LUND UNIVERSITY
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Mind the Gap

The Impact of the ACA Medicaid Expansion on Health Outcomes in the United States

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Abstract

The United States is the only OECD country to not provide universal health coverage to its citizens. While majority of the population is able to obtain insurance through employer-sponsored plans, many low-income adults fall victim to the 'coverage gap' – earning too much to qualify for state-funded social programs, in jobs that fail to provide a viable alternative. The central aim of the Affordable Care Act (ACA) was to improve the health outcomes of this at-risk group through the expansion of the country's Medicaid program. In this paper, I assess the impact of this healthcare reform by comparing changes in health outcomes between the states that chose to participate in the expansion and those that declined. Applying a difference-in-difference model to repeated cross-sectional survey data, I examine four different measures of health (access, preventative care, status, and behaviour) over a six-year period from 2010-2015. I find a significant improvement in these outcomes in expansion states relative to non-expansion states when focusing on low-income non-elderly adults, in particular health access and preventative care. These translate into modest improvements in health status, and there is also some evidence of ex ante moral hazard with regards to risky health behaviours.

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1. Introduction

The Affordable Care Act (ACA) was signed into law on March 23, 2010, and represented the largest U.S. healthcare reform in nearly five decades. With the healthcare sector accounting for approximately 17% of the entire U.S. economy, this represented a monumental undertaking done in the face of a number of disturbing trends, chief among them the highest level of per capita expenditure on healthcare amongst OECD countries and a steadily growing percent of the population without any form of health coverage (Kinney, 2015; Gagnon & Hébert, 2010). As a testament to the size of this coverage gap, approximately 48.6 million Americans (16%) under the age of sixty-five lacked any form of health insurance in 2010 (Zamitti et al., 2016).

The ACA was enacted in 2010 with the aim of extending insurance to this at-risk group. One the main provisions of the act was the expansion of the country's Medicaid program, a health insurance platform designed for individuals and families with limited financial means. Whereas prior only individuals living at or under the Federal Poverty Level (FPL) had been eligible for financial assistance, the ACA expanded this criterion to 138% of the FPL, qualifying millions of previously ineligible Americans. The targeted effects of these reforms was an aggregate decrease in uninsurance rates, and improved outcomes with regards to health status and preventative care. Opponents of the ACA however, pointed out that comprehensive coverage could lead to adverse selection issues for insurance companies, and moral hazard opportunities for newly eligible participants. With the financial consequences no longer as high, individuals could be more compelled to engage in risky behaviour, such as smoking or alcohol abuse. These concerns, among others, were brought before the U.S. Supreme Court in 2012, which led to the decision to have the ACA made optional for each state. Despite this, evidence from the first two years of the Medicaid expansion has shown a considerable swell in terms of both access to care and utilization of services in expansion states. An estimated 12.2 million individuals enrolled in the program in the first 15 months following the roll-out, and the most recent census estimates indicate that the number of uninsured has fallen to 24.8 million (8.8%), nearly halving the level from 2010 (National Center for Health Statistics, 2016).

In this paper, I study the impact of the ACA's Medicaid expansion on insurance take-up and subsequent healthcare use, outcomes and behaviour. Using data from the Behavioral Risk Factor Surveillance System (BRFSS), a nationally representative cross-sectional survey, I focus on

individuals aged 18-64, with incomes below 138% of the FPL in order to assess what effects the expansion has had on its target demographic, and to investigate how these outcomes differ across states. In order to identify the causal effect of the expansion, I estimate a Difference-in-Difference (DiD) model at the state level, which compares the health of individuals living in expansion and non-expansion states. Outcomes are broken down into four panels, encompassing access, preventative care, health status, and behaviour, using survey data from 2010-2015. Although the ACA was signed into law in 2010, the expansion was not formally rolled-out until January 1, 2014, and in accordance, two 'post-expansion' years in 2014 and 2015 are assessed relative to the four years prior. Under the assumption that trends in the outcome variables across treatment and control groups would have been the same in the absence of reform, a premise confirmed through testing, my regressions identify the causal effects of the Medicaid expansion. These estimates showcase the variation in coverage and other health measures across the United States, and provide a glimpse of how individual location plays an important role in the healthcare one receives.

My results suggest that the Medicaid expansion has had a sizeable impact on all four outcome panels, in particular healthcare access and preventative care. Low-income adults living in expansion states are significantly more likely to have health insurance and a personal doctor than those in the control group, which has led to increased healthcare utilization. Expansion state individuals have more flu shots and gender-based screenings (such as mammograms or prostate examinations) than their non-expansion counterparts, though this does not appear to have translated into significant health improvements when focusing on all adults. There is also little evidence that transitioning into health insurance has a substantial impact in terms of behaviour, positive or negative, for all adults. A multitude of heterogeneity and robustness checks are implemented to substantiate these results, through which several new effects emerge. Women, for instance, seem to have derived less benefits from the expansion than men, are more likely to be overweight than their control group counterparts, and do not exhibit any significant change in terms of insurance take-up following the Medicaid expansion. Another focus group, African-Americans, are more likely to report poor health than the control group, and are also more likely to smoke, which could indicate a degree of moral hazard. In terms of education, my results suggest that high school graduates and college dropouts are the most likely to benefit from the Medicaid expansion in terms of access to care.

The remainder of the paper is structured as follows. Section two provides an overview of some prominent literature published on the subject of American healthcare, both prior to and following the implementation of the ACA. Section three focuses on the framework of the act – what exactly the ACA entails, and what changes it has made to the existing healthcare structure – which then paves the way for statistical methods and analysis in section four. Results and concluding remarks are then presented in section five.

2. Literature Review

This paper relates to two distinct strands of economic research concerning healthcare in the United States. The first focuses on pre-ACA studies on the relationship between uninsurance, utilization and adverse health outcomes. Early works by Davis (1975) and Davis and Rowland (1983) examined the country's fragmented insurance market and demonstrated a clear linkage between coverage and healthcare utilization, pointing out that society ultimately bears the burden of an uninsured population in the form of more emergency room visits and higher costs. Another seminal study from this period is the RAND Health Insurance Experiment (HIE), conducted by Manning et al. (1987) from 1974-1977. Participating families were randomly enrolled in 14 different insurance plans featuring different levels of cost sharing, in order to gauge how demand for medical services responds to changes in out-of-pocket expenditures. The authors were able to conclude that health insurance featuring lower or no coinsurance rates definitively leads to higher utilization per person, and found health improvements in several areas (high blood pressure, near-sightedness and dental care). Moreover, the authors famously established the price elasticity of demand for healthcare to be approximately -0.2, which is pertinent for my study both in terms of utilization and the potential for moral hazard. Examining the impact on coverage on mortality, Franks et al. (1993) performed a longitudinal analysis of insured/uninsured individuals aged 25 and older over a sixteen-year period from 1971 to 1987, and found that uninsured individuals were 25% more likely to die by the end of the follow-up period. This increased risk held across all socioeconomic groups, and was equivalent in magnitude to the effects of education, income and self-reported health on mortality. A similar study by Wilper et al. (2009) was conducted of the non-elderly using hazard ratios and updated census data, and despite significant medical advancements and demography changes, the results continued to hold. The authors found that 35,327 deaths in 2005 were associated with a lack of health

insurance, while Card, Dobkin and Maestas (2007) show that individuals admitted into emergency care prior to their 65th birthday are more likely to die than individuals admitted afterwards, with this age being the threshold for Medicare eligibility. As is to be expected, the relationship between insurance health outcomes becomes more dire when examining specific illnesses. In terms of preventative care, Ayanian et al. (1993) found that uninsured women were much less likely to be screened for breast cancer, and were also given different treatments following their diagnosis, resulting in an adjusted risk of death 49% higher than privately insured patients. Similar results were found by Roetzheim et al. (2000) in their study of colorectal cancer treatment and outcomes amongst uninsured men, while Hasan, Orav and Hicks (2010) found higher mortality rates for myocardial infarction, stroke and pneumonia for both the uninsured and Medicaid recipients compared to the privately insured.

My second focus is on the growing body of research using difference-in-difference estimation techniques to assess the impact of the Medicaid expansion. Two of the earliest contributions were put forth by Sommers et al. (2014; 2015), who estimate national changes in a number of health outcomes, first using preliminary reports from rapid-turnaround surveys, and then following the second open enrollment period in February of 2015. The results from the first study show that the number of uninsured U.S. adults decreased by five percentage points in the first quarter of 2014, which coincided with the first ACA open-enrollment period. These declines were significant for all subgroups, and were most pronounced for visible minorities. The authors' second study uses data from the 2012-2015 Gallup-Healthways Well-Being Index, and using two alternative models – one using quarterly indicators, and the other an interrupted time-series design – they find that pre-ACA trends were significantly worse for all outcomes. Once again, transitions into coverage were largest amongst visible minorities, in particular Hispanic adults. Two prominent papers published within the last year are those of Simon et al. (2017) and Miller & Wherry (2017). Similar in scope, both papers apply difference-in-difference estimation methods to comprehensive national surveys in order to gauge how the Affordable Care Act affected a wide range of health outcomes in the two years following its implementation. Both papers focus on non-elderly, non-disabled childless adults with incomes below 138% of the federal poverty level. Beginning with Simon et al. (2017), the authors found that residing in an expansion state increased the likelihood of having insurance by 9% relative to non-expansion states, and significantly increased both preventative care (such as HIV screenings) and access to

care (i.e. probability of having a doctor). There was no discernable impact in terms of health behaviors, which encompassed negative actions such as binge drinking, smoking or obesity, though expansion was associated with improvements in self-rated health. The results found by Miller and Wherry (2017) were much less pronounced. While the authors did find a marked decrease in financial strain in expansion states in the second year of coverage, implying less cost-related non-adherence and barriers to treatment, there were no significant changes with regards to access to care or health status relative to the control group. It is also worth noting that Miller and Wherry performed an analogous study a year prior, and found more pronounced results with regards to preventative care, hospital visits, and health outcomes (Miller and Wherry, 2016). This suggests that there was a considerable rush to enroll in the first year of eligibility, which then tapered off moving into 2015.

In this study, I make a number of new contributions to the body of research referenced above, in particular with regards to heterogeneity and robustness checks. This is the only paper that uses six years of data to assess the impact of the expansion on visible minorities (Hispanics and African-Americans). Sommers et al. (2015) do focus on these groups, but only use three years of data, two of which are from before the expansion. This is also the only paper to perform regressions by education group, which provides valuable insight into how human capital affects the likelihood of obtaining health coverage. In terms of robustness checks, I implement state-level GDP controls to investigate a) whether state-specific macroeconomic phenomenon produce any distortions in the data, and b) to see what role geographic controls have on demographic results. California, for instance, has a disproportionately high number of Hispanics (38% of the population, according to the U.S. Census Bureau (2011)), while three of the four largest states by African-American population are in non-expansion regions. I also perform a placebo check as a means of testing the parallel trends assumption, creating a false expansion period one year prior to test for any potential confounders in the data.

3. Background

The United States is one of the only industrialized nations to not offer universal health coverage to its citizens. Instead, coverage is provided through a dual private-public system, with majority of the country obtaining insurance privately through their employers or plans purchased individually in the marketplace (65% of the population as of 2013). (Kinney, 2015). The bedrock

of the country's public healthcare services are Medicare and Medicaid, separate programs signed into law in 1965. Medicare eligibility is limited to individuals aged sixty-five or older, or those living with disability, and is depended on by over 52 million Americans, roughly one-sixth of the population (Kinney, 2015). Medicaid is a social insurance program for the rest of the population: very low-income individuals and their children with legitimate concerns about not being able to afford the treatment and care they require (though poverty was not necessarily a sufficient qualification until the ACA). This system is jointly funded by the federal government and individual states, with management falling under the responsibility of the latter. At the time of the ACA rollout in 2013, approximately 54 million citizens were dependent on Medicaid in some form, nearly 18% of the population (U.S. Census Bureau, 2014). Other government plans are provided for veterans and active military (4.5%), with the remainder of the population falling into a 'coverage gap' (16.7% in 2010; 13.4% in 2013) (Kinney, 2015).

Rather than supplanting the existing infrastructure, the ACA is designed to play a more supplementary role and builds on the private and public programs already in place. In the private sphere, the main undertaking has been the creation of private exchanges or marketplaces where individuals or small businesses can choose between competing insurance plans offered by private carriers (Kinney, 2015; Morrisey et al., 2016). Federal subsidies in the form of tax credits are provided based on income level to make these plans more affordable, and a number of provisions were put in place to ensure greater transparency between firms and consumers.[1] Premiums and deductibles are also held steady as part of cost-sharing reductions – a crucial feature for low-income households – and individuals cannot be excluded or have their coverage amended on the basis of pre-existing conditions (Volk et al., 2017).

The Affordable Care Act's most significant contributions have been with regards to Medicaid, however. One of the first stipulations of the act was raising the eligibility threshold from 100 to 138% of the Federal Poverty Level (FPL), beginning in January 2014.[2] As noted by Simon et al. (2017), this expansion made coverage available for a demographic that had previously been ineligible: low-income, non-elderly, non-disabled childless adults. This group comprised approximately 16% of the population from 1995-2007, before experiencing a spike

[1] Tax credits are available to those with incomes between 138-400% of the Federal Poverty Level (FPL), who do not benefit from any other form of private insurance (Buettgans et al., 2015)

[2] Approximately $27,724 USD in 2015 (Artiga, Damico and Garfield, 2015).

with the onset of the financial crisis in 2008 (Artiga, Damico and Garfield, 2015). After reaching a high of 20.4% in 2013, the uninsured rate for this demographic has dropped in each successive year following the Medicaid expansion, reaching 12.8% at the end of 2015. (Artiga et al., 2015). While each state is ultimately responsible for determining the scope of services provided as part of their Medicaid programs, mandatory benefits include inpatient and outpatient hospital services, physician services, and any follow-up appointments that may arise as a result (such as laboratory or x-ray services) (Medicaid.gov, 2017). In addition, the ACA provides an assortment of block grants to states in order to provide various health initiatives with an emphasis on preventative care.

While these provisions were originally intended to be implemented across the United States, a 2012 Supreme Court decision ruled against the constitutionality of the ACA, and gave each state the option of whether or not to participate in the Medicaid expansion (Artiga et al., 2015; Wherry and Miller, 2017). This was a monumental decision that weakened the impact of the ACA considerably, and exacerbated the coverage gap that the act intended to close. Twenty-four states would decline the expansion option in 2014, leaving an estimated 6.7 million otherwise-eligible residents uninsured (Dorn et al., 2014). While five states have since agreed to join, there remains a sizeable fissure between expansion and non-expansion states in terms of both healthcare coverage and geography. Approximately one in five uninsured Americans in non-expansion states meet the criteria for Medicaid coverage, but are constrained by their address, and 91% of uninsured adults reside in the American South, with Texas (17%), Georgia (23%) and Florida (18%) accounting for nearly two-thirds (Garfield et al., 2016). There is also a demographic division to consider. Studies by Han et al. (2015) and Marks et al. (2016) have shown that low-income uninsured individuals in non-expansion states are much more likely to be African-American or Hispanic, with the latter having the highest rates of uninsurance amongst all racial/ethnic groups (Buchmueller et al., 2016). In Texas, approximately one-third of Hispanics lack any form of health coverage, compared to 10% of white adults, and more than half of this subgroup have incomes under 138% of the federal poverty line (Han et al., 2015). Moreover, approximately 60% of African-Americans eligible for the Medicaid expansion reside in non-expansion states, which has further widened racial disparities in coverage (Abdus et al., 2015).

4. Methods

Data

Data for analysis was obtained from the Behavioral Risk Factor Surveillance System (BRFSS), a repeated cross-sectional survey conducted in each of the 50 states and District of Columbia (DC). Approximately 400,000 interviews are conducted each year, in which respondents are asked a wide variety of questions pertaining to health status, behaviour, and utilization of healthcare services. This sample is nationally representative of the population above the age of eighteen. The BRFSS is uniquely suited for analyzing the effects of a nation-wide healthcare reform because it features the largest sample size by a significant margin, and is the only survey to provide public-use state identifiers, which are essential for differentiating between expansion and non-expansion states. Moreover, the survey is continuously adjusted on a year-to-year basis based on priority health issues and state proposals – opioid addiction in recent years, for instance – though a fixed 'core' group of questions are maintained for longitudinal purposes.

As the expansion specifically targeted low-income individuals and families, I restricted the BRFSS sample to individuals between the ages of 19-64 with reported incomes under 138% of the Federal Poverty Level (FPL). The rationale for this age criterion was that individuals aged 18 and under qualify for their parents' coverage under the ACA, and individuals aged 65+ are eligible for Medicare coverage. To qualify for expansion state status, participating states must have implemented the ACA expansion between January 1, 2014 and December 2015.[3] Table 1 provides some descriptive statistics for the restricted sample living in expansion and non-expansion states. The two groups appear to be remarkably similar across a range of demographic and socioeconomic traits, with the exception being that the expansion states have a larger number of respondents who identify as Hispanic, while non-expansion states feature a greater number of African-Americans. In terms of educational attainment, roughly 60% of the respondents do not have any form of post-secondary education, with expansion states having a

[3] This criterion encompasses AK, AZ, AR, CA, CO, CT, DE, DC, HI, IL, IN, IA, KY, MD, MA, MI, MN, NV, NH, NJ, NM, NY, ND, OH, OR, PA, RI, VT, WA and WV. Montana and Louisiana, which both adopted the expansion in 2016, are included in the control group along with AL, FL, GA, ID, KS, ME, MS, MO, MT, NE, NC, OK, SC, SD, TN, TX, UT, VA, WI and WY. Wisconsin only provides coverage to individual incomes under 100% of the FPL, and have been included in the control group as a result, though Simon et al. (2017) consider it an expansion state in their analysis.

slightly higher number of college/trades and university graduates. Women comprise a disproportionately large share of the sample in both expansion and non-expansion states.

Table 1: Summary statistics of respondents earning <=138% of the FPL

Characteristics		Expansion States (*N* = 92395)		Non-Expansion States (*N* = 106408)	
Gender	Female	65%	(0.477)	66%	(0.472)
Ethnicity	White	56%	(0.498)	49%	(0.499)
	Black	12.4%	(0.302)	20.6%	(0.376)
	Hispanic	22.4%	(0.492)	12.6%	(0.436)
Education	< High school	21.3%	(0.383)	21.3%	(0.409)
	High school degree	37.5%	(0.484)	40.2%	(0.490)
	Some post-secondary	27.2%	(0.445)	26.7%	(0.442)
	Post-secondary degree	13.70%	(0.344)	11.4%	(0.318)
Family size	Married	34.8%	(0.476)	35.3%	(0.478)
	No children	54.4%	(0.498)	54.0%	(0.498)
	1-2 children	30.5%	(0.460)	29.7%	(0.457)
	3+ children	15.2%	(0.358)	16.1%	(0.368)
	Unemployment rate	17.9%	(0.383)	16.5%	(0.371)
	Mean age (years)	48.98 ± 9.78		49.02 ± 9.81	

Source: Behavioral Risk Factor Surveillance System (BRFSS)

Health-related outcomes in my analysis are broken down into four panels. The first concerns access to care, and includes questions on health insurance, whether or not individuals have a general practitioner (GP), have experienced difficulty acquiring the care they need in the past, and whether they have transitioned into having coverage within the past 12 months at the time of the survey. Also included in this section is whether or not the individual has been able to have a routine check-up in the past year, an important means of monitoring one's health that is often disregarded in the absence of insurance coverage. The second panel concerns preventative care. This encompasses routine health checks that an individual would likely receive with proper access to care, including flu shots and blood sugar monitoring for diabetes. Women in the sample were asked if they had received a mammogram or a pap test in the previous two years, while

men were asked if they have received a prostate test. The third panel pertains to health status, and includes questions on a variety of different outcomes/ailments that the respondents may have been experiencing at the time of the survey. This provides some clarity on the general condition of individuals in the treatment and control groups, and also casts some light on the short-term impact of the Affordable Care Act on individual health outcomes. Variables include angina/coronary heart disease, general health limitations, whether the individual is obese (BMI>30) or overweight (BMI>25), have been diagnosed with high blood pressure, are taking medication for any mental health issues, have had five or more 'poor health' days in the past month at the time of the survey, and their general satisfaction with life. The fourth and final panel concerns health behaviour and includes questions on alcohol consumption, smoking habits, whether or not respondents always wear a seatbelt when driving, or exercise at least once per week. These behaviours were included on the basis of the fact that they are relatively easy to change with the guidance of a medical practioner, and thus might display more pronounced effects following the Medicaid expansion. Descriptive statistics for outcome variables are also reported in the results section.

Empirical Strategy

As stated previously, this paper applies a Difference-in-Difference (DiD) model to BRFSS data from 2010-2015 in order to assess the changes in health-related outcomes in expansion states relative to non-expansion states. The years 2010-2013 represent the "pre" period, while the two years following signify the "post" period. The treatment group consists of 29 states as well as the District of Columbia, while the control group consists of the 21 states that chose not to participate in the Medicaid expansion. The following regression was estimated for each outcome:

$$Y_{ist} = \alpha + \beta_1 Post + \beta_2 Expansion + \beta_3 (Expansion_s \times Post_t) + \beta_4 \chi_{ist} + \delta_s + \delta_q + \varepsilon_{ist}$$

where Y represents the outcome variable, *i* the individual respondent, *s* the state in which the respondent lives, and *t* the time at which the survey was conducted. *Post* is a 0-1 indicator of whether the survey was conducted prior to or following the 2014 enrollment period, while *Expansion* indicates if the respondent is included in the treatment (expansion) or control (non-expansion) group. Our main parameter of interest is β_3, which captures the mean difference between the treatment and control group after transitioning from the 'pre' period to the 'post'

period. χ_{ist} captures individual characteristics. This includes indicator variables for marital status, race, unemployment status, age, education, gender and household size. δ_s and δ_q refer to state and year-quarter fixed effects. DiD estimates can thus be interpreted as the percentage change in the outcome variable in expansion states in the post period relative to non-expansion states. A baseline is provided for each outcome, which represents the mean value in expansion states prior to the Medicaid expansion (2010-2013). Variables were only selected if they were asked in both the 2014 and 2015 BRFSS surveys, and at least two of the years from 2010-2013. Each response is weighted to be representative of the U.S. population, and standard errors are clustered by state.

This paper presents results for different groups in order to assess the impact of the Medicaid expansion, two of which focus on demographics. In the first, main body of results, DiD estimates are presented separately for all adults, males, females, and respondents identifying as Hispanic and African-American, with the latter two groups included due to their disproportionately high uninsurance rates. The second specification maintains the same focus groups, but excludes individuals under the age of 30 on the basis of the fact that young adults are often healthier, and also tend to face more economic uncertainty following their transition into the workplace. It also could influence the results for preventative tests often administered later on in life, such as mammograms for women, or prostate tests for men, and conditions commonly associated with the elderly such as high blood pressure or coronary heart disease. Thirdly, DiD estimates are produced by education group, with specifications for respondents with less than a high school degree ('high school dropouts'), a high school degree but no post-secondary, some university/college experience but not to completion ('College/Univ. dropouts'), and those who have graduated from college/university. With very low-income adults having been eligible for financial assistance even prior to the ACA, and college graduates presumed to have employer-sponsored coverage, this examines which level of attainment contributes the most to the U.S. coverage gap.

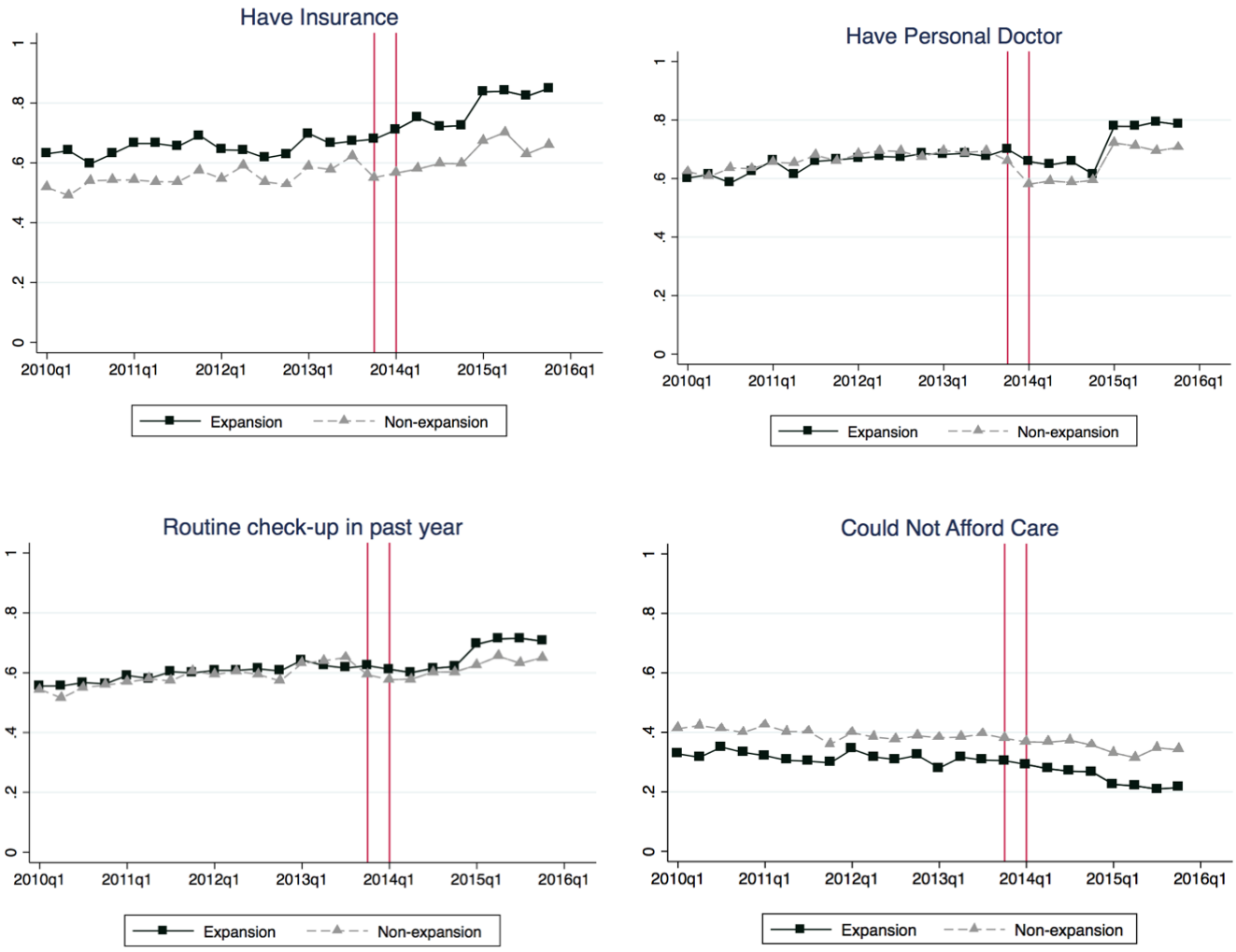
5. Results

Parallel Trends Assumption

A central tenet of any difference-in-difference evaluation is the parallel trends assumption, which holds that in the absence of policy change or intervention, trends between treatment and

control groups should follow similar trajectories. To account for this assumption, pre-trends in the data pertaining to healthcare access are provided below, with 'q1' referring to the first quarter of each year.

Figure 1: Trends in access to care from 2010-2015



Source: 2010-2015 BRFSS surveys. The sample has been restricted to only include individual incomes <=138% of the FPL belonging to respondents between the ages of 18-64. The vertical lines represent the first enrollment period of the 2014 Medicaid expansion.

We observe that there doesn't appear to be any abnormal fluctuations in the data prior to the Medicaid expansion. The trends exhibit similar paths in all four cases before diverging in the first quarter of 2014, with expansion states subsequently experiencing increases in the number of

individuals with health coverage, personal doctors, and routine check-ups, and a decrease in the number of citizens unable to afford care. The most consistent disparities are observed for insurance and medical costs; treatment states perform better in both cases even prior to the expansion, which could be indicative of state policies or demographic differences. Trends for the remaining outcome variables were also examined, and similarly look parallel.

Difference-in-difference results

Demographics

Table 2 presents results from the main DiD estimation focusing on demographics. Beginning with the Access panel and focusing on all adults, we observe that residing in an expansion state increases the likelihood of low-income adults having health insurance by 3.5 percentage points, which is statistically significant at the 1% level. Expansion state status is also shown to have a strong effect on the likelihood of having a personal doctor, resulting in a five percentage point increase over the control group in the 2014-2015 period, also significant at the 1% level. No pronounced impact is found with regards to having a check-up in the last year, outpatient medical costs, or difficulty accessing treatment when needed. These latter two variables do not include prescription drug costs or emergency care however, which tend to produce a larger financial burden. We observe a statistically significant increase in the likelihood of having transitioned into having coverage within the past 12 months of the time of the survey, which is expected and a testament to the ACA's outreach.

Examining subgroups, we observe that women and Hispanics did not experience a notable spike in health insurance following the Medicaid expansion, in contrast with the findings of Simon et al. (2017) and Sommers et al. (2015), while men and African-Americans both display significant positive coefficients. A possible explanation for this gender disparity is that married women often obtain insurance as dependents on their spouse's insurance policies, which is supported by the noticeably higher baseline value. All four subgroups display significant, positive coefficients with regards to the likelihood of having a personal doctor, with the results for women and Hispanics significant at the 1% level. Women experience an increase of 5.2 percentage points over their control group counterparts here, while Hispanics exhibit a substantial 8-point increase. Outcome variables for routine check-ups, inability to afford care, and difficulty accessing care appear relatively similar between treatment and control groups and

do not display statistical significance for the most part. Men in expansion states were more likely to visit a doctor following 2014, and women were found to experience more difficulty accessing care when needed. This could be a product of longer wait-times/doctor shortages following the expansion or perhaps a higher tendency to reside in rural areas. We observe that in terms of individuals who have transitioned into having coverage within the past 12 months at the time of the interview, low-income adults, women and African-Americans all show significant improvements over non-expansion states.

Looking at preventative care, low-income adults display a 1.9 percentage point increase in the likelihood of having a flu-shot as a result of the expansion, significant at the 5% level, and show a marked increase in terms of gender-based screenings. Women in expansion states are more likely to have received a mammogram within the past two years, while men show a 4.1 percentage point increase in the likelihood of receiving a prostate test. These results are more pronounced than in previous studies, which could be a product of the higher income-eligibility threshold used in my study (Simon et al. (2017) restrict their BRFSS sample to incomes <= 100%). We observe no notable differences in terms of diabetes or pap smear tests.

These results continue to hold for the most part when examining subgroups. Both genders and Hispanics display significant, positive results in terms of flu shots, and Hispanics also display a 4.3 percentage point increase in the probability of having a mammogram. Interestingly, African-Americans do not display any significant increases or decreases in terms of preventative care, though it should also be noted that this group features the highest baselines. This could imply sufficient medical care was already being attained prior to the Medicaid expansion.

Estimates for health status are more subdued than the previous panels. Only one outcome variable displays significant results for all adults, that being mental health medication, though this outcome is highly significant. Individuals living in expansion states show an increase of 8.7 percentage points over the control group in this regard, which is significant at the 1% level. With the National Institute of Health (2015) estimating approximately 43.4 million Americans (17.9%) as having some form of mental, behavioral or emotional disorder, this would appear to suggest that the expansion has made it easier for low-income adults to seek they help they require. No other studies use this particular outcome variable, though Simon et al. (2017) do show a marked expansion-state decrease in terms of poor mental health.

Table 2: DiD estimates by demographic group

	All Adults		Women Only		Men Only		Hispanics		African-Americans	
	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate
Access										
Do you have health insurance?	0.69	0.0359***	0.72	0.0191	0.65	0.0434**	0.60	0.00655	0.67	0.0542**
	(0.478)	(0.0133)	(0.473)	(0.0197)	(0.486)	(0.0169)	(0.489)	(0.0312)	(0.470)	(0.0227)
		N = 191539		*N* = 124843		*N* = 66696		*N* = 39759		*N* = 27888
Do you have a personal doctor?	0.74	0.0504***	0.78	0.0520***	0.66	0.0413**	0.62	0.0808***	0.77	0.0443**
	(0.441)	(0.0152)	(0.418)	(0.0139)	(0.474)	(0.0164)	(0.484)	(0.0298)	(0.421)	(0.0237)
		N = 191517		*N* = 124768		*N* = 66749		N=39720		*N* = 27894
Had routine check-up in past year?	0.64	0.0112	0.67	-0.000565	0.58	0.0332**	0.61	-0.00605	0.75	0.0162
	(0.485)	(0.0127)	(0.477)	(0.0208)	(0.495)	(0.0153)	(0.493)	(0.0286)	(0.435)	(0.0183)
		N = 189494		*N* = 123461		*N* = 66033		*N* = 39417		*N* = 27737
Could not see doctor because of cost	0.31	-0.0145	0.33	-0.0104	0.29	-0.00996	0.34	-0.0106	0.36	0.00614
	(0.427)	(0.0112)	(0.483)	(0.0148)	(0.462)	(0.0192)	(0.483)	(0.0214)	(0.479)	(0.0248)
		N = 191657		*N* = 95210		*N* = 66827		*N* = 39779		*N* = 24885
Could not access care when needed	0.30	0.0112	0.31	0.0310*	0.27	-0.0052	0.31	0.0464	0.3	0.0502
	(0.477)	(0.0137)	(0.452)	(0.0175)	(0.434)	(0.0168)	(0.462)	(0.0524)	(0.458)	(0.0407)
		N = 57815		*N* = 37117		*N* = 20698		*N* = 8982		*N* = 9782
Did not have coverage 12 months prior	0.12	0.0438***	0.12	0.0532***	0.13	0.0273	0.14	0.0376	0.12	0.0572**
	(0.340)	(0.0134)	(0.343)	(0.0146)	(0.334)	(0.0239)	(0.361)	(0.0958)	(0.327)	(0.0300)
		N = 41475		*N* = 27367		*N* = 14108		*N* = 5188		*N*=7199
Preventative										
Flu shot in past year	0.33	0.0196**	0.35	0.0146*	0.29	0.0268***	0.32	0.0389***	0.30	0.0361
	(0.465)	(0.00787)	(0.470)	(0.00871)	(0.455)	(0.00905)	(0.458)	(0.0127)	(0.456)	(0.0239)
		N=180772		*N* = 117926		*N* = 62846		*N* = 36753		*N*=22307
Diabetes test in past 2 years	0.16	0.00286	0.18	0.00818	0.15	-0.00307	0.16	-0.00914	0.21	0.0088
	(0.375)	(0.00426)	(0.383)	(0.00637)	(0.360)	(0.00542)	(0.371)	(0.00628)	(0.404)	(0.0118)
		N=177423		*N* = 115483		*N* = 61940		N=37116		*N*=21717
Mammogram test in past 2 years	0.35	0.0242***	0.35	0.0242***			0.33	0.0434**	0.39	0.00397
	(0.4706)	(0.00885)	(0.4706)	(0.00885)			(0.460)	(0.0196)	(0.488)	(0.0285)
		N=61475		*N* = 61474				*N* = 15063		*N*=10808
Pap test in past 2 years	0.49	-0.00223	0.49	-0.00223			0.58	0.00326	0.56	-0.0141
	(0.498)	(0.0130)	(0.498)	(0.0130)			(0.498)	(0.0263)	(0.495)	(0.0362)
		N = 62451		*N* = 62451				*N* = 15205		N=11003
Prostate test in past 2 years	0.23	0.0417***			0.23	0.0417***	0.20	0.0289	0.29	0.0589
	(0.420)	(0.0145)			(0.420)	(0.0145)	(0.402)	(0.0349)	(0.453)	(0.0638)
		N = 19421				*N* = 19421		*N* = 4052		*N*=2597

Table 2: Continued

Health Status										
Diagnosed with angina/coronary heart disease	0.06	-0.0017	0.06	0.00178	0.07	-0.00641	0.03	0.000178	0.05	-0.00821
	(0.242)	(0.00266)	(0.234)	(0.00241)	(0.257)	(0.00519)	(0.181)	(0.00530)	(0.226)	(0.00884)
		N=190348		*N*= 124074		*N*= 66274		*N*= 39619		*N*= 23699
Limited due to health issues	0.40	0.00652	0.40	0.00339	0.41	0.0113	0.24	0.0418**	0.36	-0.00616
	(0.492)	(0.00989)	(0.491)	(0.0109)	(0.494)	(0.0146)	(0.416)	(0.0165)	(0.481)	(0.0197)
		N=186840		*N*= 121697		*N*= 65143		*N*= 38372		*N*= 23526
BMI > 30 (Obese)	0.38	-0.00275	0.40	0.0106	0.34	-0.0178	0.38	0.0134	0.50	-0.0440*
	(0.489)	(0.00838)	(0.494)	(0.00834)	(0.478)	(0.0173)	(0.484)	(0.0162)	(0.500)	(0.0243)
		N= 180984		*N*= 115587		*N*=65397		*N*= 35317		*N*= 22826
BMI > 25 (Overweight)	0.45	0.00938	0.43	0.0163**	0.49	0.0000252	0.59	0.00313	0.57	0.00517
	(0.498)	(0.00740)	(0.496)	(0.00786)	(0.499)	(0.0110)	(0.498)	(0.0127)	(0.495)	(0.0280)
		N= 180984		*N*= 115587		*N*= 65397		*N*= 35317		*N*= 22826
Diagnosed with high blood pressure	0.45	0.00574	0.44	0.0197	0.47	-0.0156	0.33	0.0413	0.58	0.0309
	(0.497)	(0.0201)	(0.495)	(0.0237)	(0.499)	(0.0257)	(0.469)	(0.0249)	(0.493)	(0.0415)
		N= 62965		N= 41577		*N*= 21388		*N*= 10601		*N*= 3169
Taking medication for any mental health issues	0.25	0.0871***	0.28	0.0957***	0.20	0.0679	0.14	0.0687	0.16	0.0945***
	(0.436)	(0.0186)	(0.452)	(0.0132)	(0.401)	(0.0258)	(0.346)	(0.0539)	(0.365)	(0.00851)
		N= 22125		*N*= 17261		*N*= 4864		*N*= 1192		*N*= 1363
5+ poor health days in the last month	0.70	0.00291	0.70	-0.00347	0.69	0.00941	0.56	-0.0851***	0.72	0.0392***
	(0.460)	(0.0122)	(0.458)	(0.0168)	(0.461)	(0.00995)	(0.408)	(0.0181)	(0.451)	(0.0217)
		N= 63984		N= 42279		*N*= 21705		*N*= 9950		*N*= 4736
Dissatisfied with life	0.16	-0.025	0.17	-0.0460**	0.15	0.000561	0.08	-0.000966	0.11	0.119
	(0.367)	(0.0216)	(0.371)	(0.00876)	(0.356)	(0.0336)	(0.277)	(0.0309)	(0.314)	(0.0539)
		N= 23072		N= 15877		*N*= 8339		*N*= 2033		*N*= 1667
Behaviour										
Heavy drinker (5+ times per month)	0.04	-0.00589	0.03	-0.00312	0.06	-0.0101	0.02	-0.0126***	0.03	-0.000266
	(0.199)	(0.00360)	(0.177)	(0.00380)	(0.236)	(0.00637)	(0.155)	(0.00365)	(0.172)	(0.0131)
		N= 182019		*N*= 119079		*N*= 62940		*N* = 36979		*N*=22690
Regular smoker	0.32	-0.00732	0.31	-0.0122	0.36	-0.000956	0.17	0.000086	0.29	0.0524**
	(0.473)	(0.00851)	(0.466)	(0.00929)	(0.483)	(0.00992)	(0.374)	(0.0121)	(0.454)	(0.0222)
		N=188634		*N*= 122930		*N*=65704		*N* = 38800		*N*= 23307
Always drive with a seatbelt	0.85	0.00215	0.88	0.0175*	0.81	-0.016	0.89	-0.00882	0.84	0.0116
	(0.378)	(0.00989)	(0.353)	(0.00931)	(0.418)	(0.0144)	(0.311)	(0.0179)	(0.363)	(0.0159)
		N=180013		*N*= 117543		*N*= 62470		*N*= 36442		*N*= 22158
Exercise at least once per week	0.62	0.016	0.61	0.0201	0.66	0.00711	0.63	-0.00543	0.59	0.0172
	(0.484)	(0.0145)	(0.487)	(0.0165)	(0.478)	(0.0274)	(0.481)	(0.0233)	(0.491)	(0.0368)
		N= 136037		*N*= 90095		*N*= 45942		*N*=28865		*N*= 15656

Several negative results emerge when looking at subgroups. Hispanics appear significantly more likely to report some form of physical or mental limitation than the control group, while women in expansion states are more likely to be overweight. The most substantial impact is once again found for mental health issues, with three of the four subgroups displaying marked increases in terms of medication use. Women and African-Americans both showed increases of 9.5 percentage points relative to the control group, while the increase for all adults was slightly lower at 8.7 percentage points. Looking at the number of poor health days in the past month, Hispanics and African-Americans both displayed statistically significant results, though in opposite directions. The former experienced a decrease of 8.5 percentage points relative to the control group, while the latter experienced a 3.9% increase. Women in expansion states also display a significant decrease in terms of life dissatisfaction relative to non-expansion states.

In terms of health behaviours, there are no detectable changes across all adults as a result of the Medicaid expansion. Women do appear more likely to wear a seatbelt when driving, though this is only significant at the 10% level. Focusing on visible minorities however, we observe a significant decrease in the likelihood of being a heavy drinker (5+ drinks per month) amongst Hispanics, significant at the 1% level, and 5.2 percentage point increase in smoking habits amongst African-Americans, significant at the 5% level. Further research on this latter finding may be warranted to rule out moral hazard concerns.

Education

Table 3 displays estimates by education group. Beginning with the Access panel, we observe that the Medicaid expansion significantly increased the likelihood of having insurance for high school graduates and college dropouts, both significant at the 1% level, but not high school dropouts or college graduates. This could be related to the factors alluded to earlier, namely that very low-income citizens are eligible for Medicare across the United States, reducing the variation between expansion and non-expansion states. Post-secondary graduates also represent the group most likely to benefit from employer-sponsored coverage. With that said, all four education groups experienced a significant increase in the likelihood of having a personal doctor following the expansion, implying that there was still a quantifiable impact. We observe the largest increase for college dropouts, who show a 6.1 percentage point increase over their control group counterparts. College dropouts were also more likely to have a routine check-up (3.7

percentage points), while high school graduates were the group most likely to have transitioned into having coverage within the past 12 months at the time of the survey. Once again, no detectable changes were found with regards to medical costs or difficulty accessing care, which is line with previous research from Simon et al. (2017) and Wherry and Miller (2016).

Table 3: DiD specifications by education group

	Less than High School		High school diploma		College/Univ. dropout		College/Univ. degree	
	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate
Access								
Do you have health insurance?	0.63	0.0151	0.70	0.0418***	0.72	0.0471***	0.72	0.0251
	(0.481)	(0.0294)	(0.459)	(0.0105)	(0.450)	(0.0164)	(0.447)	(0.0225)
		N= 39440		*N*= 90684		*N* = 53091		*N* = 23707
Do you have a personal doctor?	0.67	0.0546***	0.75	0.0364**	0.78	0.0619***	0.76	0.0543**
	(0.469)	(0.0192)	(0.433)	(0.0183)	(0.416)	(0.0181)	(0.424)	(0.0221)
		N= 39395		*N*= 90722		*N* = 53121		*N* = 23665
Had routine check-up in past year?	0.64	0.0121	0.65	-0.00836	0.63	0.0373**	0.61	0.0218
	(0.479)	(0.0189)	(0.476)	(0.0145)	(0.482)	(0.0156)	(0.486)	(0.0231)
		N = 38932		*N*= 89759		*N* = 52573		*N* = 23445
Could not see doctor because of cost	0.33	-0.0244	0.30	-0.0108	0.33	-0.0186	0.31	-0.0199
	(0.470)	(0.0171)	(0.456)	(0.0127)	(0.470)	(0.0295)	(0.464)	(0.0297)
		N= 39449		*N*= 90776		*N* = 53136		*N* = 23684
Could not access care when needed	0.33	0.0046	0.29	0.0181	0.30	0.0265	0.27	-0.0355
	(0.475)	(0.0297)	(0.454)	(0.0196)	(0.457)	(0.0242)	(0.442)	(0.0462)
		N= 11090		*N*= 22919		*N* = 16680		*N* = 7398
Did not have coverage 12 months prior	0.12	0.0195	0.11	0.0598***	0.14	0.0257	0.12	0.0725*
	(0.322)	(0.0376)	(0.310)	(0.0207)	(0.348)	(0.0284)	(0.327)	(0.0409)
		N= 7136		*N*= 16367		*N* = 12466		*N* = 5707
Preventative								
Flu shot in past year	0.32	0.0299*	0.33	0.0124	0.34	0.0272**	0.34	0.0111
	(0.465)	(0.0150)	(0.470)	(0.0122)	(0.472)	(0.0132)	(0.473)	(0.0182)
		N = 44478		*N* = 85698		*N* = 61157		*N* = 22584
Diabetes test in past 2 years	0.19	0.000801	0.16	-0.0056	0.16	0.00661	0.13	0.0172
	(0.394)	(0.00999)	(0.370)	-0.00762	(0.365)	(0.00977)	(0.336)	(0.0147)
		N = 44839		*N* = 85113		*N* = 59846		*N* = 21731
Mammogram test in past 2 years	0.36	0.0152	0.35	0.0330**	0.32	0.0226*	0.36	0.017
	(0.480)	(0.0222)	(0.477)	(0.0159)	(0.467)	(0.0130)	(0.478)	(0.0230)
		N = 17116		*N* = 32530		*N* = 25448		*N* = 10272
Pap test in past 2 years	0.52	0.0302*	0.48	-0.0151	0.47	0.0238	0.50	0.000307
	(0.499)	(0.0159)	(0.499)	(0.0203)	(0.499)	(0.0194)	(0.500)	(0.0413)
		N = 17236		*N* = 32828		*N* = 25772		*N* = 10430
Prostate test in past 2 years	0.20	0.0273	0.22	0.0704***	0.23	0.0154	0.26	-0.019
	(0.396)	(0.0230)	(0.411)	(0.0229)	(0.420)	(0.0474)	(0.436)	(0.0473)
		N = 6361		*N* = 11088		*N* = 6593		*N* = 3628

Table 3: Continued

Health Status								
Diagnosed with angina/coronary heart disease	0.06	-0.0141**	0.06	-0.000499	0.06	0.00219	0.05	0.0145**
	(0.243)	(0.00616)	(0.235)	(0.00371)	(0.237)	(0.00437)	(0.214)	(0.00799)
		N = 39021		*N* = 90116		*N* = 63627		*N* = 28363
Limited due to health issues	0.37	-0.00877	0.40	0.0202	0.45	-0.00834	0.38	0.0306
	(0.483)	(0.0134)	(0.489)	(0.0127)	(0.497)	(0.0169)	(0.485)	(0.0239)
		N = 38199		*N*= 88580		*N* = 62669		*N* = 27865
BMI > 30 (Obese)	0.40	-0.0129	0.39	0.00445	0.38	-0.00438	0.30	-0.014
	(0.490)	(0.0150)	(0.486)	(0.0111)	(0.485)	(0.0137)	(0.458)	(0.0182)
		N = 36081		*N* = 86205		*N* = 60961		*N* = 27214
BMI > 25 (Overweight)	0.50	-0.00394	0.45	0.0144	0.44	-0.0079	0.42	-0.00838
	(0.500)	(0.0174)	(0.497)	(0.0158)	(0.496)	(0.0155)	(0.494)	(0.0338)
		N = 36081		*N* = 86205		*N* = 60961		*N* = 27214
Diagnosed with high blood pressure	0.50	-0.0723	0.46	-0.0437**	0.43	-0.0358	0.39	-0.0192*
	(0.507)	(0.0544)	(0.498)	(0.0199)	(0.495)	(0.0379)	(0.487)	(0.110)
		N= 12720		*N* = 25304		*N* = 17459		*N* = 8030
Taking medication for any mental health issues	0.16	0.0271***	0.25	0.0374	0.28	0.0790***	0.29	0.0357*
	(0.369)	(0.0192)	(0.434)	(0.0428)	(0.450)	(0.0344)	(0.453)	(0.0361)
		N = 1245		*N* = 2905		*N* = 2353		*N* = 1016
5+ poor health days in the last month	0.65	0.00812	0.70	-0.0290**	0.70	0.00816	0.76	-0.0888**
	(0.477)	(0.0310)	(0.459)	(0.0202)	(0.459)	(0.0203)	(0.428)	(0.0421)
		N = 12720		*N* = 24578		*N* = 10275		*N* = 8228
Dissatisfied with life	0.19	0.0207	0.13	-0.0524	0.14	-0.0427*	0.17	0.015
	(0.391)	(0.0253)	(0.340)	(0.0274)	(0.349)	(0.0128)	(0.372)	(0.0808)
		N = 1042		*N* = 1899		*N* = 1749		*N* = 935
Behaviour								
Heavy drinker (5+ times per month)	0.03	-0.00204	0.04	-0.00568	0.04	-0.0206**	0.05	0.0101
	(0.182)	(0.00718)	(0.203)	(0.00778)	(0.207)	(0.00997)	(0.212)	(0.0104)
		N = 36988		*N* = 71435		*N* = 50849		*N* = 22747
Regular smoker	0.34	0.00572	0.35	-0.00645	0.33	-0.0258**	0.19	0.0324**
	(0.473)	(0.0159)	(0.478)	(0.0115)	(0.471)	(0.0122)	(0.395)	(0.0155)
		N = 38752		*N* = 74169		*N* = 52375		*N* = 23338
Always drive with a seatbelt	0.86	-0.0187	0.84	0.00317	0.85	0.00968	0.87	0.0385***
	(0.344)	(0.0174)	(0.362)	(0.0123)	(0.355)	(0.0152)	(0.331)	(0.0122)
		N = 36488		*N* = 70533		*N* = 50461		*N* = 22531
Exercise at least once per week	0.57	0.0455	0.62	0.00904	0.68	-0.0142	0.74	0.0161
	(0.495)	(0.0312)	(0.4863)	(0.0275)	(0.465)	(0.0253)	(0.438)	(0.0523)
		N = 28375		*N* = 53839		*N* = 37305		*N*= 16518

In terms of preventative care, both high school and college dropouts exhibit significant, positive coefficients for flu shot outcomes, with the effect for the latter being more pronounced. High school graduates also experienced a marked increase in terms of cancer screenings (mammograms and prostate tests). The expansion does not appear to have had a detectable change in terms of diabetes screenings, and only high school dropouts exhibit any degree of significance with regards to pap smear tests, though only at the 10% level.

Looking at health status, we observe that high school dropouts living in expansion states are significantly less likely to be diagnosed with angina/coronary heart disease, though college graduates show a positive coefficient of nearly equal magnitude. There were no pronounced results in terms of health limitations or weight status, while the expansion appears to have contributed to a 4.3 percentage point decrease in the likelihood of having high blood pressure amongst high school graduates, and a 1.9 percentage point decrease amongst college graduates. High school graduates are also significantly less likely to report 5+ poor health days per month than the control group. These findings indicate that the Medicaid expansion has had a discernable impact on health status, despite the relatively short post-expansion period at the time of this study.

Positive signs can also be inferred from the behavioural results, with college dropouts exhibiting a lower likelihood of engaging in heavy drinking (-2.0 percentage points) and smoking habits (-2.5 percentage points). College graduates in expansion states are also statistically more likely to wear a seatbelt when driving, though this is partially countered by their higher smoking habits. This latter finding could once again be indicative of moral hazard at play, and provides grounds for subsequent research.

My third test of heterogeneity displays demographic estimates after removing adults aged 18-29 from the sample (Table 4 in appendix). In terms of access to care, all of the significant findings from my first specification continue to hold, with insurance and having a personal doctor displaying the largest increases relative to the control groups. For preventative care, the major change was with regards to pap tests, which were not statistically significant prior to the exclusion of young adults. All of the other significant results in terms of health status and behaviour found in Table 2 continue to hold.

To summarize my main body of results, there is a perceptible increase in terms of access to care, preventative care, health status, and health behaviour in expansion states relative to non-expansion states. The most pronounced and consistent findings are with regards to health insurance, the likelihood of having a personal doctor, flu shots, and the use of mental health medication. In terms of moral hazard, there is evidence that the Medicaid expansion increases the likelihood of being a smoker, though there is also evidence that it decreases heavy drinking. In terms of education group, high school graduates and college dropouts appear to derive the greatest benefits from the expansion, though all groups exhibit significant results.

Robustness Checks

In order to substantiate my main body of results and test for any potential confounders in the data, I perform two robustness checks (both included in the appendix). In Table 5, I implement a state-level GDP control into my main DiD model using data obtained from the U.S. Bureau of Economic Analysis (BEA). This provides a suitable proxy of economic success, which helps ensure that any unmeasured trends – such as a state-specific industry downturn – do not produce any biases in the data. These findings are qualitatively similar to my main DiD estimates, with two exceptions. In the Access panel, women are 3.2 percentage points more likely to have health insurance after controlling for state-level GDP, whereas results were insignificant before. Another change can be found with regards to high blood pressure in women, which is shown to decrease by 5.0 percentage points after the implementation of state-level controls. The rest of the results exhibit the same effects as in the main DiD model.

Table 7 shows the results of a placebo check, in which the years 2014 and 2015 were dropped from the sample and the "post" period is changed to 2013. By placing a lead on the treatment variable, I am able to assess whether any of the findings in the main body of results were caused by other factors beyond the Medicaid expansion, as theoretically there should not be any statistical significance. In terms of access to care, the placebo Medicaid expansion does not exhibit any of the significant results found in the main results section. There is one statistically significant result, which shows that African-Americans living in expansion states are more likely to experience difficulty accessing care, but this does not challenge or substantiate any of the previous findings. In terms of preventative care, it appears that expansion states are more likely to administer prostate tests even in the absence of the ACA, though this is only significant at the 10% level. In terms of behaviour, Hispanics living in the expansion states are significantly more likely to drive with a seatbelt, which appears unrelated to the Medicaid expansion.

Conclusion

In this study, I assess the impact of the ACA's Medicaid expansion on low-income non-elderly adults across the United States. Taking advantage of the natural partition between expansion and non-expansion states, I compare changes in health access, preventative care, health status, and behaviour, which identify the causal effects of the expansion and show the importance of geographical location on individual health outcomes. No study to date has used a

larger sample to assess these effects, and new contributions are also made in the form of heterogeneity and robustness checks. These provide new insights into the role of demographics and education on health, which are substantiated through state-level GDP controls and identification of pre-trends in the data.

My results show that the Medicaid expansion has had a sizeable impact on all four health panels in expansion states, in particular access and preventative care. Adults in this group are more likely to have health insurance, a personal doctor, and to have received a routine check-up in the past year than their control group counterparts, with Hispanics the only subgroup to not show statistically significant improvements in multiple areas. No significant changes are found in terms of medical costs or difficulty obtaining care, which is supported by previous studies. As a result of more comprehensive coverage, expansion-state individuals have increased their utilization of healthcare resources, receiving more flu shots and gender-based screenings, which has translated into improved health outcomes. Many have been able to obtain medication for mental issues, showing an 8.7 percentage point increase across all adults, while Hispanics exhibit a marked decrease in poor health days, significant at the 1% level. Several negative outcomes also emerge. Women show a 1.6 percentage point increase in the probability of being overweight as a result of the expansion, while African-Americans show a 3.9 percentage point increase in poor health days. In terms of behaviour, it appears that subgroup plays a strong role in determining the potential for moral hazard: Hispanics show a significant decrease in the likelihood of being a heavy drinker, while African-Americans in expansion states are much more likely to smoke.

Findings from my second main body of results, which focuses on education, reiterate many of these findings. High school graduates and individuals with some post-secondary education appear to have benefited the most from the Medicaid expansion, showing statistically significant improvements in coverage, personal doctors, routine check-ups, and the likelihood of having transitioned into health insurance within 12 months of the time of the survey. In terms of health status, high school dropouts in expansion states are less likely to suffer from coronary heart disease, while graduates show a notable decrease in high blood pressure diagnoses. The only education group to exhibit signs of moral hazard are college graduates, who are significantly more likely to smoke.

Testing the sensitivity of these results did not produce any notable discrepancies, which supports the quality of the data. With that said, there are several limitations to consider. This study uses survey data, which depends on respondents' subjective recollections and self-assessments, and thus may not be as accurate as clinical studies (Wherry and Miller, 2017). Another limitation noted by Simon et al. (2017) is that expansion-state respondents interviewed in 2014 would have spent a much smaller amount of time in the post-expansion period than individuals interviewed at the end of 2015. This would likely understate the effects of the expansion for the former.

Despite these limitations, my study makes a number of new contributions to the growing body of research on the ACA's Medicaid expansion. This evidence suggests that health outcomes are significantly better in states that chose to participate in the expansion, which could hold policy implications at the state and federal levels moving forward.

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Appendix

Table 4: DiD estimates after removing young adults (18-29)

	All Adults		Women Only		Men Only		Hispanics		African-Americans	
	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate
Access										
Do you have health insurance?	0.70	0.0334**	0.72	0.0146	0.67	0.0541***	0.59	-0.00457	0.75	0.0382
	(0.459)	(0.0153)	(0.448)	(0.0202)	(0.473)	(0.0143)	(0.491)	(0.0331)	(0.431)	(0.0274)
		N= 173987		*N*= 106495		*N* = 67492		*N* = 32447		*N* = 20474
Do you have a personal doctor?	0.76	0.0464***	0.82	0.0509***	0.69	0.0420*	0.64	0.0761**	0.81	0.0293
	(0.424)	(0.0172)	(0.38)	(0.0135)	(0.461)	(0.0220)	(0.480)	(0.0315)	(0.392)	(0.0253)
		N= 173853		*N*= 106408		*N* = 67445		*N* = 32394		*N* =20466
Had routine check-up in past year?	0.65	0.0123	0.69	0.0126	0.60	0.0169	0.62	-0.0158	0.78	0.0283
	(0.476)	(0.0111)	(0.461)	(0.0168)	(0.490)	(0.0132)	(0.485)	(0.0238)	(0.412)	(0.0197)
		N= 172060		*N*= 105359		*N* = 66701		*N* =32158		*N* = 20324
Could not see doctor because of cost	0.32	-0.0179	0.34	-0.0118	0.30	-0.0236	0.35	-0.0247	0.29	0.00945
	(0.467)	(0.0115)	(0.474)	(0.0156)	(0.456)	(0.0149)	(0.476)	(0.0230)	(0.451)	(0.0280)
		N= 182165		*N*= 106430		*N* = 75735		*N* =32432		*N* =20454
Could not access care when needed	0.29	0.00721	0.31	0.0116	0.27	0.00393	0.33	0.0407	0.34	0.0347
	(0.456)	(0.0148)	(0.461)	(0.0153)	(0.443)	(0.0199)	(0.469)	(0.0522)	(0.474)	(0.0458)
		N= 48663		*N*= 31263		*N* = 17041		*N* = 7114		*N* = 8323
Did not have coverage 12 months prior	0.11	0.0402**	0.10	0.0329**	0.12	0.0491	0.13	0.00976	0.10	0.0487*
	(0.316)	(0.0173)	(0.296)	(0.0138)	(0.322)	(0.0343)	(0.339)	(0.0789)	(0.293)	(0.0283)
		N= 35233		*N*= 23102		*N* = 11852		*N* = 4161		*N* = 6195
Preventative										
Flu shot in past year	0.34	0.0268***	0.38	0.0242**	0.32	0.0354**	0.32	0.0478***	0.33	0.0363*
	(0.474)	(0.00916)	(0.484)	(0.00968)	(0.464)	(0.0155)	(0.467)	(0.0113)	(0.471)	(0.0193)
		N= 174847		*N*= 122491		*N* = 52356		*N* = 30010		*N* = 19117
Diabetes test in past 2 years	0.19	0.00495	0.22	0.00515	0.17	0.00666	0.19	-0.00691	0.21	0.0144
	(0.387)	(0.00677)	(0.412)	(0.00845)	(0.375)	(0.00702)	(0.392)	(0.0104)	(0.406)	(0.0179)
		N= 161361		*N*= 110160		*N* = 51201		*N* = 30087		*N* =18472
Mammogram test in past 2 years	0.48	0.0284*	0.48	0.0284*			0.38	0.0486*	0.44	-0.0375
	(0.487)	(0.0149)	(0.487)	(0.0149)			(0.485)	(0.0266)	(0.496)	(0.0347)
		N= 51791		*N*= 71791				*N* =12165		*N* = 9047
Pap test in past 2 years	0.47	0.0268**	0.47	0.0268**			0.58	0.0291	0.59	-0.011
	(0.499)	(0.0123)	(0.499)	(0.0123)			(0.493)	(0.0307)	(0.492)	(0.0314)
		N= 52634		*N*= 72634				*N* = 12292		*N* = 9222
Prostate test in past 2 years	0.22	0.0417***			0.22	0.0417***	0.21	0.0289	0.28	0.0589
	(0.414)	(0.0145)			(0.414)	(0.0145)	(0.408)	(0.0349)	(0.449)	(0.0638)
		N= 19260				*N*= 19260		*N* = 4052		*N* = 2597

Table 4: Continued

Health Status										
Diagnosed with angina/coronary heart disease	0.07	-0.000884	0.08	0.00545	0.08	-0.00573	0.04	0.00498	0.05	-0.00505
	(0.25)	(0.00443)	(0.266)	(0.00707)	(0.266)	(0.00551)	(0.193)	(0.00874)	(0.219)	(0.0107)
		N= 160773		*N*= 105678		*N* = 55095		*N* = 25927		*N* = 20263
Limited due to health issues	0.48	0.0126	0.50	0.00184	0.46	0.0154	0.25	0.0344	0.40	-0.00172
	(0.496)	(0.0131)	(0.499)	(0.0133)	(0.498)	(0.0201)	(0.435)	(0.0245)	(0.489)	(0.0210)
		N= 158032		*N*= 103816		*N*= 54216		*N* = 25446		*N* = 20141
BMI > 30 (Obese)	0.39	0.0061	0.42	0.0174*	0.35	0.00417	0.38	0.0151	0.48	-0.0336
	(0.488)	(0.00724)	(0.493)	(0.00948)	(0.477)	(0.0143)	(0.485)	(0.0125)	(0.499)	(0.0274)
		N= 153697		*N*= 99063		*N* = 54534		*N* = 23148		*N* = 19619
BMI > 25 (Overweight)	0.46	0.00304	0.43	0.0192**	0.51	0.0112	0.55	-0.00608	0.54	0.00509
	(0.498)	(0.00729)	(0.495)	(0.00863)	(0.499)	(0.0124)	(0.497)	(0.0169)	(0.498)	(0.0277)
		N= 153697		*N*= 99063		*N* = 54534		*N* = 23148		*N* = 19619
Diagnosed with high blood pressure	0.48	-0.0141	0.52	0.00962	0.51	0.0287	0.36	-0.0264	0.62	0.0244
	(0.499)	(0.0124)	(0.499)	(0.0271)	(0.499)	(0.0203)	(0.48)	(0.0371)	(0.484)	(0.0389)
		N= 55905		*N*= 36644		*N* = 18649		*N* =2594		*N* = 2874
Taking medication for any mental health issues	0.27	0.0374***	0.32	0.0719***	0.22	0.0672**	0.14	0.0289**	0.24	0.0218***
	(0.443)	(0.0234)	(0.468)	(0.0153)	(0.415)	(0.02272)	(0.346)	(0.0178)	(0.032)	(0.0125)
		N= 16739		*N*= 9068		*N* =7671		*N* =1388		*N* = 1342
5+ poor health days in the last month	0.63	0.00355	0.62	-0.0169	0.64	- 0.0304*	0.75	-0.0735	0.69	-0.0343***
	(0.477)	(0.0183)	(0.485)	(0.0214)	(0.481)	(0.0180)	(0.432)	(0.151)	(0.464)	(0.0272)
		N= 54352		*N*= 35850		*N* =17886		*N* =4108		*N* = 3983
Dissatisfied with life	0.17	-0.0646**	0.18	-0.0554**	0.17	-0.00539	0.04	-0.078**	0.13	0.0852
	(0.372)	(0.0315)	(0.384)	(0.0133)	(0.371)	(0.0532)	(0.198)	(0.0254)	(0.340)	(0.0738)
		N= 19038		*N*= 9982		*N* = 9056		*N* =1097		*N* = 1587
Behaviour										
Heavy drinker (5+ times per month)	0.04	-0.00791*	0.03	-0.00932	0.06	-0.00736	0.02	-0.00780*	0.04	-0.0118
	(0.199)	(0.00396)	(0.181)	(0.00565)	(0.232)	(0.0125)	(0.147)	(0.00441)	(0.186)	(0.0129)
		N= 154199		*N*= 101744		*N* = 52455		*N* = 30203		*N* = 19457
Regular smoker	0.33	-0.00179	0.32	0.000815	0.36	-0.0139	0.17	-0.00306	0.33	0.0436*
	(0.469)	(0.0133)	(0.465)	(0.0111)	(0.48)	(0.00858)	(0.372)	(0.0133)	(0.468)	(0.0218)
		N= 159630		*N*= 104905		*N =54725*		*N* = 31662		*N* = 19967
Always drive with a seatbelt	0.86	0.00175	0.89	0.0119*	0.82	-0.0114	0.91	0.0141	0.87	0.0106
	(0.342)	(0.00746)	(0.312)	(0.00670)	(0.382)	(0.0117)	(0.288)	(0.00955)	(0.339)	(0.0147)
		N= 152337		*N*= 100360		*N* =51977		*N* = 29710		*N* = 18978
Exercise at least once per week	0.62	-0.00122	0.60	-0.00748	0.64	0.0131	0.63	-0.0442*	0.61	0.0404
	(0.485)	(0.0158)	(0.49)	(0.0221)	(0.480)	(0.0293)	(0.482)	(0.0244)	(0.488)	(0.0364)
		N= 118102		*N*= 78590		*N* = 39512		*N* = 24097		*N* = 13720

Table 5: Controlling for state-level GDP

	All Adults	Women Only	Men Only	Hispanics	African-Americans
	Estimate	Estimate	Estimate	Estimate	Estimate
Access					
Do you have health insurance?	0.0341**	0.0323*	0.0499***	0.0201	0.0607***
	(0.0143)	(0.0182)	(0.0119)	(0.0271)	(0.0206)
Do you have a personal doctor?	0.0418***	0.0458***	0.0372***	0.0752***	0.0441**
	(0.0102)	(0.0117)	(0.0124)	(0.0134)	(0.0198)
Had routine check-up in past year?	0.00916	-0.00587	0.0289*	-0.0171	0.0125
	(0.0135)	(0.0220)	(0.0161)	(0.0263)	(0.0186)
Could not see doctor because of cost	-0.00715	-0.00519	-0.0171	-0.0111	0.0177
	(0.0102)	(0.0144)	(0.0230)	(0.0215)	(0.0200)
Could not access care when needed	0.00650	0.0216	-0.00752	0.0353	0.0145
	(0.0121)	(0.0157)	(0.0205)	(0.0512)	(0.0301)
Did not have coverage 12 months prior	0.0488***	0.0587***	0.0369	0.0513	0.0727**
	(0.0166)	(0.0179)	(0.0260)	(0.0981)	(0.0347)
Preventative					
Flu shot in past year	0.0175*	0.0178*	0.0260**	0.0379***	0.038
	(0.00916)	(0.00932)	(0.0107)	(0.0130)	(0.0258)
Diabetes test in past 2 years	-0.00094	0.00519	-0.00506	-0.00946	0.0102
	(0.00452)	(0.00653)	(0.00674)	(0.00690)	(0.0125)
Mammogram test in past 2 years	0.0212**	0.0204**		0.0433**	0.00561
	(0.00859)	(0.00964)		(0.0162)	(0.0293)
Pap test in past 2 years	-0.00412	0.00599		0.00225	-0.0128
	(0.0132)	(0.0131)		(0.0217)	(0.0371)
Prostate test in past 2 years	0.0417***		0.0417***	0.0291	0.0551
	(0.0140)		(0.0140)	(0.0294)	(0.0647)
Health Status					
Diagnosed with angina/coronary heart disease	-0.000917	0.00264	-0.00647	0.000585	-0.00726
	(0.00375)	(0.00316)	(0.00546)	(0.00537)	(0.00863)
Limited due to health issues	0.00673	0.00916	0.00625	0.0287**	-0.00399
	(0.00979)	(0.00997)	(0.0167)	(0.0141)	(0.0187)
BMI > 30 (Obese)	-0.00341	0.0123	-0.0182	0.0182	-0.0505*
	(0.00815)	(0.0119)	(0.0167)	(0.0131)	(0.0257)

Table 5: Continued

BMI > 25 (Overweight)	-0.00222 (0.0108)	0.0183** (0.00840)	0.00642 (0.0160)	-0.00253 (0.0196)	0.00488 (0.0288)
Diagnosed with high blood pressure	-0.0143 (0.0287)	-0.0513** (0.0225)	0.0000325 (0.0601)	-0.0280* (0.0150)	0.0328 (0.0415)
Taking medication for any mental health issues	0.0640* (0.02421)	0.0970*** 0.0143)	0.0544 (0.0256)	0.0239 (0.0728)	0.105*** (0.00908)
5+ poor health days in the last month	-0.00187 (0.0111)	-0.0109 (0.0134)	0.00775 (0.0106)	-0.0870*** (0.0179)	-0.0297*** (0.0215)
Dissatisfied with life	-0.0514 (0.0219)	-0.0495** (0.00785)	-0.0133 (0.0337)	0.00198 (0.0332)	0.123 (0.0523)
Behaviour					
Heavy drinker (5+ times per month)	-0.00681 (0.00451)	-0.0055 (0.00408)	-0.0134 (0.00872)	-0.0157*** (0.00413)	-0.000849 (0.0137)
Regular smoker	-0.00247 (0.00785)	-0.0135 (0.00894)	-0.000779 (0.00998)	0.00651 (0.0106)	0.0488** (0.0235)
Always drive with a seatbelt	0.00234 (0.00567)	0.0174** (0.00803)	-0.0175 (0.0115)	-0.00507 (0.0131)	0.00801 (0.0146)
Exercise at least once per week	0.0107 (0.0153)	0.0138 (0.0142)	0.00855 (0.0246)	-0.00501 (0.0232)	0.0269 (0.0377)

Table 6: Placebo check

	All Adults		Women Only		Men Only		Hispanics		African-Americans	
	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate	Baseline	Estimate
Access										
Do you have health insurance?	0.68	-0.0189	0.71	-0.033	0.64	0.00277	0.58	0.038	0.74	-0.0243
	(0.465)	(0.0139)	(0.454)	(0.0205)	(0.481)	(0.0152)	(0.493)	(0.0269)	(0.438)	(0.0378)
		N = 118112		*N* = 77837		*N* = 40275		*N* = 19393		*N*= 13238
Do you have a personal doctor?	0.73	0.00547	0.78	-0.00179	0.67	0.00745	0.60	0.0168	0.78	-0.0458
	(0.441)	(0.0168)	(0.416)	(0.0260)	(0.476)	(0.0177)	(0.489)	(0.0240)	(0.414)	(0.0354)
		N = 117071		*N* = 82681		*N* = 34389		*N*= 19359		*N*= 13233
Had routine check-up in past year?	0.63	-0.0235	0.67	-0.0355	0.56	-0.0187	0.60	-0.0377	0.77	-0.0344
	(0.482)	(0.0251)	(0.471)	(0.0263)	(0.495)	(0.0386)	(0.419)	(0.0480)	(0.419)	(0.0432)
		N = 117331		*N* = 82185		*N* = 35145		*N*= 19232		*N*= 13165
Could not see doctor because of cost	0.32	-0.00134	0.34	-0.0077	0.30	0.0219	0.35	-0.0213	0.30	-0.00786
	(0.467)	(0.0132)	(0.472)	(0.0128)	(0.457)	(0.0260)	(0.475)	(0.0335)	(0.459)	(0.0247)
		N = 121128		*N* = 72676		*N*= 48452		*N*= 19382		*N*= 13234
Could not access care when needed	0.28	-0.0112	0.29	-0.0291	0.26	-0.0214	0.31	-0.0291	0.30	0.0354*
	(0.446)	(0.0229)	(0.452)	(0.0320)	(0.434)	(0.0217)	(0.462)	(0.0354)	(0.458)	(0.0287)
		N = 33464		*N* = 18512		*N* = 14952		*N*= 4477		*N*= 3832
Did not have coverage 12 months	0.13	0.0169	0.14	0.0152	0.13	-0.0154	0.15	-0.0302	0.12	-0.0204
	(0.340)	(0.0294)	(0.343)	(0.0181)	(0.334)	(0.0254)	(0.361)	(0.0383)	(0.327)	(0.0281)
		N = 26040		*N* = 16405		*N* = 9635		*N*= 2664		*N*= 2733
Preventative										
Flu shot in past year	0.32	0.0191	0.34	0.0432	0.28	0.0176	0.29	0.0145	0.29	0.0195
	(0.465)	(0.0174)	(0.472)	(0.0299)	(0.451)	(0.0220)	(0.453)	(0.0266)	(0.455)	(0.0316)
		N =124830		*N* = 69900		*N*= 54930		*N*= 18239		*N*= 12513
Diabetes test in past 2 years	0.16	0.0172	0.17	0.023	0.14	0.011	0.16	0.0213	0.17	-0.0067
	(0.365)	(0.0118)	(0.373)	(0.0141)	(0.348)	(0.0175)	(0.363)	(0.0185)	(0.373)	(0.0242)
		N = 118262		*N* = 55887		*N*= 62375		*N*= 19401		*N*= 13258
Mammogram test in past 2 years	0.34	0.0327	0.34	0.0327			0.33	-0.023	0.40	-0.0659
	(0.475)	(0.0228)	(0.475)	(0.0228)			(0.469)	(0.0319)	(0.489)	(0.0558)
		N = 52058		*N* = 52058				*N*= 9596		*N*= 8344
Pap test in past 2 years	0.49	-0.00114	0.49	-0.00114			0.58	-0.0211	0.61	-0.0076
	(0.499)	(0.0383)	(0.499)	(0.0383)			(0.493)	(0.0376)	(0.488)	(0.0228)
		N = 57930		*N* = 57930				*N*= 9554		*N*= 7062
Prostate test in past 2 years	0.22	0.0264*			0.22	0.0264*	0.21	0.0159	0.28	0.0323
	(0.414)	(0.0148)			(0.414)	(0.0148)	(0.409)	(0.0357)	(0.450)	(0.0549)
		N = 17076				*N* = 17076		*N*= 2405		*N*= 1227

Table 6: Placebo check continued

Health Status										
Diagnosed with angina/coronary heart disease	0.06	-0.00267	0.05	-0.00595	0.06	0.0047	0.03	0.00944	0.04	0.00303
	(0.232)	(0.00513)	(0.225)	(0.00549)	(0.245)	(0.0110)	(0.178)	(0.00805)	(0.188)	(0.0108)
		N = 114909		*N*= 71475		*N* = 43434		*N*= 13281		*N*= 13104
Limited due to health issues	0.39	0.0128	0.39	-0.0033	0.40	0.0398*	0.22	0.0099	0.34	0.0182
	(0.488)	(0.0147)	(0.487)	(0.0148)	(0.488)	(0.0219)	(0.411)	(0.00123)	(0.474)	(0.0330)
		N= 114562		*N* = 71427		*N* = 43135		*N*= 13208		*N*= 13137
BMI > 30 (Obese)	0.37	0.0194	0.39	0.0165	0.33	0.0145	0.36	0.011	0.45	0.0327
	(0.482)	(0.0118)	(0.487)	(0.0219)	(0.471)	(0.0171)	(0.478)	(0.0284)	(0.497)	(0.0310)
		N= 109948		*N*= 68504		*N*= 41444		*N*= 11893		*N*= 12751
BMI > 25 (Overweight)	0.51	0.00334	0.49	0.0443*	0.55	-0.00517	0.59	-0.00475	0.75	0.0331
	(0.499)	(0.0105)	(0.499)	(0.0232)	(0.497)	(0.0211)	(0.492)	(0.0497)	(0.432)	(0.0236)
		N= 109948		*N*= 68504		*N*= 41444		*N*= 11893		*N*= 12751
Diagnosed with high blood pressure	0.45	0.0136	0.43	0.00374	0.46	0.00765	0.49	0.0347	0.54	0.00371
	(0.497)	(0.0120)	(0.489)	(0.0100)	(0.434)	(0.00906)	(0.475)	(0.0256)	(0.442)	(0.0287)
		N = 74293		*N*= 37560		*N*= 36733		*N*= 4198		*N*= 7939
Taking medication for any mental health issues	0.25	0.00346	0.28	0.0105	0.21	0.0261	0.17	0.0338	0.16	-0.0369
	(0.433)	(0.0107)	(0.446)	(0.0177)	(0.404)	(0.0338)	(0.361)	(0.0502)	(0.392)	(0.0891)
		N = 13064		*N* = 6934		*N*= 5130		*N*= 997		*N*= 8253
5+ poor health days in the last month	0.70	-0.0155	0.69	0.012	0.71	-0.0038	0.67	0.0159	0.74	0.0208
	(0.460)	0.0163)	(0.480)	(0.0146)	(0.455)	(0.0177)	(0.489)	(0.0120)	(0.451)	(0.0213)
		N= 11547		*N* = 6577		*N*= 4970		*N*= 13250		*N*= 13158
Dissatisfied with life	0.16	-0.00351	0.17	0.00527	0.16	-0.00303	0.14	-0.0205	0.19	0.0107
	(0.367)	(0.00787)	(0.372)	(0.0125)	(0.385)	(0.0203)	(0.315)	(0.0260)	(0.327)	(0.0155)
		N = 13539		*N* = 6532		*N*=7007		*N*= 1862		*N*= 12767
Behaviour										
Heavy drinker (5+ times per month)	0.04	-0.00359	0.03	0.00276	0.06	-0.0162	0.02	-0.00627	0.038	-0.0012
	0.202	(0.00246)	(0.181)	(0.0113)	(0.236)	(0.00886)	(0.156)	(0.00819)	(0.191)	(0.0122)
		N = 111940		*N*= 51257		*N*= 60683		*N*= 18466		*N*= 12748
Regular smoker	0.33	0.00335	0.31	0.00144	0.36	-0.0071	0.17	0.00771	0.32	0.012
	0.468	(0.00828)	(0.461)	(0.00386)	(0.479)	(0.0198)	(0.374)	(0.0133)	(0.467)	(0.0241)
		N = 114370		*N*= 50456		*N*= 63914		*N*= 19022		*N* = 13071
Always drive with a seatbelt	0.85	-0.0200*	0.88	-0.0118	0.81	-0.0227	0.90	-0.0392**	0.85	-0.0296
	0.354	(0.0108)	(0.330)	(0.0109)	(0.392)	(0.0227)	(0.305)	(0.0153)	(0.354)	(0.0276)
		N = 110380		*N*= 49295		*N*= 61085		*N*= 18038		*N*= 12429
Exercise at least once per week	0.64	-0.00863	0.63	0.00638	0.67	-0.0189	0.64	-0.0248	0.61	0.0133
	0.48	(0.0123)	(0.483)	(0.0146)	(0.471)	(0.0207)	(0.478)	(0.0276)	(0.485)	(0.0302)
		N = 97326		*N*= 50502		*N*= 46824		*N*= 18963		*N*= 12800