Essays in Health Economics and Health Policy

By

Salama S. Freed

Dissertation

Submitted to the Faculty of the

Graduate School of Vanderbilt University

in partial fulfillment of the requirements

for the degree of

DOCTOR OF PHILOSOPHY

in

Economics

May 11, 2018

Nashville, Tennessee

Approved:

Christopher S. Carpenter, PhD

Melinda B. Buntin, PhD

Andrew J. Goodman-Bacon, PhD

Michelle Marcus, PhD

Copyright © 2018 by Salama Salihah Freed
All Rights Reserved

ACKNOWLEDGMENTS

I would like to thank my committee for critical and insightful comments and support on this work. Further, I must express my deep appreciation for my committee members' patience, encouragement, and bottomless pool of support as I sought to make my way through this process.

This work also benefited from helpful comments of participants at the IU/VU/UL Workshop as well as the weekly Applied Microeconomics Working Group at Vanderbilt.

Without the financial support of the Robert Wood Johnson Center for Health Policy at Meharry Medical College, I would not have been able to complete this doctoral program. I am eternally appreciative to Robyn Folks, Mariah Cole, Ayesha Keller, Charlane Oliver, Drs. Frank Sloan, Dexter Samuels, and Dan Howard, as well as the rest of the Meharry Center for Health Policy staff for professional development guidance.

I would also like to thank Laura Keohane, Robert Gambrel, David Stevenson, and Melinda Buntin for collaboration on the joint publication "Understanding Trends in Medicare Spending, 2007-2014." This work was published online on March 6, 2018 in Health Services Research (https://doi.org/10.1111/1475-6773.12845) and has been reproduced for this dissertation with copyright permission from Wiley Online Library. Funding for this work is through a multi-year grant provided by The Commonwealth Fund, for which I am deeply grateful.

I owe gratitude to Joseph Benitez and Susan Camilleri for allowing me to share "Diff'rent Votes, Same Strokes," a joint collaboration, as the final chapter of this dissertation.

I must thank the Department of Health Policy at Vanderbilt Medical Center, my colleagues in the Economics Department at Vanderbilt, and my mentors at Duke University (Drs. Frank Sloan, Charles Becker, and Sandy Darity) for seeing my potential and giving me a chance.

Most importantly, my parents have been consistent sources of support and encouragement, while my sister was my first and best teacher. Finally, my family and friends–old and new, near and far–have taken care of me when I have forgotten to take care of myself. Thank you for supporting me and believing in me.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Chapter 1

Health Insurance Take-Up Among the Near-Elderly in the Age of the Affordable Care Act

1.1 Introduction

Policies aimed at expanding insurance coverage can have very different effects on different groups. For example near-elderly individuals' proximity in age to Medicare eligibility further the effects of programs that increase health insurance coverage. Those receiving generous benefits may be able to seek treatment immediately; those with less generous or no coverage have an incentive to forgo elective or preventive care until they are eligible for Medicare.

Because the near-elderly transition into near-universal health coverage at age 65, it is crucial to understand how programs intended to increase coverage prior to this transition will affect this population. If individuals are already covered, the policy to increase insurance coverage will have little effect. However, if individuals are obtaining insurance coverage prior to reaching the Medicare eligibility age, the new insurance coverage may help them gain treatment for conditions earlier, reducing the potential for sharp health care demand increases upon entering Medicare and possibly improving their health. Finally, the structure and generosity of insurance plans obtained through expansion efforts compared to Medicare generosity may determine whether newly insured individuals seek care in the near term or wait until enrolling in Medicare.

The ambiguity of effects of the Affordable Care Act (ACA) on the near-elderly population and threats to repeal the law motivate for this paper. While the ACA reduced the uninsurance rate by half among all non-elderly adults (The Henry J. Kaiser Family Foundation, 2017), we know little about the law's effect on the near-elderly. Changes in health care access and health insurance among this group are particularly important to understand, as this group consumes more medical services than their younger counterparts. Further, health care coverage of the near-elderly may impact consumption and spending once these individuals enter Medicare.

In this paper, I estimate the effect of the ACA on insurance coverage of the near-elderly transitioning into Medicare. I specifically study the short-term change in insurance rates of near-elderly individuals before and after the implementation of the ACA. I utilize the exogenous transition into

Medicare at age 65 to evaluate whether the ACA reduced the gap in continuous insurance coverage of newest Medicare beneficiaries. I use a Difference-in-Regression Discontinuity (RD-DD) research design with data from the American Community Survey (ACS), Behavioral Risk Factor Surveillance Survey (BRFSS), and National Health Interview Survey (NHIS) to estimate the change in the insurance rate at the age 65 threshold (i.e. the RD) before and after the ACA (i.e the DD).

Before 2014, insurance coverage jumps by 7.97 percentage points at age 65 (90.1% to 98%): after the ACA the difference falls by 3.4 ($p<0.001$) percentage points. Sixty percent of the insurance gains in Medicaid expansion states come from Medicaid, while 86 percent of gains in non-expansion states come from private insurance policies. Further, I find that the ACA narrowed but did not close insurance coverage disparities between races. The insurance rates both before and after the cutoff are higher for whites than blacks; for whites, insurance rates jumped from 91.4% to 98.7% at the cutoff, while insurance rates for blacks jumped from 87.7% to 96.2%. Though the point estimates are similar for non-Hispanic Whites and non-Hispanic blacks (2.99 and 2.61 percentage points, respectively), the relative effect of the ACA is larger for whites (40%) than blacks (30%).The relative effect of the ACA on other races is the largest; of the 12.9 percentage point jump in insurance coverage (from 81.3% to 94.1%) at the cutoff, two-thirds of that is due to the coverage provisions of the ACA.

Despite extending health care coverage for 20 million Americans, efforts to repeal and replace the ACA have moved forward several times in 2017. Each bill proposed would have entailed large reductions in the insurance rate; the Congressional Budget Office (CBO) estimated up to 14 million individuals would be without insurance by the end of 2018 in scoring the American Health Care Act (AHCA).[1] The near-elderly population, those between the ages of 55 and 64, who obtained insurance under the ACA were expected to be affected disproportionately by its repeal; passage of the AHCA could result in premiums increasing up to five times higher than those of younger adults, while tax credits would only be twice as large (Congressional Budget Office, 2017, p. 2). Additionally, proposed Medicaid block grants that diminish in real terms over time, where states receive lump sums to administer Medicaid, would effectively halt and eventually reverse Medicaid expansions.

[1] CBO scores for other bills (Graham-Cassidy and Better Care Reconciliation Act) produced similar estimates of the number of uninsured individuals resulting from ACA repeal.

The order of the paper is as follows. In the next section, I describe the institutional setup pertinent to this population and the mechanisms through which obtaining health insurance prior to age 65 would affect use patterns in Medicare. I review the sample selection and research design for this study in Section 1.3, and discuss results and robustness checks in Section 1.4. Finally, I close with policy implications and future steps in Section 1.5.

1.2 Institutional Setup and Literature Review

Prior to the Affordable Care Act, 81.5 percent of those aged 18 to 64 were covered by some source of health insurance compared to 87.6 percent of 60- to 64-year olds (United States Census Bureau, 2016).[2] In 2013, 52.5% of the near-elderly population obtained coverage via employer-sponsored insurance (ESI) plans. Disabled low-income individuals and low-income adults with dependent children may have been eligible for public insurance under Medicare or Medicaid, though state-level eligibility depended on income and disability qualifications. Seventeen states offered basic health insurance plans for low-income childless adults, although plan options, eligibility, and availability were by no means universal across states.[3] About 3 percent of near-elderly individuals obtained health insurance through other programs sponsored by the federal government, such as TRICARE or the Indian Health Service. Finally, those who did not qualify for any of the former options could have purchased individual insurance plans directly from companies; nearly 10% of the near-elderly obtained coverage this way.

For the near-elderly, whose medical use and costs are generally higher than the rest of the non-elderly population, the effects of being uninsured or underinsured are clear. Those who lack health insurance use fewer medical services, often leading to undiagnosed, untreated, or unmanaged chronic conditions (Wilper et al., 2009; McWilliams et al., 2004; Kaufman et al., 2015). These effects are more pronounced in the near-elderly, who generally have a higher prevalence of chronic conditions such as hypertension and diabetes.

Once reaching Medicare eligibility age, previously underinsured and underinsured people tend to utilize Medicare services at a higher rate than new enrollees who were previously adequately insured, particularly if they have been uninsured for a long period of time (Card et al., 2008;

[2] See (The Henry J. Kaiser Family Foundation, 2017) for the most recent statistics on non-elderly uninsurance rates.
[3] A full list of states providing basic health plans prior to 2014 can be found in Simon et al. (2017).

McWilliams et al., 2007) McWilliams et al. (2009) linked administrative claims data with the Health and Retirement Study to investigate utilization before and after individuals enroll in Medicare. The authors found previously uninsured individuals had higher hospitalization rates for lower extremity joint replacement and complications related to certain chronic conditions. Decker et al. (2012) also linked administrative data with the National Health Interview Survey (NHIS) and Health and Retirement Study (HRS) but did not find the same increases in hospitalizations. However, the authors did find previously uninsured people had more emergency department and outpatient hospital visits and fewer office-based physician visits.

Most relevant to this topic is a study by Card et al. (2008), which used the NHIS and inpatient discharge data to analyze coverage and utilization of near-elderly individuals near the Medicare eligibility threshold. Using a regression discontinuity based on the Medicare age cutoff, they found a 9.5 percentage point increase in health insurance coverage, sharp increases in use of low cost health services, and modest increases in elective surgeries. Subgroups who been uninsured or underinsured showed the largest increases in utilization, suggesting that pre-Medicare insurance coverage affects post-Medicare consumption.

The ACA included three kinds of policies meant to increase health insurance among non-elderly individuals who previously were unable to afford it. The first effort to expand insurance coverage came via several changes to employer sponsored insurance between 2010 and 2016. In 2010, employers received funding to cover insurance for near-elderly individuals in the case of retirement prior to age 65. Between 2014 and 2016, small firms began offering insurance to their employees; employer mandates went into effect for firms with at least 50 employees (2015), then firms with at least 100 employees (2016). The government offered tax credits aimed at assisting small firms, those with less than 25 employees, obtain health insurance coverage. The credit incentives, first offered in 2010, increased in 2014 for firms purchasing insurance via the state insurance exchanges (French et al., 2010).

Second, the ACA established health insurance marketplaces, where the uninsured could purchase community-rated and potentially subsidized private health insurance plans. In states that expanded Medicaid, those obtaining insurance via the exchanges qualify for premium tax credits if their income is between 138 and 400% of the Federal Poverty Level. In states that did not expand Medicaid, premium tax credits are available for people with incomes between 100 and 400% of

the federal poverty level. These two coverage options had the potential to benefit the near elderly population substantially; half the uninsured individuals between ages 60 and 64 stated high cost as a reason for lacking health insurance (National Center for Health Statistics, 2016).

Third, the ACA allowed states to expand Medicaid to low-income childless adults. Prior to the ACA, low-income people who were childless had few options to obtain affordable coverage. The ACA offered incentives to states to expand Medicaid eligibility and offer low- to no-cost state-run public insurance to single childless adults earning below 139% of the Federal Poverty Level (FPL).[4] To date, thirty-one states and the District of Columbia have implemented the ACA's Medicaid expansion.

Numerous studies have detailed the effects of Medicaid expansions on health insurance coverage for the low-income non-elderly population. A few, such as Sommers et al. (2014), estimated the effect of the Medicaid expansion on uninsurance rates in states that opted to expand prior to full ACA roll-out in 2014. The authors found modest (between 3.7 and 4.9 percentage point) increases in health insurance coverage in these states. Others analyzed the effects following the full Medicaid expansion rollout. Simon et al. (2017), using data from the Behavioral Risk Factor Surveillance Survey, found an increase of 5.4 percentage points in health insurance coverage after the first 2 years of the Medicaid expansion; this was between the 7.4 percentage points reported by Wherry & Miller (2016) using the National Health Interview Survey and 2.9 percentage points reported by Courtemanche C, Marton J, Ukert B, Yelowitz A, Zapata D. (2017) using American Community Survey data. Others (Barbaresco et al., 2015; Long et al., 2017; Sommers et al., 2017) reported similar estimates.

Few have given attention to the near-elderly population. At most, there is a mention of increased insurance rates among those ages 55 to 64 (Long et al., 2017). However, there is no study, to my knowledge, that evaluates coverage rates in the near-elderly population and whether these changes bring near-elderly insurance rates to parity with Medicare coverage rates. This particular population is important for a few reasons. As previously mentioned, the near-elderly are more likely to have chronic conditions and higher demand for medical care; this group gaining health insurance prior to

[4]Initially, the federal government mandated state expansions of Medicaid. However, the Supreme Court, in National Federation of Independent Business v. Sebelius ruled against the mandate and granted states the option to refuse expansion. See Rosenbaum & Westmoreland (2012) for implications of this decision on Medicaid and the flexibility of enacting the ACA.

entering age 65 may alleviate the pent-up demand that occurs after initial Medicare enrollment. The newly insured individuals may manage chronic conditions at earlier stages, potentially offsetting future costly medical procedures. The benefits of these coverage provisions may provide substantial savings for the 45% of uninsured near-elderly individuals who have been so for longer than three years (National Center for Health Statistics, 2016). This paper fills this gap by studying how the ACA affected the coverage transition to Medicare.

1.3 Data and Estimation Strategy

1.3.1 Data

To measure the changes in insurance rates among the near-elderly and elderly, I use the 2009-2016 waves of data from three sources: American Community Survey (ACS), Behavioral Risk Factor Surveillance Survey (BRFSS), and National Health Interview Survey (NHIS). I restrict each sample to individuals between 60 and 70 years old, resulting in 3.1 million observations from ACS, 636,000 observations in BRFSS, and 75,000 observations in NHIS.

The American Community Survey is the most comprehensive source for this study, as it provides state-level identifiers and detailed information on respondents' insurance types. Of interest to this study is the question asking: "Is this person currently covered by any of the following types of health insurance or health coverage plans?" Respondents may identify more than one type of insurance coverage from the following choices:employer or union, direct purchase from an insurance company, Medicare, Medicaid, Veterans Administration, TRICARE, and Indian Health Service.

Second, I use the Behavioral Risk Factor Surveillance Survey. For this study, I focus on the question "Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, government plans such as Medicare, or Indian Health Service?" The respondent is given a binary choice, unless they refuse to answer or do not know.

Finally, I use the National Health Interview Survey, which unfortunately does not provide state identifiers, to verify my results and maintain consistency with other studies. I focus on the set of questions in the family health insurance module. I measure any health insurance coverage from the question "Are you covered by an kind of health insurance or some other kind of health plan?" and specific types of insurance with the follow-up question "What kind of health insurance do

you have?" The options offered to the respondent are: Private Health Insurance, Medicare, Medigap, SCHIP, Military Health Coverage (TRICARE, VA, CHAMPUS), Indian Health Service, State Sponsored Plan, Other Government Plan, and Single Service Plan.

Descriptive statistics for data associated with each of these sources can be found in Table 1.1. Prior to the Affordable Care Act, the insurance rate among 60-64 year olds ranged from 87.4% (in BRFSS) to 88.3% (in NHIS), compared to an average of 98.4% among 65-70 year olds, as shown in Table 1.1. After the ACA, the insurance rate for the elderly remained steady, but for the near-elderly, there was a substantial increase in insurance rates to 91.7% due to the ACA. Just over half the observations are female, and the fraction of females increases after age 65. Approximately 2 of every 3 individuals in each sample are married both before and after age 65. Because of the conflicting definitions of employment in each survey, the fraction of individuals employed varies by data source; however, the decline in employment before compared to after age 65 is consistent across all samples. Across all surveys, approximately 11.7% to 15.7% of respondents had left school prior to obtaining a diploma, while 25% to 29% obtained a high school diploma or GED. On average, 30% to 32% have completed postsecondary education or continued to obtain higher level degrees.

1.3.2 Research Design

To estimate the change in insurance coverage due to the ACA at age 65, I use a Difference-in-Regression-Discontinuity (DiRD or DD-RD) design. I compare the difference in insurance for near-elderly individuals prior to ACA implementation to the elderly who are enrolled in Medicare after ACA implementation. I first estimate the difference in insurance rates at the threshold just prior to individuals becoming eligible for Medicare at age 65. Second, I estimate the magnitude of the change in the insurance rate among near-elderly adults.

First, I replicate the Card et al. (2008) regression discontinuity design, utilizing the change in Medicare eligibility that occurs among nearly every US citizen at age 65. The main outcome of interest, Y_{it}, is insurance rate. For individual i in time t, outcome Y_{it} is modeled as:

$$Y_{it} = \alpha_0 + \alpha_1(PostAge65_i) + \alpha_2 f(Age_{it}) + X'_{it}\alpha_3 + \gamma_t + \varepsilon_{it} \tag{1.1}$$

In this equation, *PostAge*65 is an indicator that equals one if the individual is age 65 or older. The coefficient α_1 measures the magnitude of the abrupt discontinuity of the probability of being insured upon reaching age 65.

The second difference is based on the date of implementation for the two relevant pieces of the law–Medicaid expansion and creation of the exchanges. Most states that expanded Medicaid did so in January 2014; it should follow that outcomes would be most strongly affected in 2014-2016 compared to 2009-2013. The same applies to insurance obtained through the exchanges, which became active in January 2014. I combine the Regression Discontinuity in Equation 1.1 with a differences-in-differences model to measure the effect of the ACA on the disparity in insurance rates at the age 65 discontinuity. This is estimated by:

$$Y_{it} = \beta_0 + \beta_1(PostAge65_i * PostACA_t) + \beta_2 f(Age_{it}) + X'_{it}\beta_3 + \delta_t + \varepsilon_{it} \tag{1.2}$$

In Equation (1.2), *PostACA* is an indicator that equals one in 2014 and after. The coefficient β_1, is an estimate of change in insurance rates at the age 65 threshold between pre- and post-ACA periods. I also include a set of controls, including indicators for marital status, sex, education level, race, and employment status in this regression. Finally, I include a linear function of an individual's age as well as time fixed effects and cluster by age.

1.4 Results

For consistency and clarity, I discuss only the results from the American Community Survey. Estimates from BRFSS and NHIS, shown in Appendix A, are consistent with these results.

1.4.1 Full Sample

Figure 1.1 highlights the usefulness of an RD-DD framework to estimate the effect of the ACA on insurance rates for the near-elderly as they approach Medicare age. This figure shows the probability of being insured for individuals between age 60 and 70 both before and after the ACA. Insurance rates for those aged 65 to 70 do not change over time. Insurance rates for the near-elderly, however, change substantially. Prior to the ACA, the difference in the insurance rate at the threshold was 9 percentage points on a base of 88.7%. After the ACA, the difference at the cutoff decreases

to 5.9 percentage points. Figure 1.2 plots the year-by-year discontinuity in insurance rates at the Medicare eligibility threshold. (Of note is the slight decrease in the uninsurance rate in 2013. This early effect can be attributed to a combination of early expansions in some states and the "woodwork" effect, where previously eligible individuals take up Medicaid due to increased publicity and the threat of penalties.) In the first year of widespread ACA implementation, the disparity in insurance rates at the age 65 threshold dropped 1.2 percentage points ($p<0.001$) from 8.1% to 6.9%.[5] The change in insurance coverage in the second year of implementation was slightly smaller (0.9 percentage points), but there was another substantial drop in 2016 of 1.45 percentage points. In total, the gap in insurance rates at the threshold was reduced by 44% due to newly enacted ACA coverage provisions.

Several other pieces of evidence suggest that these changes in the age 65 discontinuity are due to the ACA. Since policies associated with the Affordable Care Act were aimed at expanding Medicaid and providing an avenue for individuals to purchase private insurance, it is reasonable to expect changes only in these two types of insurance. Figure 1.3 graphs the RD estimates of the change in the probability of having Medicaid as the sole source of insurance at age 65. Prior to 2014, only 4.4% of 63- and 64- year-olds were insured by Medicaid alone. Medicaid expansion after the first year resulted in an increase of 2.3 percentage points, followed by another 1.2 percentage point increase in 2015 and 2016. Combined, the average effect of Medicaid expansion resulted in a decrease in the insurance rate gap at the age 65 threshold by 3.5 percentage points. I find similar effects on private insurance coverage, shown in Figure 1.3. Prior to the ACA, approximately 10% of the near-elderly population purchased insurance directly. Marketplaces were open to the public in the final months of 2013 for coverage in 2014. In the first year of marketplace offerings, the the fraction of individuals gaining coverage via the private market insurance rate changed by less than one percentage point. Coverage via the marketplace further reduced the gap in insurance coverage at the cutoff by 1.4 percentage points in 2015 and 1 percentage point in 2016.

I further show the changes in other types of insurance and, by extension, changes in the discontinuity at age 65, as individuals become eligible to enroll in Medicare are negligible after the ACA became law. Columns 1, 4, and 7 in Table 1.2 display the difference in magnitude at the cutoff

[5] RD estimates may be biased toward zero in 2014 as the open enrollment period extended through March 31, 2014 or beyond for some. See Claxton et al. (2014) for more details.

for Medicare, Employer Sponsored Insurance (ESI), and any combination of two or more types of insurance. In order for the changes in the magnitude of the discontinuity to be due to the ACA, the year-on-year estimates must remain constant for Medicare and those who have insurance from two or more sources. Among the full sample, there were no statistically significant changes in the discontinuity gap at the age 65 cutoff for those enrolled in Medicare, ESI, or two or more sources of insurance.

1.4.2 Low Income Earning <139% FPL

Before the ACA, the gap in insurance coverage at the cutoff is twice as large in individuals earning less than 139% of the FPL compared to the overall population: reaching Medicare eligibility age increases insurance coverage 14 percentage points relative to a base of 78.5%. The ACA specifically targeted this group, and reduced the uninsurance rate among low-income 63- and 64-year-olds by 6.3 percentage points, closing the gap at the threshold by 45%.

Figure 1.3 plots the magnitude of the discontinuity by year for low-income Medicaid enrollees. Expansion of Medicaid for low-income childless adults resulted in immediate changes for this group; after a slight increase in the gap at the cutoff in 2013, the difference in insurance coverage at age 65 reached a new low in 2014 and continued to decline in 2015 and 2016. Overall, the ACA, through Medicaid expansions and increased take-up of previously eligible individuals in all states, reduced the insurance coverage gap at the cutoff by 7 percentage points.

Point estimates by year are charted for the change in private insurance coverage are shown in Figure 1.3. Overall, the ACA increased private insurance rates among the low-income near-elderly; this is due to take-up of private insurance by those earning between 100% and 138% of the FPL and living in states that did not expand Medicaid. There was no effect of the ACA on private market coverage for those earning less than 100% of the FPL.[6]

Columns 2 and 8 of Table 1.2 show there is no change in the discontinuity upon reaching age 65 in the fraction of individuals with Medicare and two or more types of insurance coverage. However, the probability of having Employer Sponsored Insurance while earning <139% of the FPL drops by 2.3 percentage points after the ACA, as shown in column 2. This is inconsistent with the hypothesis

[6]See supplemental Table A1 in Appendix C

that only insurance coverage rates of Medicaid and private insurance change while other types remain constant. Rather, it suggests a potential crowd-out effect for this low-income population; becoming eligible for a health insurance option with low- to no-cost sharing drives employed, low-income individuals away from (potentially expensive) Employer Sponsored Insurance to Medicaid. This is consistent with the results reported by Kaestner et al. (2015), but at odds with the analysis of Frean et al. (2017).

1.4.3 Low Income, Earning Between 139% and 400% FPL

Prior to the ACA, the insurance coverage rate for 63- and 64-year-olds earning between 139% and 400% of the FPL was 87.2%, about 8.5 percentage points higher than the rate for individuals earning less than 139% of the FPL. Making health insurance marketplaces available to this group reduces the uninsurance rate by 4.45 percentage points.

Figure 1.3 plots the year over year estimates of the change in the probability of those who earn 139-400% of the FPL having private insurance at the discontinuity. This figure shows the change in insurance prevalence among those aged 63 and 64 by year. Figure 1.3 plots the same for Medicaid. Although Medicaid expansion did not direct apply to this group, there were still statistically significant increases in the fraction of 63 and 64-year-olds insured; the ACA increased Medicaid insurance coverage for this group by 2.64 percentage points. These increases are explained by take-up in state-sponsored plans that offered basic health insurance for individuals earning up to 200% FPL.

1.4.4 Stratification by Education Level and Ethnicity

1.4.4.1 Any Insurance

The first row of each category in Table 1.3 shows the mean insurance rate of 63- and 64-year-olds and estimated jump in insurance rates at the cutoff. The second row shows the change in the magnitude of the discontinuity that is due to the ACA. Overall, insurance coverage upon reaching age 65 increases by 7.97 percentage points on a base of 90.1%. Prior to the ACA, 88.5% of 63 and 64 year olds had some type of health insurance. Upon reaching age 65, this increases by 10 percentage points. There is no effect on insurance rates for the elderly due to the ACA; before

2014, 98.2% of 65- to 67-year-olds were insured, whereas 98.5% of this group was insured after 2014. The change in the prevalence of insurance, 3.44 percentage points, is due to ACA coverage provisions. This is graphically shown in Figure 1.1 referenced earlier.

1.4.4.2 By Ethnicity

Medicare is often touted as equalizing racial and socioeconomic disparities in health insurance and health care access (Card et al., 2008). Prior research suggests the ACA may not have the same effect; Shane & Ayyagari (2014) found that the dependent coverage mandate increased insurance rates for all groups, but did not reduce disparities among low-income populations. Estimates presented in Table 1.3 reinforce those results. The prevalence of any health insurance among near-elderly Non-Hispanic whites is higher than the national average in these data, driven by high rates of private and employer sponsored insurance; reaching Medicare-eligibility age adds 7.3 percentage points to a base of 91.4%. Non-Hispanic blacks have a lower prevalence of any kind of insurance prior to reaching age 65. However, reaching Medicare eligibility age increases the prevalence of health insurance by 8.49 percentage points.

The effect of the ACA on insurance coverage also varies both in the magnitude and the mechanism through which insurance is obtained. The ACA closed the insurance coverage gap by 2.9 percentage points in whites and 2.61 percentage points in blacks. This alone is notable in that prior to the ACA, insurance rates among 63- and 64-year-old whites were 4 percentage points higher than those of blacks; one would expect more substantial changes in the group with lower initial rates of insurance coverage. The difference is even larger among other races; the ACA reduced the insurance coverage gap by 8.69 percentage points at the cutoff, but their initial insurance coverage is 10 percentage points lower than that of whites. The difference in the source of newly obtained insurance coverage is notable, as shown in Table 1.3. Specifically, take-up of private health insurance after the ACA among blacks and whites is similar (2.5 and 3.11 percentage points, respectively), but Medicaid enrollment among blacks after the ACA is nearly three times that of whites (3.6 and 1.38 percentage points, respectively) on a base mean that is already 2.5 times that of whites (10.5% vs 4.08%).

1.4.4.3 By Education Status and Ethnicity

The changes in insurance rates upon reaching Medicare eligibility are mixed when stratifying by education status (not shown). It is expected those with the lowest levels of education would benefit more from new coverage provisions compared to those with a college degree. However, what is surprising is the difference when stratifying by race and education level. Reaching Medicare enrollment age increases the likelihood of blacks who did not complete high school having insurance coverage by 12.4 percentage points, while the effect is only 3.64 percentage points for their white high educated counterparts. Combined with a substantial 15 percentage point difference in insurance rates prior to Medicare eligibility, reaching age 65 closes the gap between these two subgroups by 10 percentage points. This is demonstrated graphically in Figure 1.3.

Coverage provisions provided through the ACA closed the gap in insurance prevalence at age 65 by 4.58 percentage points for low educated blacks, while the effect was less than 1 percentage point for high educated whites. This is not surprising; high educated whites were three times more likely than low educated blacks to have employer-sponsored coverage, which was subject to few substantial changes under the ACA.

1.4.5 Medicaid Expansion vs Health Insurance Exchanges

Sources of new insurance coverage varied based on whether or not a state expanded Medicaid to low-income individuals. Figure 1.4 shows the private market and Medicaid insurance rates for expansion and non-expansion states before and after the ACA. In states that did not expand Medicaid, the fraction of individuals with Medicaid coverage increased slightly after the ACA, but the prevalence of private coverage increased significantly. For Medicaid expansion states, there was an increase in private coverage and substantial increase in Medicaid recipients.

Table 1.4 contains point estimates reflecting the change in Medicaid and private insurance (outcomes are mutually exclusive) for individuals aged 63 or 64 just prior to transitioning into Medicare. Columns 1 through 3 show how the ACA affected insurance coverage through Medicaid in states that expanded the program compared to those that did not expand Medicaid. Prior to expansion, around 3.4% percent of individuals were insured through Medicaid in non-expansion states, lower than the five percent in expansion states. After the implementation of the ACA, there was 0.7 per-

centage point increase in the Medicaid insurance rate in non-expansion states due to a "woodwork effect." In expansion states, the ACA increased the Medicaid insurance rate by 3.9 percentage points. Post-ACA Medicaid uptake is 3.13 percentage points higher in expansion states than non-expansion states for the overall near-elderly population.

Columns 4 through 6 show the same results for individuals with private coverage. Just under 9.2% of 63 and 64 year-olds in non-expansion states had private insurance prior to the ACA. After ACA implementation, the share of individuals purchasing directly or via the exchange increased by 4.8 percentage points. In Medicaid expansion states, the fraction purchasing private insurance increased by 2.65 percentage points on a base of 10%. Post-ACA private coverage uptake is 2.2 percentage points higher in non-expansion states than expansion states.

Medicaid coverage gains in expansion states are concentrated among low-income individuals: the change in Medicaid coverage due to the ACA is 10 percentage points in these states. Overall, the ACA increased Medicaid coverage by 7 percentage points among low-income near-elderly individuals, composed mostly of Medicaid gains in expansion states. Gains in coverage through Medicaid in expansion states exceeded that in non-expansion states by 8.23 percentage points, while coverage gains through private insurance in non-expansion states exceeded gains in expansion states by 4.53 percentage points.

While there were coverage gains in both expansion and non-expansion states, the sources of the insurance increase were different. In states that expanded Medicaid, approximately 60% of the insurance gains (3.9/(3.9+2.65)) can be attributed to Medicaid and the remaining 40% were through private insurance. For states that did not expand Medicaid, only 14% of insurance gains (0.75/(0.75+4.82)) are through Medicaid, while 86% are through private insurance.

1.5 Discussion

This paper evaluates the effects of the ACA on insurance rates of the near-elderly population just prior to entering Medicare. The disparity between insurance rates at the age 65 threshold prior to the ACA was nearly 8 percent. After the ACA became law, the gap at age 65 decreased by 3.4 percentage points. The ACA narrowed but did not close the insurance disparity; the gap in insurance prevalence at age 65 declined by 2.61 percentage points in non-Hispanic blacks and 8.7 percentage

points for other races compared to 2.99 percentage points for whites. However, the mean insurance rate of near-elderly whites is still substantially higher than that of other races both before and after the law went into effect. Of the newly insured, nearly half were previously uninsured for three years or more. Sixty percent of newly insured people in states that expanded Medicaid obtained insurance through Medicaid, while 86% of individuals in non-expansion states obtained insurance through the health insurance exchanges.

There are a few limitations to this study. First, while it would be ideal to have monthly or quarterly survey data, none of the data sources provides such granularity. This means the variance of each regression is based on five age clusters. However, the large sample size used in the ACS is sufficient enough to offset concerns about variance. Second, this study would ideally use longitudinal data, which would allow me to track the near-elderly into Medicare and examine their use habits. Finally, as discussed in Claxton et al. (2014), the time frame in which these surveys are conducted leaves open the possibility of differences in estimates between the surveys used in this paper and any estimates from other literature studying this topic.

This paper raises several questions about the relationship between the ACA and Medicare near the age of transition. It is known that long term uninsured individuals utilize more services immediately after gaining insurance, perhaps due to newly-diagnosed conditions (Kaufman et al., 2015) or pent-up demand. What is still up for debate are the implications for Medicare spending compared to Medicaid or private market insurance in the long run. There are two possibilities: either individuals newly insured through the ACA smooth consumption of medical services prior to entering Medicare then utilize fewer services upon entry into Medicare, or newly insured individuals consume more services both before and after entering Medicare (ex-post moral hazard). If the former is the case, a valid argument can be made that reducing the near-elderly uninsurance rate may curb Medicare spending growth by shifting costs of health care to states through Medicaid or to the insurers on the exchange. If the latter is the case, the implications are uncertain, as it is possible newly insured are engaging in ex-post moral hazard or their health status upon gaining insurance is poor, requiring more care to manage chronic health conditions.

The results of this paper also raise the possibility of Medicaid crowd-out among low-income, employed 63- and 64-year-olds. The reasons for the shift from ESI to Medicaid are unclear; eligible individuals may learn of their eligibility under new coverage conditions and choose to drop

the employer plan or employers may decide against offering plans to the group that is newly eligible for Medicaid. More analysis is necessary to confirm this. However, should this be supported with further research, the implications of this phenomenon are ambiguous. Because Medicaid cost sharing is low and benefits are generous, low-income near-elderly enrollees can obtain necessary health care at a lower out of pocket cost. However, although there is potential for consumption smoothing across the transition into Medicare, the true costs of care prior to reaching age 65 would be transferred from employers to states and the federal government.

Finally, an important long term measurable effect of the ACA in general is whether it reduced morbidity or mortality. Previous large scale government interventions providing health care and health insurance (Medicare and Medicaid) have resulted in substantial improvements in mortality (Card et al., 2009; Chay et al., 2010; Goodman-Bacon, 2018), particularly at the outset of those programs. Future evaluations of the short- and long-term effects on mortality and morbidity on both Medicaid expansion and private insurance will inform future policy on health care and health insurance reform.

1.6 Main Results

1.6.1 Main Figures

Figure 1.1: Probability of Being Insured at Age 65 Cutoff, Before vs After the ACA.
Source: ACS, 2009-2016

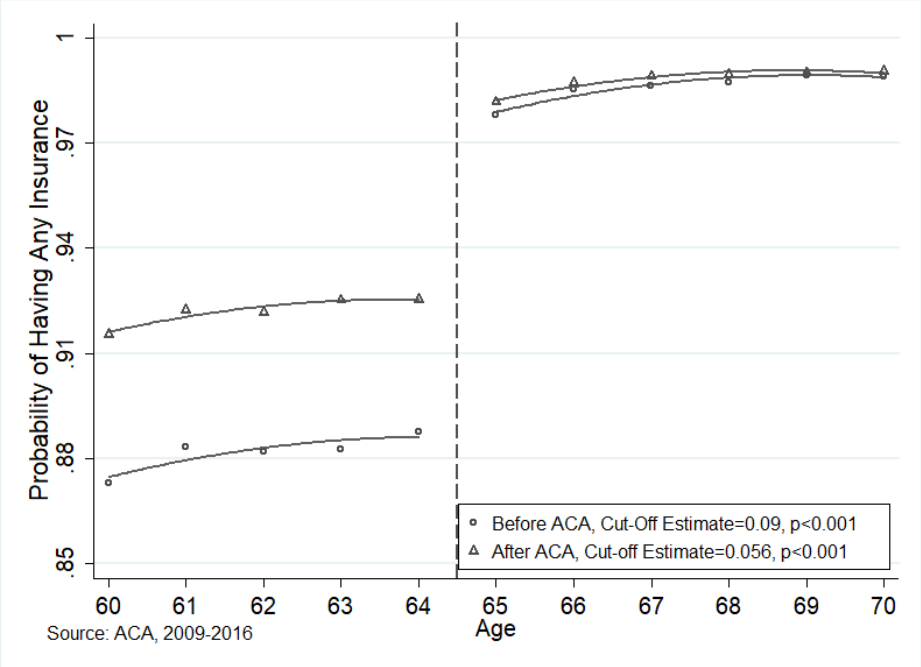
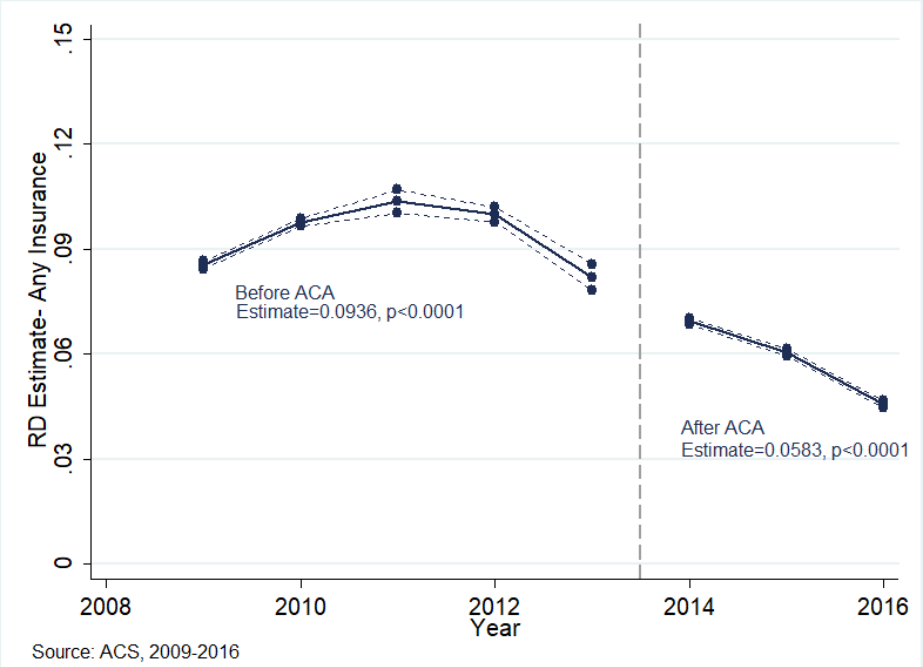


Figure 1.2: Estimates of the Effect of the ACA on Having Insurance at the Age 65 Discontinuity
Source: ACS, 2009-2016

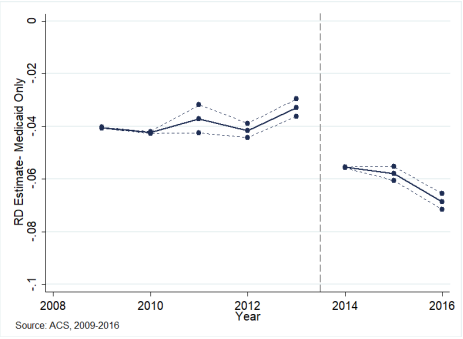


This chart shows the year-by-year regression-adjusted RD estimates of the change in coverage rates for any insurance at the cutoff at age 65. The estimates to the left of the gray reference line represent years prior to the ACA. The difference in the mean of the insurance gap at the cutoff before and after the ACA is 3.44 percentage points.

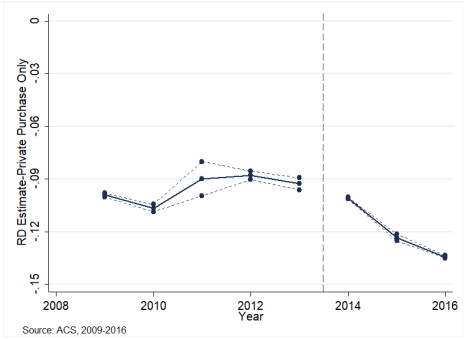
Regression includes state-level dummies, controls for sex, employment status, education level, race, and marital status. Standard errors are clustered by age.

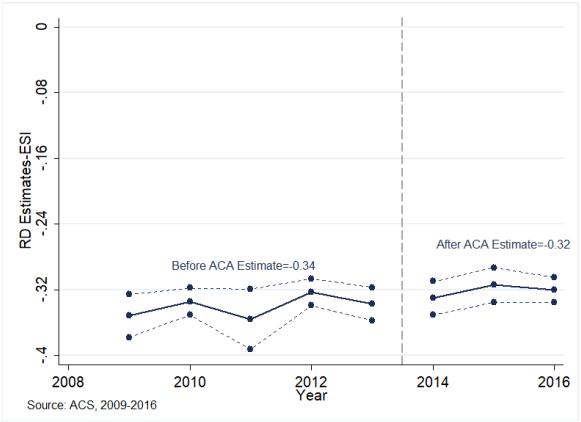
Figure 1.3: RD Estimates of the Effect of the ACA on Age 65 Discontinuity
Source: ACS, 2009-2016

(a) Medicaid



(b) Private

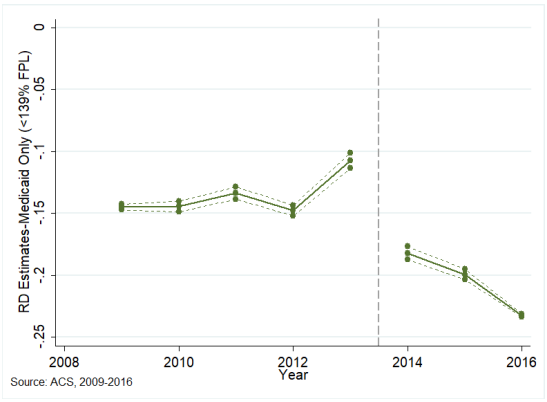




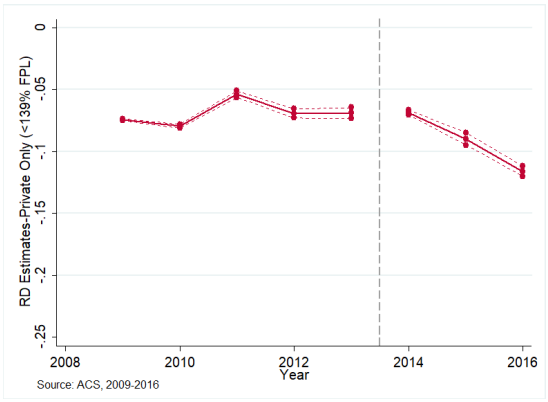
(c) ESI

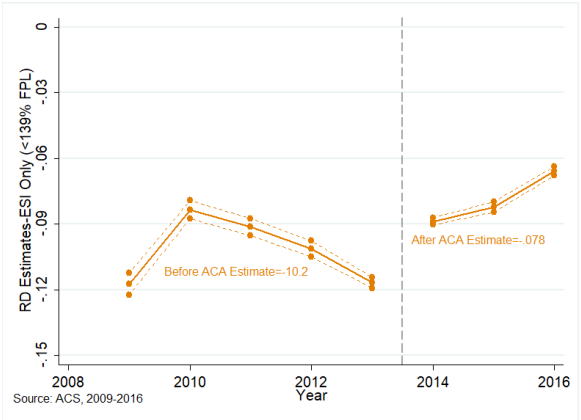
Figure 1.3: RD Estimates of the Effect of the ACA on Age 65 Discontinuity for Low Income Near-Elderly Individuals (<139% FPL)
Source: ACS, 2009-2016

(a) Medicaid



(b) Private

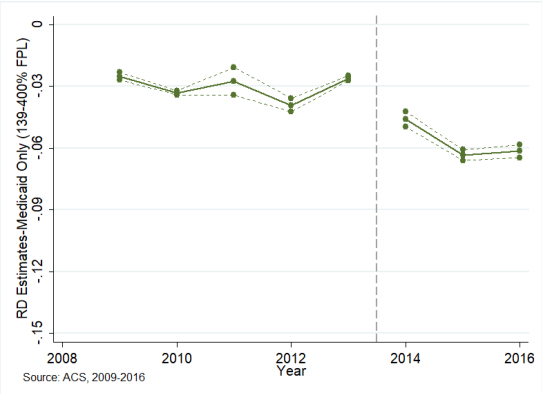




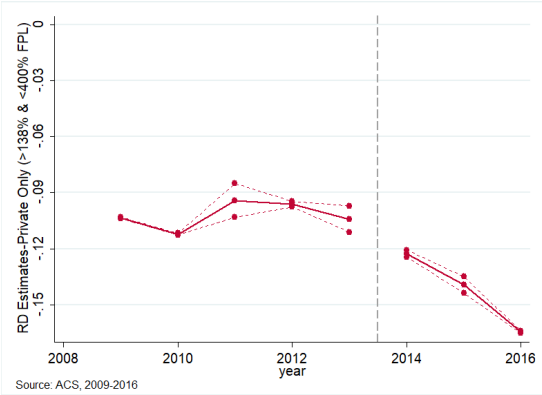
(c) ESI

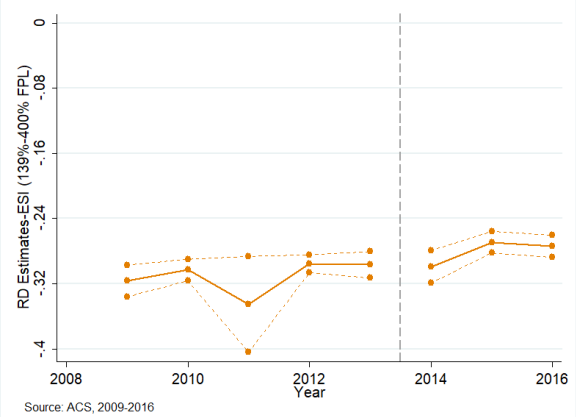
Figure 1.3: RD Estimates of the Effect of the ACA on Age 65 Discontinuity for Low Income Near-Elderly Individuals (139% -400% FPL)
Source: ACS, 2009-2016

(a) Medicaid



(b) Private





(c) ESI

Figure 1.3: RD Estimates by Ethnicity and Education Type
Source:ACS, 2009-2016

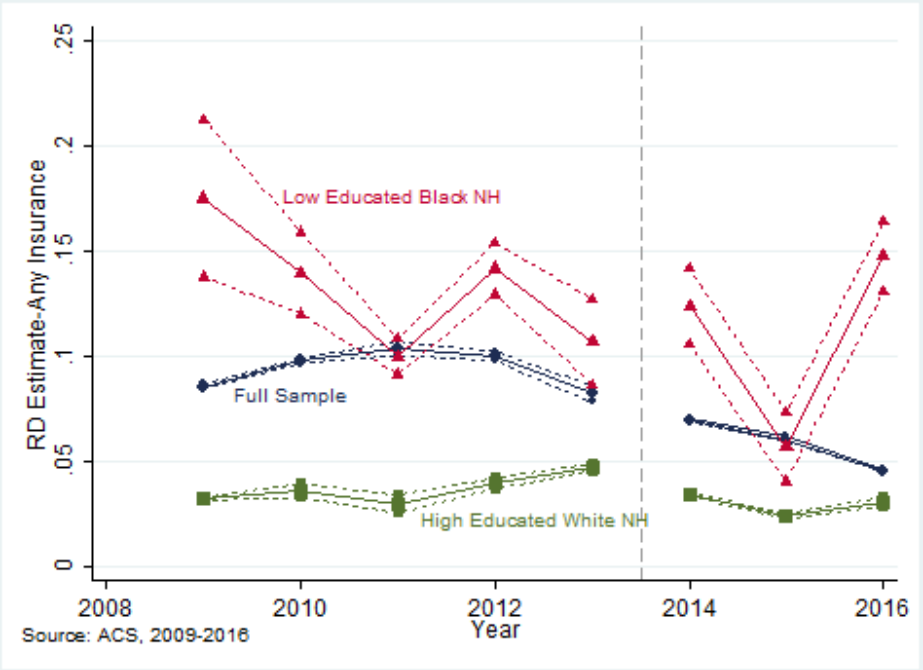
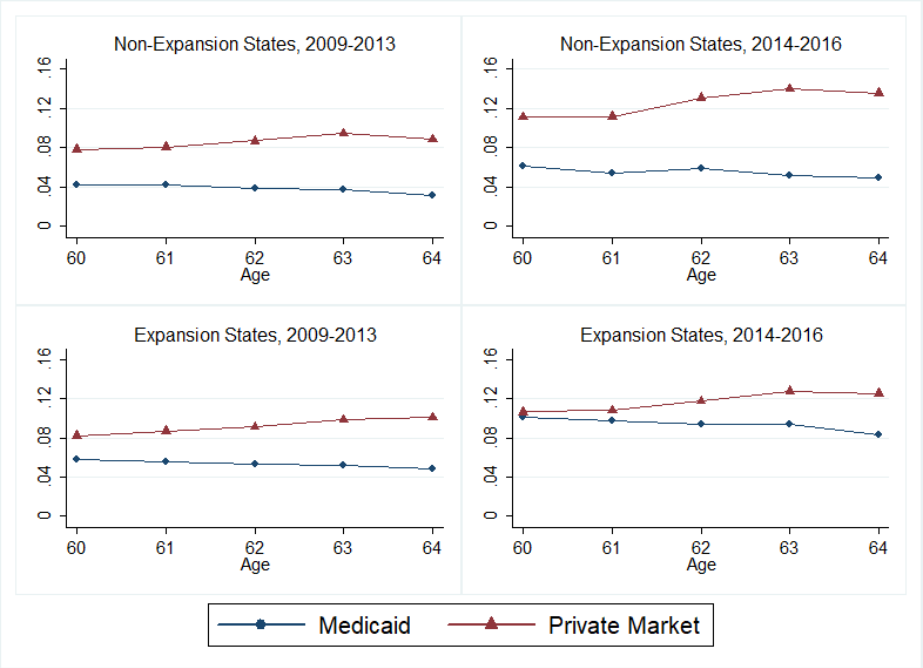


Figure 1.4: Fraction of Medicaid vs Private Insurance by Expansion Status



1.6.2 Main Tables

Table 1.1: Summary Statistics, Ages 60-70

	(1) Full Sample	(2) Under Age 65	(3) Over Age 65
Panel A: ACS, 2009-2016			
Insured	0.930	0.881	0.986
Female	0.525	0.520	0.531
Married	0.647	0.650	0.644
Employed	0.406	0.521	0.279
Race			
White Non-Hispanic	0.819	0.810	0.830
Black Non-Hispanic	0.0997	0.105	0.0940
Other	0.0810	0.0851	0.0765
Education Level			
Less Than High School	0.133	0.119	0.148
High School Diploma or GED	0.292	0.279	0.305
Some College	0.286	0.300	0.271
College Degree or Higher	0.289	0.301	0.276
Observations	2844857	1459825	1385032
Panel B: BRFSS, 2009-2016			
Insured	0.921	0.874	0.978
Female	0.504	0.500	0.508
Married	0.646	0.653	0.638
Employed	0.373	0.478	0.250
Race			
White Non-Hispanic	0.806	0.799	0.813
Black Non-Hispanic	0.103	0.107	0.100
Other	0.090	0.093	0.086
Education Level			
Less Than High School	0.117	0.109	0.126
High School Diploma or GED	0.279	0.268	0.291
Some College	0.299	0.305	0.292
College Degree Or Higher	0.305	0.317	0.291
Observations	635948	313615	322333
Panel C: NHIS, 2009-2016			
Insured	0.926	0.883	0.975
Female	0.525	0.519	0.532
Married	0.665	0.675	0.654
Employed	0.486	0.596	0.366
Race			
White Non-Hispanic	0.815	0.804	0.827
Black Non-Hispanic	0.102	0.109	0.0946
Other	0.0826	0.0866	0.0782
Education Level			
Less Than High School	0.156	0.142	0.170
High School Diploma or GED	0.251	0.240	0.262
Some College	0.273	0.285	0.260
College Degree or Higher	0.321	0.333	0.308
Observations	74780	39172	35608

Table 1.2: Estimated Discontinuities at Age 65 Threshold-Other Insurance Types

	Medicare			ESI			Two or More		
	Full Sample	<139% FPL	139%-400%FPL	Full Sample	<139% FPL	139%-400%FPL	Full Sample	<139% FPL	139%-400%FPL
2009	**0.149**	**0.154**	**0.197**	**-0.390**	**-0.117**	**-0.343**	**0.359**	**0.261**	**0.321**
	(0.0005)	(0.0017)	(0.0008)	(0.0006)	(0.0018)	(0.0018)	(0.0023)	(0.0022)	(0.0010)
2010	**0.165**	**0.147**	**0.217**	**-0.358**	**-0.0835**	**-0.320**	**0.322**	**0.262**	**0.303**
	(0.0030)	(0.0010)	(0.0000)	(0.0023)	(0.0015)	(0.0027)	(0.0056)	(0.0013)	(0.0013)
2011	**0.180**	**0.193**	**0.223**	**-0.385**	**-0.0915**	**-0.369**	**0.338**	**0.256**	**0.300**
	(0.0011)	(0.0012)	(0.0022)	(0.0123)	(0.0014)	(0.0213)	(0.0031)	(0.0022)	(0.0037)
2012	**0.187**	**0.219**	**0.217**	**-0.349**	**-0.101**	**-0.311**	**0.304**	**0.257**	**0.285**
	(0.0005)	(0.0028)	(0.0006)	(0.0024)	(0.0013)	(0.0023)	(0.0059)	(0.0030)	(0.0013)
2013	**0.169**	**0.191**	**0.211**	**-0.368**	**-0.117**	**-0.318**	**0.330**	**0.242**	**0.311**
	(0.0038)	(0.0005)	(0.0061)	(0.0024)	(0.0009)	(0.0013)	(0.0028)	(0.0010)	(0.0088)
2014	**0.198**	**0.173**	**0.231**	**-0.360**	**-0.0888**	**-0.326**	**0.324**	**0.234**	**0.315**
	(0.0006)	(0.0012)	(0.0014)	(0.0008)	(0.0006)	(0.0032)	(0.0003)	(0.0006)	(0.0009)
2015	**0.187**	**0.173**	**0.219**	**-0.345**	**-0.0822**	**-0.284**	**0.335**	**0.255**	**0.299**
	(0.0005)	(0.0013)	(0.0009)	(0.0017)	(0.0009)	(0.0033)	(0.0010)	(0.0015)	(0.0009)
2016	**0.183**	**0.165**	**0.221**	**-0.342**	**-0.0658**	**-0.288**	**0.431**	**0.335**	**0.385**
	(0.0001)	(0.0017)	(0.0010)	(0.0023)	(0.0008)	(0.0032)	(0.0010)	(0.0015)	(0.0009)

Standard errors in parentheses

Source: ACS 2009-2016

Table 1.3: Estimated Discontinuities at Age 65 Threshold By Insurance Type

	Any Insurance		Medicare		Medicaid		Private		Employer Sponsored		Two or More	
	Mean Age 63-64	Estimate	Mean Age 63-64	Estimate	Mean Age 63-64	Estimate	Mean Age 63-64	Estimate	Mean Age 63-64	Estimate	Mean Age 63-64	Estimate
Full Sample												
Post-Age65	**0.0901**	**0.0797**	**0.0474**	**0.179**	**0.0553**	**-0.0479**	**0.110**	**-0.103**	**0.491**	**-0.364**	**0.138**	**0.342**
		(0.000)		(0.001)		(0.001)		(0.001)		(0.003)		(0.001)
Post-ACA*Post-Age65		**-0.0344**		**0.0185**		**-0.0204**		**-0.0272**		**0.0257**		**0.0325**
		(0.001)		(0.001)		(0.001)		(0.001)		(0.004)		(0.001)
By Income Level												
<139% FPL												
Post-Age65	**0.785**	**0.141**	**0.104**	**0.180**	**0.197**	**-0.163**	**0.0925**	**-0.0759**	**0.121**	**-0.0918**	**0.205**	**0.252**
		(0.001)		(0.001)		(0.000)		(0.001)		(0.000)		(0.002)
Post-ACA*Post-Age65		**-0.0636**		**-0.00922**		**-0.0705**		**-0.0169**		**0.0211**		**0.0253**
		(0.002)		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
139%-400% FPL												
Post-Age65	**0.872**	**0.101**	**0.0623**	**0.215**	**0.0481**	**-0.0405**	**0.124**	**-0.111**	**0.428**	**-0.313**	**0.142**	**0.300**
		(0.002)		(0.003)		(0.002)		(0.002)		(0.012)		(0.005)
PostACA*Post-Age65		**-0.0415**		**0.00652**		**-0.0264**		**-0.0445**		**0.0534**		**0.0242**
		(0.004)		(0.005)		(0.001)		(0.003)		(0.014)		(0.003)
By Ethnicity												
White NH:												
Post-Age65	**0.914**	**0.0732**	**0.0429**	**0.180**	**0.0408**	**-0.0358**	**0.119**	**-0.113**	**0.521**	**-0.392**	**0.132**	**0.357**
		(0.001)		(0.001)		(0.001)		(0.001)		(0.004)		(0.001)
Post-ACA*Post-Age65		**-0.0299**		**0.0224**		**-0.0138**		**-0.0311**		**0.0234**		**0.0329**
		(0.001)		(0.002)		(0.001)		(0.001)		(0.005)		(0.001)
Black NH:												
Post-Age65	**0.877**	**0.0849**	**0.0774**	**0.160**	**0.105**	**-0.0979**	**0.0557**	**-0.0530**	**0.372**	**-0.246**	**0.191**	**0.263**
		(0.001)		(0.001)		(0.000)		(0.000)		(0.001)		(0.001)
Post-ACA*Post-Age65		**-0.0261**		**-0.00647**		**-0.0360**		**-0.0250**		**0.0420**		**0.0511**
		(0.000)		(0.001)		(0.000)		(0.000)		(0.001)		(0.001)
Other:												
Post-Age65	**0.813**	**0.129**	**0.0516**	**0.191**	**0.125**	**-0.110**	**0.0919**	**-0.0683**	**0.367**	**-0.222**	**0.131**	**0.286**
		(0.005)		(0.001)		(0.002)		(0.001)		(0.002)		(0.001)
Post-ACA*Post-Age65		**-0.0869**		**0.00734**		**-0.0365**		**-0.0104**		**-0.0290**		**0.0449**
		(0.007)		(0.001)		(0.002)		(0.001)		(0.003)		(0.002)
By Ethnicity and Education Level												
Whites w/College Degree and Higher:												
Post-Age65	**0.957**	**0.0364**	**0.0189**	**0.179**	**0.0173**	**-0.0136**	**0.139**	**-0.131**	**0.641**	**-0.485**	**0.0974**	**0.401**
		(0.001)		(0.001)		(0.001)		(0.000)		(0.002)		(0.002)
Post-ACA*Post-Age65		**-0.00965**		**0.0342**		**-0.000799**		**-0.0220**		**0.0174**		**0.0382**
		(0.002)		(0.002)		(0.002)		(0.000)		(0.002)		(0.004)
Blacks w/Less Than HS Diploma												
Post-Age65	**0.82**	**0.124**	**0.116**	**0.128**	**0.211**	**-0.195**	**0.0392**	**-0.0315**	**0.187**	**-0.0992**	**0.220**	**0.288**
		(0.001)		(0.002)		(0.002)		(0.000)		(0.003)		(0.001)
Post-ACA*Post-Age65		**-0.0458**		**-0.0348**		**-0.0422**		**-0.0188**		**-0.0150**		**0.118**
		(0.002)		(0.002)		(0.002)		(0.000)		(0.002)		(0.004)

Source: ACS, 2009-2016. Insurance types are mutually exclusive. Standard errors in parentheses and clustered by age.

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

Table 1.4: Changes in Medicaid and Private Insurance Uptake by Medicaid Expansion Status
Mutually Exclusive Sources of Insurance
Source: ACS, 2009-2016

	(1) Medicaid Non-Expansion State	(2) Medicaid Expansion State	(3) Medicaid Full Sample	(4) Private Non-Expansion State	(5) Private Expansion State	(6) Private Full Sample
Mean, Age 63-64	**0.0344**	**0.0502**		**0.0916**	**0.0995**	
Post-ACA	**0.00746*****	**0.0389*****		**0.0482*****	**0.0265*****	
	(0.0013)	(0.0050)		(0.0039)	(0.0020)	
Expanded			**-0.00365**			**0.00982**
			(0.0078)			(0.0069)
Post-ACA*Expanded			**0.0313*****			**-0.0218*****
			(0.0051)			(0.0043)
College Degree or Higher:						
Mean, Age 63-64	**0.007**	**0.0172**		**0.120**	**0.122**	
Post-ACA	**0.00265****	**0.0261****		**0.0360*****	**0.0261*****	
	(0.0008)	(0.0073)		(0.0042)	(0.0026)	
Expanded			**0.00187**			**0.00363**
			(0.0069)			(0.0089)
Post-ACA*Expanded			**0.0232****			**-0.00986**
			(0.0073)			(0.0050)
Less Than HS Diploma:						
Mean, Age 63-64	**0.115**	**0.171**		**0.0543**	**0.0539**	
Post-ACA	**0.0122***	**0.0766*****		**0.0414*****	**0.0249*****	
	(0.0049)	(0.0131)		(0.0053)	(0.0045)	
Expanded			**-0.0260**			**0.00583**
			(0.0201)			(0.0133)
Post-ACA*Expanded			**0.0637*****			**-0.0168***
			(0.0136)			(0.0070)
$<$ 139% FPL:						
Mean, Age 63-64	**0.125**	**0.199**		**0.0745**	**0.0837**	
Post-ACA	**0.0192*****	**0.103*****		**0.0558*****	**0.0110****	
	(0.0047)	(0.0114)		(0.0055)	(0.0038)	
Expanded			**-0.0278**			**0.0217**
			(0.0152)			(0.0148)
Post-ACA*Expanded			**0.0823*****			**-0.0453*****
			(0.0122)			(0.0066)
139%-400% FPL:						
Mean, Age 63-64	**0.0249**	**0.0441**		**0.0941**	**0.110**	
Post-ACA	**0.00772*****	**0.0429*****		**0.0697*****	**0.0404*****	
	(0.0018)	(0.0061)		(0.0061)	(0.0031)	
Expanded			**-0.0114**			**0.00891**
			(0.0114)			(0.0109)
Post-ACA*Expanded			**0.0353*****			**-0.0292*****
			(0.0062)			(0.0068)

Standard errors in parentheses. Controls include gender, marital status, employment status, education level and race.

I also include state level fixed effects and cluster by state.

Source: ACS 2009-2015

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

Appendix A

Supplemental Figures and Tables

Table A1: Private Market Estimated Discontinuities at Age 65 Threshold

	>100% & <138% FPL		<100% FPL	
	Non-Expansion State	Expansion State	Non-Expansion State	Expansion State
2009	**-0.153**	**-0.0776**	**-0.0389**	**-0.0737**
	(0.0047)	(0.0022)	(0.0027)	(0.0017)
2010	**-0.101**	**-0.108**	**-0.0624**	**-0.0744**
	(0.0012)	(0.0020)	(0.0012)	(0.0026)
2011	**-0.0437**	**-0.0508**	**-0.0562**	**-0.0476**
	(0.0022)	(0.0034)	(0.0031)	(0.0004)
2012	**-0.0652**	**-0.0729**	**-0.0655**	**-0.0763**
	(0.0020)	(0.0020)	(0.0019)	(0.0015)
2013	**-0.0457**	**-0.0870**	**-0.0663**	**-0.0645**
	(0.0016)	(0.0026)	(0.0039)	(0.0034)
2014	**-0.104**	**-0.0587**	**-0.0732**	**-0.0490**
	(0.0072)	(0.0033)	(0.0041)	(0.0012)
2015	**-0.106**	**-0.115**	**-0.0539**	**-0.0653**
	(0.0019)	(0.0030)	(0.0068)	(0.0025)
2016	**-0.137**	**-0.102**	**-0.124**	**-0.0879**
	(0.0022)	(0.0008)	(0.0012)	(0.0026)

Standard errors in parentheses

Source: ACS 2009-2016

Table A2: Estimated Discontinuities at Age 65 Threshold for Low Income Adults-ESI and Medicaid

	Employer Sponsored		Medicaid	
	Non-Expansion State	Expansion State	Non-Expansion State	Expansion State
<139% FPL				
2009	**-0.116**	**-0.124**	**-0.117**	**-0.166**
	(0.0016)	(0.0026)	(0.0004)	(0.0025)
2010	**-0.0993**	**-0.0825**	**-0.109**	**-0.169**
	(0.0022)	(0.0021)	(0.0022)	(0.0017)
2011	**-0.0735**	**-0.0826**	**-0.0992**	**-0.157**
	(0.0043)	(0.0020)	(0.0004)	(0.0021)
2012	**-0.103**	**-0.0968**	**-0.117**	**-0.164**
	(0.0036)	(0.0019)	(0.0017)	(0.0012)
2013	**-0.112**	**-0.121**	**-0.0591**	**-0.149**
	(0.0023)	(0.0013)	(0.0010)	(0.0023)
2014	**-0.0852**	**-0.0880**	**-0.104**	**-0.235**
	(0.0017)	(0.0010)	(0.0006)	(0.0031)
2015	**-0.107**	**-0.0531**	**-0.137**	**-0.244**
	(0.0015)	(0.0032)	(0.0019)	(0.0012)
2016	**-0.0672**	**-0.0874**	**-0.186**	**-0.293**
	(0.0010)	(0.0046)	(0.0009)	(0.0021)
<100% FPL				
2009	**-0.120**	**-0.117**	**-0.114**	**-0.199**
	(0.0013)	(0.0037)	(0.0018)	(0.0037)
2010	**-0.0899**	**-0.0661**	**-0.137**	**-0.201**
	(0.0016)	(0.0044)	(0.0022)	(0.0036)
2011	**-0.0676**	**-0.0884**	**-0.137**	**-0.197**
	(0.0069)	(0.0024)	(0.0015)	(0.0030)
2012	**-0.124**	**-0.121**	**-0.137**	**-0.212**
	(0.0031)	(0.0014)	(0.0014)	(0.0012)
2013	**-0.0989**	**-0.119**	**-0.0829**	**-0.158**
	(0.0027)	(0.0015)	(0.0016)	(0.0043)
2014	**-0.0837**	**-0.102**	**-0.105**	**-0.245**
	(0.0031)	(0.0018)	(0.0030)	(0.0014)
2015	**-0.0834**	**-0.0435**	**-0.170**	**-0.247**
	(0.0027)	(0.0044)	(0.0038)	(0.0010)
2016	**-0.0715**	**-0.101**	**-0.200**	**-0.305**
	(0.0039)	(0.0060)	(0.0021)	(0.0027)

Standard errors in parentheses

Source: ACS 2009-2016

Figure A1: Probability of Being Insured at Age 65 Cutoff, Before vs After the ACA.
Source: NHIS, 2009-2016

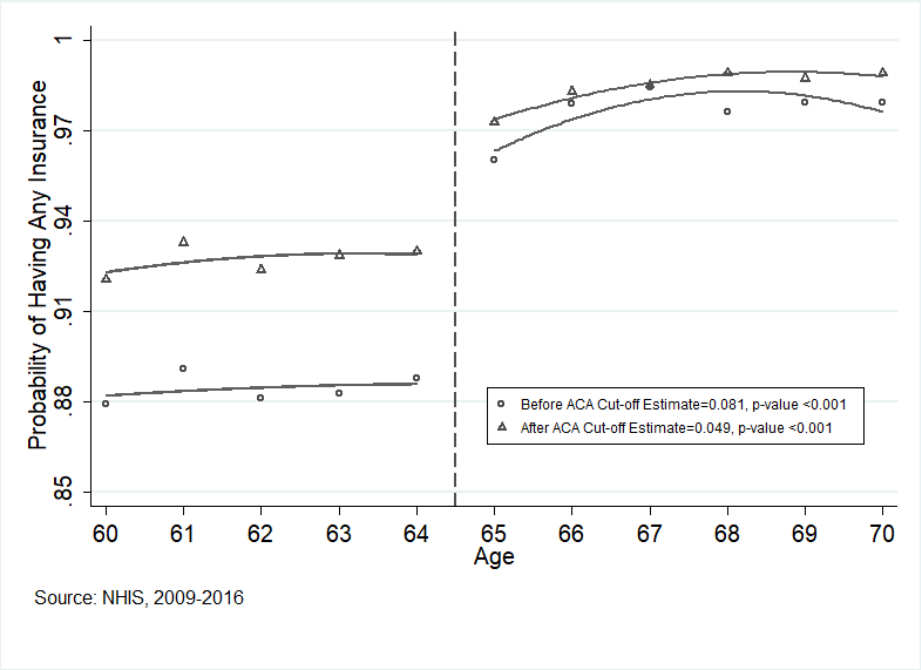


Figure A2: Probability of Being Insured at Age 65 Cutoff, Before vs After the ACA.
Source: BRFSS, 2009-2016

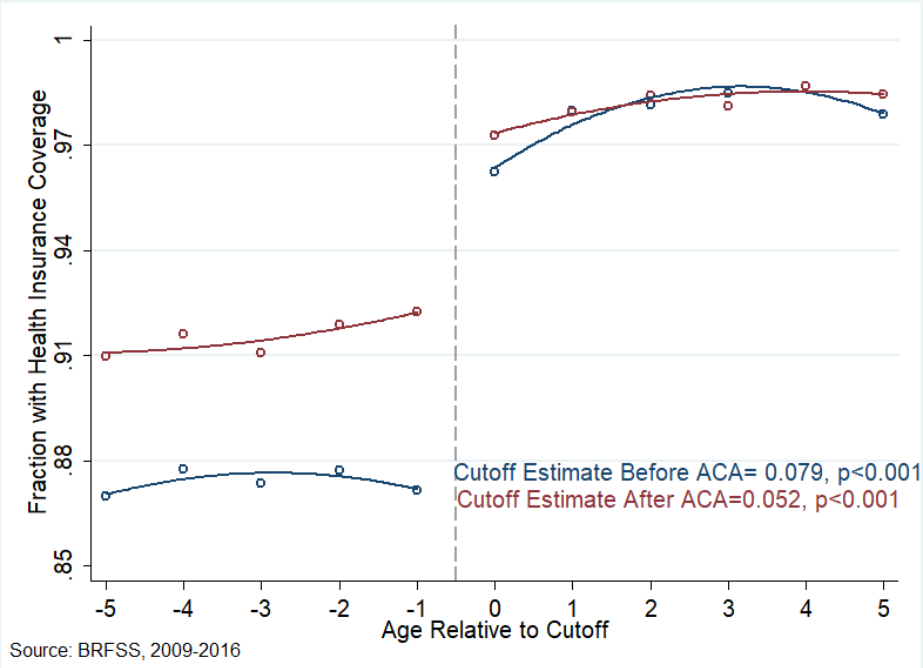


Figure A3: Estimates of the Effect of the ACA on Having Insurance at the Age 65 Discontinuity
Source: NHIS 2009-2016

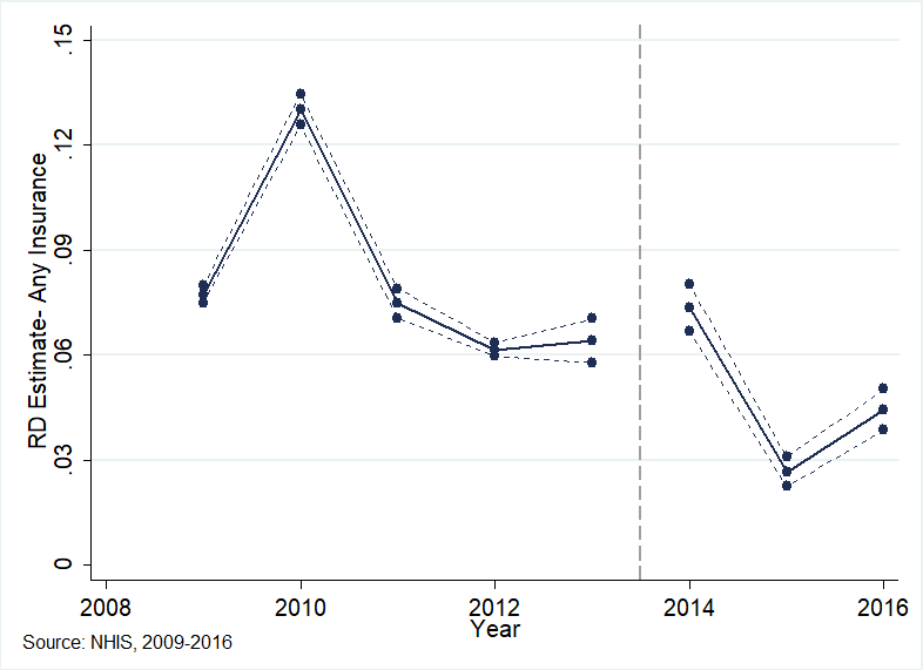


Figure A4: Estimates of the Effect of the ACA on Age 65 Discontinuity-Medicaid
Source: NHIS, 2009-2016

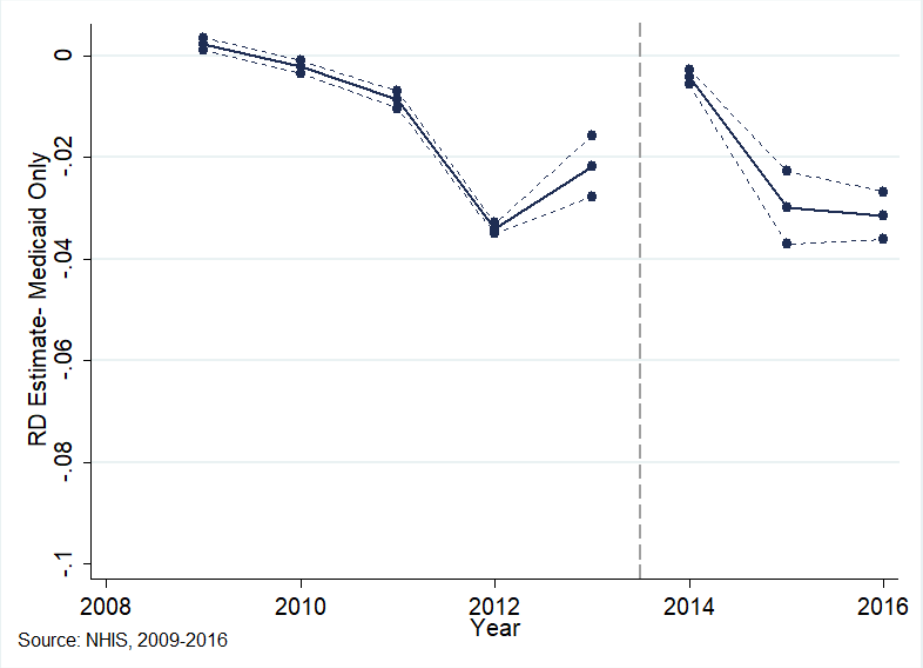


Figure A5: Estimates of the Effect of the ACA on Having Insurance at the Age 65 Discontinuity
Source: BRFSS 2009-2016

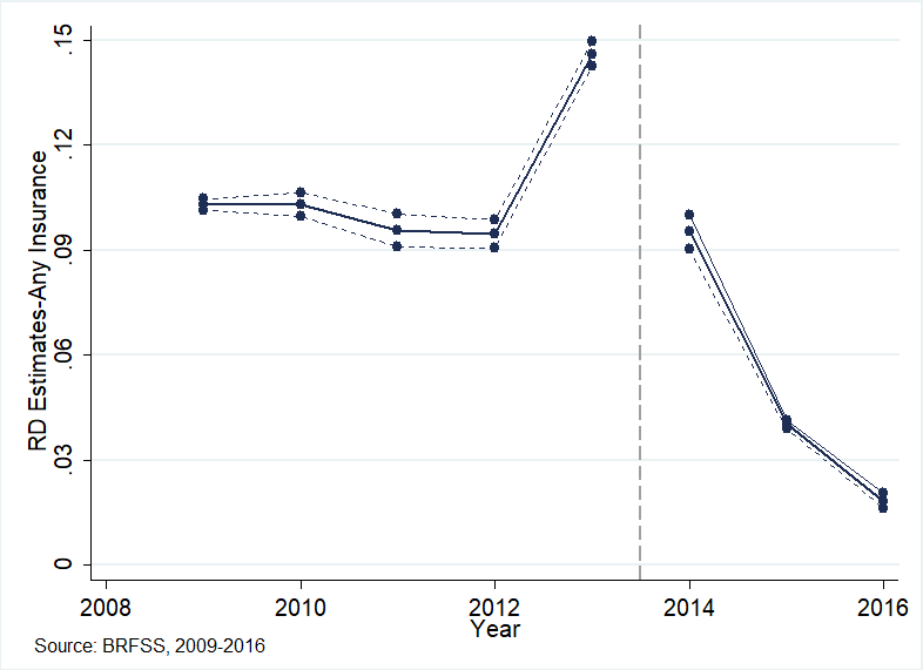


Figure A6: Estimates of the Effect of the ACA on Age 65 Discontinuity-Medicaid
Source: NHIS, 2009-2016

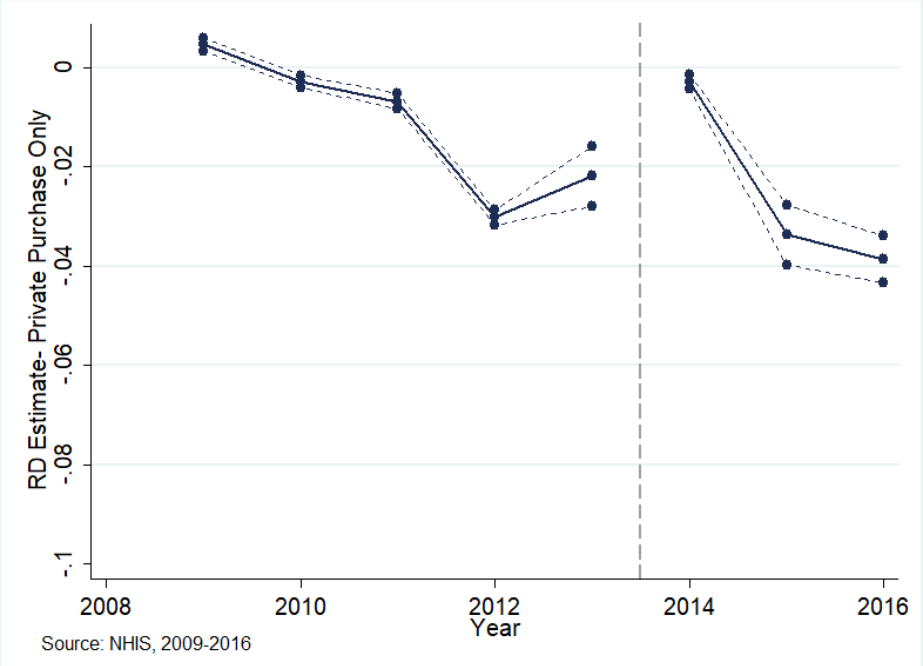


Figure A7: RD Estimates by Ethnicity and Education Type: BRFSS, 2009-2016

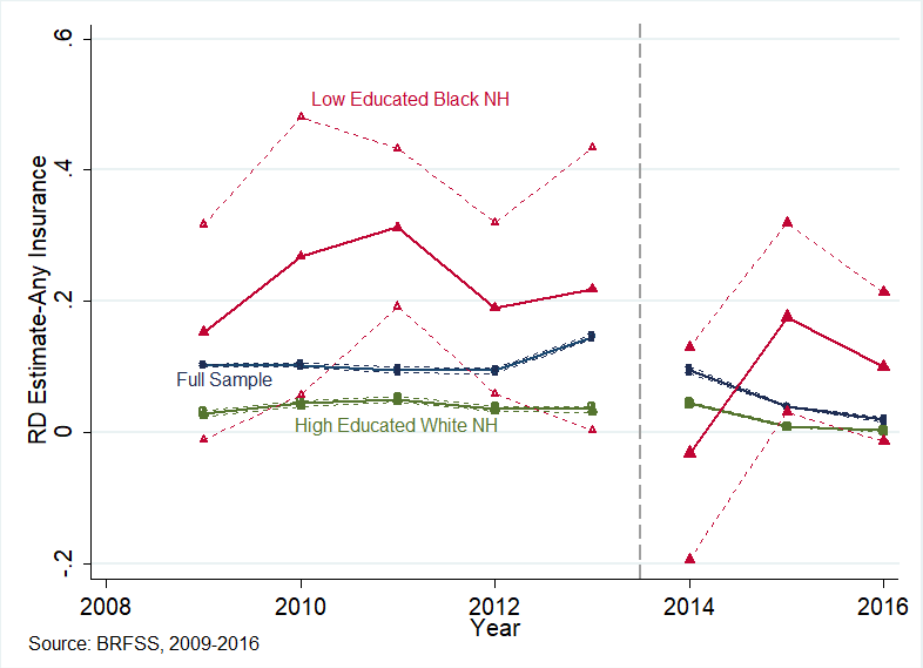


Figure A8: RD Estimates by Ethnicity and Education Type
Source:NHIS, 2009-2016

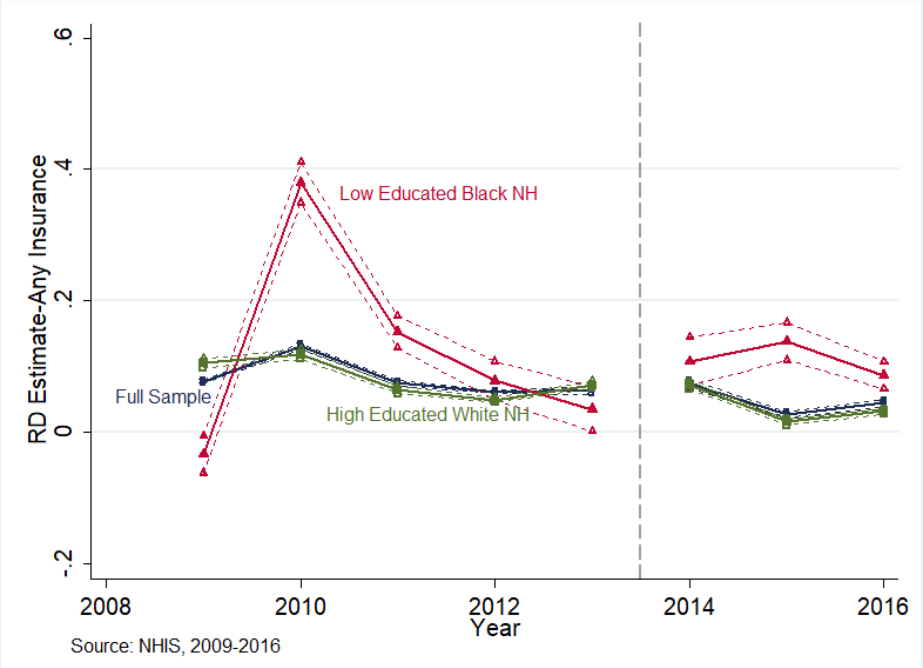


Table A3: Estimated Discontinuities at Age 65 Due to ACA
Source: NHIS, 2009-2016

	Any Insurance		Medicare		Medicaid		Private		Employer Sponsored		Two or More		Other	
	Mean Age 63-64	Estimate at Age 65	Mean Age 63-64	Estimate at Age 65	Mean Age 63-64	Estimate at Age 65	Mean Age 63-64	Estimate at Age 65	Mean Age 63-64	Estimate at Age 65	Mean Age 63-64	Estimate at Age 65	Mean Age 63-64	Estimate at Age 65
Full Sample														
Post-ACA*Post-Age65	**0.901**	**-0.0318**	**0.0618**	**0.0164**	**0.0380**	**-0.00524**	**0.187**	**-0.0561**	**0.376**	**0.0447**	**0.135**	**-0.0418**	**0.0903**	**0.0102**
		(0.000)		(0.002)		(0.000)		(0.001)		(0.001)		(0.001)		(0.001)
Female														
Post-ACA*Post-Age65	**0.896**	**-0.0465**	**0.0611**	**0.0726**	**0.0426**	**-0.00409**	**0.209**	**-0.0476**	**0.369**	**0.0591**	**0.129**	**-0.111**	**0.072**	**-0.0111**
		(0.002)		(0.002)		(0.001)		(0.001)		(0.002)		(0.001)		(0.001)
By Ethnicity														
White Non-Hispanic														
Post-ACA*Post-Age65	**0.905**	**-0.0390**	**0.0557**	**-0.00189**	**0.0302**	**0.0051**	**0.196**	**-0.0570**	**0.391**	**0.0215**	**0.133**	**-0.0346**	**0.0876**	**0.0263**
		(0.000)		(0.001)		(0.000)		(0.001)		(0.002)		(0.002)		(0.001)
Black Non-Hispanic														
Post-ACA*Post-Age65	**0.881**	**0.000279**	**0.112**	**0.151**	**0.0868**	**-0.0440**	**0.133**	**0.0284**	**0.280**	**0.0288**	**0.163**	**-0.0277**	**0.0930**	**-0.113**
		(0.004)		(0.005)		(0.002)		(0.002)		(0.004)		(0.005)		(0.003)
Other														
Post-ACA*Post-Age65	**0.867**	**0.00806**	**0.0633**	**0.0457**	**0.0697**	**-0.0631**	**0.159**	**-0.236**	**0.326**	**0.332**	**0.104**	**-0.103**	**0.128**	**0.00983**
		(0.006)		(0.017)		(0.005)		(0.003)		(0.002)		(0.004)		(0.007)
By Education Level														
Less Than High School Diploma														
Post-ACA*Post-Age65	**0.789**	**0.00592**	**0.132**	**0.0629**	**0.126**	**0.00691**	**0.108**	**-0.0353**	**0.183**	**-0.0327**	**0.158**	**0.0428**	**0.0958**	**0.0348**
		(0.008)		(0.013)		(0.003)		(0.006)		(0.002)		(0.005)		(0.003)
High School Diploma or GED														
Post-ACA*Post-Age65	**0.888**	**-0.0745**	**0.0718**	**-0.0897**	**0.0355**	**-0.00449**	**0.184**	**-0.0796**	**0.374**	**0.156**	**0.125**	**-0.0969**	**0.0839**	**-0.0471**
		(0.003)		(0.002)		(0.001)		(0.001)		(0.005)		(0.003)		(0.001)
Some College														
Post-ACA*Post-Age65	**0.909**	**-0.0140**	**0.0567**	**-0.123**	**0.0253**	**0.00775**	**0.197**	**0.0432**	**0.376**	**0.0893**	**0.150**	**-0.0345**	**0.0965**	**-0.00854**
		(0.003)		(0.016)		(0.002)		(0.002)		(0.003)		(0.002)		(0.001)
College Degree or Higher														
Post-ACA*Post-Age65	**0.954**	**-0.00763**	**0.0302**	**0.199**	**0.0135**	**-0.0276**	**0.217**	**-0.113**	**0.465**	**-0.0254**	**0.117**	**-0.0512**	**0.0871**	**0.0557**
		(0.001)		(0.002)		(0.000)		(0.002)		(0.002)		(0.002)		(0.001)
By Ethnicity and Education Level														
Whites w/College Degree or Higher														
Post-ACA*Post-Age65	**0.956**	**-0.0188**	**0.0276**	**0.190**	**0.0117**	**-0.0277**	**0.220**	**-0.0942**	**0.472**	**-0.0589**	**0.117**	**-0.0370**	**0.0849**	**0.0736**
		(0.001)		(0.003)		(0.001)		(0.002)		(0.003)		(0.003)		(0.001)
Blacks w/Less Than High School Diploma														
Post-ACA*Post-Age65	**0.824**	**0.0517**	**0.172**	**0.553**	**0.192**	**-0.183**	**0.0915**	**0.103**	**0.163**	**-0.301**	**0.187**	**0.0559**	**0.0566**	**0.0596**
		(0.018)		(0.021)		(0.016)		(0.016)		(0.025)		(0.030)		(0.006)

Source: NHIS, 2009-2016. Standard errors in parentheses and clustered by age.

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

Appendix B

Tests for Research Design Validity

Test for Parallel Trends

I use pre-ACA trends in insurance rates for those over the age of 65 in an event study format to test for equality of parallel trends. Counting 2013 as the reference year, I interact treatment dummies with year dummies, regress the dependent variable (insured) on the *treatment*year* dummies and a full set of controls. I then test that coefficients on the *treatment*year* for variables in pre-treatment years (2009-2013) are statistically equal to zero.

The coefficients from each data source are graphed in Figures B1, B2, and B3. When testing the elderly population's pre-ACA insurance trends for equality using each data source, I find no evidence the pre-ACA trends for the control group compared to the treatment group are not equal. Results from all three tests (ACS p-value=0.55, NHIS p-value=0.8685, BRFSS p-value=0.9344) show that the key assumption of the DD study is satisfied.

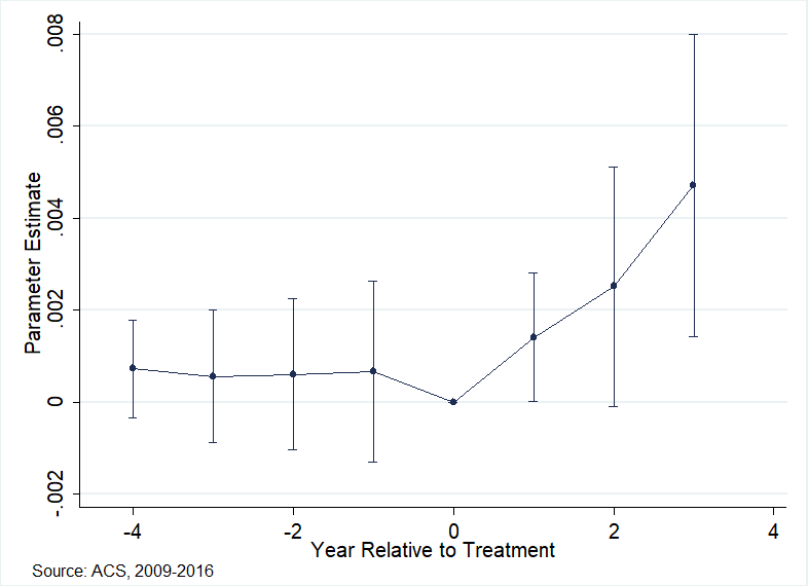


Figure B1: Event Study Test for Parallel Trends (p=0.55), ACS 2009-2015

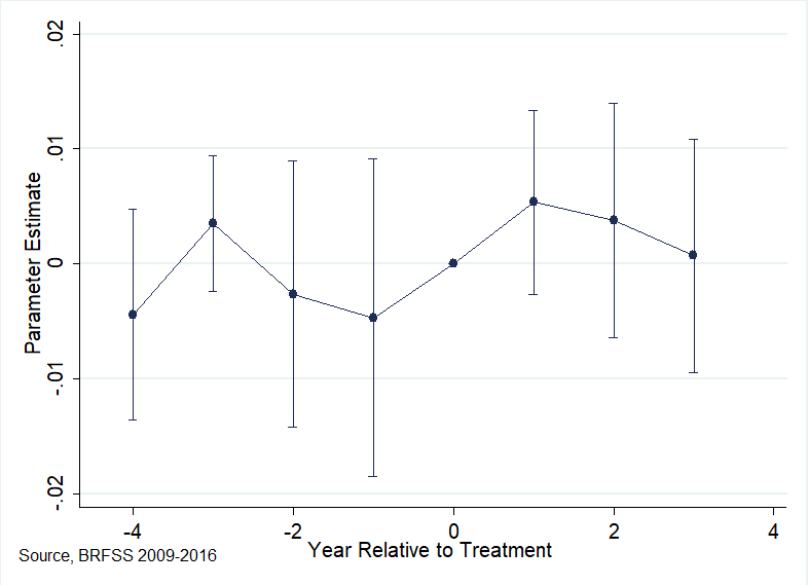


Figure B2: Event Study Test for Parallel Trends (p=0.9344), BRFSS, 2009-2016

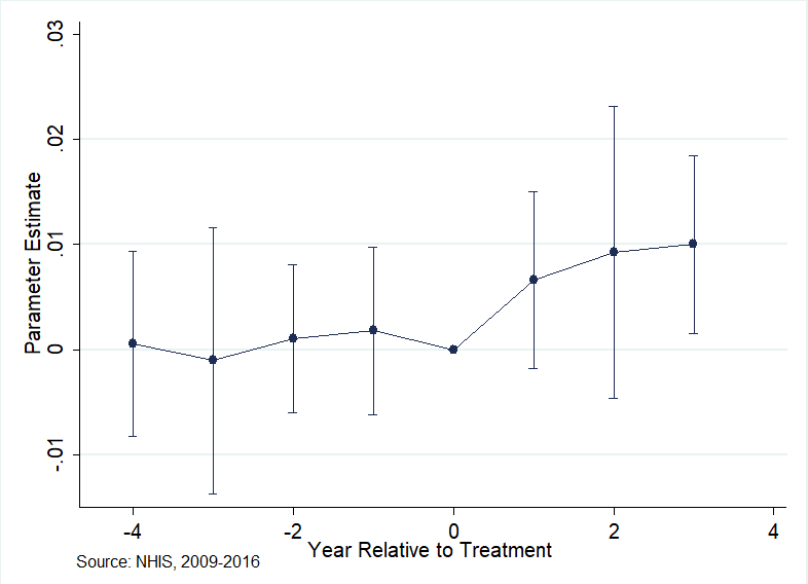


Figure B3: Event Study Test for Parallel Trends (p=0.8685), NHIS 2009-2016)

Manipulation of the Running Variable

I test for manipulation of the running variable by following standard literature (McCrary, 2008) modified for the embedded difference-in-difference in the research design (Grembi et al., 2012). For a simple regression discontinuity, I plot the kernel density by running variable (age) to show no sudden jumps in density at the cutoff age. For a difference-in- regression discontinuity design, the test for manipulation of the running variable requires showing the *difference in densities* between

the control (before ACA) and treatment (after ACA) groups do not abruptly change at the cutoff age. I plot the kernel density by age for the control and treatment groups separately in Figures B4 and B4. I then show the smoothness of the difference in control vs treatment group densities by age in B5 to conclude there is no manipulation of the running variable, satisfying the test for design validity.

Figure B4: Density Test for Manipulation of the Running Variable
Source: ACS, 2009-2016

(a) Kernel Density by Age 2009-2013 **(b)** Kernel Density by Age, 2014-2016

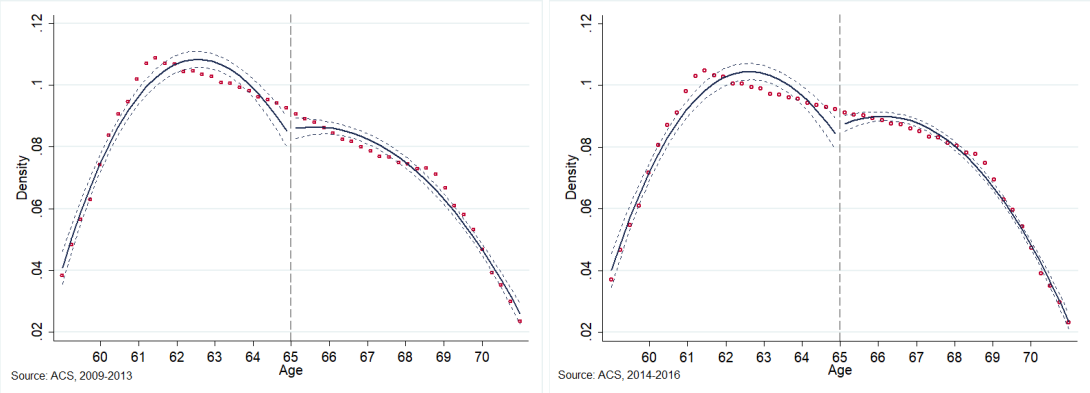
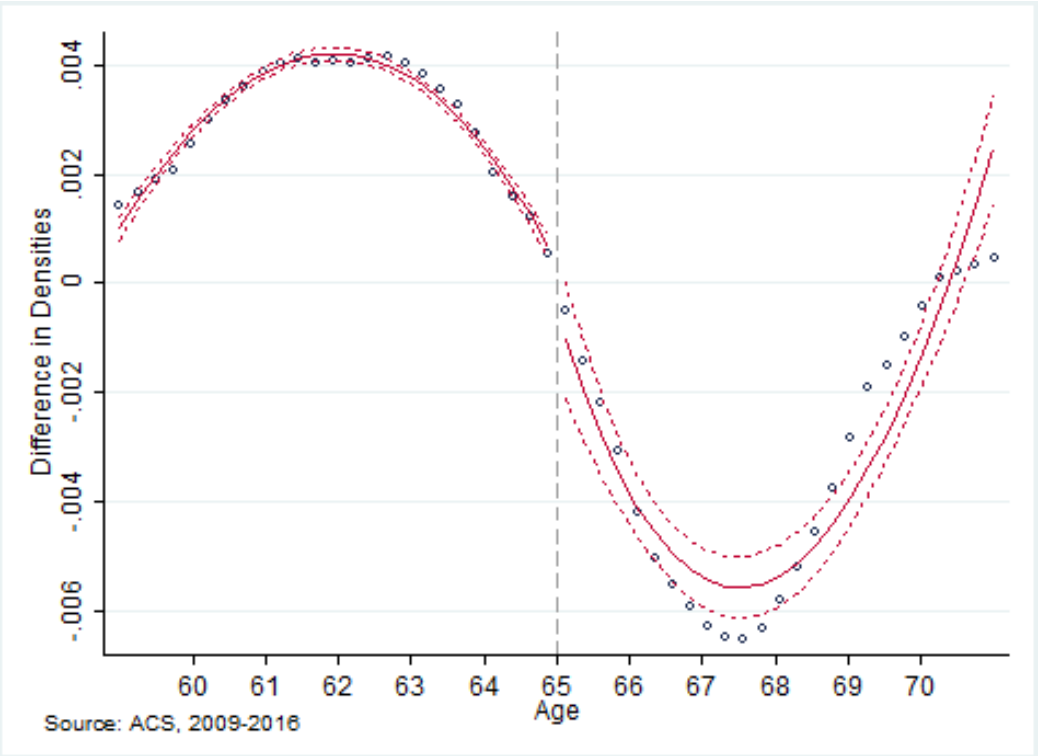


Figure B5: Difference in Kernel Densities by Age, Before and After ACA



Bibliography

Barbaresco, S., Courtemanche, C. J., & Qi, Y. (2015). Impacts of the Affordable Care Act dependent coverage provision on health-related outcomes of young adults. *J. Health Econ.*, *40*, 54–68.

Card, D., Dobkin, C., & Maestas, N. (2008). The Impact of Nearly Universal Insurance Coverage on Health Care Utilization : Evidence from Medicare. *Am. Econ. Rev.*, *98*(5), 2242–2258.

Card, D., Dobkin, C., & Maestas, N. (2009). Does Medicare Save Lives? *Q. J. Econ.*, *124*(2), 1–33.

Chay, K. S., Kim, D., & Swaminathan, S. (2010). Medicare, Hospital Utilization, and Mortality: Evidence from the Program's Origins. (pp. 1–67).

Claxton, G., Levitt, L., Brodie, M., Garfield, R., & Damico, A. (2014). Measuring Changes in Insurance Coverage Under the Affordable Care Act. Tech. rep.

Courtemanche C, Marton J, Ukert B, Yelowitz A, Zapata D. (2017). Early Impacts of the Affordable Care Act on Health Insurance Coverage in Medicaid Expansion and Non-Expansion States. *J. Policy Anal. Manag.*, *36*, 178–210.

Decker, S. L., Doshi, J. A., Knaup, A., & Polsky, D. (2012). Health Service Use among the Previously Uninsured: Is Subsidized Health Insurance Enough? *Health Econ.*, *21*(10), 1–18.

Frean, M., Gruber, J., & Sommers, B. D. (2017). Premium Subsidies, The Mandate, And Medicaid Expansion: Coverage Effects of the Affordable Care Act. *J. Health Econ.*, *53*, 72–86.

French, M. T., Homer, J., Gumus, G., & Hickling, L. (2010). Key Provisions of the Patient Protection and Affordable Care Act (ACA): A Systematic Review and Presentation of Early Research Findings. *Health Serv. Res.*, *51*(5), 1735–1771.

Goodman-Bacon, A. (2018). Public Insurance and Mortality: Evidence from Medicaid Implementation. *Journal of Political Economy*, *126*(1), 216–262.
URL https://doi.org/10.1086/695528

Grembi, V., Nannicini, T., & Troiano, U. (2012). Policy responses to fiscal restraints: A difference-in-discontinuities design.
URL https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2178962

Kaestner, R., Garrett, B., Gangopadhyaya, A., & Fleming, C. (2015). Effects Of ACA Medicaid Expansions On Health Insurance Coverage and Labor Supply.
URL http://www.nber.org/papers/w21836

Kaufman, H. W., Chen, Z., Fonseca, V. A., & McPhaul, M. J. (2015). Surge in newly identified diabetes among medicaid patients in 2014 within medicaid expansion states under the affordable care act. *Diabetes Care*, *38*, 833–837.

Long, S. K., Bart, L., Karpman, M., Shartzer, A., & Zuckerman, S. (2017). Sustained gains in coverage, access, and affordability under the ACA: A 2017 update. *Health Aff.*, *36*(9), 1656–1662.

McCrary, J. (2008). Manipulation of the running variable in the regression discontinuity design: A density test. *Journal of econometrics*, *142*(2), 698–714.

McWilliams, J. M., Meara, E., Zaslavsky, A. M., & Ayanian, J. Z. (2007). Use of health services by previously uninsured Medicare beneficiaries. *N Engl J Med*, *357*, 143–153.

McWilliams, J. M., Meara, E., Zaslavsky, A. M., & Ayanian, J. Z. (2009). Medicare spending for previously uninsured adults. *Ann. Intern. Med.*, *151*(11), 757–766.

McWilliams, J. M., Zaslavsky, A. M., Meara, E., & Ayanian, J. Z. (2004). Health insurance coverage and mortality among the near-elderly. *Health Aff.*, *23*(4), 223–233.

National Center for Health Statistics (2016). National Health Interview Survey-appended, 2009-2016 [data set].
URL https://www.cdc.gov/nchs/nhis/data-questionnaires-documentation.htm

Rosenbaum, S., & Westmoreland, T. M. (2012). The Supreme Court's Surprising Decision On The Medicaid Expansion: How Will The Federal Government And States Proceed? *Health Aff.*, *31*(8), 1663–1672.

Shane, D. M., & Ayyagari, P. (2014). Will Health Care Reform Reduce Disparities in Insurance Coverage ? Evidence From the Dependent Coverage Mandate. *Med. Care*, *52*(6), 528–534.

Simon, K., Soni, A., & Cawley, J. (2017). The Impact of Health Insurance on Preventive Care and Health Behaviors: Evidence from the First Two Years of the ACA Medicaid Expansions. *J. Policy Anal. Manag.*, *36*(2), 390–417.

Sommers, B. D., Kenney, G. M., & Epstein, A. M. (2014). New Evidence on the Affordable Care Act: Coverage Impacts of Early Medicaid Expansions. *Health Aff.*, *33*(1), 78–87.

Sommers, B. D., Maylone, B., Blendon, R. J., John Orav, E., & Epstein, A. M. (2017). Three-year impacts of the affordable care act: Improved medical care and health among low-income adults. *Health Aff.*, *36*(6), 1119–1128.

The Henry J. Kaiser Family Foundation (2017). Key Facts about the Uninsured Population. URL https://www.kff.org/uninsured/fact-sheet/key-facts-about-the-uninsured-population/

United States Census Bureau (2016). American Community Survey (ACS) 1-year Public Use Microdata Sample (PUMS)-concatenated, 2009-2016 [data set]. URL https://www.census.gov/programs-surveys/acs/data/pums.html

Wherry, L., & Miller, S. (2016). Early Coverage, Access, Utilization, and Health Effects of the Affordable Care Act Medicaid Expansions: A Quasi-Experimental Study. *Ann. Intern. Med.*, *164*(12), 795–803.

Wilper, A. P., Woolhandler, S., Lasser, K. E., McCormick, D., Bor, D. H., & Himmelstein, D. U. (2009). Hypertension, diabetes, and elevated cholesterol among insured and uninsured U.S. adults. *Health Aff. (Millwood).*, *28*(6).

Chapter 2

Understanding Trends in Medicare Spending, 2007-2014

2.1 Introduction

As Medicare shifts towards greater use of value-based payments, identifying factors that drive spending growth is a pressing question for policymakers and health care organizations. Several new payment models, including accountable care organizations, incorporate incentives for providers to stay within spending growth targets. Better understanding the sources of spending growth can inform budget and policy priorities and provide evidence for evaluating whether spending targets are reasonable.

An important distinction with policy and clinical implications is whether spending growth trends reflect changes in the health status of the Medicare population or changes in the relative spending levels associated with a given health status. For example, spending growth associated with diabetes can result from increased diabetes prevalence in the Medicare population, increased spending per beneficiary with diabetes, or an interaction of these factors. By distinguishing between sources of spending growth, we can better identify the potential for cost-savings opportunities and isolate the impact of reform efforts. For instance, payment reform efforts targeting treatment efficiency might hold particular promise for conditions where spending per case factors most prominently; however, longer-term prevention efforts might be more warranted for conditions where increasing disease prevalence plays a disproportionate role in shaping spending growth. Previous spending growth trends suggest that changes in per-beneficiary spending levels outweigh population and disease prevalence changes in determining the rate of per-capita spending growth (Dunn et al., 2016; Roehrig & Rousseau, 2011; Starr et al., 2014). However, it is not clear whether those findings still apply to the most recent years of Medicare spending, which experienced historically low growth (Buntin & Levine, 2013; Martin et al., 2016; White & Ginsburg, 2012). The Baby Boomer generation began entering Medicare in 2011, shifting the Medicare population towards a younger average age. Other beneficiary attributes also have changed over time, including whether Medicare enrollees have prescription drug coverage and retiree benefits. Declines in smoking rates have improved pop-

ulation health, but rising levels of obesity suggest that associated diseases may increase in incidence and prevalence (Flegal et al., 2012; US Burden of Disease Collaborators, 2013). This combination of factors raises the possibility that changes in the Medicare population, including a shifting prevalence of disease, might play a prominent role in recent spending trends.

To inform policymakers and providers about potential factors that should be considered when setting targets for Medicare spending growth, we analyzed the extent to which changes in per-beneficiary Medicare spending between 2007-2010 and 2011-2014 reflected shifts in the composition of the Medicare population or changes in relative spending levels associated with certain beneficiary-level factors. Our analysis included consideration of several key categories of factors, including demographics, Medicare coverage characteristics, chronic disease prevalence, and chronic disease incidence. We also examined how the sources of spending growth varied across major disease categories.

2.2 Data and Estimation Strategy

2.2.1 Data Sources and Study Population

Using the 2007-2014 Master Beneficiary Summary File (MBSF), we selected a random 5% sample of beneficiaries Medicare enrollees age 65 and above. We excluded beneficiaries enrolled in Medicare Advantage as of July in a given calendar year. For beneficiaries who joined Medicare after July or died prior to July, we excluded those who had Medicare Advantage in their first or last month of Medicare benefits, respectively. Our sample size ranged from 1,527,010 to 1,639,724 beneficiaries per year, for a total of 12,599,955 observations.

Our main study outcome measured total Medicare spending per beneficiary, adjusted to 2007 payment rate levels. This outcome included total Medicare Part A and B spending and excluded any cost-sharing amounts and Part D spending. For comparison, Medicare spending was aggregated into two time periods: 2007-2010 and 2011-2014. We chose these time periods for two primary reasons. First, while per-beneficiary Medicare spending has been slowing since the mid-2000s, it slowed even more during the latter time period. For example, per-beneficiary Part A spending has declined between 2011 and 2014 (Medicare Trustees Report, 2017). This pattern raises questions about what factors have changed, even over less than a decade, to account for this decline. Second,

Part D benefits were available for the entirety of both time periods, which was important in light of evidence that prescription drug benefits may affect other medical costs (Afendulis et al., 2011; Buntin & Hayford, 2016; McWilliams et al., 2011; Zhang et al., 2009).

The MBSF provided beneficiary-level annual summaries of Medicare spending for each sector: inpatient, outpatient hospital services, physician services, Part B drugs, hospice care, skilled nursing facility care, home health care, dialysis and other Part B services, durable medical equipment, ambulatory surgical centers, and medical testing. Based on annual payment rate changes announced in the Federal Register, we applied category-specific payment adjusters to each spending category for the years 2008-2014 so that spending amounts would reflect 2007 payment rate levels. We applied the Consumer Price Index instead of payment rate updates for sectors that account for a minor share of overall Medicare spending: durable medical equipment, ambulatory surgery centers, and medical testing. To index payments for Part B drugs, we applied the Producer Price Index for Pharmaceutical preparation manufacturing (PPI Rx). Federal budget cuts to Medicare provider payments took effect in April 2013 under sequestration, so our adjusted measure inflated spending levels by 1.5% in 2013 and by 2% in 2014 for all sectors besides Part B and inflated Part B spending levels by 1.275% in 2013 and 1.7% in 2014 due to specific sequestration measures for this sector. We aggregated adjusted spending across all sectors into one measure of overall Medicare spending. By standardizing spending to 2007 payment rate levels, our results reflect changes in spending growth that are due to the volume or type of health care services provided rather than changes in price.

To account for how spending changed, we examined several characteristics: demographics, types of Medicare coverage, prevalence of chronic conditions, and incidence of chronic conditions. To assess high end-of-life medical spending levels, we also identified decedents. Demographic factors included a categorical variable for age (65-69, 70-74, 75-79, 80-84, 85+) and indicator variables for sex and race. Medicare coverage factors included binary variables indicating whether beneficiaries were new to traditional Medicare, either because their Medicare coverage began or they switched from Medicare Advantage participation in a given study year. Coverage factors also included binary indicators to identify beneficiaries with the following benefits: Part A coverage only, Part D prescription drug coverage, non-Part D prescriptive drug coverage, partial Medicaid benefits (coverage of Medicare premiums and, for lower-income beneficiaries, Medicare cost-sharing), and full Medicaid benefits (coverage of Medicare premiums and cost-sharing and other services not

covered by Medicare such as long-term care).

The MBSF includes indicators for 26 common diseases, which we used as the basis for measuring the prevalence and incidence of chronic conditions (Chronic Conditions Data Warehouse, 2016). These indicators identified whether beneficiaries had diagnosis codes in Medicare Part A and B claims that were consistent with having a specific condition. The lookback period for these algorithms ranged from 1-3 years, so even though our earliest study year is 2007, the identification of some chronic conditions was based on claims dating back as early as 2004. The MBSF also identified the month that beneficiaries first met the criteria for having a given condition, which we used as a proxy for chronic condition incidence. We created binary indicators to flag whether beneficiaries had specific incident chronic conditions. For beneficiaries who are new to Medicare or switching mid-year to fee-for-service Medicare from Medicare Advantage, there is no claims history to distinguish between incident and pre-existing conditions. Therefore, for these beneficiaries we did not categorize their chronic conditions as incident with the rest of our study population. Instead, we created two indicator variables to identify if beneficiaries who were new to Medicare or switching from Medicare Advantage had any chronic conditions.

2.2.2 Research Design

To understand how these factors contributed to changes in per-beneficiary spending between 2007-2010 and 2011-2014, we conducted an Oaxaca-Blinder decomposition analysis with the Oaxaca Stata package (Blinder, 1973; Jann, 2008; Oaxaca, 1973). We used this approach to determine how much of per-beneficiary spending growth can be attributed to (1) changes in the characteristics of the Medicare population, (2) changes in relative spending levels for beneficiaries with a given characteristic, and (3) any interaction between these two sources. In this context, a factors relative spending level is its marginal effect on spending, or how much greater (or lower) per-beneficiary spending would be if an individual had the characteristic in question.

Using the Blinder-Oaxaca decomposition approach, we decomposed the change in mean per-beneficiary spending between two time periods, 2007-2010 (the early time period) and 2011-2014 (the late time period). The preceding three equations illustrate our approach. In equation 1, we predicted mean spending per beneficiary for the years 2007-2010 (sp_{early}) based on a set of vari-

ables (x_{early}). All variables were binary indicators that identified beneficiaries demographic characteristics, coverage characteristics, presence of chronic conditions, and incidence of new chronic conditions. The coefficients (β_{early}) captured the marginal spending levels associated with each of these characteristics from 2007-2010.

$$sp_{early} = \beta_{early} * x_{early} + \varepsilon_{early} \tag{2.1}$$

In equation 2, we repeated this step to estimate mean spending per beneficiary for the years 2011-2014 (sp_{late}) based on an identical set of variables (x_{late}). We estimated a new set of coefficients (β_{late}), which captured the marginal spending levels associated with these characteristics from 2011-2014.

$$sp_{late} = \beta_{late} * x_{late} + \varepsilon_{late} \tag{2.2}$$

By comparing the coefficients and the values from these two questions, Equation 3 decomposes the changes in per-beneficiary spending levels into changes associated with changes in population characteristics, changes in spending levels, and the interaction between these two factors. To estimate the spending level differences associated with changes in population characteristics, we multiply our coefficients from the early spending period model (β_{early}) by the difference in values for each variable ($x_{late} - x_{early}$). To estimate the spending level differences associated with changes in spending levels, we multiply the values for each variable from the early period (x_{early}) by the difference in estimated coefficients ($\beta_{late} - \beta_{early}$). Our model also includes an interaction of these two differences.

$$sp_{late} - sp_{early} = (x_{late} - x_{early}) * \beta_{early} + (\beta_{late} - \beta_{early}) * x_{early} + (x_{late} - x_{early}) * (\beta_{late} - \beta_{early}) \tag{2.3}$$

In calculating the amount of spending growth attributable to changes in the Medicare population, we measured the change in prevalence for all characteristics of interest between 2007-2010 and 2011-2014. For each characteristic, we multiplied its change in prevalence by its initial relative spending level to determine how much the change in prevalence contributed to spending growth.

Each characteristics initial relative spending level was determined by a linear regression model that predicted per-beneficiary spending in the 2007-2010 period based on all characteristics of interest.

Similar logic applied to estimating the amount of spending growth due to changes in relative spending levels. We estimated two separate linear regressions, one for each time period (2007-2010 and 2011-2014), that predicted per-beneficiary spending based on all characteristics of interest. By comparing the coefficients for each characteristic between these two models, we measured whether the relative spending levels associated with each characteristic changed. For each characteristic, we multiplied its change in relative spending levels by the initial prevalence of that characteristic in the population during the 2007-2010 period. The differences in the intercept terms between these two linear regression models can be considered unattributed sources of spending change. For more details on this approach, please see the Appendix.

For each characteristic we summarized how much of the change in per-beneficiary spending can be attributed to changes in population, changes in relative spending levels, and an interaction between these two sources. The presence of an interaction term indicates that a particular characteristic experienced changes in both its prevalence and relative spending levels between the two time periods. The size of the interaction term is determined by the size of those two changes multiplied together. We report more detailed results for individual chronic conditions in two disease categories with the largest positive and negative contributions to Medicare spending growth.

To analyze whether our results changed based on the choice of the study population, we repeated our analysis for two different subpopulations. First, we limited the population to beneficiaries who had Part D coverage. Second, we excluded beneficiaries who were new to Medicare, had died or switched from MA during the year in order to analyze results for beneficiaries with 12 months of Medicare participation.

2.3 Results

After adjusting for payment increases, the mean total Medicare spending per beneficiary declined from $7,683 to $7,502 between 2007-2010 and 2011-2014 (Table 2.1). As context to determine the impact of beneficiary traits on spending, we observed multiple differences in demographics, aspects of Medicare coverage, and prevalence and incidence of chronic conditions (Table

2.1). The age distribution shifted towards younger beneficiaries, with the proportion of beneficiaries who are under age 70 increasing from 30% to 33%. The share of beneficiaries with a Part D plan increased from an average of 44% to 51% between the two time periods, while the percentage of beneficiaries with other sources of drug coverage declined from an average of 37% to 28%. Cardiovascular disease, a common chronic condition, declined in prevalence from 38% to 35% and from 8% to 7% in incidence. In contrast, the prevalence of endocrine and renal conditions increased from 37% to 39% across the two time periods, even though incidence of these conditions remained fairly constant. When comparing how per-beneficiary spending associated with different characteristics changed between 2007-2010 and 2011-2014, several trends stand out (Table 2.1). First, adjusted spending levels declined at least slightly for almost every demographic group and every group with different kinds of Medicare-related coverage options. Only older beneficiaries had greater spending levels in the latter time period. For example, adjusted spending levels for beneficiaries age 85 and above increased from $11,636 to $11,816. Second, spending levels increased for most categories of chronic conditions. One notable exception was a decline in per-beneficiary spending for beneficiaries with endocrine and renal conditions. Decedents consistently had high spending levels, averaging $29,203 and $29,242 in annual costs in 2007-2010 and 2011-2014, respectively.

Overall Medicare per-beneficiary spending declined by $180 between the 2007-2010 and 2011-2014 time periods (Figure 2.1). Declines in relative spending levels for beneficiaries, rather than a population shift towards beneficiaries with less expensive health care needs, accounts for the majority of this decline. The decomposition analysis suggests that Medicare per-beneficiary spending would have declined by $245 based on reduced spending levels if the composition of the Medicare population had not changed (Table 2.2). In fact, given the compositional changes in the Medicare population and their disease prevalence, we would have expected Medicare per-beneficiary spending to increase by $97 (holding payment rates constant) if there had been no change in spending levels. A modest amount of the decline (-$33) was attributable to the interaction of these two factors (see Appendix Table C1 for full decomposition results).

A large part of the decline in marginal spending levels was not associated with any particular characteristic or chronic condition that we measured, which we describe as unattributed changes (-$115). According to the decomposition approach, this term represents the change in the coefficient on the constant term for predicting Medicare spending between the two time periods. An alternative

way to conceptualize this difference is the change in spending levels for the reference population in our analysis: namely beneficiaries with no chronic conditions and none of the other demographic or coverage attributes that were included in the decomposition models.

Demographic characteristics were associated with net increased Medicare spending ($40) when taking into account changes in the population and spending levels (Figure 2.1). Some of this increase reflects changes in the age distribution of the Medicare population. On average, per-beneficiary spending is lower for younger individuals than older beneficiaries. However, when we compare younger and older beneficiaries who are identical in terms of their chronic conditions and other factors, younger beneficiaries have greater marginal spending levels (Appendix Table C1). When the younger share of Medicare beneficiaries increased between the two time periods, this population change was associated with expected increases in spending amounts. Between these two time periods, there were also sizable increases in marginal spending levels for beneficiaries who were white ($64) or female ($47) (Table 2).

The decomposition analysis suggests that per-beneficiary Medicare spending would have increased by $99 if we consider only the spending changes associated with Medicare-related coverage attributes (Figure 2.1). Marginal spending levels for beneficiaries with Part D and other forms of prescription drug coverage increased between these two time periods relative to spending levels for beneficiaries without any prescription drug coverage (Appendix Table C1). In contrast, marginal spending levels for beneficiaries with full Medicaid coverage decreased modestly over this time period. Changes in spending levels for other attributes of Medicare coverage, such as having only Part A coverage, did not make a significant contribution to changes in overall per-beneficiary spending. When the net changes in spending associated with chronic condition prevalence (-$84) and incidence (-$83) are combined, disease-related factors are the largest contributor to the overall spending decline, totaling -$167 (Figure 2.1, Table 2.2). Even though increases in disease prevalence would be expected to increase per-beneficiary spending by $125, these population changes were offset by even larger decreases in marginal spending levels for beneficiaries who have chronic conditions (-$175). The reverse scenario occurs with disease incidence: decreases in disease incidence were associated with a modest spending decline (-$85) that was slightly offset by very small increases in marginal spending levels for beneficiaries with new chronic conditions ($5).

The two prevalent disease categories with the largest spending decreases were cardiovascu-

lar and endocrine conditions (Figure 2.2). Every cardiovascular condition except atrial fibrillation declined in prevalence. Furthermore, almost all cardiovascular conditions also had reductions in relative spending levels, especially ischemic heart disease (-$68). In contrast, heart failure had an increase in marginal spending levels from the early to the late period. If the prevalence of heart failure had not declined, this increase would have translated to a $60 increase in overall Medicare per beneficiary spending.

Among endocrine-related disorders, the findings for chronic kidney disease (CKD) stand out because of the magnitude of changes in marginal spending levels and spending related to prevalence. CKD refers to impaired kidney functioning that can range from mild function loss to end-stage renal disease. A large increase in the proportion of beneficiaries with CKD suggests that overall per-beneficiary Medicare spending would have increased by $189 in the absence of other changes. However, this population-related change was offset by large declines in marginal spending levels for beneficiaries with CKD (-$175), which suggests that the net amount of spending decline associated with CKD was -$28 per beneficiary after including the interaction between these two effects. In contrast, spending associated with diabetes decreased because marginal spending levels for beneficiaries with diabetes declined (-$96) but spending associated with diabetes prevalence rates had small increases ($6).

Some chronic condition categories did see increases in associated per-beneficiary spending (Figure 2.3). Among cognitive diseases, increased prevalence of depression and increased marginal spending levels for beneficiaries with Alzheimers disease or dementia contributed $89 and $41, respectively, to overall increases in per-beneficiary Medicare spending. Spending associated with skeletal and joint conditions also contributed to spending growth, almost entirely due to increases in relative spending levels for these conditions, especially for beneficiaries with rheumatoid arthritis or osteoarthritis (RA/OA). Increases in prevalence and spending levels contributed to a net increase of $72 in associated spending for RA/OA.

The sensitivity analyses conducted for different segments of the Medicare population consistently demonstrated that a large share of the spending decline was related to changes in relative spending levels (Appendix Figure C1, Appendix Figure C2). Like our main cohort, changes in marginal spending levels were mainly associated with spending on chronic conditions or could not be attributed to a specific characteristic. However, the amount of the spending decline differed

between populations. Beneficiaries with Part D benefits had larger declines in spending levels, dropping by $261 from $9,858 to $9,597 in per-beneficiary spending. When the analysis excluded decedents, new Medicare beneficiaries, and switchers from MA, the remaining beneficiaries had a small decline in spending levels, decreasing by $78 from $6,992 to $6,914.

2.4 Discussion

After adjusting for changes in Medicare payment rates, we found that mean Medicare per-beneficiary spending decreased by $180 between 2007-2010 and 2011-2014. This change reflected large reductions in relative spending levels for Medicare beneficiaries that were partially offset by greater spending associated with changes in the characteristics of the Medicare population. Key factors that contributed to the spending decline were lower marginal spending levels for beneficiaries with chronic conditions and lower spending associated with decreases in disease incidence among beneficiaries. Notably, a large share of the spending decline could not be attributed to any particular demographic, coverage, or disease-related characteristic.

We observed significant variation across chronic conditions in how prevalence and spending levels influenced spending patterns. A combination of declining prevalence and associated spending levels contributed to lower spending on cardiovascular diseases. In contrast, spending declines associated with lower spending levels for beneficiaries with endocrine and renal disorders, particularly CKD, were partially offset by increased spending due to the rising prevalence of CKD. Per-beneficiary spending associated with cognitive conditions as well as skeletal and joint conditions increased, although the role of changes in composition of the population versus changes in spending levels differed across conditions.

Like other decompositions of per-capita spending growth, we found that changes in spending levels, rather than changes in the composition of the population, explained most of the difference in per-capita spending growth (Dunn et al., 2016; Roehrig & Rousseau, 2011; Starr et al., 2014; Roehrig & Lake, 2017). Furthermore, our results are supported by recent work demonstrating that population changes in disease prevalence explain only a small share of total spending growth in the United States (Dieleman et al., 2017). Most of the previous work on this topic has relied on relatively small samples from survey data. By using Medicare administrative data, we have a large

study population that enables us to model the joint effect of multiple factors. By accounting for payment rate changes, our analysis focuses on spending growth from changes in the volume or type of health care services provided.

Our results are also distinct in that previous studies have parsed out spending according to whether medical treatments and visits are for a specific condition. In contrast, we focus on total spending for a person with a given chronic condition, while controlling for the presence of other conditions and multiple characteristics. This approach is consistent with the premise that the presence of a chronic condition, even if not directly treated during a medical encounter, can influence spending associated with different chronic conditions.

For policymakers seeking to understand which chronic conditions have greater influence on Medicare spending changes, our disease-specific findings are particularly relevant for targeting future payment and delivery reform initiatives. Our findings on spending patterns correspond to national prevalence and incidence trends, as well as recent changes in health care delivery for some diseases. The prevalence of cardiovascular disease has declined, along with Medicare hospitalizations for these conditions and the use of expensive surgical procedures like coronary artery bypass grafts (Chen et al., 2010, 2011; Epstein et al., 2011; Fang et al., 2014; Likosky et al., 2013; US Burden of Disease Collaborators, 2013). Greater spending due to increasing prevalence of CKD among Medicare beneficiaries parallels long-term trends of increased early-stage CKD and end-stage renal disease among older adults (Coresh et al., 2007)system20172015. Two factors might have contributed to lower spending levels over time for CKD: a new bundled payment method for dialysis in 2011 and reduced use of high-cost anemia treatments (Iglehart, 2011; Swaminathan et al., 2012; Winkelmayer et al., 2014). If beneficiaries with milder cases of CKD were more likely to be diagnosed in the latter period, that pattern might also explain why spending levels associated with CKD declined.

Even though there was an overall decline in spending for chronic conditions, the diseases that had positive spending growth per-beneficiary merit close attention. The increased prevalence of mental illness, including depression, contributed to national per-capita spending growth between 2000 and 2010 (Dunn et al., 2016), which supports our finding that a greater prevalence of depression contributed to Medicare spending growth. The increasing spending levels for Alzheimers and dementia are particularly concerning because health care services covered by Medicare account for

only a small share of the overall costs for dementia. It is not clear whether long-term care costs, which are the largest component of overall dementia spending (Hurd et al., 2013), also increased over this time period. Finally, in light of how orthopedic procedures and subsequent follow-up care are being targeted for bundled payment reforms, it will be important to follow whether the increases in spending levels associated with skeletal and joint conditions continue. Although bundled payments may contain the costs of surgery, spending levels could still increase if a greater proportion of beneficiaries opt for surgical procedures to treat these conditions (Dummit et al., 2016; Fisher, 2016). Some data suggest that the growing rate of knee replacements began to level off in the mid-2000s after steady growth for the previous 15 years (Cram et al., 2012).

A large share of the decline in spending levels cannot be attributed to any specific beneficiary characteristic, which raises questions about the potential influence of other factors that we do not directly measure, such as policy changes. Over the time period of our study, CMS launched multiple initiatives to improve health care delivery in traditional Medicare and potentially bend the cost curve. National financial incentive programs, for example, encouraged multiple providers to adopt electronic health records and to reduce hospital readmissions. A select group of providers opted to participate in accountable care organizations and bundled payment initiatives that promoted greater efficiency in how health services are delivered. Under the Affordable Care Act and sequestration, the federal government reduced payment rates to hospitals and other providers. Although our analysis of payment-adjusted spending does not consider the direct effects of these measures, such actions could have prompted providers to respond with increases or decreases in service volume. In the short term, these initiatives are premised on the assumption that Medicare can achieve greater efficiency, especially for beneficiaries with costly conditions. Our analysis is not designed to identify whether these initiatives have decreased costs, but our findings that relative spending levels for beneficiaries with chronic conditions has decreased is consistent with the possibility that health care delivery has changed.

Furthermore, participation in the Medicare Advantage program has dramatically increased over this time period from 22% of Medicare beneficiaries in 2008 to 31% in 2014 (Jacobson et al., 2016). There is some evidence that increased Medicare Advantage participation can moderate health care spending in traditional Medicare through spillover effects on health care delivery patterns (Baicker et al., 2013; Chernew et al., 2008). On the other hand, there are mixed results about whether health-

ier Medicare beneficiaries still selectively participate in Medicare Advantage, even after recent risk adjustment reforms that were intended to encourage enrollment among sicker beneficiaries (Brown et al., 2014; McWilliams et al., 2012). The net effect of increased Medicare Advantage participation on spending levels for traditional Medicare beneficiaries is not clear.

Several aspects of our study limit the conclusions that can be drawn from our findings. Disease identification is based on claims, so we cannot observe beneficiaries who had chronic conditions but no associated treatment, nor can we observe disease severity. Our results may be sensitive to upcoding the number of diagnoses on Medicare claims if the extent of upcoding changed between our two comparison periods. If our analysis had included Part D spending, results may have changed for several conditions that are treated with expensive medications, such as rheumatoid arthritis. We do not account for several factors that are difficult to measure and could have influenced beneficiaries spending levels, such as income, assets, and Medicare supplemental coverage other than Medicaid. Because Medicare Advantage claims are not available to researchers, we could not assess whether spending decomposition results were similar for Medicare Advantage members. Our analysis does not evaluate whether changes in Medicare spending affected the quality of care for Medicare beneficiaries. Finally, we examined changes in Medicare spending over a relatively short time period when there was exceptionally low growth, so our results might not generalize to other time periods.

The success of Medicare payment reforms, at least in the short term, relies upon providers being able to reduce spending levels for beneficiaries with a given set of health care needs. For policymakers and health care organizations who are concerned about the feasibility of reducing health care spending, these results can be interpreted with some optimism. The magnitude of spending level declines for beneficiaries with chronic conditions may be an indication that there are opportunities for health care organizations to provide care more efficiently. However, the extent to which reduced spending levels are offset by spending growth due to increased prevalence of chronic conditions suggests that there is an equally important role for policies that promote disease prevention.

2.5 Main Results

2.5.1 Main Figures

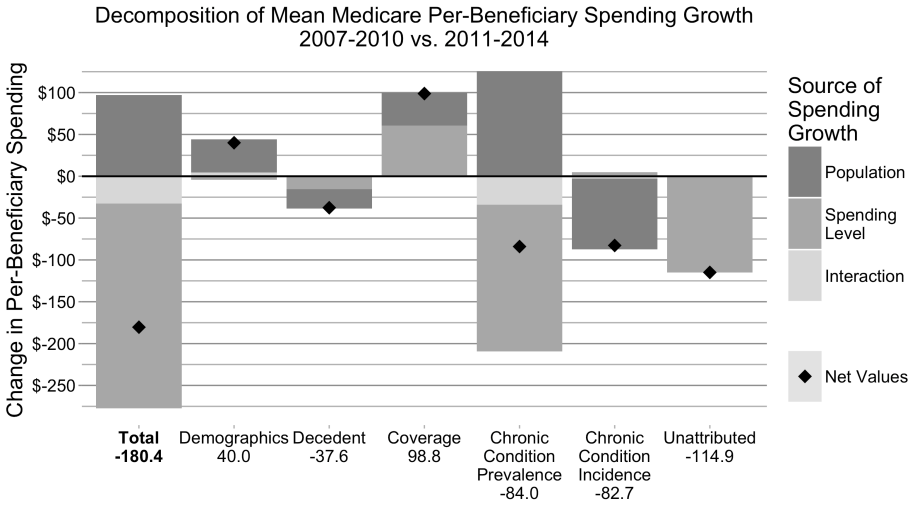


Figure 2.1: Notes: Authors calculations using a 5% sample of fee-for-service Medicare beneficiaries over age 65, years 2007-2014. Medicare spending was deflated to 2007 payment rates using sector-specific information on annual market basket updates.

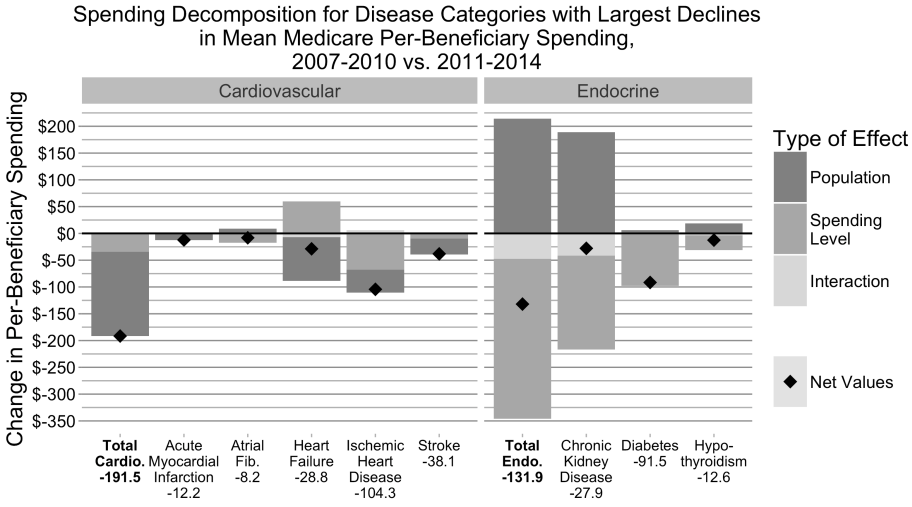


Figure 2.2: Notes: Authors calculations using a 5% sample of fee-for-service Medicare beneficiaries over age 65, years 2007-2014. Medicare spending was deflated to 2007 payment rates using sector-specific information on annual market basket updates. Total Cardio.: Total Cardiovascular; Atrial Fib.: Atrial Fibrillation; Total Endo.: Total Endocrine.

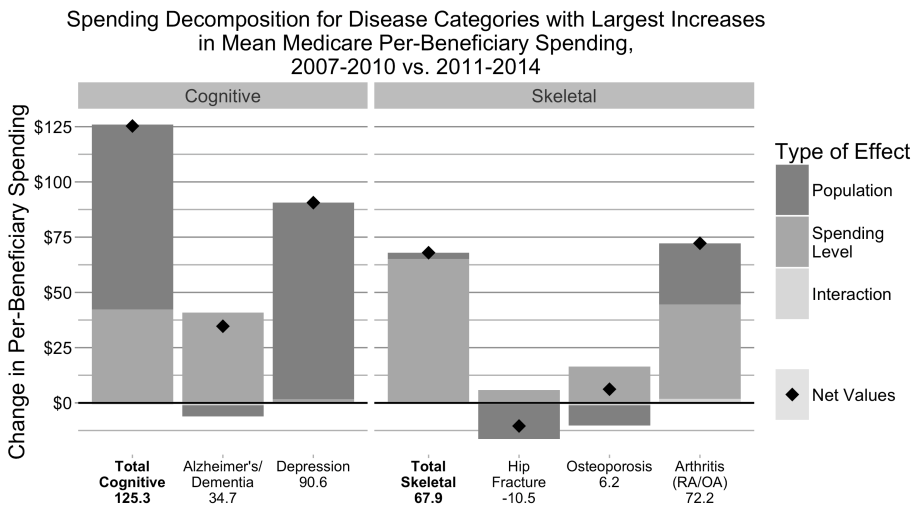


Figure 2.3: Notes: Authors calculations using a 5% sample of fee-for-service Medicare beneficiaries over age 65, years 2007-2014. Medicare spending was deflated to 2007 payment rates using sector-specific information on annual market basket updates. RA/OA: Rheumatoid Arthritis / Osteoarthritis

2.5.2 Main Tables

Table 2.1: Prevalence of Key Factors in Medicare Population and Associated Adjusted Spending Amount per Beneficiary, 2007-2010 and 2011-2014

	Prevalence of Key Factors in Medicare Population		**Associated Adjusted Spending Amount per Beneficiary**	
	2007-2010	**2011-2014**	**2007-2010**	**2011-2014**
Annual number of beneficiaries (Mean)	1,535,613	1,614,376		
Total Spending Amount Per-Beneficiary (Unadjusted)			7,682.7	7,502.3
Demographic characteristics (%)				
Age 65-69	29.8	32.7	4,536.9	4,395.5
Age 70-74	22.0	22.4	6,748.2	6,738.0
Age 75-79	17.8	16.6	8,573.3	8,567.3
Age 80-84	14.6	12.9	10,175.7	10,187.0
Age 85+	15.7	15.5	11,636.2	11,816.2
Male	43.4	44.6	7,499.2	7,252.6
Female	56.6	55.4	7,823.7	7,703.0
White	85.7	84.4	7,600.4	7,487.0
Black or other race	14.3	15.6	8,177.4	7,585.0
Decedents (%)	4.6	4.4	29,203.1	29,241.5
Medicare Coverage (%)				
New beneficiaries	6.3	7.4	1,578.6	1,535.9
New beneficiaries with chronic condition	2.0	2.2	4,571.2	4,760.0
Switched from MA to FFS	0.4	0.4	8,944.4	9,502.9
MA to FFS with chronic condition	0.2	0.2	14,061.9	14,824.3
Part A Only	8.1	9.5	613.2	550.9
Part D prescription drug coverage	43.6	50.6	9,858.4	9,597.4
Other prescription drug coverage	36.9	27.9	6,804.6	5,707.8
Medicare Only	86.9	87.1	6,833.4	6,668.5
Medicare with Full Medicaid	10.6	10.1	14,055.7	14,021.4
Medicare with Partial Medicaid	2.5	2.8	10,220.8	9,983.1
Any chronic conditions				
Cognitive	17.4	18.6	18,414.0	18,699.7
Cardiovascular	37.6	34.6	15,590.4	16,020.7
Pulmonary	12.4	12.4	20,895.7	21,127.4
Cancer	8.2	8.3	16,561.3	17,385.9
Endocrine and Renal	37.0	39.2	14,275.7	13,926.3
Skeletal and Joint	29.6	30.3	13,492.2	13,973.0
Ophthalmic	28.7	25.9	8,381.7	8,470.1
Other	65.3	63.9	11,161.2	11,288.7
Incident chronic conditions				
Cognitive	4.3	4.3	25,022.2	25,857.9
Cardiovascular	8.2	7.1	24,878.3	25,909.8
Pulmonary	3.2	2.9	23,509.7	24,057.6
Cancer	1.5	1.4	26,691.5	27,100.1
Endocrine and Renal	7.2	6.9	21,262.2	20,575.8
Skeletal and Joint	5.7	5.2	16,905.1	17,746.7
Ophthalmic	4.9	4.6	8,209.1	8,084.8
Other	11.4	9.8	13,611.8	13,981.0

Table 2.2: Decomposition of Mean Medicare Per-Beneficiary Spending, 2007-2010 versus 2011-2014

	Amount of Spending Growth Associated with Changes($)		
	Population Changes	**Changes in Relative Spending Levels**	**Interaction**
Total	96.9**	-244.8**	-32.5**
Demographics			
Age 70-74	-0.1*	-18.8**	-0.3**
Age 75-79	4.5**	-30.6**	2.2**
Age 80-84	19.1**	-32.6**	3.9**
Age 85+	6.5**	-33.2**	0.6**
Female	2.3**	46.9**	-0.9**
White	7.5**	64.0**	-1.0**
Decedents	-22.8**	-15.6**	0.8**
Medicare Coverage			
New beneficiaries	6.1**	-1.2	-0.2
New beneficiaries with chronic condition	-0.2*	-0.5	0.0
Switched from MA to FFS	-0.1**	1.0	-0.1
MA to FFS with chronic condition	-0.1	0.6	0.0
Part A Only	9.2**	-0.6	-0.1
Part D Bene	-10.8**	44.9**	7.2**
Non-D Drug Coverage	35.8**	30.0**	-7.3**
Partial Medicaid	-0.4**	-5.3**	-0.6**
Full Medicaid	-0.4**	-8.3**	0.4**
Prevalence of Chronic Conditions			
Cognitive	83.8**	42.3**	-0.7
Cardiovascular	-156.9**	-34.0**	-0.7
Pulmonary	-2.5*	-39.1**	2.6**
Cancer	2.4**	5.8*	0.8**
Endocrine and Renal	214.1**	-298.5**	-47.5**
Skeletal and Joint	2.8*	64.9**	0.2
Ophthalmic	-1.7**	27.3**	-3.6**
Other	-16.5**	56.0**	14.6**
Incidence of Chronic Conditions			
Cognitive	-6.5**	13.1**	-1.2**
Cardiovascular	-42.7**	5.4	-1.8**
Pulmonary	-5.5**	7.8**	-0.9**
Cancer	-7.8**	-6.9**	0.5**
Endocrine and Renal	-4.8**	-12.7**	1.2**
Skeletal and Joint	-8.6**	7.2**	-1.3**
Ophthalmic	-1.2**	-3.2	0.3
Other	-7.6**	-6.0*	0.4
Unattributed (Change in intercept)		-114.9**	

Appendix C

Supplemental Figures and Tables

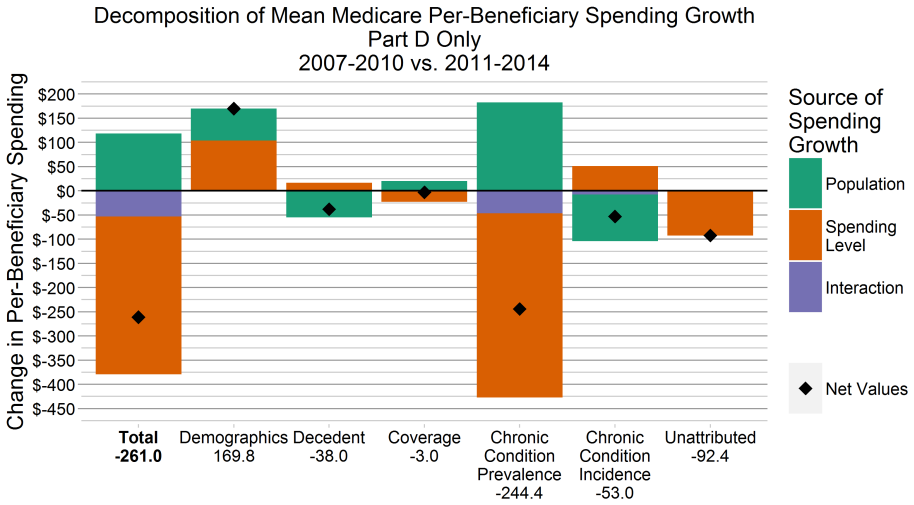


Figure C1: Notes: Authors calculations using a 5% sample of fee-for-service Medicare beneficiaries over age 65, years 2007-2014. Population limited to beneficiaries with Part D coverage. Medicare spending was deflated to 2007 payment rates using sector-specific information on annual market basket updates.

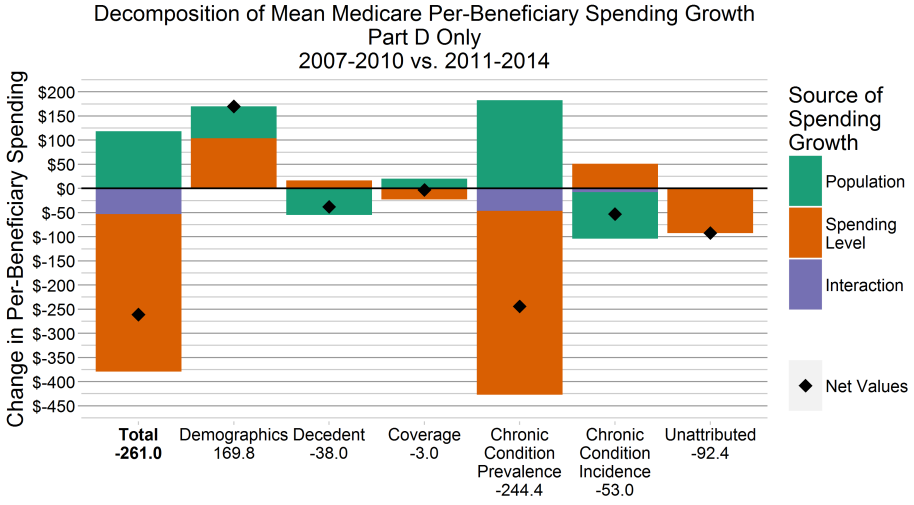


Figure C2: Notes: Authors calculations using a 5% sample of fee-for-service Medicare beneficiaries over age 65, years 2007-2014. Population excludes new Medicare beneficiaries and decedents. Medicare spending was deflated to 2007 payment rates using sector-specific information on annual market basket updates.

Table C1: Detailed Decomposition of Mean Medicare Per-Beneficiary Spending, 2007-2010 versus 2011-2014

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Demographics					
Age 65-69	Ref.	Ref.	-	-	-
Age 70-74	-38.6*	-123.7**	-0.1*	-18.8**	-0.3**
Age 75-79	-360.8**	-532.7**	4.5**	-30.6**	2.2**
Age 80-84	-1102.1**	-1325.8**	19.1**	-32.6**	3.9**
Age 85+	-2434.9**	-2645.8**	6.5**	-33.2**	0.6**
Female	-206.1**	-123.1**	2.3**	46.9**	-0.9**
White	-551.9**	-477.2**	7.5**	64.0**	-1.0**
Death	9288.7**	8951.4**	-22.8**	-15.6**	0.8**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Coverage					
Medicare Only	Ref.	Ref.	-	-	-
Partial Medicaid	-138.0**	-347.6**	-0.4**	-5.3**	-0.6**
Full Medicaid	76.5**	-2.1	-0.4**	-8.3**	0.4**
MA to FFS	392.5**	645.7**	-0.1**	1.0	-0.1
MA to FFS with Incident CC	3007.1**	3308.1**	-0.1	0.6	0.0
New Member	592.8**	573.5**	6.1**	-1.2	-0.2
New Member with Incident CC	-106.9*	-134.1**	-0.2*	-0.5	0.0
Part A Only	637.0**	629.5**	9.2**	-0.6	-0.1
No Drug Coverage	Ref.	Ref.	-	-	-
Part D Coverage	-155.5**	-52.6**	-10.8**	44.9**	7.2**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Non-D Drug Coverage	-395.9**	-314.7**	35.8**	30.0**	-7.3**
Cognitive Prevalence					
Alzheimer's/Dementia	1853.5**	2224.3**	-5.1**	40.8**	-1.0**
Depression	4490.2**	4505.1**	88.9**	1.4	0.3
Combined			83.8**	42.3**	-0.7**
Cognitive Incidence					
Alzheimer's/Dementia New	5884.9**	6601.2**	-9.0**	15.8**	-1.1**
Depression New	3258.9**	3149.2**	2.5**	-2.7	-0.1
Combined			-6.5**	13.1**	-1.2**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Cardiovascular Prevalence					
Acute Myocardial Infarction	17717.7**	17785.5**	-12.7**	0.6	0.0
Atrial Fibrillation	3281.5**	3070.5**	9.0**	-16.6**	-0.6**
Heart Failure	4430.7**	4813.8**	-81.7**	60.0**	-7.1**
Ischemic Heart Disease	1573.5**	1348.6**	-42.4**	-68.0**	6.1**
Stroke	7451.0**	7205.4**	-29.1**	-9.9**	1.0**
Combined			-156.9**	-34.0**	-0.7**
Cardiovascular Incidence					
Acute Myocardial Infarction New	-1379.9**	-2477.0**	0.9**	-7.4**	0.7**
Atrial Fibrillation New	8095.1**	7791.9**	-3.0**	-5.0**	0.1**
Heart Failure New	4024.5**	4093.0**	-18.2**	1.9	-0.3

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Ischemic Heart Disease New	2589.2**	2776.5**	-13.4**	6.0**	-1.0**
Stroke New	4085.9**	4685.7**	-8.9**	9.9**	-1.3**
Combined			-42.7**	5.4**	-1.8**
Pulmonary Prevalence					
Asthma	3108.4**	3457.2**	11.6**	12.5**	1.3**
COPD	5242.7**	4746.2**	-14.2**	-51.6**	1.3**
Combined			-2.5**	-39.1**	2.6**
Pulmonary Incidence					
Asthma New	1463.5**	1432.6**	0.3**	-0.3	0.0
COPD New	2346.4**	2697.4**	-5.8**	8.1**	-0.9**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Combined			-5.5**	7.8**	-0.9**
Cancer Prevalence					
Breast Cancer	2876.3**	3054.2**	5.7**	4.8**	0.4**
Colorectal Cancer	6268.3**	5720.1**	-3.5**	-7.3**	0.3**
Endometrial Cancer	5380.5**	6116.3**	3.2**	1.6**	0.4**
Lung Cancer	6834.1**	6138.9**	-0.9*	-7.2**	0.1*
Prostate Cancer	2357.1**	2774.7**	-2.1**	13.8**	-0.4**
Combined			2.4**	5.8**	0.8**
Cancer Incidence					
Breast Cancer New	5636.9**	5211.7**	0.3	-1.5**	0.0

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Colorectal Cancer New	11600.2**	10862.2**	-4.1**	-2.2**	0.3**
Endometrial Cancer New	6712.4**	5612.8**	0.9**	-0.8**	-0.2**
Lung Cancer New	7182.9**	7609.7**	-2.4**	1.7**	-0.1**
Prostate Cancer New	4332.4**	3400.4**	-2.5**	-4.2**	0.5**
Combined			-7.8**	-6.9**	0.5**
Endocrine and Renal Prevalence					
Chronic Kidney Disease	6649.4**	5184.0**	189.1**	-175.3**	-41.7**
Diabetes	1213.1**	817.9**	6.2**	-95.7**	-2.0**
Hypothyroidism	1154.4**	918.7**	18.8**	-27.5**	-3.8**
Combined			214.1**	-298.5**	-47.5**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Endocrine and Renal Incidence					
Chronic Kidney Disease New	4146.7**	3741.7**	1.4**	-13.4**	-0.1**
Diabetes New	2051.2**	1651.0**	-6.2**	-9.9**	1.2**
Hypothyroidism New	442.7**	1007.7**	0.1*	10.6**	0.1*
Combined			-4.8**	-12.7**	1.2**
Skeletal and Joint Prevalence					
Hip Fracture	17753.6**	18417.5**	-15.7**	5.8**	-0.6**
Osteoporosis	2080.8**	2320.5**	-9.2**	16.4**	-1.1**
RA/OA	2404.5**	2568.8**	27.7**	42.7**	1.9**
Combined			2.8**	64.9**	0.2**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Skeletal and Joint Incidence					
Hip Fracture New	6040.1**	5772.5**	-4.0**	-1.7	0.2
Osteoporosis New	905.9**	1238.1**	-3.5**	6.0**	-1.3**
RA/OA New	638.6**	719.5**	-1.1**	2.9	-0.1
Combined			-8.6**	7.2**	-1.3**
Ophthalmic Prevalence					
Cataract	90.9**	232.6**	-2.4**	29.4**	-3.7**
Glaucoma	-118.3**	-138.5**	0.7**	-2.0	0.1
Combined			-1.7**	27.3**	-3.6**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Ophthalmic Incidence					
Cataract New	387.1**	368.7**	-0.9**	-0.7	0.0
Glaucoma New	234.5**	55.3	-0.3**	-2.6*	0.2*
Combined			-1.2**	-3.2**	0.3**
Other Prevalence					
Anemia	6295.9**	6766.0**	-22.0**	101.8**	-1.6**
Hyperlipidemia	-360.8**	121.7**	-7.6**	196.9**	10.2**
Prostatic Hyperplasia	2496.5**	3190.4**	16.1**	39.0**	4.5**
Hypertension	1001.0**	471.9**	-3.0**	-281.7**	1.6**
Combined			-16.5**	56.0**	14.6**

Continued on next page

Table C1 – *Continued from previous page*

Variable	Relative Spending Levels		Spending Change due to		Interaction
	2007-2010 (β_{early})	**2011-2014 (β_{late})**	**Population Changes**	**Relative Spending Level Changes**	
Other Incidence					
Anemia New	1315.1**	1581.9**	-7.8**	11.5**	-1.6**
Hyperlipidemia New	-227.0**	-545.3**	1.0**	-13.1**	1.4**
Prostatic Hyperplasia New	586.2**	920.9**	-0.3**	4.7**	-0.2**
Hypertension New	93.3**	-131.9**	-0.3**	-9.1**	0.8**
Combined			-7.6**	-6.0**	0.4**

Bibliography

Afendulis, C. C., He, Y., Zaslavsky, A. M., & Chernew, M. E. (2011). The Impact of Medicare Part D on Hospitalization Rates. *Heal. Serv. Res.*, *46*(4), 1022–1038.

Baicker, K., Chernew, M. E., & Robbins, J. A. (2013). The spillover effects of Medicare managed care: Medicare Advantage and hospital utilization. *J. Health Econ.*, *32*(6), 1289–1300.

Blinder, A. S. (1973). Wage Discrimination: Reduced Form and Structural Estimates. *J. Hum. Resour.*, *8*(4), 436–455.

Brown, J., Duggan, M., Kuziemko, I., & Woolston, W. (2014). How does risk selection respond to risk adjustment? New evidence from the Medicare Advantage Program. *Am. Econ. Rev.*, *104*(10), 3335–3364.

Buntin, M., & Levine, M. (2013). Why Has Growth in Spending for Fee-for-Service Medicare Slowed? (pp. 1–61).
URL https://www.cbo.gov/publication/44513

Buntin, M. B., & Hayford, T. (2016). Evidence of Inefficiencies in Practice Patterns: Regional Variation in Medicare Medical and Drug Spending. *Forum Heal. Econ. Policy*, *19*(2), 299–331.

Chen, J., Normand, S. L., Wang, Y., Drye, E. E., Schreiner, G. C., & Krumholz, H. M. (2010). Recent declines in hospitalizations for acute myocardial infarction for Medicare fee-for-service beneficiaries: progress and continuing challenges. *Circulation*, *121*(11), 1322–1328.

Chen, J., Normand, S. L., Wang, Y., & Krumholz, H. M. (2011). National and regional trends in heart failure hospitalization and mortality rates for Medicare beneficiaries. *J. Am. Med. Assoc.*, *306*(15), 1669–1678.

Chernew, M., DeCicca, P., & Town, R. (2008). Managed care and medical expenditures of Medicare beneficiaries. *J. Heal. Econ.*, *27*(6), 1451–1461.

Chronic Conditions Data Warehouse (2016). CCW Condition Algorithms.
URL https://www.ccwdata.org/web/guest/condition-categories

Coresh, J., Selvin, E., Stevens, L. A., Manzi, J., Kusek, J. W., Eggers, P., Lente, F. V., & Levey, A. S. (2007). Prevalence of chronic kidney disease in the United States. *J. Am. Med. Assoc.*, *298*(17), 2038–2047.

Cram, P., Lu, X., Kates, S. L., Singh, J. A., Li, Y., & Wolf, B. R. (2012). Total knee arthroplasty volume, utilization, and outcomes among Medicare beneficiaries, 1991-2010. *J. Am. Med. Assoc.*, *308*(12), 1227–1236.

Dieleman, J. L., Squires, E., Bui, A. L., , et al. (2017). Factors associated with increases in US health care spending, 1996-2013. *J. Am. Med. Assoc.*, *318*(17), 1668–1678.

Dummit, L. A., Kahvecioglu, D., Marrufo, G., Rajkumar, R., Marshall, J., Tan, E., Press, M. J., Flood, S., Muldoon, L. D., Gu, Q., Hassol, A., Bott, D. M., Bassano, A., & Conway, P. H. (2016). Association Between Hospital Participation in a Medicare Bundled Payment Initiative and Payments and Quality Outcomes for Lower Extremity Joint Replacement Episodes. *J. Am. Med. Assoc.*, *316*(12), 1267–1278.

Dunn, A., Rittmueller, L., & Whitmire, B. (2016). Health Care Spending Slowdown From 2000 To 2010 Was Driven By Lower Growth In Cost Per Case, According To A New Data Source. *Heal. Aff.*, *35*(1), 132–140.

Epstein, A. J., Polsky, D., Yang, F., Yang, L., & Groeneveld, P. W. (2011). Coronary revascularization trends in the United States, 2001-2008. *J. Am. Med. Assoc.*, *305*(17), 1769–1776.

Fang, M. C., Perraillon, M. C., Ghosh, K., Cutler, D. M., & Rosen, A. B. (2014). Trends in Stroke Rates, Risk, and Outcomes in the United States, 1988-2008. *Am J Med*, *127*(7), 608–615.

Fisher, E. S. (2016). *Medicare's Bundled Payment Program for Joint Replacement: Promise and Peril?*, vol. 316.

Flegal, K. M., Carroll, M. D., Kit, B. K., & Ogden, C. L. (2012). Prevalence of Obesity and Trends in the Distribution of Body Mass Index Among US Adults, 1999-2010. *J. Am. Med. Assoc.*, *307*(5), 491–497.

Hurd, M. D., Martorell, P., Delavande, A., Mullen, K. J., & Langa, K. M. (2013). Monetary costs of dementia in the United States. *N Engl J Med*, *368*(14), 1326–1334.

Iglehart, J. K. (2011). Bundled Payment for ESRD–including ESAs in Medicare's Dialysis Package. *N Engl J Med*, *364*(7), 593–595.

Jacobson, G., Casillas, G., Damico, A., Neuman, T., & Gold, M. (2016). *Medicare Advantage 2016 spotlight: enrollment market update*. Menlo Park, CA.
URL http://kff.org/medicare/issue-brief/medicare-advantage-2016-spotlight-enrollment-market-update/

Jann, B. (2008). A Stata implementation of the Blinder-Oaxaca. *Stata J.*, *8*(4), 453–479.

Likosky, D. S., Zhou, W., Malenka, D. J., Borden, W. B., Nallamothu, B. K., & Skinner, J. S. (2013). Growth in Medicare Expenditures for Patients with Acute Myocardial Infarction: a Comparison of 1998 Through 1999 and 2008. *JAMA Intern. Med.*, *173*(22), 2055–2061.

Martin, A. B., Hartman, M., Benson, J., & Catlin, A. (2016). ational Health Spending In 2014: Faster Growth Driven By Coverage Expansion And Prescription Drug Spending. *Heal. Aff. (Millwood).*, *35*(1), 150–160.

McWilliams, J. M., Hsu, J., & Newhouse, J. P. (2012). New risk-adjustment system was associated with reduced favorable selection in Medicare Advantage. *Heal. Aff. (Millwood).*, *31*(12), 2630–2640.

McWilliams, J. M., Zaslavsky, A. M., & Huskamp, H. A. (2011). Implementation of Medicare Part D and nondrug medical spending for elderly adults with limited prior drug coverage. *J. Am. Med. Assoc.*, *306*(4), 402–409.

Medicare Trustees Report (2017). *Table V.D1. HI and SMI Average Incurred per Beneficiary Cost*.
URL https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/ReportsTrustFunds/Downloads/TR2017.pdf

Oaxaca, R. (1973). Male-Female Wage Differentials in Urban Labor Markets. *Int. Econ. Rev. (Philadelphia).*, *14*(3), 693–709.

Roehrig, C., & Lake, C. (2017). *An Updated Analysis of the Roles of Cost per Case and Treated Prevalence in Health Spending Growth*. Ann Arbor, MI.

Roehrig, C. S., & Rousseau, D. M. (2011). The growth in cost per case explains far more of US health spending increases than rising disease prevalence. *Heal. Aff. (Millwood).*, *30*(9), 1657–1663.

Starr, M., Dominiak, L., & Aizcorbe, A. (2014). Decomposing growth in spending finds annual cost of treatment contributed most to spending growth, 1980-2006. *Heal. Aff. (Millwood).*, *33*(5), 823–831.

Swaminathan, S., Mor, V., Mehrotra, R., & Trivedi, A. (2012). Medicare's payment strategy for end-stage renal disease now embraces bundled payment and pay-for-performance to cut costs. *Heal. Aff.*, *31*(9), 2051–2058.

US Burden of Disease Collaborators (2013). The state of us health, 1990-2010: Burden of diseases, injuries, and risk factors. *JAMA*, *310*(6), 591–606.
URL +http://dx.doi.org/10.1001/jama.2013.13805

White, C., & Ginsburg, P. (2012). Slower Growth in Medicare Spending:Is This the New Normal? *N Engl J Med*, *366*(12), 1073–1075.

Winkelmayer, W. C., Mitani, A. A., Goldstein, B. A., Brookhart, M. A., & Chertow, G. M. (2014). Trends in anemia care in older patients approaching end-stage renal disease in the United States (1995-2010). *JAMA Intern. Med.*, *174*(5), 699–707.

Zhang, Y., Donohue, J. M., Lave, J. R., O'Donnell, G., & Newhouse, J. P. (2009). The effect of Medicare Part D on drug and medical spending. *N Engl J Med*, *361*(1), 52–61.

Chapter 3

Diff'rent Votes, Same Strokes: Did the ACA's Benefits Cross Kentucky's Political Aisle?

3.1 Introduction

Since passage of the Affordable Care Act (ACA), there have been many notable gains made in individual access to health insurance coverage and health care services that may not have been otherwise feasible without major reform (Antwi et al., 2013; Simon et al., 2017; Courtemanche C, Marton J, Ukert B, Yelowitz A, Zapata D., 2017; Barbaresco et al., 2015). Despite some of ACA's major achievements, including historically low rates of uninsured individuals, there remains substantial partisan discord among political officials and the public. While hyper-partisanship is not a new phenomenon, in the current political landscape it has been highly influential in the policy directions of many states regarding health reform (Jacobs LR, 2013; Olson, 2015; Sommers et al., 2012). Since the inception of the ACA in 2010, there were dozens of attempts by Republican lawmakers to repeal the law. Even so, it is unclear how much of this staunch opposition represents realized action among their constituency.

The extent to which these partisan views permeated into the opinions of the general constituency is obvious in polls, and the latest polls show those identifying as Democrats tend to view the ACA favorably given a favorability rating of 63 percent in the July 2016 Kaiser Health Tracking Poll The Henry J. Kaiser Family Foundation (2017). Meanwhile, Republicans maintain unfavorable views of the ACA with 73 percent viewing the law through a negative lens. The strong partisan opinions about the ACA clash with the numerous documented effects of the law, most notably being availability of affordable insurance through state Marketplaces or Medicaid.

While the stark levels of optimism and pessimism toward the ACA can be drawn down party lines, we found that people in Kentucky utilized the benefits of the law in Kentucky regardless of their political party affiliation. Prior research shows the bulk of the positive effects of Kentucky's participation in the reform were concentrated in the poor (Benitez et al., 2017a), and we find relatively uniform gains in coverage and access to care by political identity, with some of our results suggesting Republican strongholds experienced some in Kentucky benefited equally from the ACA's

coverage expansions and Republican (i.e. areas with dense support for Republican presidential candidates) leaning counties benefited slightly more than Democratic leaning counties.

3.2 Study Data and Methods

3.2.1 Framework

If behavior is largely dictated by one's own political orientation, we would observe differential trends in the outcomes between Democratic and Republican Kentuckians. Democratic-leaning Kentuckians would expectedly be more receptive to the ACA's reforms, and thus more likely to participate in the coverage expansions including both expanded Medicaid and the exchanges. Because of this, some would expect Democrats to experience the brunt of the benefits associated with Kentucky's recent reform because they would be most willing to take up the offer of expanded eligibility for coverage and coverage assistance than those with prevailing negative views towards the law. We tests this theory utilizing two distinct data sourcesthe Kentucky Health Issues Poll (KHIP) and the Behavioral Risk Factor Surveillance System (BRFSS).

3.2.2 Data

3.2.2.1 Kentucky Health Issues Poll (KHIP)

The KHIP is an annual survey jointly funded by the Foundation for a Healthy Kentucky, based in Louisville, KY, and Interact for Health, a health and wellness oriented foundation based in Cincinnati, OH. The KHIP samples 1500-1700 adults per year via random digit dialing to landline and mobile phone. The KHIP resembles the Kaiser Family Foundations Health Tracking Poll and asks similar questions related to public opinion about health reform among other issues related to the publics health. Using the 2009-2015 waves of the KHIP, we have four years of pre-expansion and two years of post-expansion observations. The outcomes contained in the KHIP that are most pertinent to our analyses are trends in: 1) insurance coverage (e.g. coverage of any kind, and Medicaid coverage) [2009-2015], and 2) financial barriers to seeking health care [2009, 2014, 2015].[1] Be-

[1]The key survey items from the KHIP to be used in this analysis include: 1) Political Identity: Generally speaking, do you usually think of yourself as a Republican, a Democrat, an Independent or what?; 2) Insurance Coverage: Do you have any kind of health care coverage, including health insurance, prepaid plans such as HMOs, or government plans such as Medicare or Medicaid?; and 3) Financial Barriers to Care: In the past 12 months, was there a time when you or

cause the KHIP ask respondents questions about their political identity and ideology, we are able to compare and contrast trends in coverage and access to care among Republican-leaning Kentuckians likely to have a distaste for the ACA and Democrats likely to have more positive feelings towards ACA.[2]

3.2.2.2 Behavioral Risk Factor Surveillance System (BRFSS)

To complement our KHIP analyses, we use the restricted BRFSS data for 2011-2015 from Kentucky's Cabinet for Health and Family Services. [3]These restricted versions of the BRFSS contain county identifiers, an attribute not common to the public-use version of the BRFSS. We matched observations to political data from the Atlas of U.S. Presidential Elections (Leip, 2016), and we label the county–the smallest geographic unit we could identify with aggregate voting data– as Republican- or Democratic-leaning based on the margins of victory in favor of Barack Obama [D] over Mitt Romney [R] in the 2012 U.S. presidential election. In this approach, we hypothesize if political motivation and candidate selection during the 2012 election was partly motivated by dynamics in the health care landscape, then it is possible that more Kentucky Republicans swayed towards the Romney-Ryan [R] ticket as they would have a distaste for the direction of national health care being taken under then-president Obama [D].

Results are survey-weighted to account for the complex sampling strategies of both the KHIP and the BRFSS; however, all the survey weights used in the BRFSS regression models receive additional augmentation to account for variation in voter turnout among registered voters in the 2012 election. This addition to our approach multiplies the BRFSS' sampling weight by the counties voter turnout. Under this approach, observations sampled from counties with higher voter turnout receive more weight in the regression than do persons from counties with lower voter turnouts.

---

another member of your household needed medical care but did not get it, or delayed getting it because of the cost?

[2]Please consult the technical appendix to learn more about the strategy used to create the two groups based on political identity using the KHIP.

[3]The restricted versions of the BRFSS were necessary because we rely on county-level variation in voting patterns, and county identifiers are not available for all counties in the public use file obtainable from the Centers for Disease Control and Prevention. The state-restricted versions of the BRFSS include county-of-residence identifiers for more than 90 percent of the observations sampleincluding representation from each of Kentucky's 120 counties.

3.2.3 Research Design

Using the KHIP, we use differences-in-differences regression approach to compare trends in coverage and deterred access because of cost of Republican-leaning Kentuckians against Democratic-leaning residents. Using the BRFSS, we perform similar regressions but because we cannot link political ideology within the survey, we use the political leanings of the county. To determine if there were identifiable differential effects by the political leaning of the county based on the 2012 election, we perform regressions using a post-2014 indicator interacted with the county's Republican margin of victory from the 2012 presidential election between president Barack Obama [D] and Mitt Romney [R]. The KHIP allows us to compare the trends of Kentuckians self-identifying their political affiliation as one of seven categories: 1) Strong Democrat, 2) Not Very Strong Democrat, 3) Independent, but closer to Democrat, 4) Independentcloser to neither, 5) Independent but closer to Republican, 6) Not very strong Republican, or 7) Strong Republican. For simplicity, we collapse the categories into three groups1) all Democrats, 2) all Independents, and 3) all Republicans. To allow for cleaner comparison of the groups based on political identity we omit persons identifying as political independents because their political beliefs could be more malleable to experiences under the ACA. A benefit in collapsing into the two groups is we will have one group with a distaste towards the ACA (Republicans and Republican-leaning persons) and those with more tolerable attitudes towards the ACA (Democrats and Democratic-leaning persons). Explicitly, our specification of interest using the Kentucky Health Issues Poll (KHIP) is:

$$Y_{it} = \beta_0 + \beta_1 Republican_i + \beta_2 Post_t + (Republican_i Post_t) + \gamma X_i + \lambda_t + \varepsilon_i t \tag{3.1}$$

Y_{it} references our outcome of interest; $Republican_i$ is a dummy variable indicating the individuals self-reported political leaning towards Republican ideology. In this model, the reference category includes persons identifying as Democrats. $Post_t$ is a dummy variable indicating the observation was taken following the states full implementation of the health care reform. $Republican_i Post_t$ is the difference-in-differences term, and β_2 is the parameter of interest that would allow us to determine whether the coverage and access trends among Kentucky Republicans evolved differently than their non-Republican counterparts. To adjust for individual level variation, in X_i, that may influence the outcomes, we control for: age, racial/ethnic group, sex, income, marital status, number of chil-

dren own in the household, employment status, poverty status, and level of education (i.e. <high school completion, high school diploma/equivalent, some college/technical school, and BA/BS or more). To account for variation in the outcome due to the timing of the survey, we include year fixed effects–$_t$.

Using the Kentucky Behavioral Risk Factor Surveillance System (KY-BRFSS) with county identifiers (i.e. to determine the political leanings of the county), we model the following specification:

$$Y_{ict} = \alpha_0 + \alpha_1 Post_t + \rho(RepublicanLeaning_c Post_t) + \delta X_i + \zeta_c + \sigma_t + \varepsilon_{ict} \tag{3.2}$$

To maintain consistency across each of the different data sources in our analysis, we included similar covariates in our approach using the BRFSS. Instead of poverty status, we dummy variables to control for income. In addition we included county fixed effects, ζ_c, to control for other important yet unobservable factors at the county level we anticipate are time invariant but could impact the levels of the outcomes. Time effects are controlled for by including year fixed-effects, σ_t. As with our regressions using the KHIP, Y_{ict} represents the outcome being evaluated, and the key parameter of interest is ρ.

BRFSS files do not contain identifiers that would determine political identity; therefore, we opt to assess changes in our outcome variables using the political leanings of the county of residence based on the 2012 presidential election between President Barack Obama [D] and Mitt Romney [R]. A key limitation of using BRFSS is that we must assume: 1) the distribution of political ideologies represented in the counties true population is reflected in the BRFSS samples (i.e. one's political ideology/leanings do not influence one's willingness to participate in the BRFSS interview), and 2) if we label a county as Republican-leaning, then the observations sampled from the county should have a large share that would identify as Republican-leaning. Neither assumption is testable given the structure of the BRFSS; however, to address this limitation we also include difference-in-difference regressions with categorical representations of the leanings of the county: 1) Democratic leaning [Control group, 21.7 percent of sample]; 2) Republican leaning: 0-23 points [18.4 percent]; 3) Republican leaning: 23-35 points [22.7 percent]; 4) Republican leaning: 35-50 points [19.3 percent]; and 5) Republican leaning: 50+ points [17.9 percent].

$$Y_{ict} = \eta_0 + \eta_1 Post_t + \sum_{j=1}^{4} \theta_j (Post_t RepublicanLeanCat_c^j) + \iota X_i + \kappa_c + \mu_t + \varepsilon_{ict} \tag{3.3}$$

Although using BRFSS forces us to ascribe political leanings of the entire county to individuals sampled within the county thus creating potential for an ecological fallacy, we reiterate that Kentucky largely tended towards Republican presidential candidates in the past five general elections. Only 22 percent of the sample reside within a county that leaned Democratic as of the 2012 general election, and the subgroups among the Republican-leaning counties reflected the natural breaks in the distribution for Republican margin of victory.

Limitations The KHIP has some inherent limitations in that its small sample size could lead to problems with statistical inference and identifying valid estimations of the effects on Kentucky Democrats versus Republicans. Furthermore, because several KHIP items are not asked annually, it is difficult to track the effects of many of the policy changes across time. There are limitations with the BRFSS that would preclude us from making the same inferences as we would using the KHIP, although we argue using both in this setting provides a more comprehensive and even complementary analysis. We anticipate that the weaknesses of one data source would be partially addressed by the strengths of the other data source; therefore, observing similar patterns across data sources should add to the validity of our findings.

Our approach using the BRFSS forces us to ascribe political leanings of the entire county to individuals sampled within the county, the larger sample sizes allow for testing alternative model specifications which should allow us to both complement our approach using the KHIP and overcome its small sample size limitations. Kentucky tended towards Republican presidential candidates in the past five elections, and our preferred approach allows us to describe the ACA implementation effects emerging from counties with higher densities of support for the policy positions of Republican candidates. [4] One argument against either of our approaches could be potential endogeneity

[4] In the 2012 election, Barack Obama [D] lost in Kentucky counties by an overall margin of 23 percentage points to Mitt Romney [R], showing the state's general preferences towards the Republican candidate as a whole. Even if one were to assume the large uptakes in coverage and access effects were concentrated among those in favor of the ACA's policies, there were only four counties (Elliot [+2.5], Fayette [+1.0], Franklin [0.8], and Jefferson [+11.1]) where the president won with winning margins. In contrast to the narrow wins in four Kentucky counties for President Obama, the average margin in counties where he lost was -37 points (range: -81 to -5). Jefferson and Fayette counties contain the states two largest metropolitan centers (Louisville and Lexington); combined with the other two counties that trended in favor of the president, these four counties make up just under 26 percent of the state's population of 4.4 million. Alone, Jefferson (17 percent) and Fayette County (7 percent) make up 24 percent of the state's population.

in political tilt at the individual- and county-levels because of personal experiences associated with health reform. For this reason, we are classifying the political lean of the county based on the 2012 election rather than the 2016 election between Donald Trump [R] and Hillary Clinton [D] which are at presently being investigated and their validity in some districts remains in question 18. Furthermore, we argue the political leanings of counties would be generally slow to change over time within short periods.[5]

The larger sample sizes and annual representation for the outcomes of interest in the BRFSS provide an advantage over the KHIP in many ways despite our inability to identify political leanings at the individual level. For comparability between the BRFSS and the KHIP, we compare trend shifts in coverage uptake and financial barriers to seeking health care, but we also investigate the reforms impact on having a regular source of care, having a regular doctor visit within the past year, and self-reported health status.

3.3 Results

Focusing on panels A and B in Figure 3.1, we see almost no discernible differences in terms of starting places for overall uninsured rate and share that had to either delay or even forgo entirely some medical need because of cost using the KHIP data. For both groups, we observe a downward trend in both outcomes on par with other studies (Benitez et al., 2016, 2017b; Sommers et al., 2016). Visual inspection suggests coverage patterns and improved access to care were similar for Republicans and Democrats under reform. Partisan trends in favorability remain virtually parallel to one another over time, though at different starting places, though reductions in negative attitudes towards the ACA occurred. In 2012, about 80 percent of Republican-leaning Kentuckians viewed the ACA negatively before falling to just over 60 percent in 2015. Favoritism towards the ACA among Democrats was consistently higher than that of Republicans, and peaking in 2014–the first full year of the ACAs coverage expansions (Figure 3.1, Panels C and D). Using the BRFSS data, the panels in Figure 3.2 display similar trends for coverage and access. Consistent with the results

[5]To test our assumption, we regressed the counties' 2016 Republican margin of victory on the 2012 margin of victory and the correlation was 0.994(95% confidence interval = 0.937-1.050). Doing the procedure again but regression the 2016 on the 2008 margin of victory, the correlation coefficient was 0.910(95% confidence interval = 0.813-1.008). The correlation between the 2012 Republican margin of vicory and the 2008 margin was 0.971(95% confidence interval = 0.910-1.032) The regressions were completed using all 120 counties in Kentucky.

of the KHIP data, Panel A (Figure 3.2) suggests a similar level of decline in the rate of uninsurance for respondents residing in both Democratic- and Republican-leaning counties in Kentucky post-expansion. Consistent with Figure 3.2, respondents appear to have benefited similarly in terms of improved access to care regardless of the political leaning of their county of residence. In Panels B, C, and D we observe similar trends in cost related barriers to care, having no regular source of care, and scheduled doctor visits, respectively. Tables 3.1 and 3.2 provide the baseline demographic information by political leanings from the KHIP and BRFSS samples. To discern if there are any substantial differences of note, we turn to our regression results in Table 3.5. Focusing on the KHIP results in Panel A, Republican and Democratic respondents report comparable pre-ACA uninsured rates. A larger portion of Kentucky Democrats experienced an unmet medical need due to cost, but the trend shifts along this dimension of access were statistically indistinguishable from one anothersuggesting neither group had benefited more so than the other. Panel B presents the regression results using the BRFSS. Pre-ACA, respondents in Democratic-leaning counties had similar levels of uninsurance as those in Republican-leaning. Respondents in each group also had similar baseline levels in terms of the access to care measures, with approximately 27 percent having experienced an unmet medical need due to cost and 17 to 18 percent without a regular source of care. An exception occurs for last measure, with 63 percent of respondents in Republican-leaning counties reporting having scheduled a doctor visit with then past year compared to 70 percent for respondents in Democratic-leaning counties. The objective of this analysis was to determine if, for any of the outcomes of interest, did those identifying as Republicans experience differential trends compared to their Democrat counterparts, and we are unable to suggest that Republicans were at all slower to take-up the ACA's provisions (i.e. expanded coverage through Medicaid, private health coverage on the exchange) or that Democrats disproportionately benefited in terms of improved access to care. On the contrary, we observe that residents of Republican-leaning counties were more likely to benefit from the ACA's provisions in experiencing fewer unmet medical needs due to cost medical care (-2.8 pp, n.s), increased access to a regular provider (3.0 pp, $p<0.10$), and increases in regularly scheduled doctor visits (7.2 pp, $p<0.01$). In Table 3.3, we provide additional results allowing for even more heterogeneity of the effect, and observe the most substantial benefits associated with the reform were concentrated among counties where the Mitt Romney [R] had winning margins of 50

points or more.[6] There were no meaningful differences in the uptake of health insurance coverage or improved ability to afford needed care in the sample of adults eligible for the full scope of the ACA's coverage expansions (i.e. Medicaid expansion and the exchange). However, residents of Republican-leaning counties where Romney [R] won by 50 points or more experienced a 9 pp ($p<0.01$) increase in having a regular source of medical care with a 10 pp increase in scheduled visits to the doctor (See table 4, panel A). In the Medicaid expansion populationspecifically, all low-income adults with incomes below 138 percent FPL–the coverage uptake was nearly twice as large by magnitude, and the reductions in delayed or unmet medical needs due to costs were concentrated in republican-leaning counties where Romney [R] won by at least a 23 point margin in 2012 ($p<0.10$).

3.4 Discussion

The results of this study reveal that, though stark differences existed between Republican-leaning and Democratic-leaning Kentuckians in their attitudes regarding the ACA prior to its implementation, there were no differences in coverage take-up and access to care across political ideologies. Furthermore, attitudes toward President Obama's signature health care reform remained consistent across the study years, with Republican Kentuckians continuing to view the ACA more negatively than their Democratic counterparts despite being just as likely to benefit from its provisions. These findings suggest that partisan attitudes do not necessarily influence political behavior, which may be the result of a documented disconnect between the Affordable Care Act and individuals' own experiences with health care reform. According to the results of a nationally representative survey of 1,000 adults conducted by Sances and Clinton (2017) in February of 2017, 73 percent of respondents in non-expansion states and 71 percent of respondents in expansion states were not able to correctly identify whether the ACA had caused Medicaid to expand in their state (Sances & Clinton, 2017). Nevertheless, this lack of knowledge has not precluded individuals from having an opinion about the law, nor has it stopped people from reaping its benefits, regardless of ideology. The results of this study have important political implications given recent legislative efforts to repeal the ACA. Sommers and Epstein questioned how Republicans from states that have benefited

[6] Please consult supplementary findings in the technical appendix.

from the ACA insurance expansions would approach the decision of repeal (Sommers & Epstein, 2017), and, after failing to gain sufficient support in March 2017, a revised version of the American Health Care Act (AHCA) was narrowly passed by House Republicans two months later, with all Democrats and 20 Republicans voting against. Of Kentucky's six representatives, two voted against (one Democrat and one Republican), while four (Republican) voted in favor of the repeal bill, which includes steep cuts to Medicaid, despite the positive impact the expansion has had on the state and limited access to an alternative coverage source for many gaining coverage (Seiber & Berman, 2017). Gutting the ACA of its core provisions may assert credibility with political allies and the base of core support in the immediate short run, as indicated by early polls showing that 67 percent of Republicans view the AHCA favorably compared to only 8 percent of Democrats (The Henry J. Kaiser Family Foundation, 2017). However, the longer-term political effects are less predictable. Regardless of their sentiments towards Obamacare, many Republican-leaning constituents in states like Kentucky, where individuals benefitted greatly from the Medicaid expansion but overwhelmingly supported then presidential candidate Donald Trump [R], are likely lose coverage and their recently acquired ability to pay for health care without fearing financial burden gained under the ACA should either the 2015 Senate ACA replacement bill, the 2017 American Health Care Act, or the 2017 Better Care Reconciliation Act come to pass. Overall, the ACA in its entirety was credited for reducing the national uninsurance rate by 46 percent between 2010 and 2015, with even larger gains in the expansion states (Department of Health and Human Services, 2016b). Previous estimates from the Gallup-Healthways Well-Being Index estimate the number of newly insured under the ACA through early 2016 to be around 20 million (Department of Health and Human Services, 2016a)–a large number likely including members across the political spectrum. According to the Congressional Budget Office (CBO), 23 million Americans would lose coverage under the AHCA by 2026 (Congressional Budget Office, 2017). Given that many of those who are likely to lose coverage under the new legislation include lower-income Americans that rely on Medicaid, it is conceivable that Kentuckians of all ideologies would be particularly harmed by the AHCA, as over 400,000 people in the state gained coverage as a result of the Medicaid expansion (Congressional Budget Office, 2017). Should people start losing benefits they only recently procured, it is plausible that voters could take these frustrations with them to future Congressional and Senate elections. In order for coverage loss to feed back into political preferences, however, voters must first be able

to recognize the connection between their personal health care circumstances and the AHCA, the occurrence of which is not guaranteed. Anecdotal evidence suggests American can have generally positive views towards the ACAs major coverage provisions (Kliff, 2016), yet still experience confusion in their views towards the ACA and "Obamacare." The ACA is comprised of a set of incredibly complex reforms that touch upon every aspect of the health care continuum. Second, the Medicaid expansion was branded separately in each state that participated, with officials of several right-leaning states intentionally obscuring the link between the Medicaid expansion in their state and the ACA. Former Kentucky Governor, Steve Beshear [D], admitted to such obfuscation when he stated that officials in the state wanted to get as far away from Obamacare as we could (Kliff, 2016), which included branding tactics such as naming the state's federally mandated marketplace kynect. This limited knowledge, compounded by the highly partisan debate surrounding Obama's signature health care reform, mitigated the extent to which the ACA itself influenced the attitudes and preferences of the public toward it (Sances & Clinton, 2017). Should ACA repeal occur, the extent that citizens will respond to these losses at the polls depends on voters' ability to link their situation to the appropriate culprit which has, unsurprisingly, been a difficult undertaking for the American public thus far. However, as time progresses, the American public has become more familiar with the potential for the colloquial termed "Trumpcare,"and generally indicate negative views towards negative feelings towards some of the current health care proposals (The Henry J. Kaiser Family Foundation, 2017).

Our results support, in opposition to partisan rhetoric, that there was no evidence suggesting those with specific political leanings were negatively affected by the ACA's major expansion provisions; on the contrary, the largest improvements in access to care may have been among those who tended to superficially oppose the ACA or as it is colloquially referred'Obamacare.' Though our analysis reflects a single state's experience under ACA, Kentucky provided a case with two competing factors in this era of hyper-partisanship: the state's overwhelming support for Republican candidates in five (i.e. 2000, 2004, 2008, 2012, and 2016) consecutive presidential elections and the magnitude of the participation in the coverage expansions generated by the Obama administration's landmark legislation–the ACA. With the national health care landscape largely focused on the potential repeal and replacement of the ACA, our results suggest Republican constituencies are equally at risk from the negative impacts should the ACA be repealed. Our manuscript con-

tributes to the literature on implications of the rhetoric and partisan division surrounding ACA, and regardless of differences in public perception towards 'Obamacare,' there was uptake in coverage, and likely positive effects in access to care, on both sides of the political aisle. Stated opposition to the ACA is likely to be in name only as we show no detectable differences in the effects of the ACA between Democrats and Republicans using two different but complementary approaches. While partisan rhetoric largely dictates people's feelings about health care reform spearheaded by President Obama's [D] administration, the observed effects appeared to be independent of partisan rhetoric.

3.5 Main Results

3.5.1 Main Figures

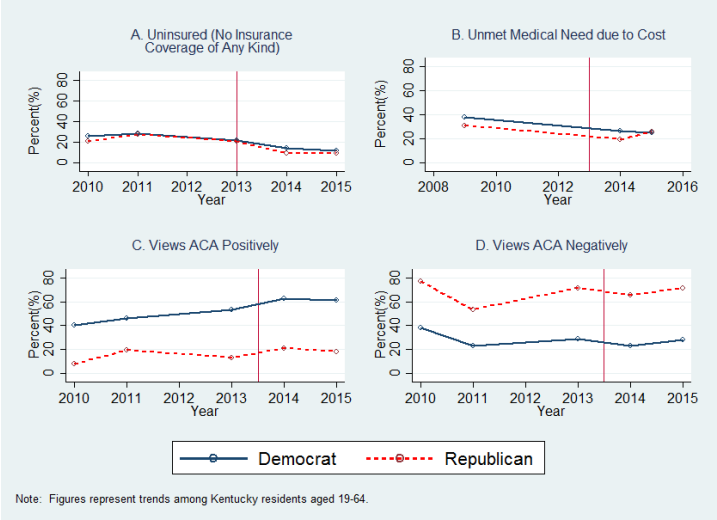


Figure 3.1: Trends in Views towards ACA, Coverage, and Unmet Medical Needs by Political Orientation in Kentucky. Source: Authors' own analysis of the Kentucky Health Issues Poll, 2009-2015. Note: Sample was weighted to reflect the complex sampling design of the survey, and figures represent trends among Kentucky residents aged 19-64. Percent reporting an unmet medical need because of cost care was only available for waves 2009, 2014, and 2015 of the Kentucky Health Issues Poll.

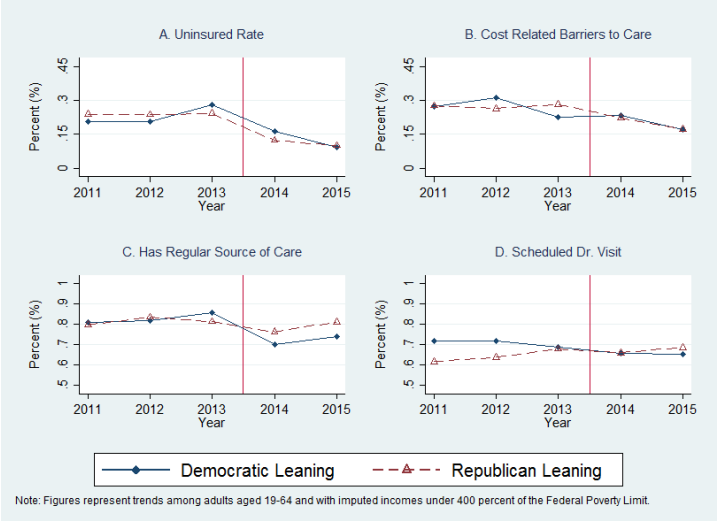


Figure 3.2: Trends in Coverage and Access to Care by Political Party Leanings of County of Residence. Source: Author's own analysis of the 2011-2015 Kentucky Behavioral Risk Factor Surveillance Systems databases. Note: Political leaning of the county of residence was assigned based on the 2012 presidential candidate with the winning margin of victory. Counties with a positive margin in favor of Barack Obama [D] were coded as Democratic-leaning; likewise, counties with a positive margin in favor of Mitt Romney [R] were labeled Republican-leaning.

3.5.2 Main Tables

Table 3.1: Summary Characteristics of Kentuckians by Political Orientation

	Democrat	**Republican**
Outcomes		
% Uninsured	26.6%	25.4%
% Unmet Medical Need due to Cost	37.5%	30.8%
% Viewing the ACA Positively	39.0%	11.3%
% Viewing the ACA Negatively	23.7%	53.5%
% Indicating they Understand the ACA	27.2%	27.0%
Demographics		
Age	41.8	40.5
%Married	58.0%	58.7%
%Parent	48.1%	54.0%
% Childless Adults	51.8%	46.0%
% White, Non-Hispanic	84.0%	96.5%
% Non-White, Non-Hispanic	13.3%	1.3%
% Hispanic	2.0%	1.3%
% Male	44.5%	52.4%
% Female	55.5%	47.6%
Educational Attainment		
% High School Diploma or Less	49.5%	45.6%
% Some College/Technical School	30.9%	31.4%
% BA/BS or Higher	19.7%	22.9%
Income (as Ratio of Federal Poverty Limit)		
$<$100% of Federal Poverty Limit	29.7%	21.2%
100-200% of Federal Poverty Limit	22.2%	16.8%
$>$200% of Federal Poverty Limit	48.1%	62.0%
Political Ideology		
% Liberal	29.2%	8.0%
% Moderate	45.9%	26.1%
% Conservative	24.9%	65.8%
Observations	1984	1700

Table 3.2: Summary Characteristics by Political Leanings of the County for Kentucky, 2011-2013

	Democratic-Leaning	**Republican-Leaning**
% Uninsured	23.3%	23.7%
% Unmet Medical Need due to Cost	27.4%	27.4%
% No Regular Source of Medical Care	17.3%	18.4%
% With Scheduled Dr. Visit in Past Year	70.1%	62.8%
Demographics		
Age	46.1	44.7
% Male	38.8%	42.7%
% Female	61.2%	57.3%
% Childless Adult	54.9%	50.0%
% Married	49.7%	61.3%
% Unemployed	10.4%	9.5%
Income as Ratio to Federal Poverty Level (FPL)		
% Under 200 Percent FPL	57.7%	62.8%
% Under 138 Percent FPL	38.3%	40.8%
% Under 100 Percent FPL	27.2%	27.6%
% Under 50 Percent FPL	12.6%	11.1%
% Annual Household Income under $25,000	40.3%	39.8%
% Annual Household Income under %15,000	22.1%	18.7%
Race/Ethnicity		
% White, Non-Hispanic	74.4%	92.2%
% Black, Non-Hispanic	20.5%	3.3%
% Other, Non-Hispanic	3.9%	2.8%
% Hispanic (Any Race)	1.2%	1.6%
Education Attainment		
% <High School	13.2%	19.8%
% High School or Equivalent	31.3%	38.5%
% Some College/Technical School	36.6%	29.4%
% BA/BS or Higher	19.0%	12.3%
Political Leaning of County of Residence		
Residing in Democratic Leaning County	100.0%	0.0%
Residing in a Republican Leaning County	0.0%	100.0%
Mitt Romney won County by 10+ Points	0.0%	98.1%
Mitt Romney won County by 20+ Points	0.0%	91.1%
Mitt Romney won County by 50+ Points	0.0%	25.5%
Observations	1,601	7,569

Table 3.3: Difference-in-Differences Estimates of Effect of Kentuckys ACA Implementation

	Pre-2014 Mean	2013 Absolute Change In Outcomes	Effects of Coverage Expansions on Republicans/Republican Leaning Counties
A. Results from the Kentucky Health Issues Poll			
Uninsured (n=5,048)			
Democrats	26.6%	-19.0***	
Republicans	25.4%	-21.4***	-2.4
Unmet Medical Need due to Cost (n=2,169)			
Democrats	37.5%	-10.9**	
Republicans	30.8%	-7.1	3.8
Views ACA Positively (n=4,241)			
Democrats	39.0%	18.9***	
Republicans	11.3%	12.2***	-6.8
Views ACA Negatively (n=4,241)			
Democrats	23.7%	-10.0**	
Republicans	53.5%	-5.8	4.2
B. Results from Kentucky Behavioral Risk Factor Surveillance System			
Uninsured (n=16,307)			
Democratic Leaning Counties	23.3%	-15.3***	
Republican Leaning Counties	23.7%	-12.8***	2.5
Unmet Medical Need due to Cost (n=16,280)			
Democratic Leaning Counties	27.4%	-10.8***	
Republican Leaning Counties	27.4%	-8.0***	-2.8
Without a Regular Source of Care (n=16,307)			
Democratic Leaning Counties	17.3%	-0.3	
Republican Leaning Counties	18.4%	-2.8	-3.0*
Scheduled Dr. Visit in Past Year (n=16,010)			
Democratic Leaning Counties	70.1%	-0.6	
Republican Leaning Counties	62.8%	6.6***	7.2***

Table 3.4: Effects of Expansion on Coverage and Access to Care by Margins of Republican Victory in 2012 Presidential Election

Panel A. Full Sample [<400% FPL]				
	Uninsured	Cost-Related Barriers to Care	Has No Regular Source of Medical Care	Scheduled Doctor's Visit
Post 2014	-0.13***	-0.09***	0.01	0.00
	(0.03)	(0.03)	(0.03)	(0.02)
0-23 Point Republican Margin * Post 2014	0.01	0.02	-0.02	0.07***
	(0.04)	(0.03)	(0.03)	(0.02)
23-35 Point Republican Margin * Post 2014	0.00	0.01	-0.04	0.04
	(0.04)	(0.03)	(0.03)	(0.03)
35-50 Point Republican Margin * Post 2014	-0.00	0.01	-0.02	0.04
	(0.04)	(0.03)	(0.04)	(0.03)
50+ Point Republican Margin * Post 2014	-0.05	-0.02	-0.09***	0.10***
	(0.04)	(0.03)	(0.03)	(0.02)
Observations	16,307	16,280	16,275	16,010

Table 3.5: Effects of Expansion on Coverage and Access to Care by Margins of Republican Victory in 2012 Presidential Election

Panel B. **Medicaid Expansion Population [<138% FPL]**				
	Uninsured	Cost-Related Barriers to Care	Has No Regular Source of Medical Care	Scheduled Doctor's Visit
Post 2014	-0.25*** (0.07)	-0.06 (0.05)	0.01 (0.06)	0.11** (0.05)
0-23 Point Republican Margin * Post 2014	0.07 (0.09)	-0.05 (0.06)	-0.05 (0.07)	0.01 (0.06)
23-35 Point Republican Margin * Post 2014	0.06 (0.08)	-0.11* (0.06)	-0.10 (0.07)	-0.01 (0.06)
35-50 Point Republican Margin * Post 2014	0.01 (0.08)	-0.12* (0.06)	-0.09 (0.07)	0.03 (0.07)
50+ Point Republican Margin * Post 2014	-0.01 (0.08)	-0.11* (0.06)	-0.12* (0.06)	0.03 (0.06)
Observations	6,470	6,450	6,457	6,323

Appendix D

Supplemental Figures and Tables

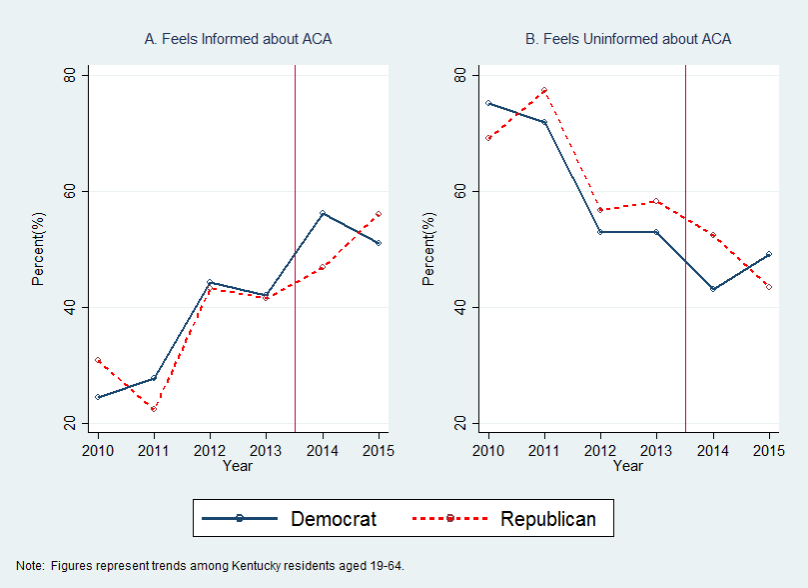


Figure D1: Trends in Comprehension of ACA Provisions and Policies by Political Orientation in Kentucky

Source: Authors own analysis of the Kentucky Health Issues Poll, 2009-2015. Note: Sample was weighted to reflect the complex sampling design of the survey.

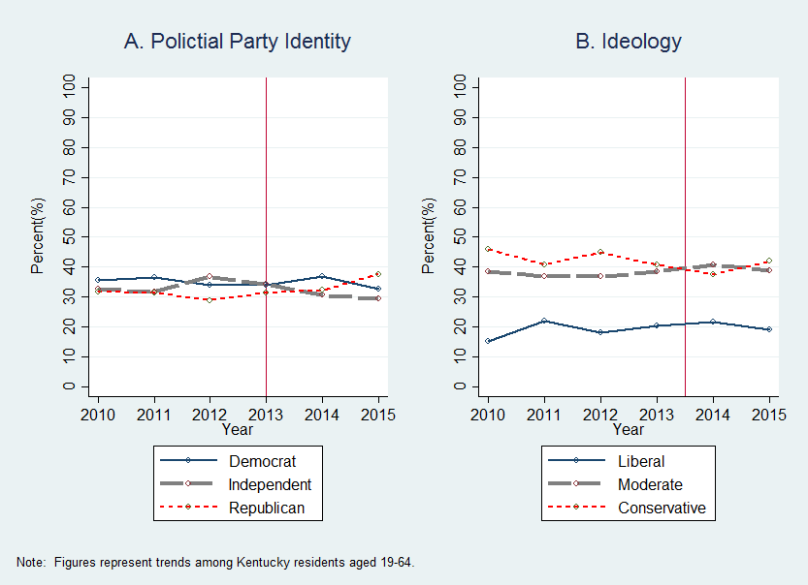


Figure D2: Time Trends of Political Party Identity and Ideology, 2010-2015.
Source: Authors own analysis of the Kentucky Health Issues Poll, 2009-2015. Note: Sample was weighted to reflect the complex sampling design of the survey. This graph was provided to show that trends by political identity and ideology were fairly constant before and after the ACA was fully implemented in Kentucky.

Bibliography

Antwi, Y., Moriya, A., & Simon, K. (2013). Effects of Federal Policy to Insure Young Adults: Evidence from the 2010 Affordable Care Act's Dependent-Coverage Mandate. *AEJ Econ. Policy*, *5*, 1–28.

Barbaresco, S., Courtemanche, C. J., & Qi, Y. (2015). Impacts of the Affordable Care Act dependent coverage provision on health-related outcomes of young adults. *J. Health Econ.*, *40*, 54–68.

Benitez, J., Adams, E., & Seiber, E. (2017a). Did Health Care Reform Help Kentucky Address Disparities in Coverage and Access to Care among the Poor? *Heal. Serv. Res.*.

Benitez, J., Creel, L., & Jennings, J. (2016). Kentucky's Medicaid Expansion Showing Early Promise On Coverage And Access To Care. *Heal. Aff. (Millwood)*, *35*, 528–534.

Benitez, J., Creel, L., & Jennings, J. (2017b). Who and Where are Kentucky's Remaining Uninsured? *Med. Care*, *55*, 215–219.

Congressional Budget Office (2017). American Health Care Act: Cost Estimate. Tech. rep.
URL https://www.cbo.gov/publication/52486

Courtemanche C, Marton J, Ukert B, Yelowitz A, Zapata D. (2017). Early Impacts of the Affordable Care Act on Health Insurance Coverage in Medicaid Expansion and Non-Expansion States. *J. Policy Anal. Manag.*, *36*, 178–210.

Department of Health and Human Services (2016a). Affordable Care Act Has Led to Historic, Widespread Increase in Health Insurance Coverage. Tech. rep.
URL https://aspe.hhs.gov/pdf-report/affordable-care-act-has-led-historic-widespread-increase-health-insurance-coverage

Department of Health and Human Services (2016b). Health Insurance Coverage and the Affordable Care Act, 2010-2016. Tech. rep.
URL https://aspe.hhs.gov/sites/default/files/pdf/187551/ACA2010-2016.pdf

Jacobs LR, C. T. (2013). Why States Expand Medicaid: Party, Resources, and History. *J. Heal. Polit. Policy Law*, *38*, 1023–1050.

Kliff, S. (2016). Why Obamacare enrollees voted for Trump. *Vox Media*.
URL https://www.vox.com/science-and-health/2016/12/13/13848794/kentucky-obamacare-trump

Leip, D. (2016). Dave Leip's Atlas of U.S. Presidential Elections.
URL http://uselectionatlas.org/

Olson, K. L. (2015). The ACA Medicaid Expansion Waiver in the Keystone State: Do the Medically Uninsured "Got a Friend in Pennsylvania"? *J. Heal. Polit. Policy Law*, *40*, 599–611.

Sances, M., & Clinton, J. (2017). New Policy, New Politics? The Effect of Medicaid Expansion on Public Support for the Affordable Care Act.
URL https://csap.yale.edu/sites/default/files/files/apppw_jc2_3-8-17.pdf

Seiber, E., & Berman, M. (2017). Medicaid Expansion and ACA Repeal: Evidence From Ohio. *Am. J. Public Health*, *107*, 889–892.

Simon, K., Soni, A., & Cawley, J. (2017). The Impact of Health Insurance on Preventive Care and Health Behaviors: Evidence from the First Two Years of the ACA Medicaid Expansions. *J. Policy Anal. Manag.*, *36*(2), 390–417.

Sommers, B., Blendon, R., Orav, E., & Epstein, A. (2016). Changes in utilization and health among low-income adults after medicaid expansion or expanded private insurance. *JAMA Intern. Med.*, *176*, 1501–1509.

Sommers, B., & Epstein, A. (2017). Red-State Medicaid Expansions–Achilles' Heel of ACA Repeal? *New Engl. J. Med.*, *376*, e7.

Sommers, B., Tomasi, M., Swartz, K., & Epstein, A. (2012). Reasons For The Wide Variation In Medicaid Participation Rates Among States Hold Lessons For Coverage Expansion In 2014. *Heal. Aff. (Millwood)*, *31*, 909–919.

The Henry J. Kaiser Family Foundation (2017). Kaiser Health Tracking Poll - May 2017: The AHCA's Proposed Changes to Health Care.
URL http://www.kff.org/health-reform/report/kaiser-health-tracking-poll-may-2017-the-ahcas-proposed-changes-to-health-care/