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ACA Medicaid Expansion Improves Access to Primary Care, Regardless of Race/Ethnicity

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An abstract of
A thesis submitted to the Faculty of the
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Abstract

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By Katherine A. Singh

The Affordable Care Act (ACA) of 2010 expanded Medicaid eligibility for low-income adults; yet, several states have chosen not to expand their Medicaid programs. Though research has been done on the effect of ACA Medicaid expansion on access to primary care, these studies were limited in their ability to specifically attribute their results to Medicaid expansion rather than other contemporaneous policy changes. In addition, none has looked specifically at how race/ethnicity may moderate the effects of ACA Medicaid expansion. The purpose of this study is to examine how Medicaid expansion under the ACA has affected access to primary care (measured by the likelihood of having a usual source of care and the likelihood of delaying care due to cost), and if race/ethnicity moderates that relationship. Survey data from the Behavior Risk Factor Surveillance System (BRFSS) for the years 2011-2015 and logistic regression models were used to test for effects on rates of having a usual source of care and delaying care following Medicaid expansion for a precisely targeted population in a difference-in-difference framework. In secondary models, a triple-difference interaction term measured the moderating effect of race/ethnicity in this relationship. Individuals in ACA Medicaid expansion states were 5.9 percentage points more likely to have a usual source of care and 3.6 percentage points less likely to delay care due to cost post-expansion. There were no statistically significant differences in access to primary care post-expansion by race/ethnicity. The findings of this study support the importance of Medicaid expansion as a step that can help improve access to primary care for low-income individuals, regardless of race/ethnicity. They also suggest that policies that decrease Medicaid coverage, such as ACA repeal or Medicaid block grants, may significantly reduce low-income individuals' ability to access primary care.

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Chapter 1: Introduction

Primary care is seen by many to be a fundamental part of any health system.[1] It promotes health through the provision of preventive care, chronic condition management, and care coordination.[2–4] Whether a person has access to primary care is often determined by whether they have health insurance.[5] This is especially true for low-income individuals, for whom Medicaid is a common source of insurance.[6] The Affordable Care Act (ACA) of 2010 aimed to improve access to care for uninsured and underinsured individuals in several ways, including expanding Medicaid eligibility for low-income adults.[7] However, the 2012 Supreme Court decision NFIB v. Sebelius left Medicaid expansion optional. Nineteen states have chosen not to expand their Medicaid programs, leaving 3 million individuals who would have been otherwise eligible for expanded Medicaid uninsured.[8] These people are mostly poor, minority, childless adults living in the southern United States—they are also sicker and costlier, and particularly likely to benefit from improved access to primary care.[7,9]

This expansion is among the largest in history.[10] There is much to learn about its effects. This study uses nationally representative data to answer the question of how ACA Medicaid expansion has affected access to primary care. It is among the first to use a precise strategy for isolating the specific effects of Medicaid expansion—as distinct from the effects of other contemporaneous policy changes—by limiting its study population to childless adults over age 25 who are making less than 100% of Federal Poverty Level (FPL). It also is the first to use this strategy to examine how race/ethnicity may moderate the effects of ACA Medicaid expansion on access to primary care. It uses a difference-in-difference analytic framework within logistic regression models to compare access to primary care in expansion and non-expansion states

before and after expansion went into effect. A triple-difference interaction term measures the moderating effect of race/ethnicity on access to primary care.

The results of this study have the potential to inform state policy stakeholders concerned with how to improve access to care for low-income populations. The future of the ACA and its Medicaid expansion remain uncertain. Even if the provisions supporting Medicaid expansion are not repealed outright, a reduction in outreach efforts or structural changes to Medicaid financing, like block grants or per-capita caps, could limit the number of people able to enroll in expanded Medicaid.[11] If access to insurance is restricted through these sorts of policy changes, it is important to understand how access to primary care may be affected. The results of this study can help determine the extent to which Medicaid expansion is sufficient to overcome barriers to accessing care, understand how Medicaid expansion affects racial and ethnic disparities in primary care access, and inform future policy discussions about the gaps in access that remain.

Chapter 2: Background and Literature Review

2A: Access to Primary Care—Measurement and Effects of Insurance

Measuring Access to Primary Care

Primary care is widely acknowledged to be the "backbone of a rational health care system."[1] Definitions of the services and practitioners that constitute "primary care" vary, but broadly speaking, a well-functioning primary care system can be seen as a practice environment that is characterized by four main features. First, the primary care system is accessible, meaning that patients can easily obtain an appointment and see their primary care provider as their first point of contact for each new medical need. Second, primary care is continuous, offering long-term person-focused care (not disease-focused care). Primary care is also comprehensive, able to cover most health needs, and coordinated, organizing care when it must be sought elsewhere.[12]

This paper will focus on the first two aspects of primary care: accessibility and continuity. Access to care is defined by the Institute of Medicine to be "the timely use of personal health services to achieve the best possible health outcomes."[13] One indicator of primary care access that is often used in health services research is whether a patient has a Usual Source Of Care (USOC).[14–16] A USOC captures two characteristics of primary care. Having a usual provider that a patient considers their "regular doctor" suggests that a patient 1) knows how to access care, and 2) has enough of a relationship with their provider to suggest continuity of care. A USOC has been shown to be positively associated with other measures of access to primary care, such as regular check-ups.[17]

A USOC is also associated with improved health outcomes, promoting improved health and health care use outcomes through three main pathways. First, patients with USOC have better receipt of preventive services, such as cancer screenings.[2,18–21] Second, having a USOC is associated with better management of chronic conditions, like hypertension.[3,22,23] Lastly, individuals with a USOC often have a stronger doctor-patient relationship based on continuous care. This stronger relationship with a usual provider has been found to be associated with healthier behaviors overall.[4]

Another indicator of access to care that is frequently used in health services research is whether a person has delayed needed medical care due to cost.[24–27] Though measures like having a USOC indirectly capture whether care is affordable for an individual, delaying care due to cost is a direct measure of whether a person has experienced a financial barrier to obtaining needed medical care.[28] Delaying care due to cost has been used as a measure of access in several prominent articles on the subject.[29–31]

Delaying needed care is associated with negative health outcomes. People who report greater financial barriers to accessing care are more likely to delay care they need, creating an unmet need for medical care during the time that care is delayed.[32,33] One study found that people who reported forgoing medical care due to cost were significantly less likely to report excellent or very good health, and had significantly lower quality of life scores.[34] Having an unmet need for medical care is also associated with negative health outcomes, including higher rates of avoidable hospitalizations and increased mortality.[35–37]

Insurance Coverage and Access to Primary Care

Health insurance improves access to care. It does this both by lowering out-of-pocket costs for individuals—often covering many primary care services with little or no out-of-pocket cost for patients—and by connecting patients to a network of care providers.[38] Reduced out-of-pocket costs are especially important in low-income populations, who may not be able to afford medical care without insurance.[39–41] The positive effects of health insurance can be seen in both USOC and delaying care due to cost; studies have indicated that people with insurance, including both high-income individuals with private insurance and low-income individuals on Medicaid, have higher rates of having a USOC, and lower rates of delaying needed medical care.[19,37,42]

2B: The Affordable Care Act and Medicaid Expansions

Medicaid and the Affordable Care Act

Medicaid is the most common health insurance provider for low-income populations.[6] This is because low-income populations have higher unemployment rates than the general population, and low-income jobs are generally less likely to provide individuals with employer-sponsored health insurance coverage.[43,44] Prior to the passage of the Affordable Care Act (ACA) in 2010, Medicaid eligibility requirements varied widely by state, particularly among adults, for

whom Medicaid eligibility would vary with income thresholds and also with parental status.[45] However, under the ACA, the federal government offered enhanced matching funds if states raised their Medicaid eligibility thresholds to include all adults with household incomes less than 138% of FPL. The aim was to provide public insurance to those who were at a high risk of being uninsured. Among participating states, most Medicaid expansions went into effect in 2014; however, 19 states have refused to participate, mostly in the South and Midwest.[46]

Many other contemporaneous policy changes went into effect that could also affect access to care as part of the ACA.[47] These include expanding dependent coverage to include young adults up to age 26, and subsidizing the purchase of health insurance through the ACA marketplace (in expansion states, the purchase of health insurance was subsidized for those with an income above 138% FPL; in non-expansion states it was subsidized for those with an income above 100% FPL).[48]

Systematic Differences Exist Between Expansion and Non-Expansion States

States that chose to expand Medicaid have some notable systematic differences from those that chose not to participate. For example, expansion states generally tend to be more affluent than non-expansion states.[49] They had more generous safety-net policies in place prior to expanding Medicaid, which created a stronger administrative infrastructure to implement policy reform.[50] These differences may also have a political component; most, but not all, of the states that expanded Medicaid have Democratic governors.[51] Most non-expansion states are in the South, and have larger racial/ethnic minority populations.[7] In addition, the low-income adults who make up the Medicaid-eligible population tend to be sicker in non-expansion states than in expansion states—not only are they more likely to be uninsured, they are also more likely to

have had an ED visit in past year, to smoke, to be in poor health, and to have chronic health conditions.[9]

Many of these systematic differences between states can be controlled for at the individual level. In many data sets, individual-level data about demographic, socioeconomic status (SES), and health status characteristics are available and can be included as control variables in regression models. Some measurable state-level variables, such as affluence, can be obtained from other data sets, while other more abstract variables, such as political culture and administrative infrastructure, are harder to measure and control for. These factors are important because they may affect access to care by facilitating or impeding individuals' ability to obtain care after the implementation of Medicaid expansion.

Pre-ACA Medicaid Expansions Have Improved Primary Care Access

Before the ACA, several states expanded eligibility for their Medicaid programs with the goal, in part, of improving primary care access among adults.[31,52,53] An examination of Oregon's Medicaid expansion for nonelderly adults earning 100% FPL or less found higher reported rates of having a USOC, and a 2012 study of pre-ACA Medicaid expansions in Arizona, New York, and Maine found that nonelderly adults had lower rates of delaying needed medical care due to costs compared to adults in neighboring non-expansion states.[31,52] The pre-ACA study whose study population most closely resembled the ACA Medicaid expansion population (childless nonelderly adults earning 100% FPL or less) was a study of Massachusetts' 2006 expansion. Similar to the 2012 study, it also found an increase in rates of people reporting a USOC.[53] However, these studies have been limited to the states that expanded Medicaid before the ACA. That choice itself suggests that these states were more inclined to have generous social safety net policies in place outside of Medicaid, which could mean that the effects of Medicaid expansion

were felt differently—for example, states with more well-supported community health centers may have been better prepared to handle an influx of newly insured Medicaid patients. Nationally representative results that cover multiple regions of the U.S. with different racial and ethnic composition, political cultures, and different regional healthcare market dynamics may differ.

Emerging Data on ACA Expansions Suggests Improved Primary Care Access

Because ACA Medicaid expansions are a recent development, data on the policy's effect are only just beginning to emerge. Broad studies looking at the effects of the ACA overall have found that insurance coverage rates have increased nationally, especially in Medicaid expansion states.[47,54] Since implementation of the ACA began, Medicaid-eligible populations have reported that health care is more affordable, and fewer low-income individuals are delaying medical care due to cost.[29,55] Nationally, young adults have also reported higher rates of having a USOC.[56] Though Medicaid expansion likely played a large role in these changes, in all of these studies it has not been possible to pinpoint which specific aspects of the ACA are most responsible for the observed effects.

Several recent papers have attempted to determine more precisely the specific effects of ACA Medicaid expansion on access to care. Studies examining the effects of Medicaid expansion in "early expander" states that implemented ACA expansion before 2014 have found high enrollment rates and increased rates of health insurance coverage among Medicaid-eligible adults.[57,58] Notable post-ACA studies have evaluated Medicaid expansion, but have not been able to fully attribute results to expansion alone, because their study populations include those who are eligible for other ACA coverage provisions. These include Sommers et al., who compared access outcomes among nonelderly adults, including parents, making up to 138% of FPL in two

expansion states (Arkansas and Kentucky) and one non-expansion state (Texas) pre- and post-Medicaid expansion. In two 2016 papers, they found that adults in expansion states had improved rates of insurance coverage and of having a USOC, and lower rates of delaying care due to cost post-expansion.[59,60] Wherry and Miller (2016) examined the same population using nationally representative data from the National Health Interview Survey (NHIS) and found a similar positive relationship between expansion and having a USOC/not delaying care due to cost.[29]

A 2016 working paper from the National Bureau of Economic Research (NBER) by Simon et al. used BRFSS data to examine changes in having a USOC and delaying access to care among childless adults making 100% FPL before and after Medicaid expansion, and found a modest positive relationship between the two.[30] While Simon et al. use data and methodology similar to ours, their paper focused on how Medicaid expansion has affected a broad set of health behaviors rather than access to care. We also offer an additional examination of potential racial and ethnic disparities in gaining access to primary care after Medicaid expansion.

2C: Race/Ethnicity – A Key Moderator

An unexplored factor that could affect the relationship between ACA Medicaid expansion and access to primary care among low-income individuals is race/ethnicity. Minority race/ethnicity is negatively associated with insurance status and receipt of medical care.[61,62] Even when controlling for health insurance status, racial disparities in access to care often persist.[63] In addition, external factors like residential segregation can lead to fewer providers available in predominantly minority neighborhoods; indeed, research suggests that segregated neighborhoods also have lower rates of primary care utilization.[64,65] Discrimination and distrust may also be

associated with a lack of engagement with the healthcare system, and lead minorities to report less access to care.[66,67]

Nonetheless, Medicaid expansion may be a tool to improve access to care for low-income minorities, who are especially unlikely to have access to private health insurance from an employer.[44] Medicaid expansions prior to the ACA have seen minorities achieve greater gains in coverage than non-Hispanic/Latino whites.[68] Minorities were also overrepresented in groups targeted by ACA coverage provisions, including Medicaid expansion.[69] Research has suggested that the ACA has improved coverage rates for minorities, but, like the aforementioned studies, this research has been unable to attribute coverage gains specifically to Medicaid expansions, rather than another policy change.[70]

However, there is also evidence that barriers remain in minorities' access to primary care after the ACA. Latinos remain less likely than non-Hispanic whites and blacks to sign up for coverage through the ACA.[71] A 2015 study found that Latinos have lower awareness of the law, especially in states that lacked targeted assistance and outreach to foster insurance enrollment.[72] Medicaid expansion also fails to address the many other barriers that may hinder minorities' access to care. Thus, the moderating effect of minority race/ethnicity is unclear—it could strengthen the relationship between Medicaid expansion and access to primary care, because minorities were disproportionately targeted for coverage by the ACA. Alternatively, it could weaken the relationship, because Medicaid expansion may not be enough to overcome the other barriers that prevent minorities from receiving equitable access to care.

2D: Gaps Filled and Policy Implications

Post-ACA studies of Medicaid expansion have suffered from an attribution problem. Because multiple ACA provisions affecting low-income childless adults have gone into effect at

the same time, it is difficult to attribute an outcome to one single policy change. Even Sommers et al. and Wherry and Miller included individuals who could have been eligible for dependent coverage (age 26 and younger) or Marketplace subsidies (income between 100% and 138% FPL) and did not limit their samples by parental status, all of which might lead to further measurement error.[29,59,60] Simon et al.'s 2016 working paper comes closest to being able to attribute its findings specifically to Medicaid expansion because they analyzed a sample of childless adults with family incomes at 100% FPL or less. However, the inclusion of adults aged 18-26 receiving dependent coverage could still have contributed some measurement error. This paper offers a focused, detailed analysis that will explain precisely the effects of ACA Medicaid expansions.

This study uses nationally representative data to examine the effects of the ACA's Medicaid expansions across a broad geographic area and to identify more specifically the effects of the ACA's Medicaid expansions, rather than of a mix of ACA-related provisions. Additionally, it is the first study to specifically limit its sample population to childless adults, over age 25, who are making less than 100% of FPL, a population that would be unlikely to gain insurance coverage through pre-existing Medicaid eligibility rules or another provision of the ACA.[73] This paper is also the first to use this methodology to pinpoint the effects of ACA Medicaid expansion on minority populations, who have long been especially at risk of being uninsured and having limited access to primary care.

Understanding changes in access to primary care among low-income childless adults, especially racial and ethnic minorities, can inform future state policy conversations about the effectiveness of Medicaid expansion and gaps that remain. This information will be especially important as policymakers consider the future of the ACA, and Medicaid as a whole. Understanding how minority populations experience the effects of Medicaid expansion will also

be beneficial to policymakers trying to alleviate racial and ethnic disparities in healthcare access. This can help inform the need for possible future interventions that address issues beyond insurance status that impede access to care among minorities, such as increasing the representation of minorities in the delivery of primary care.

Chapter 3: Methodology

3A: Conceptual Framework

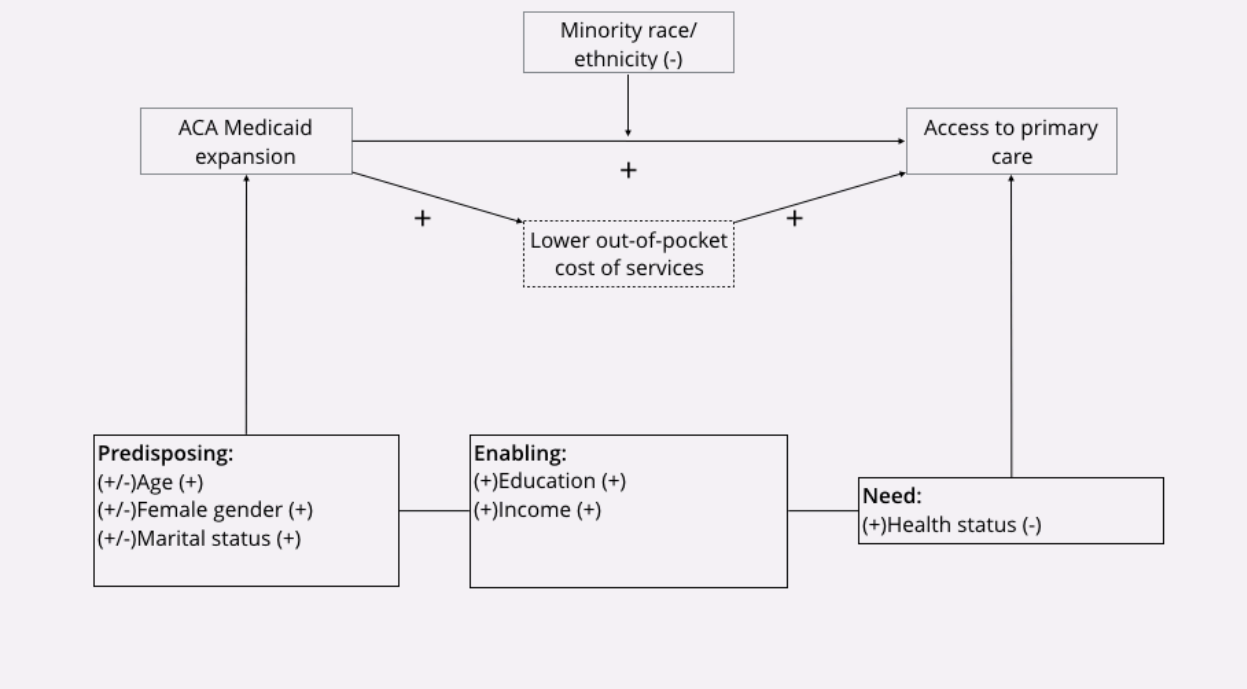


Figure 1: Conceptual Framework

The conceptual model we use to inform our analyses examining the relationship between ACA Medicaid expansions and access to primary care is displayed in Figure 1. The model's foundation is the Andersen Behavioral Model for Health Care Utilization. This paper's outcomes of interest are access to care, and not utilization per se; as such, the Andersen model has been substantially cut back to focus on factors that affect health care access. The model describes predisposing, enabling, or need-based factors that affect health care utilization and access.[74] These occur on both the individual and contextual levels. At the individual level, predisposing factors are characteristics that affect an individual's inclination to use health services, and include demographic characteristics such as marital status, age, and gender. Enabling factors, which may directly help or hinder a person's ability to use health services, include education and

income on the individual level. Need-based factors may be diagnosed or perceived health conditions that necessitate the utilization of care, and include such constructs as health status. On the contextual level, enabling factors include provider supply. Health policy is also a contextual enabling factor; Medicaid expansion fits into the model as a policy intended to enable the utilization of health services. Unmeasured constructs in the model are indicated with dotted lines, and the directions of the hypothesized relationships are informed by economic theory and previous health services research.

Focal Relationship

The focal relationship of the model is the effect of ACA Medicaid expansions, or Medicaid eligibility threshold increases for adults to 138% of FPL, on access to primary care, using USOC and delaying care due to cost as indicators of access.[13] Economic theory contends that gaining health insurance increases the demand for health services, and is therefore associated with increased access to and utilization of medical care.[38] More specifically, Medicaid expansion lowers the out-of-pocket cost of health services for individuals who newly gain coverage. It also connects individuals to a network of providers, though this effect is less pronounced with Medicaid than with private insurance.[38] Numerous studies have suggested that having health insurance leads individuals to consume more health services.[5,39,75–77] Expanding Medicaid provides more people with health insurance coverage, and thus, it is hypothesized that Medicaid expansion will be positively associated with access to primary care.

Confounders to the Focal Relationship

The individual-level characteristics listed below are hypothesized to be confounders of the focal relationship.

Predisposing Characteristics

Demographic characteristics include race/ethnicity, age, gender, and marital status. Older age, female gender, and being married or coupled (versus being single) are associated with higher access to primary care.[19,78,79] The association between these characteristics and state Medicaid expansion status is unknown. The relationship between race/ethnicity and the focal relationship is examined in more detail below.

Enabling Characteristics

Enabling characteristics include education and household income. Higher income and higher educational achievement level are positively associated with access to primary care.[80,81] Medicaid expansion states, on average, have a higher median income than non-expansion states; they are also hypothesized to have higher average levels of educational achievement.[49]

Need Characteristics

Health status is a construct that, as per the World Health Organization's definition, encapsulates an individual's mental, physical, and social well-being.[82] Individuals living in Medicaid expansion states, on average, have higher health status than those in non-expansion states.[9,83,84] Economic theory, supported by empirical data, suggests that health status is negatively associated with utilization of health services.[85]

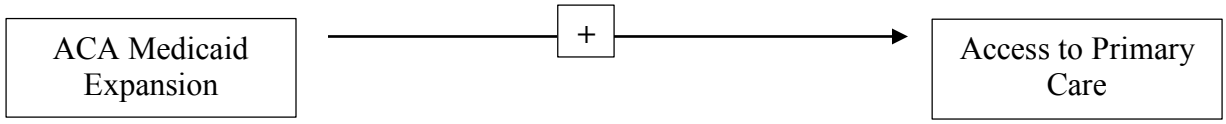
Minority Race/Ethnicity: A Moderator

While the policy of Medicaid expansion is intended to help low-income individuals of all racial groups, there are reasons to believe this policy change may have a differential impact between those of minority race/ethnicity and non-Hispanic whites. Many outreach efforts around the ACA were specifically targeted toward minorities, and there is evidence to suggest that minorities have disproportionately gained health insurance coverage because of the ACA, thus

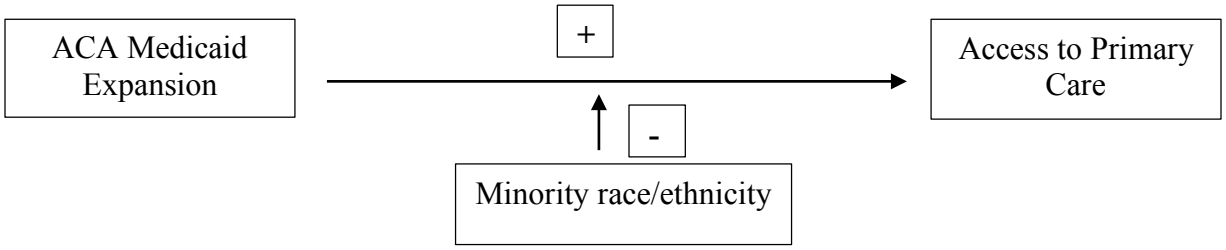
improving access to primary care.[69,70] However, minority race/ethnicity is negatively associated with access to primary care due to a host of socioeconomic and cultural factors.[62,63,86] Recent studies suggest that low-income individuals of minority race/ethnicity, especially Latinos, have less awareness of the ACA and more trouble signing up for coverage.[72] For this reason, the effect of Medicaid expansion may be weaker among minority race/ethnicity groups than among non-Hispanic whites. This effect moderation is represented in the model by the construct of minority race/ethnicity, which is hypothesized to weaken the focal relationship.

3B: Hypotheses

H1: There is a positive causal relationship between Affordable Care Act Medicaid expansion and access to primary care.



H2: The positive relationship between ACA Medicaid expansion and access to primary care is weakened for individuals of minority race/ethnicity.



3C: Data

This analysis used multiple years of data (2011-2015) from the Behavioral Risk Factor Surveillance System (BRFSS).

BRFSS is an annual telephone survey of U.S. adults conducted by state health departments with technical and methodological support from CDC.[87] The sample of households

is randomly selected through the use of random-digit dialing, and has included both cell phones and landlines since 2011. BRFSS is designed to be representative of the civilian, non-institutionalized U.S. adult (age 18+) population. Information regarding U.S. adult residents' demographic information, health-related risk behaviors, chronic health conditions, and use of preventive services is collected using three modules of questions: a core module that is asked in all states every year, a rotating core module that is asked in all states in alternating years, and state-specific modules that are asked at the discretion of each state. Questions regarding access to primary care are part of the core component; thus information is available across all states in each year. Between 2011 and 2015, annual BRFSS sample sizes for completed interviews ranged from 464,664 (2014) to 506,467 (2011), and median response rates for all states and territories ranged from 48.7% (2014) to 53.0% (2011).

Because this study uses secondary data that lacks personally identifiable information, the Emory University Institutional Review Board did not consider this study human subjects research and exempted it from review.

3D: Analytic Sample

The analytic sample is diagrammed in Figure 2. It includes childless adults, aged 25-64, whose income is less than 100% of Federal Poverty Level (FPL). These criteria are intended to identify the sample that would be most likely to be affected by the ACA Medicaid expansion and not affected by other key ACA-related policies. The age criteria limit the sample to those who are unable to gain dependent or Medicare coverage, while the income criteria exclude anyone who would be both eligible for expanded Medicaid and ACA marketplace subsidies (those between 100-138% of FPL). In addition, many states have more generous Medicaid eligibility thresholds for low-income parents; thus, the sample is limited to childless adults to better capture

the effects of ACA Medicaid expansion alone. Observations that were missing values for USOC, delaying care due to cost, or any of the control variables (including those who responded, "don't know") were dropped from the sample.

In most states, ACA Medicaid expansion went into effect on January 1, 2014. However, California and the District of Columbia expanded their Medicaid eligibility thresholds for childless adults up to at least 100% of FPL in 2010 and 2011.[88] In addition, Delaware, Massachusetts, New York, and Vermont already had Medicaid eligibility thresholds of at least 100% FPL prior to 2011. To more clearly capture the results of the ACA expansion, observations from these states are excluded from the analysis.[29,30]

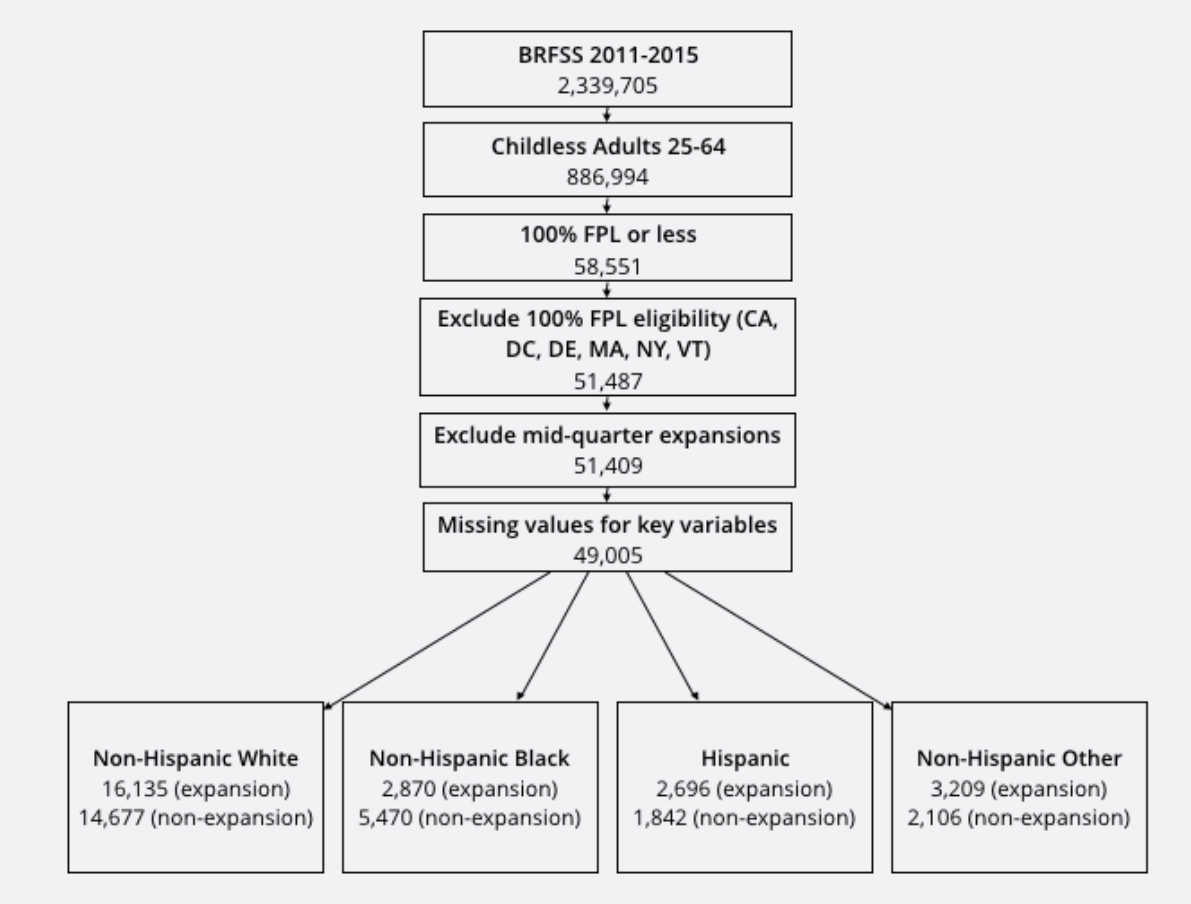


Figure 2: Analytic Sample

3E: Constructs and Measures

Access to Primary Care

The construct of access to primary care is assessed using two dichotomous measures: usual source of care (USOC), and delaying care due to costs. Respondents were asked whether they have one person whom they think of as their personal doctor or health care provider—those who responded "Yes, only one" or "More than one" are coded as having a USOC, while those who responded "No" were coded without a USOC. Respondents were also asked whether they had delayed seeing a doctor in the past year due to cost, which is coded dichotomously as "delaying care" versus not. Those who reported that they had delayed care due to cost are coded

as "0", while those who had not delayed care due to cost are coded as "1." Thus, improvements in access, as measured using both outcome variables, will be positive numerically.

ACA Medicaid Expansion

ACA Medicaid expansion is measured as a dichotomous state-quarter level variable, which is set to "1" if a respondent is in a Medicaid expansion state post-expansion. Because the available BRFSS data includes responses through the end of 2015, treatment states were identified as those that implemented expansion between Q1 2014 and Q4 2015. The post-treatment period is defined as Q1 2014 and following for all expansion states, except for the following states, which implemented their expansions after Q1 2014: Alaska (September 1, 2015, post-expansion defined as Q4 2015), Indiana (February 1, 2015, post-expansion defined as Q2 2015), Michigan (April 1, 2014, post-expansion defined as Q2 2014), New Hampshire (August 1, 2014, post-expansion defined as Q4 2014), and Pennsylvania (January 1, 2015, post-expansion defined as Q1 2015).[30] If a state implemented its expansion in the middle of a calendar quarter, observations from that quarter were dropped and post-expansion was defined as the following quarter.[*]

Predisposing Characteristics

Respondents' race/ethnicity is assessed with three questions. First, they were asked if they consider themselves Hispanic or Latino. Then, they were asked to select the race or races with which they identify. If they selected more than one race, they were asked a follow-up question about the race they feel "best" describes them. The BRFSS contains a computed variable that priority coded those who identified as Hispanic as Hispanic, regardless of other

[*] The following observations were dropped for each state: Alaska, Q3 2015; Indiana, Q1 2015; and New Hampshire, Q3 2014.

races they selected. Using this variable, race/ethnicity is coded as four groups (non-Hispanic white, non-Hispanic black, Hispanic, and non-Hispanic other).

Age is coded as a categorical variable based on respondents' reported age in years, grouped into four categories: age 25-34, age 35-44, age 45-54, and age 55-64. Marital status is coded as two groups based on whether or a person is married/in a couple or not (e.g., widowed, divorced, separated, never married).

Enabling Characteristics

Education is assessed categorically, with respondents classified into four categories based on their educational achievement (did not graduate high school, graduated high school, attended college or technical school, graduated from college or technical school). Household income is also coded categorically, with categories corresponding to those available on the BRFSS survey: $10,000 or less, $10,000 to $14,999, $15,000 to $19,999. Because the sample is limited to childless adults making 100% FPL or less, no observations fell into income categories above $15,000 to $19,999. The midpoint of each income range is used as a proxy for household income in calculations of FPL; this number is divided by household size and compared to annual FPL thresholds to determine what percentage of FPL the respondent made that year.

Need Characteristics

Self-reported health status is categorized as a series of dummies on a 5-point Likert scale ranging from excellent to poor.

Unmeasured Constructs

In the model, the out-of-pocket cost of services were unmeasured.

Table 1: Constructs and their Associated Measures

Construct	**Measure**	**Hypothesized Relationship with Dependent Variable**

Access to Primary Care	**Access to Primary Care** is measured by two dichotomous variables:
	• Usual source of care:
	  ○ Yes
	  ○ No
	• Delaying care in the past year due to cost:
	  ○ Yes
	  ○ No
		Access to primary care is the primary dependent variable.

ACA Medicaid Expansion	**ACA Medicaid expansion** is a dichotomous variable, based on whether the state expanded Medicaid according to ACA guidelines before December 2015.	Medicaid expansion will increase access to primary care.
Race/Ethnicity	**Race/ethnicity** is categorized into 4 racial/ethnic groups: • White, non-Hispanic • Black, non-Hispanic • Hispanic • Other, non-Hispanic	Minority race/ethnicity will be associated with lower access to primary care. (Minority race/ethnicity is hypothesized to weaken the relationship between ACA Medicaid expansion and primary care access.)
Age	**Age in years**. Respondents' age in years is coded into 4 categories: • Age 25-34 • Age 35-44 • Age 45-54 • Age 55-64	Access to primary care will increase as age increases.
Gender	**Sex** is categorized as • Male • Female	Women will report higher access to primary care than men.

Marital Status	**Marital status.** Respondents were categorized into two groups based on their relationship status: • Married/Member of an unmarried couple • Not married/Living with partner (widowed, divorced, separated, never married)	Individuals in a couple relationship will report higher access to primary care.
Education Status	**Education status** is categorized as: • Did not graduate high school • Graduated high school • Attended college or technical school • Graduated college or technical school	Access to primary care will increase as education increases.
Income	**Household income.** Respondents' income is categorized as: • $10,000 or less • $10,000- $14,999 • $15,000-$19,999	Access to primary care will increase as income increases.
Health Status	**Health status** is measured using self-reported health, with the following categories: • Excellent • Very good • Good • Fair • Poor	Access to primary care will increase as health status decreases.

3F: Data Analysis

The analysis consists of two parts. The first, which tests H1, uses a difference-in-differences approach with logistic regression to compare the likelihood of having a USOC and delaying care due to cost in expansion and non-expansion states before and after Medicaid expansion was enacted.

Model 1

$$USOC/Delayed\ Care\ (0/1)_{ist} = \lambda(\beta_0 + \beta_1\ Expansion_{st} + \beta_2 X_{ist} + \beta_3\ State_s + \beta_4\ Time_t) + \varepsilon_{ist}$$

In the above model λ represents the logistic cumulative distribution function. The variable ($Expansion_{st}$) represents the interaction between the state's expansion status and time (pre- or post-expansion) of the observation; its coefficient β_1 is the parameter of interest. The variable X_{ist} represents all control variables for the individual i in a state s in a given month t. $State_s$ and $Time_t$ represent state and month fixed effects. ε represents the regression error term.

Model 2

$$USOC/Delayed\ Care\ (0/1)_{ist} = \lambda(\gamma_0 + \gamma_1(Expansion_{st}) + \gamma_2(Expansion_{st} * Race/Ethnicity_{st}) + \gamma_3 Race/Ethnicity_{ist} + \gamma_4 X_{ist} + \gamma_5 State_s + \gamma_6 Time_t) + \omega_{ist}$$

The second model builds upon the first to test H2. This model introduces an interaction term into the logistic regression, creating a triple-differences approach to test whether minority race/ethnicity moderates the relationship between ACA Medicaid expansion and access to primary care. The term ($Expansion_{st} * Race/Ethnicity_{st}$) represents the triple interaction between the state's expansion status, time (pre- or post-expansion) of the observation, and the respondent's race/ethnicity; its coefficient γ_2 describes the moderating effect of minority race/ethnicity and is an additional parameter of interest for Model 2.

All analyses were performed in Stata Version 14, and incorporated BRFSS sampling weights to correct for unequal selection probability, noncoverage bias, and nonresponse bias in the BRFSS data. Standard errors are computed using BRFSS survey weights, which account for clustering by state; we also bootstrapped standard errors to confirm that inferences are valid.

Chapter 4: Results

4A: Descriptive Statistics

Table 2 describes key characteristics of the analytic sample. The full sample size is 49,005. Of this sample, 24,095 were living in non-expansion states, and 24,910 were living in expansion states.

Table 2: Characteristics of the Analytic Sample

Characteristic	Non-Expansion States	Expansion States	Total	P-value, Pearson chi-square
Total sample size	24,095	24,910	49,005	
Sex				0.0157
Male	51%	53%	52%	
Female	49%	47%	48%	
Age Group				0.1775
Age 25 to 34	16%	18%	18%	
Age 35 to 44	16%	16%	16%	
Age 45 to 54	34%	33%	33%	
Age 55 to 64	34%	33%	33%	
Race/Ethnicity				<0.0001
White only, non-Hispanic	49%	58%	53%	
Black only, non-Hispanic	26%	19%	23%	
Hispanic	19%	14%	17%	
Other, non-Hispanic (including Multiracial)	6%	9%	7%	
Education Status				<0.0001
Did not graduate high school	39%	32%	35%	
Graduated high school	33%	35%	34%	
Attended college or technical school	21%	23%	22%	

Graduated from college or technical school	7%	9%	9%	
Self-Rated Health Status				<0.0001
Excellent	8%	8%	8%	
Very Good	12%	14%	13%	
Good	27%	29%	28%	
Fair	29%	29%	29%	
Poor	23%	20%	22%	
Usual Source of Care				<0.0001
Yes	62%	69%	66%	
No	38%	31%	34%	
Delayed Care in Past Year Due to Cost				
Yes	45%	37%	41%	<0.0001
No	55%	63%	59%	

P-values calculated using Pearson Chi-Square test

Expansion and non-expansion states exhibited significant differences across several key characteristics including sex, age group, race/ethnicity, education status, and self-rated health status (calculated using Pearson chi-square tests). Expansion states had a higher proportion of males than non-expansion states; they also had a slightly younger age distribution. Differences in the sex distribution were statistically significant at the 5% level. Expansion states were also whiter, more educated, and in better health. Non-expansion states had higher proportions of black and Hispanic individuals, more people who did not graduate high school, more who ranked their health status as "Poor," more people who lacked a USOC, and more who delayed care in the past year due to cost. Differences in the distributions of race/ethnicity, education status, health status, USOC, and delaying care were all significant at the 0.01% level.

4B: Descriptive Results

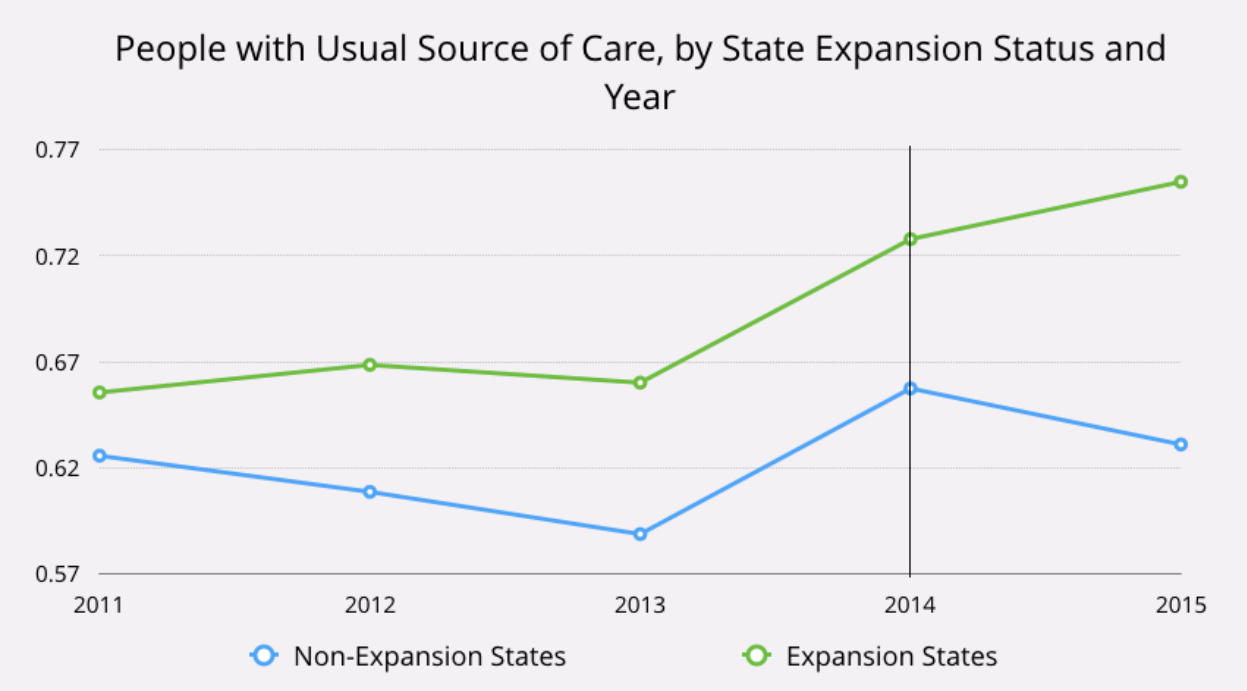


Figure 3: Changes in Percentage of People with a Usual Source of Care, by State Expansion Status and Year

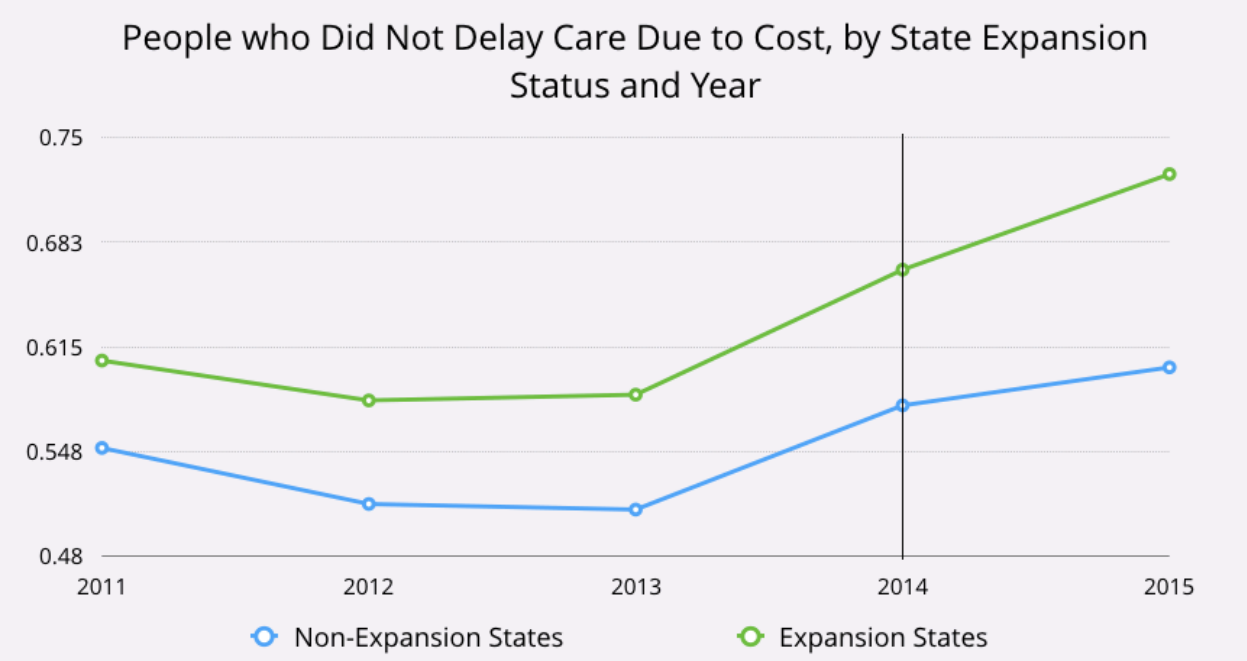


Figure 4: Changes in Percentage of People who Did Not Delay Care Due to Cost, by State Expansion Status and Year

Figures 3 and 4 show the gap between the number of individuals in the sample who had a usual source of care and who did not delay care due to cost in expansion and non-expansion states over time. The vertical line at 2014 indicates where the majority of ACA Medicaid expansions went into effect. Both figures display parallel trends in primary care access prior to 2014, and there is a significant gap between expansion and non-expansion states. After the 2014 Medicaid expansions went into effect, the gap between expansion and non-expansion states appears to widen, suggesting that expansion states did indeed see greater gains in primary care access for low-income childless adults.

4C: Results of Model 1

Table 3: Difference-in-Difference Estimates for Impact of Medicaid Expansion on Access to Primary Care for Low-Income Non-Elderly Childless Adults

	USOC Marginal effects, p-values in parentheses	**Did Not Delay Care Due to Cost** Marginal effects, p-values in parentheses
Main Effect		
Expansion	0.063 (0.000)***	0.036 (0.044)*
Age Group		
Age 25 to 34	Ref	Ref
Age 35 to 44	0.111 (0.000)***	-0.011 (0.533)
Age 45 to 54	0.182 (0.000)***	0.008 (0.564)
Age 55 to 64	0.265 (0.000)***	0.111 (0.000)***
Education Status		
Did Not Graduate High School	Ref	Ref
Graduated High School	0.051 (0.000)***	-0.003 (0.785)
Attended College or Technical School	0.060 (0.000)***	-0.045 (0.000)***
Graduated from College or Technical School	0.063 (0.000)***	-0.023(0.134)
Marital Status		
Married/Member of an unmarried	Ref	Ref

couple		
Not married/Not living with partner	0.011 (0.346)	-0.027 (0.029)*
Self-Rated Health Status		
Excellent	Ref	Ref
Very Good	0.012 (0.525)	-0.064 (0.000)***
Good	0.036 (0.037)*	-0.149 (0.000)***
Fair	0.129 (0.000)***	-0.206 (0.000)***
Poor	0.195 (0.000)***	-0.249 (0.000)***
Sex		
Male	Ref	Ref
Female	0.138 (0.000)***	-0.037 (0.000)***
Income		
Less than $10,000	Ref	Ref
$10,000-$14,999	0.034 (0.014)*	0.002 (0.907)
$15,000-$19,999	0.049 (0.290)	-0.047 (0.423)
Race/Ethnicity		
White only, non-Hispanic	Ref	Ref
Black only, non-Hispanic	-0.012 (0.279)	-0.011 (0.344)
Hispanic	-0.111 (0.000)***	-0.039 (0.017)*
Other, non-Hispanic	-0.007 (0.660)	-0.006 (0.704)

Marginal effects reported; *p*-values in parentheses. USOC refers to the indicator for an individual having a usual source of care.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3 shows the results of Model 1. After controlling for individual predisposing, enabling, and need characteristics, we find that individuals in expansion states had a 5.9 percentage point increase in the probability of having a usual source of care (p=0.000) and a 3.6 percentage point decrease in the likelihood of delaying care in the past year due to cost (p=0.044) after Medicaid expansion went into effect.

Several control variables are also significantly associated with the likelihood of having a USOC and/or delaying care due to cost. Age, education status, and female sex are all positively associated with having a USOC. Health status is negatively associated with having a USOC; those with "Fair" or "Poor" self-rated health status were significantly more likely to have a

USOC than those of with "Excellent" self-rated health status. Hispanic ethnicity is negatively associated with both having a USOC and not delaying care due to cost. Age, education status, marital status, health status, and female sex are also significantly associated with not delaying care due to cost.

4D: Results of Model 2

Table 4: Difference-in-Difference Estimates for Impact of Medicaid Expansion on Access to Primary Care for Low-Income Non-Elderly Childless Adults, Moderated by Race/Ethnicity; Select Estimates

	USOC Marginal effects, p-values in parentheses	**Did not delay Care Due to Cost** Marginal effects, p-values in parentheses
Race/Ethnicity – Triple-Differences Interaction Effects		
Expansion × White only, non-Hispanic	Ref	Ref
Expansion × Black only, non-Hispanic	.0308 (0.291)	0.024 (0.464)
Expansion × Hispanic	-0.006 (0.853)	-0.037(0.291)
Expansion × Other, non-Hispanic	-0.041 (0.220)	0.057 (0.113)
Main Effect		
Expansion	0.063 (0.000)***	0.036 (0.046)*

Marginal effects reported; *p*-values in parentheses. Age group, education status, marital status, self-rated health status, sex, income, and race/ethnicity were also included as covariates in the model. Full results of Model 2 can be found in Appendix 1.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4 shows the results of Model 2, which added on to Model 1 by adding a triple-differences interaction term to test the moderating effect of minority race/ethnicity on the relationship between ACA Medicaid expansion and access to primary care. None of the triple-differences interaction terms were statistically significant. We find that the positive main effects on having a usual source of care and not delaying care due to cost that we identify in the previous model persist.

Other covariates in Model 2 displayed the same patterns of direction and significance as

in Model 1.

Chapter 5: Discussion

5A: Key Findings

This study examined the effect of ACA Medicaid expansion on access to primary care using a difference-in-differences approach with logistic regression to compare likelihood of having a USOC and delaying care due to cost in expansion and non-expansion states before and after the policy was enacted (Model 1); a triple-differences approach was then used to further examine the moderating effect of race/ethnicity (Model 2). Both Model 1 and Model 2 found that, on average, individuals in expansion states were more likely to have a USOC and less likely to delay care due to cost after Medicaid expansion went into effect versus individuals in non-expansion states. These results support our hypothesis H1, that there is a positive relationship between ACA Medicaid expansion and access to primary care. The results are also consistent with previous literature suggesting that ACA Medicaid expansion has increased the likelihood of having a USOC and decreased the likelihood of delaying care due to cost.[29,30,59,60]

The magnitude of the effect size for overall changes in USOC and delaying care is highly consistent between Model 1 and Model 2, suggesting that race/ethnicity did not play a large role in moderating changes in access to primary care. Indeed, Model 2 yielded no statistically significant results for the triple-differences term testing the interaction between race/ethnicity and state expansion status.

5B: Strengths and Limitations

This study has several limitations. First, certain cells may have had small sample sizes, such as the number of minority race/ethnicity individuals in certain states, and this may have affected the statistical power of our models to observe statistically significant differences among

certain subsamples. The BRFSS response rate for 2011-2015 ranges from 48-53%, which is lower than an in-person survey; however, this response rate is quite high compared to other telephone surveys.[89] Nonetheless, the overall BRFSS response rate may not be representative of the response rate for the specific minority populations we focus on in this study. The exclusion of large states like California and New York from the model may limit the generalizability of the results. Primary care access measures in these states tend to be higher, because these states tend to be more generous and proactive with programs to improve health care access, leaving less room for improvement in our access outcome measures; thus, the exclusion of these states may have increased the magnitude of our observed effects.

Additionally, certain variables could not be meaningfully measured at the state level, such as provider supply and rurality, and so they were not included in our models. Both of these omitted variables may bias the results away from the null, leading to estimates that are higher than the actual population parameter. Moreover, data only are available for a limited time after Medicaid expansion—the length of exposure to the expansion treatment ranged from a minimum of one quarter to a maximum of 8 quarters. This study thus only provides initial information about the effect of ACA Medicaid expansion on access to primary care, and further research will be needed to observe the intermediate and longer-term effects of this policy.

There are also many policy changes that occurred concurrently with Medicaid expansion as part of the ACA, including the extension of dependent coverage to those up to age 26, premium subsidies for individuals with incomes between 100-400% FPL, and the creation of state and federal health insurance exchanges that made it easier to purchase private health insurance coverage. It is impossible to fully pinpoint Medicaid expansion as the sole cause of changes in access to primary care during the time period of our study, as there may be spillover

effects from concurrent policy changes that confound our estimates. For example, primary care physicians in expansion states, anticipating across-the-board gains in adult insurance coverage, could have increased their appointment availability to a greater extent than physicians in non-expansion states. We attempt to account for this as much as possible by limiting our study population to only childless adults between ages 25 and 64 who are making less than 100% FPL, the population that would have been least affected by concurrent policy changes.

Despite these limitations, this study also has several strengths. It uses a nationally representative dataset, which allows for generalizability of the findings to low-income, non-elderly childless adults living in the U.S. Furthermore, it uses a quasi-experimental design to control for time-invariant characteristics between states. Thus it is better-equipped to isolate the causal effect of the Medicaid policy change. It is also the first to examine whether the ACA Medicaid expansion affected different racial and ethnic groups differently.

5C: Policy Implications

The findings of this study underscore the importance of Medicaid expansion in improving access to primary care for low-income individuals without creating or exacerbating racial/ethnic disparities. The effects of this policy are experienced relatively similarly for minorities and non-Hispanic whites when it comes to improvements in the likelihood of having a USOC and delaying care due to cost.

These findings are valuable, especially as the future of ACA Medicaid expansion is debated in Congress. It is estimated that up to 11 million low-income individuals could lose insurance coverage if ACA Medicaid expansion were repealed.[90] This study's findings indicate that repealing this provision of the ACA would also threaten significant gains in access to

primary care. Both low-income minorities and non-Hispanic whites could see comparable reductions in access to primary care if Medicaid expansion is repealed.

Despite the failure of the first attempted ACA repeal bill, the American Health Care Act (AHCA), there are still policy changes that could threaten the gains in primary care access, especially for minority race/ethnicity individuals. One such policy change is cutting funding for enrollment outreach and navigators in minority communities. Previous studies have shown community outreach and patient navigators play an important role in helping minorities enroll in insurance and learn how to use the health care system, especially Latinos—for this reason, the ACA included resources to fund such efforts.[72,91] These navigator resources may be at least partially responsible for the equitable gains in access across white and minority groups. If these resources were cut, we could see racial and ethnic disparities in access widen among low-income adults, even with Medicaid expansions still in place.

Additionally, structural changes to Medicaid on the federal or state level could also threaten access. For example, changing the federal funding structure of Medicaid from an open-ended matching grant to a block grant or per-capita cap system would limit the number of people who could enroll, potentially reducing access to primary care for low-income individuals.[11] On the state level, some current non-expansion states may consider alternative Medicaid expansion proposals through Section 1115 demonstration waivers, which could impose additional requirements on Medicaid-eligible adults and limit access. Several states currently have pending waivers that could reduce existing Medicaid coverage rates, institute work requirements for Medicaid coverage, increase cost-sharing for Medicaid beneficiaries, and impose lifetime limits on coverage.[92] These more "conservative" approaches to Medicaid expansion may not realize the same gains in access as traditional expansions, especially across racial and ethnic lines.

5D: Recommendations for Further Research

This study also suggests several areas for future research. As time passes and more post-ACA Medicaid expansion data become available, it would be beneficial to continue assessing the long-term effects of the policy change. In addition, an examination of the effects of some of the factors that are not included in this study, such as provider supply or rurality, would be valuable for further understanding the role of Medicaid expansions in a complex health care environment.

Further studies about the effects of ACA Medicaid expansions on minorities are also recommended. Although this study finds no significant differences between minorities and non-Hispanic whites' access to primary care post-Medicaid expansion, there may be other differences in non-Hispanic whites' and minorities' experiences when enrolling in Medicaid and seeking primary care. In this context, qualitative or mixed methods studies might be especially valuable for understanding the different barriers that minority communities face when accessing primary care.

Chapter 6: Conclusion

Though research has been done on the effect of ACA Medicaid expansion on access to primary care, these studies were limited in their ability to specifically attribute their results to Medicaid expansion rather than other contemporaneous policy changes under the ACA. This study precisely examines the effect of ACA Medicaid expansion on access to primary care by limiting its sample to those eligible for expanded Medicaid, but unlikely to be eligible for other ACA coverage provisions. It is also the first to examine the relative effects of expansion for those of minority race/ethnicity.

We find that individuals in ACA Medicaid expansion states were more likely to have a usual source of care and less likely to delay care due to cost post-expansion. We did not find any

statistically significant differences in the effects of expansion by race/ethnicity. Results from this study show the importance of Medicaid expansion in improving access to primary care for low-income populations.

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Appendix 1: Full Results of Model 2

Table 5: Full Triple Difference Estimates for Impact of Medicaid Expansion on Access to Primary Care for Low-Income Non-Elderly Childless Adults

	USOC Marginal effects, p-values in parentheses	**Did Not Delay Care Due to Cost** Marginal effects, p-values in parentheses
Race/Ethnicity – Triple-Differences Interaction Effects		
Expansion × White only, non-Hispanic	Ref	Ref
Expansion × Black only, non-Hispanic	.0308 (0.291)	0.024 (0.464)
Expansion × Hispanic	-0.006 (0.853)	-0.037(0.291)
Expansion × Other, non-Hispanic	-0.041 (0.220)	0.057 (0.113)
Main Effect		
Expansion	0.063 (0.000)***	0.036 (0.046)*
Age Group		
Age 25 to 34	Ref	Ref
Age 35 to 44	0.111 (0.000)***	-0.011 (0.538)
Age 45 to 54	0.181 (0.000)***	0.009 (0.551)
Age 55 to 64	0.265 (0.000)***	0.111 (0.000)***
Education Status		
Did Not Graduate High School	Ref	Ref
Graduated High School	0.051 (0.000)***	-0.003 (0.801)
Attended College or Technical School	0.061 (0.000)***	-0.045 (0.000)***
Graduated from College or Technical School	0.064 (0.000)***	-0.023(0.135)
Marital Status		
Married/Member of an unmarried couple	Ref	Ref
Not married/Not living with partner	0.011 (0.338)	-0.027 (0.030)*
Self-Rated Health Status		
Excellent	Ref	Ref
Very Good	0.012 (0.522)	-0.065 (0.000)***
Good	0.036 (0.036)*	-0.149 (0.000)***
Fair	0.129 (0.000)***	-0.206 (0.000)***

Poor	0.195 (0.000)***	-0.249 (0.000)***
Sex		
Male	Ref	Ref
Female	0.138 (0.000)***	-0.037 (0.000)***
Income		
Less than $10,000	Ref	Ref
$10,000-$14,999	0.034 (0.014)*	-0.002 (0.895)
$15,000-$19,999	0.052 (0.258)	-0.051 (0.386)
Race/Ethnicity		
White only, non-Hispanic	Ref	Ref
Black only, non-Hispanic	-0.011 (0.321)	-0.011 (0.367)
Hispanic	-0.111 (0.000)***	-0.039 (0.018)*
Other, non-Hispanic	-0.005 (0.727)	-0.007 (0.642)

Marginal effects reported; *p*-values in parentheses. USOC refers to the indicator for an individual having a usual source of care.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$