

Impact of ACA Medicaid Expansion on Health Care Access Across Age Groups

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Abstract

This paper aims to investigate the impact of the 2014 Affordable Care Act (ACA) Medicaid expansion on cost barriers to healthcare among different age groups (18-24 & 25-64) in expansion vs. non-expansion states with additional analysis on its effect among different races (whites & nonwhites). This paper uses data from the Behavioral Risk Factor Surveillance System (BRFSS), an annual health survey conducted in the United States by the Centers for Disease Control and Prevention (CDC) to evaluate and analyze American health behaviors. The statistical method applied in this paper to estimate the effect of the ACA expansion is a difference-in-differences estimator. The results from this study indicate that the ACA Medicaid expansion led to a statistically significant reduction in cost barriers to healthcare among both age groups and across both race groups. These results may provide evidence that ACA expansion adoption is equally crucial in increasing healthcare access for all eligible individuals and specifically young adults.

Introduction

Various studies have been done in the past analyzing the overall effect of the Affordable Care Act (ACA) on health insurance coverage for the United States population. These studies have all mainly agreed on the consensus that the ACA has been successful in its main goal of reducing the percentage of the population that is uninsured. However, health insurance coverage does not make all individuals immune to amassing financial burden (Hamel, Kearney, Brodie & Stokes, 2021). Therefore, this paper aims to investigate how successful the ACA has been in reducing cost barriers to healthcare for the individuals its policies were intended to benefit the most. These individuals are low-income American adults ages 18-64 that earn at or below the 138% federal poverty line. However, this paper also desires to investigate how cost barriers to healthcare differentiates between young adults ages 18-24 and adults ages 25-64. This is because the ACA implemented policies that could influence different outcomes for each age group. Additional subgroup analysis among white vs nonwhite individuals will be done as well to see if there was any difference in the affects. While previous literature has indicated that nonwhite individuals have seen higher benefit among uninsurance changes, direct analysis on the ACA affects on cost barriers to healthcare is harder to come across (Courtemanche et al., 2020).

The ACA was an expansion to the previous public health insurance program, Medicaid. It was fully enacted on January 1, 2014, and its policies lowered the eligibility requirements for Medicaid. Previously, to be eligible for Medicaid individuals had to satisfy the low-income requirements along with fitting into a Medicaid category group (Buchmueller et al., 2015). Examples of categories include pregnant women, children, single parents, sick, and elderly. Due to these requirements, a big portion of the United States remained uninsured. The ACA was enacted to reduce the uninsured population by lowering the eligibility requirements to just an

Impact of ACA Medicaid Expansion on Health Care Access

income requirement 138% or below the Federal Poverty line. The ACA also allowed for young adults up to the age of 26 to remain on their parents' health insurance plan. This is very important because young adults are the age group that have previously represented the part of the population with the lowest uninsurance rate (Johnston & Gangopadhyaya, 2021). Therefore, the ACA enacted policies which were aimed to increase insurance rates for both young adult and non-elderly adults and as a result potentially reduce the burden of healthcare costs.

Data from the Behavioral Risk Factor Surveillance System (BRFSS) was used to formally conduct this research. The BRFSS data is collected annually and contains health related information from individuals in states all over the United States. Therefore, it serves as a suitable dataset in investigating the impact of the ACA among states who adopted the expansion or not.

A difference-in-differences model is used to evaluate the impact of the ACA expansion on cost barriers to healthcare for different age groups and subgroup analysis. This is done by comparing changes in the average outcome of cost barrier rate between expansion and non-expansion states pre and post ACA intervention. The main DiD is followed by an events study model to allow the DiD model estimates to have a causal interpretation.

The results from the DiD model produced statistically significant estimates for both age groups in the reduction of cost barriers to healthcare when an individual is from an ACA expansion state. The age group that demonstrated the highest reduction of cost barriers were older adults, but this was only with a 1 percent change difference.

The results from this study are important because it credits the ACA adoption in increasing health care access for all eligible individuals. Therefore, healthcare access is better

Impact of ACA Medicaid Expansion on Health Care Access

accessible for individuals in expansion states. My results also distinguish that the ACA has been successful in reducing cost barriers for young adults unlike previous research has dictated.

Literature Review

Adele Shartzter, Sharon K. Long, and Nathaniel Anderson are all researchers at the Health Policy Center at the Urban Institute that were interested in studying the preliminary effects in access and affordability of health care following the ACA implementation. In their research they used self-reported data from the Health Reform Monitoring Survey (HRMS) which is conducted by the Urban Institute. Their goal was to research changes in access and affordability among nonelderly adults (18-64) to healthcare before the first ACA enrollment period (September 2013) to just after the second enrollment period (March 2015) (Shartzter et al., 2016). Their results did show statistical significance in improving access to care among low-income adults. To be precise, they reported an increase of 5.2 percentage points from September 2013 to March 2015. Regarding cost barriers preventing care among low-income adults, their results were statistically significant and optimistic as well. They reported a 10.5 percentage point decrease from September 2013 to March 2015 (Shartzter et al., 2016). While these results seem impactful in crediting the ACA with increasing health access and reducing cost barriers so quickly after its implementation there still was room for improvement. As of 2015, more than 40% of low-income adults reported not receiving needed care due to cost and more than 20% reported problems accessing care (Shartzter et al., 2016). However, further established improvements to health care due to the ACA are expected especially with the positive preliminary results already found. Supplemental research is also needed to follow to potentially expose any inequalities among different demographic factors which weren't fully accounted for in this research. This absence gives justification for the main analysis by age group performed in this study along with further race sub analysis.

Impact of ACA Medicaid Expansion on Health Care Access

Anuj Gangopadhyaya and Emily Johnston are also fellow research associates in the Health Policy Center at the Urban Institute that also researched the effect of the ACA and focused specifically on low-income young adults ages 18-25. They were primarily concerned with the ACA's impact on health care access and insurance coverage. This is unlike the previous research mentioned that focused primarily on all low-income adults. Gangopadhyaya and Emily Johnston's attention on this age group was due to young adults having had the "highest rates of uninsurance among all age groups before passage of the (ACA)" (Johnston & Gangopadhyaya, 2021). The ACA expansion as mentioned earlier had created a provision which allowed adults to stay on their parent's health plan up to the age of 26. This could cause an increase in health care access for young adults. In their research, they also used data from the BRFSS. Their results did credit the ACA with a 13.7 percent reduction in uninsurance rates and therefore they argued the expansion did have an overall impact on reducing uninsurance among young adults (Johnston & Gangopadhyaya, 2021). However, their results analyzing changes in cost barriers for young adults proved that overall higher amounts of health insurance do not equate to overall higher reductions in cost barriers. Specifically, their results found that among all Medicaid eligible young adults, the ACA was responsible for a statistically insignificant 1.6 percentage point reduction in the likelihood of postponing health care due to cost barriers. Only the results for non-Hispanic Black young adults showed that the reduction of cost barriers to health care was large and significant. Another paper that analyzed the ACA's impact on insurance coverage credited the full implementation of the ACA with increasing coverage by 5.9 percentage points for all eligible individuals (Courtemanche et al., 2020). When splitting this analysis by non-Hispanic whites vs non-whites a larger affect was experienced by non-whites (7.9 percentage points in comparison to 5.9 percentage points). This is important because their data showed that

Impact of ACA Medicaid Expansion on Health Care Access

the non-white group originally experienced a higher percentage of uninsurance. As a result of that initial finding, the researchers correctly hypothesized that they would experience the higher benefit in uninsurance reduction. However, as stated earlier and demonstrated in Johnston & Gangopadhyaya's research an increase in insurance does not equate to a reduction in cost barriers. Therefore, further subgroup analysis by race in this study will help determine if the higher rates of insurance coverage granted by the ACA to nonwhites translates to less cost barriers as well.

Data

This paper uses data from the Behavioral Risk Factor Surveillance System (BRFSS) which was initiated by the CDC in 1984 (*CDC - about the behavioral risk factor surveillance system (BRFSS)* 2014). The BRFSS is a pooled cross-sectional dataset that gathers information from annual telephone questionnaires. Each year, over 350,000 adults aged 18 and older are randomly interviewed from all states and some territories in the United States. The interview consists of questions regarding demographics, health related behaviors, preventive health measures, and healthcare access. Therefore, the BRFSS allows for a suitable analysis of past and future health related policies among different states and regions in the United States.

For my research, I composed a sample from the BRFSS dataset consisting of low income, non-elderly adults from the years 2011-2016. The individuals in this sample would be ages 18-64 and have an annual income of less than \$35,000. 550,000 observations were included in this subpopulation for which the Medicaid expansion was intended to affect the most. Also, the years 2011-2016 were selected to best capture the pre-Medicaid expansion effects (2011-2013) and post Medicaid expansion effects (2014-2016). To conduct my analysis on further subpopulations I split my already restricted sample size into two groups by age. Age group 1 consisted of low-

Impact of ACA Medicaid Expansion on Health Care Access

income 18–24 year old individuals and age group 2 consisted of low-income 25–64 year old individuals. Age group 1 consisted of around 60,000 observations while age group 2 consisted of close to 500,000 observations.

The treatment and control groups used in this research consisted of all 50 US states plus Washington, DC. The treatment group includes states that expanded Medicaid by the year 2016 while the control group includes states that did not expand Medicaid by the year 2016. Our treatment group consisted of 32 states including Washington, DC while our control group consisted of 19 states summing to 51 groups in total. Figure 1 displays a map that illustrates the location of our treatment and control groups. It also shows that most expansion states are in the Northeast and west coast while non-expansion states are in the Southeast and Midwest.

Most of the variables used in this research, including the dependent variable, are binary and represent categorical information. The dependent variable is barriers to healthcare which demonstrates if an individual could not see a doctor due to cost. All variables are listed in Table 1 which portrays the mean values of each variable in expansion and non-expansion states before and after the ACA Medicaid expansion. Also, the main variable of interest is represented with the full sample size, age group 1, and age group 2. After the ACA expansion, the average percentage of cost barriers to healthcare in expansion states for all eligible individuals decreased by 7.05 %. while in non- expansion states there was a 4.39 % decrease. For age group 1, there was a 5.99% decrease in average healthcare cost barriers for expansion states and a 4.17% decrease in non-expansion states. For age group 2, There was a 7.18% average decrease in expansion states and a 4.33% decrease in non-expansion states. This signifies that there was an overall decrease in cost barriers to healthcare across all eligible individuals and my age groups of interest from both expansion and non-expansion states. It appears that expansion states also

Impact of ACA Medicaid Expansion on Health Care Access

experienced higher average amounts of the reduction of cost barriers to healthcare than non-expansion states. This makes sense considering the intentions of the policies of the ACA Medicaid expansion to improve healthcare access for all low-income adults. Another important result is that age group 1 which consists of individuals who are more likely to be accepted on a parents' insurance plan show the higher average percentage reduction as well.

Figure 2a illustrates the percent changes in cost barriers to health care over time for the total sample size and two age groups from both control and treatment states. For the total sample, there appears to be a constant decrease in the percentage of cost barriers for expansion states after 2013. However, non-expansion states seemed to have a small increase in the percentage of cost barriers after 2015. For age group 1, there is a decrease for both states for all years after 2013 but the decrease in the percentage of cost barriers for expansion states is noticeably steeper in comparison. For age group 2, there was a noticeable increase in the percentage of cost barriers for non-expansion states in the year 2015 which most likely means this age group was responsible for the small increase in the total sample size. The expansion states however had a decrease in the percentage of cost barriers for this age group.

Methods

A differences-in-difference (DiD) regression approach was taken to compare changes in the average outcome of cost barriers to healthcare between expansion and non-expansion states. A traditional DiD model works by comparing the before vs after treatment changes in outcome of a treatment group from a control group.

For the main study, a DiD regression model was conducted three times with the same control variables but differences in the ages. The first DiD regression included all eligible Medicaid recipients. The second DiD regression only included age group 1 which were eligible

Impact of ACA Medicaid Expansion on Health Care Access

Medicaid recipients ages 18-24 while the third DiD regression only included age group 2 which were eligible Medicaid recipients ages 25-64. These were all done to capture the causal effect of the expansion policy on the treated states for each group of eligible recipients listed before. The DiD regression model is presented below as equation 1:

$$(1) Medcost = a + B_1 medexp + B_2 post + \delta(medexp * post) + Controls + \epsilon$$

The variable “medexp” is a dummy variable that takes the value of 0 to indicate the observation comes from a control state that did not expand Medicaid or 1 to indicate if the observation comes from a treatment state that did expand Medicaid. The variable “post” is also a dummy variable which indicates if the observation was taken before the ACA expansion (2011-2013) by a value of 0 or after the ACA expansion (2014-2016) by a value of 1. “medexp*post” is a dummy interaction variable that has a value of 1 for a control state after the ACA expansion and 0 for all other variations of grouping. B_1 captures the average difference in outcome pre-expansion between both groups and B_2 captures the time trend in control states. δ is the coefficient of interest or DiD estimator that captures the causal changes over time due to the expansion. The controls used in this model as mentioned before consisted of different dummy variables that represent categorical information regarding race, sex, education level, and different brackets of income that qualify for Medicaid coverage.

A major assumption in a DiD model is that the trends of outcomes for both the treatment and control groups would be similar without the intervention of a treatment. This is called the parallel trends assumption and it is needed to give a causal interpretation of the DiD regression results. Therefore, to test if the parallel trend assumption holds, an event study model was also conducted. The event study model is presented below as equation 2:

Impact of ACA Medicaid Expansion on Health Care Access

$$(2) \text{ Medcost} = a + B_1\text{medexp} + B_22011y + B_32012y + B_42014y + B_52015y + B_62016y \\ + \delta_1(\text{medexp} * 2011y) + \delta_2(\text{medexp} * 2012y) + \delta_3(\text{medexp} * 2014y) \\ + \delta_4(\text{medexp} * 2015y) + \delta_5(\text{medexp} * 2016y) + \text{Controls} + \epsilon$$

In this specific case, the event study model is splitting the DiD effect of the Medicaid expansion by each year instead of a time period indicator of before or after expansion. Therefore, we can examine the trends in cost barriers to healthcare between expansion and non-expansion states before the Medicaid expansion. This is to see if the trends are parallel to each other and an indicator if the results of the non-expansion states can serve as a proper counterfactual for expansion states. To test this assumption the coefficient of δ_1 which signifies expansion state classification in the year 2011 and δ_2 which signifies expansion state classification in the 2012 would need insignificant. This is because we would not expect any difference between the two groups since the Medicaid expansion has not taken place to affect the outcome variable of interest. If significance is shown on these coefficients, then we cannot interpret the Medicaid expansion as the cause of the change in our outcome variable.

Results

The DiD regression results from equation 1 are presented on Table 2a for each variation in age group. For all eligible recipients in the sample, the ACA Medicaid expansion led to a statistically significant 2.73 percentage point decrease in cost barriers to health care. Before the ACA expansion in 2013, the mean cost barrier rate in expansion states was 28.66 %. Therefore, the 2.73 percentage point decrease in cost barriers represents a 9.53 percent change.

The results of the event study (Table 3) allow the DiD estimator to have a causal interpretation since the first two coefficients that compare the years before the ACA expansion took place are insignificant and the parallel trends assumption is satisfied for the outcome. Now the effects of the Medicaid expansion in the years of 2014, 2015, 2016 can each be justly interpreted. The

Impact of ACA Medicaid Expansion on Health Care Access

results suggest that the ACA Medicaid expansion led to a .29 percentage point reduction in cost barriers in year 2014 (statistically insignificant), 2.08 percentage point reduction in cost barriers for year 2015, and a 3.69 percentage point reduction in year 2016. In table 2a, the combined effect was a 2.73 percentage point decrease in reduction to cost barriers which is an average of the smaller effects in 2014 and the larger effects in 2015 and 2016.

For age group 1, the DiD results estimate the ACA Medicaid expansion led to a statistically significant 1.92 percentage point decrease in cost barriers to health care. Since the mean cost barrier rate for expansion states right before policy implementation was 21.71%, the 1.92 percentage point decrease represents a 8.84 percent change. Again, the event study regression results for this sole age group satisfy the parallel trends assumption. Therefore, for age group 1 the ACA Medicaid expansion led to a .87 percentage point reduction in the year 2014 (statistically insignificant), 3.04 percentage point reduction in the year 2015, and 2.99 percentage point reduction in 2016. This shows that the combined effect of the DiD estimator of a 1.92 percentage point decrease is an average of the smaller effect in 2014 and larger effects in 2015 and 2016.

For age group 2, the DiD results estimate the ACA Medicaid expansion led to a statistically significant 2.91 percentage point decrease in cost barriers to health care. Since the mean cost barrier rate for expansion states right before the policy was 29.6%, the 2.91 percentage points decrease represents a 9.88 percent change. However, the event study regression results for this age group do not satisfy the parallel trends assumption because the coefficient comparing the years before expansion between groups show a difference in trends. Therefore, the average effects per year cannot be causally interpreted.

Subsample Analysis and Results

Impact of ACA Medicaid Expansion on Health Care Access

To perform further analysis regarding the ACA's impact on cost barriers by race the original DiD model (same controls) was once again split by race grouping. Precisely, races were split into two groups: white and nonwhite. Nonwhites represented individuals that characterized themselves as either Hispanic, black, Asian, Hawaiian, American Indian, or other. Figure 2b is like Figure 2a however instead of age it illustrates the percent changes in cost barriers to health care by whites and nonwhites from both control and treatment states. The nonwhite group noticeably starts off as the highest cost barrier reporting group for both expansion and non-expansion states. They also similarly report the highest percentages of cost barriers in 2016 in comparison to white individuals in both state types again. However, improvement is indicated by the sharp percentage decrease in cost barriers after 2013 in expansion states (trend is common among white individuals and total sample however). In non-expansion states, nonwhites also experience a consistently decreasing trend after 2013 while white individuals experience an increase in 2016.

The DiD results for this analysis is illustrated on Table 2b. For all white individuals, the ACA Medicaid expansion led to a statistically significant 3.4 percentage point decrease in cost barriers. Since the mean cost barrier rate for expansion states right before the policy was roughly 28%, the 3.4 percentage point decrease represents a 12.13 percent change decrease. Next, for all nonwhite individuals, the ACA Medicaid expansion led to a statistically significant 1.61 percentage point decrease in cost barriers. Since the mean cost barrier rate for expansion states right before the policy was roughly 29.71%, the 1.61 percentage point decrease represents a 5.44 percent change decrease overall.

Discussion

Impact of ACA Medicaid Expansion on Health Care Access

The results of my study provide evidence that the Medicaid expansion was successful in reducing cost barriers to health care for all eligible individuals by a relatively significant amount (9.53 percent change). This is important because while uninsurance rates have been credited with declining due to the ACA, insurance coverage does not directly affect an individual's likelihood of being immune to health care costs. Johnston and Gangopadhyaya's study also indicated that in their research specifically on young adults where they found that uninsurance reduced but the financial burden of health care costs was still prevalent. My results were also different from theirs regarding the impact of the ACA on cost barriers for young adults. They concluded the ACA did not have a clear impact on reducing cost barriers for young adults, however, my results proved the opposite. Our results may be different because I used BRFSS data from the years 2011–2016 while they used BRFSS data from the years 2011-2018. Therefore, they account for trends in years which I did not. Another important result from my study is that the older age group (25-64) experienced the highest reduction of cost barriers compared to the younger age group but by a 1 percent change difference. However, the event study indicated that for age group 2 the parallel trends assumption was not satisfied. This is interesting considering the parallel assumption was satisfied for the total sample size and individuals from age group 2 consisted of 89.3 % of the sample. The difference in sizes between the two groups could potentially limit the interpretations of my results as well.

My subgroup analysis also had some surprising results as well. Overall, the ACA expansion reduced cost barriers to healthcare for both eligible white and nonwhite individuals after it was enacted. However, white individuals seemingly benefited the most in comparison to nonwhite individuals who reported slightly higher rates of cost barriers to healthcare preceding full ACA enactment. In other words, the ACA seemingly did not reduce racial disparities between

Impact of ACA Medicaid Expansion on Health Care Access

white individuals and nonwhite individuals. This is surprising since previous literature as mentioned before credited the ACA with improving the gap between uninsurance rates between both groups.

Overall, my results indicate that Medicaid adoption is pivotal in reducing the likelihood of eligible individuals and specifically eligible young adults on avoiding health care due to cost. However, perhaps additional years of post ACA data should be included in future research to give adequate time for its policies affects to extend between different race and age group variations.

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Impact of ACA Medicaid Expansion on Health Care Access

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Tables and Figures

Table 1: Descriptive Statistics

Variables	Expansion States		Non – Expansion States	
	Before	After	Before	After
Medcost: total sample	0.2942	0.2237	0.3335	0.2897
Medcost: subgroup 1	0.2285	0.1686	0.2526	0.2109
Medcost: subgroup 2	0.3022	0.2304	0.3429	0.2996
Insurance	0.7016	0.8342	0.6481	0.7275
Hispanic	0.1505	0.1766	0.1070	0.1390
White	0.6249	0.6069	0.6400	0.6200
Black	0.1253	0.1109	0.1846	0.1742
Asian	0.0216	0.0288	0.0085	0.0097
Hawaiian	0.0044	0.0049	0.0018	0.0018
American Indian	0.0325	0.0299	0.0306	0.0296
Other	0.0408	0.0420	0.0275	0.0256
Age 18-24	0.1079	0.1080	0.1040	0.1114
Age 25-29	0.0868	0.0883	0.0881	0.0912
Age 30-34	0.0827	0.0827	0.0852	0.0888
Age 35-39	0.0763	0.0780	0.0761	0.0808
Age 40-44	0.0832	0.0790	0.0824	0.0791
Age 45-49	0.1012	0.0942	0.1018	0.0899
Age 50-54	0.1373	0.1320	0.1359	0.1274
Age 55-59	0.1545	0.1581	0.1548	0.1555
Age 60-64	0.1701	0.1798	0.1716	0.1758
Married	0.2951	0.2852	0.3273	0.3181
Female	0.6016	0.5818	0.6162	0.5977
High School	0.3784	0.3754	0.3843	0.3802
Some College	0.3018	0.3000	0.3075	0.3074
College	0.1724	0.1743	0.1519	0.1556
Income < \$10,000	0.1698	0.1640	0.1627	0.1507
Income btwn \$10,000 & \$15,000	0.1459	0.1430	0.1461	0.1371
Income btwn \$15,000 & \$20,000	0.1876	0.1945	0.1919	0.1954
Income btwn \$20,000 & \$25,000	0.2249	0.2290	0.2273	0.2374
Income btwn \$25,000 & \$30,000	0.2718	0.2695	0.2721	0.2794

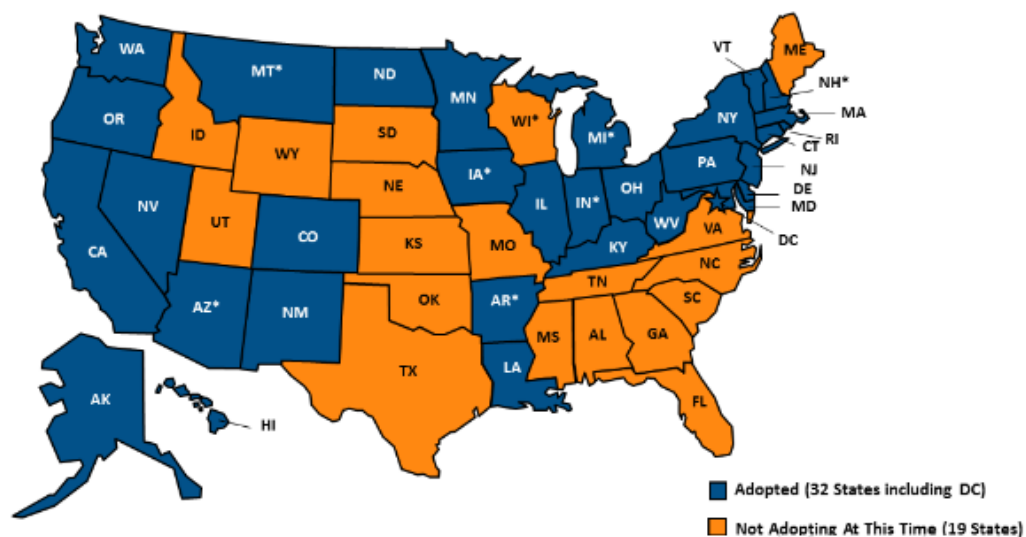
Note: Means of outcome variables of interest & other covariates above.

*Before represents the years before ACA expansion (2011-2013)

*After represents the years after ACA expansion (2014-2016)

Figure 1

Current Status of State Medicaid Expansion Decisions



Source: "Status of State Action on the Medicaid Expansion Decision," KFF State Health Facts, updated January 1, 2017

Figure 2a

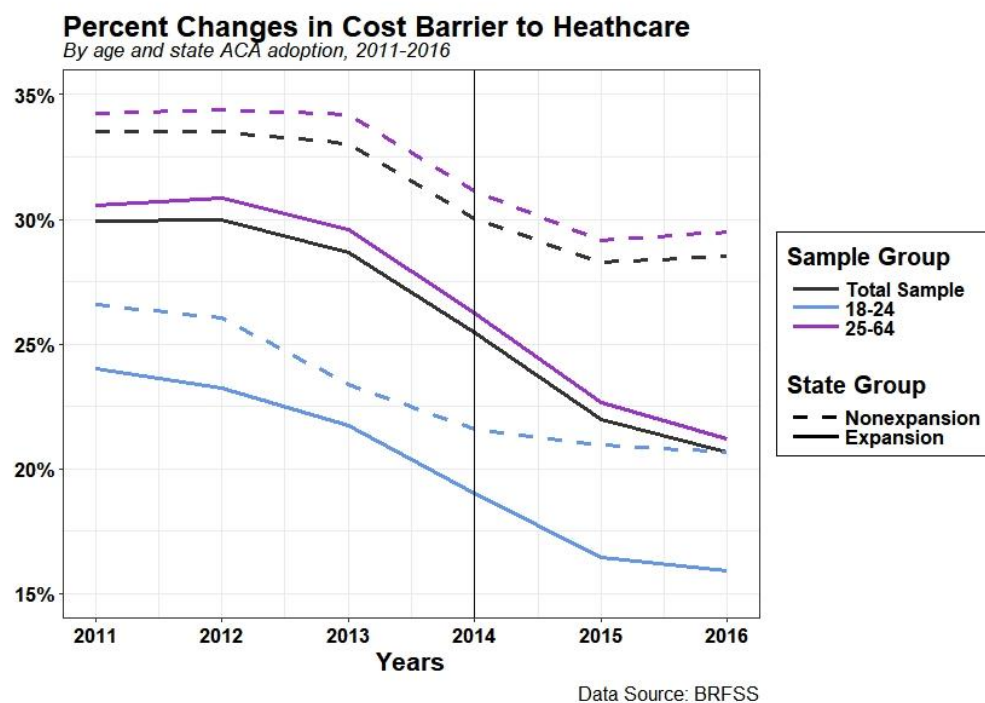


Figure 2b

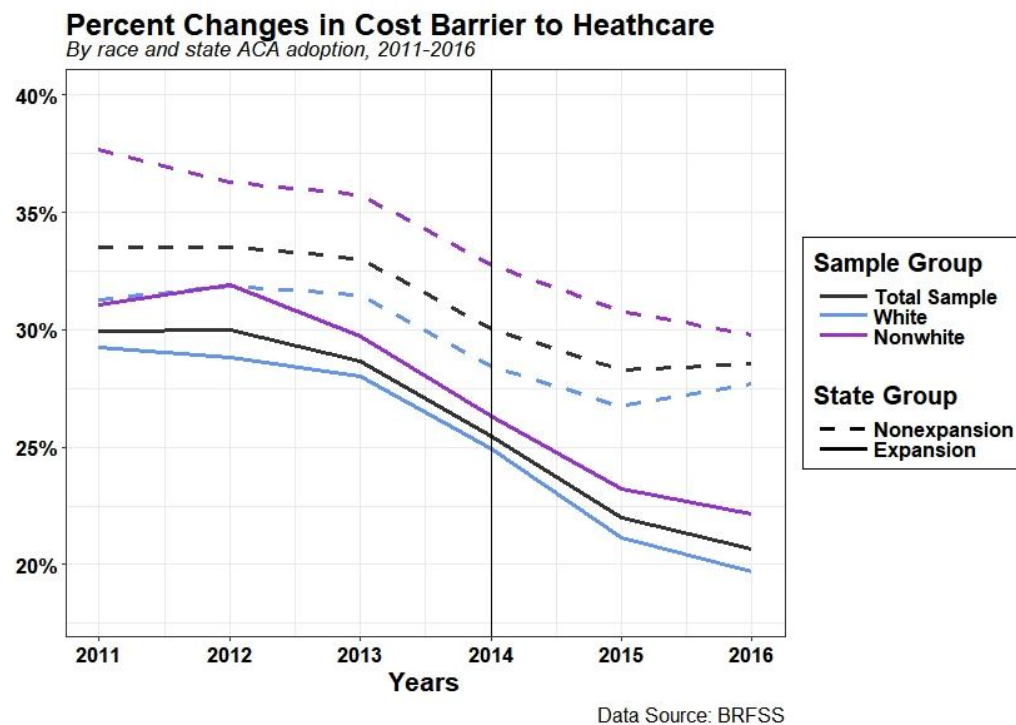


Table 2a Difference-in-Differences Regression Results

	Coefficient	Standard Error	P-Value
Total Sample: medexp*post	-0.0273774	0.0024418	0
18-24: medexp*post	-0.0192059	0.0067428	0.004
25-64: medexp*post	-0.0290625	0.0026045	0

Table 2b Difference-in-Differences Regression Results

	Coefficient	Standard Error	P-Value
Total Sample: medexp*post	-0.0273774	0.0024418	0
White: medexp*post (Pre-treatment cost-barrier rate =.280)	-0.0340811	0.0030515	0
Nonwhite: medexp*post (Pre-treatment cost-barrier rate =.297)	-0.0161825	0.0040705	0
18-24: medexp*post	-0.0192059	0.0067428	0.004
25-64: medexp*post	-0.0290625	0.0026045	0

Table 3. Event Study Results

		Coefficient	Standard Error	P-Value
Total Sample (18-64)	medexp*y2011	0.0057382	0.0040555	0.157
	medexp*y2012	0.0065892	0.0041634	0.113
	medexp*y2014	-0.002979	0.0042036	0.479
	medexp*y2015	-0.0208147	0.0042759	0
	medexp*y2016	-0.0368398	0.0041579	0
Ages 18-24	medexp*y2011	-0.0103039	0.0115766	0.373
	medexp*y2012	-0.0101741	0.0114035	0.372
	medexp*y2014	-0.0087525	0.0112235	0.435
	medexp*y2015	-0.0304026	0.01158	0.009
	medexp*y2016	-0.0299508	0.0111975	0.007
Ages 25-64	medexp*y2011	0.0075611	0.0043096	0.079
	medexp*y2012	0.0088404	0.0044438	0.047
	medexp*y2014	-0.0027194	0.0045009	0.546
	medexp*y2015	-0.0202506	0.0045727	0
	medexp*y2016	-0.0381443	0.0044484	0