Medicaid versus Private Coverage for Low-Income Families: What are the Tradeoffs between Cost-Sharing and Access to Care?*

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Abstract

Not all health insurance is created equal. Medicaid typically provides coverage with little or no patient cost-sharing, while private plans may expose patients to high out-of-pocket spending. On the flip side, not all providers will accept Medicaid patients, so that access to providers may be better with private coverage. We evaluate the pros and cons of Medicaid versus private coverage for low-income families using a regression discontinuity design (RDD). The RDD exploits the sharp cutoff in Medicaid eligibility in many states at 138% of the federal poverty level (FPL) as a result of the Affordable Care Act. For these states, we estimate a sharp decline in Medicaid coverage and a corresponding increase in private non-group coverage at the 138% FPL cutoff, with no change in overall insurance coverage. Therefore, any outcome changes at the 138% FPL cutoff should be interpreted as the result of a change in the source of insurance, from public to private. We find a sharp increase in out-of-pocket medical spending at the cutoff, driven by premium payments. In contrast, there is no change in self-reported health or in the take-up of other public benefits, an issue of concern for some states that chose not to expand Medicaid. Future work will use restricted data from the Medical Expenditure Panel Survey (MEPS) to contrast these increases in personal spending with changes in access to care.

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I. Introduction

Improved financial well-being is an important benefit of health insurance coverage. This was one of the strongest findings from the Oregon Health Insurance Experiment (Finkelstein et al. 2012) and has been documented for early Medicaid expansions (Gross and Notowidgo 2011), the Massachusetts' comprehensive health reform (Mazumder and Miller 2016) and for seniors as they transition to Medicare (Barcellos and Jacobson 2015). Financial protection is also emerging as an important theme in early evaluations of the Affordable Care Act (Blavin et al. 2018; Brevoort, Grodzicki, Hackmann 2017; Hu et al. 2017; Allen et al 2017; Selden, Lipton and Decker 2017). Another less appreciated benefit of health insurance, however, is it that it enables access to medical care that would otherwise not be affordable (Nyman 1999; Zeckhauser 1970).

Not all health insurance is created equal, however. While Medicaid includes virtually no patient cost-sharing, private insurance marketplace plans can require as much as $7,150 out-of-pocket for an individual/$14,300 for a family at the point of service; this is on top of any premium payments. Thus, private insurance plans can leave households exposed to considerable out-of-pocket costs. On the other hand, an important advantage of private coverage *may* be better access to care than Medicaid provides (Asplin et al 2005; Rhodes et al. 2014; Polsky et al. 2015). In particular, because many state Medicaid programs reimburse providers at rates far below those paid by Medicare or commercial insurers, providers appear to ration slots for Medicaid enrollees more tightly than for privately insured individuals (Polsky et al. 2015). That said, evidence of access problems in Medicaid comes from audit studies, which do not necessarily capture the range of providers actually used by Medicaid enrollees. As a result, these studies may not accurately represent real world access problems (Harrison and List 2004), a concern that our work will more credibly address.

More generally, we have limited evidence on the relative value of Medicaid versus private health insurance for low-income households. Understanding how these approaches to coverage compare is increasingly important as states continue to debate whether and how to expand coverage (Pradhan 2018; Villeneuve 2018). Arkansas implemented a novel expansion in 2014 that used Medicaid funds to enroll beneficiaries between 100 and 138% of the poverty level in private plans through the health insurance marketplace. The Obama administration granted Arkansas a Section 1115 waiver to make this possible; the Trump administration may be even more receptive to such arrangements (McIntyre, Joseph, and Bagley 2017). States that have not yet expanded Medicaid – and even some that have – may be interested in this approach both because it is cheaper for states and because of ideological preferences for expanding coverage through private markets instead of public programs.

In this work, we evaluate the pros and cons of Medicaid versus private coverage for low-income families using a regression discontinuity design (RDD). Our RDD exploits the income threshold for Medicaid eligibility versus private exchange subsidies in states that expanded Medicaid under the Affordable Care Act (ACA). In other words, we compare families in expansion states who are just above and just below the income threshold for Medicaid versus premium tax credits for marketplace coverage. Using data from the Current Population Survey (CPS), we estimate the impact of coverage source on both the average and the distribution of out-of-pocket medical payments, payments for premiums versus cost-sharing, self-reported health, and self-reported take-up of other public benefits such as Food Stamps (SNAP) and public housing. The analysis of public benefits is motivated by concerns among some states that participation in public programs and thus spending will increase as a result of Medicaid expansions. Future work will use restricted data from the Medical Expenditure Panel Survey

(MEPS) to both validate the out-of-pocket spending results and analyze measures of utilization and access such as doctor visits, inpatient and outpatient stays, prescription drug utilization, and self-reported difficulty in accessing care.

Our analysis complements recent work by Selden et al. (2017) and Blavin et al. (2018). Selden et al. (2017) compare outcomes for individuals with family incomes between 100 and 138% of the federal poverty line (FPL), comparing their coverage, access and spending outcomes in expansion versus non-expansion states before versus after 2014. In non-expansion states, these individuals were eligible for marketplace premium tax credits but not Medicaid. Coverage increased for both groups, but those in expansion states had larger reductions in out-of-pocket medical spending and smaller reductions in reported difficulty accessing care after 2014 than those in non-expansion states. Blavin et al. (2018) take a similar analytic approach, using different data, and also find increases in coverage and reductions in out-of-pocket spending for individuals living between 100 and 138% of the poverty line in expansion versus non-expansion states. Similar findings emerge from comparisons of individuals in Arkansas, which had a private-insurance based Medicaid expansion waiver, Kentucky, which had a traditional Medicaid expansion and Texas, which did not expand Medicaid expansion (Sommers, Blendon and Orav, 2016)

Three important differences distinguish our work from Selden et al. (2017) and Blavin et al. (2018). The primary difference is our identification strategy. While both of those papers use a difference-in-differences (DID) strategy that compares individuals in expansion and non-expansion states, we propose an RDD to compare outcomes for those just above and just below the 138% FPL cut-off for Medicaid within expansion states. Thus, we will effectively compare those who can sign up for the state's Medicaid program versus those who can access premium

tax credits to purchase a private health plan on the exchange. The main advantage of the RDD relative to the DID is that it is less likely to be confounded by unobserved differences either within or across states, an issue of particular importance here, given the many health care market changes occurring as a result of both the ACA and the economic recovery. Second, in future versions of this paper, we will value changes in the distribution of out-of-pocket spending, access to care and health using an economic framework that allows us to quantify the tradeoff between Medicaid and private coverage from the beneficiary perspective. We will base this exercise on recent valuation approaches developed by Finkelstein et al. (2016) and on methods used in our prior work (Barcellos and Jacobson, 2015). Finally, we will use two high quality data sources to validate our findings: CPS and restricted versions of the Medical Expenditure Panel Survey (MEPS).[1]

The current draft of our paper makes several contributions. First, using data from the Current Population Survey (CPS), we demonstrate that at 138% of the federal poverty level in states that expanded Medicaid, there is a sharp change in the source of insurance coverage. Those in households below the threshold are more likely to be covered by Medicaid, while those above it are more likely to have private individual insurance, with no change in the overall likelihood of coverage. The difference is meaningful, with approximately 5-percentage point fewer (more) individuals covered by Medicaid (private non-group coverage). These changes are concentrated in the low-income population without access to employer-sponsored insurance. We find no such change at 138% of poverty in states that did not expand Medicaid.

[1] While the American Community Survey (ACS) is, in principle, a good source to verify our insurance results, the income and tax unit information in the dataset are insufficient to successfully implement an RDD based on a discrete AGI threshold. This also explains why we do not use the National Health Interview Survey (NHIS). Although the NHIS is a great source of information on both health insurance coverage and health care access, it does not capture income with sufficient detail to support an accurate calculation of income relative to the Medicaid eligibility threshold and thereby enable an RDD analysis.

We further demonstrate a sizeable, discontinuous increase in average out-of-pocket medical spending of $400 or 15%, driven by higher premium payments. The increase is larger at the right tail of the medical spending distribution, with increases of nearly $700 or 17% at the 75th percentile of the out-of-pocket spending distribution. Estimates at other points in the right tail of the distribution are even larger but also less precise. These changes are unique to Medicaid expansions states in the post-expansion period; that is, we find no such changes in coverage or spending at 138% FPL in either Medicaid expansion states prior to 2014 or in non-expansion states before or after 2014. These placebo findings suggest that the estimates at 138% FPL in Medicaid expansion states post 2014 are attributable to the discrete change in (subsidized) health benefits at this threshold. At the same time, we find no evidence of increases in the take-up of other public benefits or of changes in self-reported health in Medicaid expansion states after 2014. Future drafts of this paper will include analysis of restricted data from the Medical Expenditure Panel Survey (MEPS) on health care utilization and access to care.

II. Study Data

We use pooled data from two main sources: the Current Population Survey's Annual Social and Economic Supplement (ASEC or "March CPS") and the Medical Expenditure Panel Survey (MEPS). Our main estimates from the CPS are based on 2014 to 2017 for most outcomes but 2015 to 2017 data for spending outcomes, which are intended to capture prior year coverage. As mentioned above, we also analyze pre-ACA, specifically 2010 to 2013, data to test whether our post-ACA estimates may be capturing other unobserved factors. In robustness checks, we also take advantage of the 2014 addition of questions to the CPS on the offer of and respondent eligibility for employer-sponsored insurance coverage. To the extent our findings are tied to the

ACA insurance expansions, they should be larger in the group without access to employer-sponsored coverage. Because we need access to the restricted version of the MEPS in order to identify state of residence, i.e., to select individuals residing in expansion states, the current version of the paper only presents the CPS results.

Our RDD analysis, which we describe in more detail in Section III, requires the calculation of income relative to poverty thresholds. The relevant income for Medicaid eligibility is modified adjusted gross income (MAGI). MAGI is identical to adjusted gross income (AGI) except that it includes several income categories excluded from AGI, such as tax-exempt interest, foreign income, and the taxable portion of social security benefits. In practice, the difference between AGI and MAGI should be very small for low-income families, particularly those headed by working age adults who are not yet eligible for social security benefits (see Hinde 2017; Brooks 2015). Therefore, we rely on AGI, which is relatively straightforward to calculate in the CPS and the MEPS. In the case of the CPS, the Census Bureau supplements the CPS's Annual Social and Economic Supplement (ASEC) with a simulated measure of AGI (see O'Hara 2004). In the case the MEPS, the dataset has enough income information to allow us to simulate AGI using the NBER's TaxSim 9.0 program (see Banthin and Selden 2006). In all cases, we divide AGI by the relevant poverty threshold from the Census Bureau for each family size and year to calculate income relative to poverty.

Our RDD analysis of outcomes (spending, access and health) for those with access to Medicaid versus subsidies for the purchase of private non-group insurance hinges on the first-stage findings for insurance coverage. Consequently, we choose to estimate coverage changes using both datasets. Fortunately, the CPS and the MEPS have high quality information on health insurance coverage and type of insurance held (e.g. Medicaid, Medicare, employer-sponsored,

non-group private). Both datasets also have good measure receipt of Food Stamps/SNAP, Supplemental Security Disability Insurance

Out-of-pocket medical spending is captured by the CPS, which began collecting information on out-of-pocket medical spending in 2014, as well as the MEPS, which corroborates self-reports with provider level data. Whereas CPS data on out-of-pocket spending is exclusively from self-reports, the MEPS gathers detailed information about health care visits, hospital stays, prescription drug fills, other medical services, out-of-pocket expenses and sources of other payments (Stanton and Rutherford 2006). A provider component obtains follow-up data on payments by private insurance, Medicaid, Medicare and other sources.[2] Because MEPS and CPS are household surveys, they miss spending by individuals in institutional settings (Aizcorbe et al. 2010, Zuvekas and Olin 2009).

The MEPS also captures standard measures of access to care including health care utilization (e.g. doctor visits, inpatient/outpatient care, prescription drugs) and difficulty and/or delay accessing care due to cost. Both the MEPS and the CPS capture self-reported health (excellent/very good/good/fair/poor). Although subject to limitations (Crossley and Kennedy 2002), self-reported health is a remarkably reliable indicator of both individual mortality and morbidity (e.g., see Idler and Kasl, 1995; McCallum et al., 1994; Okun et al., 1984).

III. Empirical Strategy: Regression Discontinuity Design

To understand the impact of health insurance type on spending and access, we would, in principle, estimate the following reduced-form equation:

[2] Unfortunately, while the follow-up surveys supplement self-reported payment information, they do not update self-reported utilization (Zuvekas and Olin 2009). That is, the quantity of care from the household survey is taken as given and it is only expenditures that get updated/validated.

$$Y_i = \alpha + \beta InsType_i + X_i\delta + \varepsilon_i \quad (1)$$

where Y_i is an outcome measure such as out-of-pocket spending or difficulty accessing care for individual i; X_i is a set of demographics characteristics of individual i; $InsType$ is the type of health insurance individual i has (e.g. Medicaid or private insurance); and ε_i is an unobserved error. A fundamental and well-known problem in interpreting β as the causal effect of health insurance type on outcomes is that coverage is endogenous; it both affects and is affected by outcomes such as medical spending, confounding observational comparisons of people by insurance type.

To circumvent this problem, we exploit income-related insurance expansions under the Affordable Care Act. Affordable Care Act introduced both an optional expansion of Medicaid eligibility to all adults with incomes up to 138 percent FPL, as well as tax credits for the purchase of private insurance through health insurance marketplaces for individuals above the Medicaid threshold but below 400 percent of FPL. As a result, beginning in 2014, adults in Medicaid expansion states faced a sharp discontinuity in their eligibility for different programs, with those with family income just below 138% of FPL eligible for Medicaid while those with slightly higher incomes qualified instead for tax credits to help them purchase private coverage. This discontinuity provides the basis for our research design and allows us to assess the relative merits of Medicaid versus private insurance for low-income households.

Formally, we will estimate a first-stage as follows

$$InsType_i = \beta_0 + \beta_1 1(IRFPL_i > 1.38) + g(IRFPL_i) + g(IRFPL_i) * 1(IRFPL_i > 1.38) + X_i\boldsymbol{\beta_2} + \varepsilon_i \quad (2)$$

where IRFPL stands for income relative to the federal poverty line such that $1(IRFPL_i > 1.38)$ is an indicator of whether household income is above 138% of the FPL; the vector X_i contains predetermined characteristics such as gender, age, race, and ethnicity. Including X_i is not needed for identification, but might improve the precision of our estimates. The function $g(\cdot)$ captures health insurance gradients with respect to IRFPL that are allowed to vary on both sides of the 138% FPL eligibility threshold.

Combining equations (2) and (1) the resulting reduced form model for outcome y_i is

$$y_i = \gamma_0 + \gamma_1 1(IRFPL_i > 1.38) + f(IRFPL_i) + X_i\boldsymbol{\gamma_2} + v_i \quad (3)$$

where y is a measure of OOP medical spending, health care utilization or health for individual *i* and all other variables are defined as above. Our main estimate of interest, γ_1, gives the causal effect of relative access to public versus private insurance on spending, health and utilization.

In our model, income relative to the federal poverty level (IRFPL) is the "running" or "forcing" variable for the analysis; that is, the variable that, as a result of policy, discontinuously alters the likelihood of Medicaid versus private non-group insurance coverage. Because reported income and the subsequent simulation of AGI (described above) will be subject to measurement error, we aggregate income into 5 percentage point bins. In future drafts, we will conduct "donut' analyses that drop respondents close to the income eligibility threshold – e.g., between 136 and 140% of the FPL in our setting – to test whether heaping in the measure of income relative to the federal poverty line, caused, for example, by rounding of reported income, biases our results (Barecca, Lindo and Waddell 2015).

There are two primary approaches to estimating the RDD – a parametric, global polynomial approach and a non-parametric local linear approach. Because of measurement error

in our income measure, relying on exact values of income relative to the federal poverty line and on the smaller bandwidths usually implied by the local linear approach might lead to biased estimates. In particular, individuals on either side of the 138% FPL threshold are likely miscategorized, which should bias towards zero any estimated difference in outcomes between the Medicaid eligible versus subsidized private insurance eligible populations. To avoid overweighting the local difference at the 138% FPL threshold, our main specification take a global polynomial approach. Specifically, we estimate models with both quadratic and linear polynomials that are allowed to vary on either side of 138% FPL. We cluster our standard errors at the same level of aggregation of our running variable (5 percentage point income relative to FPL bins). In future drafts, we will test the sensitivity of these estimates to a local linear (or non-parametric) approach, using a standard algorithm such as Calonico, Cattaneo and Titiunik (2014) or Imbens and Kalyanaraman (2012), to find an "optimal bandwidth" around the 138% FPL eligibility threshold.

Our analytic sample is restricted to individuals with household income between 53 and 223% of the FPL and between the ages of 26 and 64. The age restriction accounts for access to parental coverage for adults below age 26 and for (near universal) access to Medicare for those ages 65 and older. In our main analyses, we exclude respondents from New York after 2015 and Minnesota in all years, because these states have a Basic Health Plan option, connected to the Medicaid program for those between 138 and 205% FPL. We further exclude respondents from Alaska, Connecticut, the District of Columbia and Indiana because these states used thresholds

greater than 138% FPL in their Medicaid eligibility criteria (KFF 2018).[3]

Analyses of different points in the distribution of out-of-pocket spending—e.g., spending at the median, seventy-fifth and ninety-fifth percentile—are estimated using a quantile regression version of equation (3). Standard errors for quantile models are estimated using an income-based block bootstrap, analogous to income-based clustering, that randomly samples with replacement the data within each income group and estimates the models on these random samples (Efron and Tibshirani 1994). When an income-block is randomly selected all respondents in this income group are included in the estimation. The standard errors are then calculated simply as the standard deviation of the coefficient estimates from 500 bootstrap samples.

A key identifying assumption of our RDD is that the unobserved determinants of spending, utilization and health – that is, the elements of the error term υ_i – are a smooth function of income. We partially test this assumption by running specifications similar to (3) with predetermined or plausibly unaffected characteristics, such as gender, race/ethnicity, education, employment and place of birth as the dependent variable. Figure 1 demonstrates smoothness in several key covariates: the fraction employed, average hours worked per week in the previous year, conditional on working and the fraction white. Table 1 shows the RDD estimates for these and several other covariates: the fraction Hispanic, fraction black, fraction foreign born, average age, fraction female and the fraction married. For each covariate, we show two RDD estimates, one with linear and the other with quadratic polynomials in income relative to the poverty line. In most cases, the point estimates are small and they are rarely statistically

[3] The expansion sample is from the following 28 states: AZ, AR, CA, CO, DE, HI, IL, IN (after 2015), IA, KY, LA (2017), MD, MA, MI (after 2015), MT (after 2015), NV, NH (after 2014), NJ, NM, NY (before 2016), ND, OH, OR, PA (after 2014), RI, VT, WA, WV.

distinguishable from zero. Where the estimates are significant, it is across only one specification, possibly as a result of functional form (e.g., see Figure 1, fraction white) and at the 10 percent level. The general smoothness in our data suggests our analysis satisfies the continuity assumption of the RD design.

Another potential threat to the validity of the RDD design is that individuals near the 138% FPL cut-off may "manipulate" their income based on their preferences for either Medicaid or exchange subsidies; for example, individuals may limit their work hours so as not to earn too much to qualify for Medicaid. In this case, the RDD design fails to provide a valid comparison between individuals who are identical except for their access to Medicaid vs. tax credits on either side of the income threshold. In order to test for this possibility, we implement a "McCrary Test" (after McCrary 2008) to look for heaping in the distribution of income just below 138 percent FPL. Using CPS data on individuals between 53 and 233 percent of FPL (encompassing approximately 35% of the working-age adult population), we find no evidence of such heaping as shown in Appendix Figure 1 ($p>0.475$ for the null of no discontinuity), which supports the validity of the regression discontinuity design. Alternative tests of manipulation of the running variable (i.e., income relative to the federal poverty line), such as that developed in Cattaneo, Jansson and Ma (2017), also show no evidence of manipulation ($p>0.481$) and lend further support to the research design.

Our analysis lends itself to two placebo checks – estimates of equations (2) and (3) for the states that did not expand Medicaid, and for all states prior to the ACA (e.g. 2010-2013).[4] That is, we do not expect any discontinuities in coverage, financial well-being or access to care

[4] The placebo non-expansion sample is from the following 26 states AL, AK (before 2016), FL, GA, ID, IN (2014), KS, LA (before 2017), ME, MI (2014) , MS, MO, MT (before 2016), NE, NH (2014), NC, OK, PA (2014), SC, SD, TN, TX, UT, VA, WI, WY.

at the 138 percent FPL cutoff in these cases; if we observe any such discontinuities prior to 2014 or in non-expansion states, this is an indication that our regression discontinuity design is not valid. Consequently, these analyses help test whether our main findings are a result of misspecification errors or of other unobserved determinants of our outcomes that may vary discontinuously at the 138% FPL threshold. As will be shown below, our placebo checks are reassuring. Prior to the ACA we find no discontinuities in the outcomes of interest while in non-expansion states post-ACA we find either no discontinuities or discontinuities inconsistent with a shift from Medicaid to individual private insurance in either set of placebo checks. Furthermore, we demonstrate that our findings are larger in the population that does not have access to employer-sponsored insurance coverage, defined as eligibility for coverage offered by individual's employer or the spouse's employer. This is consistent with the idea that Medicaid and exchange subsidies target, among others, low-income individuals without access to ESI.

IV. Results

A. Insurance Coverage and Medicaid vs. Subsidy Eligibility

Figure 2 shows coverage type by household income relative to the federal poverty line in expansion and non-expansion states. Figure 2a shows that, as expected, Medicaid coverage decreases with relative income in both expansion and non-expansion states. However, only in Medicaid expansion states do we see a sharp drop in Medicaid coverage at 138% of the FPL. As shown in Table 2, the drop is almost 5 percentage points, or about 15 percent off a base rate of 32.8% of individuals below 138% FPL on Medicaid.[5] Both visually and in Table 2 (Panel B), we find no change in Medicaid coverage at this threshold in non-expansion states. Likewise, prior

[5] Take-up of Medicaid is known to be incomplete, at least in part because of the ability to sign up at the point of care. See Sommers et al. (2012) for a thorough review of the issues.

to the ACA, between 2010 and 2013, we find no discontinuity in Medicaid coverage in either expansion or non-expansion states (see Appendix Table 1).

Figure 2b shows the complementary figure for private, nongroup health insurance coverage. Above 138% FPL, individuals in expansion states can receive subsidies to purchase insurance on an exchange marketplace; in non-expansion states the subsidy threshold is 100% FPL. Figure 2b and Table 2 shows a complementary, discontinuous increase of between 4 to 6 percentage points in individual private coverage in expansion states at the 138% FPL cutoff. Again, we find no discontinuous change for non-expansion states or prior to the ACA (see Appendix Table 1) in expansion or non-expansion states, lending support to our hypothesis that this change is caused by the Medicaid vs. exchange subsidy eligibility.

Importantly, these changes are not driven by changes in the likelihood that respondents either have access to ESI coverage (see Appendix Figure 2) or take up such coverage (see Appendix Figure 3). Not surprisingly, the coverage changes observed in Figure 2a and 2b are even larger when we restrict to individuals who are not eligible to enroll in ESI coverage (either through their spouse's or their own employer). At the 138% FPL threshold, Medicaid coverage drops by between 8 to 9 percentage points off a base of 16% and non-group coverage increases by between 6.5 and 10 percentage points off a base of 9% among those without an ESI coverage option (see Appendix Figures 4a and 4b and Appendix Table 2).

In contrast, in Figure 3 we find no sharp break in the rate of uninsurance at the 138% FPL cutoff in either Medicaid expansion or non-expansion states. Likewise, and as shown in Appendix Figure 5, rates of uninsurance are smooth among individuals without the option of ESI coverage. Taken together, Table 1 and Figures 2 and 3 suggest that, although those on both sides of the 138% FPL cutoff in expansion states are equally likely to have any insurance, those to the

left of the cutoff are more likely to have Medicaid while those to the right of the cutoff are more likely to have private insurance. These estimates are robust to the use of much tighter bandwidths, such as 68 to 208% FPL or 78 to 198% FPL (see Appendix Table 3). Estimates for the period 2015-2017, which corresponds to our spending estimates shown below, are quite similar to those in Table 2 (see Appendix Table 4). Consequently, we can attribute any discrete changes in out-of-pocket spending, access to care, self-reported health, and take-up of other public programs at the 138% FPL cutoff to the source of coverage induced by changes in eligibility for Medicaid versus subsidies to purchase private health insurance coverage.

B. Personal Medical Spending

Next, we consider changes in personal medical spending. For these outcomes, we focus on spending between 2015 and 2017 since the CPS questions ask about prior year spending. Figure 4 and Table 3 show changes at the 138% FPL threshold in total personal medical spending, which includes spending on premiums, co-insurance, copays and over-the-counter medications and other health products. Figure 4a shows a sharp increase in the inverse hyperbolic sine (IHS) of personal medical spending at the 138% FPL threshold. Note that this transformation, which is used to address skewness in the data, is akin to a log transformation but can handle zero. This increase seems to be driven primarily by premium spending (Figure 4b) as opposed to increases in out-of-pocket spending (Figure 4c). The estimates in Table 3 imply an overall increase in personal spending of between $400 and $500, although the level estimates (Panel A) are rather imprecise and only significant at the 10 percent level with linear trends in income. Estimates that use the inverse hyperbolic sine are more precise and imply increases in spending at the 138% threshold of 20 to 36% depending on the specification.

Changes in family premium payments account for about two-thirds to three-quarters of

the increase ($288-$338); this increase is significant at the 5 percent level when using linear trends in income. Although imprecise, the point estimates suggest that the remaining increase is coming from (direct) out-of-pocket medical spending. In the pre-ACA period, we find no economically or statistically significant changes in personal medical spending at the 138% FPL threshold (see Appendix Table 5). Likewise, we find no robust evidence of an increase in personal medical spending at the 138% FPL cutoff in nonexpansion states (Panels C and D of Table 3). If anything, these estimates suggest a decrease in out-of-pocket spending. To the extent this is real, it could reflect a misunderstanding of the ACA rules, whereby individuals in nonexpansion states think they are ineligible for exchange subsidies until 138% FPL; due to a mistake in the drafting of the law, the actual threshold in nonexpansion states is 100% FPL.

These results are robust to several checks. First, the effects are concentrated in the sample without access to ESI. Results for this group imply increases in spending of $500 to $700 or between 32 to 48% using the IHS specification (see Appendix Table 6). Second, the estimates are robust to the use of narrower bandwidths, although in some cases the standard errors increase considerably (see Appendix Table 7).

Table 4 shows results for quantile regressions versions of equation 3, for the median, 75th and 97th percentiles of the family OOP and premium spending distributions. Among expansion states, the effects are considerably larger among the high spenders. Consistent with what we find at the means, the changes in total OOP are driven by premium spending. Corresponding results for non-expansion states have the opposite sign and are mostly insignificant.

C. Access to Care

In future drafts, we will use data from the MEPS to analyze how access to care changes at the 138% FPL threshold. This outcome is crucial for considering whether any increase in out-of-pocket spending are "worth it" from the beneficiary perspective.

D. Self-reported Health

If access to care and/or quality of care is higher for those with private insurance, this could manifest as a change in health. To assess this, we analyze self-reported health, the share of individuals who report they are in excellent or very good health and the share who report that they are in good, fair or poor health. We also consider reported disabilities limiting work. As shown in Figure 5, self-reported health, where 1 = excellent and 5 = poor, improves with income. However, these ratings do not change discontinuously at the 138% FPL cutoff. Smoothness through the eligibility threshold is seen for all health and disability outcomes analyzed (see Table 5).

E. *Take-up of Other Social Programs*

A concern, particularly among states that did not expand Medicaid, was that the ACA's Medicaid expansions would increase take-up of other social programs and thus indirectly create budgetary pressure in expansion states. We test the impact of the expansion relative to private exchange subsidies on take-up of other social programs. Specifically, we consider receipt of unemployment income, use of public housing and take-up of free and reduce price lunch among children. As shown in Figure 6 for free and reduced price lunch and Table 5 for all outcomes, we see no consistent impact of access to Medicaid versus subsidies for exchange plans on any of these outcomes.

V. Conclusion

Private insurance for low-income households can result in significantly higher out-of-pocket spending than public insurance. Using an RDD, we document that households eligible for private insurance subsidies have annual out-of-pocket medical spending that is $500-688 higher on average than otherwise similar households who have access to Medicaid. Importantly, these differences are significantly larger among high spenders, where access to Medicaid can decrease the 97th percentile of the OOP spending distribution by as much as $1,836-3,380. In our preliminary results, we do not find an effect of access to public versus private insurance on self-reported health or utilization of other public programs. Ongoing work will reproduce the analyses presented here in the MEPS and investigate whether our results can be replicated.

Our results provide new insights in the trade-offs of public versus private insurance for low-income households. In doing so, it informs the current debate at the state level on the best ways to increase coverage among this population. Future drafts of this work will include analyses of utilization and access to care trade-offs, and cost-benefit calculations based on recently developed valuation frameworks.

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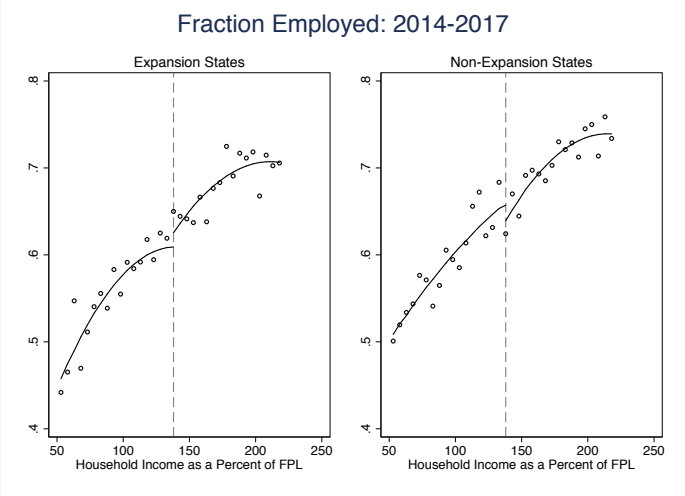
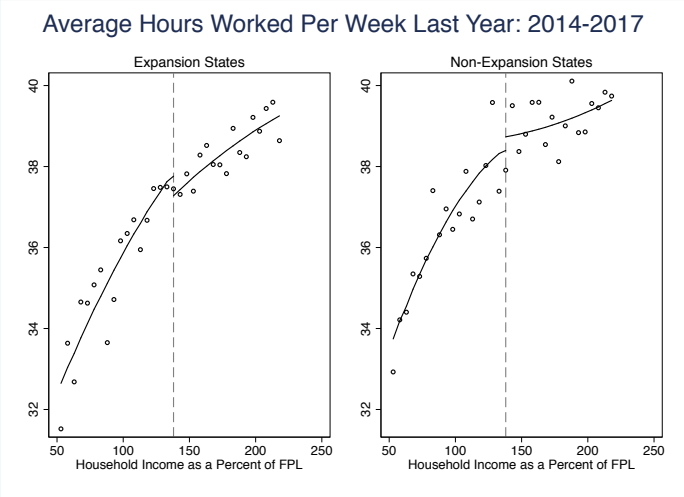
Figure 1. Balance Tests





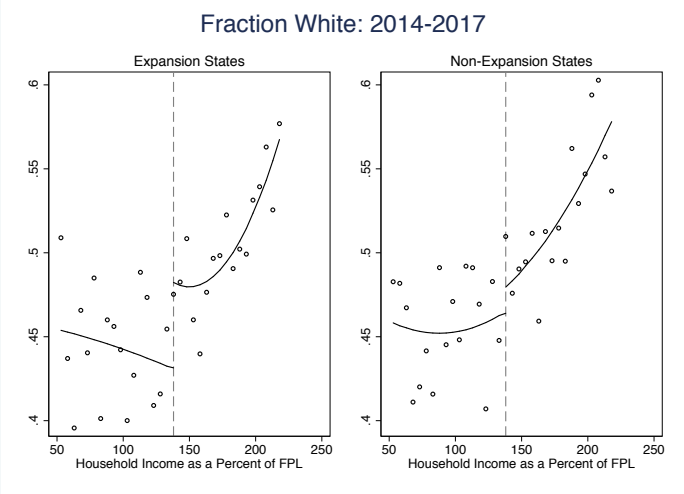


Figure 2a. Medicaid Coverage at the Medicaid Eligibility Threshold

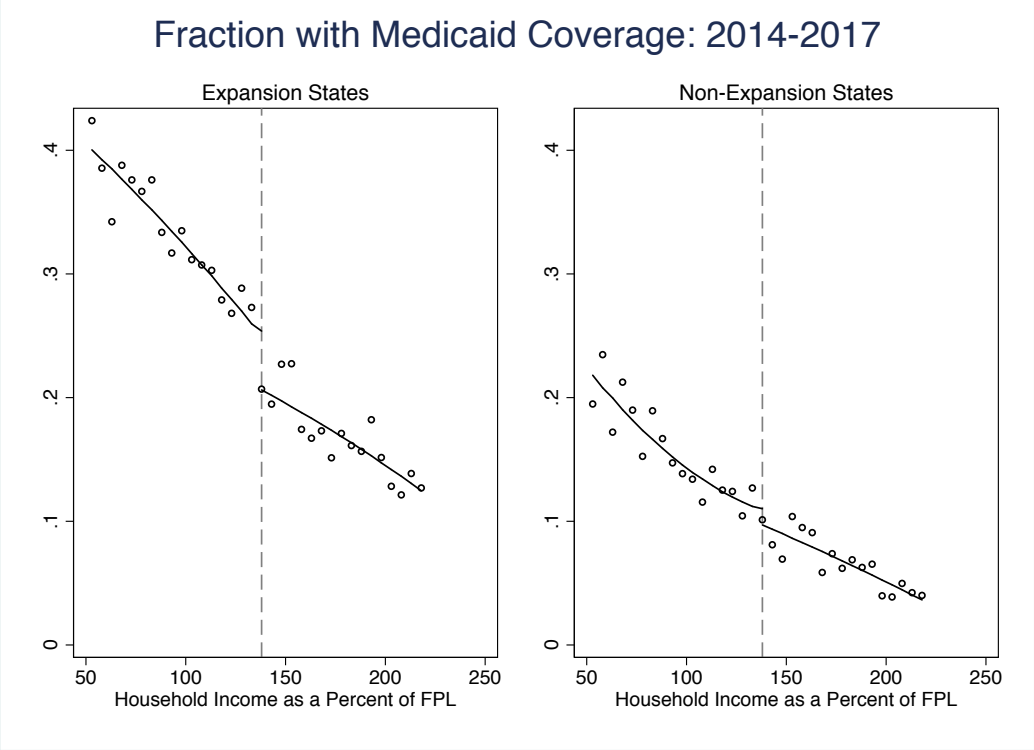


Figure 2b. Non-group Coverage at the Medicaid Eligibility Threshold

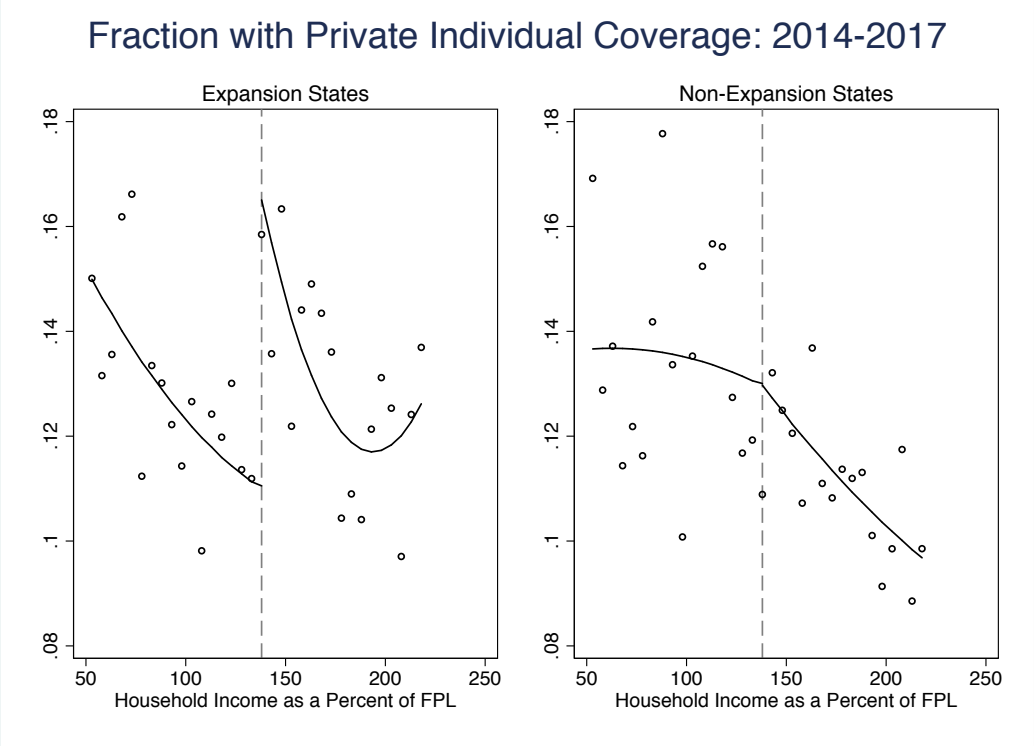


Figure 3. Rates of Uninsurance at the Medicaid Eligibility Threshold

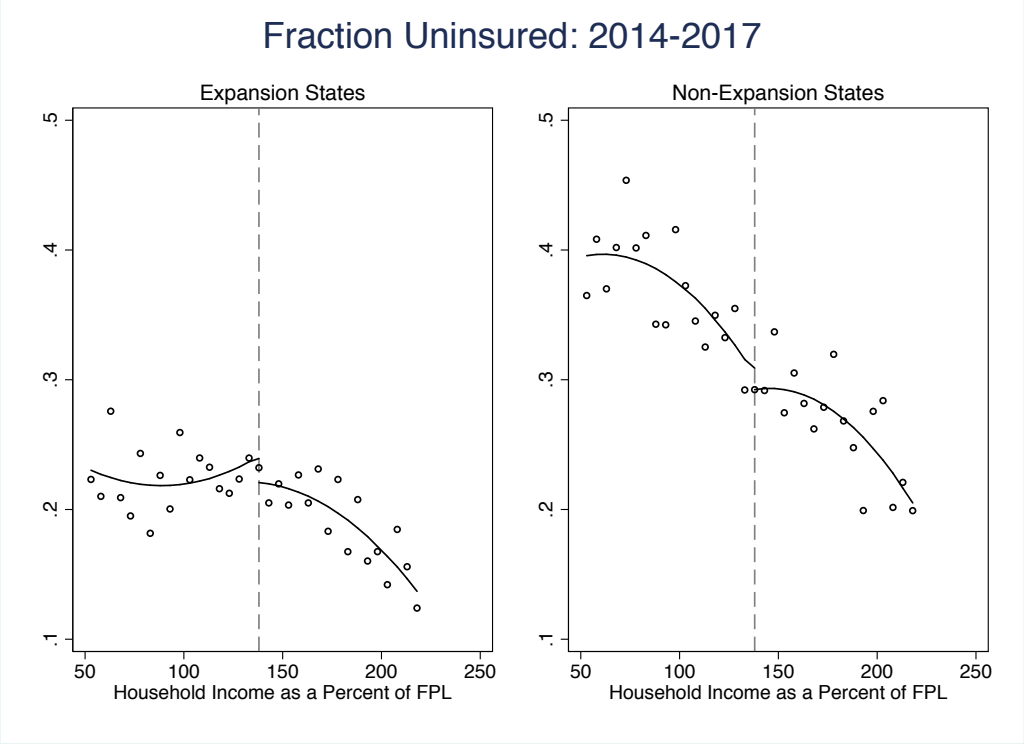


Figure 4a. Personal Family Medical Spending including Premiums at the Medicaid Eligibility Threshold

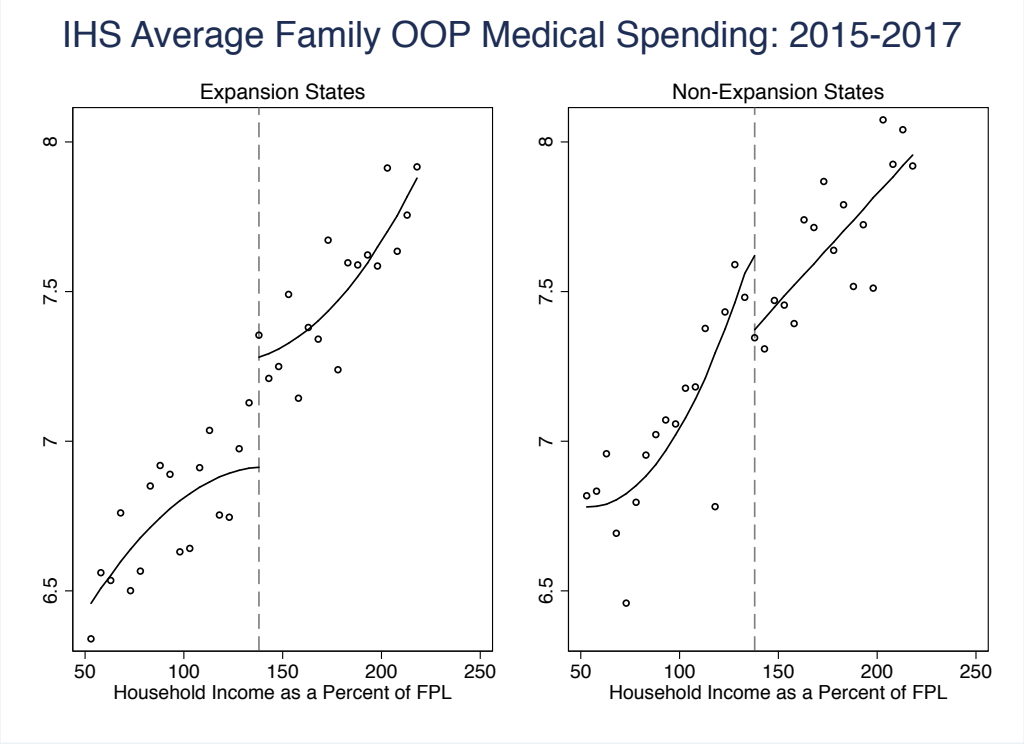


Figure 4b. Family Health Insurance Premium at the Medicaid Eligibility Threshold

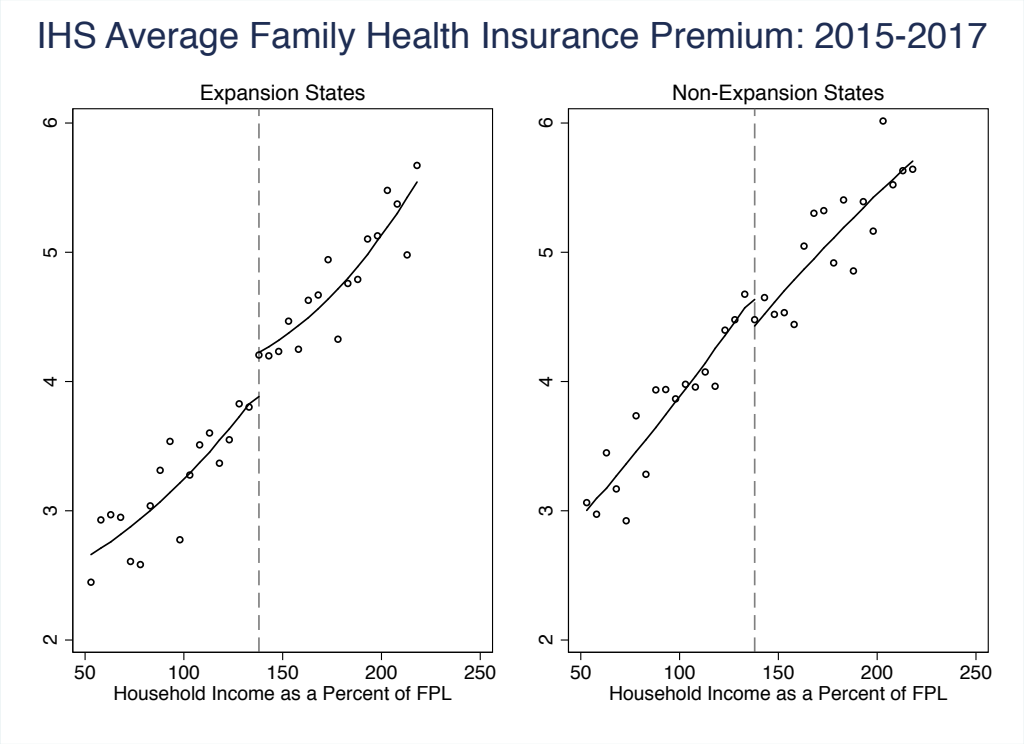


Figure 4c. Family Health Insurance Premium at the Medicaid Eligibility Threshold

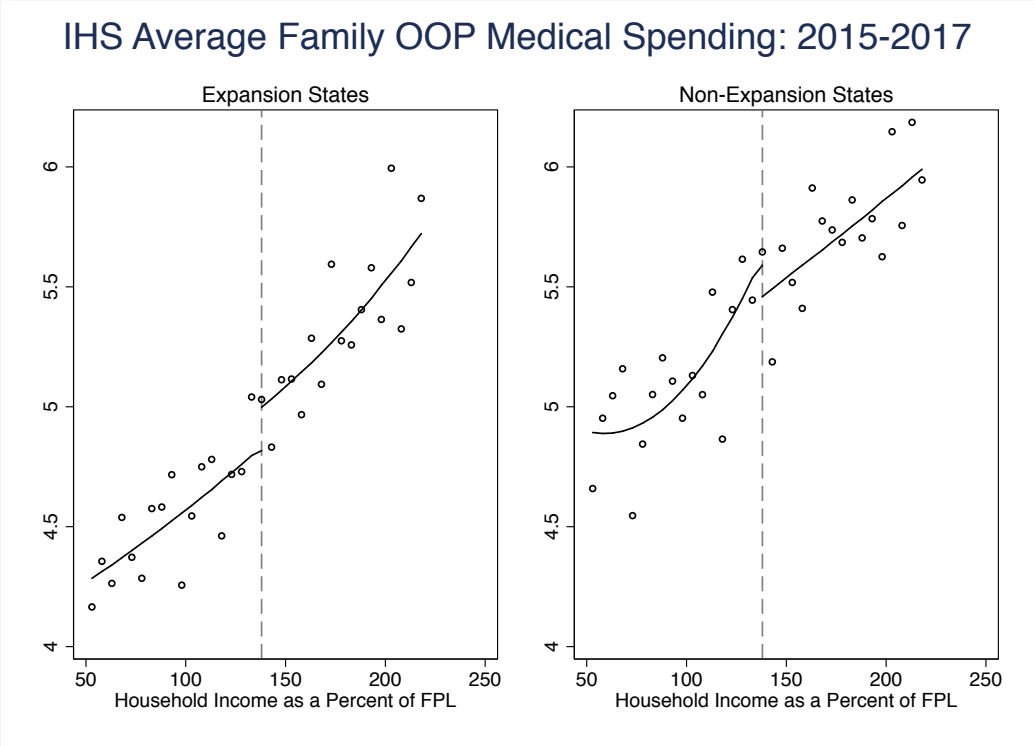


Figure 5. Self-reported Health at the Medicaid Eligibility Threshold

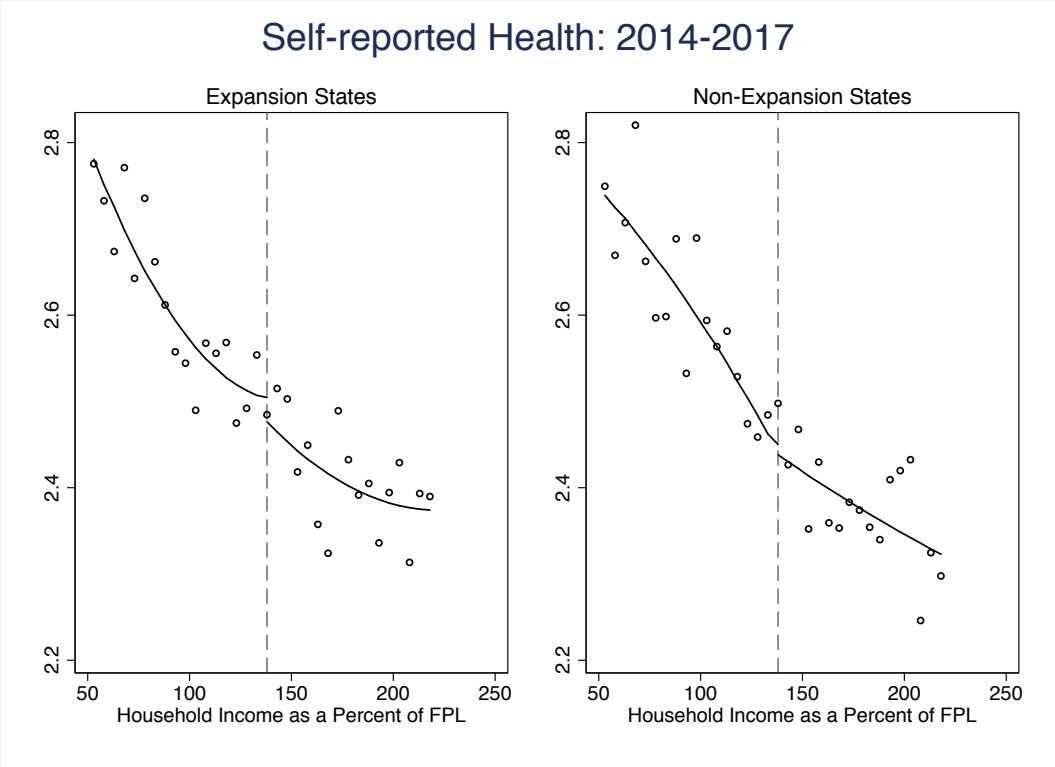


Figure 6. Share of Households with Kids Reporting Free or Reduced Price Lunch at the Medicaid Eligibility Threshold

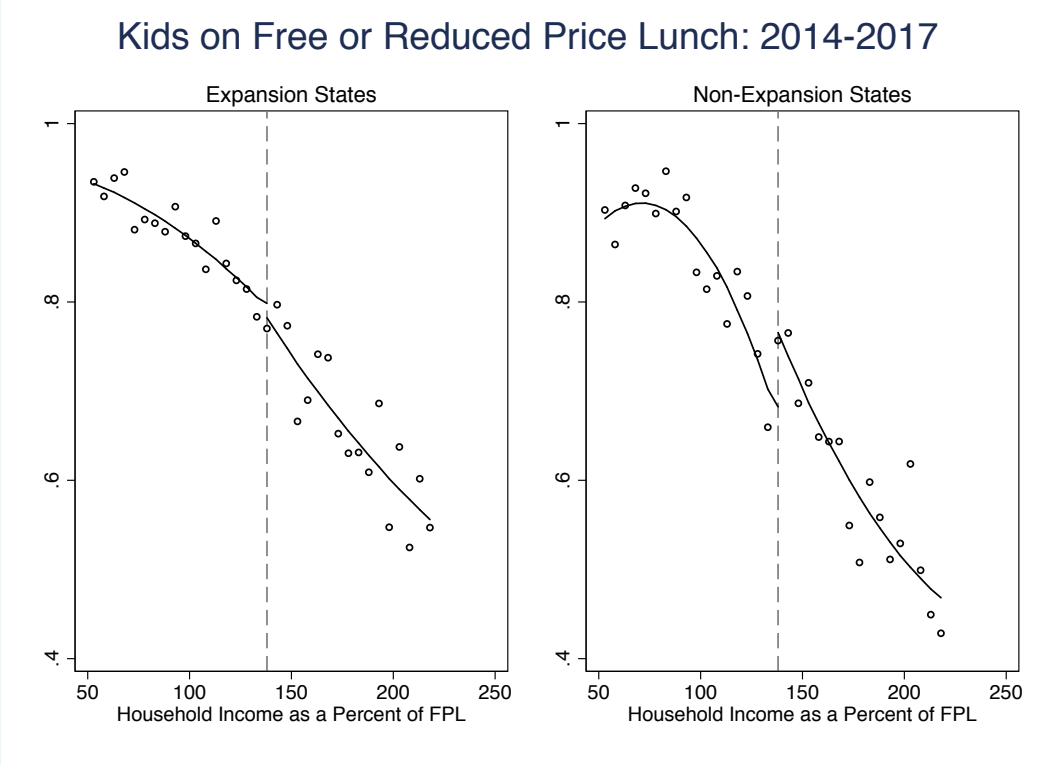


Table 1. Balance Tests: Smoothness of Observable Characteristics around the 138% FPL Cutoff

	Fraction white		Fraction black		Fraction Hispanic	
Above 138% FPL	0.0264	0.0519*	0.00364	0.0172	-0.0133	-0.0477
	(0.0197)	(0.0312)	(0.0122)	(0.0198)	(0.0192)	(0.0300)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic
Observations	32,274	32,274	32,274	32,274	32,274	32,274
Mean Below 138% FPL	0.444	0.444	0.128	0.128	0.340	0.340
R-squared	0.005	0.006	0.001	0.001	0.005	0.005
	fraction employed		Average Hours Worked/Week		fraction foreign-born	
Above 138% FPL	0.00641	0.0109	-0.651	-0.537	-0.0286	-0.0226
	(0.0148)	(0.0232)	(0.409)	(0.650)	(0.0189)	(0.0302)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic
Observations	25,058	25,058	17,756	17,756	25,058	25,058
Mean Below 138% FPL	0.561	0.561	35.620	35.620	0.348	0.348
R-squared	0.022	0.022	0.025	0.025	0.003	0.003
	age		fraction female		fraction married	
Above 138% FPL	0.781*	1.053	0.00389	-0.0133	-0.0114	-0.0278
	(0.424)	(0.666)	(0.0121)	(0.0189)	(0.0255)	(0.0390)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic
Observations	32,274	32,274	32,274	32,274	32,274	32,274
Mean Below 138% FPL	44.045	44.045	0.554	0.554	0.537	0.537
R-squared	0.001	0.001	0.001	0.001	0.002	0.002

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2014-2017 March CPS and include individuals ages 26 to 64 in states that expanded Medicaid under the ACA and used the traditional, 138% FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Hours worked per week are conditional on working and are top-coded at 99 hours. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Table 2. Relationship between Income Threshold and Insurance Type

VARIABLES	Medicaid		Private Nongroup		ESI		Uninsured	
Panel A: Expansion States								
Above 138% FPL	-0.0473***	-0.0464*	0.0418***	0.0587***	-0.000488	-0.00304	0.00820	-0.0178
	(0.0153)	(0.0241)	(0.0120)	(0.0190)	(0.0180)	(0.0289)	(0.0167)	(0.0269)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	32,274	32,274	32,274	32,274	32,274	32,274	32,274	32,274
Mean Below 138% FPL	0.328	0.328	0.127	0.127	0.265	0.265	0.224	0.224
R-squared	0.042	0.042	0.047	0.047	0.064	0.064	0.004	0.004
Panel B: Non-expansion States								
Above 138% FPL	-0.000392	-0.0117	-0.00534	-0.0167	-0.00225	0.000875	-0.0159	-0.0185
	(0.0122)	(0.0195)	(0.0142)	(0.0230)	(0.0128)	(0.0200)	(0.0194)	(0.0309)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	26,840	26,840	26,840	26,840	26,840	26,840	26,840	26,840
Mean Below 138% FPL	0.154	0.154	0.135	0.135	0.279	0.279	0.369	0.369
R-squared	0.027	0.027	0.002	0.002	0.069	0.069	0.016	0.016

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2014-2017 March CPS and include individuals ages 26 to 64. Panel A includes only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York fom 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. Panel B includes individuals in non-expansion states. All regressions include a constant and an indicator for above 138% FPL and a poynomial in income relative to the FPL that is allowed to vary on either side of 138. All insurance categories are defined to be mutually exclusive. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clusted by 5-percentage point bins of income relative to the FPL.

Table 3. Relationship between Income Threshold and Personal Medical Spending

	Family OOP, including premiums		Family Premium Payments		Family Spending on OTC Health Products		Family OOP Spending on Medical Care & Equip	
Panel A: Expansion States, levels								
Above 138% FPL	400.7*	470.9	288.3**	338.1	-5.217	-43.85	117.6	176.6
	(243.2)	(360.7)	(138.5)	(218.4)	(35.21)	(65.45)	(143.4)	(201.2)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509
Mean Below 138% FPL	$2,634.15	$2,634.15	$1,250.89	$1,250.89	$317.25	$317.25	$1,066.00	$1,066.00
R-squared	0.012	0.012	0.016	0.016	0.000	0.000	0.002	0.002
Panel B: Expansion States, IHS transformation	IHS Family OOP, including premiums		IHS Family Premium Payments		Family Spending on OTC Health Products		IHS Family OOP Spending on Medical Care & Equip	
Above 138% FPL	0.203*	0.364**	0.270*	0.332	0.0927	0.220	0.140	0.169
	(0.112)	(0.180)	(0.158)	(0.252)	(0.0951)	(0.151)	(0.142)	(0.227)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509
Mean Below 138% FPL	$2,634.15	$2,634.15	$1,250.89	$1,250.89	$317.25	$317.25	$1,066.00	$1,066.00
R-squared	0.024	0.024	0.044	0.044	0.003	0.003	0.016	0.016

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. IHS = inverse hyperbolic sine. Data are from the 2015-2017 March CPS and include individuals ages 26 to 64. Panel A and B include only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Table 3. Relationship between Income Threshold and Personal Medical Spending (continued)

VARIABLES	Family OOP, including premiums		Family Premium Payments		Family Spending on OTC Health Products		Family OOP Spending on Medical Care & Equip	
Panel C: Non-Expansion States, levels								
Above 138% FPL	-486.9*	-304.2	7.059	-31.40	-19.69	-51.72	-289.3**	-54.16
	(262.8)	(424.8)	(133.3)	(212.1)	(24.14)	(37.77)	(114.6)	(176.3)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961
Mean Below 138% FPL	$3,000.67	$3,000.67	$1,307.65	$1,307.65	$304.46	$304.46	$1,388.57	$1,388.57
R-squared	0.007	0.007	0.019	0.019	0.001	0.002	0.001	0.001
Panel D: Non-Expansion States, IHS transformation	IHS Family OOP, including premiums		IHS Family Premium Payments		Family Spending on OTC Health Products		IHS Family OOP Spending on Medical Care & Equip	
Above 138% FPL	-0.0998	-0.256	-0.173	-0.239	-0.102	-0.239	0.00366	-0.138
	(0.119)	(0.182)	(0.173)	(0.272)	(0.109)	(0.170)	(0.151)	(0.233)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961
Mean Below 138% FPL	$3,000.67	$3,000.67	$1,307.65	$1,307.65	$304.46	$304.46	$1,388.57	$1,388.57
R-squared	0.020	0.021	0.036	0.036	0.004	0.005	0.011	0.011

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. IHS = inverse hyperbolic sine. Data are from the 2015-2017 March CPS and include individuals ages 26 to 64. Panels C and D include individuals in non-expansion states. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Table 4. Relationship between Income Threshold and the Distribution of Personal Medical Spending

	Family OOP, including premiums						Family Premium Payments					
	Median		75th Percentile		97th Percentile		Median		75th Percentile		97th Percentile	
Panel A: Expansion States												
Above 138% FPL	144.2	321.3	668.1***	568.3	1,702	2,057	-26.09	96.96	368.6*	498	743.7	365.0
	(124.7)	(207.4)	(274.0)	(429.7)	(1465.2)	(2421.6)	(53.9)	(118.0)	(194.7)	(366.8)	(1101.8)	(1587.9)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509
Value Below 138% FPL	$1,200	$1,200	$3,960	$3,960	$11,532	$11,532	$0	$0	$2,000	$2,000	$6,680	$6,680
Panel B: Non-expansion States												
Above 138% FPL	-217.6	-279.3	-544.4	-1,117**	-1,059	-803.2	74.08	37.17	-148.4	-352.3	1,235	1,587
	(145.5)	(235.2)	(387.7)	(549.6)	(1812.0)	(2627.3)	(100.6)	(164.6)	(201.4)	(309.5)	(941.7)	(1299.9)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961
Value Below 138% FPL	$1,600	$1,600	$4,310	$4,310	$11,120	$11,120	$343	$346	$2,000	$2,000	$6,244	$6,244

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the March CPS and include individuals ages 26 to 64 in states that expanded Medicaid under the ACA and used the traditional, 138% FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors for quantile regressions are based on a block bootstrap with 500 draws, where the block is income as a percent of poverty line.

Table 5. Relationship between Income Threshold and Self-reported health

	Self-reported health		Very good/excellent health		Good/fair/poor health		Disability limits work	
Panel A: Expansion States								
Above 138% FPL	-0.00337	-0.0225	0.00200	0.0135	-0.00200	-0.0135	0.0131	0.0330*
	(0.0418)	(0.0654)	(0.0183)	(0.0294)	(0.0183)	(0.0294)	(0.0115)	(0.0181)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	32,274	32,274	32,274	32,274	32,274	32,274	32,274	32,274
Mean Below 138% FPL	2.601	2.601	0.468	0.468	0.532	0.532	0.159	0.159
R-squared	0.011	0.011	0.008	0.008	0.008	0.008	0.012	0.012
Panel B: Non-expansion States								
Above 138% FPL	-0.0254	-0.00990	0.0163	0.0159	-0.0163	-0.0159	0.0167	0.00796
	(0.0442)	(0.0700)	(0.0204)	(0.0324)	(0.0204)	(0.0324)	(0.0117)	(0.0192)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	26,840	26,840	26,840	26,840	26,840	26,840	26,840	26,840
Mean Below 138% FPL	2.604	2.604	0.469	0.469	0.531	0.531	0.152	0.152
R-squared	0.014	0.014	0.010	0.010	0.010	0.010	0.012	0.013

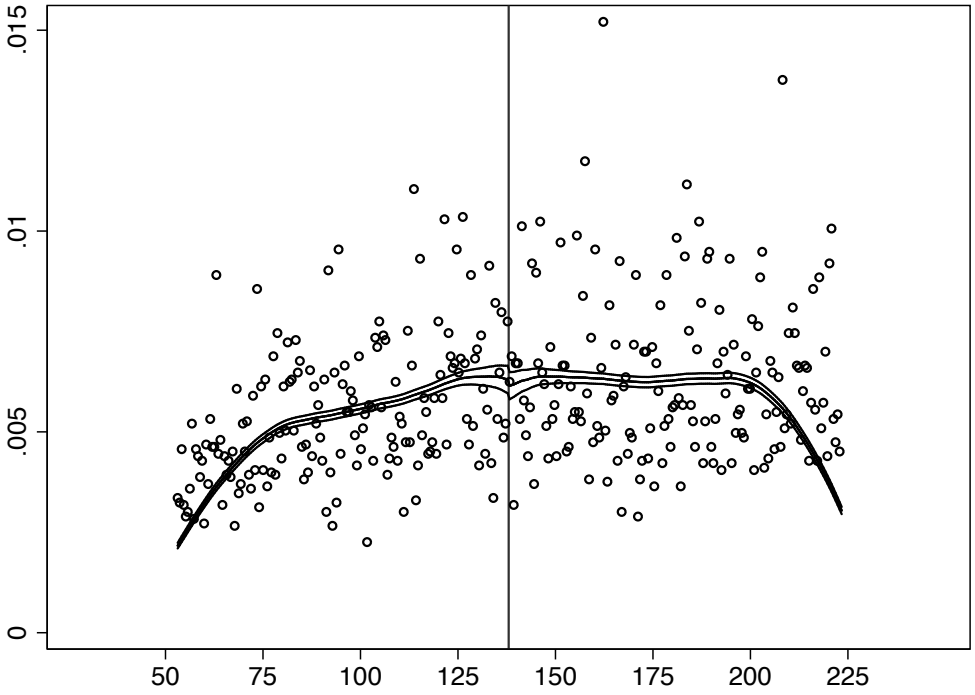
Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2014-2017 March CPS and include individuals ages 26 to 64. Panel A includes only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. Panel B includes individuals in non-expansion states. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Table 6. Relationship between Income Threshold and Other Public Programs

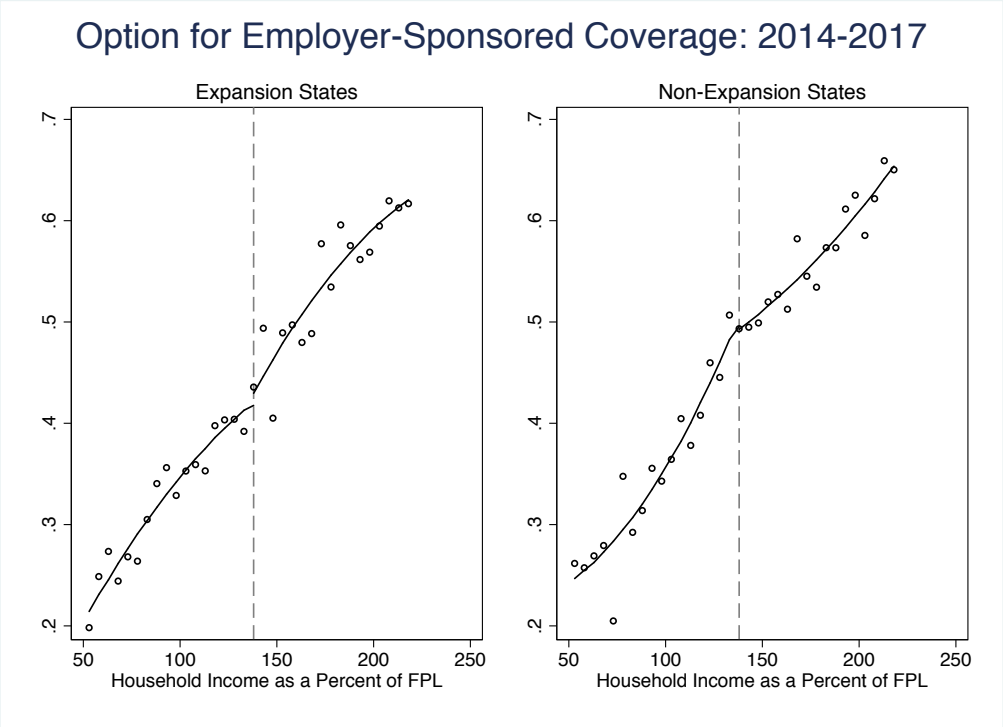
VARIABLES	Unemployment Income		Public Housing		Free Lunch	
Panel A: Expansion States						
Above 138% FPL	0.00188	-0.00395	0.0158	0.0195	-0.0301	-0.00862
	(0.00679)	(0.0104)	(0.0173)	(0.0296)	(0.0241)	(0.0369)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic
Observations	25,058	25,058	11,744	11,744	14,167	14,167
Mean Below 138% FPL	0.043	0.043	0.097	0.097	0.872	0.872
R-squared	0.000	0.000	0.006	0.007	0.080	0.081
Panel B: Non-expansion States						
Above 138% FPL	-0.0102	-0.0128	-0.0283**	-0.0353*	-0.00250	0.0940**
	(0.00714)	(0.0127)	(0.0125)	(0.0199)	(0.0292)	(0.0470)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic
Observations	26,840	26,840	11,462	11,462	12,009	12,009
Mean Below 138% FPL	0.035	0.035	0.079	0.079	0.850	0.850
R-squared	0.001	0.001	0.011	0.011	0.111	0.113

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the March CPS and include individuals ages 26 to 64.Panel A includes only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. Panel B includes individuals in non-expansion states. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

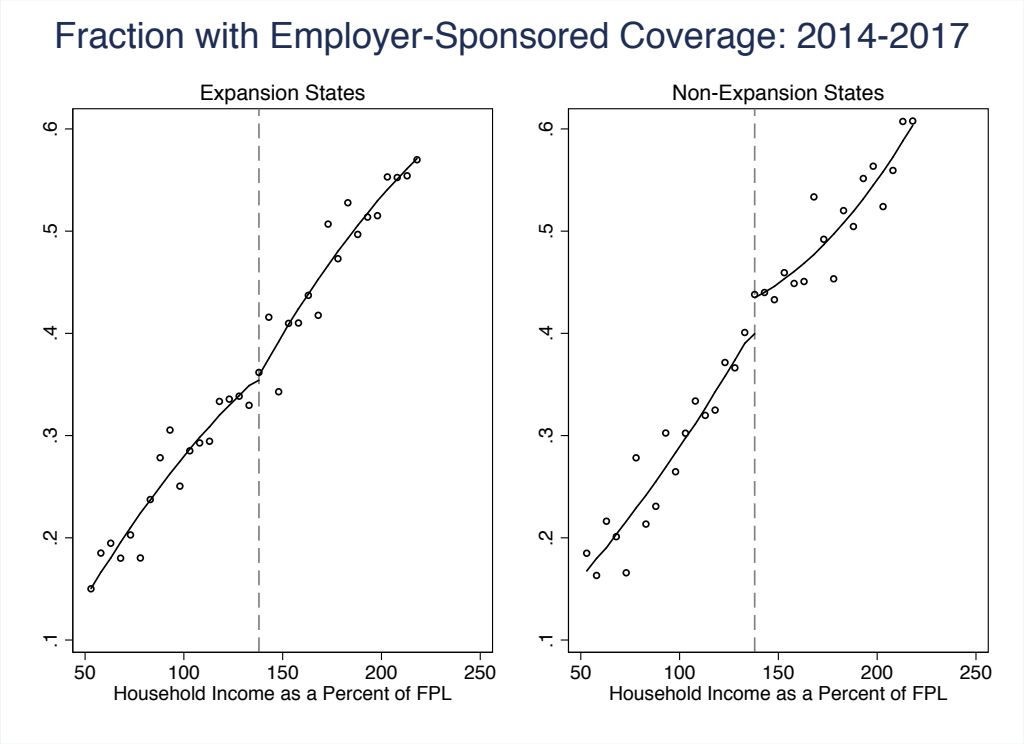
Appendix Figure 1. McCrary Density Test



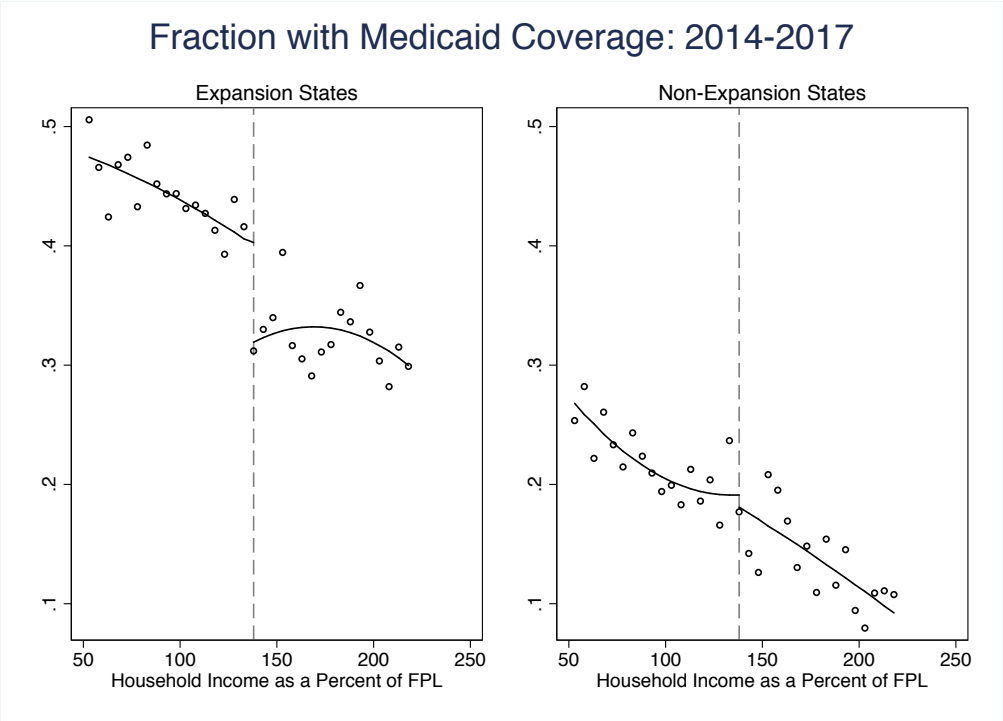
Appendix Figure 2. Option to Enroll in ESI Coverage at the Medicaid Eligibility Threshold



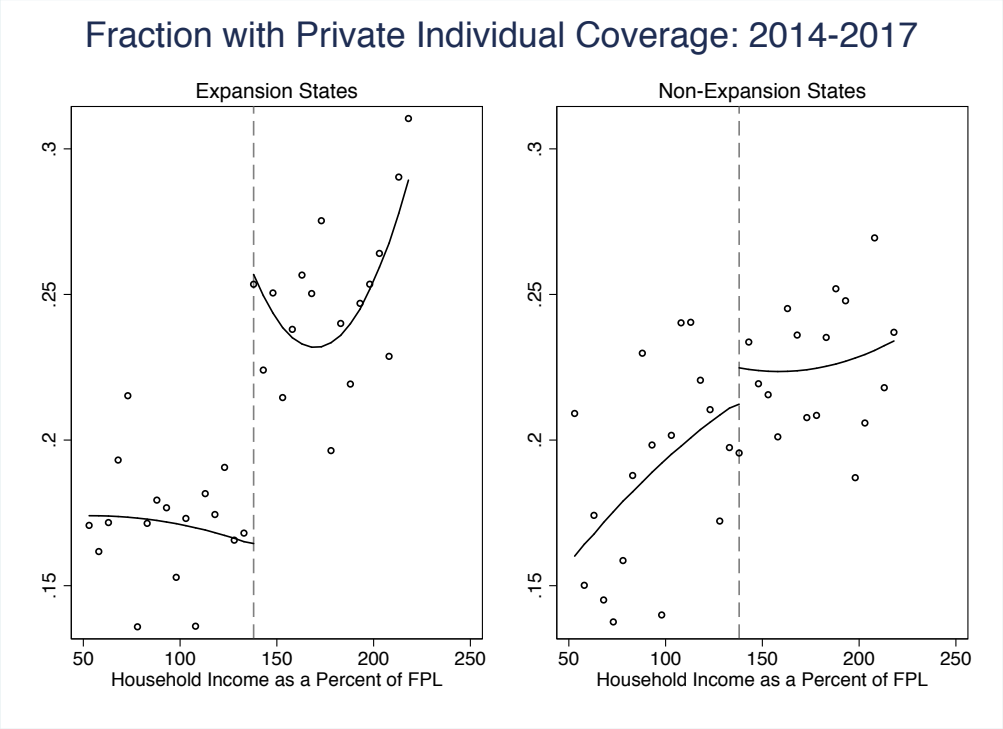
Appendix Figure 3. Employer-Sponsored Coverage Rates at the Medicaid Eligibility Threshold



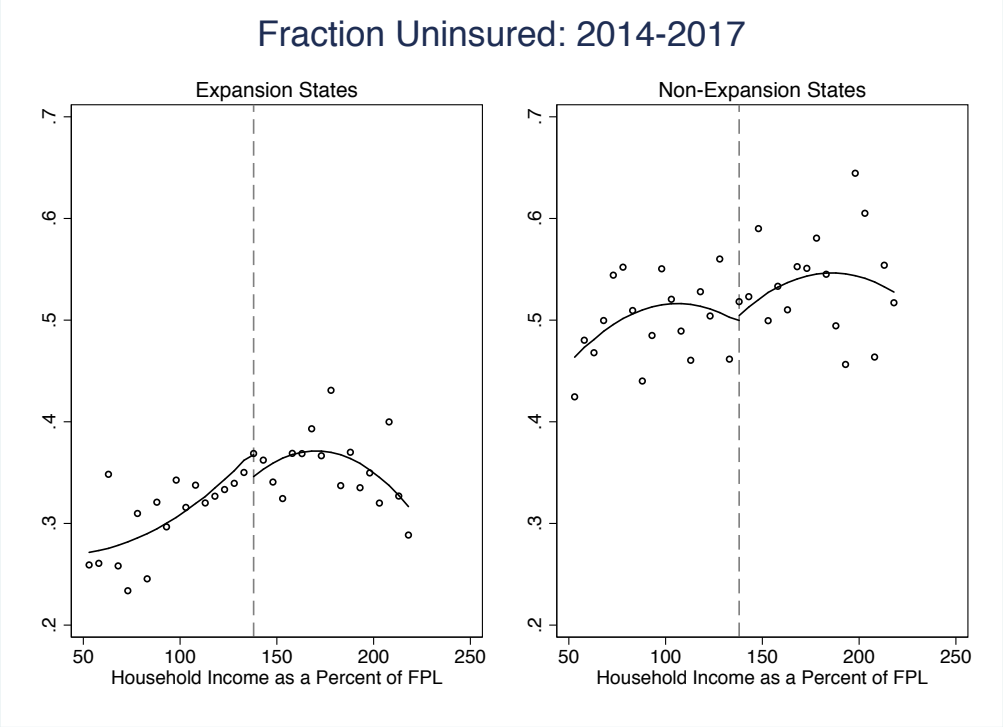
Appendix Figure 4a. Medicaid Coverage among Individuals without ESI Options



Appendix Figure 4b. Non-group Coverage among Individuals without ESI Options



Appendix Figure 5. Rates of Uninsurance among Individuals without ESI Options



Appendix Table 1. Relationship between Income Threshold and Insurance Type: 2010-2013

	Medicaid		Private Nongroup		ESI		Uninsured	
Panel A: Expansion States								
Above 138% FPL	0.00277	0.00191	0.000803	0.00207	0.00156	-0.00389	-0.0109	-0.00262
	(0.00924)	(0.0145)	(0.00680)	(0.0107)	(0.0133)	(0.0212)	(0.0139)	(0.0221)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	46,322	46,322	46,322	46,322	46,322	46,322	46,322	46,322
Mean Below 138% FPL	0.195	0.195	0.069	0.069	0.271	0.271	0.419	0.419
R-squared	0.030	0.030	0.000	0.000	0.070	0.070	0.014	0.014
Panel B: Non-expansion States								
Above 138% FPL	0.00121	-0.0193	-0.000187	0.00645	0.0114	-0.0271	-0.0290*	0.0140
	(0.00801)	(0.0127)	(0.00727)	(0.0109)	(0.0152)	(0.0238)	(0.0161)	(0.0252)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	33,355	33,355	33,355	33,355	33,355	33,355	33,355	33,355
Mean Below 138% FPL	0.118	0.118	0.063	0.063	0.275	0.275	0.491	0.491
R-squared	0.024	0.025	0.000	0.000	0.068	0.068	0.024	0.025

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2015-2017 March CPS and include individuals ages 26 to 64 in states that expanded Medicaid under the ACA and used the traditional, 138% FPL cutoff for eligibility. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. All insurance categories are defined to be mutually exclusive. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 2. Relationship between Income Threshold and Insurance Type among Those without Access to ESI

VARIABLES	Medicaid		Private Nongroup		Uninsured	
Panel A: Expansion States						
Above 138% FPL	-0.0735***	-0.0862**	0.0647***	0.0963***	0.0176	-0.0245
	(0.0232)	(0.0366)	(0.0196)	(0.0313)	(0.0244)	(0.0391)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic
Observations	17,505	17,505	17,505	17,505	17,505	17,505
Mean Below 138% FPL	0.443	0.443	0.172	0.172	0.306	0.306
R-squared	0.016	0.016	0.009	0.009	0.005	0.005
Panel B: Non-expansion States						
Above 138% FPL	0.00944	-0.00766	0.00650	0.0130	-0.00262	-3.03e-05
	(0.0205)	(0.0326)	(0.0219)	(0.0344)	(0.0277)	(0.0445)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic
Observations	13,837	13,837	13,837	13,837	13,837	13,837
Mean Below 138% FPL	0.219	0.219	0.187	0.187	0.501	0.501
R-squared	0.014	0.014	0.003	0.003	0.001	0.002

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2014-2017 March CPS and include respondents aged 26 to 64 who are either not enrolled in or are not otherwise eligible to enroll in an employer-sponsored health plan. Panel A includes only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. Panel B includes individuals in non-expansion states. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. All insurance categories are defined to be mutually exclusive. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 3. Using Alternative Bandwiths to Estimate the Relationship between Income Threshold and Insurance Type

	Medicaid		Private Nongroup		ESI		Uninsured	
Panel A: Bandwidth of 68 to 208% FPL								
Above 138% FPL	-0.0448***	-0.0493*	0.0489***	0.0515**	-0.00714	0.00867	0.00145	-0.0193
	(0.0170)	(0.0273)	(0.0133)	(0.0216)	(0.0200)	(0.0328)	(0.0184)	(0.0308)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	26,947	26,947	26,947	26,947	26,947	26,947	26,947	26,947
Mean Below 138% FPL	0.320	0.320	0.125	0.125	0.278	0.278	0.222	0.222
Panel B: Bandwidth of 78 to 198% FPL								
Above 138% FPL	-0.0479***	-0.0458	0.0478***	0.0548**	-0.00824	0.0213	-0.000670	-0.0240
	(0.0184)	(0.0299)	(0.0143)	(0.0238)	(0.0218)	(0.0364)	(0.0202)	(0.0348)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	23,282	23,282	23,282	23,282	23,282	23,282	23,282	23,282
Mean Below 138% FPL	0.311	0.311	0.120	0.120	0.291	0.291	0.224	0.224

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2014-2017 March CPS and include individuals ages 26 to 64 in states that expanded Medicaid under the ACA and used the traditional, 138% FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff.All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. All insurance categories are defined to be mutually exclusive. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 4. Relationship between Income Threshold and Insurance Type: 2015-2017

	Medicaid		Private Nongroup		ESI		Uninsured	
Panel A: Expansion States								
Above 138% FPL	-0.0489***	-0.0419*	0.0349***	0.0399**	0.00256	-0.0155	0.00823	0.00158
	(0.0146)	(0.0235)	(0.0120)	(0.0191)	(0.0163)	(0.0263)	(0.0135)	(0.0215)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	29,509	29,509	29,509	29,509	29,509	29,509	29,509	29,509
Mean Below 138% FPL	0.346	0.346	0.144	0.144	0.262	0.262	0.198	0.198
R-squared	0.044	0.044	0.001	0.001	0.063	0.063	0.003	0.003
Panel B: Non-expansion States								
Above 138% FPL	0.00293	-0.00687	-0.00115	0.00445	0.000685	-0.0242	-0.00551	0.0258
	(0.0111)	(0.0179)	(0.0135)	(0.0213)	(0.0179)	(0.0281)	(0.0172)	(0.0273)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	23,961	23,961	23,961	23,961	23,961	23,961	26,840	26,840
Mean Below 138% FPL	0.157	0.157	0.154	0.154	0.293	0.293	0.331	0.331
R-squared	0.027	0.027	0.001	0.001	0.058	0.058	0.011	0.011

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2015-2017 March CPS and include individuals ages 26 to 64 in states that expanded Medicaid under the ACA and used the traditional, 138% FPL cutoff for eligibility. All regressions include a constant and an indicator for above 138% FPL and a poynomial in income relative to the FPL that is allowed to vary on either side of 138. All insurance categories are defined to be mutually exclusive. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 5. Relationship between Income Threshold and Personal Medical Spending, 2010-2013

	Family OOP, including premiums		Family Premium Payments		Family Spending on OTC Health Products		Family OOP Spending on Medical Care & Equip	
Panel A: Expansion States, levels								
Above 138% FPL	87.17	98.84	75.02	49.37	11.96	21.22	0.193	28.24
	(194.0)	(295.3)	(94.19)	(142.8)	(23.00)	(36.58)	(142.9)	(216.5)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	34,716	34,716	34,716	34,716	34,716	34,716	34,716	34,716
Mean Below 138% FPL	$2,370.86	$2,370.86	$914.66	$914.66	$309.98	$309.98	$1,146.23	$1,146.23
R-squared	0.007	0.007	0.014	0.014	0.001	0.001	0.001	0.001
Panel B: Expansion, IHS	IHS Family OOP, including premiums		IHS Family Premium Payments		Family Spending on OTC Health Products		IHS Family OOP Spending on Medical Care & Equip	
Above 138% FPL	-0.0192	0.0860	0.202	0.207	-0.0189	0.00481	0.00704	0.0801
	(0.107)	(0.172)	(0.143)	(0.225)	(0.0909)	(0.141)	(0.136)	(0.217)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	34,716	34,716	34,716	34,716	34,716	34,716	34,716	34,716
Mean Below 138% FPL	$2,370.86	$2,370.86	$914.66	$914.66	$309.98	$309.98	$1,146.23	$1,146.23
R-squared	0.019	0.019	0.036	0.036	0.003	0.003	0.014	0.014

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2010-2013 March CPS and include individuals ages 26 to 64. Panel A and B include only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 6. Relationship between Income Threshold and Personal Medical Spending among Those without Access to ESI

VARIABLES	Family OOP, including premiums		Family Premium Payments		Family Spending on OTC Health Products		Family OOP Spending on Medical Care & Equip	
Panel A: Expansion States, levels								
Above 138% FPL	526.0*	711.6	364.7**	443.1*	-11.27	-59.93	172.5	328.4
	(302.3)	(452.9)	(161.5)	(260.3)	(50.66)	(96.11)	(183.2)	(256.1)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	16,010	16,010	16,010	16,010	16,010	16,010	16,010	16,010
Mean Below 138% FPL	$2,001.63	$2,001.63	$806.36	$806.36	$297.03	$297.03	$898.24	$898.24
R-squared	0.006	0.006	0.008	0.008	0.000	0.001	0.001	0.001
Panel B: Expansion, IHS	IHS Family OOP, including premiums		IHS Family Premium Payments		Family Spending on OTC Health Products		IHS Family OOP Spending on Medical Care & Equip	
Above 138% FPL	0.319**	0.484**	0.333*	0.404	0.153	0.290	0.337*	0.380
	(0.151)	(0.244)	(0.186)	(0.297)	(0.124)	(0.199)	(0.183)	(0.296)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	16,010	16,010	16,010	16,010	16,010	16,010	16,010	16,010
Mean Below 138% FPL	$2,001.63	$2,001.63	$806.36	$806.36	$297.03	$297.03	$898.24	$898.24
R-squared	0.007	0.007	0.016	0.016	0.001	0.001	0.005	0.005

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2015-2017 March CPS and include individuals ages 26 to 64. Panel A and B include only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 6. Relationship between Income Threshold and Personal Medical Spending (continued)

VARIABLES	Family OOP, including premiums		Family Premium Payments		Family Spending on OTC Health Products		Family OOP Spending on Medical Care & Equip	
Panel C: Non-Expansion States								
Above 138% FPL	-568.2*	-1,187**	-186.8	-486.3*	-12.81	-80.56*	-368.6*	-619.8*
	(295.3)	(487.6)	(157.0)	(249.0)	(30.51)	(43.89)	(214.7)	(370.5)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	23,961	23,961	23,961	23,961	23,961	23,961	23,961	23,961
Mean Below 138% FPL	$2,259.70	$2,259.70	$832.28	$832.28	$287.57	$287.57	$1,139.85	$1,139.85
R-squared	0.002	0.003	0.004	0.005	0.000	0.001	0.000	0.001
Panel D: IHS Tranformation	HIS Family OOP, including premiums		IHS Family Premium Payments		Family Spending on OTC Health Products		IHS Family OOP Spending on Medical Care & Equip	
Above 138% FPL	-0.0534	-0.387	-0.197	-0.523	-0.0858	-0.297	0.0254	-0.410
	(0.164)	(0.257)	(0.218)	(0.349)	(0.145)	(0.229)	(0.200)	(0.315)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	13,837	13,837	13,837	13,837	13,837	13,837	13,837	13,837
Mean Below 138% FPL	$2,259.70	$2,259.70	$832.28	$832.28	$287.57	$287.57	$1,139.85	$1,139.85
R-squared	0.003	0.002	0.006	0.007	0.001	0.001	0.003	0.003

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2015-2017 March CPS and include individuals ages 26 to 64. Panels C and D include individuals in non-expansion states. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 7. Using Alternative Bandwiths to Estimate the Relationship between Income Threshold and Personal Medical Spending, 2015-2017

VARIABLES	Family OOP, including premiums		Family Premium Payments		Family Spending on OTC Health Products		Family OOP Spending on Medical Care & Equip	
Panel A: Bandwidth of 68 to 208% FPL (Levels)								
Above 138% FPL	464.6*	333.1	326.8**	261.2	-16.06	-54.18	153.9	126.1
	(273.2)	(384.1)	(152.8)	(238.5)	(40.67)	(75.83)	(161.9)	(210.5)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	24,639	24,639	24,639	24,639	24,639	24,639	24,639	24,639
Mean Below 138% FPL	$2,653.33	$2,653.33	$1,246.93	$1,246.93	$305.80	$305.80	$1,100.61	$1,100.61
R-squared	0.009	0.009	0.012	0.012	0.000	0.001	0.001	0.001
Panel B: Bandwidth of 68 to 208% FPL (IHS)								
	IHS Family OOP, including premiums		IHS Family Premium Payments		Family Spending on OTC Health Products		IHS Family OOP Spending on Medical Care & Equip	
Above 138% FPL	0.238*	0.372*	0.226	0.451	0.115	0.253	0.119	0.208
	(0.127)	(0.203)	(0.176)	(0.285)	(0.107)	(0.171)	(0.160)	(0.255)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	24,639	24,639	24,639	24,639	24,639	24,639	24,639	24,639
Mean Below 138% FPL	$2,653.33	$2,653.33	$1,246.93	$1,246.93	$305.80	$305.80	$1,100.61	$1,100.61
R-squared	0.017	0.017	0.034	0.034	0.002	0.002	0.012	0.012

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2010-2013 March CPS and include individuals ages 26 to 64. Panel A and B include only those in states that expanded Medicaid under the ACA and used the traditional, 138% (or 139%) FPL cutoff for eligibility. We exclude Minnesota in all years and New York from 2016 on because these states ran a "Basic Health Plan" for those just above the 138% FPL cutoff. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.

Appendix Table 7. Using Alternative Bandwiths to Estimate the Relationship between Income Threshold and Personal Medical Spending, 2015-2017 (cont)

VARIABLES	Family OOP, including premiums		Family Premium Payments		Family Spending on OTC Health Products		Family OOP Spending on Medical Care & Equip	
Panel C: Bandwidth of 78 to 198% FPL (levels)								
Above 138% FPL	440.8	385.4	345.4**	189.5	-26.91	-42.91	122.3	238.8
	(294.5)	(402.7)	(165.8)	(259.7)	(45.76)	(84.80)	(173.9)	(212.9)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	21,285	21,285	21,285	21,285	21,285	21,285	21,285	21,285
Mean Below 138% FPL	$2,681.12	$2,681.12	$1,271.36	$1,271.36	$305.51	$305.51	$1,104.26	$1,104.26
R-squared	0.007	0.007	0.010	0.010	0.000	0.001	0.001	0.001
Panel D: Bandwidth of 78 to 198% FPL (IHS)								
	HIS Family OOP, including premiums		IHS Family Premium Payments		Family Spending on OTC Health Products		IHS Family OOP Spending on Medical Care & Equip	
Above 138% FPL	0.273**	0.386*	0.283	0.467	0.116	0.370*	0.126	0.242
	(0.138)	(0.227)	(0.190)	(0.314)	(0.115)	(0.189)	(0.174)	(0.282)
Polynomial	linear	quadratic	linear	quadratic	linear	quadratic	linear	quadratic
Observations	21,285	21,285	21,285	21,285	21,285	21,285	21,285	21,285
Mean Below 138% FPL	$2,681.12	$2,681.12	$1,271.36	$1,271.36	$305.51	$305.51	$1,104.26	$1,104.26
R-squared	0.013	0.013	0.025	0.025	0.002	0.003	0.009	0.009

Notes: *significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Data are from the 2015-2017 March CPS and include individuals ages 26 to 64. Panels C and D include individuals in non-expansion states. All regressions include a constant and an indicator for above 138% FPL and a polynomial in income relative to the FPL that is allowed to vary on either side of 138. For each outcome, the first column uses a linear trend and the second a quadratic. Standard errors are clustered by 5-percentage point bins of income relative to the FPL.