Do Rural Georgians Experience Disparities in Access to Healthcare? An Assessment of the Impact of the Patient Protection and Affordable Care Act for Individuals in Rural Georgia

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Dedication

I would like to dedicate this dissertation to my husband for his love and support. As always, his patience and kindness throughout some of my most trying times made it possible to prevail in this journey. Thank you!!

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I would like to acknowledge my committee members: Dr. Miranda Moore, Dr. Bonnie Peterson, and Dr. James Peterson. Thank you for agreeing to be on my dissertation committee years ago! Your time and support guided me through this process to realize my goal. Thank you!

Abstract

This study examines the relationships between (a) having insurance, (b) foregoing care due to cost, and (c) having a usual source of care, and location and/or passage of the Patient Protection and Affordable Care Act (ACA) for residents in Georgia. Data for these variables were taken from the years 2005–2009 (years preceding the ACA reform) and 2011–2017 (years after the ACA reform). Relationships between the variables were assessed for statistical significance using Pearson's chi squared (χ^2) test and a multivariable regression analysis. The study used publicly available secondary data from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System. The quantitative data sets analyzed for this study provided insights into healthcare accessibility and affordability for Georgia's rural and urban populations. Stata statistical software was used to analyze the data and test statistical significance. Pre-ACA percentages for having insurance for rural Georgians ranged from a mean value and standard deviation of 79.6% ± 1.67%, dropped to 69.3% in 2011, and returned to pre-ACA values after 2014. Foregoing care pre-ACA values of 19.0% ± 1.45% increased to 26.9% in 2011 and dropped to pre-ACA values after 2014. In contrast, usual source of care results showed pre-ACA values of 82.1% ± 0.97% with post-ACA values of 72.1% ± 1.25%. The 10% decrease is a permanent change. This study showed that disparities affected all demographic characteristics, such as age, race, marital status, education, and gender, which may be determinants for health-related behaviors for both rural and urban communities.

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Chapter 1: Introduction

Overview

This study evaluated the 2010 Patient Protection and Affordable Care Act (PPACA or ACA) reform surrounding healthcare accessibility for rural and urban locations in Georgia. The ACA was the most monumental and comprehensive health care reform since the amendment of the Social Security Act in 1965, which established Medicare (insurance for the elderly) and Medicaid (insurance for the poor). The ACA's key goals were to make affordable health insurance available to more individuals, expand the Medicaid program to cover all adults with income below 138% of the federal poverty level, and support medical care delivery methods designed to lower the costs of health care. This comprehensive health care reform law was enacted on March 23, 2010. The expansion of health insurance coverage and the improved affordability of health care brought about important underlying components associated with the ACA.

Through this study, I sought to establish the impact of the ACA's effectiveness for Georgia's rural population compared with the urban population. Specifically, having insurance, foregoing care due to cost, and having a usual source of care are highlighted in this study to look at how these variables have been affected by the ACA for residents of Georgia. Findings on access to care and affordability due to the ACA and its influences on individuals' health outcomes are complicated (Serakos & Wolfe, 2016).

Data and Methods

Data for this study came from the CDC's Behavioral Risk Factor Surveillance System (BRFSS), which I analyzed via multivariable regression analysis to test for statistically significant healthcare accessibility changes from 2005–2009 (pre-ACA period or years preceding

the ACA reform) and 2011–2017 (post-ACA period or years after the ACA reform). I treated the year 2010 as a transition year because of the kinks that needed to be worked out such as 'large dataset transfer problems and pricing errors while consumers were trying to enroll in the Marketplace' via Healthcare.gov ("Healthcare.gov Website Rollout," 2022).

The inclusion of a rural indicator in the model allows identification of rural disparities for obtaining health insurance, foregoing care due to cost, and having a usual source of care. This study's original intent was to assess the impact of the ACA's telehealth initiatives for individuals in rural Georgia. Although the topic seemed promising, publicly available data sets (including the BRFSS database) did not include data on telehealth initiatives or their impact before and after the ACA reform. Lack of data standards and trust have frustrated data collection and transmission of coordinating medical care (Ackerman et al., 2010).

Statement of the Problem

According to the U.S. Census Bureau (2017), almost 20% of the population in the United States lives in rural areas. State and federal legislation has defined rural areas, as with Georgia's 108 counties with fewer than 35,000 individuals (Georgia Department of Public Health, 2016a). Georgia's projected growth between 2010 and 2030 is estimated to be 5 million people in an already strained healthcare system, which currently ranks 37th in the nation for physician to population ratio (Brewer et al., 2011). Areas categorized as poverty-stricken bear the worst impact of burdening diseases, disabilities, and illnesses. Also, Georgia has some of the highest healthcare prices in the nation with two in five Georgians in low-income brackets (Catherman, 2019).

Despite the ACA goals of improving access to healthcare services, rural populations struggle to maintain access to quality healthcare services because of a lack of health insurance, a

lack of seeking medical care due to cost, and a lack of a usual source of care. The two million Georgians living in rural communities continue to face a significant penalty, particularly those residing in "medical deserts," where access to affordable healthcare and preventive services is severely compromised (Nelson, 2016). The delivery of rural healthcare continues to grow a base of uninsured patients, with 55 rural counties having uninsured rates well above the state average (Enroll America, 2016; Nelson, 2016). ACA reform shifted the healthcare landscape, virtually eliminating any doubt for continually decreasing reimbursement rates for healthcare providers. According to the Rural Health Information Hub (RHIH, 2019a), the existing rural disparities of geographic location, lower socioeconomic status, higher rates of health risk behaviors, limited access to healthcare specialists and subspecialists, and limited job opportunities for employment and training have only compounded issues with overall health-related behaviors.

Rural Georgians continue to see shortages of healthcare professionals and closings of financially vulnerable hospitals. Statewide surveys indicated that almost 80% of rural Georgians consider their local healthcare workforce shortage as severe, which compromises the community's economic health and quality of life (Nelson, 2016).

Research Questions

This study seeks to answer the following three research questions that examine the relationships between the (a) location and/or (b) passage of the ACA (proxied by year) and health-specific outcomes in (a) having health insurance, (b) foregoing care due to cost, and (c) having a usual source care for residents of Georgia. Data sources for each of these outcomes are detailed in Chapter 3. Rural location and passage of the ACA are analyzed as independent variables, and I did not investigate the interaction of rural location and passage of the ACA.

Research Question 1. Is there a statistically significant relationship between having health insurance and location and/or between having health insurance and passage of the ACA (proxied by year) for residents of Georgia?

- $H1a_0$ There is no statistically significant relationship between having health insurance and location for residents of Georgia.
- $H1a_a$ There is a statistically significant relationship between the having health insurance and location for residents of Georgia.
- $H1b_0$ There is no statistically significant relationship between having health insurance and passage of the ACA for residents of Georgia.
- $H1b_a$ There is a statistically significant relationship between having health insurance and passage of the ACA for residents of Georgia.

Research Question 2. Is there a statistically significant relationship between foregoing care due to cost and location and/or between foregoing care due to cost and passage of the ACA (proxied by year) for residents of Georgia?

- $H2a_0$ There is no statistically significant relationship between foregoing care due to cost and location for residents of Georgia.
- $H2a_a$ There is a statistically significant relationship between foregoing care due to cost and location for residents of Georgia.
- $H2b_0$ There is no statistically significant relationship between foregoing care due to cost and passage of the ACA for residents of Georgia.
- $H2b_a$ There is a statistically significant relationship between foregoing care due to cost and passage of the ACA for residents of Georgia.

Research Question 3. Is there a statistically significant relationship between having a usual source of care and location and/or between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia?

- $H3a_0$ There is no statistically significant relationship between having a usual source of care and location for residents of Georgia.
- $H3a_a$ There is a statistically significant relationship between having a usual source of care and location for residents of Georgia.
- $H3b_0$ There is no statistically significant relationship between having a usual source of care and passage of the ACA for residents of Georgia.
- $H3b_a$ There is a statistically significant relationship between having a usual source of care and passage of the ACA for residents of Georgia.

Theoretical Framework of the Study

Predicting an individual's behavior in healthcare can be a useful guide for understanding the range of factors associated with health outcomes. This study used two models—(a) the behavioral-ecological framework for healthcare access and navigation model which emphasizes the environmental and behavioral aspects of navigating the healthcare system while also incorporating the social influences to determine health behaviors, and (b) the health belief model, which focuses on how an individual's beliefs can predict health outcomes, such as perceived severity for how an individual may analyze a threat to illness and how an individual may gauge the benefits in certain health behaviors. These two models may be considered individually to predict health-behavior outcomes or combined with one another.

A Behavioral-Ecological Framework for Healthcare Access and Navigation Model

The theory for a behavioral-ecological framework for healthcare access and navigation as suggested by Ryvicker (2018) may be interpreted as the "basic structure" as a model that demonstrates how the environment plays a role in influencing health behaviors leading to outcomes. The model also highlights the level at which an individual may effectively navigate a complicated U.S healthcare system.

Health Belief Model

The health belief model was developed in the 1950s by social scientists at the U.S. Public Health Service (LaMorte, 2019) and is frequently used in predicting health-promoting behaviors based on a person's perceptions. This model is based on perceptions for engaging in certain healthcare behavior to predict whether actions are taken to prevent or improve a person's healthcare. The health belief model consists of six elements addressing health related behaviors: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action, and self-efficacy (RHIH, 2019b). This model derives from psychological and behavioral theory in determining health outcomes. These elements of the model are useful, but for the most effective use of this model theory suggests it may be incorporated with other models to account for the environmental context and to find areas that suggest change.

The ACA was intended to expand access to health insurance options primarily for those who could not qualify for private insurance or other public insurance platforms. Just as significant as the Medicare and Medicaid Policy of 1965, the ACA has been associated with an increase in access to health insurance but has posed unintended barriers to access, particularly for low-income populations. These barriers could be the creation of narrow networks wherein affordable policies offer fewer doctors and hospitals to be competitive in the current market.

However, according to Kominski et al. (2017), it has not been well established whether narrow networks create actual or perceived barriers to care.

The ACA also included ambitious reforms built upon existing employer-sponsored insurance (ESI) systems and new options for individuals, employers, providers, and insurance companies (French et al., 2016). The expansion of health insurance coverage gave an additional one million individuals the ability to obtain insurance through Medicaid expansion (Manchikanti et al., 2017). However, the working- and middle-class individuals who earn wages at more than 400% of the federal poverty level (comprising almost 40% of the U.S. population) received no assistance from the ACA (Manchikanti et al., 2017).

The impact of the ACA on coverage, access, and overall health, especially among low-income populations, is essential to understanding ongoing debates about the ACA's effectiveness. One debate reflected in a public poll showed that the ACA was viewed as successful for almost 24% of Americans and unsuccessful by almost 27% (Loehrke, 2016). According to Loehrke (2016), some pre-ACA findings for healthcare services have remained unchanged since the ACA reform. Other early evaluations of the ACA's effects have not uniformly documented improvements in access and affordability across all outcomes, and challenges persist (Shartzer et al., 2016; Sommers et al., 2016). Understanding the impact for underserved populations in rural areas is vital for further research and continuing discussions.

Although numerous studies have examined the relationship between the ACA and access to health insurance and affordability, few have examined these aspects of the ACA reform before and after its implementation for Georgia's rural residents. Since the ACA reform, claims on both sides of the aisle have been made regarding the ACA's pros and cons for more accessible and affordable healthcare.

Data and Methods Analysis

The CDC's Behavioral Risk Factor Surveillance System (BRFSS) provides an opportunity to analyze healthcare accessibility. These surveys are administered annually, with each state collecting and submitting data to the CDC each month. The BRFSS provides data and documentation for conducting analyses obtained from the Health Care Access Module (HCM) indicated in the BRFSS 2017 Codebook.

Data from the BRFSS's 2017 Codebook (CDC, 2018) were used to assess trends in healthcare behavior before and after implementation of the ACA for adults aged 18 and older. Data from 2005–2017 were pooled, and multivariate logistic regression models were built for three dependent variables: (a) having health insurance, (b) foregoing care due to cost, and (c) having a usual source of care to examine the impact of the passage of the ACA (proxied by year) and location. These models were examined for any statistically significant changes based on location and year. The final imputed data sets were used in multivariate logistic regressions for the three dependent variables. The first, second, and third hypotheses were examined using Pearson's chi-square (χ^2) test to confirm that the dependent variable differs significantly between the years at the 95% level of confidence

Significance of the Study

Debates continue around the pros and cons of the ACA's policies for ensuring that all Americans have easier access to health insurance and preventive services. Understanding the law's impact on insurance and access to medical care, especially among rural populations, is critical to informing ongoing debates about its effectiveness. This study sought to establish the impact of the ACA's effectiveness for Georgia's rural populations compared with urban populations. To my knowledge, this study was the first to examine the effects of the ACA on

changes between 2005–2009 and 2011–2017 using BRFSS data for identifying behavioral outcomes in healthcare accessibility and affordability for those in rural and urban Georgia.

Kominski et al. (2017) suggested that ACA reform has been significant in reducing the rate of the uninsured among the poor considering the law has been associated with increased health care access and affordability among low-income populations. According to Blumenthal et al. (2015), since 2010 an estimated 7–16 million young adults became eligible to join their parents' policies. Young adults, minorities, and those with low incomes have made the greatest coverage gains. Coburn et al. (2014) proposed that the ACA contributes to rural populations through improved access to insurance, financial reductions for medical expenses, and improved access to preventive services. However, Serakos and Wolfe (2016) found that increases in access to preventative services may indicate new illnesses in patients, which can be viewed as a decline in overall self-reported health.

By contrast, Kielb et al. (2017) and Kullgren et al. (2012) agreed that since the inception of the ACA, access to healthcare has been declining for those who opted for marketplace coverage. Even those insured may find that they delay services because of coverage limits and gaps in health care coverage.

To determine the ACA's impact, this study used publicly available data from the BRFSS, which is available yearly with consistently collected data for rural Georgia throughout the 2005–2017 period. The National Rural Health Association (2019) indicated that confidentiality and sample size posed concerns for researchers interested in studying rural populations. To date, these two challenges have not changed since the publication of this paper (RHIH, 2019a).

This study addressed how the 2010 ACA reform has affected health care accessibility and affordability in rural Georgia. In Chapter 2, I present the theoretical framework of this study to

challenge gaps in the literature to identify evidence of any statistically significant changes due to the passage of the ACA for having insurance, foregoing care due to cost, and having a usual source of care for rural and urban residents of Georgia. The literature review shows differences in research on the overall quality of the healthcare system for rural and urban residents since the ACA reform.

Organization of the Study

Chapter 2—Review of the Literature

This study reviewed the literature on healthcare accessibility and affordability as a result of the passage of the ACA on rural and urban populations in Georgia. For example, the Kaiser Commission (2014) suggested that Georgia's low-income population suffered due to a lack of Medicaid expansion. Factors including environmental and individual characteristics for accessing healthcare are important to understanding steps an individual may take in healthcare decision-making. Two models concerning healthcare behavior are discussed in terms of factors and outcomes for accessing healthcare.

Glied et al. (2017) used BRFSS and the National Health Interview Survey (NHIS) data to determine pros and cons of the ACA Medicaid expansion outcomes for foregoing care due to cost and having a usual source of care. Access to care improved according to Kominski et al. (2017) and Coburn et al. (2014). By contrast, Serakos and Wolfe (2016), Kielb et al. (2017), and Kullgren et al. (2012) found that passage of the ACA has been associated with reports of new illnesses and a decline in health care for those who chose marketplace coverage. This study explored gaps in the literature to find disparities in the reported outcomes. This study's 2005–2017 timeframe in assessing passage of the ACA and its effectiveness for rural and urban Georgians lay the groundwork for future research.

Chapter 3—Data & Methods Analysis

This chapter provides a background on the BRFSS, and the platform used in conducting surveys. The interview protocol and survey mode used are considered sufficient for this study. Weighted means with 95% confidence levels were calculated and assessed for statistical significance. Stata's multiple imputation method were used for data imputation for the independent variables with missing values. The two independent variables of primary interest were location and year (proxying for ACA passage). Rural location was categorized in the BRFSS 2017 Codebook as a metropolitan statistical area (MSA). I then used logistic regression models to determine the associations between the three dependent variables and the independent variables. I did not analyze the interaction of rural and urban location and passage of the ACA (as proxied by year). The reliability, validity, and limitations of BRFSS data collection were considered before the selection of data sources.

Chapter 4—Results

This chapter reports the results of the data analysis discussed in Chapter 3. Descriptive statistics are presented for all variables used in the models. I used Pearson's chi squared tests in Stata software to check for evidence of statistically significant differences in year and rural status. The logistic regression results provide insights for evaluating the null and alternative research hypotheses.

Chapter 5—Discussion

This chapter discusses the significance of the results presented in Chapter 4. The effectiveness of the ACA for rural and urban Georgians is explored and interpreted in the literature review. Research questions, limitations, data availability, and an evaluation of the data are presented. Contributions to the study of the ACA reform and its role in healthcare delivery

are explored. From this study's data and analyses, I expected to determine whether the ACA's expansion for health insurance coverage and controlling healthcare costs have been sufficient for rural residents in Georgia. These developments evident in the findings may resolve these theoretical debates for justifying whether the ACA's healthcare reform legislation benefitted rural Georgians for improving health care accessibility and affordability.

Summary

The ACA was the most historical healthcare reform since the Medicare and Medicaid Services Act more than 50 years ago. This historic legislation was a pivotal reform in making healthcare resources more accessible and more affordable. I used publicly available state-level representative survey data to look at changes in behavioral trends affecting rural and urban Georgians in terms of having health insurance, foregoing care due to cost, and having a usual source of care. This study may help to resolve inconsistencies in the literature on how the passage of the 2010 ACA reform affected health care access for rural and urban Georgians 2005–2017. Even though the enactment of the ACA has focused on insurance affordability, 'important related issues of access to services has enjoyed surprisingly little discussion' (Manchikanti et al., 2017)

Chapter 2: Review of the Literature

Overview

The literature suggests that passage of the ACA reform brought little or no change regarding the gaining of insurance or affordability of medical care. Some studies concluded that underinsurance was a problem for enrollees of the marketplace and proposed that this dilemma was due to narrow networks targeting low-income populations who have no other option than to choose high-deductible plans. Other studies found an overuse of emergency departments and hospital stays due to out-of-pocket expenses associated with high-deductible plans under the ACA. One of the ACA's goals was to expand insurance options for low-income populations who qualified for Medicaid. Some studies focused only on Medicaid expansion to compare pre- and post-ACA personal experiences with healthcare. In contrast, other studies looked at underinsurance, emergency care, transportation barriers, navigating the healthcare system, affordability, and access to care.

Although some rural communities have seen improvements in access to health insurance and financial loss due to medical expenses, the effects of the ACA remain uncertain for rural communities (Coburn et al., 2014). For example, based on evidence consistent with pre-ACA findings among nonelderly adults, improvements have been associated with having a usual source of care among low-income populations and reductions in delaying care (Antonisse et al., 2017; Kominski et al., 2017). However, these improvements reflect the populations who qualified under the ACA Medicaid expansion, which was affected by a U.S. Supreme Court decision to give states the option of adopting the expansion even though the ACA's reform targeted all states.

Georgia and Medicaid

Georgia is one of the 24 states that did not participate in the Medicaid expansion (Newkirk & Damico, 2014). This expansion in Georgia could have reached almost 600,000 uninsured low-income adults (Kaiser Commission, 2014). Medicaid has been a necessary source of health insurance coverage for low-income individuals. Even though the impact of nonexpansion has been substantial for the uninsured, the ACA required all states to simplify the enrollment process and to promote eligibility requirements for those who are qualified to participate in Medicaid. As of 2014, Medicaid enrollment in Georgia increased by almost 13% (Kaiser Commission, 2014) compared to the monthly average during the enrollment period from July to September 2013. However, this increase cannot necessarily be attributed to the ACA; the increase may reflect other factors such as the changing economic conditions and population growth (Kaiser Commission, 2014).

Theories of Environmental Factors and Individual Perceptions for Accessing Healthcare

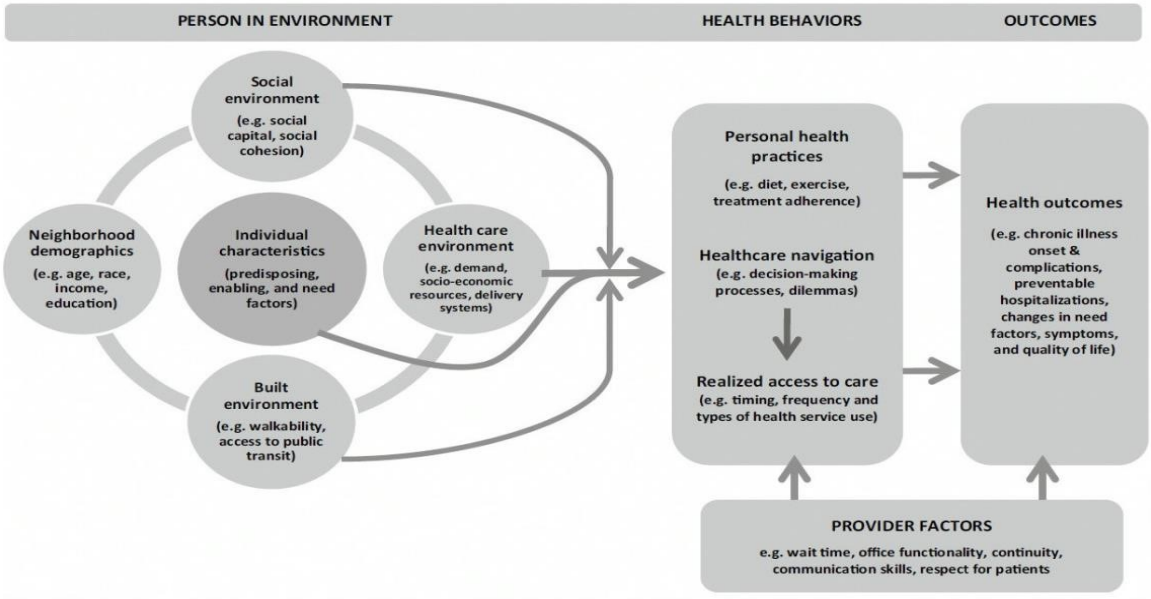
An individual's healthcare is facilitated by a behavioral ecological framework for navigating the healthcare system (Ryvicker, 2018). According to Ryvicker (2018), healthcare access and navigation are two concepts examined in a behavioral-ecological model. Figure 1 is an environmental and behavioral model for health outcomes that gives an approach to understanding the behavioral aspect for navigating and accessing healthcare resources based on a person's (a) built environment (physical infrastructures), (b) social environment (social capital and social cohesion) (c) neighborhood demographics (age, race, income, and education), and (d) healthcare environment (socioeconomic resources).

Ryvicker (2018) suggested that health behaviors are defined by an individual's environmental and individual characteristics to determine how they maneuver the healthcare

system. These internal and external factors influence the degree to which individuals can gauge healthcare outcomes with ease. For example, a person's education level, health literacy, and communication skills are examples of personal characteristics for navigating healthcare services (Gwynn et al., 2016; Passche-Orlow, 2011).

Figure 1.

Behavioral-Ecological Framework of Healthcare Access and Navigation



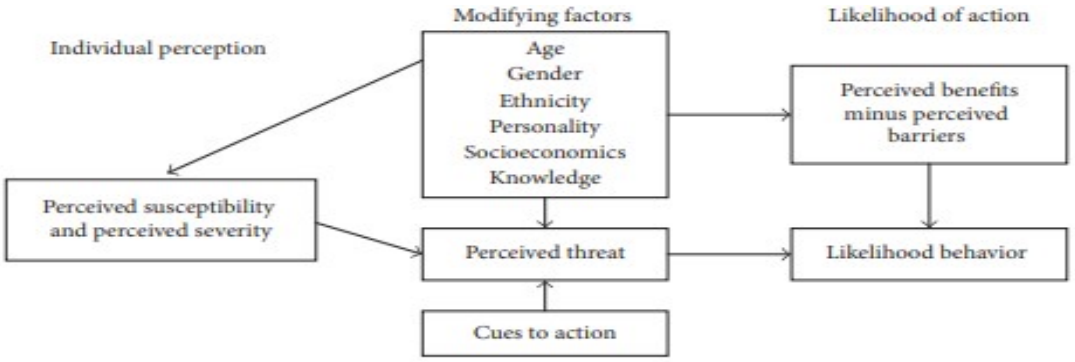
Note. Adapted from Ryvicker (2018).

Because the ACA instituted a wide variety of changes to the health insurance marketplace, navigating the complexity of healthcare resources, as suggested by Ryvicker (2018), may be biased for certain conditions. The model was designed to guide further study into the facilitation and potential barriers of effective healthcare navigation. Selecting health insurance through the marketplace can be a barrier based on financial literacy and for those who have difficulty managing their financial security. Consumer behavior in choosing a health

insurance plan, as suggested by Kim et al. (2013), may result in less than an optimal health insurance choice because of educational level and understanding the various marketplace plans.

Figure 2.

Perceptions in the Health Belief Model



Note. Adapted from Diddana et al. (2018).

Health Behaviors: Realized Access to Care

The enactment of the ACA lacked bipartisan support, so its opponents continue to criticize it, whereas proponents argue its benefits. Studies have examined the relationship between the ACA implementation and (a) having insurance, (b) foregoing care due to cost, and (c) having a usual source of care. However, researchers are still finding a vast chasm in health care resources and outcomes because of the ACA reform (Adepoju et al., 2015). An essential goal was to improve health care and make it more accessible for all Americans through existing insurance programs. However, Manchikanti et al. (2017) suggested that although aspects of the implementation have had a positive effect, other aspects have been negatively affected.

President Barack Obama (2016) described positive effects following the expansion through early 2015 on (a) nonelderly adults who have a personal physician at a 3.5% increase, (b) more affordable access to prescription drugs at a 2.5% increase, (c) a decrease in those unable to afford care, and (d) a decrease in nonelderly adults experiencing poor health related to the

ACA reform. It was also suggested that the ACA has been applauded for increasing the number of insured, but less frequently mentioned are the almost 6 million who have lost their insurance due to high premiums (Manchikanti et al., 2017, p. 111). Further, in terms of how health insurance has been provided, most of the ACA expansion was based on Medicaid expansion, with an increase of almost 13 million individuals. Consequently, the ACA has not achieved its goal in states that did not expand Medicaid, as the working and middle class are receiving less support than anticipated. These are the 'individuals who earn more than 400% of the federal poverty level, constituting 40% of the population who did not receive any help' (Manchikanti et al., 2017, p. 131). As a result, enrollment in the healthcare marketplace has been disappointing, with increased out-of-pocket expenses and high premiums. Further, consumers interested in lower premiums through the marketplace narrowed networks, so the enrollees could not keep their doctor and had limited medical care access.

According to Wherry and Miller (2016), ACA Medicaid eligibility was a key component for easier access to health care resources. However, they contended that debates surrounding the impact of Medicaid expansion have not addressed access care and utilization. Wherry and Miller conducted a cross-sectional study relating to years after the reform (2010–2014) by the National Center for Health Statistics using data from the NHIS. Surveyed respondents were aged 19–64, with family incomes below 138% of the federal poverty level. The survey's objective was to determine whether having Medicaid impacted the holding of health insurance in expansion states. The survey netted a response rate of over 70% for the study sample of nonelderly U.S. citizens with information regarding race, ethnicity, age, sex, marital status, and educational attainment. The results in the second half of 2014 showed that low-income adults in expansion

states experienced increased insurance coverage due to the Medicaid option (Wherry & Miller, 2016).

Table 1 shows that for every 1% increase in those enrolled in the marketplaces, 0.51% more reported having a usual place of care at a level of significance of $p < .05$ in the NHIS data, compared to 0.79% in the CDC's BRFSS data at a level of significance of $p < .01$. Comparisons for pre-ACA were missing from their model and a specific geographic location (Glied et al., 2017). Adjusted logistic regression models were analyzed for the year (first open enrollment period), age, income, gender, race, etc. Percentages were much higher among those with incomes in the Medicaid-eligible range. Table 1 indicates enrollment increases for a usual source of care by 1%.

Table 1.

Effect of a 1% Increase in the Marketplace Enrollment Rate on Health Care Access

Variables	Marketplace enrollment rate effects: (1) NHIS	Marketplace enrollment rate effects: (2) BRFSS
Did not get care because of cost	-0.229%*	-0.212%
No usual place of care	0.505%**	0.782%***

Note. ***p<.01, **p<.05, *p<.1 NHIS = National Health Insurance Survey; BRFSS = Behavioral Risk Factor Surveillance System. Adapted from Glied et al. (2017). NHIS 2010–2014 annual survey data and BRFSS 2011–2014 annual survey data. Includes nonelderly adults ages 18–64. Marketplace enrollment rates and Medicaid expansion decisions in the same are robust and clustered on state* month. Model controls for state Medicaid expansion decisions. Standard errors robust and clustered on state* month. Logistic regression models control for a year, state, month, and patient demographics such as age, income, gender, race, educational attainment, employment status, and marital status.

Insurance coverage also increased the probability of having a usual place of care by almost 48% and 87%. Glied et al. (2017) found that the ACA decreased the number of uninsured Americans and improved access to care for those who gained coverage. The data show that from

2010 to the enrollment period in 2014, people aged 18–64 who qualified for the Medicaid option experienced less financial stress and an increase in those who reported a usual place to access medical care. The models were specific to health care access (insurance coverage due to Medicaid expansion), which includes a 1% increase in marketplace enrollment. Results were based on self-reported information in the NHIS Survey. In Table 1, the respondents reported increased insurance coverage and increased visits with a general practitioner in those states that opted for expansion in the previous 12 months. However, there was no significant change in reporting for a usual care source across the expansion and nonexpansion states. These outcomes indicate that insurance coverage increased for those in expansion states compared to the non-expansion states; whereas Wherry and Miller (2016) focused on ACA issues before and after the states' expansion, so the study was limited to the 2010–2014 timeframe.

Glied et al. (2017) maintain that few studies have examined how access to care at the population level has improved since the ACA implementation. They examined how the 2014 coverage expansions affected health care following the first open enrollment period of October 2013 to March 2014. They found that gaining insurance coverage through the 2014 expansion decreased the probability of not receiving medical care by 21%–25%.

Health Behaviors: Personal Health Practices

Singer et al. (2019) specifically looked at the question of changes for the uninsured associated with the ACA Medicaid expansion of 2014 and the number of emergency department visits. They used a cross-sectional study of visitors to emergency departments and hospital discharges by uninsured patients from 2014–2016 for those aged 18–64. Singer et al. used data from the National Hospital Ambulatory Medical Care Survey and Healthcare Cost and Utilization Project and found that emergency department visits increased by almost 2.3 million

per year, with almost 1 in 10 visits made by the uninsured (Singer et al., 2019). The National Hospital Ambulatory Medical Care Survey and Healthcare Cost and Utilization Project data further showed that between 2014 and 2016 the proportion of uninsured emergency department visits did not significantly change. According to Singer et al., emergency rooms continue to be over relied upon despite more health insurance coverage options after the ACA reform and provider options such as urgent care clinics. Even though more health insurance options are a positive characteristic of the ACA, those with health insurance coverage may find themselves searching for providers who will accept their coverage under the ACA. Singer et al.'s study was limited in its assessment of the ACA impact, only looking at underinsurance resulting in frequent visits to the emergency room for 2014–2016 for a general population and not a specific geographic location.

Health Behaviors: Healthcare Navigation

The most notable effect of the ACA was a drop in uninsured rates across the country, primarily driven by Medicaid expansions and employer and individual mandates instituting a minimum acceptable coverage level. Despite these regulations and coverage levels, the plans for many low-income individuals left them underinsured due to high-deductible health plans (HDHPs). The use of HDHPs has increased over the past 10 years, carrying with it several concerns for low-income enrollees. Underinsurance of this sort is based on an unsustainable amount of out-of-pocket medical expenses, resulting in the inability to receive necessary care (Blewett et al., 2006; Kielb et al., 2017). According to Kominski et al. (2017), the reliance on the ACA with the availability of subsidies and cost-sharing reductions for low-income populations increases access to health insurance; however, these factors may pose unintended barriers. These barriers are most commonly narrow networks in which insurers offer plans and policies with

fewer doctors and hospitals to keep competitive. However, narrow networks have not been established in the research as a barrier to care. Also, many individuals reported that they had no usual place of care. Glied et al. (2017) used data from the NHIS and the BRFSS indicating that the study years 2010–2014 and 2011–2014, respectively, showed that a significant share (almost 10–20%) of the nonelderly population (aged 18–64) went without care because of the cost before expansion. Given the enrollment in 2014, a 1.3% increase in nonelderly adults' rate reported a usual place for obtaining medical care with more significant increases than in the CDC's BRFSS, as shown in Table 2.

Table 2.

Access to Care Before Implementation of ACA's Coverage Expansion by Income

	Nonelderly adult population: NHIS	Nonelderly adult population: BRFSS	Nonelderly, eligible for marketplace subsidy: NHIS	Nonelderly, eligible for marketplace subsidy: BRFSS	Nonelderly, eligible for Medicaid: NHIS	Nonelderly, eligible for Medicaid: BRFSS
Did not get care because of cost	9%	19%	11.6%	24%	18.3%	33.4%
No usual place of care	18.3%	26.5%	21.2%	30.3%	27.1%	38.2%

Note. BRFSS = Behavioral Risk Factor Surveillance System. Adapted from Glied et al. (2017). National Health Insurance Survey 2010–2013 annual survey data and BRFSS 2011–2013 annual survey data. Includes nonelderly adults aged 18–64. NHIS "cost" question: "During the past 12 months, was there any time when [you] needed medical care but did not get it because [person] could not afford it?" BRFSS "cost" question: "Has there a time in the past 12 months when you needed to see a doctor but could not because of cost?" NHIS "usual place of care" question: "Is there a place that you USUALLY go to when you are sick or need advice about your health?" BRFSS "usual place of care" question: "Do you have one person you think of as your doctor or health care provider?"

As indicated in Table 2, those with insurance reported that they could visit a medical professional without financial strain and had a usual place of care. Using NHIS/BRFSS data, Glied et al. (2017) examined the initial enrollment period from 2010–2014 using data from both of their respective surveys as a comparison. The study is missing an analysis of pre-ACA data for comparing post-ACA. It is essential to analyze rurality and health care access, particularly in Georgia, where almost 41% of the population is rural (RHIH, 2019a).

Table 3.

Effects of Gaining Coverage Through the ACA on Access to Care

Variables	(1)NHIS	(2)BRFSS
Did not get care because of cost	-20.9%*	-25%*
No usual place of care	47.1%**	86.5%***

Note. BRFSS = Behavioral Risk Factor Surveillance System. Adapted from Glied et al. (2017). National Health Insurance Survey 2010–2014 annual survey data and BRFSS 2011–2014 annual survey data. ***p<.01, **p<.05, *p<1.0 Includes nonelderly adults ages 18–64. Marketplace enrollment rates and Medicaid expansion decisions are used as an instrument for insurance coverage. Standard errors are robust and are clustered on state*month. Two-stage least squares (2SLS) IV regression models control for year, state, month, and patient demographics such as age, income, gender, race, educational attainment, employment status, and marital status.

The effects described in Table 3 show how access to care changed across a state's population. Gaining insurance coverage through the marketplace decreases the probability that individuals will forego care due to cost by 20.9 percent, according to the NHIS data (Glied et al., 2017). Table 3 shows 25% not foregoing medical care because of cost, according to the BRFSS data. There were substantial increases in the probability of having a usual source of care by 47.1% according to the NHIS data and almost 87% in the BRFSS data (Glied et al., 2017).

Collins et al. (2019) highlighted a 2018 Commonwealth Fund Biennial Health Insurance Survey of a nationally representative sample of 4,225 adults surveyed through random-digit-dialing (3,500 cellular phones and 725 landline phones). The results were weighted to correct for

the stratified sample design to prevent bias in the results. The adult population data were weighted for age, sex, race/ethnicity, education, household size, geographic region, population density and household telephone use using the U.S. Census Bureau's (2017) *Annual Social and Economic Supplement*. The landline portion of the survey netted an 8.4% response rate and cell phone response rate netted a 5.2% response rate. The results indicated that 45% of U.S. adults aged 19–64 were not adequately insured, which was about the same as in 2010. The uninsured rate was unchanged since 2016. The survey reported more people were underinsured in 2018 than they were in 2010 (greatest increase in employer-sponsored plans). Those who were underinsured reported problems seeing a physician and financial difficulties paying medical bills. Individuals have encountered cost-related problems, such as needing to forego care because of out-of-pocket expenses. The lack of improvement in overall access across the nation, as suggested by Collins et al. (2019), reflects the fact that there have been no gains among insured individuals and the underinsured rates have climbed.

The ACA's emphasis on the accessibility and availability of primary care providers among adults aged 18–64 years in Georgia may be affected over the next 10 years, as Gentili et al. (2016) estimated that the provider network may not have adequately met the increase in demand for health care services. They also noted that the fiscal year 2015 report by the Health Resources and Services Administration's Health Workforce project identified provider shortages as an unintended consequence resulting in healthcare services being delayed or foregone altogether. Further, lack of access to primary care providers could lead to higher healthcare costs, more frequent visits to the emergency room, and inconsistent health outcomes.

Sommers et al. (2017) used data from the Patients' Perspectives on Health Care in the United States survey conducted by the Harvard Chan School of Public Health, the Robert Wood

Johnson Foundation, and National Public Radio. The survey was a random dialing telephone survey of almost 8,000 Americans between September 8–November 9, 2015, for nonelderly adults. The focus of the sample was racial/ethnic minorities with low incomes. Sommers et al. looked at changes in the use of emergency departments due to a lack of ease accessing outpatient appointments over 2 years. They found that large racial and economic disparities remain even after the ACA expansion. One problem was the types of health insurance coverage that may lead to problems of underinsurance. These results point to continuing gaps and the need for policy and research extending beyond insurance expansion. Language barriers and cultural competence in vulnerable populations might play a role in the perceived quality of care.

This framework could be applied to both rural and urban areas to investigate how the navigation facilitators and barriers operate differently across these areas. For example, some geographic areas may have shortages of transportation and companion support and others may need to have education bolstered for those with low health literacy to heighten awareness of underutilized healthcare resources. Hence, navigating the healthcare system is complicated due to a wide range of the distribution of healthcare services as well as the existing and perceived factors that influence decision-making for how and when to use a particular service. This behavioral-ecological approach as well as perceptions in addressing care needs may be a crucial step in promoting health equity.

Control Variables in the Environmental/Individual Context

The control variables for predisposed individual characteristics in this study include age, race/ethnicity, marital status, education, employment status, income, and gender. These control variables parallel Ryvicker's (2018) proposed behavioral-ecological model because of the 'spatial distribution of individual and environmental factors' that influence decisions and

behavior. The health care environment suggested in the health belief model coincides with rurality, and the social environment correlates with marital status, education, employment status, and income. The built environment (physical infrastructures) as described by Ryvicker included factors outside the scope of this study.

This study analyzed control variables for any statistically significant change for (a) having insurance (for foregoing care due to cost and usual source of care regressions), (b) foregoing care due to cost (for insurance status and usual source of care regressions), and (c) having a usual source of care (for insurance status and foregoing care due to cost regressions). These control variables were used in this study as a valuable step in finding whether access to health care in rural and urban communities has significantly changed since the ACA reform. These analyses determined whether opportunities in the ACA have helped or hindered populations in rural and urban locations of Georgia.

Rural and Urban Characteristics for the State of Georgia

Social and Environmental Healthcare Factors

The United States Census Bureau (2017) defined rural areas as sparsely populated areas with a maximum of 50,000 residents. Also, almost 97% of America's landmass is rural, with an estimated 19% of its population living in these areas (United States Census Bureau, 2017), with almost 2 million rural Georgia residents (Nelson, 2016).

Along with low literacy levels and environmental barriers, rural areas in Georgia have distinctions in healthcare disparities that differ from those of their urban counterparts. Nelson (2016) suggested that one distinction between rural and urban communities is infrastructure which compromises poverty, unemployment, lower educational levels, transportation barriers, and demographic conditions. Rural Georgians experience higher rates of poverty and persistent

poverty, according to Nelson, with 44 rural counties defined as having persistent poverty (U.S. Census Bureau, 2022a). They also experience higher unemployment rates and higher illiteracy rates than their urban counterparts. These determinants are some of the challenges rural residents face for their health and well-being. Rural and urban populations differ in demographics; therefore, the ACA reform may have affected the two groups differently.

A higher number of rural residents tend to have a low-to-moderate income level (Newkirk & Damico, 2014). Georgia rural locations categorized as poverty-stricken bear the worst impact of burdening diseases, disabilities, and illnesses. Fertig et al. (2009) found that half of Georgia's 159 counties fit the definition of a poverty-stricken area, including the Cumberland Plateau, Piedmont, and the Blue Ridge Mountains.

Distance and Transportation

According to the Health Resources and Services Administration (2015), rural and low-income urban populations experience social and economic difficulties that impact their healthcare. The urban poor face longer waits for treatment in overcrowded emergency rooms and clinics; whereas rural areas face problems associated with medical professionals' geographic access and availability. Rural residents must travel greater distances to reach healthcare facilities, and these facilities tend to be small and offer limited resources for healthcare. Response times for emergency medical services are a significant issue in rural areas compared to shorter response times in urban areas. Lack of public transportation for rural residents also impedes medical help and follow-up visits. Hospital shortages and limited availability of professional medical help impedes medical care. Unfortunately, these specific factors were not identified as variables in the HCM in the BRFSS 2017 Codebook (CDC, 2018) for addressing issues with healthcare access for rural or urban Georgians. As a result, I considered other databases such as the U.S. Health

Resources and Services Administration's Data Warehouse. Within the Data Warehouse, the Division of Policy and Shortage Designation in the Health Resources and Services Administration and the Bureau of Health Workforce develop shortage designation criteria, which help determine whether a geographic area is a Health Professional Shortage Area, Medically Underserved Area, or Medically Underserved Population. In addition, the Health Resources and Services Administration's (2015) Area Health Resource File provides data on health care environments such as primary care providers and hospital information. These publicly available websites provide information on shortages of medical professionals, public facilities, and hospital utilization. Unfortunately, these data could not be linked to the BRFSS data because it does not gather similar geographic information; specifically, BRFSS does not collect data on residency of the survey respondents, only on urban/rural location.

Physicians and Hospitals

In rural areas, 60–90% of emergency responders are volunteers (Health Resources and Services Administration, 2011). More than 100 rural hospitals have closed since 2010—seven of them in Georgia, according to Miller (2020). States that expanded Medicaid had fewer closures (Lindrooth et al., 2018). Furthermore, Georgia's nine out of 159 counties lack a practicing physician (Health Resources and Services Administration, 2011).

The National Rural Health Association (2019) addressed inequalities defined by the number of primary care physicians, specialists, and death rates for rural and urban residents. The National Rural Health Association data show that rural areas have a ratio of almost 39 primary care physicians per 100,000 residents compared to the urban ratio of almost 54 primary care physicians per 100,000 residents. The ratio of physicians in specialized care in rural areas is 30 specialists per 100,000 people, compared to over 260 specialists per 100,000 people in urban

areas. According to the North Carolina Rural Health Research Program (2017), rural residents have 800 deaths per 100,000 people compared to almost 700 deaths per 100,000 people in urban areas. Even though mortality rates have declined nationwide, rural communities' rates have not significantly declined compared to urban areas (Warshaw, 2017).

Rural and urban health disparities are comparable, but factors specific to rural areas present an inherent economic, social, and geographic instability for rural residents. Rural areas have an older population compared to urban areas. In rural areas, 15% of the population is aged 65 and older, compared to approximately 10% in urban areas (U.S. Census Bureau, 2017). The rural safety net to provide care serving all populations provides healthcare for these elderly patients, many of whom, as suggested by Minyard et al. (2016), may be suffering from or managing chronic health conditions; thereby, putting an additional strain on an already compromised environment.

Experiences with Personal Healthcare

Towery (2017) conducted a statewide Opinion Savvy survey on rural residents' views on healthcare delivery and cost using an interactive voice response system for the sampling method. The survey weighted respondents by age, race, and gender, with benchmarks determined using combined voter registration and census data. These voters were randomly selected from Georgia rural counties, as defined by the United States Department of Agriculture's Economic Research Service (Towery, 2017). Table 4 outlines issues experienced by respondents in 2015 and 2016 relating to the cost of care, lack of doctors/providers, lack of insurance, transportation, distance to care, and cases of insurance not accepted.

Towery (2017) found significant increases of individuals without a usual source of care of 32.6% in 2015 to 46.0% in 2016, and an increase of 41.9% in 2015 to 49.5% in 2016 of

lacking insurance. Insurance not accepted surged from 28.2% in 2015 to 48.7% in 2016. As shown in Table 4, there were significant personal healthcare issues in every category except for a 0.1% decrease in the cost of care (53.1% to 53.0%) in 2016. Comparisons between 2015 and 2016 included an increase of 13.4% for those who lacked doctors/providers, 7.6% for those lacking insurance, 15.2% for those having problems with transportation or distance to medical care, and a significant surge of 20.5% of insurance not accepted (Towery, 2017).

Table 4.

Issues Experienced With Personal Healthcare

Issue	2015	2016
Cost of care	53.1%	53.0%
Lack of doctor/provider	32.6%	46.0%
Lack of insurance	41.9%	49.5%
Transportation/distance to care	18.0%	33.2%
Insurance not accepted	28.2%	48.7%

Note. Adapted from Towery (2017).

Rural communities have disadvantages compared to urban areas such as fewer healthcare providers and longer distance concerns. In Georgia, 57 out of 159 counties are considered Health Professional Shortage Areas or face primary care shortages. Only 10 counties (about 16%) have designated federally funded health centers or rural health centers (Georgia Department of Public Health, 2016a). In addition, those living in health professional shortage areas typically have Medicaid and are more likely to be in poor health or live with a serious condition compared to

those not living in Health Professional Shortage Areas. According to the Georgia Department of Community Health (2007), Georgia's rural counties have one of the highest death and disease rates due to poverty, low literacy, and limited healthcare services (Brewer et al., 2011). Unfortunately, Georgia is representative of other states and ranks second to Texas in most vulnerable areas in urban and rural settings. According to Kueppers (2019), the state ranks 40th in the nation for overall health.

This study looks specifically at rural areas compared to urban areas (which constitutes 100 counties) in Georgia to identify statistically significant changes in the holding of insurance, foregoing care due to cost, and having a usual source of care due to the passage of the ACA. Rural areas tend to have sparse resources to address a shortage of doctors, a lack of transportation, and deficient infrastructure. State and federal legislation has established rural areas as those with less than 35,000 individuals. Georgia has 110 rural counties (Georgia Department of Public Health, 2016a). The lack of resources leaves rural residents poorer and sicker than their urban counterparts. Georgia's projected growth between 2010 and 2030 is about five million people in an already strained healthcare system (suggested by Brewer et al., 2011). The relationship between pre-and post-ACA for both rural and urban populations in healthcare accessibility and affordability were analyzed using BRFSS data. This study examined the impact of the ACA on rural healthcare accessibility in Georgia using data collected by CDC's BRFSS surveys to test for significant changes in healthcare accessibility for years 2005–2017. Yearly data were weighted using multiple imputation logistical regression estimates with a 95% level of confidence. The outcome variables are the percentages for each year of respondents having insurance, foregoing care due to cost, and having a usual source of care. This study's health care access measures align with the data included in the BRFSS HCM. These measures are analyzed

based on whether an individual experienced significant changes in healthcare accessibility after the ACA reform. Rural and urban location and passage of the ACA (proxied by year for each BRFSS survey year 2005–2009 [pre-ACA] and 2011–2017 [post-ACA]) were specific factors that drove this study's analysis. As past literature suggests pros and cons on the ACA, this study assessed the effectiveness of the ACA to show any statistically significant changes for health insurance status, foregoing care due to cost, and usual source of care.

Content Searched

Relevant articles from peer-reviewed scholarly journals were identified through electronic databases searched using Google Scholar and Galileo through Valdosta State University's Odum Library. Government and state agency sites were researched for content, including the U.S. Department of Health & Human Services, which operates 19 divisions and 100 programs, the CDC, the Centers for Medicare, and Medicaid Services (CMS), and the Health Resources and Services Administration. As part of the CDC, the BRFSS provided relevant national and local data for this study. CMS and the Health Resources and Services Administration provided crucial data for this study relative to ACA health insurance and related assurance activities. The Health Resources and Services Administration promotes health care to communities that are geographically isolated and economically or medically vulnerable. Funded by the Federal Office of Rural Health Policy, the Rural Health Information Hub (RHIH) is a national clearinghouse on rural health issues. This database provides reliable sources and links to current issues for addressing rural health needs.

The U.S. National Library of Medicine, the National Institute of Health's PubMed Central and The National Center for Biotechnology Information's Medline provided numerous peer-reviewed articles included in this study pertaining specifically to the methodology of the

BRFSS and the expansion of insurance coverage under the ACA. Other peer-reviewed articles focused on the ACA, its impact on health care costs, holding of coverage and improvements in access, and Medicaid expansion areas. The *Journal of Georgia Public Health Association* provided articles on rural and urban distinctions. This journal is a peer-reviewed publication addressing issues in public health and health education specifically relevant to Georgia. Articles available via 'pay-per-download' were not considered. To narrow the abundance of publications available, I used the keywords *insurance, coverage, access health, Georgia,* and *rural*. I searched articles that referenced the ACA or Obamacare in titles or abstracts to avoid exclusion of relevant literature. Bibliographies of articles were scanned for relevant material discussing rural and urban populations.

Summary

This study examines the relationship between having health insurance, foregoing care due to cost, and having a usual source of care and location and/or passage of the ACA (proxied by year) for residents of Georgia. Control variables such as age, race, marital status, income, and gender are used in our regressions for each of our three health outcome measures. Individual and environmental factors may fluctuate due to economic conditions, demographics, and geographic location based on provisions of the 2010 ACA reformation.

According to Glied et al. (2017), studies have examined the relationship between insurance coverage and access to care which found that people with health insurance, whether Medicaid or private coverage, have better access to services. However, some studies that compare people with and without coverage can be biased. People who choose to participate in coverage may differ from those who do not. For example, people in poorer heath may be more likely to sign up for care than healthy people. Even before the ACA coverage expansion,

individuals within the income-eligible range for marketplace subsidies, went without care due to cost, and reported that they had no usual place of care.

Aspects of the ACA implementation have had a positive effect, whereas other aspects have been negatively affected as shown. Between 2014–2016, emergency departments visited by uninsured individuals decreased considerably with 1 in 10 emergency department visits and 1 in 20 hospital discharges were made by uninsured individuals (Singer et al., 2019). Manchikanti et al. (2017) suggested that even though millions of Americans gained insurance because of the ACA, six million lost their insurance. Because the national majority of those who gained insurance did so through Medicaid expansion, working- and middle-class individuals received less support, particularly for those who earned more than 400% of the federal poverty level (Manchikanti et al., 2017). Nonelderly adults experienced improvements in having a usual source of care and a substantial decrease in the share of those who are unable to afford care. However, some working-class individuals faced barriers with high premiums, high-deductible policies, and out-of-pocket expenses leaving them without a usual source of care.

Growing disparities in health and healthcare between metropolitan areas and rural Georgia communities continue to be significant among the rural population. This study provides insights into how its results may help to support the models for environmental, individual characteristics, and perceptions in determining health outcomes. Demographics, socioeconomic conditions, transportation, and perceived benefits and barriers to healthcare access may all contribute to assessing individuals' healthcare outcomes.

The methods used in this study should provide clarity and a new perspective on the ACA implementation, and its effect on individuals in rural and urban Georgia for accessing healthcare.

Chapter 3: Methodology

Overview

The purpose of this dissertation research is to examine the relationship between (a) having insurance, (b) foregoing care due to cost, and (c) having a usual source of care, and the Patient Protection and Affordable Care Act and/or location in Georgia. The literature review points to different studies which show perceptions of improved accessibility and affordability as well as perceptions of its failures since its inception. An individual's characteristics and environmental factors, according to the Health Belief Model (LaMorte, 2019) and the Behavioral-Ecological Framework for Healthcare Access and Navigation (Ryvicker, 2018), may influence their outcomes for accessing care, and they may perceive ACA coverage as a barrier or a benefit.

This study used data collected by the BRFSS, focusing on a representative sample of Georgia's population to explore those associations. It is essential for communities, health care organizations, and policymakers to understand how the ACA reform fits with individuals' needs across Georgia.

Research Questions

The three research questions and hypotheses which guided this study were designed to show any statistically significant change in healthcare trends after the 2010 ACA implementation.

Research Question 1. Is there a statistically significant relationship between having health insurance and location and/or between having health insurance and passage of the ACA (proxied by year) for residents of Georgia?

- $H1a_0$ There is no statistically significant relationship between having health insurance and location for residents of Georgia.
- $H1a_a$ There is a statistically significant relationship between having health insurance and location for residents of Georgia.
- $H1b_0$ There is no statistically significant relationship between having health insurance and passage of the ACA (proxied by year) for residents of Georgia.
- $H1b_a$ There is a statistically significant relationship between having health insurance and passage of the ACA (proxied by year) for residents of Georgia.

Research Question 2. Is there a statistically significant relationship between foregoing care due to cost and location and/or between foregoing care due to cost and passage of the ACA (proxied by year) for residents of Georgia?

- H2a0 There is no statistically significant relationship between foregoing care due to cost and location for residents of Georgia.
- H2aa There is a statistically significant relationship between foregoing care due to cost and location for residents of Georgia.
- H2b0 There is no statistically significant relationship between foregoing care due to cost and passage of the ACA (proxied by year) for residents of Georgia.
- H2ba There is a statistically significant relationship between foregoing care due to cost and passage of the ACA (proxied by year) for residents of Georgia.

Research Question 3. Is there a statistically significant relationship between having a usual source of care and location and/or between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia?

- $H3a_0$ There is no statistically significant relationship between having a usual source of care and location for residents of Georgia.
- $H3a_a$ There is a statistically significant relationship between having a usual source of care and location for residents of Georgia.
- $H3b_0$ There is no statistically significant relationship between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia.
- $H3b_a$ There is a statistically significant relationship between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia.

This study's research questions are related to ongoing changes and challenges in the healthcare environment. Since the inception of the ACA, its impact on populations of all dimensions for access to high quality care has been evaluated across multiple dimensions, including access to doctors, having a usual source of care, timeliness of care, affordability, and access to preventive, primary, and specialty care. I evaluated and compared statistically significant changes in 2005–2009 (pre-ACA proxied by year) to 2011–2017 (post-ACA proxied by year). I used pre-ACA (2005–2009) years as a baseline to compare results with post-ACA (2011–2017). I also dichotomized urban location and presented summary statistics for the urban population because they represent the most significant portion of the general population. The independent variables are rurality and year (the year represents the passage of the ACA) for Georgia.

First Question—Insurance

The first question was vital to this study because it provides a first step to discerning the impact of the ACA policies. I looked for statistically significant changes for individuals who had enrolled in any health insurance coverage based on the question posed by the BRFSS as part of

their survey. Millions of Americans have been eligible for enrollment in the Marketplace exchange, and policymakers have continued to call for the ACA's overhaul after more than a decade. The expansion of health insurance coverage due to the 2010 ACA reform targeted low- and middle-income Americans because they constituted the vast majority of the uninsured. However, these low-income populations face barriers. High premium costs associated with the ACA ensure that the plans and policies remain competitive with other public and private insurance agencies. Even though the ACA offered subsidies and cost-sharing reductions, according to Kominski et al. (2017), access to fewer doctors because of narrow networks played a significant role in the quality of care and navigating the enrollment process.

Second Question—Foregoing Care Due to Cost

For the second question, I looked for statistically significant changes for individuals who opted to forego care due to financial burden (choosing not to seek care when medically necessary over the previous year due to cost) based on the BRFSS survey question. Even though the ACA promoted preventive care benefits for accessibility, Kielb et al. (2017) and Nelson (2016) noted that poverty-stricken individuals were more likely to avoid medical care based on the financial burden. The decision to forego care may have depended on whether an individual had any type of health insurance coverage or other circumstances that could have played a part in the decision-making behavior. An individual may or may not engage in preventive health measures because of their characteristics or environmental factors (Luquis & Kensinger, 2019).

Third Question—Usual Source of Care

For the third question, I looked for statistically significant changes for individuals who had a usual source of care, or a regular doctor (during the previous year) based on the BRFSS question. Having a usual source of care could have been affected by whether an individual had

any kind of health insurance coverage or availability of medical services. The results and analysis based on these questions will be discussed in Chapter IV.

Data Source

The CDC partners with the BRFSS in collecting specific, state-level data on crucial emerging health issues to improve public health. The BRFSS was established in 1984 and currently interviews 400,000 adults per year, with 50% of BRFSS data collected from cell phone users. The BRFSS annual survey covers health risk behaviors, chronic health conditions, and the use of preventive services (CMS, 2018). This collaborative project collects data each year beginning in January in 50 states and participating territories, including the District of Columbia. The BRFSS data was chosen because of its ongoing, reliable, and valid measures for state-based cellular and landline telephone health surveys (CMS, 2018). These telephone surveys use a standard protocol and interviewing methods developed by the CDC. The BRFSS LLCP 2017 Codebook Report (CDC, 2018) presented a series of tables defining the protocol for each of the survey questions in the interviews.

Interview Protocol for Behavioral Risk Factor Surveillance System Questions

Protocol Question 1

The BRFSS surveys conducted from 2005 to 2017 asked questions that directly addressed this study's questions. Research Question 1 asks if there is a statistically significant relationship between having health insurance and location and/or between having insurance and passage of the ACA (proxied by year) for residents of Georgia. The telephone interview protocol for this question is on Page 19 of the BRFSS 2017 Codebook Report (CDC, 2018). The BRFSS question included in the codebook entry is entitled "Health Care Access" and labeled "Have any health care coverage." Under the interview protocol for this topic, the question is "Do you have any

kind of health care coverage, including health insurance, prepaid plans such as health maintenance organizations (HMOs), or government plans such as Medicare or Indian Health Services?" Responses to this question are dichotomized as *yes* (for having any health insurance coverage) and *no* (for lack of insurance; see Appendix A).

Protocol Question 2

This study's second question asks if there is a statistically significant relationship between foregoing care due to cost and location and/or between foregoing care due to cost and passage of the ACA (proxied by year) for residents of Georgia. The telephone interview protocol for this BRFSS question is found on Page 20 of the 2017 Codebook Report (CDC, 2018). The BRFSS question in the codebook entry is entitled "Health Care Access" and labeled "Could not see a doctor because of cost." Under the interview protocol for this topic, the question is "Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?" Responses to this question are dichotomized as *yes* for seeing a doctor and *no* for not seeing a doctor (see Appendix B).

Protocol Question 3

This study's third question asks if there is a statistically significant relationship between having a usual source of care and location and/or between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia. The interview protocol for this BRFSS question is on Page 19 of the 2017 Codebook Report (CDC, 2018). The BRFSS question included in the codebook entry is entitled "Health Care Access" and labeled "Multiple Health Care Professionals." Under the interview protocol for this topic, the question is "Do you have one person you think of as your personal doctor or health care provider?' "(If 'No' ask, 'Is there more than one or is there no person who you think of as your personal doctor or health care

provider?" Responses to this question are dichotomized as *yes* for identifying one or more providers and *no* for not identifying with one or more providers as only 7–10% of individuals identified "more than one person" for a usual source of care (see Appendix C).

Data Collection

This study's data collection was based on telephone-based questionnaires from the BRFSS from 2005 to 2017. Annual questionnaires dating back to 1984 are available on the BRFSS Website under BRFSS Questionnaires (CDC, 2017). Starting in 2011, the BRFSS refined the range of data to include cell phone users, because of the increased number of individuals using cell/mobile phones. The Computer-Assisted Telephone Interview system was adopted in 2014. In conducting the BRFSS landline telephone survey, interviewers collect data from a randomly selected adult in a household. Following the guidelines provided by the BRFSS, state health personnel or contractors conduct the interviews. All health departments must ask the core component questions without modifying wording; however, state-specific modules are optional. Each state-generated related question was included as an optional module of the survey. Some states maintained their own questions rather than adopting a different module version (25 different modules per state) (CDC, 2018).

The BRFSS data provided a specific population level (rural and urban) for the State of Georgia and includes questions representing both areas. This study looked at predisposing variables—age, gender, income, education, and race/ethnicity, which could have been a key factor in determining the behavior-ecological relationship with the three dependent variables (having health insurance, foregoing care due to cost, and having a usual source of care) and the independent variables of interest (rurality and year [proxying passage of the ACA]). Stata is a statistical software package created in 1985 by Stata Corp (Banach, 2011). Most of its users

work in research fields such as political science, economics, sociology, biomedicine, and epidemiology. Stata was used to produce summary statistics (weighted populations), chi-square tests of statistical differences, and regression analysis for this study. The BRFSS data were analyzed using Stata software (Stata Corp, 2015).

Research Design

The literature review examined behaviors of individuals for accessing care which determined whether individuals received adequate access to health care services with affordable options with the implementation of the ACA. These areas were examined using existing data from the BRFSS. The BRFSS data provides a relevant timeframe (2005–2017), which served as a proxy for passage of the ACA in the analysis to look at its impact.

Survey Sample

In this study, 13 years of data were pooled from the BRFSS to form a sample of 25,388 rural respondents, 60,151 urban respondents, and 85,529 total respondents specific to Georgia. Descriptive statistics were reported for socioeconomic and demographic status—age, race, marital status, education, employment income, and gender. The survey sample population comprises the entire sample of Georgians and used rural status and year (proxying passage of the ACA) as independent variables for calculating covariances. I analyzed healthcare accessibility factors of health insurance coverage, foregoing care, and usual source of care, modeled as dependent variables in the regression analysis. The yearly data were pooled and weighted to adjust for nonresponse bias. The factors observed included rural and urban areas in the years 2005–2009 (pre-ACA proxied by year) and 2011–2017 (post-ACA proxied by year).

Rural and Urban Characteristics

Rural areas have often been considered areas far distant from city areas, with low

population density and a large amount of undeveloped land. Urban areas can refer to towns, cities, and suburbs. An urban area includes a city itself and the surrounding areas.

Rural status was coded as a dichotomous variable using the BRFSS data for a metropolitan statistical code based on MSAs (Bethea et al., 2012). An MSA is defined by the U.S. Office of Management and Budget as a metropolitan area that is distinct from another metropolitan area (U.S. Census Bureau, 2018). Therefore, rural status is not considered part of an MSA (and is analogous to being outside metropolitan areas); the remaining categories compose urban status (CDC, 2018). This study used rural and urban as indicated by the BRFSS in analyzing the data. This study indicated rural if the respondent lived outside of any metropolitan areas and urban if the respondent lived within an MSA.

Demographics

Demographics are possible indicators of health-related behavior. Demographics for this study include respondents' age (designated as 18–29, 30–39, 40–49, 50–59, 60–69, and 70 plus years); race/ethnicity (non-Hispanic Whites, non-Hispanic Blacks, non-Hispanic other race, and Hispanic); marital status (married and unmarried); education (less than high school, high school, some college, and college graduate); employment status (employer employed, self-employed, unemployed, student, and retired); income (less than $20,000, $20,000–$35,000, $35,000–$75,000, and $75,000 plus); and gender (male and female). Other predictors not associated with the demographic composition include the built environment, which includes available transportation. The proposed predictors of healthcare outcomes given the healthcare environment may be central in determining the relationship between potential access and realized access in the navigation process for healthcare utilization. These factors are observed for any statistically significant change.

Even though this study is specific to rural location in Georgia, topographic differences between urban and rural may have led to quite different outcomes for residents for accessing healthcare resources. Classifications of rural and urban can allow differences between these two types of places to be shown for a bigger sample (urban) as well as a smaller (rural) sample. The results in Chapter 4 address if barriers existed between rural and urban locations.

Stata and Behavioral Risk Factor Surveillance System Techniques

I calculated descriptive statistics for all the variables in my models. The dependent variables represent health-promoting behaviors for accessing care—insurance status, personal health practices (foregoing care), and healthcare navigation (having a usual source of care). The control variables focused on the theoretical environmental framework for accessing healthcare based on age, race, marital status, education, employment, income, and gender. The control variable effects may link perceptions of severity, susceptibility, benefits, barriers, cues to action and self-efficacy for health-promoting behaviors. For the exposure variables, I examined individual location (rural or urban) and the survey year.

Stata's multiple-imputation methods for analyzing incomplete data (in which some values are missing) provide both the imputation and estimation steps on individual datasets and pooling based on Stata (Stata Corp, 2015) for results. Stata's multiple-imputation method uses data input for the independent variables (foregoing care, insured status, usual source of care, MSA/rural status, age, race/ethnicity, marital status, education, employment status, income, gender, and year). I used standard multivariate regression to conduct most of the imputations. The variables with no missing data, and thus not inputted, were gender and year. The logistic regression models used the results from the multiple data sets. Mean differences examined using weighted multiple imputation logistical regression estimated a 95% confidence interval (CI) to assess

statistical significance. Categorical variable differences were examined using Pearson's χ^2 tests. The reliability, validity, and limitations of BRFSS data collection were considered before selecting data sources. The BRFSS provides weights to account for sample selection and adjusted for nonresponse bias (CDC, 2017). The BRFSS uses a technique for weighting methods called poststratification (CDC, 2017). This technique accounts for known proportions of characteristics of a population, e.g., race and ethnicity, gender, and age.

Limitations of the Behavioral Risk Factor Surveillance System.

Poststratification and Raking

The BRFSS annual sample designs are fixed for specific collection beginning in January of any given year, and samples are chosen quarterly and screened monthly to ensure a good representative sample for monthly data collections.

Beginning in 2011, the BRFSS added cell phone users in addition to landline users, which shifted the method from the poststratification (CDC, 2017) statistical weighting method to an iterative proportional fitting method (or raking) (Glied et al., 2017). The difference in these methods (poststratification versus raking) is the inclusion of smaller samples to remove biases (Glied et al., 2017). Specifically, the data better represented lower-income and minority populations as well as those with lower levels of formal education. The process of raking to include cell phone interviews and using this new weighting method ensures that the BRFSS data is accurate and meaningful.

In 2012, the BRFSS changed the final disposition code assignment rules, which modified the complete partial interview requirements. If an interview was terminated during or after the questionnaire's demographics section, the BRFSS coded it as a partial-complete. Therefore, data

users should account for participants' missing refused-to-answer values when determining which records to include in any researcher's data analysis (CDC, 2018).

Technical Support

One weakness of the BRFSS data is the CDC's limited technical support in survey data collection of multiple survey questions (up to three questions) in observations for 2016. This weakness could account for anomalies, but none were expected in the results of this study.

Summary

Individual beliefs about health choices and health conditions play a role in determining perceived benefits and barriers in accessing healthcare. The study's research questions were chosen to reflect the urgency of healthcare access and affordability for preventative services in rural Georgia.

The methods used in this study were based on a theoretical model for behavioral and ecological factors for healthcare practices. The BRFSS data source provided the framework for data analysis using the BRFSS 2017 Codebook. The survey conducted in the BRFSS 2017 Codebook collected current health and health-related behaviors based on environmental and individual characteristics used to improve individuals' health and health outcomes. The years observed in this study were 2005–2009 (pre-ACA proxied by year) and 2011–2017 (post-ACA proxied by year), and rurality was observed. The literature review in Chapter 2 discusses the need for further analysis on the barriers and advantages of the ACA, which are considered in Chapter 4. I was granted approval for this research by the Institutional Review Board (IRB) at Valdosta State University (see Appendix D).

Chapter 4: Results

Overview

The ACA promoted improvements for increasing the number of insured and for reducing the cost of healthcare. The purpose of this study was to assess the relationship of the passage of the ACA (proxied by year) and location upon three dependent variables: (a) having health insurance, (b) foregoing care due to cost, and (c) having a usual source of care for residents of Georgia. The CDC's (2017) BRFSS is a state-based telephone survey that collects data about U.S. citizens regarding health-related risk behaviors. The compiled results from the responses to three core questions in the BRFSS survey were analyzed using Stata 14.0 statistical software.

The results suggest that residents of rural communities in Georgia continue to lack health insurance coverage, continue to forego seeking medical care from a doctor or clinic because of cost, and continue to lack a regular medical provider when in need of medical care after the implementation of the ACA. Because of the rapid introduction of the various insurance reforms during the months and years that followed implementation, our study treated 2010 as a transition year. Therefore, 2010 was a dividing point in the results, showing results for 2005–2009 and 2011–2017.

Methods of Analysis

All analysis was conducted using the BRFSS provider sample survey weights to address nonresponse bias. Each year of the BRFSS data was pooled together for analysis, and values were imputed for variables with missing responses. The chi-square test is a widely used statistical test applied to sets of categorical data to evaluate any observed differences between data sets. The Stata statistical software used to analyze the 2005–2017 BRFSS Georgia surveys provides Pearson χ^2 contingency tables for individual respondents' answers to yes or no

questions. Contingency tables were produced for each of the three 2005–2017 BRFSS survey questions that were analyzed in this study. These are tables in which each row represents a category for one variable and each column represents a category for another variable. The procedure for establishing the statistical significance of observed differences between data sets is to make a null hypothesis that there is no relationship between the independent variables and the dependent variables; in other words, the values obtained are no closer to observed values than would be expected by random chance. If the null hypothesis is false, the alternative hypothesis shows differences between the observed samples which are statistically significant with the same level of confidence that had been associated with trying to prove that the null hypothesis was wrong.

Demographic Characteristics

All variables used in this study are summarized in Table 5. The table presents a comparison of the demographic characteristics for the BRFSS samples from years 2005–2017. Table 5 documents responses to the survey questions used in this study (i.e., did the respondents have insurance, did the respondents forego care because of cost, or did the respondents identify with a usual source of care). The populations listed below include the entire sample (n = 85,539), and subsamples of urban (n = 60,151) and rural (n = 25,388) respondents. The characteristics presented consist of age, race/ethnicity, marital status, education, employment status, income, and gender. These demographic characteristics can be linked to the health belief model. This behavior-ecological model for individual perceptions in identifying health outcomes is a good guide to focus not only on this study's analysis but also on interpreting the results.

Table 5.

Independent Effects of Individual Characteristics of Georgia Respondents

Variables		All (*N*=85,539)	Rural (*N*=25,388)	Urban (*N*=60,151)
Forego care	Yes	17.5±0.2	20.6±0.5	16.5±0.2
	No	82.5±.02	79.4±0.5	83.5±0.2
Insured	Yes	81.1±0.2	77.0±0.5	82.4±0.3
	No	18.9±0.2	23.0±0.5	17.6±0.3
Usual Source of Care	Person(s) identified	75.8±0.2	75.9±0.5	75.7±0.3
	None	24.2±0.2	24.0±0.5	24.3±0.3
Metropolitan Statistical Area	Yes	24.3±0.3	N/A	N/A
	No	75.7±0.3	N/A	N/A
Age (years)	18–29	20.3±0.2	20.3±0.5	20.3±0.3
	30–39	20.2±0.2	17.5±0.4	21.0±0.3
	40–49	19.4±0.2	18.5±0.4	19.7±0.2
	50–59	17.2±0.2	17.7±0.3	17.0±0.2
	60–69	12.4±0.1	13.8±0.3	11.9±0.2
	70+	10.2±0.1	11.7±0.3	9.7±0.1
Race/ethnicity	Non-Hispanic Whites	59.4±0.3	65.5±0.7	57.4±0.3
	Non-Hispanic Blacks	28.1±0.2	24.4±0.7	29.3±0.3
	Non-Hispanic other race	5.7±0.1	3.6±0.3	6.4±0.2
	Hispanic	6.8±0.2	6.4±0.4	6.9±0.2
Marital status	Married	55.6±0.2	54.5±0.5	55.9±0.3
	Unmarried	44.4±0.2	45.5±0.5	44.1±0.3
Education	Less than high school	13.7±0.2	20.7±0.5	11.5±0.2
	High school	28.9±0.2	34.6±0.5	27.0±0.3
	Some college	27.8±0.2	26.7±0.5	28.1±0.3
	College graduate	29.6±0.2	18.0±0.3	33.4±0.3
Employment status	Employer employed	50.0±0.3	45.6±0.6	51.5±0.3
	Self-employed	8.7±0.1	8.5±0.3	8.8±0.2
	Unemployed	21.0±0.2	24.2±0.5	20.0±0.3
	Student	5.3±0.1	5.0±0.4	5.3±0.2
	Retired	15.0±0.1	16.8±0.4	14.5±0.2
Income	<$20,000	20.7±0.2	29.0±0.5	18.1±0.3
	$20,000–$35,000	22.5±0.2	26.8±0.4	21.1±0.3
	$35,000–$75,000	28.9±0.2	27.1±0.5	29.4±0.3
	$75,000+	27.9±0.2	17.1±0.4	31.4±0.3
Gender	Male	48.4±0.3	48.4±0.6	48.4±0.3
	Female	51.6±0.3	51.6±0.6	51.6±0.3

Note. Data are weighted percentage means ± SD. Behavioral Risk Factor Surveillance System, 2005–2017.

Results for Research Questions

Research Question 1

Research Question 1 asked, "Is there a statistically significant relationship between having health insurance and location and/or between having health insurance and passage of the ACA (proxied by year) for residents of Georgia?"

- $H1a_0$ There is no statistically significant relationship between having health insurance and location for residents of Georgia.
- $H1a_a$ There is a statistically significant relationship between the having health insurance and location for residents of Georgia.
- $H1b_0$ There is no statistically significant relationship between having health insurance and passage of the ACA for residents of Georgia.
- $H1b_a$ There is a statistically significant relationship between having health insurance and passage of the ACA for residents of Georgia.

Results for the Research Question 1

During the 2005–2017 BRFSS survey period, the adjusted odds ratio (OR) value for each year ranged from 0.64 to 1.07. Table 6 shows that residents of rural locations (MSA = no) compared to those living in urban locations (MSA = yes) had lower odds of being insured over the entire survey period because they had an adjusted OR of 0.85 and a 95% CI of .76–.95 for the likelihood of adults being insured in rural locations. This result means that residents living in a rural location, compared to those living in an urban location, had 15% lower odds of being insured (OR = .85). Because of the symmetry associated with calculating OR values, any given OR value can be interpreted in the opposite direction by taking its reciprocal (1 divided by the number). Thus, if this OR had been recalculated using the rural OR instead of the urban OR for

reference, the new urban value would be OR = 1/.85 = 1.18. For that alternative example, urban respondents had 18% higher odds of being insured than rural respondents over the 2005–2017 BRFSS survey period.

Table 6 shows the Stata output table for the input variables from the 2005–2017 BRFSS survey. This table shows that after controlling for confounding variables (including demographic characteristics that may influence behavioral-related health outcomes), the passage of the ACA as proxied by year had a statistically significant relationship with the likelihood of having health insurance every year except years 2015 and 2016 (when the adjusted OR was greater than the reference value of 1.00).

Table 6.

Independent Effects of Individual Characteristics and Year on the Likelihood of Adults Being Insured

Variables		Total sample		Rural		Urban	
		Adjusted OR	(95%CI)	Adjusted OR	(95%CI)	Adjusted OR	(95%CI)
		(*N* = 85,539)		(*N* = 25,388)		(*N* = 60,151)	
Metropolitan statistical area	Yes	1.00	(reference)	N/A		N/A	
	No	0.85	(0.76–0.95)	N/A		N/A	
Usual source of care	Person(s) identified	4.67	(0.08–0.11)	4.24	(0.05–0.11)	4.85	(0.08–0.14)
	None	1.00	(reference)	1.00	(reference)	1.00	(reference)
Age (years)	18–29	0.09	(0.07–0.10_	0.07	(0.05–0.11)	0.11	(0.07–0.12
	30–39	0.08	(0.08–0.11)	0.07	(0.05–0.120	0.09	(0.08–0.13)
	40–49	0.09	(0.10–0.14)	0.08	(0.07–0.15)	0.10	(0.11–0.16)
	50–59	0.12	(0.19–0.26)	0.10	(0.14–0.28)	0.13	(0.19–0.30)
	60–69	0.22	(0.85–1.00)	0.20	(0.78–1.14)	0.24	(0.83–1.02)
	70+	1.00	(reference)	1.00	(reference)	1.00	(reference)
Race/ethnicity	Non-Hispanic Whites	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Non-Hispanic Blacks	0.92	(0.85–1.00)	0.94	(0.78–1.14)	0.92	(0.83–1.02)
	Non-Hispanic other race	0.91	(0.77–1.07)	1.03	(0.69–1.51)	0.88	(0.72–1.08)
	Hispanic	0.47	(0.41–0.54)	0.43	(0.32–0.58)	0.49	(0.41–0.58)

Marital status	Married	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Unmarried	0.76	(0.70–0.82)	0.84	(0.70-1.01)	0.73	(0.66–0.81)
Education	Less than high school	1.00	(reference)	1.00	(reference)	1.00	(reference)
	High school	1.32	(1.18–1.47)	1.31	(1.10–1.57)	1.33	(1.16–1.52)
	Some college	1.60	(1.43–1.79)	1.55	(1.29–1.88)	1.64	(1.42–1.89)
	College graduate	2.66	(2.33–3.03)	2.66	(1.98–3.57)	2.69	(2.29–3.16)
Employment status	Employer employed	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Self-employed	0.30	(0.27–0.34)	.032	(0.25–0.41)	0.30	(0.26–0.35)
	Unemployed	0.58	(0.53–0.64)	0.60	(051–0.72)	0.57	(0.51–0.64)
	Student	1.22	(1.01–1.48)	1.21	(0.82–1.8)	1.22	(0.98–1.52)
	Retired	1.31	(1.12–1.52)	1.25	(0.88–1.77)	1.34	(1.07–1.69)
Income	<$20,000	0.12	(0.10–0.14)	0.12	(0.07–0.21)	0.12	(0.10–0.15)
	$20,000–$35,000	0.19	(0.16–0.22)	0.20	(0.12–0.35)	0.18	(0.15–0.22)
	$35,000–$75,000	0.46	(0.40–0.52)	0.47	(0.29–0.74)	0.45	(0.39–0.53)
	$75,000+	1.00	(reference)	1.00	(reference)	1.00	(reference)
Gender	Male	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Female	1.06	(0.98–1.14)	1.12	(0.94–1.33)	1.03	(0.93–1.14)
Year	2005	0.83	(0.7–1.00)	0.80	(0.56–1.33)	0.86	(0.67–1.09)
	2006	0.81	(0.69–0.95)	0.69	(0.48–0.99)	0.87	(0.70–1.07)
	2007	0.69	(0.58–0.82)	0.76	(0.53–1.08)	0.67	(0.54–0.85)
	2008	0.75	(0.62–0.90)	0.56	(0.38–0.82)	0.84	(0.65–1.08)
	2009 (pre-ACA)	0.65	(0.54–0.78)	0.60	(0.41–0.90)	0.67	(0.53–0.85)
	2010	0.65	(0.55–0.77)	0.55	(0.38–0.80)	0.70	(0.55–0.88)
	2011 (post-ACA)	0.64	(0.55–0.74)	0.54	(0.39–0.73)	0.69	(0.56–0.84)
	2012	0.69	(0.58–0.81)	0.63	(0.42–0.96)	0.72	(0.57–0.90)
	2013	0.70	(0.60–0.82)	0.64	(0.46–0.88)	0.73	(0.60–0.90)
	2014	0.83	(0.70–0.98)	0.69	(0.45–1.06)	0.90	(0.70–1.16)
	2015	1.07	(0.89–1.29)	0.98	(0.68–1.40)	1.11	(0.87–1.42)
	2016	1.05	(0.88–1.26)	0.88	(0.53–1.46)	1.14	(0.86–1.52)
	2017	1.00	(reference)	1.00	(reference)	1.00	(reference)
Intercept		66.75	(51.35–86.77)	72.6	(31.87–165.400	58.4	(41.92–81.36)

Note. Behavioral Risk Factor Surveillance System 2005–2017.

Table 7 shows the weighted percentage of respondents for insured residents of rural locations for the 2005–2017 BRFSS surveys. In this table, a weighted mean resulted in a 77% for rural respondents with insurance. The table also shows a drastic reduction in rural respondents

who had health insurance between 2005 (81.3%) and the first pre-ACA year 2011 (69.3%). After 2011, the rural percentages slowly increased to 80.5% by 2017 (less than 1% away from the initial pre-ACA value of 81.3% in 2005).

Table 7.

Weighted Percentage of Respondents Insured

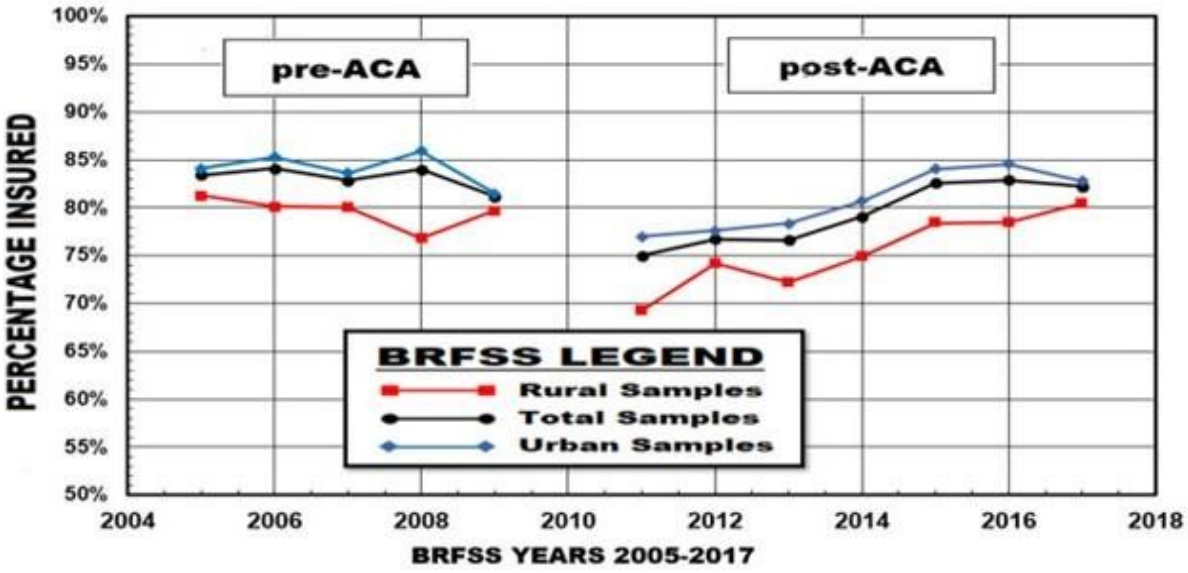
Year	Total sample	Rural sample	Urban sample
Observation	85,539	25,388	60,151
Weighted population	95,364,155	22,944,091	72,420,064
All years	81.1%	77.0%	82.4%
2005	83.4%	81.3%	84.1%
2006	84.1%	80.1%	85.3%
2007	82.8%	80.1%	83.6%
2008	84.0%	76.8%	85.9%
2009	81.1%	79.7%	81.5%
2010	83.7%	77.7%	85.3%
2011	75.0%	69.3%	77.0%
2012	76.7%	74.1%	77.6%
2013	76.6%	72.2%	78.3%
2014	79.1%	74.9%	80.7%
2015	82.6%	78.4%	84.1%
2016	82.9%	78.5%	84.5%
2017	82.2%	80.5%	82.8%

Note. Behavioral Risk Factor Surveillance System 2005–2017.

Table 7 presents results associated with the graph presented in Figure 3. The statistical significance of any observed changes displayed in this figure must be established. It is necessary to demonstrate that the BRFSS sampling procedures provided unbiased data sets for which the survey responses in each category are independent, which would mean that the survey respondents in each category were randomly selected in such a way that the value obtained for that category did not depend on the values obtained for observations in other categories.

Figure 3.

Weighted Percentage of Respondents Insured, BRFSS 2005-2017



Note. Behavioral Risk Factor Surveillance System 2005–2017.

Percentages for rural respondents' pre-ACA data (the red plots in Figure 3 began with a value of 81.3% in 2005 with no apparent trend observed between 2005–2009. They have a mean value and sample SD of 79.6% ± 1.67% (calculated from the year-to-year percentages displayed for the rural sample in Table 7). The percentages of rural respondents during the post-ACA period then dropped over 10 points from a pre-ACA mean value of 79.7% in 2009 to a value of 69.3% in 2011, and, by 2017, had risen back to 80.5%, which lies within the range of the average values observed for rural areas during the pre-ACA period.

Pre-ACA percentages for urban respondents with insurance (the blue plots in Figure 3 also exhibited only a small amount of year-to-year variability. The percentages for urban respondents had a mean value and sample standard deviation of 84.1% ± 1.72% during the 2005–2009 period. Post-ACA, the percentage dropped over 7 points to a value of 77.0% in 2011 and rose back close to the pre-ACA average value by 2015.

Georgia results for rural and urban respondents who were insured showed rural percentages about 5% less than urban percentages (estimated by comparing Figure 3 differences between the blue urban and red rural percentages for each survey year). To quantify this observation, differences between urban and rural percentages yielded a mean value and a sample standard variation of 5.2% ± 2.26% throughout the entire 2005–2017 survey period.

In summary, the plots showing the percentage of insured respondents showed rural results usually about 5 percentage points less than their corresponding urban values for each year. In the year after ACA implementation, rural values dropped over 10 points below the average pre-ACA percentages and urban values dropped more than 7 points below pre-ACA values. In both rural and urban areas, the percentages slowly climbed back to their average pre-ACA values before the end of the BRFSS survey period in 2017.

Table 8 is a contingency table produced as part of the Stata software output and displays both the value of Pearson's χ^2 parameter and the *p* value, which were used to show that the observed results are statistically significant at the 95% level of confidence. The *p* value is the probability that the observed differences exceeded a critical value that is statistically significant, and the null hypothesis should be rejected on the assumption that the data sets have differences that could be due to chance. Consequently, the alternative hypothesis can then be accepted, and the observed differences are deemed statistically significant.

Table 8.

Results of Pearson's χ^2 Test for Respondents Having Health Insurance

Individual responses	2005–2009 observations	2011–2017 observations	2010 data (not used)	Total number
No	7,667	24,675	1,222	25,897
Yes	51,366	123,533	9,361	132,894
Total	59,033	148,208	10,583	158,791

Note. Pearson's χ^2 = 561.366, *p* value = 0.000. Number of observations from 2005–2017 BRFSS Georgia surveys.

Table 8 shows the number of individual responses (yes or no) for pre-ACA 2005–2009 observations versus post-ACA 2011–2017 observations based on the BRFSS survey question asking whether the respondents had health insurance. This study's first research question asks, "Is there a statistically significant relationship between having health insurance and rural location and/or between having health insurance and passage of the ACA (proxied by year) for residents of Georgia?" The 95% CI is established by showing that the *p* value is less than or equal to .05 for a statistical significance level of 5% (i.e., $p = .05$). If the *p* value is less than .05, the null hypothesis can be rejected, and the alternative hypothesis that differences in samples between the time periods are statistically significant can be accepted at the 95% level of confidence. It should also be noted that a significance level of 1% ($p = .01$) has a 99% CI with less than 1 chance in 100 of being wrong, and the 95% significance test of $p \leq .05$ was easily satisfied. The *p* value in Table 8 is .000 and is obviously less than $p = .05$. Therefore, this result provides justification of why the null hypothesis must be rejected. The alternative hypotheses can be accepted, and a statistically significant relationship exists between having health insurance and rural location or having health insurance and passage of the ACA for residents of Georgia that meets (and exceeds) the 95% level of confidence.

In summary, the CDC's BRFSS surveys conducted for the state of Georgia provided data sets in which differences in the percentage of those insured in Table 7 are statistically significant at the 95% level of confidence because the *p* value from Table 8 is less than .05 in pre-ACA (2005–2009) compared to post-ACA (2011–2017) results. Significant differences were obtained for both urban and rural percentages of respondents with health insurance.

Research Question 2

Research Question 2 asked, "Is there a statistically significant relationship between foregoing care due to cost and location or between foregoing care due to cost and passage of the ACA (proxied by year) for residents of Georgia?"

- $H2a_0$ There is no statistically significant relationship between foregoing care due to cost and location for residents of Georgia.
- $H2a_a$ There is a statistically significant relationship between foregoing care due to cost and location for residents of Georgia.
- $H2b_0$ There is no statistically significant relationship between foregoing care due to cost and passage of the ACA for residents of Georgia.
- $H2b_a$ There is a statistically significant relationship between foregoing care due to cost and passage of the ACA for residents of Georgia.

Results for the Research Question 2

The second research question posed to randomly selected household adults focused on whether they chose to forego care due to cost. The Stata output data documenting input variables from the BRFSS surveys in Table 9 represent the weighted percentages of respondents foregoing care due to cost in rural locations for BRFSS years 2005–2017. Table 9 shows that after controlling for confounding variables including demographic characteristics, the passage of the ACA (as proxied by year) had a statistically significant relationship with the likelihood of rural respondents having to forego care due to cost for each year between 2005 and 2017. The adjusted OR values for each year in the total sample column ranged from 0.87 to 1.10 while satisfying the 95% CI requirements. Additionally, residents of rural locations, compared to those living in urban locations, had lower odds of having to forego care over the entire 2005–2017

BRFSS survey period. Table 9 shows that OR = 0.99 with 95% CI = (0.91–1.07) for the likelihood of adults foregoing care in rural locations, which indicates that rural respondents with an adjusted OR of 0.99 had only 1% lower odds of foregoing care than urban respondents.

Table 9.

Independent Effects of Individual Characteristics and Year on the Likelihood of Foregoing Care Due to Cost

Variables		Total sample		Rural		Urban	
		Adjusted OR	(95%CI)	Adjusted OR	(95%CI)	Adjusted OR	(95%CI)
		(*N* = 85,539)		(*N* = 25,388)		(*N* = 60,151)	
Metropolitan statistical area	Yes	1.00	(reference)	N/A		N/A	
	No	0.99	(0.91–1.07)	N/A		N/A	
Insured	Yes	0.27	(0.25–0.30)	0.28	(0.24–0.32)	0.27	(0.24–0.30)
	No	1.00	(reference)	1.00	(reference)	1.00	(reference)
Usual source of care	Person(s) identified	0.85	(0.78–0.92)	0.89	(0.76–1.04	0.83	(0.76–0.92)
	None	1.00	(reference)	1.00	(reference)	1.00	(reference)
Age (years)	18–29	2.28	(1.98–2.64)	2.29	(1.57–3.34)	2.28	(1.87–2.77)
	30–39	2.73	(2.38–3.14)	2.86	(2.11–3.88)	2.69	(2.25–3.22)
	40–49	3.17	(2.78–3.61)	3.28	(2.45–4.40)	3.13	(2.64–3.70)
	50–59	2.91	(2.57–3.29)	2.99	(2.29–3.90)	2.87	(2.44–3.38)
	60–69	1.96	(1.75–2.20)	1.92	(1.46–2.53)	1.99	(1.69–2.33)
	70+	1.00	(reference)	1.00	(reference)	1.00	(reference)
Race/ethnicity	Non–Hispanic Whites	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Non–Hispanic Blacks	1.03	(0.96–1.10)	0.94	(0.78–1.13)	1.06	(0.96–1.16)
	Non–Hispanic other race	1.11	(0.96–1.30)	1.03	(0.69–1.54)	1.14	(0.95–1.37)
	Hispanic	0.78	(0.67–0.90)	0.65	(0.49–0.86)	0.83	(0.70–0.99)
Marital status	Married	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Unmarried	1.03	(0.96–1.11)	0.97	(0.82-1.14)	1.06	(0.97-1.15)
Education	Less than high school	1.00	(reference)	1.00	(reference)	1.00	(reference)
	High school	0.81	(0.73–0.89)	0.75	(0.63–0.90)	0.84	(0.74–0.95)
	Some college	0.97	(0.87–1.07)	0.80	(0.67–0.96)	1.05	(0.92–1.20)
	College graduate	0.80	(0.71–0.90)	0.66	(0.46–0.93)	0.86	(0.74–0.99)
Employment status	Employer employed	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Self–employed	1.13	(1.00–1.27)	0.98	(0.76–1.28)	1.17	(1.01–1.36)
	Unemployed	1.30	(1.20–1.41)	1.27	(1.08–1.50)	1.31	(1.18–1.45)
	Student	0.67	(0.56–0.81)	0.63	(0.42–0.94)	0.69	(0.55–0.85)
	Retired	0.65	(0.58–0.72)	0.69	(0.53–0.89)	0.62	(0.54–0.72)

Income	<$20,000	5.53	(4.74–6.44)	5.41	(3.33–8.97)	5.49	(4.57-6.59)
	$20,000–$35,000	4.11	(3.62–4.67)	3.75	(2.42–5.81)	4.21	(3.62–4.90)
	$35,000–$75,000	2.03	(1.81–2.26)	1.83	(1.27–2.66)	2.07	(1.83–2.35)
	$75,000+	1.00	(reference)	1.00	(reference)	1.00	(reference)
Gender	Male	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Female	1.59	(1.48–1.70)	1.54	(1.30–1.83)	1.60	(1.46–1.76)
Year	2005	0.93	(0.80–1.09)	1.05	(0.77–1.45)	0.89	(0.72–1.09)
	2006	0.87	(0.75–1.01)	0.85	(0.62–1.18)	0.86	(0.71–1.05)
	2007	1.03	(0.88–1.20)	1.08	(0.78–1.49)	1.00	(0.81–1.22)
	2008	0.95	(0.80–1.12)	0.92	(0.65–1.29)	0.95	(0.77–1.18)
	2009 (pre–ACA)	1.10	(0.93–1.30)	1.08	(0.77–1.52)	1.09	(0.88–1.35)
	2010	1.03	(0.88–1.21)	1.04	(0.75–1.45)	1.03	(0.84–1.26)
	2011 (post–ACA)	1.07	(0.93–1.23)	1.20	(0.85–1.70)	1.02	(0.84–1.23)
	2012	0.98	(0.84–1.14)	0.96	(0.68–1.36)	0.98	(0.81–1.19)
	2013	0.99	(0.86–1.14)	1.00	(0.73–1.37)	0.99	(0.82–1.19)
	2014	1.01	(0.87–1.18)	1.07	(0.75–1.53)	0.99	(0.80–1.22)
	2015	0.87	(0.73–1.02)	0.92	(0.62–1.35)	0.84	(0.67–1.06))
	2016	0.96	(0.82–1.12)	0.95	(0.58–1.57)	0.96	(0.75–1.23)
	2017	1.00	(reference)	1.00	(reference)	1.00	(reference)
Intercept		0.08	(0.06–0.10)	0.09	(0.06–0.14)	0.07	(0.06–0.10)

Note. Behavioral Risk Factor Surveillance System 2005–2017. Data are weighted, multiple imputation logistical regression estimates with 95% confidence interval.

Table 10 shows weighted percentages for three Georgia MSAs: (a) the total sample, (b) rural samples, and (c) urban samples for each year. The figure also shows time trends of the percentage of those who had foregone care for each of the sample populations. The findings show a weighted mean of 20.6% was reported for those foregoing medical care in rural Georgia during the entire time from 2005 to 2017.

Table 10.

Weighted Percentage of Respondents Foregoing Care Due to Cost

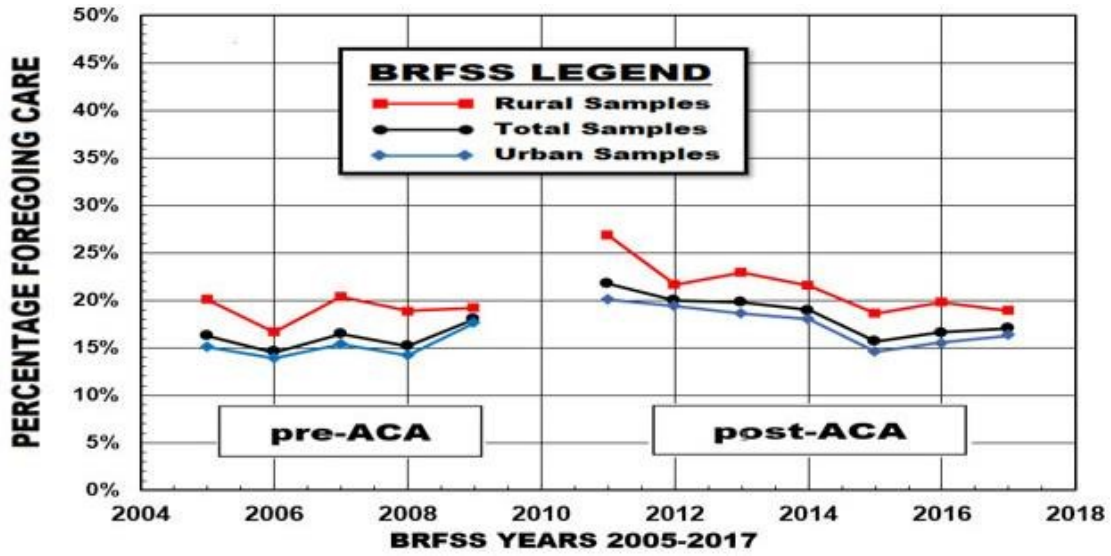
Year	Total sample	Rural sample	Urban sample
Observation	85,539	25,388	60,151
Weighted population	95,364,155	22,944,091	72,420,064
All years	17.5%	20.6%	16.5%
2005	16.2%	20.1%	15.0%
2006	14.5%	16.7%	13.9%
2007	16.5%	20.3%	15.4%
2008	15.2%	18.9%	14.2%
2009	18.0%	19.2%	17.7%
2010	16.5%	20.5%	15.3%
2011	21.8%	26.9%	20.1%
2012	20.0%	21.6%	19.4%
2013	19.8%	22.9%	18.6%
2014	19.0%	21.5%	18.0%
2015	15.7%	18.6%	14.5%
2016	16.6%	19.8%	15.5%
2017	17.0%	18.9%	16.3%

Note. Behavioral Risk Factor Surveillance System 2005–2017.

Significant differences were observed between percentages of both urban and rural survey respondents who had to forego care because of cost. Percentages for rural respondents in the pre-ACA period (the red plots in Figure 4) begin with a value of 20.1% in 2005 with no apparent trend throughout the 2005–2009 survey period, resulting in a mean value and sample standard deviation of 19.0% ± 1.45%. During the post-ACA period, percentages rapidly increased by almost 8 points the year after ACA implementation; they rose to a value of 26.9% in 2011 and returned to a pre-ACA value of 18.9% by 2017.

Figure 4.

Weighted Percentage of Respondents Foregoing Care Due to Cost



Note. Behavioral Risk Factor Surveillance System 2005–2017.

In the urban results, pre-ACA percentages for respondents foregoing care (the blue plots in Figure 4) also exhibited only a small amount of year-to-year variability. The percentage of urban respondents foregoing care started with a value of 15.0% in 2005 and had a mean value and sample standard deviation of 15.2% ± 1.48% throughout the 2005–2009 period. The urban post-ACA foregoing care percentages increased by about 5 points the year after ACA implementation, showing a value of 20.1% in 2011 and returning to pre-ACA average values close to 15% by 2015 and beyond.

The BRFSS 2005–2017 results for Georgia respondents having to forego care showed differences between rural and urban percentages that are normally about 4% more each year than the corresponding urban percentages. To quantify this observation, calculations of the difference between the urban and rural percentages for each of the annual surveys between 2005 and 2017 yielded a mean value and sample standard deviation of 4.0% ± 1.43% for the average differences between the urban and rural percentages.

For each MSA sampled in the BRFSS surveys (rural samples, urban samples, and total samples), each of the three plots for the percentage insured in Figure 3 and each of the corresponding three plots for respondents who had to forego care in Figure 4 are almost mirror images. If all plots in Figures 3 and 4 were to be transferred to a single graph with vertical axis percentages ranging from 0% to 100%, the plots from each of those figures would be nearly symmetric around the 50% horizontal line. In both figures, pre-ACA data points have nearly constant values throughout the entire 5-year (2005–2009) interval in which their percentages can be represented by average values with sample standard deviations of less than 1.7% (e.g., the rural plots show 79.6% ± 1.67% insured and 19.0% ± 1.45% foregoing care).

In 2011 (the year after the ACA implementation date), percentage points for plots for each of the two BRFSS MSA categories experienced substantial changes. For example, the percentage of insured rural respondents dropped over 10% below pre-ACA values whereas the percentage of rural respondents foregoing care increased over 7%. For the following 6 years until the end of the 2011–2017 sample interval, percentage values for each of these two categories asymptotically returned to each of their pre-ACA values.

Table 11.

Results of Pearson's χ^2 Test for Respondents Foregoing Care Due to Cost, BRFSS 2005-2017

Individual responses	2005–2009 observations	2011–2017 observations	2010 data (not used)	Total number
No	50,637	123,276	9,121	25,897
Yes	8,396	24,932	1,462	132,894
Total	59,033	148,208	10,583	158,791

Note. Pearson's $\chi^2 = 251.1604$, p value = 0.000. Number of observations from 2005–2017 BRFSS Georgia surveys.

The pre-ACA 2005–2009 observations versus the post-ACA 2011–2017 observations based on the BRFSS survey question asking whether the respondents had to forego care due to

cost. The study's second question asks, "Is there a statistically significant relationship between foregoing care due to cost and location or between foregoing care due to cost and passage of the ACA (proxied by year) for residents of Georgia?" The contingency table output includes chi-square parameter and *p* value ($\chi^2 = 251$ and $p = 0.000$) for the analysis of this research question. Because the *p* value is less than .05, the null hypothesis is rejected, and the alternative hypothesis shows a statistically significant relationship between foregoing care due to cost and location or between foregoing care due to cost and passage of the ACA for residents of Georgia, which meets (and exceeds) the 95% level of confidence.

Research Question 3

Research Question 3. Is there a statistically significant relationship between having a usual source of care and location and/or between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia?

- $H3a_0$ There is no statistically significant relationship between having a usual source of care and location for residents of Georgia.
- $H3a_a$ There is a statistically significant relationship between having a usual source of care and location for residents of Georgia.
- $H3b_0$ There is no statistically significant relationship between having a usual source of care and passage of the ACA for residents of Georgia.
- $H3b_a$ There is a statistically significant relationship between having a usual source of care and passage of the ACA for residents of Georgia.

Results for the Research Question 3

The third research question asked respondents if they identified one or more person(s) as their usual source of care. A provider or place that a patient would consult when sick or seeking

medical advice is referenced as their usual source of care. The BRFSS Codebook includes a health care access question labeled "Multiple Health Care Professionals." The prologue for the third question asked, "Do you have one person you think of as your personal doctor or health care provider? (If the answer is 'no,' then ask, 'Is there more than one, or is there no person who you think of as your personal doctor or health care provider?')." Only 7–10% of respondents identified with more than one provider. Thus, responses to this question were dichotomized as *yes* for identifying one or more providers and *no* otherwise.

Stata output data documenting variables from the BRFSS surveys are shown below in Table 12. The range of OR values by year for this table proves to be much larger than the values displayed in Tables 6 and 9, which showed the adjusted OR values for having insurance or having to forego care. A careful review of this table reveals an interesting feature: the pre-ACA (2005–2009) and post-ACA (2011–2017) BRFSS survey periods both have relatively constant OR values throughout each period, with the OR dropping to noticeably lower values after the passage of the ACA in 2010. The OR values for the rural samples ranged from 1.62 to 2.06 for pre-ACA and from 0.99 to 1.32 for post-ACA surveys, whereas values for urban samples range from 1.47 to 1.56 for pre-ACA and from 0.93 to 1.42 for post-ACA. The distinctly different OR values observed before and after passage of the ACA for both rural and urban respondents showed relatively constant pre-ACA values followed by an abrupt change to lower post-ACA values for both groups.

Table 12.

Independent Effects of Individual Characteristics and Year on the Likelihood of Identifying a Usual Source of Care

Variables		Total sample		Rural		Urban	
		Adjusted OR	(95%CI)	Adjusted OR	(95%CI)	Adjusted OR	(95%CI)
		(*N* = 85,539)		(*N* = 25,388)		(*N* = 60,151)	
Metropolitan statistical area	Yes	1.00	(reference)	N/A		N/A	
	No	1.28	(1.17–1.39)	N/A		N/A	
Insured	Yes	4.44	(4.10–4.79)	4.05	(3.36–4.89)	4.60	(4.12–5.13)
	No	1.00	(reference)	1.00	(reference)	1.00	(reference)
Forego care	Yes	0.82	(0.76–0.89)	0.85	(0.73–0.99)	0.81	(0.73–0.89)
	No	1.00	(reference)	1.00	(reference)	1.00	(reference)
Age (years)	18–29	0.15	(0.13–0.18)	0.21	(0.14–0.30)	0.14	(0.11–0.17)
	30–39	0.19	(0.17–0.22)	0.25	(0.18–0.36)	0.18	(0.14–0.21)
	40–49	0.32	(0.28–0.37)	0.41	(0.29–0.58)	0.29	(0.24–0.35)
	50–59	0.50	(0.44–0.58)	0.63	(0.45–0.88)	0.46	(0.38–0.55)
	60–69	0.72	(0.63–0.81)	0.83	(0.63–1.11)	0.67	(0.57–0.79)
	70+	1.00	(reference)	1.00	(reference)	1.00	(reference)
Race/ethnicity	Non–Hispanic Whites	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Non–Hispanic Blacks	1.05	(0.98–1.13)	0.99	(0.77–1.26)	1.07	(0.97–1.17)
	Non–Hispanic other race	0.81	(0.71–0.92)	070	(0.40–1.24)	0.83	(0.70–0.99)
	Hispanic	0.71	(0.62–0.80)	0.64	(0.43–0.96)	0.73	(0.62–0.86)
Marital status	Married	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Unmarried	0.75	(0.71–0.81)	0.80	(0.68–0.94)	0.74	(0.68–0.81)
Education	Less than high school	1.00	(reference)	1.00	(reference)	1.00	(reference)
	High school	1.29	(1.16–1.43)	1.41	(1.16–1.71)	1.25	(1.08–1.43)
	Some college	1.39	(1.24–1.55)	1.46	(1.18–1.81)	1.35	(1.17–1.56)
	College graduate	1.49	(1.32–1.68)	1.79	(1.41–2.26)	1.40	(1.21–1.62)
Employment status	Employer employed	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Self–employed	0.93	(0.84–1.03)	0.98	(0.73–1.31)	0.92	(0.80–1.05)
	Unemployed	1.14	(1.04–1.24)	1.36	(1.13–1.65)	1.06	(0.95–1.19)
	Student	1.10	(0.94–1.27)	1.09	(0.77–1.35)	1.10	(0.92–1.32)
	Retired	1.23	(1.09–1.40)	1.54	(1.16–2.04)	1.14	(0.98–1.32)
Income	<$20,000	0.65	(0.57–0.74)	0.74	(0.54–1.02)	0.63	(0.54–0.73)
	$20,000–$35,000	0.71	(0.63–0.81)	0.75	(0.59–0.94)	0.72	(0.61–0.84)
	$35,000–$75,000	0.82	(0.74–0.91)	0.84	(0.68–1.04)	0.83	(0.75–0.92)
	$75,000+	1.00	(reference)	1.00	(reference)	1.00	(reference)
Gender	Male	1.00	(reference)	1.00	(reference)	1.00	(reference)
	Female	1.95	(1.84–2.07)	1.84	(1.60–2.12)	2.00	(1.86–2.15)
Year	2005	1.58	(1.36–1.84)	2.06	(1.50–2.83)	1.47	(1.22–1.76)
	2006	1.59	(1.39–1.82)	1.69	(1.24–2.30)	1.56	(1.34–1.84)

	2007	1.52	(1.33–1.75)	1.62	(1.20–2.17)	1.49	(1.26–1.77)
	2008	1.59	(1.36–1.85)	1.97	(1.38–2.83)	1.49	(1.24–1.78)
	2009 (pre–ACA)	1.54	(1.32–1.81)	1.81	(1.23–2.67)	1.49	(1.24–1.79)
	2010	1.78	(1.52–2.07)	1.72	(1.23–2.39)	1.78	(1.48–2.15)
	2011 (post–ACA)	1.35	(1.19–1.53)	1.32	(0.93–1.87)	1.35	(1.14–1.59)
	2012	1.40	(1.22–1.60)	1.32	(.0.99–1.77)	1.42	(1.20–1.69)
	2013	1.13	(1.00–1.28)	1.09	(0.74–1.60)	1.15	(0.96–1.37)
	2014	1.03	(0.90–1.17)	1.02	(0.77–1.35)	1.03	(0.88–1.21)
	2015	0.95	(0.82–1.10)	0.99	(0.70–1.40)	0.93	(0.77–1.12)
	2016	1.00	(0.87–1.15)	1.01	(0.69–1.46)	0.99	(0.82–1.20)
	2017	1.00	(reference)	1.00	(reference)	1.00	(reference)
Intercept		2.10	(1.70–2.60)	1.77	(0.90–3.49)	2.44	(1.76–3.37)

Note. Behavioral Risk Factor Surveillance System 2005–2017. Data are weighted, multiple imputation logistical regression estimates with 95% confidence interval.

Table 12 shows that after controlling for confounding variables, including the demographic characteristics, the passage of the ACA, as proxied by year, had a statistically significant relationship with the likelihood of having a usual source of care in each year between 2005 and 2017. Respondents living in a rural location, compared to those living in an urban location, had 28% higher odds of having a usual source of care (OR = 1.28; 95% CI = 1.17–1.39). The OR for each year throughout the entire BRFSS survey period ranged from 0.95 to 1.59 while satisfying 95% CI requirements.

Table 13.

Weighted Percentage of Respondents With a Usual Source of Care, BRFSS 2005-2017

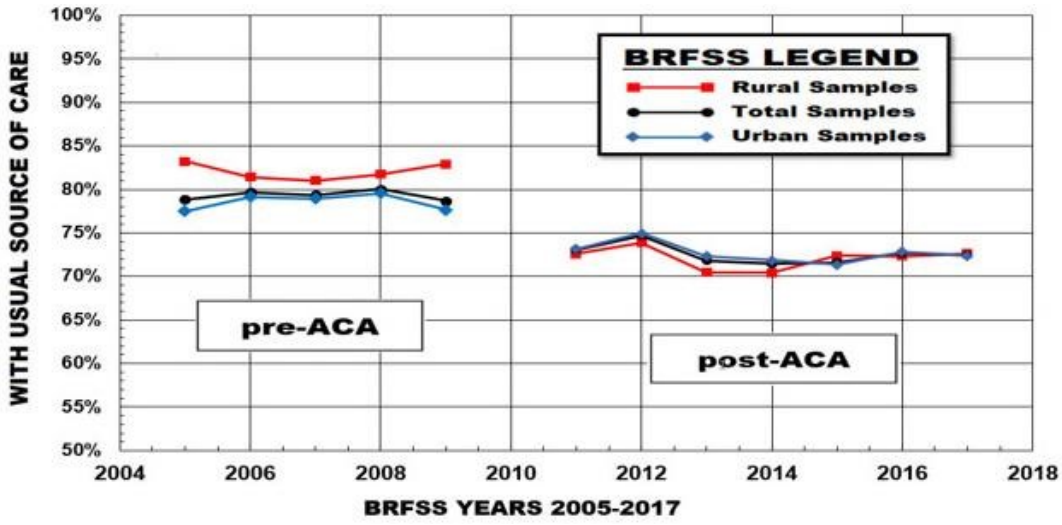
Year	Total sample	Rural sample	Urban sample
Observation	85,539	25,388	60,151
Weighted population	95,364,155	22,944,091	72,420,064
All years	75.8%	75.9%	75.7%
2005	78.8%	83.2%	77.5%
2006	79.6%	81.4%	79.1%
2007	79.4%	81.0%	78.9%
2008	80.0%	81.7%	79.5%
2009	78.7%	82.9%	77.6%
2010	82.6%	81.7%	82.9%
2011	73.0%	72.6%	75.0%
2012	74.7%	73.9%	72.5%
2013	71.8%	70.5%	72.4%
2014	71.5%	70.4%	71.9%
2015	71.6%	72.4%	71.4%
2016	72.7%	72.4%	72.8%
2017	72.5%	72.6%	72.4%

Note. Behavioral Risk Factor Surveillance System 2005–2017.

Table 13 shows the weighted percentage of BRFSS 2005–2007 respondents with an identified usual source of care for rural and urban locations. The yearly trend for these percentages is plotted in Figure 5, which highlights several interesting changes to the percentage of respondents with a usual source of care before and after the implementation of the 2010 ACA healthcare reform. The BRFSS 2005–2017 results have been separated into two categories (BRFSS 2005–2009 and BRFSS 2011–2017) to focus on the year-to-year changes in Figure 5. The first set of data covers 5 years of the pre-ACA 2005–2009 period. The second set of data covers 7 years of the post-ACA 2011–2017 period.

Figure 5.

Weighted Percentage of Respondents With a Usual Source of Care, BRFSS 2005-2017



Note. Behavioral Risk Factor Surveillance System 2005–2017.

The pre-ACA results for 2005–2009 rural and urban data can be characterized as two nearly horizontal, slightly bowed lines; the rural lines are consistently 3 or 4 percentage points higher than the urban lines during the pre-ACA period. The 2011–2017 post-ACA data also exhibit a distinct shift from pre-ACA values. However, the changes observed for percentages obtained for respondents with a usual source of care are entirely different from the changes that were displayed after passage of the ACA in Figures 3 and 4. In Figure 5, there are only small differences between the percentages displayed for rural and urban results for every year in the 2011–2017 period. Both post-ACA lines are almost the same with rural and urban data points that seldom vary by over 1 percentage point. The post-ACA rural and urban data appear as red and blue horizontal lines that are almost on top of each other, with both lines located about 10 percentage points below the rural pre-ACA lines. Between 2005 and 2009, yearly changes in the percentage of those who had a usual source of care did not appear to be significant, but there is a

slightly higher level for rural than for urban values. However, in 2011, the percentage for both rural and urban usual sources of care plummeted from a nearly constant value in 2011 and stayed at a nearly constant level throughout the entire 2011–2017 period.

The 2005–2009 pre-ACA results in Figure 5 show the average percentage of respondents with a usual source of care each year between 2005–2009 and can be used to calculate an average percentage of 82.1% ± 0.97% for the rural sample and 78.6% ± 0.92% for the urban sample. The percentages for rural respondents with a usual source of care are 3.5% higher than the percentages for the urban respondents in the pre-ACA BRFSS surveys. Figure 5 shows that about 82% of the rural population of Georgia had a usual source of care during the 2005–2009 pre-ACA period. This percentage was 3.5% higher than for the urban respondents.

The post-ACA plots in Figure 5 resemble the pre-ACA plots, showing only small variations from a nearly constant percentage following a large change from the values observed before passage of the ACA. Calculations of the mean and standard deviations of the weighted percentage of respondents with a usual source of care for the post-ACA of BFRSS 2011–2017 show the post-ACA data was 72.1% ± 1.25% for the rural sample and 72.7% ± 1.16% for the urban samples. The mean values (72.1% and 72.7%) had standard deviations of 1.25% and 1.16%, respectively, and the difference between the two values is only 0.6%. Note that the percentage of having a usual source of care for rural locations had decreased from an average rural value of 82.1% in pre-ACA times to a nearly constant level with an average value of 72.1% within the year after the ACA began taking effect. The significant decrease of about 10% below pre-ACA percentages for rural locations and a decrease of over 5% below pre-ACA percentages for urban locations appear to be permanent changes in the number of respondents with a usual source of care for both rural and urban areas throughout the entire 2011–2017 post-ACA period.

Table 14 is the Pearson's χ^2 contingency table showing the number of individual responses (yes or no) for pre-ACA 2005–2009 observations versus post-ACA 2011–2017 observations based on the BRFSS survey question asking whether the respondents had a usual source of care. The study's third research question asks, "Is there a statistically significant relationship between having a usual source of care and location or between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia?" The contingency table output includes chi-square and a *p* value ($\chi^{2\,=}$ 2300 and $p = .000$) for this research question.

Table 14

Results of Pearson's χ^2 Test for Respondents Having a Usual Source of Care

Individual responses	2005–2009 observations	2011–2017 observations	2010 data (not used)	Total number
No	8,552	33,947	1,267	35,241
Yes	50,481	114,234	9,316	123,550
Total	59,033	148,208	10,583	158,791

Note. Pearson's $\chi^2 = 2.3\text{x}10^3$, *p* value = 0.000. Number of observations from 2005–2017 BRFSS Georgia surveys.

The *p* value is clearly less than .05 so the null hypothesis must be rejected. The alternate hypothesis proves that there is a statistically significant relationship between having a usual source of care and location or between having a usual source of care and passage of the ACA for residents of Georgia that meets (and exceeds) the 95% level of confidence.

Discussion of Results

Trends in the means of the data showed significant fluctuations immediately after implementation for both rural and urban individuals having insurance and those foregoing care before and after the ACA reform. These values returned to pre-ACA values by the end of the

study. However, those with a usual source of care experienced a permanent decrease from pre-ACA values throughout the entire 2011–2017 post-ACA period.

Table 15 shows a synopsis of the major results for healthcare accessibility for both rural and urban Georgia residents before and after the ACA reform law.

Table 15.

Synopsis of BRFSS Results for Healthcare Accessibility for Rural and Urban Residents of Georgia

BRFSS Results	Pre-ACA percentages			Post-ACA percentages			Post-ACA Final result
Years	First p (%) 2005	Last p (%) 2009	Pre-ACA p (%) 2005–2009	First p (%) 2011	After-ACA Shift* (%)	Last p (%) 2017	2011–2017
Percentage of responders with insurance							
Rural	81.3%	79.7%	79.6%±1.67%	69.3%	-10.3%	80.5%	Pre-ACA value
Urban	84.1%	81.5%	84.1%±1.72%	77.0%	-7.1%	82.8%	Pre-ACA value
Percentage of responders foregoing care							
Rural	20.1%	19.2%	19.0%±1.45%	26.9%	+7.9%	18.9%	Pre-ACA value
Urban	15.0%	17.7%	15.2%±1.48%	20.1%	+4.9%	16.3%	Pre-ACA value
Percentage of responders with a usual source of care							
Rural	83.2%	82.9%	82.1%±0.97%	72.6%	-9.5%	72.6%	72.1%±1.25%
Urban	77.5%	77.6%	78.6%±0.92%	73.2%	-5.4%	72.4%	72.7%±1.16%

Note. Each "after-ACA shift" is the difference between 2011 percentage and the average 2005–2009 pre-ACA value.

For rural respondents with insurance, values averaged 79.6% ± 1.67% during the 2005–2009 pre-ACA time interval; those values dropped 10.3% immediately after the ACA was implemented and returned to a pre-ACA value of 80.5% in 2017. The average pre-ACA values for urban respondents were 84.1% ± 1.72%, followed by a 7.1% drop from pre-ACA values in 2011 with a gradual return to a pre-ACA value of 82.8% by 2017.

The pre-ACA average percentages of rural respondents who had to forego care because of cost average pre-ACA values of 19.0% ± 1.45%, followed by an increase of 7.9% in 2011

with a gradual return to a pre-ACA value of 18.9% in 2017. Urban pre-ACA values of 15.2% ± 1.48% were followed by a 4.9% increase in 2011 and a gradual drop back to pre-ACA values after 2015.

The analysis also showed that the pre-ACA percentages for rural and urban respondents with a usual source of care significantly decreased to an apparently permanent change in post-ACA values. For rural locations, the pre-ACA surveys resulted in a nearly constant percentage for those who had a usual source of care (82.1% ± 0.97%) and decreased by 9.5% to become what appears to be a new level with nearly constant percentages (72.1% ± 1.25%) throughout the entire 2011–2017 post-ACA period. For urban locations, average pre-ACA values (78.6% ± 0.92%) dropped by 5.4% to a new post-ACA value of 72.7% ± 1.16%. It should also be noted that after implementation of the ACA only a 0.6% difference (within the sample standard deviations for each parameter) was observed between average post-ACA percentages for both urban and rural respondents with a usual source of care.

Using the heath belief model as a guide, some possibilities for this significant permanent change could include several possibilities. The decision of Georgia's government not to expand Medicaid may have impacted whether individuals had access to a usual provider. Medicaid recipients may have found that their usual provider did not accept Medicaid because of low provider reimbursement rates. A fee bump mandated by the ACA for 2013 and 2014 increased Medicaid primary care services reimbursement rates in-line with Medicare rates (Kaiser Family Foundation [KFF], 2021). However, 2-year increase should not have had an influence on the results. Places that generally served as safety nets for those needing care may have exhausted their resources. Those taking advantage of marketplace platforms may have lost their provider due to lack of coverage from their insurance, which could also lead to increases in emergency

room visits. Others with marketplace insurance may have been burdened with out-of-pocket expenses or higher premiums than their previous providers. Demographic characteristics such as age, income, and employment or gender may play a role in decisions for having insurance, foregoing care due to cost, or having a usual source of care.

The results are discussed further in Chapter 5.

Chapter 5: Discussion

Overview

The ACA was a watershed reformation in health care for the nation and has been associated with the reform that instituted guidelines for better healthcare accessibility and affordability for U.S. citizens. The ACA was the most monumental and comprehensive health care reform since the amendment of the Social Security Act in 1965, which established Medicare and Medicaid. This study examined (a) whether having insurance is associated with location and/or passage of the ACA (proxied by year), (b) whether foregoing care due to cost is associated with location and/or passage of the ACA (proxied by year), and (c) whether having a usual source of care is associated with location and/or passage of the ACA (proxied by year).

Data and Methods

This study relied on data available from the CDC BRFSS. The BRFSS data were used to assess specific trends in health-related risk behaviors and preventive services for Georgians before and after the implementation of the ACA. Rural status was coded as a dichotomous variable using the BRFSS MSA data. The data analyzed were pre-ACA years (2005–2009) and post-ACA years (2011–2017) using Stata 14.0 statistical software (Stata Corp, 2015). The data were pooled, and multivariate logistic regression models were built for three dependent variables: (a) having health insurance, (b) foregoing care due to cost, and (c) having a usual source of care.

Analysis and Implications of the Results

Health Insurance

The first question asked if there is a statistically significant relationship between having health insurance and location or between having health insurance and/or passage of the ACA

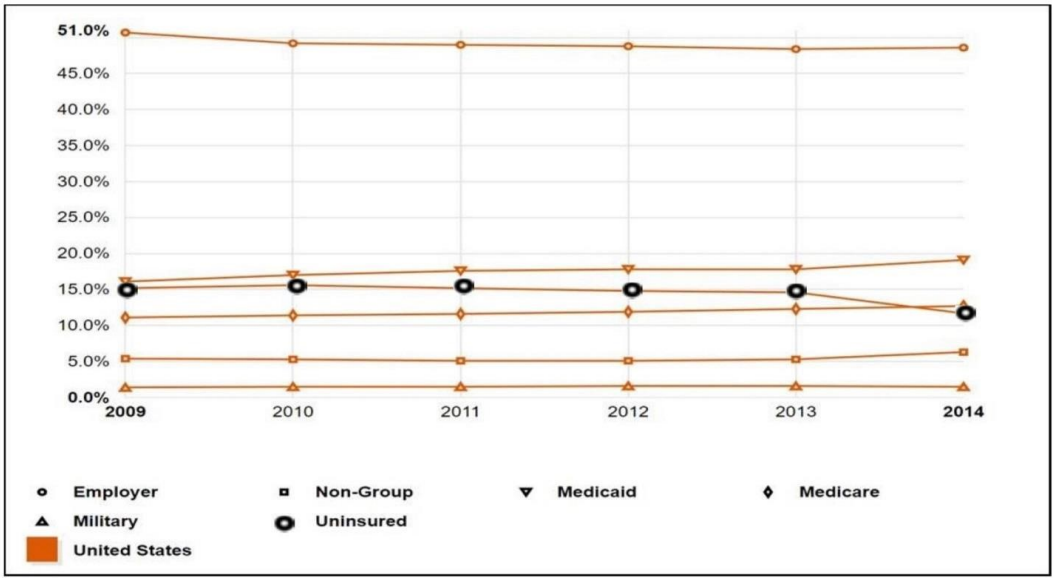
(proxied by year) for residents of Georgia. With respect to the effects of rurality for Georgia respondents, the results indicated that insured rural and urban Georgians experienced similar responses to the passage of the ACA. For both cases, the initial percentage differences grew smaller each year, with the numbers moving closer to their pre-ACA mean values until 5 years after ACA passage when the percentages returned to and remained at their pre-ACA levels. For rural respondents with insurance, an average value of 79.6% ± 1.67% was observed during the 2005–2009 pre-ACA time interval; that value dropped 10.3% immediately after the ACA was implemented, returned to a pre-ACA value of 78.4% in 2015, and remained within one standard deviation from the pre-ACA mean for the rest of the survey period. The average pre-ACA value for urban respondents was 84.1% ± 1.72%, followed by a 7.1% drop from the pre-ACA value in 2011 with a gradual return to pre-ACA values by 2015.

The similarities in rural and urban areas showed that there was a dip in percentages for those insured in both areas after implementation of the ACA. The shift could imply that individuals who had insurance pre-ACA found that after the ACA reform their employer-sponsored insurance plan was dropped due to the employer's noncompliance with ACA standards. Another implication for noninsurance after the ACA reform, suggested by Manchikanti et al. (2017), is that those individuals enrolled in marketplace insurance may have experienced out-of-pocket costs for preventive care with the additional burden of existing high-deductible premiums. A similar increase in the percentages for rural and urban respondents after 2014, according to Wherry and Miller (2016), may have resulted in increased insurance coverage due to the expanded Medicaid option or changing economic conditions. Georgia Medicaid enrollment increased by 13% in June 2014 (KFF, 2021).

As a comparison of the Georgia results for insured individuals, Figure 6 shows a nationwide trend graph for health insurance coverage versus those uninsured for the total population from 2009–2014 (pre-ACA to post-ACA). These data are based on an analysis by the Census Bureau's American Community Survey, cited by the KFF (2021). The American Community Survey limited the type of insurance coverage into one category even though individuals may fall into more than one type of coverage. This type of general survey question was also a limitation for this study using the data provided by the BRFSS. For respondents who were uninsured, the average value was 14.5% ± 1.30% (Figure 6). From 2009 to 2014, percentages for the uninsured dropped from 15.2% (2009) to 11.7% (2014). Even though there were no significant improvements (fewer uninsured) in the Georgia results, the nationwide results did show a small improvement in 2014. The "ACA required that all states implement new simplified eligibility and enrollment processes to promote increased enrollment who were Medicaid eligible" (KFF, 2021).

Figure 6.

Health Insurance Coverage of the United States, 2009–2014



Note. Kaiser Family Foundation (2021).

Foregoing Care Due to Cost

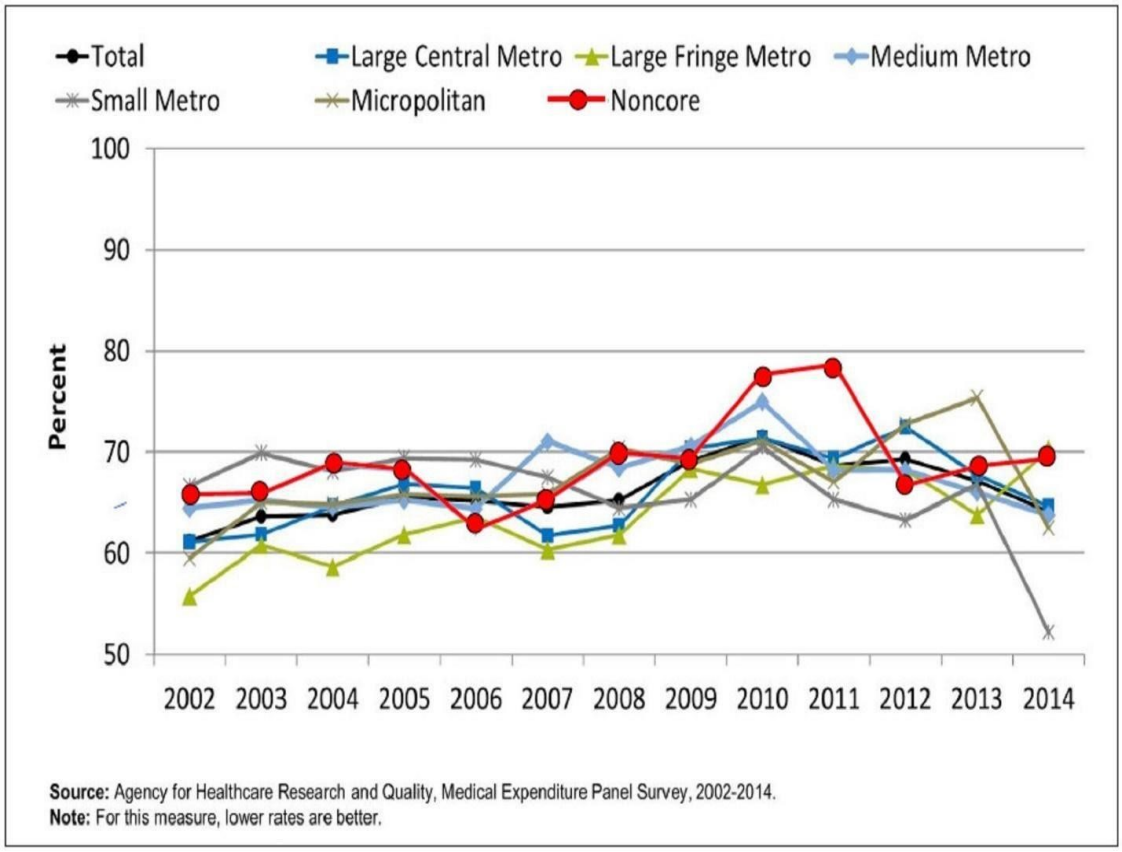
The second question asks if there is a statistically significant relationship between foregoing care due to cost and location and/or between foregoing care and passage of the ACA (proxied by year). The pre-ACA average percentages of rural respondents who had to forego care because of cost had an average pre-ACA value of 19.0% ± 1.45%, followed by an increase of 7.9% in 2011 and a gradual return to pre-ACA values after 2014. An urban pre-ACA value of 15.2% ± 1.48% was followed by a 4.9% increase in 2011 and a gradual drop back to pre-ACA values after 2014. Individuals choosing not to seek medical care due to cost could be explained through behavioral theory. For example, some uninsured individuals may engage in avoidance behavior or delaying care until their health worsens or they may fear that unforeseen costs for the insured could be higher due to an accident. Low health insurance literacy levels, according to Kim et al. (2013), may lead to delays seeking care or avoiding care due to cost. Medical costs could be higher for certain diseases or illnesses or for perceived severity (one of the constructs of the health belief model) as observed by LaMorte (2019). "Nearly 20% of adults in worse health delayed or did not receive medical are due to cost barriers, while 9% of adults in better health reported the same" (KFF, 2021).

The National Healthcare Quality and Disparities Report (Agency for Healthcare Research and Quality, 2021) presented data before and after the ACA for 2002–2014. This survey regarding delaying care for financial or insurance reasons included areas specific to rural locations as noncore. For both nationwide and the state of Georgia, there was little change in foregoing care until an increase occurred around 2011, leveling back down to pre-ACA levels thereafter. However, nationwide total percentages reached pre-ACA values in 2012, whereas in the Georgia results for both rural and urban locations did not return to pre-ACA until 2015

(Figure 7). The nationwide trend for noncore areas was about 65% in 2002, with small annual changes thereafter until the percentages rapidly increased in 2010, reaching 79% in 2011 and then returning to pre-ACA levels near 65% in 2012 and thereafter. This pattern suggests that rural Georgia locations required an additional 3 years (2012, 2013, and 2014) to return to pre-ACA percentages.

Figure 7.

Delays or Difficulty Getting Needed Care for Financial or Insurance Reasons, 2002–2014



Note. Agency for Healthcare Research and Quality (2017).

A Usual Source of Care

The third research question asks if there is a statistically significant relationship between having a usual source of care and location and/or between having a usual source of care and passage of the ACA (proxied by year) for residents of Georgia. The results for having a usual

source of care proved to be noteworthy. This analysis showed that the pre-ACA percentages for rural and urban respondents with a usual source of care significantly decreased to a permanent change in post-ACA values. For rural locations, the pre-ACA surveys revealed a nearly constant percentage for those who had a usual source of care (82.1% ± 0.97%), and it decreased significantly by 9.5% in 2011. This appears to be a new level with nearly constant percentages (72.1% ± 1.25%) throughout the entire 2011–2017 post-ACA period. For urban locations, average pre-ACA values (78.6% ± 0.92%) dropped by 5.4% in 2011, with an average value of 72.7% ± 1.16% for the rest of the survey period. The significant drop in a usual source of care for rural locations was almost double the percentage drop for urban locations. The drop in having a source of care could be due to a trend in out-of-network physicians due to their plan under the ACA. In addition, this significant drop for those in rural areas could be due to environmental factors such as economic strain, provider shortage, or lack of insurance. Nelson (2016) described the Georgia rural landscape as one in which residents continue to struggle with low percentages of provider care. Nelson also described these areas as poverty stricken with transportation barriers to visit medical facilities, which are sparse. Others may find that their insurance does not cover certain services and may find themselves visiting emergency rooms for nonemergency reasons, which in turn leads to a lack of continuity in care.

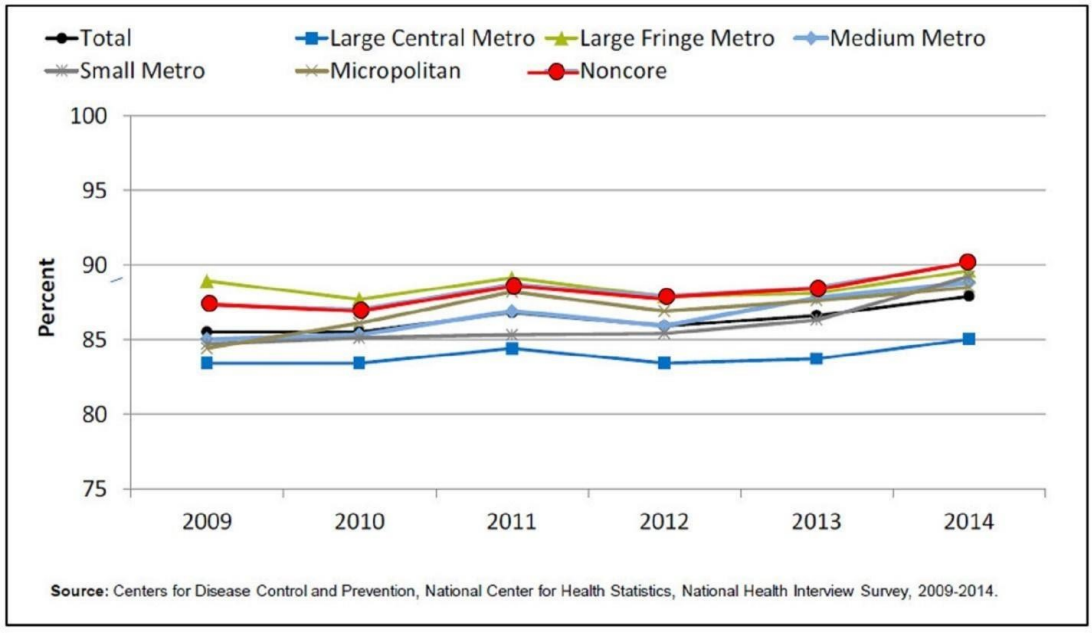
In contrast to the rural and urban findings for Georgia, a study looked at those who had a specific source of care (Agency for Healthcare Research and Quality, 2021). Figure 8 shows the percentage of people with a specific source of care for rural and urban areas. The percentages increased over the course of 6 years. The 4% increase from about 86% in 2010 to 90% in 2014 for rural (noncore) locations could have resulted from Medicaid expansion or changing economic patterns across the nation. The slight increase observed for all the urban locations may be due to

Medicaid-enrollment increases across the nation. Since the ACA's subsidies took effect in 2014, uninsured rates for nonelderly individuals with incomes between 138% and 400% of the poverty line have drastically decreased. From 2009–2014, the percentage of people with a specific source of ongoing care slightly improved for people in all locations, even though the increase was not statistically significant (Agency for Healthcare Research and Quality, 2021). This improvement proved to be an interesting contrast with the national-level findings for rural locations in Georgia. This small nationwide increase could have resulted from Medicaid enrollment, from enrollment in private insurance for those with preexisting conditions, or due to health-seeking behavior changes such as choosing to have a usual source of care instead of visiting the emergency room. Regardless of whether states opted for the expansion, the ACA reformed the enrollment process and required all states to implement new simplified eligibility and enrollment processes.

In a study using data from the Medical Expenditure Panel Survey from 2011–2016, rates of coverage problems in expansion versus non-expansion states and in subgroups of states were influenced by increasing subsidies (Figure 8). Compared to non-expansion states, among low-income adults ages 19 to 64 in Medicaid expansion states the disruptions in health insurance coverage decreased by 4.3 percentage points following expansion. Men, people of color, and people without chronic illnesses experienced the largest improvements in continuity of coverage (Goldman & Sommers, 2020).

Figure 8.

Specific Source of Care, 2009-2014



Note. Agency for Healthcare Research and Quality (2021).

Literature Support and Implications

The results for having insurance, foregoing care due to cost, and having a usual source of care do not reflect well on the ACA healthcare reform in rural and urban locations in Georgia. A few studies have found access to care at the population level has improved and other studies have found the ACA has not fulfilled its promise. Manchikanti et al. (2017) suggested that even though millions of Americans gained insurance because of the ACA reformation, almost six million lost their insurance. In large part, this was due to new regulations under the ACA that eliminated noncompliant insurance policies. In addition, those who did opt for marketplace coverage were surprised with high-deductible health plans, leaving many individuals with inadequate insurance coverage, resulting in the inability to receive the necessary medical care or keep their current usual source of care.

However, Obama (2016) noted the 2015 Medicaid expansion year showed improvements because of the ACA reform. In contrast to the findings of this study, positive effects were seen by individuals having a personal physician (an increase of 3.5%), a substantial decrease for those who were unable to afford care (5.5% decrease), and a 3.4% decrease for those who reported poor health (Manchikanti et al., 2017). The reform has remained in question due to the coverage and the cost of health insurance. A public opinion polling administered by the *Journal of the American Medical Association* presented reasons for replacing or repairing the ACA (as cited by Manchikanti et al., 2017). The polling showed that the ACA was viewed positively by 24% of Americans whereas 27% viewed it as a debacle (individuals who were aided by the reform while disregarding those who qualified and enrolled in the marketplace insurance but were then faced with higher premiums and deductibles). The "affordable" part of the Affordable Care Act seems like "promises that were misleading under the law for those who have continued to experience high deductibles and burdening out-of-pocket costs" (Goodnough et al., 2021). In 2014, the Commonwealth Fund, which promotes health care issues and universal health care for the common good, ranked the U.S. as "the worst of the industrialized nations in terms of efficiency, equity, and outcomes, despite being the most expensive health care system in the world" (as cited in Manchikanti et al., 2017).

Nelson (2016) reported that even after the 2010 reform, rural and urban communities continued to see disparities. Nelson's analysis on urban and rural Georgia disparities parallels the findings from this study. In particular, the findings show a disproportionately represented rural Georgia. According to Nelson the ACA did not eliminate disparities for a majority of the two million rural residents. For example, approximately 60% of residents continue to experience issues with the affordability of health insurance. Rural residents' health care was further

compromised by low educational levels, transportation barriers, and demographic conditions. "Forty-four rural counties experience persistent poverty, and shortages in the healthcare workforce across multiple disciplines is endemic" (Nelson, 2016). The place-based differences in the administration of the ACA, as characterized by Nelson, resulted in health disparities in rural Georgia compared to urban Georgia, which lines up with the findings of this study for affordability and accessing care. Even though both rural and urban locations demonstrated changes throughout the survey years, the rural locations were further compromised because of challenges such as poverty, low educational levels, and unemployment.

A 2016 Georgia Opinion Savvy survey conducted by Towery (2017) outlined experiences with personal healthcare. Not only do Towery's results align with the results in this study regarding having insurance, but a lack of a usual source of care is also framed in a negative light. Towery's survey included four categories: (a) lack of a doctor, (b) lack of insurance, (c) transportation/distance problems, and (d) insurance not accepted. The survey results showed that disparities continued to exist with significant increases in every category; for example, for the reported rate of insurance nonacceptance at a healthcare facility rose from 28.2% to 48.7%. Additionally, the survey showed that the rural areas are more disadvantaged with fewer healthcare providers and longer distances than urban areas. The shortage of primary care providers is not adequate to meet demand for health care services in rural communities. Only 10 counties in Georgia have federally funded health centers or rural health centers (Georgia Department of Public Health, 2016b). According to a Government Accountability Office report, "The median travel distance to a hospital increased by about 20 miles between 2012 and 2018 in areas that saw rural hospital closures" (Heath, 2021). Hospital closures could also impact individuals who visit them with nonemergency issues.

In contrast to the findings in this study, Glied et al.'s (2017) looked at nationwide BRFSS and NHIS data from 2013–2014, which showed that accessibility and affordability improved nationwide due to the ACA reform. They found that gaining insurance coverage decreased the probability of not receiving medical care by 20.9% (NHIS data) and 25% (BRFSS data). They also found that gaining insurance coverage increased the probability of having a usual place of care by 47.1% (NHIS data) and 86.5% (BRFSS data). Their findings suggest that the ACA coverage decreased the number of uninsured Americans and improved access to care.

Blumenthal et al. (2015) reviewed ACA implementation and indicators of quality healthcare. In contrast to the findings for accessibility and affordability in this study, Blumenthal et al. reported positive findings in the 2015 *Healthcare Research & Quality Annual Report*. Their findings indicate that historically at-risk groups (young adults, Hispanics, Blacks, and those with low incomes) saw the greatest coverage gains and individuals who were new to the marketplace insurance option were happy with the outcomes of their respective plans. Since 2010, almost three quarters of those insured were able to secure an appointment with a general physician or specialist without extended time-delays, and fewer individuals reported having financial concerns for paying medical bills and financial barriers to obtaining care (Blumenthal et al., 2015).

The Affordable Care Act

The significance of the findings in this study for healthcare in the U.S. is the realization that our healthcare system remains flawed on many levels. This negative relationship with the ACA is supported by earlier findings and findings from this study. It is noteworthy that the results from this study not only showed no long-term change in insurability and affordability but also showed a substantial negative response for those not having a usual source of care. The cost

of healthcare remains the top concern of the uninsured. A 2018 Commonwealth Fund survey found that 67% of adults did not visit the marketplace for information on insurance plans due to the belief that they could not afford it (Collins et al., 2019). Others were dropped from the Medicaid due to eligibility. Others (15%) said they did not believe they needed insurance. The ACA health reform sought to provide Americans another viable option to obtain insurance and more affordable and accessible coverage. Doing so would, in turn, provide more access to medical professionals and improved ability to maintain a regular source of care. However, the resulting effects of coverage on access to health care remain unclear. Some studies have examined the relationship between insurance coverage and access to care as well as comparing rural and urban populations. Others are specific to Medicaid and whether the expansion improved access to care.

The ACA was monumental legislation aimed at providing an option for insurance coverage for those with preexisting conditions. Before this new 2010 reform, these individuals were uninsurable in the private market. However, others did not qualify for the marketplace option, and others who did not believe that obtaining health insurance would benefit their health. The ACA marketplace website was too complex to navigate, or they could not find a plan which suited their healthcare needs. All these factors were unfavorable for making optimal use of the health care system.

Behavioral Theory

The study used elements of the health belief model and the behavioral-ecological framework of healthcare access and navigation. These models were applied to show the individuals' approach to health prevention strategies in determining barriers and benefits for accessing care and navigating the healthcare environment. I used both models to theorize factors

that influence decision-making around healthcare. Factors in both models helped to explain why and how individual made decisions about healthcare coverage, choosing providers, scheduling appointments, and treatment. “Addressing barriers to navigation in vulnerable populations may be essential to reducing health disparities” (Ryvicker, 2018). These two models combine individual characteristics and environmental dimensions, which add another important dimension to the outcomes of this study.

One construct of the health belief model is perceived barriers, such as affordability and transportation, especially in rural areas. Addressing barriers to care is crucial to reducing health disparities, particularly for vulnerable populations in rural communities with lower educational levels and middle-to-lower incomes on issues such as high-deductible insurance premiums and out-of-pocket costs. Transportation barriers exist especially for those in rural areas where medical practice locations are limited. Another construct is perceived susceptibility of acquiring certain illnesses or disease, which can prompt people to engage in certain behaviors to access care—cues to action—to seek medical care and accept evaluation and recommendation of a healthcare provider (LaMorte, 2019).

The health belief model can be combined with other models such as the behavioral ecological framework of healthcare access and navigation (Ryvicker, 2018) regarding how social environment may influence the process of healthcare navigation and the ability of individuals to effectively use them. This model suggests that the social environment could balance the relationship between potential access and realized access to care by enabling or hindering the complex process of navigation. Ryvicker (2018) found that navigation is a factor in areas of healthcare services and may influence the individual and environmental factors of decision making. For example, neighborhood social cohesion is associated with the likelihood that

individuals would visit a primary care physician while accounting for demographic and socioeconomic conditions. Even though the reasons for this remain unclear, Ryvicker suggested that the social cohesion may enable the use of public transportation and facilitate the exchange of information leading to beliefs on health behaviors and knowledge of healthcare services.

Navigation may be viewed as a barrier or a benefit to navigating health insurance providers and plans. For example, a person's ability to understand the various plans offered by the marketplace could make choosing the appropriate insurance policy difficult. Perceived threats and benefits could also signal actions based on demographics. For example, older adults may seek care more often than younger patients. "The percentage of the population aged 65 and older is projected to reach 22 percent by 2050" (Statista, 2021).

Limitations and Delimitations of the Study

The limitations of the data selection for this study were varied. I found that accessing secondary data was difficult and time consuming because there was no control in how the data was manipulated. Some sources were hesitant to share data content. Either they did not respond to requests or offered access to their data at an unreasonable price. The details for how the data was collected or known biases may be missing. In the case of this study, the chosen data from the BRFSS offered only three survey modules involving health care access. Data sets were fixed, and survey questions may need further evaluation to find the best fit for analysis. The BRFSS does not track health insurance and does not include information on the type of coverage. The survey question is only a general one asked during the survey.

The literature review turned up a lack of consensus on the accessibility and affordability of healthcare, and the studies were conducted with a range of approaches. Synthesizing the vast

literature on access to healthcare coverage was time consuming. Research-related articles on rural areas were more limited than those for other geographical areas.

The delimitations of the study brought several items to mind. At the time I began gathering data for my analyses, the latest data published by the BRFSS was 2017. Since that time, the BRFSS has been updated and changes have occurred since 2017. Congress passed the American Rescue Plan of 2021, which was a critical piece of legislation for economic recovery in the wake of the COVID-19 crisis. Direct stimulus payments and unemployment assistance due to the COVID-19 public health crisis were part of the relief effort (U. S. Department of Health & Human Services, 2021) The American Rescue Plan also made major improvements in access to and affordability of health care coverage through the ACA by lowering premiums for those who were enrolled in the Marketplace beginning in April 2021 (CMS, 2021).

The objectives in this study may have been too broad for a topic in health care. The scope of the study could have focused on more specific topic such as primary care providers. Studying healthcare accessibility and affordability is complex, and the concept may not be robust enough to explain these complex issues. The State of Georgia was the only state considered for this study. A state that had opted to take part in the Medicaid expansion of 2014 could have been considered for comparison with this study. It has been suggested that if Georgia opted for the Medicaid eligibility expansion, “the level of met need in the state will increase considerably from 67% to 80% by 2025” (Gentili et al., 2016).

Recommendations for Further Study

There are several suggestions for continuing discussions and research in health care accessibility. Further studies could address and recommend patient-centered behavioral changes in phone surveys compared to physical one-on-one surveys in rural and urban areas and changes

in a different location as opposed to one area and one state. For example, it would be informative to look at a comparison of rural areas in two different states: one state which chose not to expand Medicaid, and another which did opt to expand Medicaid.

Using a similar platform as was conducted in this study, a researcher could analyze the most recent data found on healthcare accessibility and affordability. Other studies could look at the impact of health insurance affected by job loss due to COVID-19.

The Coronavirus – Covid-19

Even though this study's data was compiled years before the COVID-19 pandemic, the pandemic has become the major topic of discussion worldwide. It has intertwined itself into healthcare systems in which people continue to struggle, as outlined in this study.

COVID-19 first surfaced in December 2019, with the first case identified in the U.S. in January 2020. Since that time, the U.S. has seen overwhelming job loss. In the first quarter of 2020, employment decreased around 13% (roughly 20 million people jobless), leaving many Americans without employer-sponsored insurance in addition to the almost 31 million who were already uninsured (Blumenthal and Abrams, 2020). Additionally, out of concern over contracting the virus, many people went without medical care they might otherwise have received. General practitioner offices had reductions of approximately 60% in visits during the first several months of the pandemic, and it was estimated that hospital losses would reach an estimated $33 billion during 2020 (Blumenthal & Abrams, 2020).

These are just some examples of the toll COVID-19 had on the American people. This pandemic is unlikely to be the last one. Preparedness at the state and local levels in areas such as testing and contract tracing are good first steps in combating this pandemic, especially for

vulnerable and marginalized communities. State coordination driven by federal regulations could help to contain the next pandemic.

An area that could be explored is telehealth platforms for healthcare professionals that allow them to participate without borders and allowing cross-state interactions. Further testing and additional research are needed to examine how other relevant outcomes have been associated with the ACA. For example, studies of improvements in health status due to telemedicine platforms (remote health). Also, further studies analyzing how the preexisting conditions' policy due to the ACA improved patients' accessibility to obtain medical insurance and prescription drug benefits and any resulting barriers.

Summary

The research questions analyzed in this study were important to discussing the historic ACA health care reform legislation and to raising discussions for legislation that affected millions of Americans. This dissertation examined three areas of health care access: (a) having insurance, (b) foregoing care due to cost, and (c) having a usual source of care.

This study has important implications for health care accessibility and affordability. Previous literature was explored to form unbiased views and findings for accessibility and affordability for Georgia residents before and after the ACA reform. The disparities between rural and urban health care were cited as examples of cultural differences, individual, and environmental factors that influence decision-making in the role of healthcare.

The healthcare system is complicated and challenging. The ACA has helped millions and saved lives for the previously uninsured, those with lower-incomes, and those with preexisting conditions, among others. However, the goals of the ACA for accessible and equitable health care for all citizens may never be accomplished, as evidenced by continuing inequities in the

provisions of the marketplace insurance addressing such issues as having insurance, foregoing care due to cost, and having a usual source of care. Discussions in all these areas of health care delivery are essential for continuing debates for addressing health disparities including ensuring equitable rates of medical services and providing greater access to health insurance coverage.

References

Ackerman, M., Filart, R., Burgess, L., Lee, I., & Poropatich, R. (2010). Developing next generation telehealth tools and technologies: Patients, systems, and data perspectives. *Telemedicine Journal and E-Health, 16*(1), 93–95. https://doi.org/10.1089/tmj.2009.0153

Adepoju, O. E., Preston, M. A., & Gonzales, G. (2015). Health care disparities in the post-Affordable Care Act era. *American Journal of Public Health, 105* (Suppl 5), S665–S667. https://doi.org/10.2105/AJPH.2015.302611

Agency for Healthcare Research and Quality. (2017). *National healthcare quality and disparities report.* https://www.ahrq.gov/research/findings/nhqrdr/nhqdr17/index.html

Agency for Healthcare Research and Quality. (2021). *National healthcare quality and disparities report*. https://www.ahrq.gov/research/findings/nhqrdr/nhqdr21/index.html

Antonisse, L., Garfield, R., Rudowitz, R., & Artiga, S. (2017). *The effects of Medicaid expansion under the ACA: Updated findings from a literature review* [Issue brief]. Kaiser Family Foundation. http://resource.nlm.nih.gov/101707525

Banach, M. (2011). *CTSPEDIA*. https://www.ctspedia.org/do/view/CTSpedia/STATA

Bethea, T. N., Lopez, R. P., Cozier, Y. C., White, L. F., & McClean, M. D. (2012). The relationship between rural status, individual characteristics, and self-rated health in the Behavioral Risk Factor Surveillance System. *The Journal of Rural Health, 28*(4), 327–338. https://doi.org/10.1111/j.1748-0361.2012.00414.x

Blewett, L., Ward, A., & Beebe, T. (2006). How much health insurance is enough? Revisiting the concept of underinsurance. *Medical Care Research and Review*, *63*(6), 663–700. https://doi.org/10.1177/1077558706293634

Blumenthal, D., & Abrams, M. K. (2020). The Affordable Care Act at 10 years: What's changed in health care delivery and payment? *The Commonwealth Fund*. https://commonwealthfund.org/publications/journal-article/2020/feb-aca-at-10-years-changed-health-care-delivery-payment

Blumenthal, D., Abrams, M. K., & Nuzum, R. (2015). The Affordable Care Act at 5 years. *New England Journal of Medicine*, *372,* 2451–2458. https://doi.org/10.1056/nejmhpr1503614

Brewer, R., Goble, G., & Guy, P. (2011). A peach of a telehealth program: Georgia connects rural communities to better healthcare. *Perspectives in Health Information Management, 8*, 1c. https://perspectives.ahima.org/a-peach-of-a-telehealth-program-georgia-connects-rural-communities-to-better-healthcare/

Catherman, C. (2019). *Study: Georgia uninsured, lack of health care access, rank state 42nd nationwide.* Georgia Public Broadcasting. www.gpbnews.org/post/studygeorgias-uninsured-lack-health-acces-rank-sate-42nd-nationwide

Centers for Disease Control and Prevention. (2017). *Behavioral risk factor surveillance system survey questionnaire*. [2005–2017]. https://www.cdc.gov/brfss/questionnaires/index.htm

Centers for Disease Control and Prevention. (2018, September 2018). *LLCP 2017 codebook report.* https://www.cdc.gov/brfss/annual_data/2017/pdf/codebook17_llcp-508.pdf

Centers for Medicare & Medicaid Services. (2018). *Behavioral risk factor surveillance system (BRFSS)*. https://www.cms.gov/About-CMS/Agency-Information/OMH/resource-center/hcps-and-researchers/data-tools/sgm-clearinghouse/brfss#:~:text=The%20BRFSS%20is%20an%20ongoing,and%20use%20of%20preventive%20services.

Centers for Medicare & Medicaid Services. (2021, March 12). *American Rescue Plan and the Marketplace* [Fact sheet]. https://www.cms.gov/newsroom/fact-sheets/american-rescue-

plan-and-marketplace

Coburn, A., Lundblad, J., MacKinney, A., McBride, T., Mueller, K., & Watson, S. (2014, April). *The Patient Protection and Affordable Care Act of 2010: Impacts on rural people, places, and providers: A second look.* Rural Policy Research Institute. https://www.rupri.org/?library=the-patient-protection-and-affordable-care-act-of-2010-impacts-on-rural-people-places-and-providers-a second-look-April-2014

Collins, S., Bhupal, H., & Doty, M. (2019, February 7). *Health insurance coverage eight years after the ACA: Fewer uninsured Americans and shorter coverage gaps, but more underinsured* [Issue brief]. Commonwealth Fund. https://doi.org/10.26099/penv-q932

Diddana, T. Z., Kelkay, G. N., Dola, A. N., & Sadore, A. A. (2018). Effect of nutrition education based on health belief model on nutritional knowledge and dietary practice of pregnant women in Dessie town, Northeast Ethiopia: A cluster randomized control trial. *Journal of Nutrition and Metabolism, 2018*, a6731815. https://doi.org/ 10.1155/218/6731815

Enroll America. (2016). *Changing uninsured rates by county from 2013–2015*. https://www.enrollamerica.org/research-maps/maps/changes-in-uninsured-rates-by-county

Fertig, A. R., Bachtel, D., Okundaye, M., & Dahal, A. (2009). *Exposing persistently poor health in Georgia*. https://hdl.handle.net/10724/19006

French, M., Homer, J., Gulcin, G., & Hickling, L. (2016). Key provisions of the Patient Protection and Affordable Care Act (ACA): A systematic review and presentation of early research findings. *Health Services Research*, *51*(5), 1735–1771. https://doi.org/1111/1475-6773-12511

Gentili, M., Harati, P., & Serban. (2016). Projecting the impact of the Affordable Care Act provisions on accessibility and availability of primary care providers for the adult population in Georgia. American Journal of Public Health, *106*(8), 1470-1476. Retrieved https://doi:10.2105/AJPH.2016.303222

Georgia Department of Community Health. (2007). *2007 annual report*. https://dch.georgia.gov/document/publication/fy07-annual-report/download

Georgia Department of Public Health. (2016a). *A report of the Georgia state health assessment*. https://www.dph.georgia.gov/georgia-state-health-assessment

Georgia Department of Public Health. (2016b). *State of Georgia state health assessment*. https://www.dph.georgia.gov/document/document/Georgia-state-health-assessment/download/

Glied, S., Ma, S., & Borja, A. (2017). *Effect of the Affordable Care Act on health care access* [Issue brief], The Commonwealth Fund. https://www.commonwealthfund.org/publications/issue-briefs/2017/may/effect-affordable-care-act-health-care-access

Goldman, A. L., & Sommers, B. D. (2020). Among low-income adults enrolled in Medicaid, churning decreased after the Affordable Care Act. *Health Affairs 39*(1), 85–93. https://doi.org/10.1377/hlthaff.2019.00378

Goodnough, A., Abelson, R., Sanger-Katz, M., & Kliff, S. (2021). Obamacare turns 10. Here's a look at what works and doesn't. *The New York Times*. https://www.nytimes.com/2020/03/23/health/obamacare-aca-coverage-cost-history.html

Gwynn, K., Winter, M., & Cabral, H. (2016) Racial disparities in patient activation: Evaluating the mediating role of health literacy with path analyses. *Patient Education and Counseling, 99*(6), 2033–1037. https://doi.org/10.1016/j.pec.2015.12.020

Healthcare.gov website rollout. (2022). In *Balletpedia*. Ballotpedia.org/Healthcare.gov_website_rollout

Health Resources and Services Administration, U.S. Department of Health & Human Services. (2011). *Office of Rural Health Policy 2010 annual profile*. https://www.hrsa.gov/sites/default/files/ruralhealth/pdf/Annual%20Report/annualreport2010.pdf

Health Resources and Services Administration, U.S. Department of Health, and Human Services. (2015). *Fiscal year 2015. Justification of estimates for appropriations committees.* https://www.hrsa.gov/sites/default/files/about/budget/budgetjustification2015.pdf

Heath, S. (2021). Rural hospital closures a hit to patient care access, outcomes. *Patient Engagement Hit*. https://patientengagementhit.com/news/rural-hospital-closures-at-hit-to-patient-care-access-outcomes#:~:text=January%2026%2C%202021%20%2D%20In%20areas,Accountability%20Office%20(GAO)%20report

Kaiser Commission on Medicaid and the Uninsured. (2014). *The Georgia health care landscape*. kff.org/health-reform/factsheet/the-georgia-health-care-landscape/

Kaiser Family Foundation. (2021). *Medicaid to Medicare fee index*. https://www.kff.org/medicaid/state-indicator/medicaid-to-medicare-fee-index/

Kielb, E., Rhyan, C., & Lee, J. (2017). Comparing health care financial burden with an alternative measure of unaffordability. *Inquiry: A Journal of Medical Care Organization, Provision and Financing.* 2017 Jan 1*; 54*(1-7*).* https://doi.org/10.1177/0046958017732960

Kim, J., Braun, B., & Williams, A. D. (2013). Understanding health insurance literacy: A

literature review. *Family and Consumer Sciences Research Journal, 42*, 3–13. https://https://doi.org/ 0.1111/fcsr.12034

Kominski, G., Nonzee, N., & Sorensen, A. (2017). The Affordable Care Act's impacts on access to insurance and health care for low-income populations. *Annual Review of Public Health, 38*, 489–505. https://doi.org/10.1146/annurev-publhealth-031816-044555

Kueppers, C. (2019, December 10). Georgia ranks among the worst states in the nation in terms of healthiness. *The Atlanta-Journal Constitution*. ajc.com/news/health-med-fit-science//how-health-are-georgians-here-jhow-the-state-ranks-nationally/j6yyBgefN9TZnhDaxllvz/M

Kullgren, J., Mclaughlin, C., Mitra, N., & Armstrong, K. (2012). Nonfinancial barriers and access to care for U.S. adults. *Health Services Research, 47*(1Pt2), 462–485. https://doi.org/10.1111/j.1475-6773.2011.01308.x

LaMorte, W. (2019). *The health belief model.* Boston University's School of Public Health. https://sphweb.bumc.bu.edu/otlt/mph-modules/sb/behavioralchangetheories/behavioralchangetheories2.html

Lindrooth, R. C., Perraillon, M. C., Hardy, R. Y., & Tung, G. J. (2018). Understanding the relationship between Medicaid expansions and hospital closures. *Health Affairs, 37*(1), 111–120. https://doi.org/10.1377/hlthaff.2017.0976

Loehrke, J. (2016, December 20). Split decision: Americans assess Obama's legacy. *USA Today*. https://www.usatoday.com/story/news/politics/2016/12/20/suffolk-poll-americans-assess-obama-legacy/95646610/

Luquis, R., & Kensinger, W. (2019). Applying the health belief model to assess prevention services among young adults. *International Journal of Health Promotion and Education*,

57(1), 37–47. doi.org/10.1080/14635240.2018.154995

Manchikanti, L., Helm II, S., Benyamin, R., & Hirsch, J. (2017). A critical analysis of Obamacare: Affordable care or insurance for many and coverage for few? *Pain Physician, Health Policy Review, 20*, 111–138. https://doi.org/10.36076/ppj.2017.138

Minyard, K., Parker, C., & Butts, J. (2016). Improving rural access to care: Recommendations for Georgia's health care safety net. *Journal of Georgia Public Health Association, 5*(4). a14. https://doi.org/10.21663/jgpha.5.412

Miller, A. (2020, March 22). Rural hospitals: A new crisis on top of the old one. *Georgia Health News.* http://www.georgiahealthnews.com/2020/03/rural-hospitals-crisis-top/

National Rural Health Association. (2019). *About rural health care.* www.ruralhealthweb.org/about-nrha/about-rural-health-care

Nelson, G. (2016). The two Georgias: Disparities in rural health and healthcare. *Journal of Georgia Public Health Association, 5*(4), 294–296. https://doi.org/10.21663/jgpha.5.401

Newkirk, V., & Damico, A. (2014, May). *The Affordable Care Act and insurance coverage in rural areas* [Issue brief]. The Kaiser Family Foundation. https://www.kff.org/uninsured/issue-brief/the-affordable-care-act-and-insurance-coverage-in-rural-areas/

North Carolina Rural Health Research Program. *Rural Health Snapshot*. (2017). Retrieved from shepscenter.unc.edu/wp-content/uploads/dim_uploads/2017/05/snapshot2017.pdf

Obama, B. (2016). United States health care reform: Progress to date and next steps. *Journal of the American Medical Association*, *316*(5), 525–532. https://doi.org/10.1001/jama.2016.9797

Paasche-Orlow, M. (2011). Caring for patients with limited health literacy; a 76-year-old man with multiple medical problems. *JAMA, 306*(10), 1122-9.

https://doi.org/10.1001/jama.2011.1203

Rural Health Information Hub. (2019a). *Finding statistics and data related to rural health: Selecting rural data in American factfinder*. https://www.ruralhealthinfo.org/topics/statistics-and-data

Rural Health Information Hub. (2019b). *The health belief model–Rural health promotion and disease prevention toolkit*. https://www.ruralhealthinfo.org/toolkits/health-promotion/2/theories-and-models/helath-belief

Ryvicker, M. (2018). A conceptual framework for examining healthcare access and navigation: A behavioral-ecological perspective. *Social Theory and Health, 16*(3), 224–240. https://doi.org/10.1057/s41285-017-0053-2

Serakos, M., & Wolfe, B. (2016). The ACA: Impacts on health, access, and employment. *Forum for Health Economics & Policy*, *19*(2), 201–259. doi.org/10.15.15/fhep-2015-0027

Shartzer, A., Long, S. K., & Anderson, N. (2016). Access to care and affordability have improved following Affordable Care Act implementation; problems remain. *Health Affairs, 35*(1), 161–168. https://doi.org/10.1377/hlthaff.2015.0755

Singer, A., Thode, H. Jr., & Pines, J. (2019). U.S. emergency department visits and hospital discharges among uninsured patients before and after implementation of the Affordable Care Act. *Journal of the American Medical Association, 2*(4)1–8, e192662. https://doi.org/10.1001/jamanetworkopen.2019.2662

Sommers, B. D., Gourevitch, R., Maylone, B., Blendon, R. J., & Epstein, A. M. (2016). Insurance churning rates for low-income adults under health reform: Lower than expected but still harmful for many. *Health Affairs*, *35*(10), 1816–1824. https://doi.org/10.1377/hlthaff.2016.0455

Sommers, B. D., McMurtry, C. L., Blendon, R., Benson, J. M., & Sayde, J. M. (2017). Beyond health insurance, remaining disparities in U.S. health care in the post-ACA era. *The Milbank Quarterly, 95*(1). 43–69. doi.org/10.1111/1468-0009-12245

Stata Corp LLC. (2015). Stata (Version 14) [Computer software]. https://www.stata.com/stata14/

Statista. (2021). U.S. – seniors as a percentage of the population 1950-2050. *Statista Research Department*. https://www.statista.com/statistics/457822/share-of-old-age-population-in-the-total-us-population/#:~:text=U.S.%20%2D%20seniors%20as%20a%20percentage%20of%20the%20population%201950%2D2050&text=In%202019%2C%20about%2016.5%20percent,population%20was%2065%20or%20over

Towery, M. (2017). *HealthVoices: Rural Health and Healthcare: 2016 Georgia Survey Results*. https://www.healthcaregeorgia.org/healthvoices/

U.S. Census Bureau. (2017). *Annual social and economic supplement.* https://www2.census.gov/programs-surveys/cps/techdocs/cpsmar17.pdf

U.S. Census Bureau. (2022). *American community survey, summary file*. census.gov/programs-surveys/acs/data/summary-file.html

U.S. Department of Health and Human Services. (2021, March 12). *Fact sheet: The American Rescue Plan: Reduces health care costs, expands access to insurance coverage and addresses health care disparities* [Press release]. hhs.gov/about/news/2021/03/12/fact-sheet-american-rescue-plan-reduces-health-care-costs-expands-access-insurance-coverage.html

Warshaw, R. (2017). Health disparities affect millions in rural U.S. communities. *AAMCNews.* https://www.aamc.org/news-insights/health-disparities-affect-millions-rural-us-

communities

Wherry, L. R., & Miller, S. (2016). Early coverage, access, utilization, and health effects associated with the Affordable Care Act Medicaid expansions: A quasi-experimental study. *Annals of Internal Medicine, 164*(12), 795–803. https://doi.org/10.7326/M15-2234.

Appendix A: Question 1

Interview Protocol for BRFSS Survey Participants—Health Insurance

Question 1 Interview Protocol for BRFSS Survey Participants—Health Insurance

Label: Have any health care coverage
Section Name: Health Care Access
Core Section Number: 3
Question Number: 1
Column: 97
Type of Variable: Num
SAS Variable Name: HLTHPLN1
Question Prologue:
Question: Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?

Value	Value Label	Frequency	Percentage	Weighted Percentage
1	Yes	412,502	91.66	87.49
2	No	35,743	7.94	12.01
7	Don't know/Not Sure	1,073	0.24	0.34
9	Refused	697	0.15	0.15
BLANK	Not asked or Missing	1	.	.

Note. Adapted from the Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System (2018).

This question correlates with Research Question 1. For this protocol, the BRFSS question asked was, 'Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare, or Indian Health Service?' Responses to this question were dichotomized as 'yes' for having any kind of insurance and 'no' for not having any kind of insurance.

Appendix B: Question 2

Interview Protocol for BRFSS Survey Participants—Foregoing Care Due to Cost

Question 2 Interview Protocol for BRFSS Survey Participants—Foregoing Care Due to Cost

Label: Could Not See Doctor Because of Cost
Section Name: Health Care Access
Core Section Number: 3
Question Number: 3
Column: 99
Type of Variable: Num
SAS Variable Name: MEDCOST
Question Prologue:
Question: Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?

Value	Value Label	Frequency	Percentage	Weighted Percentage
1	Yes	47,528	10.56	13.46
2	No	401,190	89.15	86.27
7	Don't know/Not sure	1,001	0.22	0.22
9	Refused	296	0.07	0.06
BLANK	Not asked or Missing	1	.	.

Note. Adapted from the Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System (2018).

The question correlates with Research Question 2. For this protocol, the BRFSS question asked was, 'Was there a time in the past 12 months when you needed to see a doctor but could not because of cost?' Responses to this question were dichotomized as 'yes' for seeing a doctor and 'no' for not seeing a doctor.

Appendix C: Question 3

Interview Protocol for BRFSS Survey Participants—Usual Source of Care

Question 3 Interview Protocol for BRFSS Survey Participants—Usual Source of Care

Label: Multiple Health Care Professionals
Section Name: Health Care Access
Core Section Number: 3
Question Number: 2
Column: 98
Type of Variable: Num
SAS Variable Name: PERSDOC2
Question Prologue:
Question: Do you have one person you think of as your personal doctor or health care provider? (If ´No´ ask ´Is there more than one or is there no person who you think of as your personal doctor or health care provider?´.)

Value	Value Label	Frequency	Percentage	Weighted Percentage
1	Yes, only one	340,807	75.73	70.11
2	More than one	34,083	7.57	7.06
3	No	73,313	16.29	22.34
7	Don't know/Not Sure	1,212	0.27	0.34
9	Refused	598	0.13	0.15
BLANK	Not asked or Missing	3	.	.

Note. Adapted from the Centers for Disease Control and Prevention, Behavioral Risk Factor Surveillance System (2018)

This question correlates with Research Question 3. For this protocol, the BRFSS question asked was, 'Do you have one person you think of as your personal doctor or health care provider?' (If 'No' ask 'Is there more than one or is there no person who you think of as your personal doctor or health care provider?') Responses were dichotomized as 'yes' as identifying one or more providers and 'no' otherwise. Because only 7–10% of respondents identified with more than one usual source of care, this percentage was combined with those who identified with having one usual source of care. Therefore, this variable is calculated as 'person(s) identified.'

Appendix D: IRB Protocol Exemption Report

IRB Protocol Exemption Report

Institutional Review Board (IRB)
For the Protection of Human Research Participants

PROTOCOL EXEMPTION REPORT

Protocol Number: 03866-2020 **Responsible Researcher:** Celia Grams

Supervising Faculty: Dr. Bonnie Peterson

Project Title: *Do rural Georgians experience disparities in access to care? An assessment of the impact of the Patient Protection and Affordable Care Act for individuals in Georgia.*

INSTITUTIONAL REVIEW BOARD DETERMINATION:

This research protocol is **Exempt** from Institutional Review Board (IRB) oversight under Exemption **Category 4**. Your research study may begin immediately. If the nature of the research project changes such that exemption criteria may no longer apply, please consult with the IRB Administrator (irb@valdosta.edu) before continuing your research.

ADDITIONAL COMMENTS:

- *Upon completion of this research study all data (email correspondence, survey data, participant lists, pseudonym lists, etc.) must be securely maintained (locked file cabinet, password protected computer, etc.) and accessible only by the researcher for a minimum of 3 years.*

☒ ***If this box is checked, please submit any documents you revise to the IRB Administrator at irb@valdosta.edu to ensure an updated record of your exemption.***

Elizabeth Ann Olphie *02.26.2020*
Elizabeth Ann Olphie, IRB Administrator

Thank you for submitting an IRB application.
Please direct questions to irb@valdosta.edu or 229-253-2947.

Revised: 06.02.16