The Effect of Health Insurance Coverage on the Reported Health of Young Adults

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Abstract

We exploit a sharp change in the likelihood that an individual is covered by health insurance when they turn 19 years of age to study how health insurance affects reported health status. We find that an individual is 6 percentage points less likely to have health insurance when they turn 19. Using a fuzzy regression discontinuity design, we find that having health coverage significantly increases the likelihood of reporting *excellent* health among young adults.

Keywords: Reported Health; Health Insurance; Young Adults

JEL codes: I12; I13; I18

1 Introduction

The recent passage of the Affordable Care Act's (ACA) dependent mandate has significantly increased the number of young adults that are covered by health insurance (Antwi et al., 2013). Given this increase in coverage, an important question deserves attention: does having health insurance coverage increase one's health status? The motivation of this study is to empirically investigate how having health insurance coverage impacts the health status of young adults.

Prior to the implementation of the ACA's dependent mandate, individuals typically aged off their parents' insurance plan or government plan at the age of 19. Using data prior to the ACA, we exploit this sharp decrease in health insurance coverage that occurred at an individual's 19th birthday to credibly estimate the causal effect of insurance coverage on self-reported health status. We find that when an individual turns 19, there is an abrupt 6 percentage point decrease in the probability of being covered by health insurance. Consequently, we estimate that this change in insurance coverage decreased the reported health status among individuals who reported *excellent* health prior to aging out their insurance plan.

Two recent studies, Anderson et al. (2012) and Timmins (2012), have similarly utilized the 19th birthday threshold to analyze the effect of insurance coverage on health care utilization. Anderson et al. (2012) find that not having insurance leads to a large and significant reduction in both emergency department visits and inpatient hospital admissions; however, Timmins (2012) finds that office-based physician visits and prescription drugs are not affected. In the context of the Grossman health production model (Grossman, 1972), an individual's health is determined by a number of factors, including medical care. Hence, the effect on health care utilization is the effect on the derived demand for health. That said, the overarching outcome of interest is the health of the individual, which is the focus of this study.

There are a number of potential mechanisms through which health coverage can impact an individual's health status. Primarily, individuals who lose coverage may be less likely to utilize health care and, therefore, may report lower health status because of a reduction in actual health. Relatedly, the loss of insurance may cause individuals to change other health related behaviors, such as exercise or diet. There may also be behavioral or psychological effects that immediately

follow from changes in health coverage; for example, losing health insurance may cause individuals to feel less healthy because they have more stress from the increased uncertainty or the stigma of not being insured, leading such individuals to report lower health status.

The link between health insurance and self-reported health recently gained attention following the findings of the Oregon Medicaid Experiment. Finkelstein et al. (2012) exploit a lottery that randomly assigned access to Medicaid coverage. Shortly after the random assignment, the authors find an increase in self-reported health for those who gained access to coverage, as well as an increase in self-reported happiness a year later. Generally, their findings are in relation to all uninsured adults below the federal poverty line. Our study differs from Finkelstein et al. (2012) in that our findings are relative to another important population: young adults. Given that recent health care reforms have focused on increasing the insurance rate of young adults, understanding the effects of health insurance on this population is important. Thus, our results are complementary to those of Finkelstein et al. (2012) in an effort to deepen our overall understanding of how having health insurance impacts health.[1]

Our paper contributes to the literature in health economics by documenting a positive effect of health insurance coverage on self-reported health for young adults. This is important because the evaluation of policies aimed at extending access to health care hinge on the associated welfare implications; improved reported health status would represent an important welfare implication. Furthermore, higher reported health has been shown to be associated with better actual health (see Currie and Madrian, 1999, pg. 3315 for references), as well as being positively correlated with other important outcomes including: economic status (Smith, 1999) and happiness (Easterlin, 2003).

2 Data and Empirical Strategy

Data for this paper comes from the National Health Interview Survey (NHIS) for the period of 1997 through March 2010. The NHIS provides the month a respondent is interviewed, their birth year, birth month, and age at the time of the interview. The NHIS also collects information

[1] We are not the first to study the effect of health insurance on health status. Using data from the Medical Expenditure Survey, Timmins (2012) finds inconclusive evidence on the topic. A key difference between the two studies is that we have a considerably larger sample size.

on health insurance coverage and self-reported health status. Respondents reported on a 5-point scale whether they have *excellent*, *very good*, *good*, *fair*, or *poor* health. Among respondents, the percentages of 18 year olds who report having *excellent*, *very good*, *good*, *fair*, or *poor* health were 47.8%, 29.4%, 19.2%, 3.1%, and .4%, respectively. For 19 year olds, the corresponding percentages were 43.8.%, 31.8%,20.7%, 3.1%, and .5%, respectively.

Figure 1 shows that the health insurance coverage rate of young adults begins to decline at age 18 before a sudden jump of 5 to 6 percentage points at age 19. It is this discontinuous change in the likelihood of coverage at the age of 19 that enables us to identify its effect on health status. The slight decline in coverage beginning at age 18 is likely due to individuals exiting their parent plans as they become more independent, as well as exiting government plans as they become disqualified through income changes or moving out of state. Figure 2 suggests that accompanying the discontinuous jump in health insurance at age 19 is a three to four percentage point jump in the probability of reporting excellent health. However, Figure 3 shows that the change in self-reported health at age 19 is mostly associated with individuals moving from excellent health to very good health. The change in reported health status at age 19 is small or non-existent at poorer levels of health (good, fair, and poor).[2]

Our estimation strategy, which uses this discontinuous change in health insurance at age 19, is a fuzzy regressions discontinuity design (RDD), since age is only one of many factors that affect insurance coverage. Therefore, the estimate of the effect of having insurance coverage on health status is interpreted as a weighted average effect for the subpopulation affected by the age 19 cutoff for insurance. Formally, we model health status as:

$$Y_i = \alpha_0 + \alpha_1 HI_i + f(Z_i - c) + \varepsilon_i, \tag{1}$$

where Y_i is our measure of health status of individual i. HI_i is an indicator that takes the value of one if individual i has health insurance coverage. Z_i is individual i's age in months and c is the age 19 threshold (228 months). The functional form between the forcing variable, Z_i, and the outcome, is described by $f(\cdot)$.

[2]The fitted line in figures 1-3 are from local mean smoothing at a bandwidth of 12 months.

Straightforward estimation of equation 1 will result in a biased estimate of α_1 because insurance coverage is correlated with unobserved factors that are in the error term. To overcome this endogeneity problem, we can instrument health insurance coverage with the discontinuity in insurance coverage at the age 19 threshold. Specifically,

$$HI_i = \delta_0 + \delta_1 W_i + g(Z_i - c) + \nu_i, \tag{2}$$

where $W_i = 1(Z_i \geq c)$, $g(\cdot)$ is the function relating relative age to health insurance coverage, and ν_i is the error term. For robustness, we estimate α_1 both by instrumental variables and by calculating the Wald estimate from nonparametric estimation of both the first stage and the reduced form equations. In addition, control variables can be added to increase efficiency, however, by design of the "natural experiment" that the RDD provides, control variables should be random around the cutoff. For robustness, we present results with and without the inclusion of controls.

We estimate and present the results using both kernel-weighted nonparametric local linear regressions with a triangle kernel, and a parametric local linear spline regression that allows the slope to vary from right and left of the threshold. Our preferred specification is to estimate α_1 using nonparametric local linear estimation. We choose to also report the results using parametric linear spline estimation because it is the estimation method used by Anderson et al. (2012) and, thus, makes our results directly comparable. Furthermore, we follow the precedent of Anderson et al. (2012) and report the results using a bandwidth of 12 months. The 12 month bandwidth is consistent with the visual evidence in Figure 1 of where the trends in the probability of insurance change on both sides of the age 19 cutoff. For robustness, we also display our results for bandwidths of 9 months and 15 months (see the online appendix for results with additional bandwidths).

3 Results

Table 1 displays the RDD results from the first stage, the effect of turning 19 years of age on health insurance, for three different bandwidths: 9 months, 12 months, and 15 months. Panel A reports the results from the nonparametric specification that uses local linear regressions. Panel B

reports the results from the same nonparametric specification with the inclusion of controls for race, gender, year, education level, and region. Panel C and D report the results for the parametric linear spline regressions excluding and including controls, respectively. The results in Table 1 indicate that an individual is generally 6 percentage points less likely to have health insurance when they turn 19. All of the reported point estimates are similar in magnitude and statistically significant at the 1 percent level. Heteroskedasticity-robust standard errors are reported in parentheses.[3] In the online appendix[4], we show that this result is robust for additional specifications and bandwidths. Our results are slightly smaller than Anderson et al. (2012) who find a decrease in coverage by approximately 8 percentage points at the age 19 threshold; this small difference is likely due to the fact that our data has some degree of measurement error because of self-reporting.

Table 2 presents the fuzzy RDD estimates for the indicators of *excellent* health and *very good* health. Panels A and B report the Wald estimates from using nonparametric local linear regressions and Panels C and D report the instrumental variable estimates using parametric linear spline regressions. The results in columns 1-3 indicate that the effect of health insurance significantly increases the likelihood that an individual reports having *excellent* health. For our preferred specification and bandwidth—nonparametric without controls and a bandwidth of 12 months—the Wald estimate suggests that an individual is 55 percentage points more likely to report having *excellent* health when covered by health insurance.[5] Hence, the reduced form estimate from equation 1, calculated by multiplying the IV estimate (.545) with the first stage estimate (-.059), suggests that an individual is 3.2 percentage points less likely to report having *excellent* health when the turn 19. In other words, approximately 6 percent of individuals will lose insurance at 19 and the individuals within this affected subpopulation are 55 percentage points less likely to report *excellent* health; this results in an estimated overall reduced form effect of 3.2 percentage points, which is consistent with the discontinuous jump in health status at age 19 displayed in Figure 2. Columns 4-6, which report the effect of health insurance on *very good* health, show negative effects and have similar

[3]The statistical significance of the results are consistent with standard errors clustered at age in months. However, for smaller bandwidths clustering on age in months may lead to inconsistent standard errors.

[4]The online appendix can be found at http://faculty.bus.lsu.edu/bdepew/.

[5]We note that this relatively large 55 percentage point effect at the discontinuity is in line with the magnitude of the effects found by Anderson et al. (2012). In particular, they find a 40 percentage point decrease in emergency department visits and a 61 percentage point decrease in hospital admissions.

magnitude to those in columns 1-3. Furthermore, the Wald estimate on the indicator of either *excellent* health or *very good* health is .07 and has an associated standard error is .20 (reported in the online appendix). Taken together, the results suggest that the effect is being driven by individuals moving from *excellent* health to *very good* health at the time they lose their insurance. In addition, we find no statistically significant effect on the following other measures of reported health: *good*, *fair*, *poor*, less than *very good*, and less than *good*. This is consistent with the patterns observed in Figure 3, where there is a discontinuous increase in *very good* health status at age 19, but little change in the other 3 health statuses.

4 Conclusion

In this study, we exploit the abrupt change in the likelihood that an individual is covered by health insurance when they turn age 19 years to analyze how insurance coverage affects reported health. We find that an individual is 6 percentage points less likely to have health insurance when they turn 19. Subsequently, we estimate that this discontinuous change in health insurance leads to a significant decrease in the likelihood of reporting *excellent* health. In light of recent health care reform, our results suggest that the large increase in the insurance coverage of young adults through the ACA's dependent mandate has likely been accompanied with significant increases in their reported health status. Whether the relationship between insurance and reported health is driven by access to care or changes in behavior, the point remains, having health insurance appears to lead to an increase in reported health, even in young adult populations who tend to have a relatively low demand for insurance.

References

Michael Anderson, Carlos Dobkin, and Tal Gross. The effect of health insurance coverage on the use of medical services. *American Economic Journal: Economic Policy*, 4(1):1–27, 2012.

Yaa Akosa Antwi, Asako S. Moriya, and Kosali Simon. Effects of federal policy to insure young adults: Evidence from the 2010 affordable care act's dependent-coverage mandate. *American Economic Journal: Economic Policy*, 5(4):1–28, 2013.

Janet Currie and Brigitte C Madrian. Health, health insurance and the labor market. *The Handbook of Labor Economics*, 3:3309–3407, 1999.

Richard A. Easterlin. Explaining happiness. *Proceedings of the National Academy of Sciences*, 100 (19):11176–11183, 2003.

Amy Finkelstein, Sarah Taubman, Bill Wright, Mira Bernstein, Jonathan Gruber, Joseph P. Newhouse, Heidi Allen, Katherine Baicker, and Oregon Health Study Group. The oregon health insurance experiment: Evidence from the first year. *The Quarterly Journal of Economics*, 127 (3):1057–1106, 2012.

Michael Grossman. On the concept of health capital and the demand for health. *Journal of Political Economy*, 80(2):223–255, 1972.

James P. Smith. Healthy bodies and thick wallets: The dual relation between health and economic status. *Journal of Economic Perspectives*, 13(2):145–166, 1999.

Lori L. Timmins. How much does health insurance matter for young adults?: Its role on primary medical care consumption. Working Paper, September 2012.

5 Figures and Tables

Figure 1: Health insurance coverage by age in months

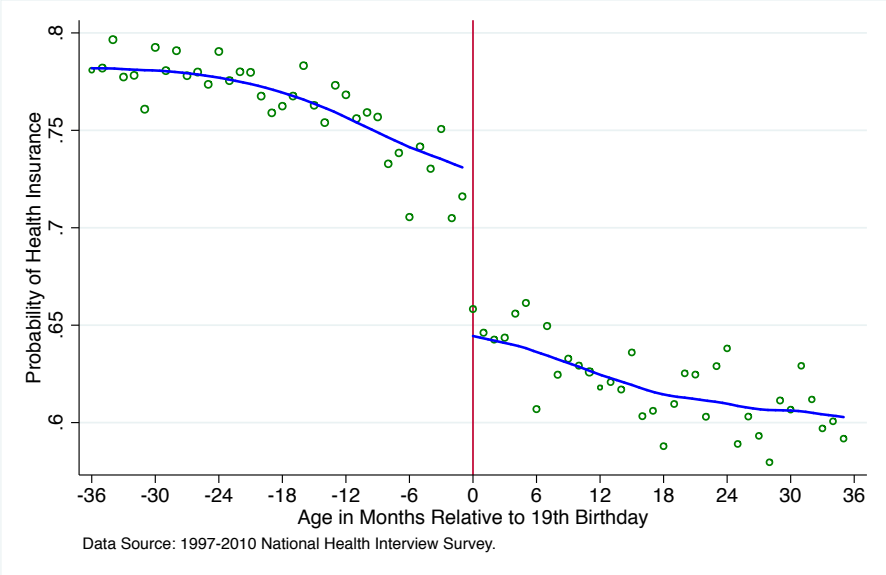

Figure 2: Probability of reporting *Excellent* health status by age in months

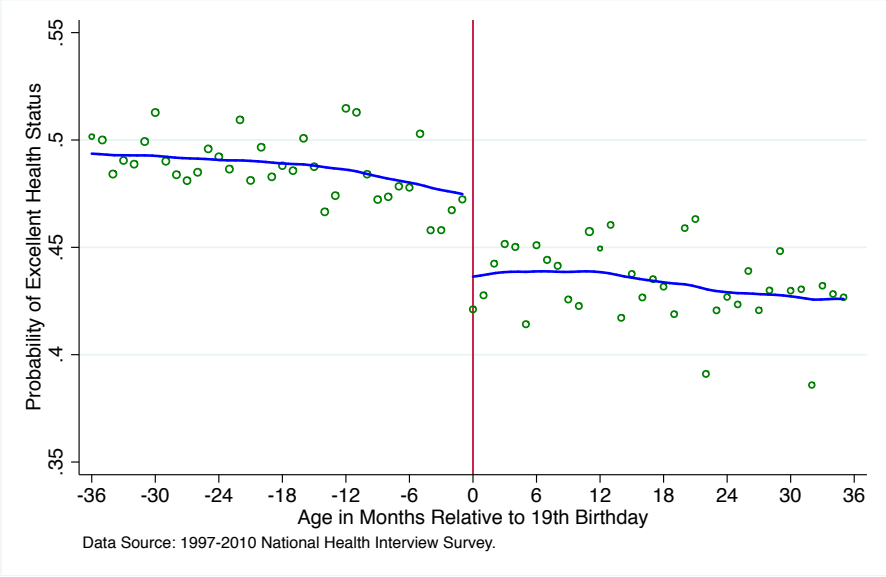

Figure 3: Probability of reporting non-*Excellent* health statuses by age in months

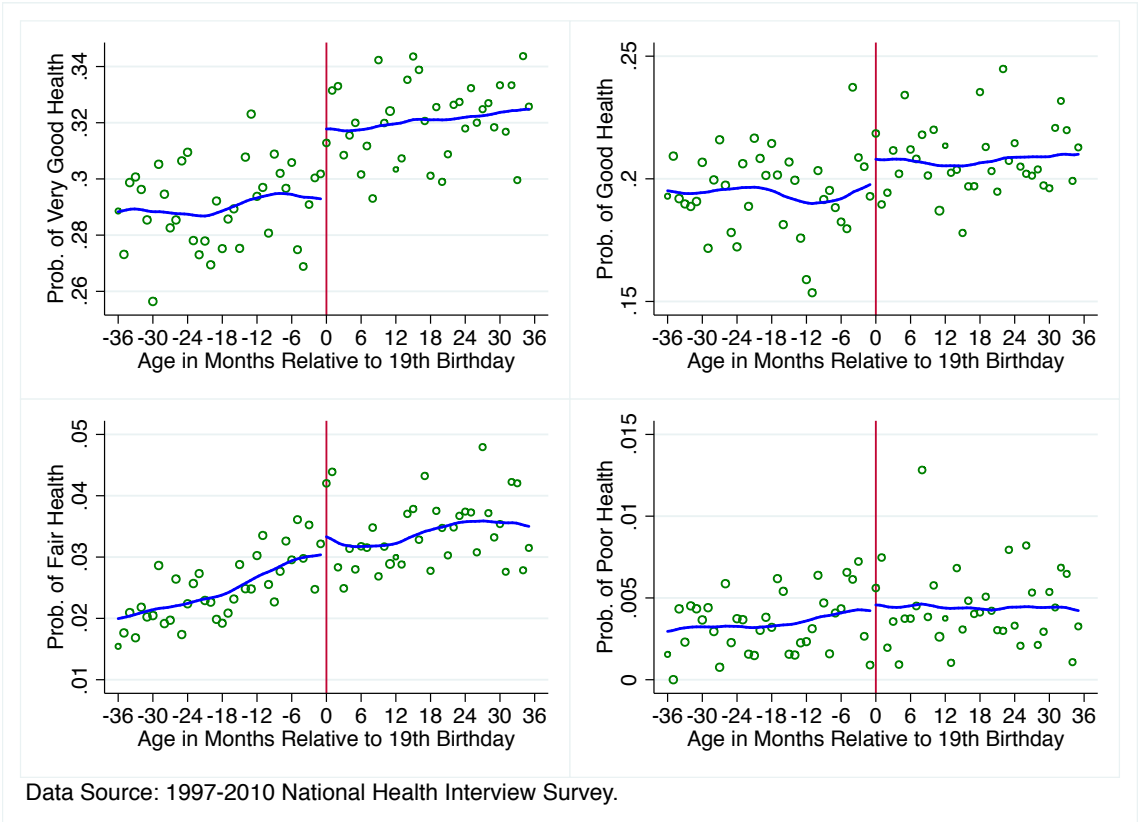

Table 1: RDD results for health insurance at age 19

	9 Months	12 Months	15 Months
	(1)	(2)	(3)
Panel A: Nonparametric			
RDD Estimate	-0.062***	-0.059***	-0.058***
	(0.015)	(0.013)	(0.011)
Controls	No	No	No
Observations	81782	81782	81782
Panel B: Nonparametric			
RDD Estimate	-0.043***	-0.049***	-0.051***
	(0.013)	(0.011)	(0.010)
Controls	Yes	Yes	Yes
Observations	81782	81782	81782
Panel C: Parametric			
RDD Estimate	-0.059***	-0.056***	-0.059***
	(0.011)	(0.010)	(0.009)
Controls	No	No	No
Observations	20362	27797	34276
Panel D: Parametric			
RDD Estimate	-0.049***	-0.054***	-0.056***
	(0.011)	(0.011)	(0.010)
Controls	Yes	Yes	Yes
Observations	20362	27797	34276

[a] Columns 1-3 report the estimates for the bandwidths of 9, 12, and 18 months, respectively. Panels A and B report the RDD estimates from using kernel-weighted local linear regressions with a triangle kernel. Panels C and D report the RDD estimates from using parametric linear spline regressions. Panels B and D include controls for gender, education level, year, region, and race.

[b] * 0.10, ** 0.05 and ***0.01 denote significance levels.

Table 2: Fuzzy RDD results for the effect of health insurance on *excellent* and *very good* health

	Excellent Health			*Very Good* Health		
	9 Months	12 Months	15 Months	9 Months	12 Months	15 Months
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: Nonparametric						
Health Insurance	0.569**	0.545**	0.542**	-0.424*	-0.474**	-0.513**
	(0.281)	(0.247)	(0.227)	(0.256)	(0.231)	(0.216)
Controls	No	No	No	No	No	No
Observations	81782	81782	81782	81782	81782	81782
Panel B: Nonparametric						
Health Insurance	0.858**	0.694**	0.643**	-0.657*	-0.600**	-0.599**
	(0.431)	(0.305)	(0.257)	(0.388)	(0.285)	(0.245)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	81782	81782	81782	81782	81782	81782
Panel C: Parametric						
Health Insurance	0.618***	0.436*	0.566***	-0.671***	-0.470***	-0.447***
	(0.212)	(0.212)	(0.201)	(0.197)	(0.157)	(0.160)
Controls	No	No	No	No	No	No
Observations	20362	27797	34276	20362	27797	34276
Panel D: Parametric						
Health Insurance	0.787***	0.485**	0.648***	-0.828***	-0.496***	-0.483***
	(0.271)	(0.223)	(0.218)	(0.167)	(0.152)	(0.162)
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Observations	20362	27797	34276	20362	27797	34276

[a] Columns 1-3 and 4-6 report the estimates for the dependent variable *excellent* health and *very good* health, respectively. Panels A and B report the Wald estimates from using kernel-weighted local linear regressions with a triangle kernel. Panels C and D report the IV estimates from using parametric linear spline regressions. Panels B and D include controls for gender, education level, year, region, and race.

[b] * 0.10, ** 0.05 and ***0.01 denote significance levels.