

**Changes in Racial and Ethnic Disparities in Preventive Cancer Screenings Among
Low-Income Women Associated with Medicaid Expansion**

by

Anna Patterson

BSN, Alvernia University, 2013

Submitted to the Graduate Faculty of the
Health Policy and Management
Graduate School of Public Health in partial fulfillment
of the requirements for the degree of
Master of Public Health

University of Pittsburgh

2021

UNIVERSITY OF PITTSBURGH
GRADUATE SCHOOL OF PUBLIC HEALTH

This essay is submitted

by

Anna Patterson

on

April 9, 2021

and approved by

Essay Advisor: Eric Roberts, PhD, Assistant Professor, Health Policy and Management,
Graduate School of Public Health, University of Pittsburgh

Essay Reader: Martha Ann Terry, PhD, Associate Professor, Behavioral and Community Health
Sciences, Graduate School of Public Health, University of Pittsburgh

Copyright © by Anna Patterson

2021

Changes in Racial and Ethnic Disparities in Preventive Cancer Screenings Among Low-Income Women Associated with Medicaid Expansion

Anna Patterson, MPH

University of Pittsburgh, 2021

Abstract

Background: Racial and ethnic disparities in preventive cancer screenings among low-income women have been documented in previous literature. These disparities result in delayed cervical and breast cancer treatment, thus affecting survivability. The relationship between insurance status and use of preventive services is likely mediated by access to primary care. Medicaid expansions under the Affordable Care Act (ACA) were meant to help increase access to care and reduce disparities. Therefore, we examined changes in racial/ethnic disparities in pap smear and mammography use among low-income women pre- and post-Medicaid expansions.

Methods: An event-study (ES) design was used to analyze data from the Behavioral Risk Factor Surveillance System (BRFSS) from years 2012 – 2018 to estimate changes in the following outcomes: insurance status, having a usual source of care, and use of preventive cancer screenings. Trends were estimated separately for both Medicaid expansion and non-expansion states. Our study population included 216,484 women aged 18 – 64 years who had an income less than 138% of the Federal Poverty Level, and met eligibility criteria for screenings.

Results: In Medicaid expansion states, insurance coverage increased across all three groups, but Hispanic women remained less likely to have coverage compared to Non-Hispanic White (NHW) women. Additionally, disparities persisted in the probability of having a usual

source of care between Hispanic and NHW women in expansion states. In both expansion and non-expansion states pap smear utilization decreased across all three groups from 2012 – 2018, with no notable reduction in racial/ethnic disparities. Further, in expansion states, mammography screenings remained higher among Non-Hispanic Black (NHB) women compared to NHW women, despite a decrease in screenings among NHB women.

Conclusion: State Medicaid expansions have increased insurance coverage but have not narrowed disparities in cancer screenings or the probability of having a usual source of care. Further research to understand the overall decrease in pap smear use is vital. These results suggest additional barriers exist aside from insurance coverage that affect using preventive cancer services. Therefore, additional social and health policies should be considered to remediate disparities in the use of preventive cancer care services.

Table of Contents

| | |
|--|-----------|
| Preface..... | ix |
| 1.0 Introduction..... | 1 |
| 2.0 Methods..... | 4 |
| 2.1 Study Design..... | 4 |
| 2.2 Data..... | 4 |
| 2.3 Outcome Measures | 6 |
| 2.4 Covariates..... | 7 |
| 2.5 Statistical Analysis..... | 8 |
| 3.0 Results | 10 |
| 3.1 Insurance Coverage..... | 12 |
| 3.2 Usual Source of Care..... | 14 |
| 3.3 Pap Smears..... | 16 |
| 3.4 Mammography | 18 |
| 3.5 Supplemental Analysis | 20 |
| 4.0 Discussion..... | 21 |
| 5.0 Conclusion | 25 |
| Appendix A Supplementary Analysis | 27 |
| Appendix B Supplemental Tables | 29 |
| Bibliography | 33 |

List of Tables

Table 1. Descriptive Statistics of Sample Population 11

Appendix A Table 1 Descriptive Characteristics of Sample Population 27

Appendix A Table 2 Effects of Expansion Among Childless Low-Income Women 28

Appendix B Table 1 Effects of Medicaid Expansion on Insurance Coverage Among Low-Income Women..... 29

Appendix B Table 2 Effects of Medicaid Expansion on Usual Source of Care Among Low-Income Women..... 30

Appendix B Table 3 Effects of Medicaid Expansion on Pap Smear Uptake Among Low-Income Women..... 31

Appendix B Table 4 Effects of Medicaid Expansion on Mammography Uptake Among Low-Income Women..... 32

List of Figures

| | |
|---|-----------|
| Figure 1. Analytic Sample Flowsheet | 6 |
| Figure 2 Changes in Insurance Status in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group..... | 13 |
| Figure 3 Changes in Usual Source of Care in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group | 15 |
| Figure 4 Changes in Pap Smear Uptake in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group | 17 |
| Figure 5 Changes in Mammography Uptake in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group | 19 |

Preface

I would like to acknowledge and thank Dr. Eric Roberts in his tireless support and guidance throughout this project. I would also like to acknowledge and thank Dr. Martha Terry for fostering my passion in women's health and providing perspective where I needed it most. Many thanks to Dr. Jarlenski for providing feedback during our initial phases of this project. Finally, an overwhelming thank you to my parents Tim and Carrie for their continued love and support throughout my journey.

1.0 Introduction

Use of cancer services is an important component of women's health care, yet in the United States (U.S.) Black and Hispanic women are less likely to get preventive services, which contributes to disparities in cancer treatment and survivorship.¹⁻⁶ For example, total cervical cancer incidence rates are 9% among Black women and 7.6% in Hispanic women compared to 5.4% in White women.¹ Timeliness of cancer detection, as measured by stage of diagnosis, also varies by race and ethnicity.² For example, the odds of being diagnosed with a later stage of breast cancer were higher for Black women (1.46) and Hispanic women (1.35) compared to White women.² These differences likely underlie substantial racial and ethnic disparities in cancer survivorship rates among women.³

Disparities in cancer detection, treatment, and survivorship can be attributed, in part, to an individual's insurance status. Insurance status predicts the probability of having a usual source of care and receiving preventive services, and the literature suggests a link between having insurance and earlier cancer detection.^{2,4-6} For example, insurance coverage may enable women to receive routine gynecological care, which can increase the timely detection and treatment of cervical and breast cancer. Without such preventive care, detection of disease is delayed and may affect survivability. Prior to the passage of the ACA, non-elderly low-income Black and Hispanic adults were 10% and 25% less likely to have health insurance than low-income White adults.⁷ Additionally, research among low-income women demonstrates that Black and Hispanic women had uninsured rates 9.8% and 24.2% higher (respectively) than White women prior to ACA implementation.⁸ These historically low rates of insurance coverage among racial/ethnic minorities contributed to disparities in the use of preventive cancer care and screenings.^{2,5,6,9-15}

Expansions of Medicaid to non-elderly adults with incomes up to 138% of the Federal Poverty Level (FPL) under the Affordable Care Act (ACA) have narrowed racial/ethnic disparities in insurance coverage.¹⁶ While states with expanded Medicaid have seen large gains in insurance coverage among low-income adults on average, these gains have been greater among Black and Hispanic adults.¹⁶⁻²⁰ For example, Sommers et al. found that Medicaid expansion reduced the uninsured rates by 10.8% and 11.9% among low-income Black and Hispanic adults respectively, compared to a 6.1% reduction among low-income White adults one-year post-expansion.²¹ On average among states that expanded Medicaid, uninsured rates increased by 3.7% and decreased by 2.9% when comparing low-income Hispanic and Black adults to White adults, respectively.⁷ While this study focuses on the impacts of Medicaid expansion and access to cancer preventive services it is important to take into consideration of other provisions of the ACA that may also have contributed to a decrease in disparate coverage among low-income women such as coverage of dependents up to age 26 and federal subsidies for individual marketplace coverage for those between 100% – 400% of the FPL, which impacted low-income women regardless of whether their state chose to expand Medicaid.

Medicaid expansions have also been linked to increases in preventive service use, including blood pressure screenings, cholesterol checks, and flu shots, among low-income adults.^{19, 22-26} However, the extent to which Medicaid expansion has reduced disparities in preventive cancer care remains largely unknown. Therefore, this study examined long-run changes (over the six years of post-expansion period) in the utilization of two preventive cancer services – pap smear and mammography use – among low-income Black and Hispanic women relative to White women before and after implementation of major insurance expansion provisions of the ACA in 2014. To examine the extent to which provisions of the Affordable Care Act may have reduced disparities

in preventive cancer care, we used an event-study (ES) design to compare changes in insurance coverage, usual source of care, and cancer screenings over time by racial/ethnic group for both Medicaid expansion and non-expansion states. This study addresses an important gap in the literature about long-run effects Medicaid expansion may have on racial and ethnic disparities in use of preventive cancer services among low-income women. The remainder of this essay is organized as follows: Chapter 2 discusses the study's methods; Chapter 3 present results; Chapter 4 discusses the study's findings; and Chapter 5 concludes with a look towards future health care policy.

2.0 Methods

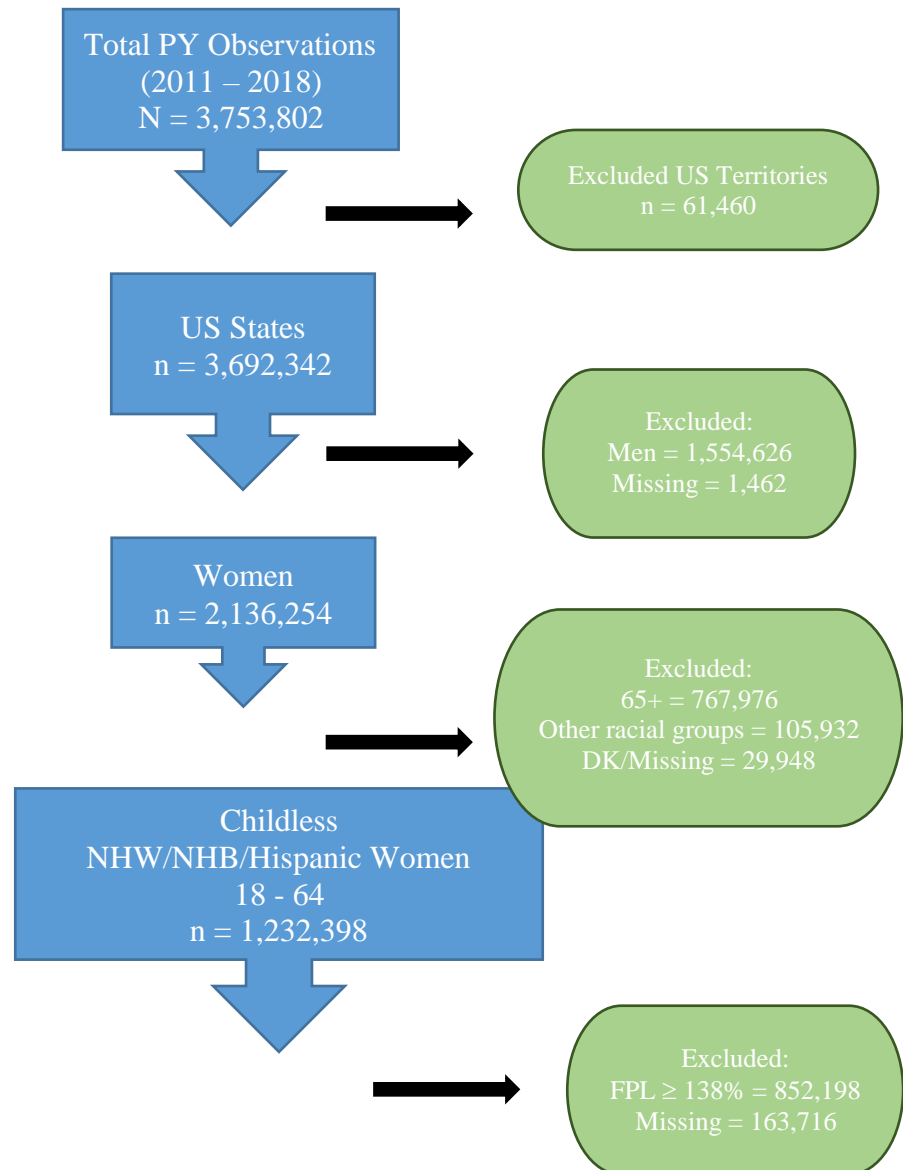
2.1 Study Design

We used an ES design to compare changes in coverage, usual source of care, and cancer screening over time by racial/ethnic group. We analyzed these changes separately in Medicaid expansion and non-expansion states, and ran models independently to compare Non-Hispanic Black (NHB) to Non-Hispanic White (NHW) women and Hispanic to NHW women (in each model, NHW were the reference group.). Our study period spans 2011 – 2018 with two years of pre-expansion data (2011- 2012) and six years of post-expansion data (2012 – 2018). Few women were asked the cancer screening questions in 2013, so this year was omitted from the analysis. We included any state that chose to expand Medicaid in our post-expansion years resulting in a total of 34 states and the District of Columbia. The post-expansion time for each state is based on the year that state expanded Medicaid. The University of Pittsburgh’s IRB determined that this study was exempt from review due to its use of de-identified data, which was therefore determined to be non-human subjects research.

2.2 Data

This study is based on data from the Behavioral Risk Factor Surveillance System (BRFSS), a nationally representative telephone survey sponsored by the Centers for Disease Control and Prevention (CDC) and conducted by state health departments. The study sample (216,484) was

restricted to U.S. residents of the 50 states and the District of Columbia who were women aged 18 – 64 with an annual income under 138% of the Federal Poverty Level (FPL). For example, the income threshold for eligibility for a single individual in 2014 was \$16,104 (138% of FPL) for all states who chose to expand Medicaid except for Hawaii and Alaska due to their higher living costs.²⁷ We further restricted the sample by including women who identified only as Non-Hispanic White (NHW), Non-Hispanic Black (NHB), or Hispanic and excluded other racial or ethnic groups. A diagram of how we obtained our analytic sample (Fig. 1) can be seen below.



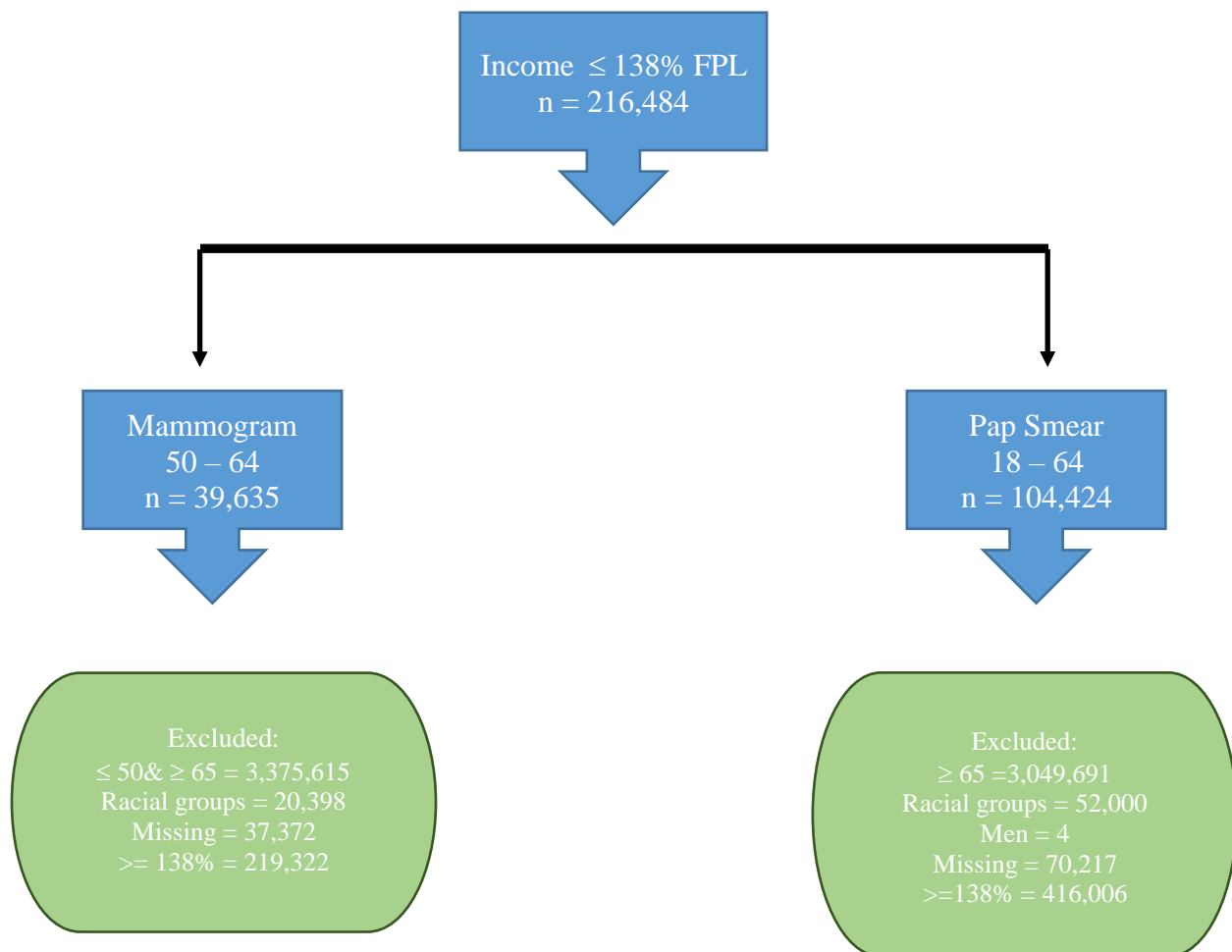


Figure 1. Analytic Sample Flowsheet¹

2.3 Outcome Measures

The two main outcomes assessed in this study were getting a pap smear or mammogram. We also examined insurance status and the probability of having a usual source of care, as having a usual source of care can mediate the relationship between insurance coverage and the use of

¹ Exclusion criteria for race/ethnicity included those who responded as Non-Hispanic Other, Non-Hispanic multi-racial, or where race/ethnicity was either missing or not reported for NHW, NHB, and Hispanic groups.

preventive cancer services. The outcome variables for both pap smear and mammogram combined two variables from the BRFSS that ask, “have you ever had a pap test/mammogram?” and “how long has it been since your last pap test/mammogram?”²⁸ Respondents were coded as having had a pap smear or mammogram if they indicated getting this screening within the past year. The insurance status variable was derived from a binary question that asked respondents if they have any kind of health care coverage. And lastly, we created our usual source of care variable from a question that asks respondents if they have a doctor they consider their primary health care provider. A binary variable was created from respondents who answered “no” and those who answered “yes, only one” and “more than one.”²⁸

2.4 Covariates

We adjusted for the following covariates from the BRFSS: smoking status, language, marital status, education level, number of dependents, employment status, age, and income, which we entered as categorical variables. These covariates were identified as primary sources of bias as they are correlated with both Medicaid enrollment and our outcomes of interest. We adjusted for these covariates to control for any compositional changes in the populations of low-income women in states before and after 2012, which helps us to isolate changes in study outcomes linked to ACA policies.

2.5 Statistical Analysis

We compared changes in racial/ethnic disparities over the study period separately for expansion and non-expansion states, using an ES model design. The ES design was used to compare trends in study outcomes between either NHB or Hispanic vs. NHW women, adjusting for observed population characteristics. To compare these trends by race/ethnicity, the ES regressions included an interaction term between a categorical variable assigned for each study year and a categorical variable for a respondent's racial or ethnic group ($year_{it} * minority_{it}$ in the model below) and used the year 2012 and NHW as our reference year and group. We ran separate models to compare trends between Black and Non-Hispanic white women and between Hispanic and Non-Hispanic white women, and further stratified our analysis by states' Medicaid expansion status. The unit of analysis in this model was the person-year. The model is written as follows:

$$y_{it} = \beta_0 + \beta_1 year_{it} + \beta_2 year_{it} * minority_{it} + \beta_3 minority_{it} + \beta_4 dependents_i + \beta_5 smoker_i + \beta_6 lang_i + \beta_7 employ_i + \beta_8 married_i + \beta_9 educa_i + \beta_{10} age_i + \beta_{11} fpl_i + \epsilon_i$$

The coefficient estimates of this interaction term give the change in outcome variables over time by racial/ethnic group relative to 2012, adjusted for covariates (smoking status, language, marital status, education level, dependents, employment, age, and income). We compared baseline (2012) disparities in utilization rates and independently calculated the changes in disparities from 2011 to 2018 between NHW and NHB or Hispanic women, estimated from the model coefficients. We used a linear regression design in order to directly interpret the coefficients and clustered our results on the state level, all analyses were conducted using Stata/SE 16.²⁹ Additionally, we calculated the unadjusted means for each outcome measure predicted from the regression models using linear combinations. We used the estimates for β_0 to calculate the baseline (2012) means for

NHW women; we used the linear combination $\beta_0 + \beta_3$ to calculate the baseline means for NHB or Hispanic women; $\beta_0 + \beta_1$ to calculate the 2018 means for NHW women; and we used the linear combination of $\beta_0 + \beta_1 + \beta_2 + \beta_3$ to calculate the 2018 means for NHB or Hispanic women. Thus, β_2 provides us with the difference in the 2012 – 2018 changes in study outcomes for NHB or Hispanic women compared to the change among NHW women.

We conducted two additional analyses to assess the sensitivity of our analysis and results. First, we estimated any changes in descriptive characteristics of low-income women who reside in Medicaid expansion compared to non-expansion states to determine if there were any compositional changes that would confound an analysis of trends pre- and post-expansion (Table 1 in Appendix A). Second, we examined trends among childless low-income women separately to determine if there were fundamental differences between this sub-group and our primary study population. Additionally, we compared our results to MEPS data in order to establish validity of outcomes.

3.0 Results

Table 1 shows the demographic characteristics of our study population in expansion and non-expansion states across the study period of 2011 – 2018. Women in the study population were more likely to live in an expansion state (58.9% vs. 41.1%). Additionally, compared to women in non-expansion states, low-income women in expansion states were more likely to be White (48.7% vs 42.6%), were more likely to have a less than high school education (33% vs. 30%) and were less likely to be married (33.8% vs. 36.3%).

Table 1. Descriptive Statistics of Sample Population

| | <i>States with Expanded Medicaid 58.9% (n= 127,508) weighted %(n)</i> | <i>States without Expanded Medicaid 41.1% (n= 88,976) weighted %(n)</i> |
|------------------------|---|---|
| <i>Age</i> | | |
| 18 – 24 | 16.6% | 16% |
| 25 – 29 | 13.3% | 12.9% |
| 30 – 34 | 16.5% | 16.1% |
| 35 – 39 | 11.9% | 12.7% |
| 40 – 44 | 11.1% | 11.2% |
| 45 – 49 | 8% | 8.3% |
| 50 – 54 | 8.8% | 9.2% |
| 55 – 59 | 7.2% | 7.2% |
| 60 – 64 | 6.5% | 6.8% |
| <i>Race/Ethnicity</i> | | |
| Non-Hispanic White | 43.7% | 42.6% |
| Non-Hispanic Black | 18% | 24.8% |
| Hispanic/Latino | 38.3% | 32.6% |
| <i>Income</i> | | |
| <10,000 | 30.8% | 27.8% |
| 10,000 – <15,000 | 23.6% | 22.2% |
| 15,000 – <20,000 | 20.8% | 23% |
| 20,000 – <25,000 | 14.8% | 16.9% |
| 25,000 – <35,000 | 8.4% | 8.7% |
| 35,000 – <50,000 | 1.5% | 1.5% |
| <i>Education Level</i> | | |
| Less than High School | 33% | 30.3% |
| High School Graduate | 32.7% | 33.9% |
| Some College | 27.8% | 29.1% |
| College + Graduate | 6.5% | 6.8% |
| <i>Marital Status</i> | | |
| Married | 33.8% | 36.3% |
| Divorced | 13.9% | 15% |
| Widowed | 3.5% | 4% |
| Separated | 7% | 8.1% |
| Never Married | 33.3% | 29.7% |
| Unmarried Couple | 8.5% | 6.8% |
| <i>Outcomes</i> | | |
| Pap Smear – Yes | 89.3% | 89.3% |
| Mammogram – Yes | 93.4% | 91% |

3.1 Insurance Coverage

As an individual's insurance status can affect whether they are able to gain access to a usual source of care and thus preventive services we looked at gains in coverage across all three racial and ethnic groups. We first examined low-income women in Medicaid expansion states. Baseline (2012) coverage rates were slightly higher for NHB (74.8%) vs. NHW (70%) women but were significantly lower among Hispanic women (51.7%; $p < 0.001$) (Fig. 2; Table 1 in Appendix B). Coverage increased considerably across all three groups from 2012 to 2018. By 2018, coverage was higher among NHW women but remained comparable for NHW and NHB women (89.9% vs. 89%). From 2012 to 2018 coverage increased 17.9% among low-income Hispanic women but remained 20.9% less likely ($p < 0.001$) to have coverage compared to NHW women, suggesting that Medicaid expansion did not eliminate this disparity between these two groups.

For low-income women who reside in states that did not expand Medicaid we see similar trends in the baseline (2012) rates. In 2012, coverage was comparable between low-income NHW and NHB women (60.7% vs. 58.2%), and rates among low-income Hispanic women are significantly lower compared to NHW women (31.5% vs. 60.7%; $p < 0.001$). Coverage increased among all three groups, although the gains were smaller in non-expansion states. Assessing the adjusted changes in coverage from 2012 to 2018 shows a significant narrowing of disparities by 7.7% ($p < 0.1$) when comparing low-income NHW and NHB women. Among low-income Hispanic women there is a non-significant widening of disparate coverage by 2.7% compared to NHW women when comparing the adjusted changes from 2012 to 2018. Similar to Medicaid expansion states, there is a non-significant widening in disparate coverage among low-income Hispanic women compared to NHW women. Also, Hispanic women remain 30.4% ($p < 0.001$) less likely to have insurance coverage compared to NHW women.

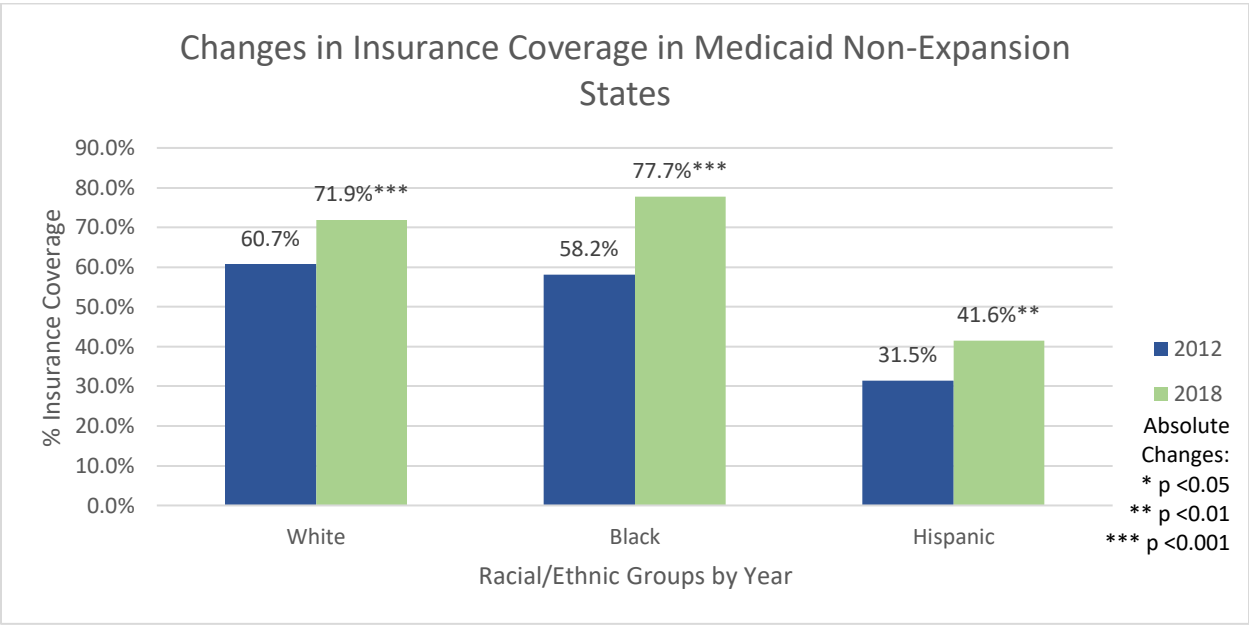
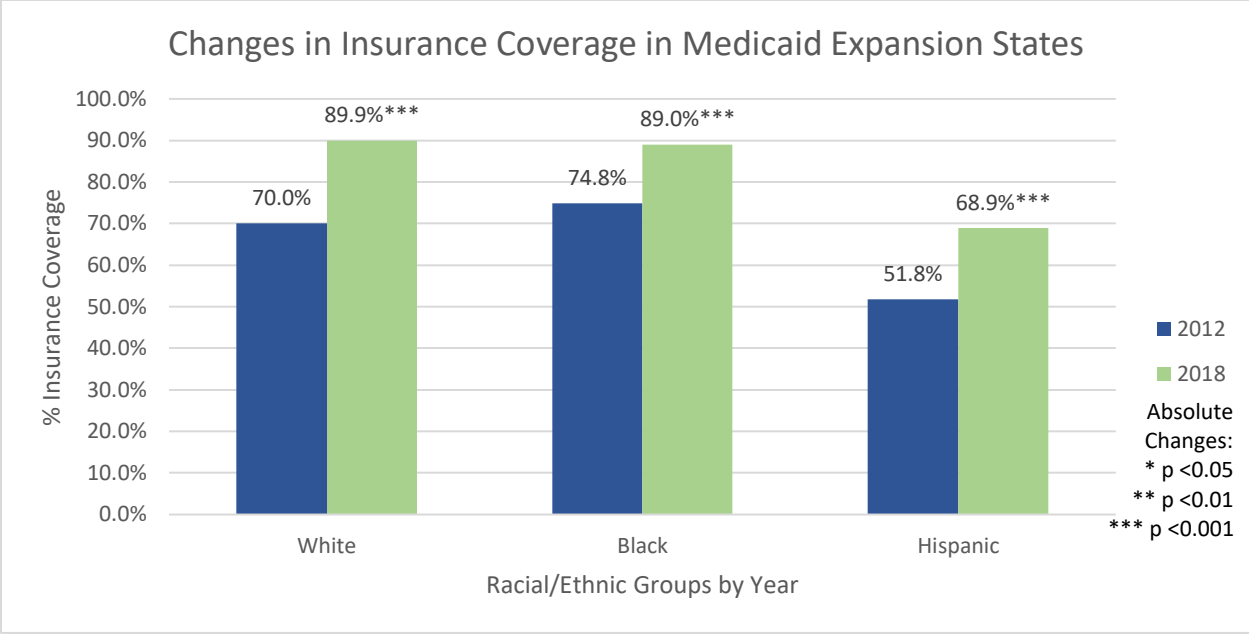


Figure 2 Changes in Insurance Status in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group

3.2 Usual Source of Care

Having a usual source of care results in individuals being more likely to have access to and utilize preventive services. Thus, having a usual source of care may mediate the relationship between insurance coverage expansions and pap smear and mammography use among low-income women. Among low-income women in Medicaid expansion states, we see no difference at baseline (2012) in utilization of usual source of care when comparing low-income NHW and NHB women. Additionally, low-income Hispanic women are 18.1% ($p < 0.001$) less likely to have a usual source of care compared to NHW women, which is a significant disparity between these two groups at baseline (Fig. 3; Table 2 in Appendix B). When evaluating the adjusted changes from 2012 to 2018 we see small gains across all three groups. Further, no difference in the probability of having a usual source of care between low-income NHW and NHB women was noted. However, there remains a significant difference in likelihood of having a usual source of care among low-income Hispanic women (-17.7%, $p < 0.01$) compared to NHW women, which did not narrow appreciably from 2012 to 2018.

At baseline (2012), for low-income women who live in non-expansion states, NHB women were 1.4% and Hispanic women were 18.5% ($p < 0.001$) less likely to have a usual source of care compared to NHW women. Similar to expansion states low-income Hispanic women compared to NHW women continue to have substantially lower utilization rates. Among low-income NHB women there is a small non-significant narrowing of disparity in source of care of 2.9% compared to NHW when evaluating the adjusted changes from 2012 to 2018. Upon evaluating the adjusted changes between low-income NHW and Hispanic women, we see there is a significant widening in the disparity of having a usual source of care of 4.8% ($p < 0.1$), further resulting in low-income

Hispanic women being 23% less likely to have a usual source of care compared to NHW women (p <0.001).

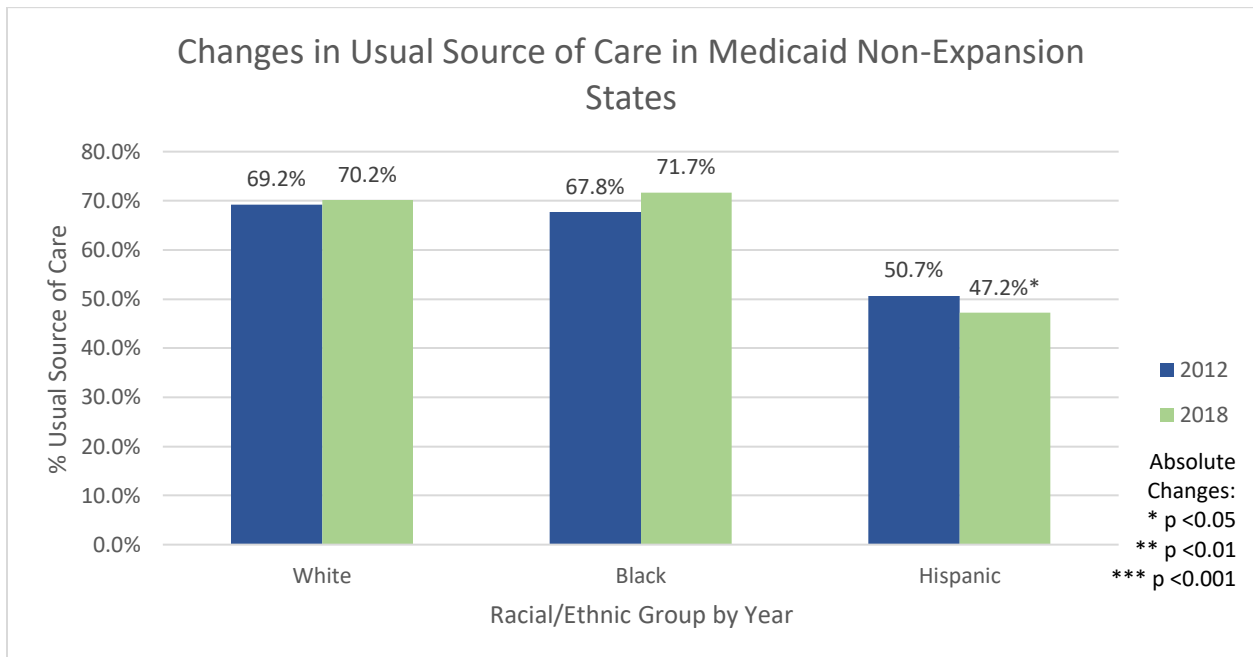
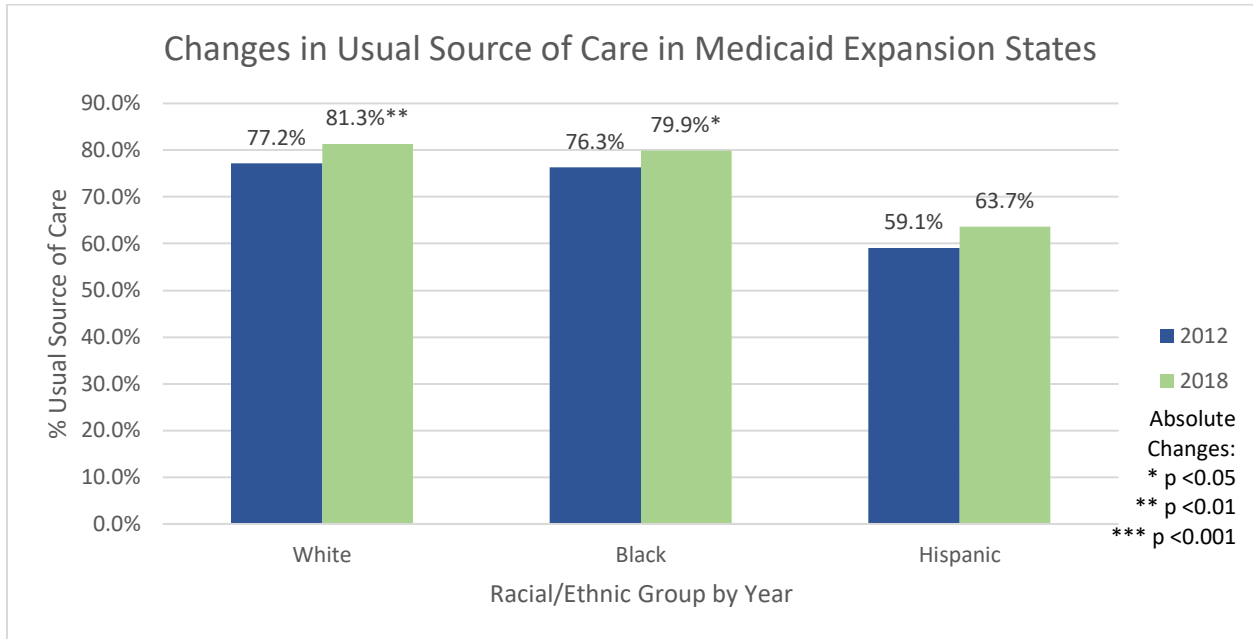


Figure 3 Changes in Usual Source of Care in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group

3.3 Pap Smears

Pap smears are often the first line of preventive procedures in detecting abnormal cervical cells that may lead to cervical cancer. A lack of access to regular gynecological care may result in later detection and thus delaying cancer care. Among low-income women in expansion states the baseline (2012) rates show that uptake among all three groups is low, ranging from approximately 44 - 54%. Low-income NHB and Hispanic women were 10.3% ($p < 0.001$) and 2.8% ($p < 0.05$) *more* likely to receive a pap smear respectively, compared to NHW women (Fig. 4; Table 3 in Appendix B). When evaluating the adjusted changes from 2012 to 2018 pap smear use decreased across all three groups. However, the changes were similar when comparing low-income NHB and Hispanic women to NHW women, resulting in no widening or narrowing of disparities. Thus in 2018, compared to low-income NHW women, NHB women (11.1%; $p < 0.001$) and Hispanic women (2.9%; $p < 0.05$) remained more likely to get this service.

Among low-income women who do not reside in Medicaid expansion states, the baseline (2012) rates of pap smear uptake were low, similar to trends noted in expansion states. Non-Hispanic Black and Hispanic women have higher baseline (2012) rates (54.7% and 46.6% respectively) compared to NHW women (40.6%), resulting in NHB and Hispanic women being 14.2% ($p < 0.001$) and 6.1% ($p < 0.05$) *more* likely to receive pap smear testing, respectively. Similar to expansion states, pap smear utilization decreased from 2012 to 2018 across all three groups. When comparing NHW to NHB women, NHW women had a decrease in use by 4.5% and there was no change in NHB women, meaning that NHB women were 17.8% ($p < 0.001$) *more* likely to receive a pap smear. Hispanic women had a decrease in use by 8.5%, compared to a 4.5% decrease in NHW women, resulting in comparable rates of uptake in 2018 (36.7% for Hispanic vs 35.6% for NHW women).

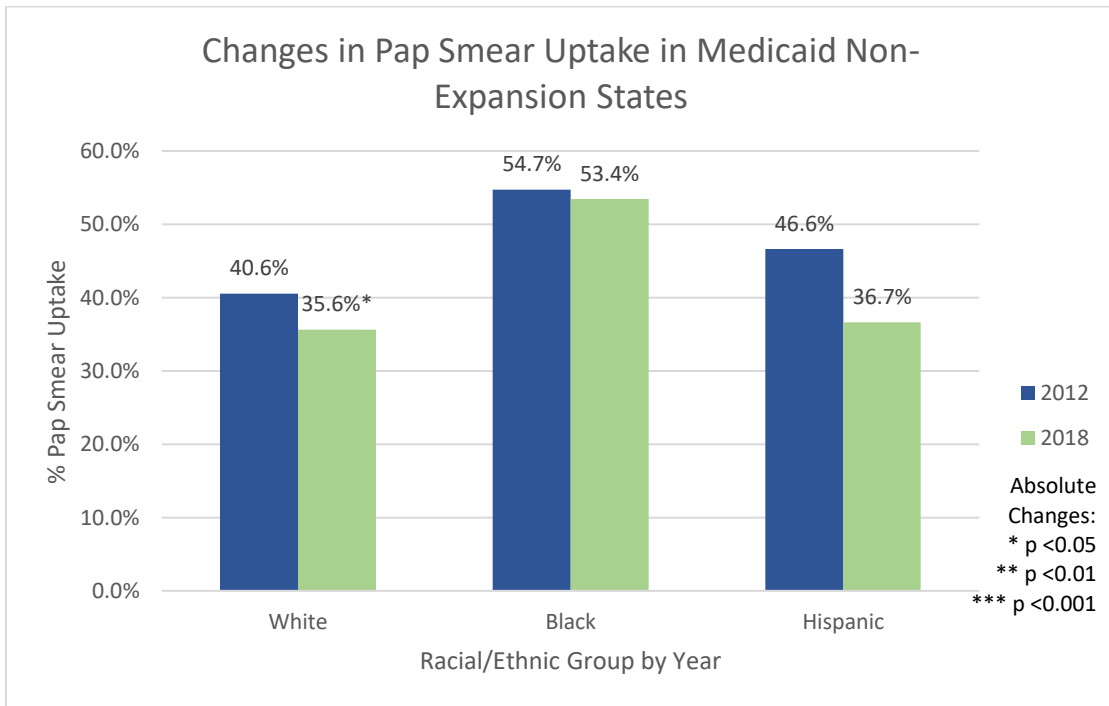
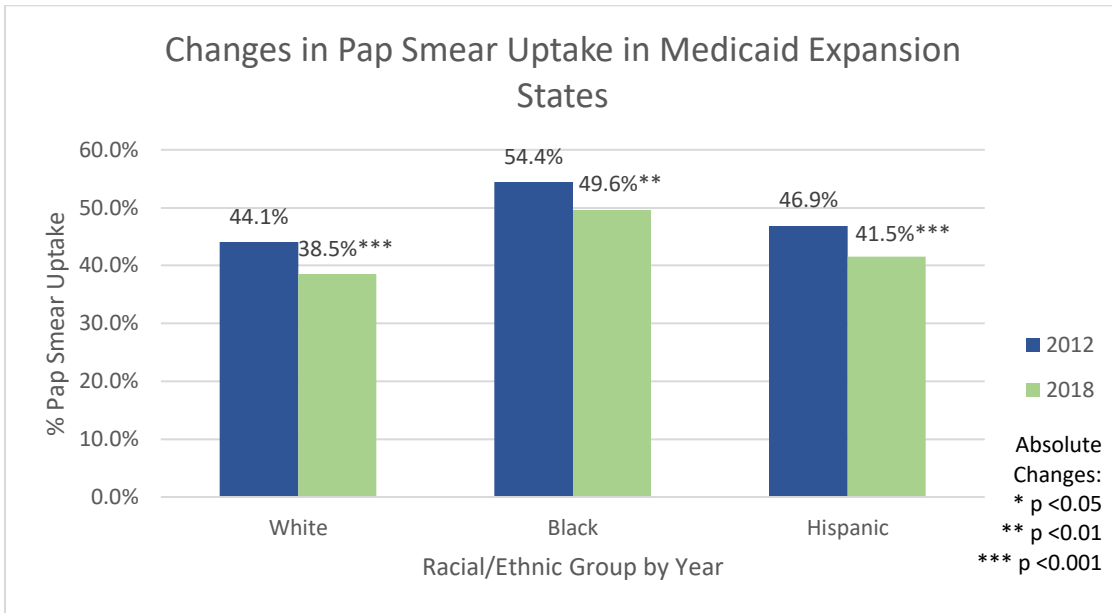


Figure 4 Changes in Pap Smear Uptake in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group

3.4 Mammography

Similar to pap smear use, mammography utilization is an important diagnostic tool in preventive cancer care for the early detection and treatment of breast cancer. Among low-income women in expansion states mammography use for all three groups in 2012 was low, ranging from approximately 18 - 29%. However, low-income NHB in 2012, were 7.4% ($p < 0.001$) *more* likely to receive a mammogram compared to NHW women (Fig. 5; Table 4 in Appendix B). Conversely, in 2012 low-income Hispanic women 3.6% ($p < 0.05$) less likely to receive a mammogram than NHW women. When comparing the adjusted changes from 2012 to 2018, mammography screening increased 2.7% among NHW women and decreased 1.6% among NHB women. Despite these changes in uptake, in 2018 low-income NHB women continue to have higher rates of use compared to NHW women (27.9% vs. 25.5% respectively). Among low-income Hispanic women we see no change in utilization when compared to NHW women; they were 3.2% less likely to receive a mammogram ($p < 0.05$).

Among low-income women in non-expansion states, we again see that mammography uptake is low across all three groups. In 2012, low-income NHB women were 7.9% ($p < 0.001$) *more* likely to receive a mammogram compared to NHW women. Looking at the adjusted changes from 2012 to 2018 shows small increases across all three groups. Further, we see no change in uptake when comparing changes among low-income NHW and NHB women. Thus, in 2018, low-income NHB women continued to be 8.5% ($p < 0.001$) more likely compared to NHW women to receive a mammogram. At baseline (2102), mammography use was comparable among NHW and Hispanic women (19.5% vs 18.6%). No change in uptake was seen in NHW women and a small 3.9% increase among Hispanic women was noted. When looking at the adjusted changes we see a non-significant 3.3% increase in mammography use among Hispanic women compared to NHW

women, but rates remained comparable between NHW and Hispanic women in 2018 (21.5% vs 23% respectively).

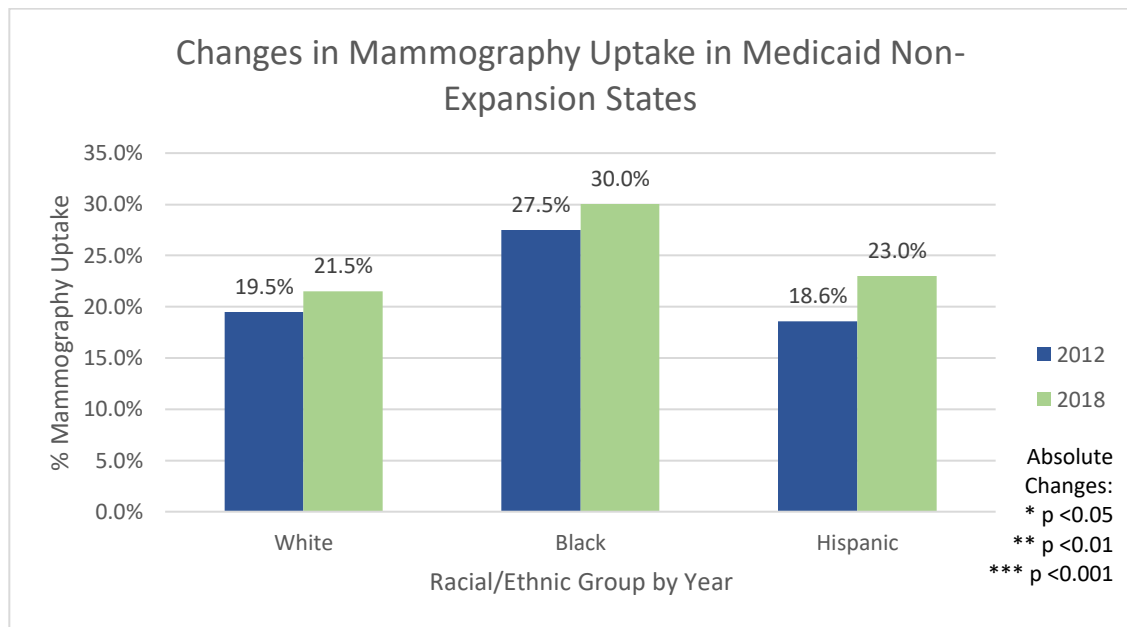
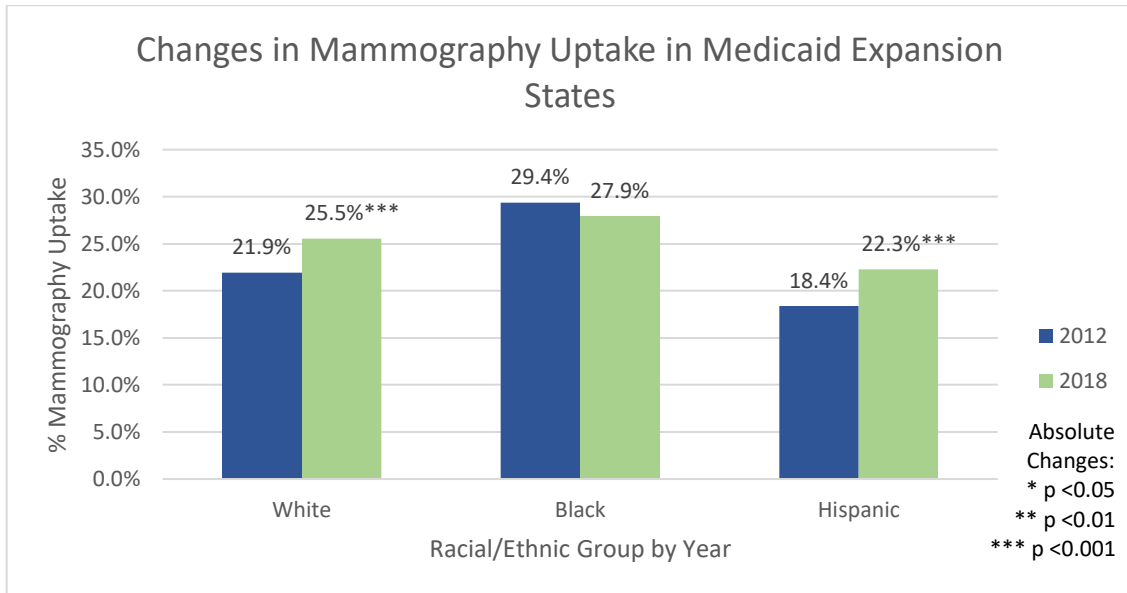


Figure 5 Changes in Mammography Uptake in Medicaid Expansion and Non-Expansion States by Racial and Ethnic Group

3.5 Supplemental Analysis

We ran additional ES models for the outcome variables to compare trends in outcomes and found similar results among childless low-income women compared to the sample including all women (Table 2 in Appendix A). Additionally, we compared levels of self-reported pap smear and mammography use by race/ethnicity and found them comparable to the means in the reference year of BRFSS data.

4.0 Discussion

Using national survey data from the BRFSS, we analyzed changes in insurance status, the probability of having a usual source of care, and the receipt of pap smears and mammography screenings among low-income women by race/ethnicity. We found that, from 2012 – 2018, insurance coverage increased for all racial/ethnic groups, and that gains were larger in states that expanded Medicaid than those that did not. Despite these gains in coverage, we did not see evidence linking Medicaid expansion to a reduction in coverage disparities for low-income NHB and Hispanic women compared to NHW women. Also, we did not find evidence suggesting that Medicaid expansions were connected to a reduction in disparities in the probability of having a usual source of care or receiving preventive cancer screenings. Specifically, when we looked at pap smear use, we found broad reductions in use of this service across all racial/ethnic groups in both Medicaid expansion and non-expansion states, and no evidence suggesting Medicaid expansions mitigated the declines to a greater extent in minority populations.

Our findings highlight that racial/ethnic disparities persist in insurance coverage and usual source of care, particularly between NHW and Hispanic women, despite overall gains after the implementation of Medicaid expansions. These results suggest that Medicaid expansion is not linked to long term decreases in coverage disparities. Similarly, the probability of having a usual source of care remained significantly lower for low-income Hispanic women compared to NHW women across expansion and non-expansion states. While the probability of having a usual source of care for NHB women increased at comparable rates compared to NHW women, there were no discernable reductions of disparities in access to care in these two groups.

Across all states and low-income racial/ethnic groups baseline pap smear uptake was low, and from 2012 to 2018 we see a broad reduction in uptake. Additionally, we saw substantially low baseline rates across all states and low-income racial/ethnic groups for mammography use. As with pap smear uptake, low-income NHB women were more likely than NHW women to have received mammography services across both expansion and non-expansion states. Previous literature has demonstrated that Medicaid expansions mediate a relationship between usual source of care and thus, utilization of preventive services.^{5,6,18-26} Since we did not find increases in pap smear and mammography use corresponding with gains in insurance coverage, our findings suggest that insurance status is not the sole mediating factor in using these services, and that factors aside from Medicaid expansion may be contributing to trends in uptake of these services.

These findings contrast with some in the previous literature.^{6,13,14} For example, Sabik, et al. found a positive association between Medicaid expansion and cervical cancer screening, particularly among low-income Hispanic women.¹⁴ Additionally, other studies have also shown an increase in breast cancer screenings associated with Medicaid expansion.^{2,15} Conversely, our findings suggest that mediating factors in addition to insurance status and usual source of care contribute to the low rates of pap smear and mammography use, which was a similar finding in Freund, et al., where stable insurance status was not associated with cancer screening rates.¹¹ More importantly, the low pap smear utilization rates that decreased from 2012 to 2018 supports the supposition that there are additional barriers aside from coverage and usual source of care in accessing these services. This is further demonstrated by the low rates of mammography use among all three groups in both expansion and non-expansion states. Our findings contribute to the current literature in demonstrating that additional understanding is needed on the effects of

Medicaid expansion on these outcomes. While there has been an exploration in breast cancer screening, little literature discusses cervical cancer screenings.

There were several limitations to our study. First, the BRFSS is a cross-sectional survey looking at an individual's health status at a particular point in time. This poses a challenge in understanding trends in coverage, access, and preventive service use, as we are unable to follow individuals longitudinally to better understand the implications of Medicaid expansion on insurance coverage, usual source of care, and use of preventive services. Second, the BRFSS is a telephone survey that asks about a person's health insurance coverage and use of care over the past year, and we expect there to be some level of recall bias. However, we do not expect such response bias to have changed differentially in expansion and non-expansion states in a way that appreciably bias our estimates. Third, due the construction of the insurance variable in the BRFSS we were unable to discern between various types of insurance. The question is posed as a yes/no questions, asks respondents "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?"²⁸ Operationalization of this variable made it difficult to exclude respondents who had private insurance, Medicare, or other insurance coverage, although restricting our population to those with an FPL less than 138% helped ensure that those who are privately insured were excluded analysis. Some strengths of our study included the large sample size resulting in an appropriately powered study. Additionally, due to access to multiple years of data we were able to assess the long-run effects of Medicaid expansion.

As previously mentioned, it is clear that an individual's insurance status alone is an important predictor, but not the sole determinant, of receiving preventive cancer screenings, and further investigation into the factors underpinning the low levels of screenings among low-income

women is vital. Certain aspects to consider are urban vs. rural settings, the built environment, availability of transportation, and the local supply of health care providers (e.g., ratio of OB/GYNs to population) in order to address access deficits and guide policy. Additionally, health literacy is crucial for individuals to understand and communicate about their health, especially regarding their insurance coverage and available services. While this is certainly not an exhaustive list of additional areas of study, it is important to take a broad approach to better understand the ways policies, particularly those governing health insurance coverage, impact the health and wellbeing of individuals, especially those in disadvantaged populations.

5.0 Conclusion

In conclusion, we found broad increases in insurance coverage among low-income women in Medicaid expansion states, but Hispanic women remained significantly less likely to be covered compared to NHW women. The probability of having a usual source of care increased across all three groups but the disparity was not reduced. Pap smear use decreased across all three groups for both expansion and non-expansion states, and no change in disparate care was noted between NHB or Hispanic women compared to NHW women. Lastly, NHB women had higher rates of mammography use compared to NHW women in expansion states. These results suggest that while Medicaid expansions have increased insurance coverage, they have not contributed to the narrowing of disparities in preventive cancer services or having a usual source of care.

With a new presidential administration, there has been a renewed commitment to comprehensive healthcare policy reform. The Biden administration has taken critical first steps demonstrating they are committed to reducing healthcare disparities and providing equitable care through the American Rescue Plan.³⁰ One example of their commitment to decreasing disparities is by increasing the federal medical assistance percentage (FMAP) an additional 5 percent for states that have yet to expand Medicaid, as a way to encourage expansion.³¹⁻³³ One main caveat to this increase in federal funding is that states must cover all individuals described as part of the ACA expansion group, as a mechanism to help decrease disparities in coverage and access to care particularly among minority groups that have disproportionately lower rates of insurance coverage.³¹⁻³³ Despite these initial steps, the results of this study underscore that Medicaid expansion alone, may not be enough to eliminate disparities in access to care. Additional policies

directed at monitoring and reducing disparities may also be necessary to work in conjunction with expansion to promote equity of care in Medicaid and rectify prior disparities.

Appendix A Supplementary Analysis

Appendix A Table 1 Descriptive Characteristics of Sample Population

| <i>Covariates</i> | <i>Expansion states</i> | | <i>Non-expansion states</i> | | <i>P-value</i> |
|--------------------------|-------------------------|-------|-----------------------------|-------|----------------|
| | 2012 | 2018 | 2012 | 2018 | |
| <i>Smoking Status</i> | 46.4% | 47.7% | 47.2% | 47.4% | 0.803 |
| <i>Language</i> | 11.5% | 5.6% | 6.5% | 6.6% | 0.674 |
| <i>Employment Status</i> | 20.3% | 20.9% | 20.8% | 21.7% | 0.301 |
| <i>Marital Status</i> | 32.2% | 31.8% | 29.2% | 28.9% | 0.448 |
| <i>Under 65 years</i> | 81.6% | 79% | 81.5% | 78.9% | 0.411 |
| <i>Dependents</i> | 37.1% | 36% | 36.9% | 35.6% | 0.560 |
| <i>NHW</i> | 72.5% | 70.9% | 67.9% | 66.2% | 0.607 |
| <i>NHB</i> | 11.1% | 11.2% | 15.5% | 16% | 0.103 |
| <i>Hispanic</i> | 16.4% | 17.8% | 16.5% | 17.8% | 0.068 |
| <i>FPL < 138%</i> | 21.6% | 19.9% | 23.6% | 21.4% | 0.117 |
| <i>Less than HS</i> | 14.4% | 12.8% | 15.7% | 13.5% | 0.137 |
| <i>HS Grad</i> | 28.5% | 27.6% | 29.3% | 28.4% | 0.035 |
| <i>Some College</i> | 28.4% | 30.6% | 31.1% | 31.7% | 0.419 |
| <i>College Grad</i> | 26.7% | 29% | 23.9% | 26.3% | 0.051 |

Appendix A Table 2 Effects of Expansion Among Childless Low-Income Women

| | <i>2013 Means</i> | <i>Effect of Expansion</i> | <i>95% CI</i> | <i>Difference in Effect of Expansion (minority v. NHW)</i> | <i>95% CI</i> |
|-----------------------------|-------------------|----------------------------|---------------|--|---------------|
| <i>Insurance Status</i> | | | | | |
| Pooled | 61.9% | 9.6% **** | 6.1%, 13% | | |
| NHW | 65.3% | 10.3% **** | 6.2%, 14.3% | | |
| NHB | 59.9% | 7.5% ** | 1.4%, 13.6% | -2.7% | -8.7%, 3.3% |
| Hispanic | 54.8% | 10.3% *** | 3.1%, 17.6% | -0.02% | -8.2%, 8.1% |
| <i>Usual Source of Care</i> | | | | | |
| Pooled | 70% | 6.4% **** | 4.5%, 8.3% | | |
| NHW | 74.1% | 4.6% **** | 2.4%, 6.9% | | |
| NHB | 68.7% | 8.3% *** | 3.6%, 12.9% | 3.4% | -1.3%, 8.2% |
| Hispanic | 60.3% | 10.7% *** | 4.6%, 16.8% | 0.9% | -3.3%, 5.1% |
| <i>Pap Smear</i> | | | | | |
| Pooled | 44.6% | 0.6% | -5.6%, 6.9% | | |
| NHW | 34.5% | 1.1% | -5.2%, 7.4% | | |
| NHB | 59.6% | -3.3% | -11.1%, 4.4% | -0.9% | -9.2%, 7.3% |
| Hispanic | 52.9% | 1.5% | -10.5%, 13.6% | 2.9% | -5.5%, 11.3% |
| <i>Mammography</i> | | | | | |
| Pooled | 53.4% | 3.6% * | -0.5%, 10% | | |
| NHW | 47.7% | 5.9% ** | 0.8%, 11% | | |
| NHB | 59.1% | -8.3% | -19.9%, 3.4% | 14.1% ** | -27.1%, -1.2% |
| Hispanic | 60.7% | 11.9% | -5.2%, 29% | 5.6% | -8.7%, 19.9% |

Appendix B Supplemental Tables

Appendix B Table 1 Effects of Medicaid Expansion on Insurance Coverage Among Low-Income Women

| <i>Insurance Coverage Means (%) - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
|--|-------|-------|----------|-------------------------|---------|-------------------------------|---------|
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| <i>2012</i> | 70.0% | 74.8% | 51.8% | 0.048 | 0.048 | -0.183 | <0.001 |
| <i>2018</i> | 89.9% | 89.0% | 68.9% | -0.009 | 0.312 | -0.21 | <0.001 |
| <i>Change from 2012 – 2018</i> | 0.198 | 0.141 | 0.171 | -0.057 | 0.023 | -0.027 | 0.539 |
| <i>Adjusted Change from 2012 - 2018</i> | 0.195 | 0.139 | 0.18 | -0.057 | 0.023 | -0.016 | 0.735 |
| <i>Insurance Coverage Means (%) - Non - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| <i>2012</i> | 60.7% | 58.2% | 31.5% | -0.025 | 0.311 | -0.292 | <0.001 |
| <i>2018</i> | 71.9% | 77.7% | 41.6% | 0.058 | 0.054 | -0.304 | <0.001 |
| <i>Change from 2012 – 2018</i> | 0.112 | 0.196 | 0.101 | 0.083 | 0.052 | -0.012 | 0.796 |
| <i>Adjusted Change from 2012 - 2018</i> | 0.101 | 0.178 | 0.074 | 0.077 | 0.07 | -0.027 | 0.461 |

Appendix B Table 2 Effects of Medicaid Expansion on Usual Source of Care Among Low-Income Women

| <i>Usual Source of Care Means (%) - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
|--|--------------|--------------|-----------------|-------------------------|----------------|-------------------------------|----------------|
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| <i>2012</i> | 77.2% | 76.3% | 59.1% | -0.009 | 0.612 | -0.181 | <0.001 |
| <i>2018</i> | 81.3% | 79.9% | 63.7% | -0.014 | 0.286 | -0.177 | <0.001 |
| <i>Change from 2012 – 2018</i> | 0.042 | 0.036 | 0.046 | -0.005 | 0.733 | 0.004 | 0.862 |
| <i>Adjusted Change from 2012 - 2018</i> | 0.029 | 0.029 | 0.044 | 0.001 | 0.96 | 0.016 | 0.592 |
| <i>Usual Source of Care Means (%) - Non - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| <i>2012</i> | 69.2% | 67.8% | 50.7% | -0.014 | 0.344 | -0.185 | <0.001 |
| <i>2018</i> | 70.2% | 71.7% | 47.2% | 0.015 | 0.647 | -0.23 | <0.001 |
| <i>Change from 2012 – 2018</i> | 0.01 | 0.039 | -0.035 | 0.03 | 0.298 | -0.045 | 0.015 |
| <i>Adjusted Change from 2012 - 2018</i> | -0.012 | 0.017 | -0.06 | 0.03 | 0.343 | -0.048 | 0.092 |

Appendix B Table 3 Effects of Medicaid Expansion on Pap Smear Uptake Among Low-Income Women

| <i>Pap Smear Means (%) - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
|---|--------------|--------------|-----------------|-------------------------|----------------|-------------------------------|----------------|
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| <i>2012</i> | 44.1% | 54.4% | 46.9% | 0.103 | <0.001 | 0.028 | 0.03 |
| <i>2018</i> | 38.5% | 49.6% | 41.5% | 0.111 | <0.001 | 0.03 | 0.025 |
| <i>Change from 2012 – 2018</i> | -0.056 | -0.048 | -0.054 | 0.008 | 0.628 | 0.002 | 0.89 |
| <i>Adjusted Change from 2012 - 2018</i> | -0.057 | -0.048 | -0.051 | 0.009 | 0.588 | 0.006 | 0.593 |
| <i>Pap Smear Means (%) - Non - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| <i>2012</i> | 40.6% | 54.7% | 46.6% | 0.142 | <0.001 | 0.061 | 0.03 |
| <i>2018</i> | 35.6% | 53.4% | 36.7% | 0.178 | <0.001 | 0.01 | 0.881 |
| <i>Change from 2012 – 2018</i> | -0.049 | -0.013 | -0.1 | 0.036 | 0.182 | -0.05 | 0.387 |
| <i>Adjusted Change from 2012 - 2018</i> | -0.045 | -0.009 | -0.085 | 0.036 | 0.219 | -0.04 | 0.403 |

Appendix B Table 4 Effects of Medicaid Expansion on Mammography Uptake Among Low-Income Women

| <i>Mammography Means (%) - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
|---|--------------|--------------|-----------------|-------------------------|----------------|-------------------------------|----------------|
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| 2012 | 21.9% | 29.4% | 18.4% | 0.074 | <0.001 | -0.036 | 0.032 |
| 2018 | 25.5% | 27.9% | 22.3% | 0.024 | 0.078 | -0.032 | 0.042 |
| <i>Change from 2012 – 2018</i> | 0.036 | -0.014 | 0.039 | -0.05 | 0.005 | 0.003 | 0.784 |
| <i>Adjusted Change from 2012 - 2018</i> | 0.027 | -0.016 | 0.033 | -0.043 | 0.01 | 0.006 | 0.667 |
| <i>Mammography Means (%) - Non - Expansion States</i> | | | | <i>NHB- NHW gap (%)</i> | | <i>Hispanic - NHW gap (%)</i> | |
| | White | Black | Hispanic | Coeff | p-value | Coeff | p-value |
| 2012 | 19.5% | 27.5% | 18.6% | 0.08 | <0.001 | -0.009 | 0.647 |
| 2018 | 21.5% | 30.0% | 23.0% | 0.085 | <0.001 | 0.015 | 0.268 |
| <i>Change from 2012 – 2018</i> | 0.02 | 0.025 | 0.044 | 0.005 | 0.782 | 0.024 | 0.201 |
| <i>Adjusted Change from 2012 - 2018</i> | 0.007 | 0.014 | 0.04 | 0.007 | 0.713 | 0.033 | 0.113 |

Bibliography

1. Islami F, Fedewa SA, Jemal A. Trends in cervical cancer incidence rates by age, race/ethnicity, histological subtype, and stage at diagnosis in the United States. *Prev Med (Baltim)* 2019; 123:316–23.
2. Ko NY, Hong S, Winn RA, Calip GS. Association of Insurance Status and Racial Disparities With the Detection of Early-Stage Breast Cancer. *JAMA Oncol* 2020;6(3):385–92.
3. United States Cancer Statistics: Highlights from 2012 Incidence [Internet]. U.S. Cancer Stat. Data Briefs, No. 17. 2020 [cited 2020 Aug 23]; Available from: <https://www.cdc.gov/cancer/uscs/about/data-briefs/no17-USCS-highlights-2017-incidence.htm>
4. Angier H, Hoopes M, Marino M, et al. Uninsured Primary Care Visit Disparities Under the Affordable Care Act. *Ann Fam Med* 2017;15(5):434–42.
5. Agirdas C, Holding JG. Effects of the ACA on Preventive Care Disparities. *Appl Health Econ Health Policy* 2018;16(6):859–69.
6. Fedewa SA, Yabroff KR, Smith RA, Goding Sauer A, Han X, Jemal A. Changes in Breast and Colorectal Cancer Screening After Medicaid Expansion Under the Affordable Care Act. *Am J Prev Med* 2019;57(1):3–12.
7. Lee H, Porell FW. The Effect of the Affordable Care Act Medicaid Expansion on Disparities in Access to Care and Health Status. *Med Care Res Rev* 2020;77(5):461–73.
8. Jones RK, Sonfield A. Health insurance coverage among women of reproductive age before and after implementation of the affordable care act. *Contraception* 2016;93(5):386–91.
9. Alharbi AG, Khan MM, Horner R, Brandt H, Chapman C. Impact of Medicaid coverage expansion under the Affordable Care Act on mammography and pap tests utilization among low-income women. *PLoS One* [Internet] 2019;14(4):1–15. Available from: <http://10.0.5.91/journal.pone.0214886>
10. Choi SK, Adams SA, Eberth JM, et al. Medicaid Coverage Expansion and Implications for Cancer Disparities. *Am J Public Health* 2015;105 Suppl 5(Suppl 5):S706-12.
11. Freund KM, Reisinger SA, LeClair AM, et al. Insurance Stability and Cancer Screening Behaviors. *Heal equity* 2019;3(1):177–82.

12. Ku L, Bysshe T, Steinmetz E, Bruen BK. Health Reform, Medicaid Expansions, and Women's Cancer Screening. *Women's Heal issues Off Publ Jacobs Inst Women's Heal* 2016;26(3):256–61.
13. Nelson HD, Weerasinghe R, Wang L, Grunkemeier G. Mammography Screening in a Large Health System Following the U.S. Preventive Services Task Force Recommendations and the Affordable Care Act. *PLoS One* 2015;10(6):e0131903.
14. Sabik LM, Tarazi WW, Hochhalter S, Dahman B, Bradley CJ. Medicaid Expansions and Cervical Cancer Screening for Low-Income Women. *Health Serv Res* 2018;53 Suppl 1(Suppl Suppl 1):2870–91.
15. Toyoda Y, Oh EJ, Premaratne ID, Chiuzan C, Rohde CH. Affordable Care Act State-Specific Medicaid Expansion: Impact on Health Insurance Coverage and Breast Cancer Screening Rate. *J Am Coll Surg* 2020
16. Courtemanche C, Marton J, Ukert B, Yelowitz A, Zapata D, Fazlul I. The three-year impact of the Affordable Care Act on disparities in insurance coverage. *Health Serv Res [Internet]* 2019; 54:307–16. Available from: <http://10.0.4.87/1475-6773.13077>
17. Chait N, Glied S. Promoting Prevention Under the Affordable Care Act. *Annu Rev Public Health* 2018; 39:507–24.
18. ASPE Office of Health Policy. Overview of the uninsured in the United States: a summary of the 2011 current population survey. *Health Policy (New York) [Internet]* 2011; Available from: <http://aspe.hhs.gov/health/reports/2011/CPSHealthIns2011/ib.pdf>
19. Gotanda H, Jha AK, Kominski GF, Tsugawa Y. Out-of-pocket spending and financial burden among low income adults after Medicaid expansions in the United States: quasi-experimental difference-in-difference study. *BMJ* 2020;368:m40.
20. Miller S, Wherry LR. Health and Access to Care during the First 2 Years of the ACA Medicaid Expansions. *N Engl J Med* 2017;376(10):947–56.
21. Sommers BD, Gunja MZ, Finegold K, Musco T. Changes in self-reported insurance coverage, access to care, and health under the Affordable Care Act. *JAMA - J Am Med Assoc* 2015;314(4):366–74.
22. Kominski GF, Nonzee NJ, Sorensen A. The Affordable Care Act's Impacts on Access to Insurance and Health Care for Low-Income Populations. *Annu Rev Public Health* 2017; 38:489–505.
23. Mahmoudi E, Cohen A, Buxbaum J, Richardson CR, Tarraf W. Gaining Medicaid Coverage During ACA Implementation: Effects on Access to Care and Preventive Services. *J Health Care Poor Underserved* 2018;29(4):1472–87.

24. Sommers BD, Blendon RJ, Orav EJ, Epstein AM. Changes in utilization and health among low-income adults after medicaid expansion or expanded private insurance. *JAMA Intern Med* 2016;176(10):1501–9.
25. Sommers BD, Maylone B, Blendon RJ, John Orav E, Epstein AM. Three-year impacts of the affordable care act: Improved medical care and health among low-income adults. *Health Aff* 2017;36(6):1119–28.
26. Wherry LR, Miller S. Early Coverage, Access, Utilization, and Health Effects Associated With the Affordable Care Act Medicaid Expansions: A Quasi-experimental Study. *Ann Intern Med* 2016;164(12):795–803.
27. 2014 Poverty Guidelines [Internet]. Off. Assist. Secr. Plan. Eval. 2014 [cited 2021 Mar 31];Available from: <https://aspe.hhs.gov/2014-poverty-guidelines>
28. CDC. LLCP 2017 Codebook Report Overall version data weighted with _LLCPWT Behavioral Risk Factor Surveillance System. 2018;1–156.
29. StataCorp. 2019. *Stata Statistical Software: Release 16*. College Station, TX: StataCorp LLC.
30. The American Rescue Plan [Internet]. 2021. Available from: <https://www.whitehouse.gov/wp-content/uploads/2021/03/American-Rescue-Plan-Fact-Sheet.pdf>
31. Rudowitz R, Corallo B, Garfield R. New Incentive for States to Adopt the ACE Medicaid Expansion: Implications for State Spending [Internet]. Kaiser Fam. Found. 2021 [cited 2021 Mar 23];Available from: <https://www.kff.org/coronavirus-covid-19/issue-brief/new-incentive-for-states-to-adopt-the-aca-medicaid-expansion-implications-for-state-spending/>
32. Musumeci M. Medicaid Provisions in the American Rescue Plan Act [Internet]. Kaiser Fam. Found. 2021 [cited 2021 Mar 23];Available from: <https://www.kff.org/medicaid/issue-brief/medicaid-provisions-in-the-american-rescue-plan-act/>
33. Rosenbaum S, Handley M, Casoni M, Morris R. Medicaid And The American Rescue Plan: How It All Fits Together [Internet]. *Health Aff*. 2021 [cited 2021 Mar 23];Available from: <https://www.healthaffairs.org/doi/10.1377/hblog20210322.860778/full/>