket health care costs, and treatment outcome. The covariates included age, gender, and race.

Research Questions and Hypotheses

The research questions guiding this study were as follows:

RQ1: What is the impact of the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals?

H_o1: There will be no impact due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals.

H_a1: A statistically significant impact exists due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals.

RQ2: What is the impact of the implementation of the ACA on the poverty status of HIV-positive individuals?

H_o2: There will be no impact due to the implementation of the ACA on the poverty status of HIV-positive individuals.

H_a2: A statistically significant impact exists due to the implementation of the ACA on the poverty status of HIV-positive individuals.

RQ3: What is the impact of the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals?

H_o3: There will be no impact due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals.

H_a3: A statistically significant impact exists due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals.

RQ4: What is the impact of the implementation of the ACA on access to health care for adults in the United States?

H_o4: There will be no impact due to the implementation of the ACA on access to health care for adults in the United States.

H_a4: A statistically significant impact exists due to the implementation of the ACA on access to health care for adults in the United States.

RQ5: What is the impact of the implementation of the ACA on out-of-pocket health care costs for adults in the United States?

H_o5: There will be no impact due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States.

H_a5: A statistically significant impact exists due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States.

Theoretical Foundation and Conceptual Framework

Theoretical Foundation

The theoretical foundation of this study was based on economic theory and R. M. Andersen's (1995) behavioral model of utilization of health services. Economic theory indicates that a patient can use the information provided and the price of the medication to gauge the balance between benefits and limitations of the medication (Ekelund & Hebert, 2013). As a result, the patient will consume only the optimum amount of medication depending on priorities and level of income. Insurance companies provide patients with prescription coverage, which motivates insured patients to access and consume needed medications, in contrast to uninsured patients (Ekelund & Hebert, 2013). Therefore, improving access to insurance coverage can have significant behavioral and economic implications for HIV-infected individuals. Doshi, Li, Ladage, Pettit, and Taylor (2016) further pointed out that an increase of insurance coverage could reduce patients' economic burden, thus improving adherence to ART, which ensures retention in the HIV care continuum. On the other hand, movement of patients from the coverage gap means that they have to meet the full cost of medications, thus reducing the likelihood of adherence, which may lead to poor retention in the HIV care continuum (Doshi et al., 2016).

R. M. Andersen’s behavioral model has been widely used to investigate the usage of health care services (Babitsch, Gohl, & von Lengerke, 2012). R. M. Andersen’s model is based on the premise that patient outcomes are determined by environmental factors, health behavior factors, and population factors (Babitsch et al., 2012). Based on R. M. Andersen’s model, environmental factors comprise factors in the health care system and the external environment (Babitsch et al., 2012). Population factors include predisposing characteristics, enabling resources, and need. Finally, health behavior factors comprise personal health practices and utilization of health services (Babitsch et al., 2012). The focus of this study was directed toward population factors, specifically toward enabling resources, to determine if the implementation of the ACA has had a significant impact on the health care needs of HIV-infected individuals.

Conceptual Framework

The conceptual framework for this study involved R. M. Andersen’s (1995) behavioral model for health care utilization and economic theory. Andersen’s framework is based on identifying the conditions that promote or impede utilization of health care services. The purpose of such a framework is to facilitate the development of a health behavioral model that provides variables that can be used to measure accessibility of health care. Andersen’s model was first developed in the 1960s and has undergone numerous transformations (R. M. Andersen, 1995). The fourth and final phase, which was developed in the 1990s, involved three major characteristics: predisposing factors, enabling factors, and need factors. The predisposing factors involve people’s sociocultural characteristics, which exist before an illness occurs (R. M. Andersen, 1995). These sociocultural characteristics include race/ethnicity, culture, occupation, social networks and interactions, and education. Health beliefs are also categorized under sociocultural factors and include attitudes, social values, and existing knowledge regarding the health care system. Enabling factors involve the logistical aspects of accessing health care. Enabling factors include the family, community, and additional factors such as genetic and psychological factors that transfer support (R. M. Andersen, 1995). Last, need factors represent the most common reasons for use of health care services and involve health issues that necessitate the use of health services. Based on Andersen’s model, health behaviors need to be identified before the implementation of health behavior models. According to Andersen, effective behavioral change can occur only when a specific set of health behaviors is targeted. The targeted change that was measured in this study was the impact of the ACA on access to health care for HIV-positive individuals, affordability of service for HIV-positive individuals, and treatment outcome for HIV-positive individuals, as measured by viral suppression using the HRSA data set. However, in order to provide a broader context for the effects of the ACA on HIV-positive individuals, I also included a nationally representative sample from the

BRFSS data set to measure the impact of the implementation of the ACA on access to health care and out-of-pocket health care costs for other adults in the United States.

Economic theory indicates that when patients want to purchase medications, they are faced with a decision on which products meet their needs or have the least adverse effects on their health status. Therefore, patients have to forego other medical options and consume the optimal amount of the medications or health care services they can afford (Squires & Anderson, 2015). In this study, economic theory has been applied to assess the behavior of PLWHA in relation to the cost of medical coverage before and after the implementation of the ACA. A detailed discussion of the conceptual framework for this study is provided in Chapter 2.

Nature of the Study

This study employed a quantitative design, which aligned with the aim of evaluating the relationship between the implementation of the ACA and its impact on the HIV care continuum for HIV-positive individuals, specifically with respect to access to health care, out-of-pocket health care costs, and treatment outcome. This study involved data collection at a defined time so that the data could be used for answering the research questions after the intervention of the ACA and its effect on the HIV care continuum. While relying solely on secondary data that were originally collected after the implementation of the ACA, I compared treatment outcomes before and after the ACA. I used a quantitative correlational research design, which was adopted based on economic theory and R. M. Andersen's behavioral model of the use of health services. The choice of a quantitative correlational research design helped to establish whether a relationship existed between the dependent and independent variables. Keeping the focus of this study on health care access and affordability should be consistent with economic theory and Andersen's behavioral model. To answer the research questions posed for the study, data from the Annual Client-Level Data Program Services Report (RSR) from 2014 to 2015 were used to compare health care access, affordability, and treatment outcome for HIV-infected individuals since the implementation of the ACA in 2014 with the same factors as observed in the years just prior to the implementation of the ACA. I also collected BRFSS data from the years 2014 to 2015 to assess changes in health care access and out-of-pocket health care costs for other adults in the United States since the implementation of the ACA in 2014, comparing these data to the same factors observed in the years just prior to the implementation of the ACA. It was expected that, by the end of this study, the results would demonstrate the impact of the ACA on the HIV care continuum and, depending on the results, similar policies might be implemented to continue or to improve the care continuum. The key variables in this study were implementation of the ACA as the independent variable and access to health care, out-of-pocket costs, and treatment outcome as measured by viral suppression as the dependent variables. The participants' sociodemographic characteristics (age, gender, and race) were the covariates.

Definition of Terms

Affordable Care Act (ACA): The ACA is health care legislation that was signed into law in 2010 by President Barack Obama to improve access to and affordability of medical insurance coverage for individuals with limited income (Burge & Schade, 2014).

HIV care continuum: Also known as the *HIV treatment cascade*, the HIV care continuum refers to a framework that is employed by state, federal, and local institutions to improve the delivery of HIV care to people living with HIV/AIDS (PLWHA) across the continuum of care (McNairy & El-Sadr, 2012).

Medicaid: Medicaid refers to a joint program, funded primarily by the federal government but run at the state level, that helps qualified families or individuals with low income and disabilities to meet long-term medical and custodial costs (Lyon et al., 2014).

Medicare: Medicare is medical health insurance coverage in the United States for people who are aged 65 years or older and people under the age of 65 years who have certain qualifying disabilities or end-stage renal disease (ESRD; M. Andersen, 2012).

People living with HIV/AIDS (PLWHA): The term *PLWHA* refers to individuals who are infected with HIV or have been diagnosed with AIDS (Khan, Moorthy, Omar, & Hasan, 2012).

State: The term *state* is used in this study to capture all of the areas that participated in the BRFSS survey during the study period. These areas include the 50 states of the United States, the District of Columbia, the Virgin Islands, Puerto Rico, American Samoa, Palau, and the Federated States of Micronesia (CDC, 2013).

Viral suppression: Viral suppression refers to the instance when the ART regimen has significantly reduced an individual's viral load (HIV RNA) to undetectable levels (Phillips et al., 2013).

Viremia: A medical condition in which viruses enter the bloodstream and have access to the rest of the body ("Medical Definition of Viremia," n.d.).

Assumptions

A number of assumptions had to be made in this study. First, it was assumed that the research articles used in this study were consistent with those used by health care professionals and contained adequate empirical and theoretical data regarding the impact of the ACA. It was also assumed that the secondary data used in this study were reliable and free of any type of bias that might influence the findings. Another assumption was that data for the relevant variables used in the statistical analysis were accessible and could be modeled using existing theoretical frameworks. It was also assumed that R. M. Andersen’s (1995) behavioral model could be used to demonstrate the effectiveness of the use of HIV care resources.

Another assumption was that the PLWHA maintained the same patterns of expenditure and encounters that they used before the implementation of the ACA. For example, it was assumed that the services offered under Medicaid insurance coverage would not change after implementation of the ACA.

To get reliable results, it is important to minimize the likelihood of bias during data collection (Tripathy, 2013). However, because secondary data had to be used in this study, it was assumed that the data from the BRFSS were reliable. The assumption that the ACA may significantly influence viral suppression, cost, and accessibility of HIV care was also based on previous research findings (Hall et al., 2013).

Scope and Delimitations

Scope

The problem addressed in this project involved the high rates of HIV infection and transmission in the United States, which are caused by lack of adequate medical coverage for PLWHAs (Crowley & Kates, 2013). The implementation of the ACA in 2014 was expected to improve medical insurance coverage among PLWHA with low income significantly, thus facilitating viral suppression and positive health outcomes (Kates, 2013). I chose this focus because of the lack of access to HIV care among PLWHAs with low income due to costly health care plans and the high cost of HIV treatment (Crowley & Kates, 2013). With the change in health care reform resulting from the ACA, the enrollment of PLWHA in Medicaid and Medicare was expected to increase (Crowley & Kates, 2013). As a result, this study was aimed at assessing the impact of the ACA on access and affordability of HIV care, as well as treatment outcome, as measured by the achievement of viral suppression. It was my hope from the outset of this study that, with more people achieving viral suppression, the rate of HIV transmission would be significantly reduced, thereby reducing the rate of HIV/AIDS in general (CDC, 2016b).

Delimitations

This study was based on a quantitative approach using a correlational design. Secondary data were collected to evaluate the impact of the ACA on the HIV care continuum. Unlike the limitations of a study, delimitations are under the control of the researcher. The population for this study included participants who had already been surveyed and might be eligible for Medicaid or other private health insurance coverage in the United States through the ACA. A limited number of conceptual models exist that can explain the behavior of HIV patients and their decisions based on accessing health care services (Smith, Fisher, Cunningham, & Amico, 2012). To date, studies on care for HIV/AIDS and other chronic diseases have focused on factors that influence access and usage of health care services, provision of chronic care, and management of chronic diseases (Smith et al., 2012). This study was based on economic theory and R. M. Andersen's (1995) behavioral model of health care utilization. However, other theories have also been used by researchers to evaluate access to health care, such as Edward Wagner's chronic care model and Penchansky and Thomas's model (Levesque, Harris, & Russell, 2013; Mai, Alan, Grace, &Yoo, 2012).

Limitations

A few limitations were anticipated for this study. First, the use of a quantitative correlational research design implied that the study would be affected by the limitations of using secondary data. Dissimilar to primary data, secondary data do not come with a guarantee of quality, in that the researcher was not in control of the data collection procedures. There is a higher likelihood of errors and reliability issues in secondary data, which may influence the results of a study (Tripathy, 2013). This study was also limited by the fact that its main focus was the impact of the ACA on the HIV/AIDS care continuum, even though a brief comparison was included for a nationally representative sample from the CDC data set. Thus, generalizability of the findings is somewhat limited.

In addition, the data involved only those PLWHA who were actively engaged in HIV care. Involving all PLWHAs might provide more reliable results.

Another limitation of this study was related to the assumption that the patients' patterns of expenditure remained the same after implementation of the ACA. This may not be the case because some PLWHA who used specific services pre-ACA might have changed their services after the implementation of the ACA. In addition, individuals who were previously uninsured might have differences in patterns when compared to those who were already insured. This study was also limited by the unpredictable nature of the ACA, the impact of which was based only on future predictions. The ACA was implemented in 2014; thus, the available data were limited in volume. Consequently, the analysis had to be limited to a mere few years, which may not have provided the most comprehensive representation of the impact of the ACA on accessibility of HIV care. A possible source of bias in this study was the use of secondary data. There was a high likelihood of missing data, which could have affected the reliability of the findings; however, data cleaning was conducted to ensure that all missing entries were eliminated before data analysis.

Significance

The year 2010 marked an important step in the transformation of HIV care in the United States with the enactment of the ACA by Congress and the release of the National HIV/AIDS Strategy (NHAS). This signified the start of a new era in the fight against HIV/AIDS (Kates, 2013; The White House, 2015). According to Kates (2013), these two changes formed the basis for guiding the transformation of care delivery to HIV-infected persons in the United States. The ACA was introduced with the aim of increasing access to affordable care through the expansion of Medicaid, reform of the private health care sector, and provision of tax incentives to aid the private insurance market (Kaiser Family Foundation, 2013).

On the other hand, the NHAS has three main goals: reducing the prevalence of HIV-infected individuals, increasing health care access among HIV-infected individuals, and reducing health disparities associated with HIV (The White House, 2015). The continuum of HIV care stipulates that timely initiation of ART and effective suppression of viral loads among HIV-infected individuals requires three behavioral processes of engagement: timely linkage to HIV care after positive diagnosis, increased adoption of HIV testing to identify HIV-infected individuals who are not aware of their status, and sustained retention of HIV care throughout the course of the disease (Howarth et al., 2016; Yehia et al., 2015). Despite the ACA's offering of several opportunities for improvement of HIV care, there is uncertainty concerning its potential impact on individuals living with HIV (Kates, 2013). Additionally, there is a lack of adequate research evidence to support HIV/AIDS service organizations (ASOs) in applying the provisions of the ACA to the HIV care continuum (Aderko et al., 2012).

This study aimed at closing a gap in the knowledge base regarding the impact of the ACA on HIV-infected individuals in the United States. This study is distinctive because it is focused on assessing whether the ACA has significantly impacted the HIV care continuum. This research is timely and suitable for understanding how changes in health care policy can influence health care delivery to individuals of a particular population. The results from this study could assist in determining the significance of comprehensive health insurance, especially among PLWHA. This study could also increase the public's knowledge regarding factors that influence retention of HIV-infected individuals in the HIV care continuum. By addressing gaps in the literature regarding the impact of the ACA on the HIV care continuum, this study could lead to positive social change by increasing knowledge and understanding of how the ACA contributes to the improvement of access to health care and reduction in health care costs for HIV-positive individuals. The results of this study could also lead to better implementation of models of differentiated care for HIV-positive individuals.

Over the past few years, there has been an increase in the number of national strategies for funding HIV care (Greenberg et al., 2015). Other programs such as the United Nations programme on HIV/AIDS (UNAIDS) have introduced the 90-90-90 targets, which aim at ensuring adequate access and quality of care for PLWHA by the year 2020 (Davies & Pinto, 2015). The 90-90-90 target aims to ensure that 90% of PLWHA are aware of their HIV status, 90% are virologically suppressed, and 90% are engaged in HIV care by 2020 (Davies & Pinto, 2015). However, there is still a significant number of PLWHA who cannot access adequate HIV care. According to Greenberg, Purcell, Gordon, Barasky, and Del Rio (2015), 34% of PLWHA cannot access HIV care and thus remain viremic with an increased risk of infecting other people with the disease. Therefore, by understanding the impact of the ACA on the components of the HIV care continuum, this study could lead to positive social change through improved viral suppression, increased access to care, and reduction in health care costs for HIV-positive individuals.

Summary

Before implementation of the ACA, only PLWHA with incomes below 100% of the FPL could access full medical insurance under the Medicaid program (ObamaCare Facts, 2016). From the FPL to below 400% of the FPL, PLWHA received limited access to HIV care through the Ryan White and Medicaid programs. However, implementation of the ACA has led to an expansion of medical coverage among PLWHA, with approximately 15% having full coverage (Blumenthal et al., 2015). Given the fact that the ACA was implemented only 3 years ago (from the time of this writing), only limited research is available regarding the impact of the ACA on the HIV care continuum. However, research indicates that the ACA is expected to improve access to and affordability of care for PLWHA significantly through the expansion of the Medicaid program (Kates, 2013). Based on the reviewed literature, improved access to health care will facilitate effective viral suppression, thus reducing the rate of HIV transmission (Davies & Pinto, 2015). In addition, improved access to medical coverage should facilitate positive health outcomes and prolonged life expectancy among PLWHA (Davies & Pinto, 2015). Although efforts to improve access and affordable HIV care have been implemented, HIV/AIDS will continue to be a public health issue until new cases of HIV are significantly reduced or eradicated. Therefore, it is important to ensure that all PLWHA are engaged, linked to HIV care, and retained in the HIV care continuum. While the impact of the ACA on HIV care has already been observed, a considerably expanded impact is expected as the program rolls out.

With this study, I aimed at assessing the impact of the ACA on the HIV care continuum. There is a gap in the professional literature regarding how the ACA impacts PLWHAs with low incomes. While most researchers agree that the ACA has impacted HIV care, it is believed that a considerably greater impact will occur in the future (Crowley & Kates, 2013). In the next chapter, I provide a comprehensive review of the literature regarding the impact of the ACA on the HIV care continuum in the United States. In addition, I explain the literature search strategy and discuss the theoretical foundation of the study. I also review literature regarding the key variables used in this study.

Chapter 2: Literature Review

Introduction

The purpose of this study was to assess the impact of the ACA on the HIV care continuum. This study focused on addressing a gap in current research by improving the understanding of the impact of the ACA on care for individuals living with HIV. In 2012, it was estimated that over 1 million Americans were living with HIV (Kates, 2013). Although the number of HIV infections has stabilized at around 50,000 annually, there have been reports of new strains of HIV arising among homosexuals (Kates, 2013). PLWHA are less likely to be insured due to low socioeconomic status (SES); therefore, they rely mainly on Medicaid for insurance coverage. Statistics indicate that only 25% of PLWHAs are virally suppressed, despite research indicating that early intake of combination antiretroviral therapy (cART) regimens is clinically efficient and could significantly reduce the risk of HIV transmission (Langebeek et al., 2014). However, it may be possible to achieve an HIV-free generation if more PLWHAs are engaged in care and effectively retained in the care continuum.

Before the implementation of the ACA in 2014, over 100,000 HIV patients lacked adequate health care coverage and depended on Ryan White HIV/AIDS program support, charities, and uncompensated care to meet their health care needs (Berry et al., 2016). Today, various fiscal pressures and scientific assurances continue to present valid opportunities for improved access to HIV care by PLWHA. In the United States, most PLWHA access their health services through Medicaid, and changes have been brought about by the ACA with the aim of improving the accessibility of Medicaid in the states that choose to participate in the program (Snider et al., 2014). Some of these anticipated changes involve expanding Medicaid eligibility for HIV patients, in particular among those whose income falls within 138% of the federal poverty level and among patients without children (Snider et al., 2014). The expansion of Medicaid has the potential to improve access for approximately 115,000 uninsured HIV patients (Snider et al., 2014). However, beneficiaries of this expansion must access insurance coverage through a federal or state insurance exchange. This improved access to care has the potential to improve the consistency of care for PLWHAs, thus improving the quality and length of their lives.

Since HIV/AIDS was discovered over 3 decades ago, the body of literature regarding the disease has been progressively growing alongside interventions to control the disease. Once a terminal condition with high mortality rates, HIV has been transformed into a manageable chronic disease, mainly due to changes in treatment approaches arising from major scientific discoveries (Siddiqi & Hall, 2015). Additionally, the use of new testing, treatment, and HIV prevention strategies has improved HIV care (Berry et al., 2016). However, the achievement of an HIV-free generation is dependent on continuous scientific progress and the development of policies that positively influence the prevention and treatment of HIV/AIDS.

In this chapter, I provide an in-depth review of current literature relating to the impact of the ACA on care for PLWHAs and the theories and models that were used in this study. I also provide a brief introduction to the ACA, the literature search strategy used, the theoretical foundation of the study, and an in-depth review of literature relating to the research objectives and major variables examined in the study. The chapter ends with a summary and conclusion section, which provides a comprehensive overview of the findings of this literature search. This chapter contains seven sections, which contain an introduction, the literature search strategy, the theoretical foundation, the conceptual framework, a literature review related to key variables and concepts, and a summary and conclusion section.

Literature Search Strategy

Between July 2016 and February 2017, I conducted a systematic literature search using Medline, EBSCOhost, CINAHL, ProQuest, and other reliable websites to identify research articles and books that met the inclusion criteria for this literature review. The inclusion criteria encompassed articles that were published between 2012 and 2017, studies that had a defined sampling procedure and were published in English, and articles that involved primary studies. The key search terms used included *ACA, Ryan White program, HIV care continuum, retention, linkage, Andersen's behavioral model of health care utilization, economic model, PLWHA,* and *health care utilization.*

Initially, I included articles that described a single study and reviews. The reviewed articles were limited to studies that described adherence to cART regimens by PLWHAs and the impacts of the ACA on the HIV care continuum. The exclusion criteria for the literature review applied to dissertations, articles published before 2012, secondary studies, studies that did not have a defined sampling method, and articles that were not written in English. However, one article that described R. M. Andersen's behavioral model of health care utilization, published in 1995, was cited because was highly relevant to the current study and clearly stated a fact that still is germane (Blumenthal et al., 2015).

In toto, I retrieved 40 articles from various databases and stored them in my personal database. Six articles had to be eliminated because they were secondary studies, and five articles were excluded from the study because they focused on economic benefits of the ACA, as opposed to health care outcomes. Two other studies were eliminated because they were not published in English. The review involved a thorough examination of the articles' abstracts and titles to ensure that they met the inclusion and exclusion criteria and were consistent with the research objectives and purpose of this study. After winnowing, a critical appraisal was performed on the remaining articles to achieve the purpose of this research.

Theoretical Foundation

R. M. Andersen's (1995) behavioral model of health services use and economic theory were applied as the foundation for this study. Andersen's model and economic theory provided a framework for the assessment of utilization of health services with respect to cost and other important variables. Within economic theory, cost acts as a driver for changes in behavior, whereas Andersen's model involves a wide range of variables and feedback routes that may ultimately impact health care usage and outcomes.

Andersen's Behavioral Model of Health Care Utilization

R. M. Andersen's model of health care utilization was developed in the 1960s to describe the influence of environmental and population characteristics on health behaviors and outcomes (R. M. Andersen, 1995). Andersen's model is based on the premise that individuals’ health outcomes are dependent on behavioral factors, population characteristics, and environmental factors. Andersen’s behavioral model of health utilization facilitated the assessment of individual behaviors at a population level while also accounting for systems that are associated with the individual, including his or her family, culture, and community (R. M. Andersen, 1995). Based on Andersen’s model, the factors that affect health services can be grouped into three categories: individual, societal, and health system. According to Andersen, societal determinants include technology as a tool for change, as well as norms, whereas the health system factors comprise health services and goods such as drugs, dental care, physician care, and hospital care. Individual factors, which constitute the third category in Andersen’s model, have been widely studied and involve various factors.

Predisposing factors. The predisposing components of R. M. Andersen’s (1995) model are meant to identify individual behaviors that determine the use of health care resources. For some people, the tendency to use health care resources can be predicted by behaviors that existed before the individuals contracted the disease. Predisposing characteristics can be categorized into three groups: demographics, social structure, and health belief factors. Demographic information includes gender, age, family size, and other variables that predispose individuals to use health care services (R. M. Andersen, 1995). Social structure represents the second subcomponent of predisposing factors and involves the location of the person in the community, based on variables such as employment, occupation, education, ethnicity, and SES (R. M. Andersen, 1995). Last, health belief factors include values, attitudes, and knowledge that people have concerning health care services, which may affect their perception of the need to seek health services (R. M. Andersen, 1995).

Enabling resources. Enabling factors represent the second component of R. M. Andersen's (1995) model. This component involves individuals' conditions that facilitate their decisions to satisfy their needs with health care services based on value. Though an individual may be predisposed to a chronic disease, he or she can access only health services based on available means and resources (Babitsch et al., 2012). Insurance cannot measure the exact amount of care provided to an individual. However, it is widely considered an enabling factor because it is strongly correlated with the use of health care services. Andersen (1995) argued that health insurance coverage is a key predictor of the utilization of services.

Need factors. With the assumption of the existence of predisposing factors and enabling factors, the individual must first perceive a disease for use of health care resources to occur (R. M. Andersen, 1995). Need factors, including perceived health status, established diagnosis, and level of disease, are important in determining whether an individual should seek help.

Use of health services. The final component of R. M. Andersen's (1995) model is the use of health services. Utilization of health care services in this study involved the PLWHA's perceived and actual need for HIV services. Family or community factors form the enabling factors that inhibit or promote the ease of obtaining help. Some of the enabling factors were health insurance, income level, accessibility, community resources, time constraints, and proximity to help (Babitsch et al., 2012). The predisposing factors included gender, age, race, and social status, which were believed to affect an individual's tendency to use services before the need arises.

Application of Theory in Previous Studies

Li, Chen, and Essien (2015) utilized R. M. Andersen's behavioral model in their retrospective study of HIV-positive individuals to examine the significant factors that determined the use of ART among their study population in the United States. The authors performed a logistic regression analysis to assess the relationship between ART usage and the features included in Andersen's behavioral model, namely predisposing, enabling, and need components. According to Li et al., inequality in health care has presented a major burden for individuals in the minority populations of the United States. For instance, Li et al. contended that HIV-positive individuals may have had difficulty accessing treatment because of limited awareness and understanding of socioeconomic factors. To increase their knowledge regarding health care utilization, the authors applied Andersen's behavioral model to examine observed health care results and the use of health care among the study population.

Economic Theory

Economic theory states that when patients are charged the full price of medications and are provided with adequate information to compare the benefits and adverse effects of medication, they will use an optimal amount of the medication while taking into account their priorities and income (Eaddy, Cook, O'Day, Burch, & Cantrell, 2012). Based on economic theory, it is assumed that rational patients must first evaluate the benefits and potential costs of medications and compare them to alternative methods of promoting health. As a result, the patients will use a combination of these methods that promote health while considering their income limitations. According to Eaddy, Cook, O'Day, Burch, and Cantrell (2012), patients who obtain medical insurance coverage that includes prescription benefits are more likely to be motivated to take more medications that are prescribed because they pay less for the prescriptions compared to uninsured patients. Therefore, an increase in the price of medications for HIV patients through higher levels of cost sharing can result in various economic and behavioral effects. The increased cost of health care for patients can affect consumption. Consumption of medication is significantly reduced when the patient moves up the demand curve toward the optimal economic amount due to the increased cost of sharing (Eaddy et al., 2012).

With respect to this study, changes in care utilization patterns among patients became evident as patients moved into the coverage gap and met the full cost of HIV regimens. For instance, patients could reduce the number of times they took medications daily with the aim of cutting costs. Higher costs of health care could also result in substitution. Substitution is the process by which patients seek cheaper substitutes when the price of their medications rises (Meyer-Rath & Over, 2012). Due to high costs of prescription medications, patients may be forced to use smaller quantities of prescription medications or to substitute less expensive drugs. Patients who use brand-name drugs may also be forced to switch to generic medications or over-the-counter prescriptions when they reach the coverage gap.

Rationale for Choosing Andersen's Model and Economic Theory

The majority of the models used in previous studies of HIV patients and their decisions to attend HIV clinics focused mainly on factors that promoted access to HIV care and utilization of health care resources or provision and management of chronic care. These models adequately identified various demographic, policy, social, funding, and structural challenges that affected the retention of PLWHA in the care continuum (Babitsch et al., 2012). However, these models did not describe the behavioral practices that HIV patients employed to address these challenges or that they attended HIV clinics regularly over an extended period of time.

R. M. Andersen's (1995) behavioral model for health care utilization specifically addresses access to and utilization of HIV care. The Andersen model explains how the following predict an individual's likelihood of using HIV care: (a) predisposing factors, including race, age, norms, living standards, level of education, and treatment information; (b) enabling factors, including stigma, health insurance status, population density, wait times, and current income; and (c) needs factors, including perceived health status.

R. M. Andersen's (1995) behavioral model for health care utilization is important because it is flexible and allows researchers to select dependent variables that are related to specific hypotheses. Andersen's model has been widely adopted in frameworks for predicting health care utilization since it was developed in the 1960s. Furthermore, Andersen's model has been successfully applied in studying various health outcomes in advanced stages of life, covering use of health care, informal care, and formal social care

(Hoeck, van der Heyden, Geerts, & Guido, 2014). The usefulness of Andersen's model in gerontological research has been widely demonstrated.

Conceptual Framework

Before a health behavior model can be applied, the targeted health behavior must be clearly defined. Effective behavioral change occurs only when a given health behavior is targeted. Additionally, the targeted health behavior needs to be operationalized and evaluated using specific actions, which involve attending HIV clinics. In the present study, the target involved HIV care visits, the context, and the duration linked to the target behavior. In this study, R. M. Andersen's (1995) behavioral model of health care utilization and economic theory were used to examine the association between demographic and social factors that influence access to HIV care by PLWHA. Based on Andersen's model, ethnicity/race had an impact at all levels of predisposing, needs, and enabling factors.

According to R. M. Andersen (1995), patients' ethnicity is the key independent variable, with predisposing factors being continuously added to the model in sequences. The need factor in this study was the presence of HIV/AIDS, which is a chronic disease that manifests an immediate need for health care support. In this case, the predisposing factors involved demographic characteristics such as sex and age; they represented the biological requirements that suggest the likelihood of PLWHA seeking health services. Under the predisposing factors, the social structure is measured using various factors that influence the individuals' status in society and their ability to cope with health problems (Babitsch et al., 2012). Enabling factors form the final component of Andersen's model.

Enabling factors include SES, income, access to care, and marital status. The concept of enabling factors in Andersen’s (1995) model implies that the enabling factors cannot be achieved if they are not enabled to access support. The enabling factors, if present, can facilitate the transfer of support, but they can inhibit support to care as well, if they are absent.

According to the economic theory, a patient makes determinations regarding goods and services to purchase based on their cost, the anticipated benefit, and the limitation of the product (Ekelund & Hebert, 2013). It is believed that HIV patients do not understand the cost of HIV and that weighing the cost will help them to make good economic decisions and set their priorities right (Ekelund & Hebert, 2013). However, since the patients’ income level is a big determinant of medication consumption, having comprehensive insurance will motivate patients to access and consume the medications that they need (Ekelund & Hebert, 2013). Therefore, the concepts of the economic theory relate to outcome through behavioral and economic implications, from retention through patient satisfaction for HIV-positive individuals in this framework (Doshi, Li, Ladage, Pettit, & Taylor, 2016). Figure 1 shows the conceptual framework for the combination of R. M. Andersen’s (1995) model and the economic theory.

Literature Review Related to Key Variables and Concepts

The literature review conducted for this study focused on the ACA and its impact on accessibility to and retention of PLWHA in the HIV care continuum. More focus was directed at studies that evaluated the association between various factors and individuals’ retention, linkage, and adherence to the ARTs. Further, the review addressed the impact of the ACA on other programs such as the Ryan White grant and their role in HIV care.

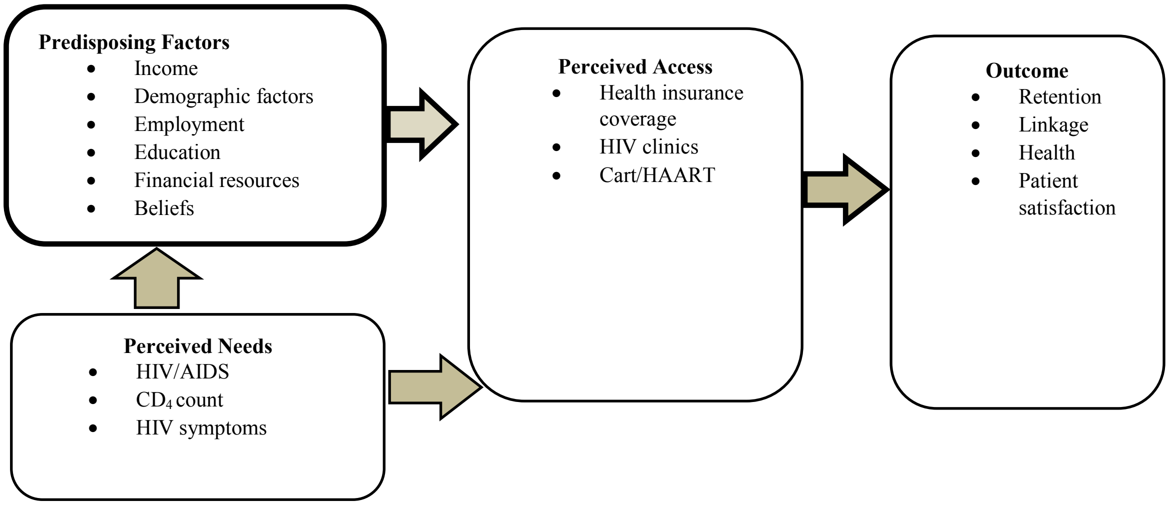

Figure 1. Conceptual framework based on Andersen's model and economic theory. Adapted from "A Theory-Based Model for Predicting Adherence to Guidelines for Screening Mammography Among Women Age 40 and Older," by S. M. M. Rahman, M. B. Dignan, and B. J. Shelton, 2005, *International Journal of Cancer Prevention*, *2*(3), p. 169-179.

Access to HIV Care

HIV/AIDS is one of the top priorities in the United States health care sector as demonstrated by the governments' 2010 National HIV/AIDS Strategy (NHAS). Some of the goals of the NHAS include increasing accessibility to care by PLWHA, promoting positive health outcomes, and reducing disparities in HIV care. There is much optimism expressed that implementation of the ACA will guide the achievement of these goals, mostly by reducing access disparities within HIV care. According to Crowley and Kates (2013), care quality has significantly improved after enactment of the ACA. However, one of the key challenges is ensuring that PLWHA are adequately educated on how to navigate the new insurance markets, helping them to determine their eligibility, enrolling them in appropriate health coverage, and ensuring that there is no interference in their treatment plans (Crowley & Kates, 2013). It is critical for PLWHAs not to experience delays or interruptions in HIV care. Therefore, it is important to ensure that effective case management exists to assist with HIV care. For instance, all patients in Ryan White-funded clinics in the United States are assigned to social workers who assist them to navigate some of the complicated care processes (Kates, 2013).

Another issue identified by Crowley and Kates (2013) concerns HIV-specific care. Despite the ACA's increasing access to care among PLWHA, it did not provide any assurances that the type of care provided will address the needs of HIV patients comprehensively. Additionally, it was not clear whether the ACA would cover all the medications and procedures that were common to PLWHA (Kates, 2013). There were no clear indications on whether the ACA strategies would be consistent with the standards of HIV care that had managed to improve HIV patients' health outcomes. Martin and Schackman (2012) also argued that the ACA might give policymakers a false sense of security regarding accessibility of HIV care. As a result, if policymakers believe that the ACA had addressed the accessibility problem, they might discourage funding of the Ryan White program, which was important in filling unexpected gaps in care for PLWHA (Martin & Schackman, 2012).

The benefits derived from current HIV treatment interventions have not been fully exploited due to the constant loss-to-follow patients from each step of the HIV care continuum to the next. As of July 2012, a third of the total of 1.1 million Americans infected with HIV received antiretroviral therapy (ART), and a quarter had suppressed viral loads, which was the key indicator of the PLWHA's response to ART (Sirpal, 2014). The full benefit of the current HIV treatment strategies can be realized only by PLWHA who achieve viral load suppression. Therefore, the impact of enhancement of the early stages of the HIV care continuum is limited, provided the viral load suppression in this stage remains low. In fact, investing more resources on viral load suppression among PLWHA could provide a more cost-effective approach to HIV control than resource allocation to other alternative strategies. As argued by Mugavero, Amico, Horn, and Thompson (2013), the process of efficiently moving people from one stage of the HIV care continuum to another is determined by various factors: stigma, substance abuse, lack of insurance, and mental illness, among others. Another major problem affecting movement along the HIV care continuum is the advocacy to get affordable care for PLWHA.

Research indicates that PLWHA who have insurance coverage have a higher likelihood of achieving viral suppression, compared to uninsured individuals (Mugavero et al., 2013). However, the majority of the PLWHA have low incomes, and the health issues related to the disease prevent them from maintaining steady employment. Howarth et al. (2016) argued that these obstacles could cause housing instability among HIV patients, which may interfere with care due to frequent moves from one place to another. Howarth et al. (2016) further stated that even the slightest interruptions of HIV care could have considerable negative effects that can jeopardize the prevention effects of the disease. Advancement in HIV treatment also poses new challenges to HIV care. As the management of HIV becomes easier, PLWHA are required to maintain a lifelong treatment plan. As a result, PLWHA usually become less compliant with strict ART regimens and may sometimes abandon the treatment altogether due to medication fatigue (Howarth et al., 2016) or other barriers, as previously described. Additionally, most HIV patients begin using ARTs when they do not have obvious symptoms, thus, becoming harder to convince about the importance of adhering to the treatment regimen. Health care for PLWHA serves also as prevention because being undetectable equals being nontransmittable, hence making a difference in the number of new transmissions. The described studies related to the current research because they discussed multiple barriers, and my study aimed at determining if significant changes in the care provided to PLWHA could be detected and if the needs of HIV patients have been comprehensively addressed with a resultant effect of increased access to HIV care.

Out-of-Pocket Health Care Costs

The aim of the ACA includes making provisions for the expansion of both Medicaid and private insurance coverage, with the ultimate goal of getting the over 50 million people insured who were uninsured before implementation of the ACA in 2014. Prior to the implementation of the ACA, the states covered low-income families, including their children, through Medicaid and the Children’s Health Insurance Program (CHIP). Still, many individuals could not get coverage because of income ineligibility, which was lower for parents than for children. The ACA, therefore, introduced the new funding program, which would allow states to expand Medicaid in order to cover all adults in families with incomes below 138% of the FPL. This new program has led to significant increases in health care coverage, ranging from 1 million to 3 million individuals (Buchmueller, Levinson, Levy, & Wolfe, 2016).

Out-of-pocket costs involve the portion of medical expenses that are expected to be paid by the HIV patient during a plan year. It has been identified as a major barrier to HIV care (Pellowski, Kalichman, Matthews, & Adler, 2013). It is not yet clear how much the ACA has impacted health care costs of HIV-positive individuals. HIV seems different from other chronic diseases such as hypertension and diabetes because the infection has been noted to be singularly highest among individuals who are faced with economic hardship such as being either below or at the poverty level (Pellowski et al., 2013). Out-of-pocket costs play an important part in the HIV care continuum because it can serve as a singular determinant in accessing health care and ultimately achieving viral suppression, which will in turn potentially decrease the number of sources for HIV transmission (Pellowski et al., 2013). Economic stress has also been linked to an increase in relationship instability, which in turn leads to frequent partner changes and increased risk of HIV transmission.

Apart from improving access and quality standards in the care for PLWHA, the ACA has also introduced provisions that aim to make private insurance more affordable for patients. One of the areas that the ACA hopes to improve is the problem of out-of-pocket costs. The introduction of the ACA has led to significant improvements for customers by introducing limits on out-of-pocket costs (Zamani-Hank, 2015). The implementation of the ACA will require PLWHA to pay less out-of-pocket for services due to cost sharing provisions. These cost reductions, however, apply to patients who are within the 100% to 250% of the FPL. According to Martin and Schackman (2012), high out-of-pocket costs promote nonadherence to medication regimens by discouraging enrollment of PLWHA in health plans. As a result, PLWHA may develop drug resistance, thus, increasing the likelihood of HIV transmission (Martin & Schackman, 2012). Therefore, PLWHA need to be aware of the application for the new ACA provisions and their effect on affordability and accessibility of private insurance.

Additionally, Buchmueller, Levinson, Levy, and Wolfe (2016) noted that HIV prevalence is overrepresented in areas that have wider income gaps; the poorer a neighborhood is, the less the social capital, which is another characteristic that promotes HIV infections. Building on information from these prior studies, I sought to determine the impact, if any, and the extent of any such impact the ACA may have had on out-of-pocket health care costs of HIV-positive individuals. The study by Buchmueller et al. had relevance for the present research because the authors discussed the different ways that the ACA could effectively reduce out-of-pocket costs for HIV care, which was an essential consideration and aim of my study.

Adherence to HIV Care

Effective adherence to cART and HAART needs a comprehensive and efficient care mechanism to support the current systems of HIV care. According to Cahill, Mayer, and Boswell (2015), the presence of supplemental care and efficient case management can promote patients’ adherence to cART and their engagement in care. This type of care engagement is an important component of the Ryan White Comprehensive AIDS Resources Emergency (CARE) Act of 1990, which is key to the delivery of HIV/AIDS care in the United States. According to Cahill et al. (2015), the Ryan White program serves over 500,000 individuals annually through the provision of outpatient, medical case management, and mental health services, as well as substance abuse treatment, housing, and transportation assistance for PLWHA. In addition, the Ryan White program also promotes accessibility to cART regimens through collaboration with other AIDS drug assistance programs (Kates, 2013). These services are vital for the reduction of viral load and improvement of the lives of PLWHAs. Through implementing the ACA and the present debates in government, more HIV-care systems are now starting to be established nationally. However, effective coordination and proper health care reform are important if an HIV-free generation is to be achieved.

Castro, Santiago, Jiménez, Dávila-Vargas, and Rosa (2015) used a socioecological framework to determine the perceived barriers and facilitators of adherence to HAART among PLWHA in southern Puerto Rico. The participants in this study included 12 HIV patients who had a history of nonadherence to HAART. This study employed a qualitative research design, where the participants were interviewed and their messages audiotaped and transcribed for analysis purposes. Three independent coders were used to perform content analysis using a codebook. Supercodes and families were also generated using Atlas TI to facilitate the development of a categorization tree, grounded analysis, and calculation of density estimates. The results of the study indicated that the majority of the participants ($n = 7$) had a monthly income of no more than $500. Seven of the participants had achieved a high school level education, and $n = 9$ were unemployed (Castro et al., 2015). However, 11 of the participants indicated that they were recipients of government health insurance. Further, 50% of the women reported that they lived alone or together with their children. The male participants reported living with their parents or relatives (*n* = 4). With regard to the grounded analysis (G), the group associated with the highest number of quotations was mental health barriers (G = 32). The second largest group comprised patients on a treatment regimen (G = 28), followed by health system (G = 24), and interpersonal relations (G = 16; Castro et al., 2015). Additionally, the group associated with the highest number of codes (or density, D) was treatment regimen (D = 4), followed by health status perception (D = 3), interpersonal relations (D = 3), and health system (D = 3). In conclusion, Castro et al. (2015) suggested that the barriers to HAART adherence by PLWHA interact at various levels of the system. Thus, there is the need for further research on these interactions and the synergistic effects among nonadhering patients. The use of the a structural equation model (SEM) in this study facilitated the assessment of a variety of barriers and facilitators of adherence to HAART. However, the use of a small sample size meant that there was a higher likelihood of uncovering age bias. Additionally, the use of qualitative research methods introduced subjectivity into the findings of the study (Denscombe, 2014). The use of a larger sample and a quantitative research design would have improved the reliability of the study.

With the aim of determining the percentage of PLWHA who optimally adhered to HAART (≥90%) and factors influencing adherence, Bezabhe, Chalmers, Bereznicki, and Gregory (2016) conducted a meta-analysis of 84 observational studies across 20 countries. Reviewed studies were retrieved from eight databases and included only studies that had been published by January 2010. Based on the coded samples, the percentage of individuals who reported optimal adherence (≥90%) was 62%. Based on Bezabhe et al.'s study, this proportion varied significantly across studies due to different factors. For instance, studies that had higher percentages of homosexuals and few injection drug users (IDU) had a higher percentage of individuals who maintained ≥90% adherence to HAART. Additionally, studies that were set in countries with low human development index (HDI) scores had a higher proportion of individuals who maintained optimal adherence to HAART. While this study used a large sample, the results were descriptive in nature. The application of logistic regression would have provided more accurate results.

Dang, Westbrook, Black, Rodriguez-Barradas, and Giordano (2013) used the SEM to evaluate a model of HIV suppression with patient satisfaction influencing suppression indirectly through adherence and retention in the HIV care continuum. This study employed a cross-sectional design to examine 489 adults with HIV receiving care at two clinics in Texas. Patient satisfaction was measured with the use of two items: one adapted from the Delighted-Terrible Scale and one from the Consumer Assessment of Health Care Providers and Systems Survey. A single validated item question was used to measure participants' adherence to HAART over a 4-week period. Retention in HIV care was defined by how constantly the participants visited the clinics in the year preceding the survey. Conversely, HIV suppression was described as plasma HIV RNA< 48 copies/mL. The mean patient satisfaction score was 8.5 based on a 10-point scale. The results also indicated that 46% of the participants had *excellent* adherence to HAART, while 76% were *adequately* retained, and 70% achieved HIV suppression (Dang et al., 2013). The SEM analysis indicated that retention in HIV care and adherence to HAART were influenced by patient satisfaction, which was also a key determinant of HIV suppression. However, this study was limited by the duration of measurement of adherence to HAART. The use of a 4-week duration to measure adherence to HAART may have led to misleading results. The ACA program is expected to improve adherence to HIV care through improving access to health care services among PLWHA (Bezabhe et al., 2016; Cahill et al., 2015; Castro et al., 2015; Dang et al., 2013). As Cahill et al. (2015) argued, improvement in adherence to HIV cART among PLWHA could be achieved through adoption of effective supplemental care and efficient case management. In addition, Castro et al. (2015) stated that the barriers to adherence to HIV care among PLWHA interact at various levels. These research studies helped to answer some questions and address some of the barriers of adherence to HIV care as it relates to sex, sexual orientation, financial status, ethnicity, and patient satisfaction. Using the existing studies and some of the variables presented in previous studies, I tested if there was a significant association between having comprehensive health insurance through the ACA and adherence to HIV care, even with the existence of other barriers. I also evaluated the impact of the implementation of the ACA on the potential barriers to patients' adherence to HIV care.

Linkage to HIV Care

Eberhart et al. (2013) conducted a retrospective cohort study of 1,704 individuals with newly diagnosed cases of HIV from Philadelphia's Enhanced HIV/AIDS Reporting

System from 2008 to 2011. The main focus of this study was to identify patients who *were not linked to care, not linked to care within 90 days, not retained in care,* and *not virally suppressed.* The methodology used in this study involved analysis of spatial patterns using k-functions to determine the target intervention “hot spots.” Demographic statistics and regression analysis were also used to determine the impact of location of each outcome. Based on the results, 82% of the individuals were linked to care, 75% were linked to care within 90 days, and 37% were retained in care, and 72% achieved viral suppression. Additionally, no overlaps were identified in the outcomes from the 59 census tracts that were found in the “hot spots.” Eberhart et al. found that individuals residing in areas identified by the local K-function were 1.76 times more likely not to link to care, compared to persons living elsewhere. In addition, people living in the identified areas were 1.49 times more likely not to link to care within 90 days, compared to persons who lived elsewhere. Individuals who resided in the identified areas were also 1.84 times more likely not to be retained in care, compared to individuals who did not live in the identified locations. Lastly, individuals residing in the geographical locations identified by the local K-function were 3.23 times more likely not to be virally suppressed, compared to persons not residing in the identified areas. Eberhart et al. concluded that spatial patterns are important indicators of retention in care, linkage to care, and viral suppression among PLWHA. While the use of a retrospective cohort method minimized the risk of bias, this study was time consuming; therefore, it was also expensive. Additionally, the long duration of the study may have led to a loss of follow-up and , thus, to biased results (Mason & Fienberg, 2012). Just as with retention and viral suppression, there is a need for improvement of linkage to care among PLWHA. Eberhart et al. (2013) used geographic location to determine linkage to care for PLWHA. However, while geographic location might result in a major impact on linkage to care due to factors such as access to transportation, not having comprehensive health insurance might also enhance the problem of linkage to care since it might provide more access to health care centers that are closer to the individual's residence. I evaluated the relationship between implementation of the ACA and linkage to care among PLWHA, irrespective of geographical location.

Retention in HIV Care

Fleishman, Yehia, Moore, Korthuis, and Gebo (2012) conducted a study to examine the retention, establishment, and loss to follow-up (LTFU) from 2001 to 2009. In this study, medical records belonging to 22, 984 adult PLWHA from 12 clinics were reviewed. Establishment reflected whether patients visited outpatient clinics for at least 6 months after initial enrollment. Retention revealed whether the patients sought outpatient services at least twice between 90 days annually. The LTFU revealed if the patients had not sought outpatient care for at least 12 months before returning. A multiple regression model was used to examine the demographic and clinical relationships between outcomes and the cumulative outcome arising for addressing all three measures. The results of the study indicated that 21.7% of the participants did not establish HIV care on the first visit. Under the established category of patients, 57.4% did not satisfy the retention criterion across all the years. It was also found that 34.9% of the participants were LTFU, while only 20.4% satisfied all three criteria (Fleishman et al., 2012). Women, older patients, Hispanics, and individuals who had CD_4 levels of ≤50 were found to be more likely to meet all three criteria successfully, compared to men, younger patients, Whites, and individuals who had CD_4 levels of ≥50 cells per cubic millimeter (Fleishman et al., 2012). Overall, the findings of the study indicated the need for improvement of retention in HIV care. Using a large sample size in this study ensured accuracy of the findings (Denscombe, 2014). However, the use of a quasi-experimental design would have been more suitable to allow for practical observation of the findings and reduce the duration of the study.

In a study involving all HIV-infected individuals in the United States, Hall et al. (2013) found significant age disparities at every level of the HIV care continuum. The data used in this study were retrieved from the National HIV Surveillance System of the CDC, and the principal purpose of the study was to determine the number of PLWHA who were aware of their HIV status, using back-calculation methods. Percentages were used to calculate the proportion of HIV patients who were linked to care within a period of 3 months after initial diagnosis, based on CD_4 level and viral loads. Based on a total of 1,148, 200 PLWHA in the United States, in 2009, 81.9% had been diagnosed while only 65.8% were linked to care. Additionally, 36.7% of the participants were retained in care, 32.7% had ART prescriptions, and 25.3% had a suppressed viral load (Hall et al., 2013). The total of 857,276 PLWHA who had not achieved viral suppression comprised 74.8% males, 79% Blacks, 73% either Latinos or Hispanics, and 70.3% Whites. It was also found that 40.5% and 30.6% of PLWHA aged between 13 and 24 years had received diagnoses and were linked to HIV care, respectively (Hall et al., 2013). Compared to individuals aged between 55 and 64 years, those patients aged between 25 to 54 years were less likely to attain viral suppression. While the study offered a true representation of the entire PLWHA population, it was time-consuming due to the time spent analyzing data belonging to all the participants (Denscombe, 2014).

Ugoji et al. (2015) investigated the correlates of retention of PLWHA in a large HIV program in Nigeria, from 2005 to 2009. This study involved a review of data belonging to 5,320 PLWHA, aged 15 years and above, in 37 HIV treatment facilities in Nigeria. Based on this study, retention was defined as visiting the clinic at least once during the 2010 review period. Logistic regression was used by the researchers to determine the patient-related correlates of retention. Based on the results of the study, 144 participants had either transferred or died, thus exiting the program. Of 5,176 participants whose exit was not documented, 62.4% were retained; of these, 5.6% were female (Ugoji et al., 2015). In addition, 75.8% of participants who were on ART and 23.4% who were on pre-ART were retained. The participants who were on ART ($p < 0.001$), those aged 30 - 60 years ($p < 0.001$), those who had baseline CD_4 cell count of 100-350 cells/mm^3 (0.006), and participants who had lower World Health Organization (WHO) stage at baseline were associated with retention. Overall, Ugoji et al. (2015) stated that identifying correlates of retention assisted HIV program administrators in the development of retention strategies for implementation at all levels of the HIV care continuum.

Yehia et al. (2015) investigated how the interactions between retention in HIV care and viral suppression and changes over time improved the ability to intervene in each step of the HIV care continuum. This study consisted of a sample of 17,140 HIV patients at 11 HIV clinics in the United States, between 2010 and 2012. The patients were classified into five groups for each calendar year: retained/suppressed, retained/not suppressed, not retained/suppressed, not retained/not suppressed, and LTFU. Based on this study, patients who were retained included those who completed at least two medical visits after at least 90 days within the year (Yehia et al., 2015). Individuals who were not retained were those who completed at least one visit to an HIV clinic within 1 year but did not meet the criteria for retention. Individuals who were LTFU represented those patients who did not visit any HIV medical clinic during the year. Viral suppression was indicated by HIV-1 RNA ≤200 copies/mL on the last measurement of the year (Yehia et al., 2015). For analysis purposes, multinomial logistic regression was used to determine the likelihood of patients' transitioning between retention/suppression categories while controlling for gender, age, race, HIV risk factor, CD_4 count, insurance status, and use of ART. Based on the results, the proportion of patients retained in the year 2010 amounted to 65.8%, while 17.4% were retained/not suppressed (Yehia et al., 2015). The patients who were not retained/suppressed amounted to 10%, and those who were not retained/not suppressed amounted to 6.8%. Overall, 59.5% of the patients maintained the same status in 2011, while 3.3% maintained it in 2012. Based on Yehia et al. (2015), application of the care continuum longitudinally can enhance its utility. The use of a large sample size in this study ensured high accuracy of the findings. However, the duration of the study may have led to a loss of follow-up data.

The research indicated the need for improvement in retention of PLWHA in the care continuum (Hall et al., 2013; Ugoji et al., 2015; Yehia et al., 2015). Significant age disparities among PLWHAs could be observed at every level of the HIV care continuum; therefore, it was important to identify the correlates of retention to facilitate the development of interventions and strategies to improve access to HIV care among PLWHA of all ages (Hall et al., 2013; Ugoji et al., 2015). The full benefits of being linked to care cannot be achieved without retention in care (Kates, 2013). While covariates such as gender, age, and race contributed to the reasons why PLWHA dropped out of care or became lost to follow-up, it was also important to know that, besides the potential presence of those barriers, there might also be a foundational barrier associated with not having comprehensive health insurance, which might be perceived differently based on the other barriers. For example, a female HIV-positive individual without insurance might make different health decision when compared to her male counterpart, or a 50-year-old when compared to a 21-year old. Thus, while controlling for some of the already identified barriers to retention in care, I assessed the impact of the ACA on retention of PLWHA in the HIV care continuum and the resulting effect on adherence to HIV treatment.

Treatment Outcome and Viral Suppression

According to McManus et al. (2016), viral suppression enhances the patients' health and significantly reduces the rate of HIV transmission. The enrollment of PLWHA in the ACA plans is believed to improve the likelihood of achieving significant HIV viral load suppression (Blumenthal et al., 2015). Most PLWHAs do not have private insurance, which is the backbone of health care insurance in the United States (Blumenthal et al., 2015; Squires & Anderson, 2015). However, implementation of the ACA in 2014 significantly widened the health care coverage for PLWHA. Some provisions in the ACA allowed states to increase coverage through Medicaid programs to include individuals with higher incomes, while the government met the additional costs (Highleyman, 2015). Implementation of the ACA meant that AIDS Drug Assistance Programs (ADAP) had the choice of providing HIV care or settle the ACA insurance premiums for eligible PLWHAs (Highleyman, 2015). Compared to 79% of the individuals who continued to enjoy HIV care through ADAP, Highleyman (2015) found that approximately 86% of the individuals who enrolled in the ACA plans achieved undetectable viral loads. In addition, for every additional month of the patients' staying in the ACA plans, the likelihood of viral suppression increased by 6%, with individuals who were enrolled in the ACA plans for a whole year having a 60% likelihood of undetectable viral loads (Highleyman, 2015). Keeping PLWHA in the HIV care continuum significantly improved their likelihood of viral suppression (Highleyman, 2015). Viral suppression plays a key role in reducing the rate of HIV transmission (Blumenthal et al., 2015). According to Kates (2013), PLWHA benefit fully from HIV care with the ultimate result of viral suppression. The present study is, therefore, aimed at examining how the ACA has affected viral suppression among PLWHA to date.

Age, Gender, and Race

The patients' sociodemographic characteristics can also influence enrollment in the ACA plans, thus affecting the HIV care continuum. For example, age, gender, and race have been found to influence individuals’ perceptions regarding the ACA and its impact on the accessibility of HIV care. According to Highleyman (2015), younger people are less likely to enroll in the ACA plans because they are healthier and use health care insurance less often, compared to older individuals. According to ObamaCare Facts (2016), young people perceived that health care costs were too high for them to manage. Some parents also covered their children until the age of 26 years, thus affecting their perceptions of the ACA (ObamaCare Facts, 2016). Race is also an important aspect when it comes to individuals’ perceptions regarding the ACA. Previous literature indicated that the racial susceptibility of most white Americans had a significant impact on their perceptions of health care (Banks, 2014). In an experiment, Banks (2014) found that anger is a key emotion that has led racial conservatives to have reservations against the ACA, but increased the support of liberals. The racial conservatives believed that race and ethnicity had no influence on public policy and that the economic and political differences in the United States were caused by culture and behaviors, as opposed to institutional discrimination (Banks, 2014). Conversely, liberals believed that racism, ethnicity, and race continued to influence public policies considerably, thus upholding economic and political differences in the United States. Gender also played a major role in individuals’ perceptions regarding the ACA health reforms. Before implementation of the ACA, women paid 150% higher premiums, compared to men on health insurance (Highleyman, 2015). With the new ACA reforms, it was expected that men and women would pay the same amount for insurance, and women would get additional coverage during maternity and other preventive services (Highleyman, 2015).

Age, gender, and race influenced the patients' approach towards the ACA and, thus, affect their retention in the HIV care continuum (Banks, 2014; Highleyman, 2015). Even though some past researchers have expressed reservations about the role that race, gender, and age may have played with respect to the impact the introduction of the ACA had had on the HIV care continuum, other researchers contended that there was an association between these variables. Controlling for age, race, and gender, I sought to determine if there was a significant association between the introduction of the ACA and the HIV care continuum by focusing on and identifying the sociodemographic characteristics that affected enrollment of PLWHA in the ACA plans.

Summary

In this chapter, I provided an in-depth review of the literature regarding the ACA and its role in the retention of PLWHA in the HIV care continuum. To date, there has been no formal evaluation of any conceptual framework that describes the behavioral factors involved in the decisions of HIV patients to visit HIV clinics regularly, adhering to cART treatment, or being retained in the care continuum. While the implementation of the ACA was meant to increase accessibility to care for HIV patients, valid concerns were expressed regarding the transition of care and the preservation of current safety levels. The main objective of the present study was to evaluate the impact of the ACA on care for PLWHA. I examined different aspects of the ACA that seemed to have influenced the care for HIV patients. This study aimed at closing a gap in practice by providing a better understanding of individual behavioral characteristics that may influence the use of health care resources among PLWHA.

Conclusions Based on the Literature Review

The important questions raised by the implementation of the ACA should be quickly addressed, before the Ryan White program is eliminated; the latter should be kept in force to support HIV care by filling the gaps due to improved coverage of HIV care (Martin & Schackman, 2012). Evidence indicated that the implementation of the ACA might affect the Ryan White HIV/AIDS program because patients who had private insurance coverage before the implementation of the ACA might face increased cost-sharing requirements (Berry et al., 2016; Cahill et al., 2015; Kates, 2013).

In the next chapter, I provide a comprehensive discussion of the research design, research methods, data collection procedures, research questions, hypotheses, and ethical procedures employed in this study. The existing literature gave voice to major concerns regarding the Ryan White grant program because of the implementation of the ACA and the resulting impact on access to HIV care. Skepticism also existed with respect to the comprehensiveness of ACA coverage and ease of navigation of procedures for care of PLWHA. However, there appeared to be overall agreement that implementation of the ACA would not cause total substitution or eliminate of the important Ryan White grant program.

Chapter 3: Research Method

The purpose of this quantitative study was to assess the impact of the ACA on the HIV care continuum for HIV-positive individuals in the United States with respect to health care access, out-of-pocket health care costs, and treatment outcome (measured by viral suppression). For comparison purposes and to fully understand the impact of the ACA, I also examined the impact of the ACA on health care access and out-of-pocket health care costs for other adults in the United States. This chapter presents the study design, methodological procedures, and concepts that were used to conduct this research. Specifically, this chapter presents a detailed discussion of the data collection and statistical analysis that I used to answer the research questions posed for the study. This chapter is intended to improve the reader's understanding of my perspective in investigating the impact of the ACA on the HIV/AIDS care continuum for HIV-positive individuals in the United States. I also describe the rationale for choosing a quantitative design. Chapter 3 is subdivided into five major sections: research design and rationale, research methods, threats to validity, ethical procedures, and a summary.

Research Design and Rationale

The *research design* refers to the general strategies that a researcher uses to integrate the components of a study in a logical manner (Creswell, 2014). The main purpose of a research design is to ensure that available evidence is effectively used to address the research problem logically (Anderson & Shattuck, 2012). The research design includes the data collection procedures, measurement, and data analysis methods. According to Creswell (2014), the research design of a study provides the main approach that the researcher will use to address the research questions. The researcher should select the most appropriate research design to meet the objectives and aims of the study. For this study, I chose a quantitative correlational research design based on economic theory and R. M. Andersen's (1995) behavioral model of utilization of health services. A quantitative correlational research design involves the identification of relationships between dependent and independent variables in a particular population (Creswell, 2014). Correlational research designs can also be used to establish existing patterns in variables (Creswell, 2014). The reason for using a quantitative correlational research design is to evaluate differences in characteristics of a study group and establish whether the variables are related (Anderson & Shattuck, 2012). A univariate descriptive statistical analysis through chi-square tests, using SPSS-23 software and trend analysis, was conducted to determine whether the introduction of the ACA has had a significant impact on access to HIV care and affordability of care among PLWHA.

To achieve the purpose of this study and for comparison of the results with the results found among the general public, the following five research questions were posed for the study:

1. What is the impact of the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals?
2. What is the impact of the implementation of the ACA on the poverty status of HIV-positive individuals?
3. What is the impact of the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals?

4. What is the impact of the implementation of the ACA on access to health care for adults in the United States?
5. What is the impact of the implementation of the ACA on out-of-pocket health care costs for adults in the United States?

The first research question was used to demonstrate the impact of the ACA on access to HIV care among PLWHA. The quantitative correlational design facilitated the evaluation of the correlation between health care access among individuals before and after implementation of the ACA. The second research question was used to test the impact of the ACA on out-of-pocket health care costs of HIV-positive individuals as it related to affordability of care before and after implementation of the ACA. Using the quantitative correlational research design, I sought to determine the impact on out-of-pocket expenses before and after implementation of the ACA. The third research question was used to assess the impact of the introduction of the ACA on treatment outcome, as measured by viral suppression. The quantitative correlational design facilitated the comparison of frequencies before and after the implementation of the ACA in participants who achieved viral suppression. For comparison purposes only, the fourth and fifth research questions were used to provide a broader context for the effects of the ACA among a nationally representative sample, using a quantitative correlational research design.

This study involved a quantitative analysis of secondary data from the Ryan White HIV/AIDS Program Services Report (RSR) 2015 from the Health Resources and Services Administration (HRSA) and the CDC's Behavioral Risk Factor Surveillance

System (BRFSS). The term *secondary data* refers to data that have already been collected for use in a different study, rather than for the present research (Tripathy, 2013). Secondary data may include official statistical data such as census reports, commercial data, or data from past projects (Tripathy, 2013). Compared to researchers conducting primary research, researchers who use secondary data experience limited time and resource constraints (Richards & King, 2014). In addition, there is a higher likelihood of missing entries in secondary data when compared to primary data (Tripathy, 2013). Because the data used in this study were readily and publicly available on the BRFSS and the HRSA websites, there were no time constraints when accessing the data. The data were also free for downloading; thus, no financial resources were spent when collecting the data. The independent variable was implementation of ACA, and the dependent variables were health care access, poverty status, treatment outcome/viral suppression, and out-of-pocket health care costs. The covariates were the participants' age, gender, and race/ethnicity.

The use of a quantitative retrospective correlational research design is consistent with other designs that aim at advancing knowledge through public health research because it employs rigorous, objective, and systematic strategies that help public health practitioners to generate and refine knowledge (Venkatesh, Brown, & Bala, 2013). Quantitative research designs facilitate deductive reasoning and generalization of research findings to a larger population of interest (Khalid, Abdullah, & Kumar, 2012). Through deductive reasoning, researchers use an established theory or conceptual framework, where concepts are refined into variables (Creswell, 2014). After selecting a suitable theory or framework, researchers collect evidence to test or evaluate whether the theory or conceptual framework is supported (Khalid et al., 2012). Generalizations to a larger population are then made based on the findings, and conclusions are drawn from evidence presented by the sample (Ventakesh et al., 2013).

The most important aspect of quantitative designs in public health research is that the results are based on measurement, careful observation, and interpretation of objective variables (Khalid et al., 2012). Thus, the findings are more reliable and valid because there is minimal or no manipulation of results by the researcher (Venkatesh et al., 2013). To understand the impact of the ACA on the HIV care continuum, I as the researcher in the present study specifically analyzed the impact of the ACA on health care coverage, out-of-pocket health care costs, and treatment outcomes, as measured by viral suppression among PLWHA. In this study, I also examined the impact of the ACA on health care access and out-of-pocket costs on other adults in the United States.

Independent Variable

The independent variable in this study was the implementation of the ACA. The impact of the ACA on the HIV care continuum was measured by describing trends in health care access, out-of-pocket health care costs, and treatment outcome, as measured by viral suppression before and after implementation of the ACA.

Dependent Variables

The main dependent variables in this study were access to health care, poverty status, treatment outcome (measured by viral suppression), and out-of-pocket health care costs.

Research Methods

Population

Population refers to the total number of individuals or objects that follow a set of specifications (Creswell, 2014). In this study, the target population comprised all PLWHA in the 50 states of the United States, the Virgin Islands, Puerto Rico, the District of Columbia, American Samoa, Palau, and the Federated States of Micronesia. Throughout this study, the term *state* is used to denote all of the areas that participated in the BRFSS survey.

Sampling Procedures

Sampling is an important procedure for any survey design (Creswell, 2014). The term *sample* refers to a selected group of participants who are studied as representatives of a given population (Guetterman, 2015). Because conducting a census is not convenient for studying local problems, a small sample of participants is studied, and the findings are generalized to the entire population. However, to generalize a study to a specific population, one needs to use a random sampling technique (Creswell, 2014). Random sampling involves the selection of participants where each individual has the same probability of being included in the sample. In this study, I used secondary data from the BRFSS and HRSA; thus, the sampling procedures were conducted during the primary research by the CDC and HRSA, respectively.

For the BRFSS survey, sampling was conducted through randomized telephone interviews of adults aged 18 years and older in the United States and its territories (CDC, 2015a). In the BRFSS, a sample record was represented by one telephone number within the total list of telephone numbers that the BRFSS system randomly selects to be dialed (CDC, 2015b). To satisfy the BRFSS standard for all of the states' sampling designs, one is required to justify that the sample records are a probability sample of all households that own telephones in the specified state. The BRFSS survey is conducted by the participating states on a monthly basis using a standardized questionnaire to evaluate the distribution of health practices and risk behaviors among individuals aged 18 years and older (CDC, 2015b). The telephone interviews do not include institutionalized individuals, and the final collected data are forwarded to the CDC, where aggregation of monthly data is performed by the state, returned to the BRFSS with standard tabulations, and published annually (CDC, 2015b).

The participating states obtain the respondents' telephone numbers from the Behavioral Surveillance Branch (BSB; CDC, 2015a). After receiving telephone numbers, each state reviews the sampling methodology with the BSB, together with statisticians, to ensure that data collection is consistent with the methodology (CDC, 2016). In case of changes in the sampling methodology, states are required to consult the BSB before altering the contents on the BRFSS website (CDC, 2015a). Because data collection in the BRFSS survey is conducted by state, sampling is designed to allow for the calculation of national estimates when all of the data are combined (CDC, 2015a). According to the CDC (2014), all of the states satisfied this criterion in 2014. According to the CDC (2014), 51 "states" used disproportionate stratified sample designs (DSS) for their telephone interviews, while Guam and Puerto Rico used the random sampling technique (CDC, 2014). Based on the CDC report, the BRFSS divided the telephone numbers into two strata (high density and medium density), which were sampled separately for the states that employed the DSS (CDC, 2014). The sample in the present study was based on data from adult individuals aged between 18 and 64 years. The inclusion criteria for this study using the HRSA data allowed the inclusion of all HIV-positive individuals; further, for comparison purposes only and the use of BRFSS data, I included all individuals aged 18-64 years. The exclusion criteria for this study involved the exclusion of HIV-negative individuals using the HRSA data, and individuals aged below 18 years or above 64 years using the BRFSS data.

A sampling method or strategy is the process by which a researcher selects respondents for a particular study (Creswell, 2014). The BRFSS survey is conducted using a simple random sample where telephone numbers are chosen randomly from an existing list of telephone numbers in each participating state (CDC, 2015a). According to Guetterman (2015), the sampling method that is used to choose the respondents' telephone numbers must be statistically valid, meaning that all of the respondents from households with telephone numbers should have a known likelihood of inclusion in the sample. The use of a probability sample in the BRFSS is intended to ensure that the final results can be generalized to the total state and national population (CDC, 2015a). After a telephone number is picked, the random selection procedure is used to select a member of the family who is over 18 years of age to be interviewed (CDC, 2013). For this purpose, "family members" include unrelated adults, domestic workers, and roomers who stay at the household (CDC, 2013). Family members who live in correctional facilities, nursing homes, colleges, and military bases are excluded from the BRFSS survey (CDC, 2013).

Power Analysis

Power analysis is a statistical method used to calculate the probability of a study detecting the anticipated effects of particular treatments (Button et al., 2013). Power analysis helps researchers to determine whether a research design should be modified based on the sample size so that the study has adequate power to detect the anticipated treatment effects (Button et al., 2013). To obtain the required sample size for this study, a power analysis was conducted using the G*Power 3.0 tool. For chi-square tests, 0.80 power, a large effect size of 0.50, and $\alpha = 0.05$ required a minimum of $N = 80$ participants in the sample to detect a significant association.

Procedures for Recruitment, Participation, and Data Collection

Recruitment and participation. The recruitment of participants during the BRFSS survey is conducted using randomized telephone interviews through every state's health departments. The respondents' telephone numbers in all 50 states and the territories are availed by the CDC (2015a). The BRFSS interviews are based on responses from one member of each family who is aged 18 years or older. According to the CDC (2013), the participants are informed that the survey is voluntary and that they can abandon the interview or decline to answer questions that they feel are inappropriate. After interviews are completed, the data are entered into a database, where further evaluation is conducted to ensure validity.

Data collection. In this study, I evaluated secondary data from the HRSA and CDC to assess the impact of the ACA on the HIV care continuum for HIV-positive individuals, health care access, and out-of-pocket costs for adults in the United States.

The BRFSS data were collected for the years 2014 and 2015 to assess changes, if any, in health care access and out-of-pocket health care costs since the implementation of the ACA in 2014, by comparing the data with corresponding data from the years just prior to the implementation. Data from the Annual Client-Level Data RSR for 2014 and 2015 were used to assess changes, if any, in health care access, out-of-pocket health care costs, and treatment outcome as measured by viral suppression for HIV-positive individuals since the implementation of ACA in 2014, when compared to data for the years just prior to the implementation. In the BRFSS program, data collection is conducted using random sampling techniques through telephone surveys (CDC, 2015a). The data are then used to identify health problems, develop and track health objectives, and establish and assess public health programs and policies. Data collection in the BRFSS is based on one-on-one interviews with participants from all participating states (CDC, 2013). As the researcher in the present study, I sought authorization from the Institutional Review Board (IRB) of Walden University before conducting this study (see Appendix A).

Procedures for gaining access to the data set. The CDC's BRFSS data files and questionnaires are openly available to the public without charge and can be accessed and downloaded from the BRFSS website (CDC, 2013). The data in the BRFSS database are stored based on the years in which the surveys were conducted. Researchers who wish to access data from the BRFSS can use the *Historical Questions* page on the BRFSS website, where they are able to search for specific questions based on their research objectives (CDC, 2013). The data for this study were extracted electronically from the CDC and HRSA databases.

Permissions to gain access to the data. When conducting any type of study, it is important to seek permission to access data from the relevant institutions (Tripathy, 2013). Seeking permission for the use of data is part of the research ethics and is performed to ensure that the study adheres to ethical standards (Creswell, 2014). However, in cases where the data are freely available to the public in books, on Websites, and other public media, permission for reuse of the data is implied (Tripathy, 2013). Nonetheless, the ownership of the original piece of research must be acknowledged in secondary research (Creswell, 2014). Conversely, if the data are not freely available to the public, written permission must be obtained from the original research team in order to get ethical clearance (Tripathy, 2013). Before the BRFSS and HRSA data were used, I obtained approval from both the CDC and the HRSA (see Appendices B and C, respectively).

Instrumentation and Operationalization of Constructs

The Ryan White HIV/AIDS program data. The first source of data for this study was the Ryan White's HIV annual report. The Ryan White Comprehensive AIDS Resources Emergency (CARE) Act was passed in 1990 to improve access to HIV care for underinsured and uninsured individuals who have HIV/AIDS (Ford & Spicer, 2012). According to the HRSA (2014), the Ryan White grant is the third largest organization in the United States that funds HIV care after Medicaid and Medicare. Over the past 2 decades, this bill has been constantly amended to improve care for PLWHAs in the United States. The Ryan White HIV/AIDS program (RWHAP) is the largest federally funded program that specifically focuses on supporting and providing care for PLWHAs

(Bradley et al., 2016). The HRSA is a national program that focuses on increasing access to health care services among vulnerable populations and people without health care to reduce the existing health disparity gap. The HRSA provides free clinics for primary screening and laboratory services, including oral and gynecological services and immunizations (Stanhope & Lancaster, 2013). In addition, the HRSA provides pharmaceutical, mental health, and substance abuse services. Through the free clinics, patients with the highest needs such as PLWHAs, mothers, and pregnant women can receive adequate health care attention (Stanhope & Lancaster, 2013).

The RWHAP facilitates continuous support, treatment, and access to HIV care for PLWHAs (Bradley et al., 2016). Specifically, the RWHAP targets low income HIV-infected individuals and their families, specifically those who have no private or public medical coverage, those who have inadequate coverage, and those who lack the finances to access HIV care and treatment (HRSA, 2014). The Ryan White HIV/AIDS program data are collected to help in monitoring the NHAS 2020 indicators, which include reducing the number of HIV/AIDS infections, increasing access to care, improving health outcomes among PLWHA, reducing the number of HIV-related comorbidities, and achieving a more coordinated national approach to the HIV/AIDS epidemic (Ford & Spicer, 2012). In the RSR, the viral load suppression among PLWHA who use the RWHAP program is reported. Also, the retention of RWHAP clients in the HIV care continuum is reported in the RSR. These two variables are consistent with Goals 1 to 3 of the NHAS 2020 (HRSA, 2014). These variables are categorized based on the RWHAP clients' demographic characteristics and state. The RWHAP plays an important role in the care of PLWHA and was, therefore, a reliable data source for this study. I was able to access data on health care coverage; income level; and treatment outcome, as measured by viral suppression, from the RSR 2014 and 2015.

The BRFSS instrument. The BRFSS was founded in 1984 to collect and evaluate behavioral risk factors among adults living in households (CDC, 2014). The BRFSS's telephone health survey system is the largest ongoing telephone survey with more than 350,000 interviews being conducted annually (CDC, 2016a). When the BRFSS was first introduced, only 15 states participated in the monthly data collection interviews (CDC, 2014). Data collection through the BRFSS is based on all 50 states and U.S. territories. The BRFSS has been a reliable source for different data variables, including race/ethnicity, gender, age, alcohol consumption, physical activity, and health insurance (CDC, 2015a). By using the BRFSS instrument for data collection, the CDC significantly reduced participant and researcher bias (CDC, 2015a). Some of the information collected through the BRFSS program includes data relating to preventive health practices, health care access, out-of-pocket costs, and health risk behaviors (CDC, 2014). The BRFSS focuses on health care access, preventive health practices, and health risk behaviors. The BRFSS contains uniform data on risk behaviors and preventive health practices that are associated with chronic diseases, preventable infectious diseases, and injuries that affect adults in a specific population (CDC, 2015a).

The methodology of the BRFSS facilitates the calculation of annual state and national estimates of health risk behaviors among adults, aged 18 years and above, in the United States and its territories (CDC, 2015a). The health indicators included in the

BRFSS are used to assess progress toward the achievement of disease prevention goals, which are set by the federal government (CDC, 2014). Through the BRFSS, approximately 400,000 individuals, aged 18 years and above, are interviewed annually in all the participating states and territories (CDC, 2016a).

While the BRFSS mainly focuses on health behavior, it is also used to collect information on whether the respondents have health care coverage at the time of the interview. However, the BRFSS survey does not collect information regarding the type of the respondents' medical coverage; thus, it cannot be used to determine changes across the existing types of medical coverage by PLWHA. Although the validity of the BRFSS survey data has been a subject of debate in the past, recent estimates regarding people who lack coverage have been consistent with census data (Claxton, Levitt, Brodie, Garfield, & Damico, 2014). For instance, in 2011, 21.3% of individuals aged 18 - 64 years lacked insurance, while the Annual Social and Economic Supplement to the Current Population Survey (CPS ASEC) rate was 21.2 % (Claxton et al., 2014). Similarly, in 2012, the rate of individuals aged 18 - 64 years who lacked health care coverage based on the BRFSS and CPS ASEC was 20.4% and 21.0%, respectively (Claxton et al., 2014).

The BRFSS data for 2014 and 2015 were expected to bear sufficient information regarding the changes in the health care coverage in the United States. Because of the large sample size involved, the BRFSS is the first available resource that can provide data on significant changes in health care coverage among adults on the state and national level (Claxton et al., 2014). The BRFSS survey is mainly used by local and state health departments to identify health problems, track health care objectives, and develop health programs and policies (Xu et al., 2013). The BRFSS data used in this study contained key information on the predictors that can be used to assess the impact of the ACA on the HIV care continuum. In addition, the BRFSS information on health care coverage among adults in America can be used to determine reduction or increase in health care coverage since the ACA has been implemented.

The BRFSS was appropriate for this study because it is reliable and valid for use in studies of public health problems such as HIV/AIDS, diabetes, and obesity (Xu et al., 2013). The BRFSS is used to collect data on preventive health practices, health risk behaviors, and access to health care by adults with chronic diseases (Xu et al., 2013). The BRFSS was a suitable source of data for this study because it provided timely and accurate information with respect to indicators of health care access and out-of-pocket costs among adult Americans. Because the BRFSS data are categorized by state, I was also able easily to describe and analyze the data needed to answer part of the research questions.

Operationalization of Variables

Health care access. Based on the CDC’s (2016a) definition, health care coverage is the ownership of private, government, or prepaid health insurance plans. In the BRFSS, the participants are asked: Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare? The responses to this question are categorical with the participants required to choose either *Yes* or *No*. Data on insurance coverage will also be retrieved from RSR 2014 and 2015, specifically for HIV-positive individuals, and from the BRFSS survey.

Poverty status. Poverty status is calculated using the Office of Management and Budget's (OMB) Statistical Policy Directive 14. This bureau utilizes a conventional money income threshold that differs with the number of people in the household, to determine who is considered poor (OMB, 2016). However, the Department of Health and Human Services (HHS) uses a different poverty guideline to determine the poverty status for health-related eligibilities. Data on poverty status is in a frequency and percentage form and was retrieved from RSR 2015.

Viral suppression. Viral suppression refers to a state where HIV-patients have a low viral load of HIV in their blood as a result of continuous intake of the ARTs (McManus et al., 2016). Data on viral suppression are in a frequency and percentage form and were retrieved from RSR 2014.

Out-of-pocket costs. According to Zamani-Hank (2015), out-of-the-pocket costs are those expenses that are paid by patients during a plan year. Data on poverty status were retrieved from RSR 2014 and 2015 and used in this study to determine the impact on out-of-pocket health care costs for HIV-positive individuals. Also, data relating to out-of-the-pocket expenses were accessed from the BRFSS. In the BRFSS, the participants are asked: Was there any time in the past 12 months when you needed to see a doctor but could not do so because of cost? The data were continuous in nature.

Covariates

Covariates are characteristics of participants that are only observed, but not manipulated, in an experiment (Hsu & Small, 2013). Although covariates are not evaluated in the actual treatment, they can affect the outcome of the study. Covariates used in this study were age, race, and gender.

Age. Regarding the participants' age, this study was focused on individuals aged between 18 and 64 years. Individuals older than 65 years were already assured of medical coverage through Medicare and, thus, were not included in this study. In the BRFSS, the participants are required to answer the question: What is your age? The responses to this question are numerical in nature. The age variable is categorized into 13 groups: Ages 18-24, 25-29, 30-34, 35-39, 40- 44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, and 80 or older.

Gender. During the BRFSS survey, the participants are required to respond to the question: What is your gender? The responses to this question are categorical in nature, with the respondents required only to indicate whether they are *M* or *F*.

Race. Regarding race/ethnicity, the respondents are asked to respond to the question: Which one or more of the following would you say is your race? The respondents are provided with five choices: White, Black or African-American, Asian, Native Hawaiian or Other Pacific Islander, and American-Indian or Alaska Native. In a separate question, the respondents are also asked: Are you Hispanic or Latino? The responses to this question are categorical in nature: *Yes* or *No*.

Data Analysis Plan

Excel and the SPSS-23 software were used to perform the statistical analysis of the secondary data obtained from the HRSA and BRFSS. I chose these two packages for statistical analysis because they provided effectiveness in data management, a wide range of data analysis options, and excellent output organization (Ozgur, Kleckner, & Li, 2015). Data analysis was conducted on weighted data and percentages from the BRFSS and HRSA databases. I employed a quantitative correlational design to analyze the impact of the ACA on the HIV care continuum. Before conducting statistical analysis, I performed data cleaning to ensure that all the entries were available. Also, data belonging to respondents, aged 65 years and above, were eliminated from the BRFSS data analysis, and HIV-negative individuals were eliminated from the HRSA data analysis. This study was focused on PLWHA.

After exporting the data to SPSS and Excel, I used different statistical techniques to analyze the data. The first phase of data analysis involved the calculation of descriptive statistics such as frequencies, means, variance, and standard deviation to describe the participants' demographic characteristics. To prevent skewness of the data, I recoded the data using SPSS. After describing the participants' demographic characteristics using descriptive statistics, I performed bivariate analysis through chi-square tests to assess whether implementation of the ACA in 2014 coincided with changes in access to health care coverage, out-of-pocket costs, and viral suppression. The participants' demographic statistics, including age, gender, and race, were included in the study as covariates. The results of the statistical analysis was based on a 0.05 level of significance.

The research questions guiding this study and the associated hypotheses tested to answer the questions were as follows:

RQ1: What is the impact of the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals?

H_o1: There will be no impact due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals.

H_a1: A statistically significant impact exists due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals.

RQ2: What is the impact of the implementation of the ACA on the poverty status of HIV-positive individuals?

H_o2: There will be no impact due to the implementation of the ACA on the poverty status of HIV-positive individuals.

H_a2: A statistically significant impact exists due to the implementation of the ACA on the poverty status of HIV-positive individuals.

RQ3: What is the impact of the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals?

H_o3: There will be no impact due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals.

H_a3: A statistically significant impact exists due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals.

RQ4: What is the impact of the implementation of the ACA on access to health care for adults in the United States?

H_o4: There will be no impact due to the implementation of the ACA on access to health care for adults in the United States.

H_a4: A statistically significant impact exists due to the implementation of the ACA on access to health care for adults in the United States.

RQ5: What is the impact of the implementation of the ACA on out-of-pocket health care costs for adults in the United States?

H_o5: There will be no impact due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States.

H_a5: A statistically significant impact exists due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States.

Threats to Validity

Validity refers to the extent to which a research instrument measures variables and performs according to how it was designed. In contrast, reliability involves the consistency of the research instrument (Postmes, Haslam, & Jans, 2013). Threats to validity and reliability of a study involve issues with the ease of administration, interpretation, and scoring of the research instrument (Creswell, 2014). This study involved the use of secondary data from the BRFSS, which had been collected using telephone interviews, and the HRSA survey systems. Therefore, the threats to validity of this study were related to the reliability, acceptability, specificity, and sensitivity of the health surveillance systems (McKerr, Lo, Edeghere, & Bracebridge, 2015). While the health survey systems are effective in collecting large amounts of data from the adult population, there are questions surrounding the use of data from these systems in policy. For example, there are concerns about whether the use of state-by-state data on HIV/AIDS cases from health survey systems can be used in the allocation of funding to programs such as the Ryan White program (Hanna et al., 2013).

Regarding this study, the validity and reliability of the data were evaluated by the CDC, which was the source of the secondary data used in the analysis. Based on the CDC information, the BRFSS data were reliable and posed a minimal threat to the validity of the study. The CDC has designed procedural methods that justify the respondents' participation and dropout rates from the BRFSS survey (CDC, 2014). The use of one-on-one telephone interviews to collect data during the BRFSS surveys reduces the likelihood of manipulation, thus, increasing the reliability of the data.

Several researchers have conducted studies to evaluate the validity and reliability of the BRFSS data collection instrument (Nelson, Holtzman, Bolen, & Mack, 2001; Stein, Lederman, & Shea, 1993). With the exception of variables with extreme definitions, Stein, Lederman, and Shea (1993) found that the reliability coefficients for behavioral factors measured by using the BRFSS survey were over 0.70. Therefore, Stein et al. recommended the use of the BRFSS for research and surveillance purposes. After reviewing studies on the constructs of the BRFSS and other similar surveys, Nelson, Holtzman, Bolen, and Mack (2001) found the core questions of the BRFSS moderately valid and reliable at the very least. Pierannunzi, Hu, and Balluz (2013) conducted the most recent study on the reliability and validity of the BRFSS. The findings of this study indicated that the BRFSS prevalence rates were consistent with other national surveys that employed the use of self-reports. Overall, Pierannunzi et al. (2013) found a large amount of evidence supporting the validity and reliability of the BRFSS data.

Ethical Procedures

The application of ethical considerations is important in all kinds of research. The primary aim of using ethical standards in research is to avoid falsification and fabrication of data, thus promoting the achievement of reliable finding, which is the main purpose of research. There have been no significant changes in the ethical procedures for secondary data analysis (Richards & King, 2014). However, the adoption of new technologies has introduced new concerns about ethical issues surrounding secondary data analysis. While there has been an improvement in storage, data compiling, and data-sharing speed, new challenges have surfaced regarding the security and confidentiality of secondary data (Creswell, 2014). For instance, it is widely believed that a researcher is free of the burden of seeking ethical approval when conducting secondary research (Richards & King, 2014). However, some researchers argued that the overall research process involves ethical considerations irrespective of whether primary or secondary data are used (Creswell, 2014). The application of ethical considerations starts during the design phase of the study (Creswell, 2014). According to Tripathy (2013), a study should be designed to benefit the public or should, at least, not have a negative impact. Ethical considerations are also applied throughout the study and during presentation of the results.

While there are minimal ethical procedures needed in secondary research, there are certain factors that should be considered when dealing with secondary data (Richards & King, 2014). First, the data should be relevant and adequate. In secondary research, the original data were not meant to answer the current research question (Richards & King, 2014). Thus, there is a need for evaluation of the methodology that was used to collect the data, its accuracy, the purpose for which the data were collected, and the period of data collection (Faden et al., 2013). Thus, the data should be kept only until the purpose of the current research has been achieved. However, secondary data should also be stored in secure locations to avoid unauthorized access, destruction, or accidental loss (Faden et al., 2013). Further, it is the researcher's responsibility to ensure that appropriate analysis of secondary data is being conducted. In secondary research, ethical considerations are important when addressing data sharing, confidentiality, and copyright guidelines. According to Faden et al. (2013), the public's support and belief of a study is dependent on the researcher's application of ethical standards. Creswell (2014) argued that the public needs to be assured that the appropriate guidelines were followed regarding safety, human rights, compliance with the law, and conflict of interest. In this study, confidentiality and anonymity of the respondents were assured because data from the HRSA and BRFSS are anonymous. To obtain ethical clearance, I sought approval from the IRB of Walden University, the CDC, and HRSA before conducting the study. After retrieving the data from the respective databases, I stored the data in a password-protected computer to avoid access by third parties.

Summary

This chapter provided a description of the research design, research methods, and procedures that were performed in this study. The study design was quantitative in nature and aimed at assessing the impact of the ACA on the HIV care continuum. Specifically, this study was retrospective correlational and based on the economic theory and R. M. Andersen's (1995) behavioral model of utilization of health services. I chose to conduct quantitative research because it can be used to identify relationships between different variables in a given population. The independent variable was implementation of the ACA, while the dependent variables were access to health care; out-of-pocket costs; and health outcomes, as measured by viral suppression. The covariates were age, gender, and race. To obtain ethical clearance, I sought approval from the IRB of Walden University, the CDC, and HRSA, before conducting the study. I used secondary data obtained from the BRFSS and HRSA databases to answer the research questions. The target population for this study were PLWHA between the ages of 18 and 64 years who lived in the participating states. Univariate descriptive statistical analysis through chi-square tests, using SPSS-23 software and trend analysis, was conducted. The statistical analysis was focused on identifying if the introduction of the ACA has had a significant impact on access to HIV care among PLWHA; out-of-the-pocket costs; and treatment outcome, as measured by viral suppression. The demographic characteristics of the respondents, based on age, sex, and race/ethnicity, were also discussed. The findings of the statistical analysis were based on a 95% confidence interval and $\alpha = 0.05$. In the next chapter, I provide a comprehensive discussion of the data collection procedures and the findings of this study, based on the research questions asked and the answers obtained through hypothesis testing.

Chapter 4: Results

The purpose of this study was to evaluate the impact of the ACA on the HIV care continuum. In this research, I employed a quantitative design to evaluate the ACA and its impact on the HIV care continuum from 2010 to 2015. The study was specifically focused on the impact of the ACA on health care access and outcomes, as well as out-of-pocket health care costs. Secondary data from the HRSA and BRFSS databases were used for data analysis to answer the research questions. Three main research questions guiding the study were answered through hypothesis testing. Two additional supporting questions were included to provide a broader context for the effects of the ACA on HIV-positive individuals by including health care effects among a nationally representative sample.

Research Questions and Hypotheses

RQ1: What is the impact of the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals?

H_o1: There will be no impact due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals.

H_a1: A statistically significant impact exists due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals.

RQ2: What is the impact of the implementation of the ACA on the poverty status of HIV-positive individuals?

H_o2: There will be no impact due to the implementation of the ACA on the poverty status of HIV-positive individuals.

H_a2: A statistically significant impact exists due to the implementation of the ACA on the poverty status of HIV-positive individuals.

RQ3: What is the impact of the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals?

H_o3: There will be no impact due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals.

H_a3: A statistically significant impact exists due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression in HIV-positive individuals.

RQ4: What is the impact of the implementation of the ACA on access to health care for adults in the United States?

H_o4: There will be no impact due to the implementation of the ACA on access to health care for adults in the United States.

H_a4: A statistically significant impact exists due to the implementation of the ACA on access to health care for adults in the United States.

RQ5: What is the impact of the implementation of the ACA on out-of-pocket health care costs for adults in the United States?

H_o5: There will be no impact due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States.

H_a5: A statistically significant impact exists due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States.

Data Collection

Data Collection in the HRSA

For this research, I used secondary data from the HRSA and the BRFSS health survey to answer the research questions. The HRSA collects data on the performance of grant programs, including those with workforce-building features, using an automated electronic handbook (EHB). The EHB allows grantees to upload spreadsheets or enter data directly into the system (White, Zangaro, Kepley, & Camacho, 2014). In addition, the EHB automatically calculates percentages, rates, ratios, and totals. The HRSA collects data on an annual basis using three levels: individual, program, and cross-cutting (Ford & Spicer, 2012). Data collection on the individual-level involves gathering participants' background and demographic information, including age, race, ethnicity, and gender (White et al., 2014). Program-level data collection involves descriptive information such as retention, distribution, and training activities (Ford & Spicer, 2012). However, program-level data collection processes may differ based on program objectives. The cross-cutting level of data collection involves gathering cluster data across programs to find aggregates on initiatives with the same objectives (Ford & Spicer, 2012). In the present study, I used data on the Ryan White HIV/AIDS Program Services Report (RSR) to assess the impact of the ACA on the HIV care incontinuum in the United States. The RSR was launched in 2009 and collects individual-level data annually from HIV-positive individuals who use at least one of the services funded by the Ryan White program (Ford & Spicer, 2012). In addition, the RSR contains data for grantees and information on service providers. To ensure the confidentiality of client information, the HRSA encrypts data before they are entered into the HRSA database (Ford & Spicer, 2012).

Data Collection in the BRFSS

Unlike the HRSA RSR, the BRFSS surveys are coordinated by the CDC (2015a) and state health departments. The BRFSS uses a cross-sectional telephone survey that collects data on health-related risk behaviors, utilization of preventive services, chronic health conditions, and other health-related problems among all U.S. residents by state (CDC, 2014). Originally implemented in 1984 in only 15 states, the BRFSS is currently used to collect data from all 50 states, three U.S. territories, and the District of Columbia (CDC, 2014). Previously, the BRFSS involved only landline surveys, but the current BRFSS uses both landline and cell phone data surveys and collects data from over 400,000 Americans annually (CDC, 2015a).

The BRFSS data collection process involves a random sample of one adult per household who responds to a telephone survey, which is conducted based on guidelines from the CDC (2014). To collect data from the selected participants from each household, the data collectors use a questionnaire with three categories: core components, optional modules, and state-added questions (CDC, 2014). The core components include questions that are asked in all states (CDC, 2013). The core components are used to collect data on participants' general health, demographics, health conditions, risk behaviors, health services, and emerging core components (CDC, 2013). The demographic characteristics collected for the BRFSS questionnaire core include age, ethnicity, marital status, sex, race, educational level, pregnancy status, county of residence, employment status, income, and number of children in the household aged below 18 years (CDC, 2015a). The general health data collected with the BRFSS questionnaire core include self-reported health status, health insurance, height, weight, personal health provider, disability, and quality of life and care received (CDC, 2013). Based on health conditions, the BRFSS questionnaire's core focuses on information regarding diabetes, oral health, arthritis, cardiovascular disease, asthma, and awareness of high cholesterol and hypertension (CDC, 2013). To collect data on risk behaviors, the BRFSS questionnaire core is used to collect data on physical activity, folic acid, weight control, fruit and vegetable consumption, seatbelt use, HIV/AIDS, alcohol use, tobacco indicators and products, and lack of leisure time physical activity (CDC, 2016). The health services information collected in the BRFSS questionnaire core includes health care coverage and utilization, flu and pneumococcal vaccination, and screening for breast, cervical, prostate, and colorectal cancer (CDC, 2013). Lastly, the BRFSS questionnaire's emerging core components include gastrointestinal disease and novel H1NI adult immunization (CDC, 2016a).

The optional modules in the BRFSS questionnaire include specialized topic questions that each state can choose to include in the survey (CDC, 2013). The main components of the optional modules in the BRFSS questionnaire include diabetes, access to eye care, weight control, women's health, heart attack and stroke, intimate partner violence, actions to control hypertension, and secondhand smoke (CDC, 2016a). The final component, the state-added questions, includes state-specific questions that are used to address state and local issues (CDC, 2013). The state-added questions are acquired or developed by participating states and included in the BRFSS at a cost. The CDC does not evaluate or edit the state-added questions (CDC, 2013). All state-added questions undergo mandatory field and cognitive testing before inclusion in the BRFSS (CDC, 2013). Every year, the CDC and participating states agree on the items to include in the core components and optional-modules section of the BRFSS questionnaire (CDC, 2014b). The sources for the majority of the questions are established national surveys such as the National Health and Nutrition Examination Survey and the National Health Interview Survey (CDC, 2013). Thus, states can make comparisons between their data and data from past surveys. This practice is also beneficial to the BRFSS in that some questions may have been tested in past surveys, thus facilitating improved understanding (CDC, 2013).

Data collection with the BRFSS survey was conducted using computer-assisted telephone interviewing (CATI) technology, which is supported by the CDC (2014). The states converted their versions of the BRFSS into the CATI interface, from which the interviewers read the survey questions and recorded responses (CDC, 2014). However, states are also allowed to use their own CATI software. After collection, each state edits and checks the data using programs before submission to the CDC on a quarterly or monthly basis. After receiving data from the states, the CDC performs additional quality evaluation and summarizes the data in the form of year-to-date (YTD) reports that are sent to the states (CDC, 2013). The data are then finalized and weighted at the end of every calendar year.

The CDC (2013) programs the core and module topics for data collectors and provides questionnaire scripting for the state-added questions. The CDC (2012) also contracts with Ci3 consultants to provide assistance to states with data collection. The BRFSS interviews were conducted by contractors or state health personnel following the CDC guidelines (CDC, 2012). The core components section of the BRFSS takes approximately 18 minutes to complete, while the optional modules and state-added questions can be completed in an additional 5-10 minutes (CDC, 2013). The interviews were conducted following a BRFSS interviewing schedule, which required that all calls that were planned for a specific month be completed within that month. The state health personnel called selected households to interview one adult aged 18 years or older (CDC, 2014b). In case the call is not answered, the personnel are allowed to make up to 15 attempts to reach the household, depending on outcomes of previous attempts and state regulations regarding calling (CDC, 2016a). The rules on calling households in the BRFSS are stipulated by the CDC and distributed annually to each state in Summary Data Quality Reports (CDC, 2016a). Based on the CDC calling protocols, 80% of the BRFSS interviews are conducted on weeknights and weekdays, while 20% are reserved for weekends (CDC, 2016a). Additionally, states are required to alter their schedules to accommodate special events and holidays. The CDC also requires that data collectors conduct weekday calls after the dinner hour (CDC, 2014b). In addition, the CDC stipulates that all appointment callbacks should preferably be conducted on weekdays, during hours that are not scheduled for other interviews (CDC, 2016a). Throughout the telephone interviews, all of the standard procedures for call rotation were followed. In addition, the data collectors followed guidelines for the selection of respondents, refusal of conversation, callbacks for each sample piece, and interview periods (CDC, 2014b). Although some states preferred to contract other organizations to conduct data collection, the CDC required states to develop and maintain procedures that ensured confidentiality of all participant information (CDC, 2015a). In addition, all states were required to develop mechanisms to supervise and monitor interviewers and report the quality of the interviewing process (CDC, 2016a). The interviews were conducted from January through December, 7 days per week, during the day and in the evening (CDC, 2016a).

Time Frame and Response Rates: Univariate Characteristics

For this study, the univariate descriptive statistics of the HRSA and BRFSS samples from 2010 to 2015 are provided in Table 1. The 2015 HRSA survey had the largest sample size (N = 533,036), followed by the 2011 HRSA (N = 504, 807), 2013 HRSA (N = 489, 869), 2012 HRSA (N = 474, 129), 2014 HRSA (N = 462, 840), and 2010 HRSA (N = 449, 858). Table 1 provides the univariate characteristics of the HRSA and BRFSS samples. Table 2 provides a trend analysis for the dependent variables: access to health care, poverty rates, viral suppression, overall access, and did not visit doctor.

Table 1

Univariate Characteristics of the HRSA and BRFSS Samples From 2010-2015

	2010	2011	2012	2013	2014	2015
HIV/AIDS clients who had health care coverage from HRSA samples						
Coverage	340,695	357,478	361,956	359,799	362,789	356,429
No coverage	115,171	133,341	137,761	138,447	123,273	107,188
Wt % coverage	74.74%	72.83%	72.43%	72.21%	74.64%	76.88%
Access to health care by American adults from BRFSS samples						
Access	402,028	446,544	419,328	434,627	425,198	407,556
No access	47,830	58,263	54,801	55,242	37,642	32,060
Wt % access	84.51 %	81.32 %	81.24 %	82.20 %	85.52 %	87.28%
Poverty status from HRSA samples						
0-100 %	292,427	321,865	322,347	332,247	304,168	330,530
> 100 %	143,205	157,071	160,704	159,552	169,315	176,638
Percent (0-100%)	67.13 %	67.20 %	66.73 %	67.56 %	64.24 %	65.17 %
Out-of-pocket costs (as defined by individuals who did not visit their doctor due to cost) from BRFSS samples						
Yes	53, 129	64, 279	59, 203	60, 104	49, 315	43,514
No	396, 821	440, 873	415, 188	430, 446	414, 132	396,748
Weight %	14.61 %	16.91 %	16.50 %	15.88 %	14.25 %	13.22%
Viral suppression from HRSA samples						
Total suppressed	117,257	192,490	210,147	223,045	231,051	340,085
< 13	904	827	854	834	856	938
13-14	346	365	310	257	256	286
15-19	1,572	1,622	1,519	1,488	1,497	1,627
20-24	5,156	6,186	7,126	8,474	8,726	9,754
25-29	9,832	11,421	13,282	15,682	1,7167	21,001
30-34	14,410	16,068	17,669	19,397	20,034	24,041
35-39	19,350	19,538	20,528	21,679	22,286	27,045
40-44	29,202	29,296	29,517	29,003	27,803	30,957
45-49	36,212	37,844	39,315	38,876	37,160	42,877
50-54	28,377	31,711	35,603	38,296	40,236	49,746
55-59	17,643	20,637	24,005	26,050	28,364	37,551
60-64	8,794	10,628	12,637	14,179	16,199	22,111
> 65	5,459	6,347	7,782	8,830	10,458	15,688
Total %	69.49 %	72.58 %	75.07 %	78.62 %	81.44 %	83.4%

Note. Wt = weighted.

Table 2

Trend Analysis

	Dependent variables				
	Health care access	Poverty rates HRSA	Viral suppression	Overall access	Did not visit doctor
	(1)	(2)	(3)	(4)	(5)
Linear year	-2.409**	0.124	2.848***	-2.641*	1.478
	(0.318)	(0.938	(0.099)	(0.779)	(0.555)
Quadratic year	0.573**	-0.127		0.685*	-0.384*
	(0.061)	(0.180)		(0.150)	(0.106)
Constant	74.727***	67.191***	69.647***	84.003***	15.058***
	(0.338)	(0.997)	(0.300)	(0.828)	(0.590)
Observations	6	6	6	6	6
R^2	0.974	0.587	0.995	0.918	0.876
Adjusted R^2	0.957	0.311	0.994	0.864	0.793
Residual *SE*	0.373 (df = 3	1.100 (df = 3)	0.415 (df = 4)	0.914 (df = 3)	0.651 (df = 3)
F statistic	57.000** (df = 2; 3)	2.128 (df = 2; 3)	824.762*** (df = 1; 4)	16.901* (df = 2; 3)	10.597* (df = 2; 3)

Note. $^{*}p < .0$. $^{**}p < .01$. $^{***}p < 0.001$.

Health care access as defined by health care coverage. The weighted HRSA data for the Ryan White HIV/AIDS program clients indicated that the year 2015 had the highest number of HIV-positive individuals with health care coverage (76.88%), followed by the years 2010 (74.74%), 2014 (74.64%), 2012 (72.83%), and 2013 (72.21%).

Access to health care. Based on the 2010-2015 BRFSS, 2,535,281 participants had health insurance of some kind, while 285,838 did not have health insurance. The highest number of participants who had health care coverage was recorded in the 2015 HRSA (87.28%), followed by the 2014 HRSA (85.52%), 2010 HRSA (84.51%), 2013 HRSA (82.20%), 2011 HRSA (81.32%), and 2012 HRSA (81.24%).

Poverty status. Based on the HRSA data, the number of individuals between the 0% -100% poverty level increased between 2010 (67.13%) and 2011 (67.20%). There was a slight decrease in the frequency of individuals within the 0%-100% poverty level in 2012 (66.73%), before an estimated 1% increase in 2013. The number of individuals within the 0%-100 % poverty level declined in 2014 (64.24%), before it slightly increased in 2015 (65.17%).

Out-of-pocket costs. Based on the BRFSS, the weighted percentage of individuals who did not visit their doctor due to the cost of health care in 2010 was 14.61%. Although the number of individuals increased in 2011 (16.91%), the proportion of individuals who could not afford health care decreased steadily from 2012 (16.50%), through 2013 (15.88%), 2014 (14.25%), and 2015 (13.22%).

Viral suppression. Based on the HRSA data, there has been a constant increase in viral suppression among HIV-positive individuals in the United States from 2010-2015: 2010(69.49%), 2011 (72.58%), 2012 (75.07%), 2013 (78.62%), 2014 (81.44%), and 2015 (83.4%).

The BRFSS data for 2010-2015 were retrieved from the BRFSS database after I had obtained authorization from the CDC (see Appendix B). The BRFSS data collection processes are performed from January to December every year. Table 3 shows the total landline and cell phone interviews for the BRFSS that were conducted from 2010 to 2015.

Table 3

BRFSS Samples From 2010-2015

BRFSS year	Landline interviews	Cell phone interviews	Total
2010	451,075	-	451,075
2011	437,743	71,259	509,002
2012	377,049	100,236	477,285
2013	360,079	133,356	493,435
2014	298,568	166,100	464,668
2015	254,660	186,836	441,496

BRFSS-2010. In 2010, the CATI included a total sample of 451,075 telephone interviews. The overall response rates of the 2010 BRFSS was 35.83%, while the American Association for Public Opinion Research (AAPOR) cooperation and refusal rates were 76.92% and 14.34%, respectively.

BRFSS-2011. The 2011 BRFSS comprised a total of 509,002 interviews including 437,743 landline interviews and 71,259 cell phone interviews. The median weighted AAPOR cooperation rate in the 2011 BRFSS was 73.84%, while the median weighted AAPOR response rate was 49.72%. The landline and cell phone interview response rates were 27.9% and 53.0%, respectively.

BRFSS-2012. The 2012 BRFSS involved a total sample of 477,285 interviewees, including 377,049 landline and 100,236 cell phone interviews. The 2012 BRFSS had a median weighted AAPOR cooperation rate of 66.3% and a median weighted response rate of 45.2%. The response rates for the landline and cell phone interviews were 49.1% and 35.3% respectively.

BRFSS-2013. The 2013 BRFSS included a total sample of 493,435 interviewees, including 360,079 landline and 133,356 cell phone interviews. The median weighted AAPOR cooperation and response rates of the 2013 BRFSS were 65.7% and 45.9%, respectively. The response rates for the landline and cell phone surveys were 49.6% and 37.8%, respectively.

BRFSS-2014. The 2014 BRFSS included a total sample of 464,668 interviewees, comprising of 298,568 landline and 166,100 cell phone surveys. The median weighted AAPOR cooperation and response rates for the 2014 BRFSS were 67.1% and 47.0%, respectively. Based on the CDC, the response rates for the cell phone and landline interviews were 48.7% and 40.5%, respectively.

BRFSS-2015. The 2015 BRFSS sample comprised 441,496 interviewees, including 254,660 landline and 186,836 cell phone surveys. The median weighted AAPOR response and cooperation rates for the 2015 BRFSS survey were 47.2% and 68%, respectively.

Discrepancies in the BRFSS Data Sets

The data utilized in this study included national data from the HRSA and the BRFSS of the CDC. Some of the discrepancies observed in the CDC national data set included missing data and issues with older age groups, weight analysis, and sexual orientation (CDC, 2016b). For instance, the BRFSS data from the CDC database contained numerous missing values that had to be eliminated through data cleaning.

Apart from providing inaccurate results, missing data can affect the reliability of a study by introducing bias (Kang, 2013). Thus, cases of missing data should be appropriately addressed before statistical analysis (Kang, 2013). In this study, I appropriately recoded the missing data and completed the missing values with valid responses. According to Reilly et al. (2014), sexual orientation confounds HIV screening among homosexual and heterosexual individuals. However, gender was not included in the final analysis because the focus of this study was mainly health care access and outcome among HIV-positive individuals. The collection of data in the BRFSS is conducted using a disproportionate sampling approach (CDC, 2015a). However, a weighting analysis approach was used to estimate the standard errors (*SE*) and parameters of the sample. Though the sample was representative of the entire adult population in the United States, weighted analysis was necessary to increase generalizability.

Results

Representativeness of the Sample

The BRFSS survey involved landline and cell phone interviews that were used to collect health-related data from adult individuals in the United States. The cell phone interviews are meant to account for the households that do not have a landline (CDC, 2013). The addition of the cell phone interviewees to the BRFSS sample was aimed at improving its representativeness, validity, and coverage (CDC, 2013). Research evidence shows that individuals who own cellular phones have different demographic characteristics, when compared to those who use landline telephones (CDC, 2014). Specifically, individuals who have cell phones tend to be single, young, are predominantly Hispanic, and the majority do not own a home (Roberts, Yaya, & Manolis, 2014). It has also been found that people who have cell phones and landline telephones have varying behaviors and attitudes (Roberts et al., 2014). With the aim of maintaining the representativeness of the BRFSS, the CDC has restructured the weighting methodology to raking and eliminated the use of poststratification (CDC, 2014). Raking ensures that the proportion of the participants' known characteristics, including race, age, ethnicity, gender, marital status, education level, telephone source, region, and home owner status, are accounted for while also controlling for nonresponse bias (CDC, 2014). Thus, the BRFSS data utilized in this study were representative of the entire population of the United States, the U.S. territories, and the District of Columbia (CDC, 2013).

Statistical Assumptions

This study involved the analysis of HRSA and BRFSS data using Pearson's chi-square test to answer each research question. Thus, the statistical assumptions relating to chi-square tests and cross-tabulations had to be satisfied before the statistical analysis. According to McHugh (2013), six assumptions must be satisfied when conducting chi-square tests. First, the sample data to be used in chi-square tests should be in frequency or count form. Second, all the data levels should be mutually exclusive, meaning that a particular participant can belong to only one level of each variable. The third assumption states that a subject can provide data to only one cell in the cross-tabulation (Onchiri, 2013). The fourth assumption requires all groups to be independent; therefore, a different test should be used if any two groups are related. The fifth assumption for chi-square testing is that the variables being compared should be nominal or ordinal in nature

(McHugh, 2013). However, interval or ratio variables can also be transformed into nominal or ordinal variables and used in chi-square tests (Onchiri, 2013). The final assumption governing chi-square tests is that the value of the cells should be at least 5 in 80% or more of the cells (McHugh, 2013). The *p* value was used to determine whether a predictor variable was statistically significant at a threshold of $p < .05$.

Study Findings

Over the 6-year period examined in the present study, both the percentages of individuals with health care coverage and those who did not visit a doctor because of cost exhibited year-to-year changes. As can be seen in Figures 1 and 2, the changes from 2010 to 2015 were ultimately beneficial, and as shown in Figure 4, more people had health care coverage in 2015 (87.28%), compared to 2010 (84.51%). Figure 5 also shows that fewer individuals failed to visit their doctors (13.22%) in 2015, compared to (14.6%) 2010. The annual viral suppression rate was derived by computing the percentage of RWHAP clients who achieved viral suppression (viral load test < 200 copies/mL) during the specific year. In terms of health care coverage and relevant outcomes for HIV-positive individuals, viral suppression rates exhibited a steady linear increase over the 6-year period (Figure 3). As shown in Figure 1, the pattern of change in coverage rates for HIV-positive patients was similar to that of the general U.S. population. Additionally, HIV-positive individuals were covered at lower rates overall, compared with the general population. Finally, the poverty rate among HIV-positive patients appeared relatively stable from 2010 to 2013, and then dropped from 2013 to 2015 (see Figure 2).

Research Question 1

RQ 1 asked whether the implementation of the ACA had any impact on health care access for HIV-positive individuals in the United States. The null hypothesis tested to answer RQ 1 stated: There will be no impact due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals. The alternative hypothesis stated: A statistically significant impact exists due to the implementation of the ACA on access to health care, as measured by health care coverage, for HIV-positive individuals.

Based on the HRSA data, visual inspection of the raw data suggested that a quadratic model for change would best fit the data. The resulting model coefficients are displayed in Table 2. The model revealed a significant acceleration in health care coverage (as indicated by the significant and positive quadratic term in the model). Plotting observed and fitted values revealed that, from 2010 to 2015, health care access initially fell before accelerating (see Figure 2). A chi-square test revealed that the proportion of individuals in the 2010 HRSA survey who reported having access to health care was significantly associated with the proportion of individuals in the 2015 survey who reported having health coverage, $\chi2(1) = 576{,}417$, $p < .000$. Thus, the null hypothesis for RQ 1 had to be rejected and the alternative hypothesis accepted, meaning that implementation of the ACA was a significant predictor of access to health care for HIV-positive individuals in the United States. Figure 2 shows the trend in health care access among HIV-positive individuals in the United States from 2010 to 2015.

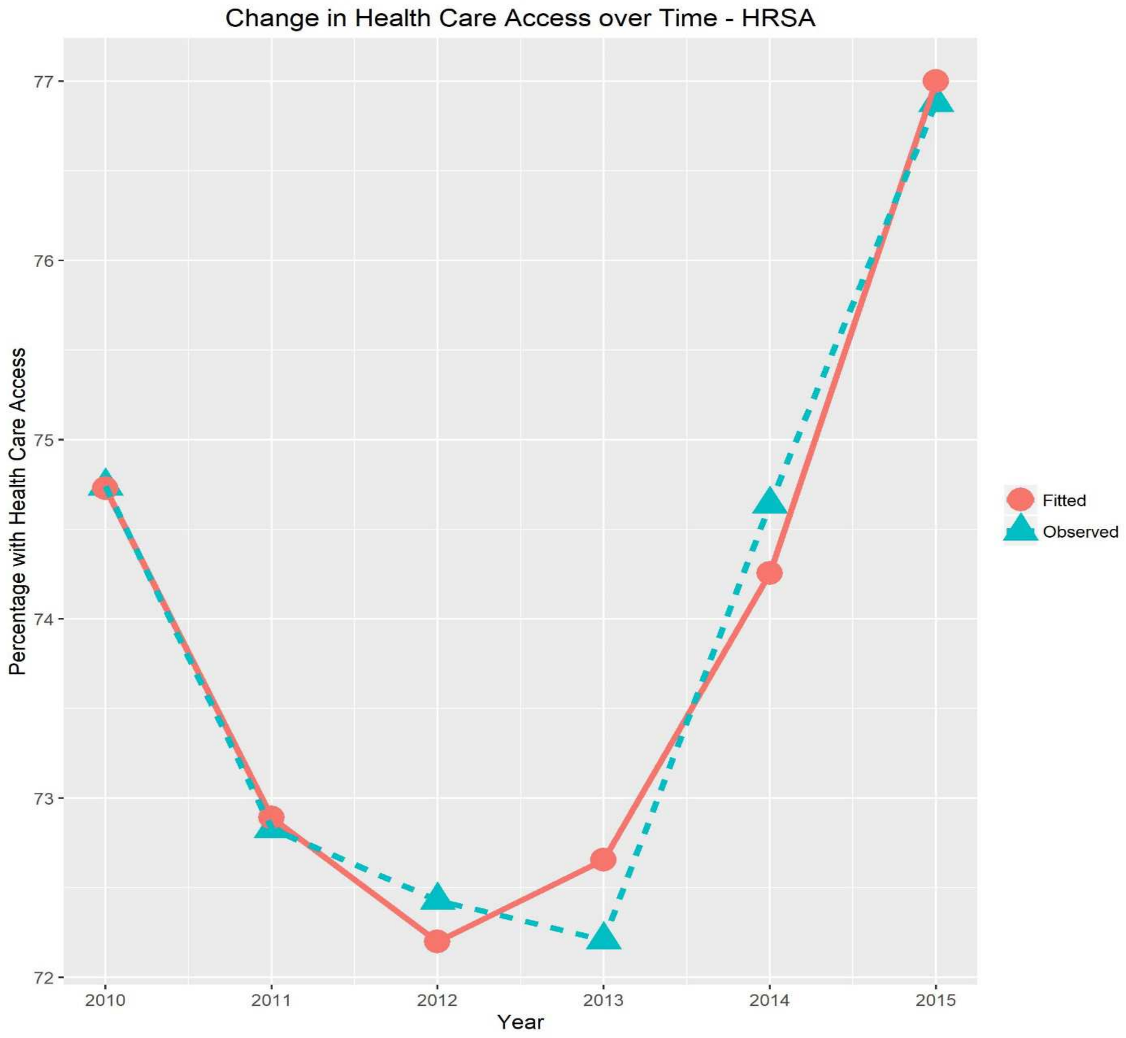

Figure 2. Trends in health care access from 2010 to 2015. Adapted from the HRSA 2015 data report.

Research Question 2

RQ 2 asked about the impact of the implementation of the ACA on the poverty status of HIV-positive individuals in the United States. The null hypothesis tested to answer RQ 2 stated: There will be no impact due to the implementation of the ACA on the poverty status for HIV-positive individuals. The alternative hypothesis stated: A statistically significant impact exists due to the implementation of the ACA on the poverty status for HIV-positive individuals.

Based on the HRSA data, the poverty rates among the participants slightly increased between 2010 (67.13%) and 2013 (67.56%), before decreasing to 64.24% in 2014. However, the poverty rate followed a positive trend between 2014 (64.24%) and 2015 (65.17%). Visual inspection of the raw data did not reveal an obvious pattern in the data (see Figure 3). Neither a linear nor a quadratic model for change over time significantly accounted for poverty rates (see Table 2). Based on the chi-square test, the poverty rate in 2010 (67.13%) was significantly higher than the poverty rate in 2015 (65.17%), $\chi^2 (1) = 399.719, p < .000$. While there was no clear overall pattern for change in poverty rates over the period studied, there was evidence to suggest that poverty rates did fall from 2013 to 2014 and remained significantly lower in the following year (2015), despite a slight uptick. However, the null hypothesis for this RQ was accepted while the alternative hypothesis was rejected. Overall, there was no statistically significant impact from the implementation of the ACA on affordability of HIV care, as measured by poverty status, for PLWHAs. Figure 3 shows the distribution of HIV-positive individuals who were at or below the FPL from 2010 to 2015.

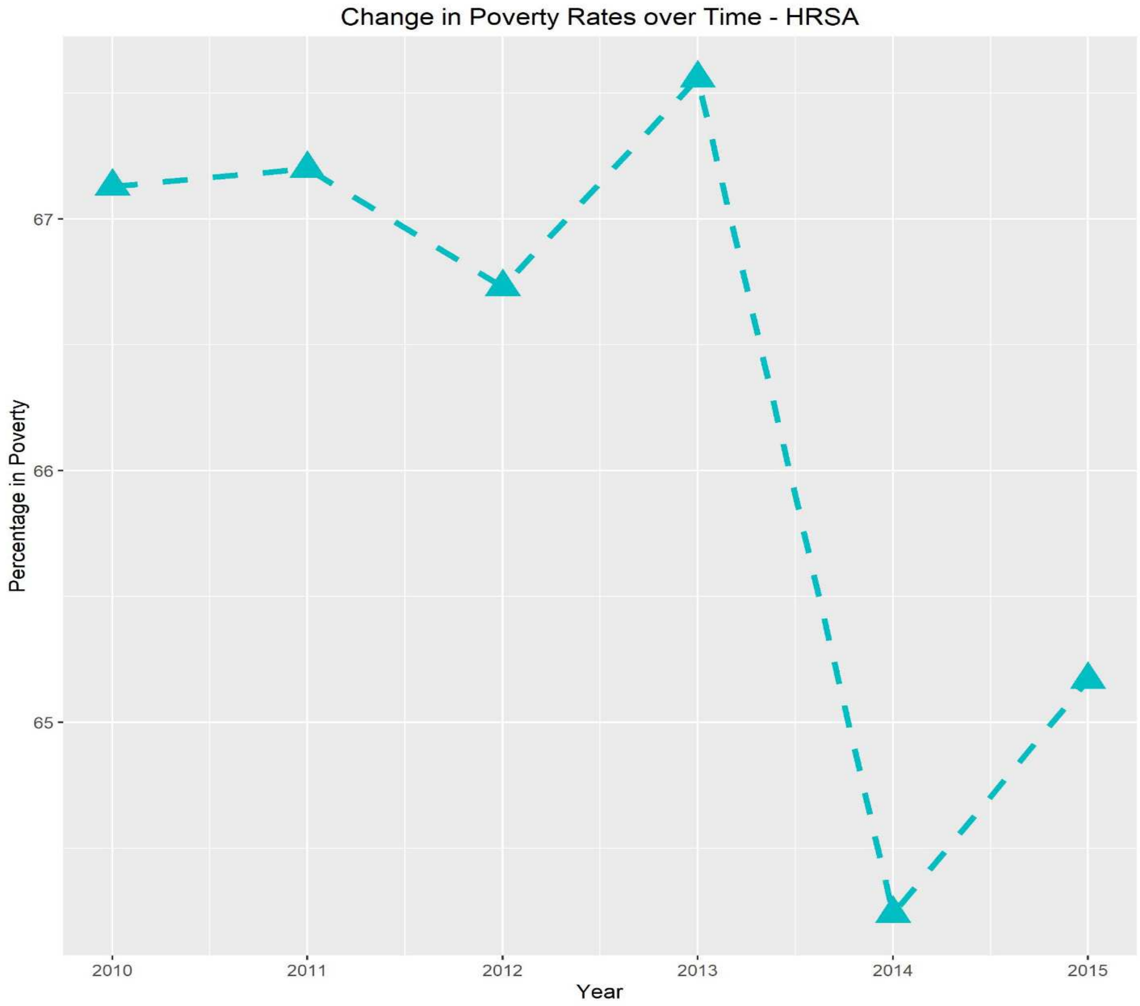

Figure 3. Changes in the poverty rate among HIV-positive individuals from 2010 to 2015. Adapted from the HRSA 2015 data report.

Research Question 3

RQ 3 focused on understanding the impact of the implementation of the ACA on viral suppression among HIV-positive individuals in the United States. The null hypothesis tested to answer RQ 3 stated: There will be no impact due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression for HIV-positive individuals. The alternative hypothesis stated: A statistically significant impact exists due to the implementation of the ACA on HIV treatment outcome, as measured by viral suppression for HIV-positive individuals.

Viral suppression rates exhibited a steady linear increase from 2010 to 2015, and visual inspection revealed a clear linear trend in the change in viral suppression. This linear trend was significant, as can be seen in Table 2. Year to year, viral suppression rates increased at a rate of 2.8% on average from 2010 to 2015, and this change is displayed in Figure 4. The Pearson chi-square test, χ^2 (1) = 105, $p < .000$ indicated a significant association between the implementation of the ACA and viral suppression among HIV-positive individuals in the United States. Thus, the null hypothesis for RQ 3 had to be rejected and the alternative hypothesis accepted. Figure 4 shows impressively the distribution of HIV-positive individuals in the United States who achieved viral suppression from 2010 to 2015.

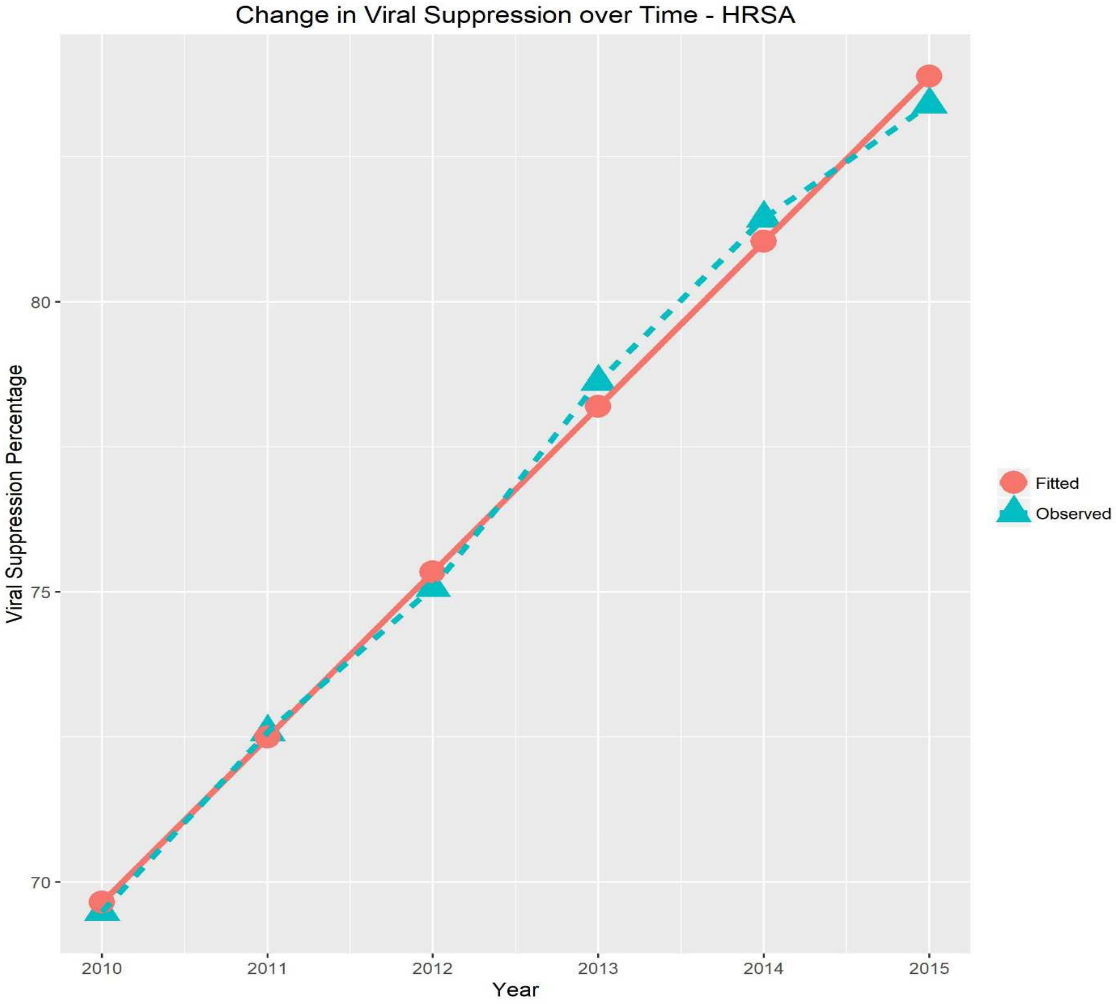

Figure 4. Annual viral suppression rates among HIV-positive patients from 2010-2015. Adapted from the HRSA 2015 data report.

Research Question 4

RQ 4 asked whether the implementation of the ACA has had any impact on access to health care for adults in the United States. The null hypothesis tested to answer RQ 4 stated: There will be no impact due to the implementation of the ACA on access to health care for adults in the United States. The alternative hypothesis stated: A statistically significant impact exists due to the implementation of the ACA on access to health care for adults in the United States.

Based on the BRFSS data, the access to health care increased from 2010 to 2015 for adults in the United States. As shown in Figure 5, access to health care decreased by approximately 3.19% between 2010 and 2011. Although coverage rates slightly dropped between 2011 (81.32%) and 2012 (81.24%), there was a constant improvement in 2013 (82.20%), 2014 (85.52%), and 2015 (87.28%). Visual inspection of the raw data suggested a quadrant model for change would best fit the data. The resulting model coefficients are displayed in Table 2. The model revealed a significant acceleration in health care access overall (as indicated by the significant and positive quadratic term in the model). Plotting observed and fitted values revealed that, from 2010 to 2015, health care access for adults in the United States initially fell, before accelerating (see Figure 5). A chi-square test revealed that there was a significant difference in the proportion of individuals in the 2010 and 2015 BRFSS surveys who reported having access to health care, $\chi^2(1) = 3033.157$, $p < .000$. Thus, the null hypothesis for RQ 4 had to be rejected and the alternative hypothesis accepted. Figure 5 shows the trend in health care access among adult Americans from 2010 to 2015.

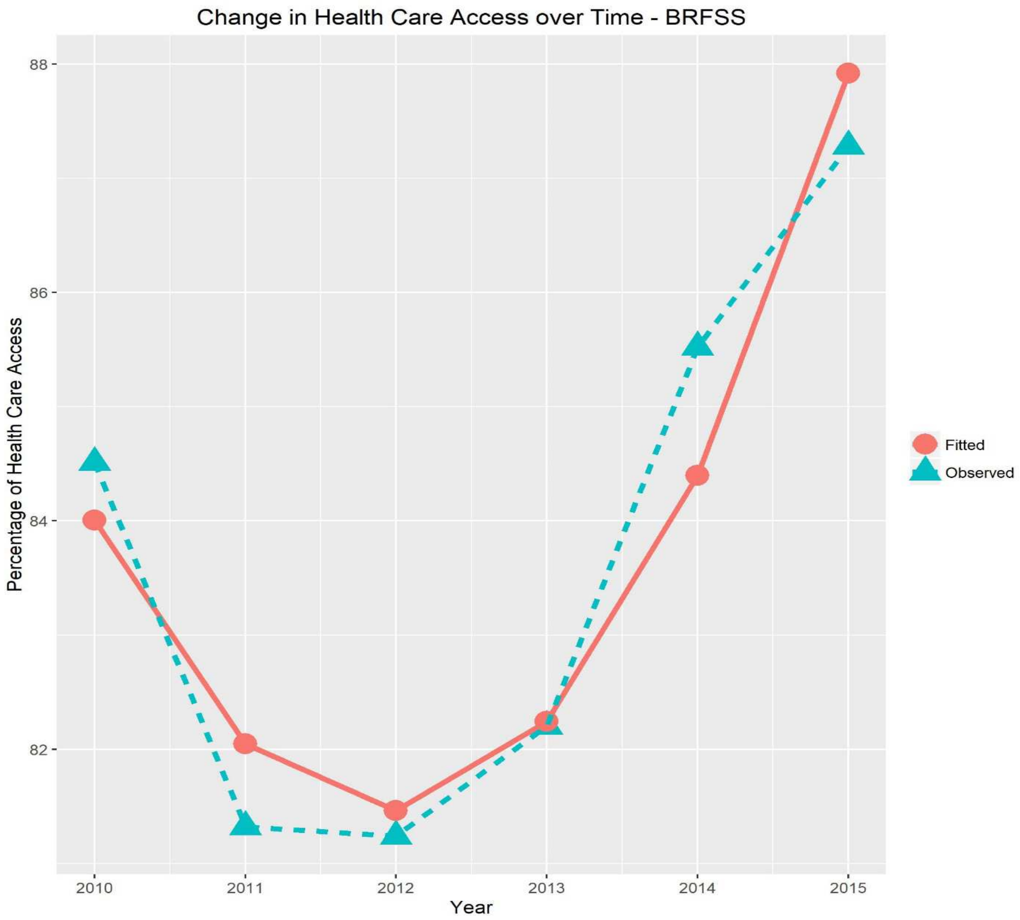

Figure 5. Health care access rates for adult Americans from 2010 to 2015. Adapted from the CDC BRFSS from 2010 to 2015.

Research Question 5

RQ 5 was focused on evaluating the impact of the implementation of the ACA on the affordability of health care among adults in the United States. The null hypothesis tested to answer RQ 5 stated: There will be no impact due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States. The alternative hypothesis stated: A statistically significant impact exists due to the implementation of the ACA on out-of-pocket health care costs for adults in the United States.

As shown in Figure 6, the number of adults in America who did not visit their doctor due to the cost of health care slightly increased (by approximately 2.3%) between 2010 and 2011. However, there was a constant decrease in the proportion of adult Americans who could not visit their doctor due to cost from 2011 (16.9 %) to 2015 (13.22%). Visual inspection of the raw data suggested that a quadratic model for change would best fit the data. The resulting model coefficients are displayed in Table 2. The model revealed a significant negative acceleration in the rate at which individuals did not visit their doctors because of costs. Plotting observed and fitted values revealed that, from 2010 to 2015, the rate at which individuals avoided visiting their doctors because of costs initially increased, before they fell (see Figure 6). Also, the chi-square test revealed a significant drop from 2010 (14.61%) to 2015 (13.22%) in the number of individuals who did not visit a doctor due to cost, $\chi 2$ (1) = 851.270, $p < .000$. The null hypothesis for RQ 5 had to be rejected and the alternative hypothesis accepted, implying that the implementation of the ACA was a significant predictor of affordability of health care for adults in the United States. Figure 6 presents the trends in the frequency of adults in the United States who did not visit their doctors due to the cost of health care.

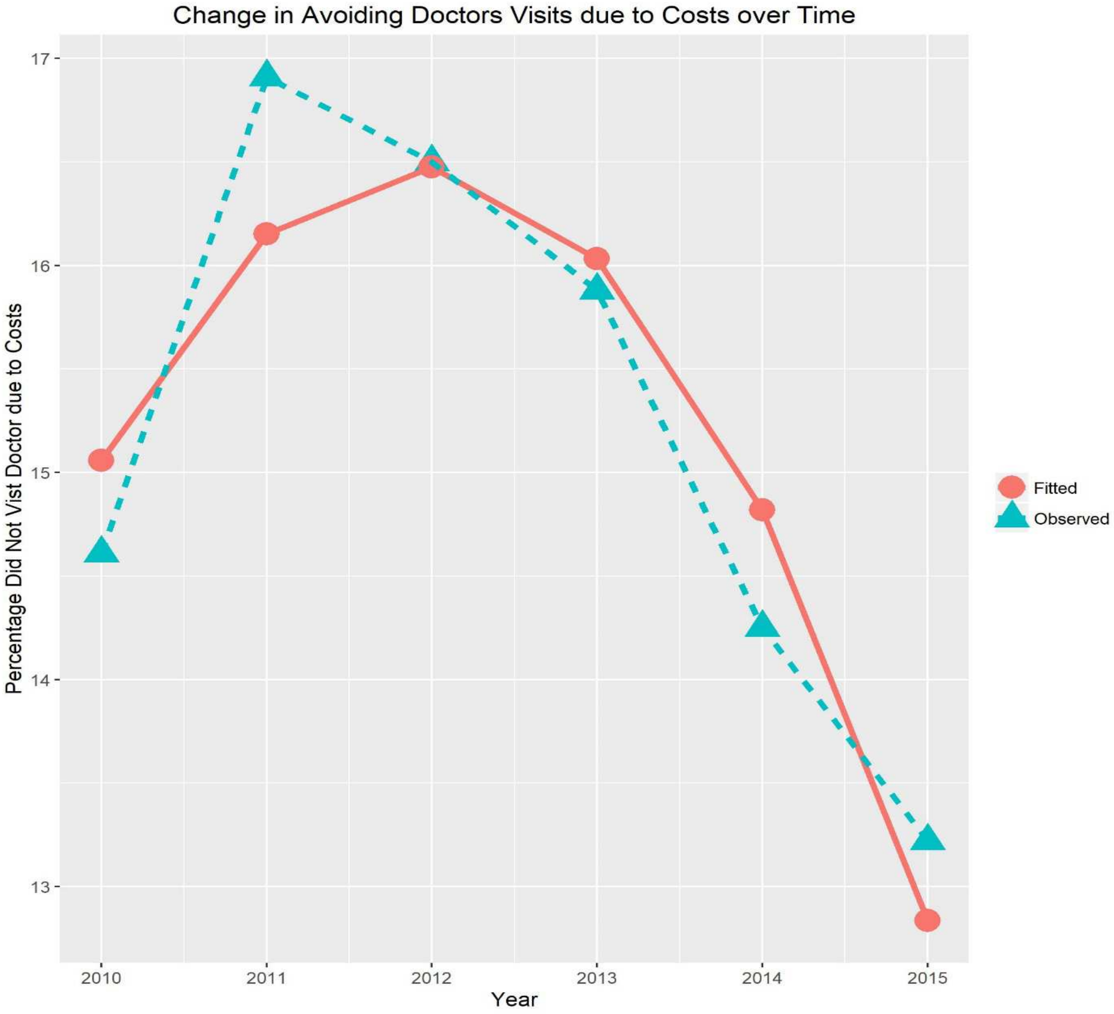

Figure 6. Frequency of adults in the United States who could not afford health care. Adapted from the CDC BRFSS from 2010 to 2015.

Summary

In this chapter, I presented the results and general statistical findings of the study, based on the research questions posed for the study and hypothesis testing to arrive at the answers. This chapter also contained the research purpose, secondary data collection methodologies, demographic characteristics of the population, and the inferential statistics that were used to test the five hypotheses. In this study, I utilized secondary data from the HRSA and BRFSS from 2010 to 2015. Statistical analysis focused on evaluating the impact of the ACA on the HIV care continuum in the United States. The primary variables in this study included viral suppression, health care access, and out-of-pocket health care costs. Chi-square tests were performed to identify any associations between the ACA and the dependent variables. Based on visual inspection of the raw data and the chi-square test results, there was evidence of significant differences in access to health care (χ^2 (1) = 576,417, $p < .000$); viral suppression rate (χ^2 (1) = 105, $p < .000$); health coverage for the general population ($\chi2$ (1) = 3033,157, $p < .000$); and out-of-pocket health care costs, as determined by individuals who did not visit their doctor due to cost (χ^2 (1) = 851.270, $p < .000$) between 2010 and 2015. However, visual inspection of the raw data for poverty rate did not reveal an obvious pattern in the data, and neither a linear nor a quadrant model for change over time significantly accounted for poverty rates.

Detailed interpretations of the findings of this study are presented in the next chapter. Chapter 5 also provides comprehensive details regarding limitations, recommendations, and implications of the findings for practice, social change, and future research.

Chapter 5: Discussion, Conclusions, and Recommendations

The purpose of this study was to assess the impact of the ACA on the HIV care continuum. I used a quantitative research design to evaluate the impact of the ACA on the HIV care continuum since its introduction in 2010 and implementation in 2014. Specifically, the current study focused on health care access, out-of-pocket costs, poverty status, and HIV treatment outcome as measured by viral suppression. The primary purpose of the current study was to close a gap in the professional literature regarding the impact of the ACA on health care affordability and access among PLWHA. Additionally, the current project was aimed at determining how the ACA may have impacted access to health care, poverty status, treatment outcomes, and out-of-pocket health care costs among PLWHA and other adults in the United States. Using data from the HRSA and BRFSS from 2010 to 2015, a quantitative research design was used to answer five research questions through hypothesis testing. Chi-square tests and trend analyses were used to evaluate the association between the ACA and viral suppression, access to health care, poverty status, and out-of-pocket costs among PLWHA and other adults in the United States. Based on the results of the study, there were beneficial annual changes in the proportion of individuals with health care access; treatment outcomes, as measured by viral suppression; and those who could not visit their doctors due to cost, from 2010 to 2015. The proportion of individuals who had health care access increased by approximately 3% between 2010 and 2015. Additionally, there was an estimated 1% decrease in the proportion of individuals who failed to visit their doctor because of the cost of health care between 2010 and 2015. Over the 6-year period studied, there was a steady increase in the number of PLWHA who achieved viral suppression, as defined by viral load test < 20 copies/mL. There was a similar pattern of increase in health care access rates for PLWHA and the general U.S. population. However, coverage rates for PLWHA were lower than for the general population. Although the poverty rate among these individuals increased between 2010 and 2013, there was relative improvement in the poverty rate between 2013 and 2014. Chi-square tests were also conducted to determine where any associations existed between the ACA and viral suppression, poverty status, health care access, and out-of-pocket costs. Based on the chi-square tests, there were significant differences after implementation of the ACA with respect to health care access for PLWHA ($\chi2$ (1) = 576,417, $p < .000$); out-of-pocket health care costs ($\chi2$ (1) = 851.270, $p < .000$); viral suppression rate ($\chi2$ (1) = 105, $p < .000$); and health care access for the participants in the general population ($\chi2$ (1) = 3033,157, $p < .000$) between 2010 and 2015.

Interpretation of Findings

Research Question 1

RQ 1 investigated whether the introduction of the ACA in 2010 and its implementation in 2014 influenced health care access among PLWHAs in the United States. The significant and positive quadratic term in the model indicated a significant increase in health care coverage among PLWHA in the United States between 2010 and 2015. The chi-square test also indicated a significant difference between PLWHA who reported having health care access in 2010, as compared to 2015, $\chi2$ (1) = 576,417, $p < .000$. Thus, the introduction of the ACA in 2010 and its implementation in 2014 were significant predictors of health care access for PLWHA in the United States. Access to health care for PLWHA is a major priority in the U.S. health care system. One of the goals of the ACA in 2010 was to improve health outcomes and reduce the disparities in access to HIV care among PLWHA in the United States.

Among the groups that were expected to benefit from the ACA was the population of PLWHA who had significant and high-cost medical needs and also faced major barriers to care and coverage. Over 100,000 PLWHA lacked adequate access to health care before the implementation of the ACA in 2014, with the majority depending on uncompensated care, charities, and the Ryan White HIV/AIDS program to meet their needs (Berry et al., 2016). It was anticipated that implementation of the ACA would increase health care access among PLWHA. While the ACA has several provisions that are specifically focused on PLWHA, only two were expected to have a major impact on health care access among PLWHA: the expansion of eligibility for Medicaid to include Americans with incomes of up to 138% of the FPL and the introduction of new health insurance marketplaces where PLWHA could purchase private coverage.

The findings of this study are consistent with those of previous studies on the impact of the ACA on health care access among PLWHA (Crowley & Kates, 2013; Kates, 2013; Martin & Schackman, 2012). Crowley and Kates's (2013) findings indicate that the implementation of the ACA has significantly improved care quality and increased access to health care among PLWHA. However, Crowley and Kates identified that the ACA health plans did not guarantee that the needs of PLWHA would be fully met. Further, there was no clear indication of whether the ACA would cover all medications for PLWHAs. It was also not clear whether ACA strategies would meet the standards of HIV care to achieve optimum viral suppression.

Research Question 2

RQ 2 asked whether the implementation of the ACA had any significant impact on the poverty status of PLWHA in the United States. As shown by the results of the study, there was a slight increase in the poverty rate among PLWHA after the 2010 announcement of the ACA that lasted until 2013. The poverty rate decreased between 2013 and 2014, before following a positive trend until 2015. Although the poverty rate could not be accounted for by a linear or by a quadratic model, the poverty rate of PLWHA in the United States in 2010 was significantly higher compared to the poverty rate in 2015, $\chi 2$ (1) = 399.719, $p < .000$. This finding implies that the implementation of the ACA positively influenced the poverty status of PLWHA in the United States. As indicated by the results of the current study, there was an overall decrease in the poverty rate from 2013 to 2014. Despite a slight increase, the poverty rate in 2015 was significantly lower compared to that in 2010. Overall, the implementation of the ACA did not have a statistically significant impact on affordability of care for PLWHA.

Before the enactment of the ACA in 2010, only PLWHA who were below the 100% FPL could access full health care coverage through Medicaid (Highleyman, 2015). In addition, PLWHA had to satisfy income and categorical requirements, which excluded pregnant women, poor children, disabled adults, and elderly patients from Medicaid (Rosenbaum, 2011). As a result, the majority of low-income parents and children were excluded, leading to high rates of transmission and disruption in HIV care plans.

However, significant improvements in health care coverage among PLWHA with incomes of up to 138% of the FPL, with approximately 15% attaining full coverage, could now be observed (Rosenbaum, 2011). The findings of the current study are congruent with Rosenbaum (2011) in that there was a significant steady decrease in the poverty rate among PLWHA between 2014 and 2015.

For PLWHAs with low income, the most affordable source of health coverage is Medicaid, through which they can access inpatient and outpatient treatment, HIV prescription drugs, laboratory services, and long-term care. Thus, expanding Medicaid would have a significant positive impact in terms of health coverage and outcomes among low-income PLWHA. Snider et al. (2014) indicated that expansion of health care coverage through Medicaid could potentially improve access for around 115,000 uninsured PLWHA. One problem is that these individuals have to access care through state or federal insurance exchanges. However, an improvement in health care access for PLWHAs could improve consistency of HIV care, thus improving the likelihood of achieving viral suppression.

Research Question 3

RQ 3 inquired whether the implementation of the ACA had a significant impact on treatment outcome, as defined and measured by viral suppression among PLWHA in the United States. Based on the results of the current study, there was a constant linear increase in the proportion of PLWHA in the United States who achieved viral suppression (viral load test < 20 copies/mL) from 2010 to 2015. Analysis indicated that the rate of viral suppression increased consistently by approximately 2.8% annually, from

2010 to 2015. Chi-square analysis indicated a significant association between the announcement of the ACA in 2010 and its implementation in 2014 and improvement in treatment outcomes, as defined by viral suppression, $\chi2$ (1) = 105, $p < .000$. Thus, the ACA of 2010 has significantly improved viral suppression among PLWHA since its enactment.

Based on Kates (2013), the ultimate benefit of HIV care is viral suppression. The results of the current study are consistent with previous research on how the ACA affected viral suppression among PLWHA in the United States (Highleyman, 2015; Rosenbaum, 2011; Squires & Anderson, 2015). Research indicated that viral suppression reduces the likelihood of HIV/AIDS transmission and significantly enhances patient outcomes among PLWHA (McManus et al., 2016). However, the majority of PLWHA have low incomes and experience difficulty in maintaining employment due to their health issues (Mugavero et al., 2013). Most PLWHA also lack adequate private insurance, which is the major source of health coverage in the United States (Squires & Anderson, 2015). Additionally, PLWHA may move from one place to another due to housing instability, leading to interruptions of health coverage. Mayer (2011) stated that slight interruptions in care for PLWHA can have dire consequences that could threaten the prevention effects of HIV/AIDS. Thus, enrollment of PLWHA in the ACA health plans was expected to improve the likelihood of achieving better viral suppression rates and promoting positive health outcomes. Previous studies have also found that the enactment of the ACA significantly increased health care coverage for PLWHA in the United States (Highleyman, 2015; Rosenbaum, 2011). The provisions of the ACA allow states to increase coverage through Medicaid to include individuals with high incomes with additional costs being paid by the government (Highleyman, 2015). The enactment of the ACA also allowed drug assistance programs (ADAPs) to provide care and meet insurance premiums for PLWHA, thus significantly decreasing viral loads (Highleyman, 2015). The findings of this study showed that an estimated 86% of PLWHA who enrolled in ACA health plans achieved significant viral suppression, compared to individuals who continued to use ADAPs (Highleyman, 2015). Additionally, there was a 6% increase in viral suppression among PLWHA for every additional month that a person stayed on his or her health care plan. Individuals who continued with the ACA health plans for the whole year had a 60% chance of achieving undetectable viral loads (Highleyman, 2015). Therefore, enrolling and retaining PLWHA in the ACA health plans significantly improved their chances of attaining viral suppression.

The findings of the current study are consistent with those of previous research on the role of the ACA in enhancing treatment outcomes among PLWHA in the United States (Rosenbaum, 2011). The implementation of the ACA was expected to significantly improve the likelihood of achieving viral suppression among PLWHA (Rosenbaum, 2011). In addition to improving health care coverage among PLWHA, the ACA encourages employers to adopt workplace wellness programs that promote viral suppression (Rosenbaum, 2011). Mugavero et al. (2013) also maintained that, by improving health care access among PLWHA, the ACA indirectly increased the likelihood of viral suppression among individuals without coverage. Based on Mugavero et al. (2013), a large proportion of PLWHA lacked health care coverage due to difficulties in maintaining employment and health problems. As a result, this population of PLWHA may not otherwise achieve optimal viral suppression due to the cost of health care.

Research Question 4

RQ 4 addressed whether the introduction of the ACA in 2010 and its implementation in 2014 had influenced health care access among the general population of the United States. The results of the current study indicate that there was a 3.19% increase in health care access among adult Americans from 2010 to 2011. Health care access rates decreased slightly during 2011, but a steady increase was witnessed from 2013 to 2015. A quadrant model of the data revealed a significant increase in health care access among the general population from 2010 to 2015. Overall, health care access rates among the general population of Americans declined before accelerating. Based on the chi-square test, there was a significant difference in the percentage of Americans who had health care access in 2010, compared to the year 2015 ($\chi 2$ (1) = 3033.157, $p < .000$). Thus, the findings of the current study indicated that the introduction of the ACA in 2010 and its implementation in 2014 have had a positively impact on health care access among the general population in the United States.

The majority of unemployed or low-income Americans source health care coverage through Medicaid (Snider et al., 2014). The implementation of the ACA in 2014 was expected to have significant positive effects on health care access in the general population of Americans, mainly through expansion of Medicaid (Snider et al., 2014). The findings of the current study indicated that the ACA is a significant predictor of health care access among the general population of Americans. These findings are consistent with previous studies relating to the influence of the ACA on health care access among PLWHA and the general American population (Crowley & Kates, 2013; Kates, 2013).

Implementation of the ACA has significantly improved health care access for uninsured individuals with high incomes through subsidized state health insurance exchanges. Under the ACA, families whose incomes fall between 100% and 400% of the FPL are subsidized using a sliding scale (Farnham et al., 2013). By improving the affordability of health care, the ACA has enabled more PLWHAs to access health care services, thus promoting viral suppression (Rosenbaum, 2011).

The findings of the current study are consistent with those of Blumberg and Holahan (2015), who anticipated that implementation of the ACA would reduce the number of uninsured Americans by approximately 31 million. Blumberg and Holahan (2015) also projected that the ACA would facilitate coverage for 94% of Americans and increase Medicaid enrollment by 15 million people. Highleyman (2015) also found that implementation of the ACA in 2014 significantly increased health care access among Americans through an increase in enrollment to Medicaid.

Research Question 5

RQ 5 was aimed at assessing whether implementation of the ACA in 2014 influenced the affordability of health care among adults in the United States, as defined by out-of-pocket costs. Based on the results of the current study, there was a 2.3% increase in the proportion of adult Americans who did not visit their doctor due to the cost of health care from 2010 to 2011. However, the number of adult Americans who did not visit their doctor due to the cost of health care steadily decreased from 2011 to 2015. A quadratic model of the data indicated a significant negative acceleration in the rate at which adult Americans did not visit their doctors due to the high cost of health care. Chi-square analysis indicated a significant decrease in the proportion of adults in the United States who did not visit their doctors due to the cost of health care, $\chi 2$ (1) = 851.270, $p < .000$. Thus, the implementation of the ACA significantly influenced affordability of health care for adults in the United States, as defined by out-of-pocket costs.

The results of the current study are consistent with those of past research on the influence of out-of-pocket costs on access to health care (Martin & Schackman, 2012; Zamani-Hank, 2015). One of the major benefits of the ACA has been the introduction of provisions that aim to make health care affordable, especially by minimizing out-of-pocket costs among PLWHA in particular and Americans in general. Out-of-pocket costs represent the portion of health care expenses that are borne by the patient during a plan year. By reducing the out-of-pocket costs for American citizens, including PLWHA, the ACA has positively impacted adherence to HIV/AIDS medications. Based on Martin and Schackman's (2012) article, affordable out-of-pocket costs promote adherence to medication by encouraging PLWHA to enroll in health plans, thus preventing drug resistance and minimizing the risk of HIV/AIDS transmission. The findings of the current study are consistent with those of Zamani-Hank (2015), who claimed that the introduction of the ACA in 2010 had improved the affordability of care by introducing friendly limits on out-of-pocket costs. As a result, PLWHAs within 100% to 250% of the FPL pay less in out-of-pocket costs due to cost-sharing provisions in the Act.

Theoretical Relevance of Findings

The findings of the current study are consistent with the economic theory and R. M. Andersen's (1995) behavioral model of health services use. The ACA had a significant positive impact on viral suppression and health care access among PLWHA and health care access and out-of-pocket costs among other adults in the United States. The patterns in health care coverage in the current study are congruent with the economic theory, which considers cost as a driver of behavioral change among patients. Given that patients must first evaluate the benefits and costs before enrolling in health plans, it is important to ensure that coverage is affordable. As indicated by the findings of the current study, there was a constant overall increase in health care access among PLWHA from 2010 to 2015. The improvement in health care access can be linked to the affordability of health plans resulting from the implementation of the ACA in 2014. Eaddy et al. (2012) suggested that people who have insurance plans that include prescription benefits are more motivated to continue taking medications due to friendly costs compared to uninsured individuals. The implementation of the ACA allows PLWHAs to pay less for Medicaid services through cost-sharing provisions. Conversely, increased cost of coverage can reduce enrollment of PLWHA in health plans due to economic problems, as evidenced by pre-ACA data. Andersen's (1995) behavioral model of health services use also stipulates that individual, societal, and system factors can affect health services. Based on the current study, the announcement of the ACA in 2010 and its implementation in 2014 led to significant changes in patterns of health care access, viral suppression, and out-of-pocket costs. Thus, the enabling factors included income level, health insurance, and accessibility of care. Based on the chi-square analysis, viral suppression, health care access, and out-of-pocket cost were found to be significant predictors of the likelihood of Medicaid utilization by PLWHA and the general adult population in the United States. However, while there was no clear overall pattern for change in poverty rates over the period studied, there was evidence to suggest that poverty rates did fall from 2013 to 2014 and remained significantly lower in the following year (2015) despite a slight uptick.

Limitations of the Study

Despite having various strengths, the current study was also limited by a few aspects. First, the current study employed a retrospective correlational research design, which involved the use of secondary data from the HRSA and BRFSS to assess the impact of the ACA on the HIV care continuum. One of the major challenges of retrospective studies is the use of secondary data, which increases the likelihood of bias in the findings (Tripathy, 2013). Due to the researcher’s lack of control in the data collection, the quality of secondary data is considered inferior for prospective studies (Tripathy, 2013). Also, secondary data are a potential source of bias due to the high likelihood of missing data, which may negatively affect the reliability of findings (Creswell, 2014). Another limitation of retrospective studies is the vulnerability to recall and misclassification bias, which can affect the reliability and validity of findings (Creswell, 2014). Temporal relationships are also difficult to evaluate in retrospective study designs (Tripathy, 2013). Additionally, retrospective studies require significantly large samples for rare outcomes.

Even though the current study made a brief mention of the general adult population of the United States, its main focus was on the impact of the ACA on PLWHA, thus becoming a limitation to the study. This limited focus significantly reduced the scope and limited generalizability of the findings. Another limitation of the current study was that the analysis and conclusions were based on key assumptions. First, it was assumed that the patterns in health care expenditures remained constant for every insurance plan before and after implementation of the ACA, in 2014. It was assumed that PLWHA in the United States who used Medicaid would use the same services from 2010 to 2015. However, the accuracy of these assumptions is questionable because PLWHA may not follow similar insurance plans. Additionally, insured and uninsured PLWHA may utilize different patterns and health care services.

Another limitation of the present study hails from the unprecedented nature of the ACA. Given that provisions of the ACA were implemented as recently as 2014, the data and analysis were significantly limited, and only projections could be relied upon to represent the actual effects of the ACA. This limited analysis may not provide a clear representation of the actual impact of the ACA on the HIV care continuum. The current study did not include the proportion of individuals who were diagnosed but not included in care or the number of PLWHA who had not been diagnosed pre- or postimplementation of the ACA. The inclusion of PLWHA who did not utilize Medicaid and those who were not diagnosed would have improved generalizability of the findings due to the anticipated impact of the ACA on this population.

Recommendations

The current study indicates a gap in the research regarding the effects of the ACA on the HIV care continuum. Given that the ACA was implemented only four years ago, there are limited primary studies available regarding the impact of the ACA on HIV care in the United States. The data I used in the present study were accessed from the HRSA and BRFSS databases, which provide current and updated information relating to PLWHA in the United States. However, a prospective cohort research design would provide more reliable results due to the unprecedented nature of the ACA. By conducting a prospective cohort study, the researcher can establish temporal relationships between variables and evaluate multiple outcomes. In addition, prospective cohort studies are suitable for studying HIV-exposed populations, rather than focusing on prevention, and the investigator can define the criteria for evaluating outcomes.

Several recommendations for future research can be made from the findings of the present study. First, the use of a prospective pretest-posttest research design would allow for a more comprehensive evaluation of the impact of the ACA on the HIV care continuum. The current study mainly involved the use of a retrospective research design. Although the current analysis was based on reliable data from the HRSA and BRFSS, reliability and validity could be improved by using a prospective pretest-posttest design. In addition to facilitating the use of primary data, a prospective pretest-posttest design would allow for a comprehensive evaluation of the impact of the ACA on HIV care in the

United States. The present study was also focused mainly on PLWHA in the United States; future research should focus on the general population of Americans comprehensively to assess the impact of the ACA on the HIV care continuum. The current retrospective study can serve as a foundation for further research on the impact of the ACA and other policy changes on PLWHA and the general American population. The current study focused primarily on the impact of the ACA on the HIV care continuum, based on viral suppression, poverty rate, and health care access among PLWHA and other adults in America based on out-of-pocket health care costs and access. While the ACA was found to have significantly impacted most of these variables, further research is required regarding other factors, including the uninsured population and those who are insured but do not utilize Medicaid. The current research could also be improved upon by evaluating the impact of the ACA on engagement and retention of PLWHA in the HIV care continuum.

Future research should also include qualitative studies on the PLWHA’s perceptions, knowledge, and attitudes regarding the implementation of the ACA. Qualitative studies could reveal more insights into the effects of the ACA and provide in-depth evaluation of the knowledge, perceptions, and attitudes of PLWHA regarding the ACA that cannot be captured with retrospective, quantitative data. In addition, future research should involve multiple years of health care coverage data to increase reliability of the findings. Given that the ACA was completely implemented only in 2014, the data that were used in the current study were somewhat limited. Further research should also be conducted on the impact of the ACA on engagement and retention of PLWHA in HIV care.

Implications for Positive Social Change

The findings of the present study have various implications for positive social change at the individual, family, organizational, and policy or societal level. From an individual level, the ACA was primarily aimed at providing affordable care for all Americans, including PLWHA. Based on the ACA policy, all American citizens can either enroll in a qualifying plan or purchase coverage options through exchanges in the deferral-regulated marketplace (Kates, 2013). Through the ACA, individuals who purchase insurance through exchanges may be eligible for premium tax credit based on household income, thus subsidizing the cost of health care plans (Crowley & Kates, 2013). With the increase in the number of individuals with full health coverage in the health care system, it is critical to ensure that appropriate changes regarding health care access are developed. Although the future of the ACA is unpredictable, the findings of the current study suggest a significant improvement in health coverage among adult and adolescent PLWHA over the next few decades. Thus, the present study provides a foundation for various changes that can be implemented in all states to increase health care coverage among PLWHA.

The findings of the current study also have important implications for families. Based on the findings, the ACA of 2010 has significantly reduced out-of-pocket costs not just for PLWHA and their families, but for the general adult population in the United States as well. High out-of-pocket costs discourages adherence to HIV medications, thus increasing the likelihood of transmission and deterioration of health outcomes (Ortego et al., 2011). Through the introduction of new affordability tax credits, the ACA has improved the affordability of health insurance for millions of low- and middle-income American families. Rosenbaum (2011) stated that parents of approximately 18 million children with preexisting medical conditions could readily access health care services, courtesy of the ACA. The ACA prohibits insurers from rescinding coverage to children or adults, based on mistakes made during application (Rosenbaum, 2011). Unlike during pre-ACA times, insurers cannot now impose lifetime caps on insurance benefits, hence, improving access to families with children and adults with HIV/AIDS or other disabling conditions (Mugavero et al., 2013). Thus, the findings of the current study could be employed to guide the development of appropriate plans for families based on level of income and size.

The current findings also have implications for various organizations. Based on Rosenbaum's (2011) report, implementation of the ACA has had a considerable impact on different organizations and businesses through direct and indirect costs, taxes, reporting requirements, and administrative duties. Thus, the findings of the current study could be used by insurance companies to ensure that patients receive adequate care without causing significant losses to the organization.

It is important that health care providers, public health leaders, and community-based organizations understand the implications and consequences of policy decisions currently facing Americans (Banks, 2014). To meet the NHAS goals of reducing health disparities, optimizing health outcomes, widening access to health care, and minimizing new infections, it is important for all states to expand Medicaid (Kates, 2013). The ACA requires states to incorporate Medicaid enrollment in other health insurance marketplaces, while also considering opportunities for leveraging innovative health delivery systems.

Another implication for social change in the implementation of the ACA is that improving the affordability of care would increase utilization of health care among PLWHA with low income. However, high health care utilization does not necessarily lead to an improvement in health outcomes. The current study employed R. M. Andersen's (1995) behavioral model of health services use and the economic theory as a theoretical foundation. Based on the economic theory, health care can improve patient outcomes only up to a point, where any further consumption will depend on the initial capital level (Eaddy et al., 2012). As indicated in the findings of the currents study, the patterns of health care utilization are evident as the number of PLWHA enter the coverage gap and access adequate HIV care through Medicaid. Based on the economic theory, high cost of HIV care can result in substitution, where patients may opt to seek more substitution medications and fewer prescription medications or decide against purchasing health plans (Meyer-Rath & Over, 2012). As a result, the likelihood of viral suppression among PLWHA would decrease while the rate of HIV transmissions would increase. The findings of the present study could be used by organizations to design adequate and affordable health insurance plans for PLWHA with low incomes.

The findings of the current study also have important implications for advanced public health practice. Health care professionals in all settings have the responsibility of identifying gaps in practice and providing evidence-based recommendations to improve the quality of care. The findings of the current study indicated that the ACA has significantly improved health care access and viral suppression, while also reducing the poverty rate during some years among PLWHA and out-of-pocket costs and health care access for other adults in the United States. The ACA is also expected to continue closing the coverage gap among PLWHA in the United States. Consequently, there is a likelihood of further increasing the percentage of PLWHA who achieve undetectable viral loads, thus reducing the rate of HIV/AIDS-related mortality and transmission of the virus.

Conclusion

Global efforts have been made to prevent the rise of new HIV infections and related mortality. In conjunction with the NHAS, the ACA provides new opportunities for increasing health care access among PLWHA, especially those with low income. The ACA has turned out to be a transformative legislation, capable of reshaping the U.S. health care system long-term. The primary performance indicators of the HIV care continuum in the United States include the percentage of PLWHA who achieve viral suppression, those who receive prescription antiretroviral therapy, and those who are engaged in care (Kates, 2013). The purpose of the current project was to evaluate the impact of the ACA on the HIV care continuum, specifically, the impact of the ACA on health care access, viral suppression, and poverty status. The results of the study indicated that implementation of the ACA significantly impacted the HIV care continuum in the United States. Implementation of the ACA has significantly increased health care access among PLWHAs in the United States. Prior to implementation of the ACA, only PLWHAs with incomes below 100% of the FPL received full health coverage through Medicaid, while those with incomes below 400% of the FPL could access limited services through the Ryan White program and partial reimbursements through Medicaid (Kates, 2013). However, after the implementation of the ACA in 2014, approximately 15% of PLWHAs accessed full coverage, thus, reducing the number of underinsured and uninsured patients.

Implementation of the ACA did not appear to have any influence on the poverty rate among PLWHA between 2010 and 2015. Although the poverty rate among PLWHA was significantly lower in 2015, compared to 2010, there was no clear pattern in the changes during the 6-year period studied. The ACA had a significant impact on patient outcome among PLWHA, as defined by viral suppression (viral load test < 20 copies/mL). As evidenced by the findings, there was a constant 2.8% annual increase in the percentage of PLWHA who achieved viral suppression, since the announcement of the ACA in 2010 and its implementation in 2014.

The results of the current study indicated that the ACA significantly influenced health care access among the general American population as well. As demonstrated by the chi-square analysis, there was a significant difference in health care access among Americans between the years 2010 and 2015. The number of Americans who had health care access in 2015 was higher, when compared to 2010, indicating that the ACA had a positive impact in overall health care access in the United States. Finally, the current study has demonstrated that the ACA significantly influenced affordability of care, as defined by out-of-pocket health care costs among adults in the United States. Although a slight increase was witnessed between 2010 and 2012, there was an overall decline in the number of Americans who did not visit their doctor because of to costs after implementation of the ACA. The findings of the current study indicated that the ACA has had a significant positive impact on the HIV care continuum in the United States. As the prevalence of HIV/AIDS continues to increase in the United States, clinicians and policy makers need to ensure that adequate state infrastructure is available to address the needs of PLWHA.

From the national level to respective states, it was evident that the disparities in health coverage among PLWHA in the United States urgently demanded new approaches. Indeed, implementation of the ACA has provided a foundation for reducing the coverage gap among PLWHAs by making improvements in the quality of HIV care in the United States. Additionally, the present study indicated that there was a 6% increase in viral suppression among PLWHA for every additional month the person stayed with the health care plans. Overall, PLWHA who continued with the ACA health plans for the whole year had a 60% chance of achieving undetectable viral loads (Highleyman, 2015). Therefore, the implementation of the ACA has had steady positive impact on treatment outcome hence enrolling and retaining PLWHA in the ACA health plans significantly improved their treatment outcome.

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Appendix A: Walden University IRB Approval

IRB Materials Approved - Ebere Erugo
IRB <irb@mail.waldenu.edu>

Wed 7/19, 5:30 PM
Ebere Erugo;
Ernest E. Ekong

Dear Ms. Erugo,

This email is to notify you that the Institutional Review Board (IRB) confirms that your doctoral capstone entitled, "Impact of the Affordable Care Act on HIV Care Continuum," meets Walden University's ethical standards. Since this project will serve as a Walden doctoral capstone, the Walden IRB will oversee your capstone data analysis and results reporting. Your IRB approval number is 07-19-17-0276837.

This confirmation is contingent upon your adherence to the exact procedures described in the final version of the documents that have been submitted toIRB@mail.waldenu.edu as of this date. This includes maintaining your current status with the university and the oversight relationship is only valid while you are an actively enrolled student at Walden University. If you need to take a leave of absence or are otherwise unable to remain actively enrolled, this is suspended.

If you need to make any changes to the project staff or procedures, you must obtain IRB approval by submitting the IRB Request for Change in Procedures Form. You will receive confirmation with a status update of the request within 10 business days of submitting the change request form and are not permitted to implement changes prior to receiving approval. Please note that Walden University does not accept responsibility or liability for research activities conducted without the IRB's approval, and the University will not accept or grant credit for student work that fails to comply with the policies and procedures related to ethical standards in research.

When you submitted your IRB materials, you made a commitment to communicate both discrete adverse events and general problems to the IRB within 1 week of their occurrence/realization. Failure to do so may result in invalidation of data, loss of academic credit, and/or loss of legal protections otherwise available to the researcher.

Both the Adverse Event Reporting form and Request for Change in Procedures form can be obtained at the IRB section of the Walden website:
http://academicguides.waldenu.edu/researchcenter/orec

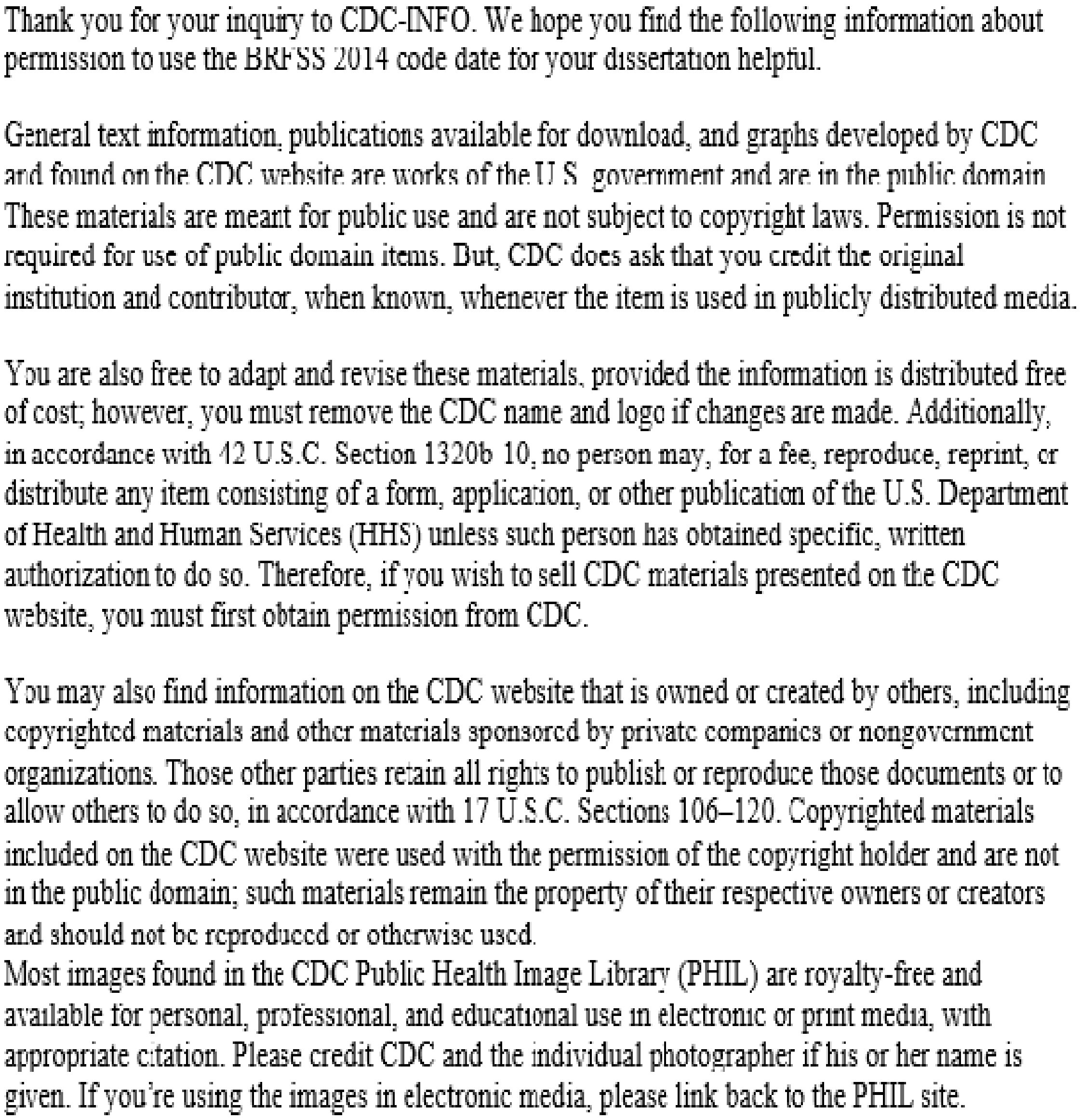
You are expected to keep detailed records of your capstone activities for the same period of time you retain the original data. If, in the future, you require copies of the originally submitted IRB materials, you may request them from Institutional Review Board.

Both students and faculty are invited to provide feedback on this IRB experience at the link below:
http://www.surveymonkey.com/s.aspx?sm=qHBJzkJMUx43pZegKlmdiQ_3d_3d

Sincerely,
Libby Munson
Research Ethics Support Specialist
Office of Research Ethics and Compliance
Walden University
100 Washington Avenue South, Suite 900
Minneapolis, MN 55401
Email: irb@mail.waldenu.edu
Phone: (612) 312-1283
Fax: (626) 605-0472

Information about the Walden University Institutional Review Board, including instructions for application, may be found at this link:
http://academicguides.waldenu.edu/researchcenter/orec

Appendix B: Approval Letter From the CDC



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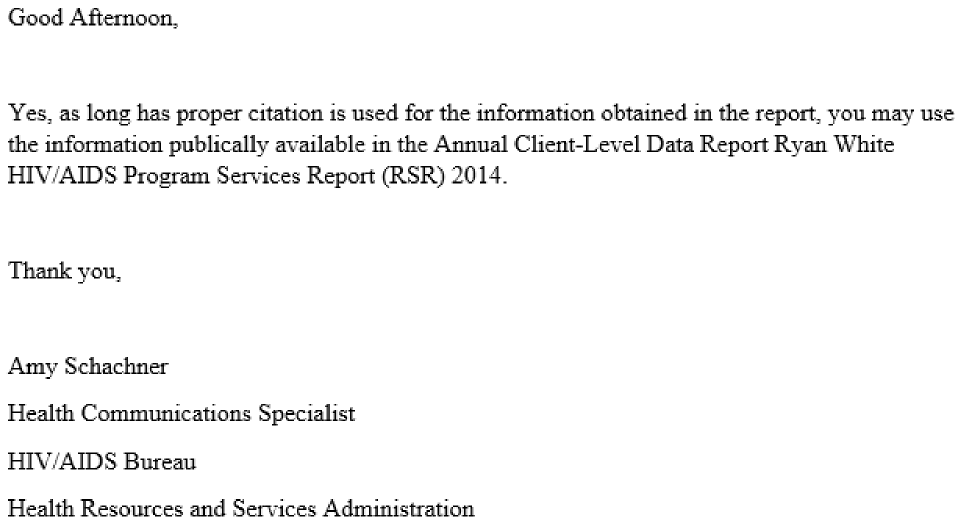
Thank you,
D.P. 5457

Appendix C: Approval Letter From the HRSA



Good Afternoon,

Yes, as long has proper citation is used for the information obtained in the report, you may use the information publically available in the Annual Client-Level Data Report Ryan White HIV/AIDS Program Services Report (RSR) 2014.

Thank you,

Amy Schachner
Health Communications Specialist
HIV/AIDS Bureau
Health Resources and Services Administration