MEDICAID PHYSICIAN FEES AND ACCESS TO CARE AMONG CHILDREN WITH SPECIAL HEALTH CARE NEEDS

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ABSTRACT

The objective of this study is to use data from the National Survey of Children with Special Health Care Needs (NS-CSHCN) to test whether Medicaid physician fees are correlated with access to health services and adequacy of insurance coverage among CSHCN. We use a difference-in-differences method, comparing the effects of Medicaid physician fees on outcomes of publicly-insured children in states that raised fees vs. in states that did not. We also consider a triple difference specification using privately-insured children as the comparison group. Our findings indicate that raising the Medicaid primary care fee level close to at least 90 percent of the Medicare level reduces the likelihood that publicly-insured CSHCN lack a usual source of care in a doctor's office by about 15 percent. Fee increases are also associated with improved access to specialty doctor care, and large improvements in caregivers' satisfaction with the adequacy of health insurance coverage, among publicly-insured CSHCN. Results for some other access measures, such as global measures of having difficulties and delays accessing services, were mixed.

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1.0 Introduction and Background

In the United States, parents of children with chronic illness and disability often face challenges in obtaining the health care services their children need. These challenges are generally not due to lack of insurance coverage. Based on 2009-2010 national data, 96 percent of children with special health care needs (CSHCN)[1] had some type of insurance coverage at the time of the survey, with about 44 percent reporting Medicaid, the Children's Health Insurance Program (CHIP), or some other form of public insurance (USDHHS, 2013).[2] Although private insurance plans typically exclude coverage for some types of services that CSHCN need, particularly behavioral treatments, Medicaid and CHIP cover a broad range of services with little or no cost-sharing (Peele et al., 2002; Davidoff et al., 2004).   In addition, Medicaid includes an Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) benefit, and CHIP programs are required to cover preventive services and meet national standards for care (Farrell, Hess and Justice, 2011). Nevertheless, despite comprehensive insurance coverage, parents of publicly-insured CSHCN still report facing serious difficulties in accessing services. As of 2009-2010, about 31 percent of parents of CSHCN with public insurance reported that they sometimes, usually or always are frustrated in obtaining services for their children, due to reasons such as waiting lists, backlogs, problems getting appointments, issues related to cost and eligibility, and lack of local services (USDHHS, 2013).

One important reason that publicly-insured CSHCN may face access problems is due to issues on the supply side of the market. In particular, low Medicaid physician fees in many states may reduce physician participation in Medicaid, and may lead to barriers in access to care,

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[1] CSHCN are defined as children who have or are at elevated risk for chronic physical, developmental, behavioral, or emotional conditions and who require a type OR amount of health and related services that is higher what children typically require (McPherson et al., 1998)

[2] This 44 percent figure includes children whose caregivers report have both public insurance and private insurance.

particularly specialty care, for families of CSHCN. Medicaid physician fees vary widely across states. As of July 2016, for example, Medicaid payments for all services were 72 percent of Medicare payments for the same service on average in the US, although this Medicaid-to-Medicare fee ratio ranged from 38 percent in Rhode Island to 126 percent in Alaska (Zuckerman et al. , 2017). These rates tend to be lower for primary care services.

As part of the Affordable Care Act (ACA), states were required to increase fees paid to primary care providers to Medicare rates during 2013 and 2014. Based on the 2012 Medicaid-to-Medicare primary fee ratio for a basket of primary care services, Zuckerman and Goin (2012) predicted that this would increase Medicaid primary care fees by an average of 73 percent in 2013-2014. Since the fee increase did not apply to all primary care services and possibly due to some implementation issues (e.g., passing through fee increases to physicians participating in Medicaid through managed care programs), some evidence suggests that the increase in Medicaid primary care physicians fees in 2013, although significant, may have been smaller than expected (Kirby and Hill, 2016; MACPAC, 2015). Early evidence from 10 states suggests that the increase improved appointment availability for adults on Medicaid relative to adults on private insurance (Polsky et al., 2015). A recent study based on data from 2009 to 2014 suggests that Medicaid fee changes during this time period improved access to care, utilization, health, and school absences among children (Alexander & Schnell, 2019). Other evidence using claims data (Mulcahy, Gracner and Finegold, 2018) and nationally-representative survey data (Decker, 2018) on physician participation in Medicaid suggests no effect of the fee bump, possibly due to the temporary nature of the bump. The effect of Medicaid physician fees on access to medical care among those on Medicaid is an important topic since, as of July 2016, nineteen states have fully or partially maintained the primary care fee increase, with fourteen of these states having a Medicaid-to-Medicare ratio above 0.80 (Zuckerman et al., 2017).

Several prior studies based on variation in Medicaid physician fees across states and over time suggest that, at least when increases may be expected to be permanent, higher Medicaid payments to health care providers improve access to care. Decker (2009), for example, uses data from the 1993-1994 National Health Interview Survey (NHIS), and the 1993/1994, 1998/1999 and 2003/2004 National Ambulatory Medical Care Surveys (NAMCS), and the National Hospital Ambulatory Medical Care Surveys (NHAMCS) to test whether Medicaid physician payments are associated with volume and site of outpatient care among Medicaid patients versus other patients. She finds that lower Medicaid payments are associated with reductions in the number of visits, as well as a move towards hospital-based outpatient services among Medicaid patients relative to other patients (Decker, 2009). In another paper based on the 1989, 1993, 1998, and 2003 NAMCS, Decker (2007) reports that more generous Medicaid physician payments are associated with higher physician participation in Medicaid, and increases in length of visits for Medicaid patients versus privately insured patients.

Only a few recent studies focus specifically on Medicaid payments and children’s access to care, with two papers on dental care. Decker (2011), using data from the 2000 and 2008 NHIS, finds that, on average, a $10 increase in state Medicaid payments to dentists for preventive care was associated with a 4 percentage point increase in the likelihood a publicly-insured child visited the dentist in the past 6 months. Buchmueller et al. (2015) also find that higher Medicaid payments are associated with increased dental services utilization among children using data from the 2001, 2004 and 2008 panels of the Survey of Income and Program Participation (SIPP). These researchers additionally find that higher payments are associated with increases in participation in Medicaid among dentists (Buchmueller et al., 2015). Sonchak (2015) focuses on the effects of Medicaid reimbursement rates for obstetric care on prenatal care utilization using the Vital Statistics Natality data from 2001 to 2010. She finds that higher rates are associated with more prenatal visits, although the findings do not support a causal relationship between prenatal care and birthweight (Sonchak 2015). Finally, Decker (2015) finds that Medicaid physician fees and physician participation in Medicaid is correlated with measures of access to and use of health services among both children and adults. This relationship appeared to be stronger for children than for adults, and among children, stronger for children with serious health conditions compared to those without. However, this study only used two years of data and had a small sample size of children with serious health conditions which precluded the inclusion of state fixed effects. This limited the study's ability to draw inferences about the causal connection between Medicaid physician fees and access to medical care among children with special health conditions since the level of state Medicaid physician fees could be correlated with other aspects of the Medicaid program or with other state-level variables affecting publicly-insured children's access to health care. The use of a general health survey also precluded examination of measures of access to care that may be particularly important for children with special health conditions.

This paper builds on the small number of papers on Medicaid physician payments and children's access to care by focusing on CSHCN, a group that faces serious access problems and is particularly dependent on public health insurance. The objective of this study is to use two waves of data from the 2001 and 2009-2010 National Survey of CSHCN (NS-CSHCN) to test whether Medicaid physician fees are correlated with access to health services and adequacy of insurance coverage among CSHCN. We use a difference-in-differences method, comparing the effects of Medicaid physician fees on outcomes of publicly-insured children in states that raised fees vs. in states that did not. We also consider a triple difference specification using privately-insured children as the comparison group. The use of both state fixed effects and a comparison group of children with private insurance helps to isolate the effect of state changes in Medicaid physician fees on access to medical care for publicly-insured CSHCN.

Our findings indicate that raising the Medicaid primary care fee level close to at least 90 percent of the Medicare level reduces the likelihood that publicly-insured CSHCN lack a usual source of care in a doctor's office by about 15 percent. Fee increases are also associated with improved access to specialty doctor care, and large improvements in caregivers' satisfaction with the adequacy of health insurance coverage, among publicly-insured CSHCN. Results for some other access measures, such as global measures of having difficulties and delays accessing services, were mixed. The findings were strongest for school-aged CSHCN, and, for some outcomes, CSHCN with less-educated parents and CSHCN with more severe conditions.

2.0 Methods

We start with a standard difference-in-differences (DD) specification, comparing publicly-insured CSHCN in states that raised Medicaid fees to publicly-insured CSHCN in states that did not raise fees, adjusting for other potentially confounding trends. Initially, we limit the sample to publicly-insured CSHCN, and estimate Equation (1) below:

$$Y_{ijt} = \alpha + \beta_1 Fee\ Ratio_{jt} + \beta_2 X_{ijt} + \beta_3 Z_{jt} + \beta_4 Survey\ Year_t + \gamma_j + \varepsilon_{ijt} \qquad (1)$$

In Equation (1), Y_{ijt} is an outcome variable for child i in state j at time t; Fee $Ratio_{jt}$ is an indicator for whether the primary care Medicaid-to-Medicare fee ratio relevant to that state and year is 0.90 or higher; X_{ijt} represents child and family characteristics; and Z_{jt} is a set of state, time-varying characteristics. The model includes survey year effects and state fixed effects (γ_j).

A fee ratio of 0.90 is close to the 90th percentile in the weighted distribution of the fee ratio in our sample, which is 0.88. Only one state (Alaska) had a fee ratio of at least 0.90 in 2001 (the first wave of data). We therefore identify the model by comparing the states that raised fees compared to the 9 that did not.[3] To gauge whether our findings are sensitive to the way in which we measure the state's fee ratio, we also try specifications of Equation (1) that use two alternative measures of the fee ratio: (1) whether or not the state's fee ratio is 0.80 or higher; and (2) the continuous fee ratio itself. [4]

We estimate ordinary least squares models with sample weights, and generate robust standard errors adjusted for clustering on state. In further analyses, we estimate models stratified by child age group, gender, race, parental education, and severity category to explore any differences across these sub-groups in the effect of raising Medicaid fees on outcomes. To test for statistically significant differences across sub-groups, we estimate a pooled model, interacting every covariate with sub-group indicators, and then conduct a joint test to determine whether the interaction terms as group were statistically different from a baseline group.

The advantage of our DD approach is we are using a very large but fairly homogenous sample of children – all are publicly-insured CSHCN and thus presumably are affected by many of the same policy changes and trends. Even so, there are a number of threats to the analysis. First, the validity of our estimation approach relies on the assumption that states that raised Medicaid fees between 2001 (the first wave of data) and 2009/10 (the second wave of data) would have had similar trends in outcomes compared to states that did not raise fees if the fee

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[3] As we discuss later, only 42 states and DC are included in the study because of missing or incomplete fee ratio data for eight states (Arkansas, Delaware, Mississippi, Montana, Nebraska, Pennsylvania, Tennessee, and Wyoming).

[4] Eleven states raised the fee ratio from under 0.9 to at least 0.9 (AZ ID KS LA NC ND NM NV OK VT WA). Thirteen states raised the fee ratio from under 0.8 to at least 0.8 (CO GA IA KS KY LA MD NM OK SC SD VA VT), and 33 states raised their fee ratio at least somewhat.

increases had not occurred. Unfortunately, we do not have data prior to 2001, so we cannot visually inspect pre-trends or test for differences in pre-trends across states that did and did not increase fees.

We address the potential for divergent pre-trends in the following ways. First, all models include a set of state-time-varying covariates (described in the next section) to account for potentially confounding changes in other state polices and state economic conditions. Second, we implement a triple difference (DDD) approach, using privately-insured CSCHN as a comparison group. This triple difference specification is shown below in Equation (2).

$$Y_{ijt} = \alpha + \beta_1 Fee\ Ratio_{jt} * PubliclyInsured + \beta_2 PubliclyInsured + \beta_3 Fee\ Ratio_{jt} + \beta_4 X_{ijt} + \beta_5 Z_{jt} + \beta_6 Survey\ Year_t + \gamma_j + \varepsilon_{ijt} \qquad (2)$$

We estimate Equation (2) using a sample that includes both publicly- and privately-insured CSHCN.[5] The specification now includes an indicator for whether or not the child is publicly-insured, and an interaction term between the fee ratio and whether or not the child is publicly-insured. This way, we can test for associations between changes in fee ratios and changes in outcomes among CSHCN with public coverage, netting out the same changes among CSHCN who are privately-insured. The advantage of this approach is we control for any time-varying trends that affect all CSHCN, regardless of insurance status. In addition, using Equation (2), we test for spillover effects of fee increases on privately-insured CSHCN, captured by β_3.

Including privately-insured CSHCN as a comparison group will capture effects of trends specific to CSHCN on outcomes, but there still may remain the possibility of confounding by

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[5] The sample excludes children who have both private insurance and Medicaid, as well as children who were uninsured at any point during the past 12 months.

unmeasured trends that are specific to publicly-insured CSHCN and that are coincident with the timing of fee increases. Given we have only two waves of data, we are somewhat limited in addressing this problem. We can build on Equation (2) further, however, by including interaction terms between whether or not the child is publicly-insured and survey year, and interaction terms between whether or not the child is publicly-insured and state fixed effects, as shown in Equation (3) below. To some extent, these additional terms will capture any confounding policies and changes specific to publicly-insured CSHCN.

$$\begin{aligned} Y_{ijt} = {} & \alpha + \beta_1 Fee\ Ratio_{jt} * PubliclyInsured + \beta_2 PubliclyInsured + \beta_3 Fee\ Ratio_{jt} \\ & + \beta_4 X_{ijt} + \beta_5 Z_{jt} + \beta_6 Survey\ Year_t + \gamma_j + \beta_7 PubliclyInsured \\ & * Survey\ Year_t + \beta_8\ PubliclyInsured * \gamma_j + \varepsilon_{ijt} \qquad (3) \end{aligned}$$

In addition to the pre-trends assumption, DD methods also rely on the assumption that the composition of the treatment and comparison groups remains stable over time. To gauge whether or not this assumption is reasonable, we conduct a covariate balance test, in which we use the models above to compare each covariate for publicly- versus privately-insured CSHCN in states that did and did not raise Medicaid fees. This analysis is a useful check of whether the composition of the treatment and comparison groups remained similar over time.

Finally, DD methods are based on the assumption that receipt of the treatment (being a CSHCN on Medicaid) cannot plausibly be affected by the outcomes. There is some evidence that higher Medicaid fees may increase take-up of Medicaid among families with eligible children (Hahn, 2013). Therefore, we conduct an intent-to-treat analysis by examining the effect of raising Medicaid fees on access measures for CSHCN who do not have a high school or GED degree. Low parental education is correlated with Medicaid eligibility, although Medicaid fee changes do not plausibly affect parental education.

3.0 Data

The National Survey of CSHCN (NS-CSHCN) is a national, cross-sectional, random digit dial telephone survey of caregivers (primarily mothers) of CSHCN. The survey was conducted in 2001 (collected between October 2000 and April 2002), 2005-2006 (collected between April 2005 and February 2007), and in 2009-2010 (collected between July 2009 and March 2011), and was available in English, Mandarin, Cantonese, Japanese, Korean, and Russian (2001), in English, Spanish, Mandarin, Cantonese, Vietnamese, and Korean (2005-2006), and in English and Spanish only (2009-2010). The data are representative of CSHCN both at the national and state levels. The survey is sponsored by the Maternal and Child Health Bureau of the Health Resources and Services Administration (HRSA) and conducted by the National Center for Health Statistics' State and Local Area Integrated Telephone Survey (SLAITS). In the main analyses, we use only the 2001 and 2009-2010 waves because of guidance obtained from HRSA that the 2009-2010 (which is the only survey wave including a cell phone sample) is more comparable to 2001 than 2005-2006, when the proportion of cell-phone-only families had risen (Ghandour RM et al., 2014). More detailed information about the survey is available from CDC (2008) and CDC (2013a-b). In supplemental analyses, we test the sensitivity of our findings to including all three waves of data (2001, 2005-2006, and 2009-2010).

The NS-CSHCN is a two-stage survey with a complex sampling design. The first stage of the survey is a screener for special health care needs. The CSHCN screener includes five stem questions about the child's general health care needs, such as need for therapy, need for prescription drugs, and use of more health services than what is typical among children of the same age. Each stem question is followed by additional questions regarding whether the child's health care needs are due to a chronic health condition. CSHCN whose caregivers indicate that the child has at least one general health care need that is due to a chronic condition meet the criteria for having a special health care need and are screened into the sample. About 200,000 households with children participate in the screener in order to identify about 40,000 CSHCN in each survey wave. Each wave includes about 750 CSHCN in each state and in the District of Columbia (CDC, 2013a-b). The large sample size of CSHCN for each state is especially helpful for this study.

In each survey wave (2001 and 2009-2010), there were about 40,000 completed interviews of caregivers of children who were identified as having special health care needs. In each wave, all children in each participating household were screened for special health care needs. In households with more than one child with special health care needs, a single child was randomly selected to complete the interview. The second stage of the NS-CSHCN includes detailed information about the nature of the focal child's special health care needs, health care utilization, access to services, and out-of-pocket spending on health care. Note that only CSHCN (children who met criteria for having a special health care need) were included in the second stage of the survey. In 2001, the weighted, overall, national response rate for the special health care needs interview was 61 percent (Blumberg et al., 2005). In 2009-2010, this same response rate was 43.7 percent for the landline sample, 15.2 percent for the cell phone sample, and 25.5 percent for the combined sample (CDC 2008, 2013a-b). All analyses in this paper employ sample weights adjusting for non-response.

We merged state fee-for-service (FFS) Medicaid-to-Medicare fee ratios for primary care visits into NS-CSHCN data (Zuckerman, Williams and Stockley, 2009; Norton and Zuckerman, 2000). The fee ratios are not available for every year, and they are not available for Tennessee since this state does not have FFS Medicaid. The fee ratios are also not available for Arkansas, Delaware, Montana, Nebraska, and Wyoming in 1998 because these states declined to participate in the survey, and are not available for Mississippi and Pennsylvania because they provided incomplete surveys. Thus, we matched 1998 fee data to the 2001 survey data, and 2008 fee data to the 2009-2010 survey data, and children from the aforementioned eight states are dropped from the sample. The state Medicaid fee-for-service ratio is constructed by dividing the Medicaid payment rate reported by states for a basket of primary care services (weighted by the distribution of services for a large sample of states) by the Medicare payment rate for the same basket of services (constructed from relative value units, conversion factor, and geographic adjustments and Clinical Diagnostic Fee Schedule for the relevant year) (Zuckerman et al., 2009).

Many state Medicaid programs have moved toward managed care payment structures, even for high-need populations such as CSHCN. In such programs, providers often are reimbursed not using FFS but instead by capitation. Medicaid FFS payments are still a reasonable measure of physician reimbursement, however, since capitation rates are often determined based on what FFS rates would have been (Zuckerman and Goin, 2012). Also, although many children (and adults) on Medicaid are enrolled in managed care programs, about half of Medicaid enrollees are either in fee-for-service plans, plans which are prepaid only for inpatient care, or primary care case management programs (PCCMs), in which providers are often paid on a fee-for-service basis with an additional fee provided for case management (CMS, 2011). Evidence from a sample of states also indicates that payment rates to physicians under Medicaid managed care are highly correlated with Medicaid FFS payment rates (GAO, 2014).

In Figure 1, we see that between 1998 and 2008, the Medicaid-to-Medicare fee ratio for primary care visits changed in most states. Of the 42 states (not including Arkansas, Delaware, Mississippi, Montana, Nebraska, Pennsylvania, Tennessee, and Wyoming) and the District of Columbia, the ratio fell between 1998 and 2008 in 7 states, stayed the same in 2 states, and increased in the remaining 33 states plus the District of Columbia. We use this variation in the Medicaid-to-Medicare fee ratio within states over time to identify the effect of the fee ratio on access to health care among CSHCN.

We focus on a range of caregiver-reported outcomes related to access to care and adequacy of insurance among CSHCN. All of our measures are binary, and are coded so that "1" indicates an adverse outcome. The outcomes can be classified into four categories: usual source of care; adequacy of health insurance coverage; delays/difficulties getting health care; and child not getting needed services due to insurance, cost, waiting time or availability. To measure whether or not the child has a usual source of care, we create three dichotomous indicators: (1) child does not have a place s/he usually goes when s/he is sick or caregiver needs advice about his/her health; (2) child does not have a doctor's office as a place s/he usually goes when s/he is sick or caregiver needs advice about his/her health; (3) child does not have a health professional that knows the child well, and that the caregiver considers to be the child's personal doctor or nurse.

The survey includes some global questions on whether the caregiver delayed or did not get health care (2001 survey) or had difficulties or delays getting services (2009-2010 survey) for various reasons. The wording for this question varies slightly across the two surveys. From these questions, we created three indicators: (4) child delayed/did not get/had difficulty getting health care services due to not having enough money to pay provider (2001) or cost (2009-2010); (5) child delayed/did not get/had difficulty getting health care services due to waiting too long (2001) or waiting lists, backlogs, and other problems getting appointments (2009-2010); and (6) child delayed/did not get/had difficulty getting health care services due to lack of availability in area.

Caregivers are also asked to provide information about whether the child received all the care s/he needed for specific kinds of services. If a caregiver reports unmet need for a type of service, the caregiver then is asked to select from an extensive set of reasons why the child's needs were not met. From these questions, we created the following dichotomous indicators: (7) during the past 12 months, child did not get all routine care that s/he needed due to costs or insurance or lack of availability issues; (8) during the past 12 months, child did not get all the specialty physician services (not including psychiatrists and dentists) that s/he needed due to costs or insurance or lack of availability issues; (9) during the past 12 months, child did not get all the mental health care or counseling that s/he needed due to costs or insurance or lack of availability issues; and (10) during the past 12 months, child did not get all physical, occupational, or speech therapy that s/he needed due to costs or insurance or lack of availability issues. The specific cost and insurance issues listed as reasons for unmet need are: "cost too much"; "no insurance"; "health plan problem; and "can't find a provider who accepts child's insurance." Lack of availability issues were "not available in area/transport problems"; "couldn't find someone"; and "not convenient times/could not get appointment." When estimating models in which lack of access to a particular type of service due to cost/insurance is the outcome of interest, we limit the samples to families reporting having a need for routine care, therapy, specialty physician, and mental health services in the past 12 months.

Moreover, caregivers are asked a set of questions about the adequacy of their child's health insurance coverage. Specifically, survey respondents answer "never", "sometimes", "usually" and "always" to questions about whether health insurance coverage offers benefits and services that meet the child's needs, whether the costs not covered by health insurance are reasonable, and whether the health insurance allows the child to see needed providers. From these questions, we created the following three dichotomous variables to measure inadequacy of insurance coverage: (11) costs not covered by child's health insurance never or sometimes are reasonable; (12) child's health insurance never or sometimes allows child to see the health care providers he or she needs; and (13) child's health insurance benefits and coverage never or sometimes meet his/her needs.

Finally, we also look at several outcome variables related to the impact on the family. Specifically, we constructed the following five dichotomous variables based on the responses from caregivers: (14) spent over $500 out of pocket for child's health care; (15) child's health care caused financial problems for the family; (16) parent or other family members had to stop working due to child's health; (17) parent or other family members had to cut work hours to care for child; and (18) provided health care at home for child.

The models include the following child and family characteristics: indicators for 3-year child age categories; child is female; race/ethnicity; parental education; indicators for household size; and an indicator for severity, which is a dichotomous variable indicating whether the child's medical, behavioral, or other conditions affect his/her ability to do things a great deal. The state-level time-varying covariates included in all models are: poverty rate, unemployment rate, minimum wage, and TANF payment level for a family of three (University of Kentucky, 2019). The main analysis sample is limited to 48,405 CSHCN between infancy and 17 years old who either have private insurance coverage only or public insurance coverage only, maintained the coverage during the past 12 months, and have non-missing data for all covariates.

4.0 Results

Table 1 shows weighted means for publicly and privately insured CSHCN in the base year, 2001. Most CSHCN have a usual source of care, which is unsurprising given their elevated need for medical services. Although publicly insured CSHCN are only slightly less likely than privately insured CSHCN to have a usual source of care, they are much less likely to have a usual source of care in a doctor's office. Nearly 40 percent of publicly insured CSHCN lack a usual source of care in a doctor's office, while this rate is only 20 percent for privately insured CSHCN. Publicly insured CSHCN also are nearly twice as likely as privately insured CSHCN to lack a regular health care provider (Table 1).

Problems accessing services because of cost, waiting times, and lack of availablity are reported by fewer than 3 percent of families of CSHCN regardless of insurance status. Publicly insured CSHCN are less likely (about 17 percent) compared to privately insured CSHCN to report difficulty accessing care due to cost, likely reflecting the low copays in Medicaid compared to private insurance. However, they are more likely to report difficulties due to waiting time or lack of availability of care, possibly due to lower provider willingness to accept Medicaid compared to private insurance.

Fortunately, less than 1 percent of CSHCN reported not getting needed routine care and less than 3 percent reported not getting needed specialty care. However, the proportion of CSHCN not getting needed routine care is about 80 percent higher for publicly compared to privately insured CSHCN. Roughly one-quarter of both publicly and privately insured CSHCN report problems with insurance covering costs which may signal substantial challenges for families of CSHCN in general, and that some publicly insured CSHCN are using providers that do not take Medicaid for some services. Publicly insured CSHCN are much more likely than privately insured CSHCN to report problems with insurance covering needed providers (a difference of nearly 7 percentage points, or 83 percent) and meeting needs (a difference of about 5.5 percentage points or 51 percent).

Publicly insured CSHCN are much less likely to report spending $500 out-of-pocket on health care compared to privately insured CSHCN; about 9 percent of families of publicly insured CSHCN report spending more than $500 compared to nearly 30 percent for privately insured. The fact that 9 percent of publicly insured CSHCN spend more than $500 may mean, though, that some families are seeking care for services not covered by Medicaid or from providers not accepting Medicaid. Although fewer public compared to privately insured CSHCN report spending $500 out-of-pocket on health care, they are more likely – by about 5 percentage points (or about 33 percent) to report that their child's health care caused financial problems for the family, likely reflecting the relatively low income level among families of publicly insured CSHCN. Families of publicly insured CSHCN are much more likely than those of privately insured CSHCN to indicate that they have cut hours of work or stopped working to care for their child, and slightly more likely to indicate that they provide health care for the child at home.

Table 2 reports the results from the covariate balance test. Appendix Table 1 shows similar results for the covariate balance test for the intent-to-treat analysis. The goal is to see if the composition of the treatment and comparison groups are changing over time in ways that may be correlated to the evolution of the Medicaid policy changes. There are some statistically significant results, but the overall pattern of findings is inconsistent. For example, the educational composition is changing as Medicaid fees increase but we don't see a pattern in race, family size or child severity. The pattern of findings is inconsistent in the intent-to-treat analysis as well (Appendix Table 1). We conclude that we do not see a pattern consistent with Medicaid beneficiaries, for example, becoming more advantaged over time in states that raised fees compared to states that did not.

Table 3 reports DD and DDD findings on the effect of raising Medicaid fees to at least 0.90 of Medicare fees on outcomes among CSHCN. Column 1, labeled "no control group", shows the DD estimate, the estimated coefficient on Medicaid fee ratio, in Equation 1. Columns 2, 3 and 4 show estimated coefficients from the DDD specification shown in Equation 2. Column 2, labeled "fee effect on private", shows the coefficient on the fee ratio, i.e., the effect of higher Medicaid fees on the control group of privately insured CSHCN; these effects can be considered spillover effects of fee increases on privately insured CSHCN. Column 3, labeled "fee effect on public", shows the effect of higher fees on publicly insured CSHCN, i.e., the sum of the coefficients on the fee dummy and the interaction of this dummy with the publicly insured dummy. Column 4, labeled "difference", shows the difference in the first two columns, i.e,,the coefficient on the interaction in Equation 2.

Starting with the DD estimates (Column 1 in Table 3), we see that most effects are negative, indicating that Medicaid fee increases improve outcomes among publicly insured CSHCN. Increasing fees improves the access to a usual source of care, although only the effect on "no usual source of care" is statistically significant at conventional levels. Fee increases are associated with a 6.3 percentage point reduction in publicly-insured CSHCN experiencing difficulties/delays in accessing services due to waiting lists and backlogs. Column 1 in Panel C also shows that fee increases are associated with large reductions in not getting needed services. There are mixed effects on the inadequacy of insurance coverage outcomes (Panel D), and an unexpected, positive effect on a family member stopping working due to the child's health (Panel E).

The pattern of findings in Column 1 of Table 3 is consistent with the idea that fee increases improve access to care among CSHCN, but some of the magnitudes of the effects are unreasonably large relative to the sample means of the outcomes. This may be due to other confounding trends affecting all CSHCN. The remaining columns of Table 3 show findings from the DDD specification (Equation 2). These models address the potential problem of confounding trends by including a comparison group in the model – privately insured CSHCN.

First, in column 2 of Table 3, we note that there are no statistically significant effects of Medicaid fee increases on privately insured CSHCN, which suggests that privately-insured CSHCN are an appropriate comparison group. Next, in Columns 3-4, we see that many of the DD effects persist in the DD models. In the DDD models, the interaction between high Medicaid/Medicare ratio and child has public insurance is not statistically significant for the models in which "child has no usual source of care" and "child has no regular health care provider" are the dependent variables. Among publicly insured children relative to privately insured children, however, a high Medicaid/Medicare ratio was associated with a nearly 6 percentage point reduction in the probability of not having a usual source of care in a doctor's office (Column 4, Panel A, Table 3). This effect corresponds to about a 15 percent reduction in lacking a usual source of care in a doctor's office relative to the mean percent of publicly insured CSHCN with such a source from Table 1. These findings indicate that an increase to a 0.90

Medicaid/Medicare payment for primary care may increase accessibility of physician office-based visits for publicly insured children relative to privately insured children.

We did not find a statistically significant effect of higher Medicaid fees on having difficulties/delays accessing services (Panel B, Table 3). We find some evidence that higher Medicaid fees are associated with a lower chance of publicly insured CSHCN not getting routine care or mental health care in higher fee states, though the coefficient on the interaction is not significant. We do find, though, that higher fees are associated with a nearly 2.5 percentage point reduction in not receiving needed specialty care. This is a very large (about 87 percent) improvement relative to the mean for publicly insured CSHCN in 2001.

There is considerable evidence that higher fees reduce problems with adequacy of health insurance coverage among publicly-insured CSHCN (Panel D, Table 3). This may imply that some families with CSHCN covered by Medicaid spend some of their own funds on care for their children in low Medicaid-fee states, a possibility worthy of future investigation. Families with publicly insured CSHCN experienced about 7 percentage, 5, and 2 percentage point reductions in having costs covered by insurance never or sometimes being reasonable, never or sometimes covering needed providers, and never or sometimes meeting needs, respectively. These improvements represent changes of about 29, 32, and 14 percent, respectively.

We also find a reduction of about 2.8 percentage points (8 percent) in families needing to cut work hours to care for their child, adding to the evidence suggesting that the burden for families of children with CSHCN may be eased in higher Medicaid-fee states (Panel E, Table 3). Finally, we find that publicly insured CSHCN are much less likely (about 10 percentage points or over 100 percent) to have spent over $500 on health care in higher fee states, another indication that parents may sometimes pay out of pocket for care in lower fee states.

Appendix Tables 2 and 3 show results from these models when we categorize “high” Medicaid fees at least 0.80 instead of 0.90 (Appendix Table 2) and replacing the categorical measure of Medicaid fee generosity with a linear measure (Appendix Table 3). Results are very similar to the main analyses shown in Table 3, and support the idea that higher Medicaid fees improve access to care among publicly-insured CSHCN.

Table 4 presents results for the intent to treat analysis. Results for outcomes measuring the adequacy of health insurance are very similar to those for the main analysis presented in Table 3. For example, Table 3 indicated that families with publicly insured CSHCN experienced about 7 percentage, 5, and 2 percentage point reductions in having costs covered by insurance never or sometimes being reasonable, never or sometimes covering needed providers, and never or sometimes meeting needs, respectively. Comparable estimates in Table 4 are about 10, 11, and 7 percentage points. In contrast to Table 3, there is no statistically significant effect of raising Medicaid fees on reducing the likelihood that publicly insured CSHCN lack a usual source of care in a doctor’s office. In Table 4, we do find, however improvements in difficulties or delays in accessing care due to cost and due to waiting lists or backlogs. These improvements are about 3-4 percentage points in magnitude. The effect of raising fees on whether a publicly versus privately insured family spends over $500 on health care is also very similar: about 7 percentage points in Table 4 compared to about 10 percentages points in Table 3. Overall, the intent-to-treat analysis in Table 4 supports prior results in Table 3.

In Appendix Tables 4 and 5, we show the main specifications from Table 3 and the intent to treat specifications from Table 4 when we include additional terms in the models – interactions between publicly insured and survey year, and a set of interactions between publicly insured and state fixed effects (Equation 3). Unsurprisingly, many effects are no longer statistically significant when we include these additional terms, as there is a high degree of collinearity between the DDD terms and these additional terms. It is notable, however, that the pattern of findings persists, and the magnitudes remain large in these models. Overall, these results still support the idea that fee increases improved access to care.

Finally, in Table 5, we present results of subgroup analyses for the DDD models (subgroup analyses for the DD models are shown in Appendix Table 6). There are some interesting patterns by child age. Generally, effects of raising fees on access to care are stronger for school-aged CSHCN than younger CSHCN, especially school-aged CSHCN aged 6-11 years old. There are a few exceptions, including an unexpected, positive effect of fee increases on the probability of a parent quitting work to care for the child among the youngest age group. There is no consistent pattern by race; some effects are stronger for white CSHCN, while others are stronger for non-white CSHCN. Effects on having a usual source of care and on having difficulties and delays accessing services are more robust for CSHCN with a severe condition vs. CSHCN without a severe condition (Column 6, Panel B, Table 5).

The analyses thus far were based on the 2001 and the 2009-2010 waves of the NS-CSHCN. We did not include the 2005-2006 wave due to concerns about the comparability of these data with the other two waves. One advantage of including the 2005-2006 data, however, is we add more within-state variation in Medicaid fees and also we have a larger sample size, which may give us power to detect effects for some less common outcomes. In Appendix Table 7, we show the same models from Table 3 estimated on a sample that includes all three waves (2001, 2005-2006, and 2009-2010) of the NS-CSHCN. The two sets of findings are very similar to each other. The only substantive difference is that the beneficial effect on access to needed mental health care becomes statistically significant when we include three waves (Panel C).

Also, the unexpected, detrimental effect of fee increases on parents cutting work hours to care for the child becomes statistically insignificant when we include all three waves (Panel E). Thus, we conclude that our findings are not affected by whether or not we include the 2005-2006 data.

5.0 Discussion and conclusions

In the US, public insurance programs play a critical role in providing coverage for CSHCN, but lack of availability and access to services has been a persistent challenge. Some have suggested that low Medicaid payments to physicians is one underlying problem. One study based on purely cross sectional data (Decker, 2015) suggested that this could be particularly an issue for children with special health care needs. Using data on a large sample of children with special needs and using state-fixed effects and a comparison group of privately-insured children, this paper substantiates a relationship between Medicaid physician fees and access to care for children with special health care needs. This is particularly important since children, especially children with special health care needs, are most likely to be reliant on Medicaid for health care.

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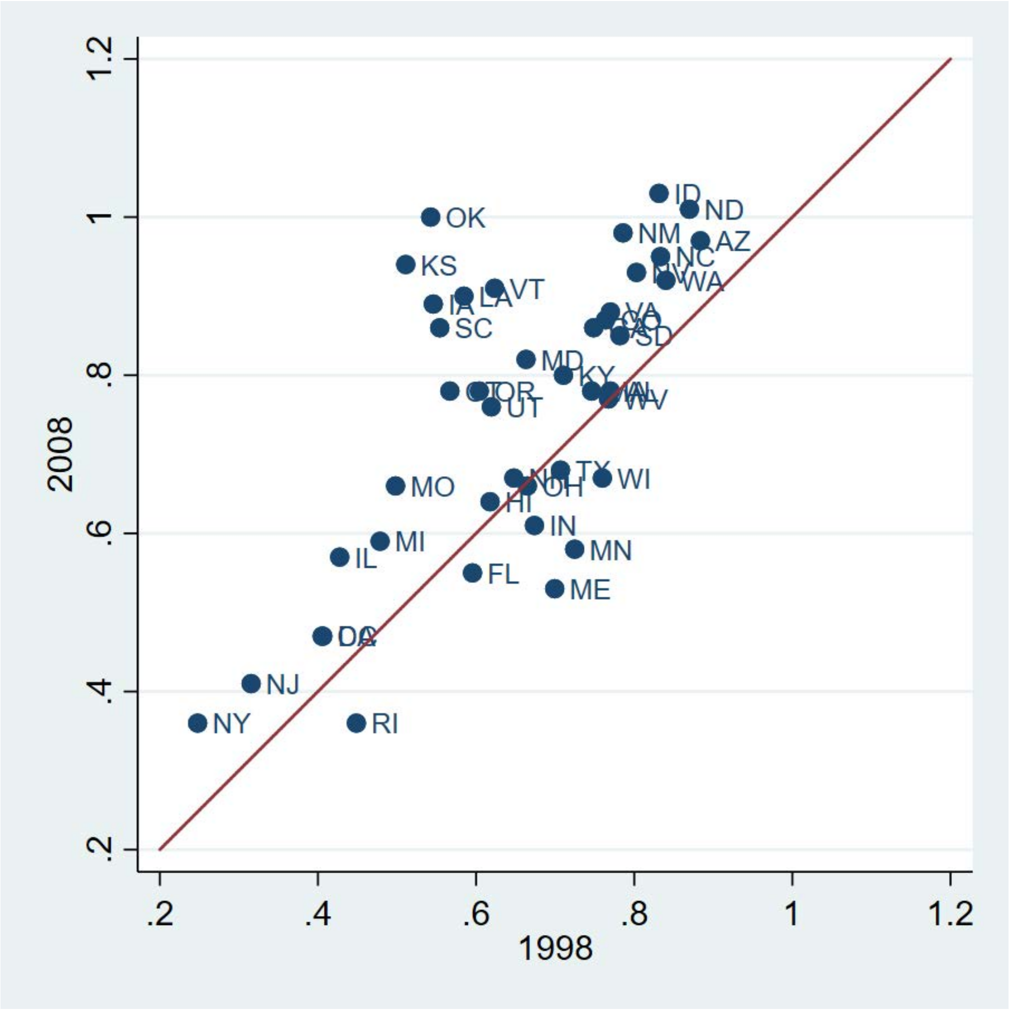
Figure 1: Medicaid-Medicare Fee Ratios for Primary Care Visits



Notes: Figure compares the Medicaid-to-Medicare fee ratios for primary care between 1998 and 2008. Alaska's fee ratio increased from 1.17 in 1998 to 1.40 in 2008. Alaska is not shown in the figure because including this point reduces the clarity of the figure.

Table 1: Unadjusted means in 2001

Outcome	Private Only	Public Only	Difference	
	Panel A: Not having a usual source of care			
No usual source of care	7.06	6.67	-0.40	
No usual source of care in doctor's office	20.20	38.97	18.77	***
No regular health care provider	6.72	12.51	5.79	***
	Panel B: Having difficulties/delays accessing services			
Difficulty/delay in access due to cost	3.23	2.67	-0.56	**
Difficulty/delay in access due to waiting lists/backlog	0.86	2.41	1.55	***
Difficulty/delay in access due to lack of availability in area	0.77	2.78	2.00	***
	Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability			
Did not get needed routine care	0.55	0.99	0.44	***
Did not get needed specialty doctor care	1.98	2.83	0.85	**
Did not get needed mental health care	7.14	6.16	-0.98	
Did not get needed therapy	5.67	3.41	-2.26	***
	Panel D: Inadequacy of health insurance coverage			
Costs covered by insurance never or sometimes reasonable	26.54	24.53	-2.01	***
Insurance never or sometimes covers needed providers	8.25	15.08	6.83	***
Insurance benefits/coverage never or sometimes meet needs	10.74	16.26	5.51	***
	Panel E: Family affected by child's health			
Spent over $500 out of pocket	29.71	9.07	-20.64	***
Child's health care caused financial problem	15.71	20.86	5.15	***
Stopped working due to child's health	7.13	20.37	13.24	***
Had to cut work hours to care for child	20.02	35.49	15.48	***
Provided health care at home for child	51.72	57.61	5.89	***
N	17,175	4,860		

Table 2: Covariate balance

	No control group		With control group					
Outcome	Fee effect on public		Fee effect on private		Fee effect on public		Difference	
Age 0-2	-0.85		1.63		-1.68		-3.30	***
	(2.85)		(1.22)		(1.22)		(0.94)	
Age 3-5	-2.45		-3.49	***	-3.64	***	-0.15	
	(1.67)		(1.09)		(1.26)		(1.77)	
Age 6-8	0.25		-0.43		1.69		2.12	
	(3.02)		(1.08)		(1.93)		(1.86)	
Age 9-11	4.38		2.03		0.73		-1.30	
	(3.04)		(1.46)		(2.09)		(2.25)	
Age 12-14	2.66		2.15	*	3.10	**	0.95	
	(2.29)		(1.22)		(1.29)		(1.28)	
Age 15-17	-3.99	**	-1.89		-0.20		1.69	
	(1.98)		(1.50)		(1.71)		(1.87)	
Female	-0.86		0.36		-4.21	**	-4.57	***
	(2.42)		(1.38)		(1.77)		(1.69)	
White	0.01		-1.79		1.76		3.55	
	(3.40)		(2.05)		(1.94)		(3.04)	
Latino	1.78		1.74		-0.95		-2.69	
	(1.76)		(1.73)		(3.31)		(2.88)	
African-American	-2.99		1.17		-3.53		-4.70	
	(2.77)		(2.17)		(2.86)		(4.54)	
Other	2.98		0.61		1.77		1.15	
	(1.85)		(1.23)		(1.63)		(2.32)	
Parent is high school dropout	-0.93		0.59		-6.26	***	-6.85	***
	(3.12)		(1.47)		(1.81)		(2.19)	
Parent is high school graduate	-6.15		1.04		1.05		0.01	
	(3.93)		(2.20)		(2.39)		(1.91)	
Parent has more than high school degree	7.08		-1.63		5.21	*	6.84	**
	(4.30)		(2.34)		(2.69)		(2.89)	
Household size 2	2.31	*	-0.81		-0.13		0.68	
	(1.27)		(1.03)		(0.44)		(1.17)	
Household size 3	-1.99		-0.19		-2.85		-2.66	
	(3.81)		(1.44)		(2.10)		(1.70)	
Household size 4	-0.90		-0.40		0.70		1.11	
	(2.82)		(1.68)		(1.98)		(1.55)	

Household size 5	-4.68	-0.38	-1.66	-1.29
	(4.51)	(1.06)	(2.40)	(2.07)
Household size 6 or more	5.26 **	1.78	3.94 **	2.16
	(2.46)	(1.76)	(1.57)	(1.94)
Child’s health/behavioral conditions greatly affect life	-0.86	-0.49	0.49	0.98
	(1.53)	(1.16)	(1.06)	(1.33)

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to publicly-insured children, and “with control group” where the sample also includes privately-insured children. Table shows estimated coefficients on three variables only: fee ratio is 0.90 or higher; sum of fee ratio is 0.90 or higher and interaction between child has public insurance and fee ratio is 0.90 or higher; interaction between child has public insurance and fee ratio is 0.90 or higher. Models also include, where appropriate, child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. The sample size is 48,405. * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Table 3: Effects of Medicaid physician fees

	No control group	With control group		
	Fee effect on public	Fee effect on private	Fee effect on public	Difference
Outcome	(1)	(2)	(3)	(4)
Panel A: Not having a usual source of care				
No usual source of care	-3.29 *	-0.98	-1.76	-0.78
	(1.92)	(1.57)	(1.48)	(0.81)
No usual source of care in doctor's office	-5.56	0.94	-4.94 *	-5.88 ***
	(4.93)	(1.82)	(2.88)	(1.90)
No regular health care provider	-2.16	1.11	-1.34	-2.46
	(1.87)	(1.40)	(1.26)	(1.50)
Panel B: Having difficulties/delays accessing services				
Difficulty/delay in access due to cost	-3.37	0.23	-1.50	-1.73
	(2.33)	(0.84)	(1.66)	(1.31)
Difficulty/delay in access due to waiting lists/backlog	-6.28 ***	-1.09	-2.90 **	-1.81
	(1.62)	(0.90)	(1.22)	(1.16)
Difficulty/delay in access due to lack of availability in area	-0.06	-0.16	0.11	0.27
	(2.12)	(0.89)	(1.42)	(1.29)
Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability				
Did not get needed routine care	-2.13 *	-0.62	-0.90 **	-0.28
	(1.22)	(0.51)	(0.34)	(0.26)
Did not get needed specialty doctor care	-6.91 ***	-1.32	-3.82 **	-2.50 **
	(2.12)	(1.04)	(1.61)	(1.01)
Did not get needed mental health care	-5.35 **	-0.85	-3.55 *	-2.70
	(2.31)	(2.45)	(1.89)	(2.76)
Did not get needed therapy	-2.33	0.81	-1.60	-2.42
	(3.50)	(1.31)	(2.73)	(2.96)
Panel D: Inadequacy of health insurance coverage				
Costs covered by insurance never or sometimes reasonable	-0.20	2.74	-4.31 *	-7.05 ***
	(3.67)	(1.65)	(2.19)	(1.79)
Insurance never or sometimes covers needed providers	1.00	0.82	-1.27	-2.10 *
	(5.00)	(1.65)	(2.02)	(1.13)
Insurance benefits/coverage never or sometimes meet needs	-1.07	1.19	-4.11 ***	-5.29 ***
	(4.01)	(1.37)	(1.18)	(1.64)

	Panel E: Family affected by child's health			
Spent over $500 out of pocket	1.42	0.66	-9.34 ***	-10.00 ***
	(1.97)	(1.43)	(2.22)	(1.64)
Child's health care caused financial problem	2.82	1.45	0.38	-1.06
	(2.49)	(1.05)	(1.28)	(1.75)
Stopped working due to child's health	4.42 *	-0.66	0.98	1.63
	(2.58)	(0.92)	(1.35)	(1.56)
Had to cut work hours to care for child	1.69	0.84	-1.96	-2.80 *
	(2.23)	(1.29)	(1.66)	(1.62)
Provided health care at home for child	-2.16	-2.49	0.07	2.55
	(4.46)	(1.78)	(1.38)	(2.43)

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to publicly-insured children, and “with control group” where the sample also includes privately-insured children. Table shows estimated coefficients on three variables only: fee ratio is 0.90 or higher; sum of fee ratio is 0.90 or higher and interaction between child has public insurance and fee ratio is 0.90 or higher; interaction between child has public insurance and fee ratio is 0.90 or higher. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. The sample size is 48,405 for all outcomes, except for those in Panel C: not getting needed routine care (40,624), specialty doctor (24,676), mental health care (11,712), and therapy (10,884). * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Table 4: Effects of Medicaid physician fees using low parental education (less than high school) as a proxy for Medicaid

	No control group	With control group		
	Fee effect on public	Fee effect on private	Fee effect on public	Difference
Outcome	(1)	(2)	(3)	(4)
Panel A: Not having a usual source of care				
No usual source of care	-9.25 *	-1.11	-3.29	-2.18
	(5.21)	(1.51)	(2.72)	(2.58)
No usual source of care in doctor's office	-9.92	-1.65	-2.77	-1.12
	(7.99)	(2.11)	(5.48)	(4.70)
No regular health care provider	-0.53	-0.12	1.22	1.34
	(5.11)	(1.42)	(3.41)	(4.30)
Panel B: Having difficulties/delays accessing services				
Difficulty/delay in access due to cost	-7.08 *	-0.20	-3.40	-3.20 *
	(4.20)	(1.04)	(2.28)	(1.75)
Difficulty/delay in access due to waiting lists/backlog	-10.50 ***	-1.62	-5.31 ***	-3.69 *
	(3.73)	(1.01)	(1.58)	(2.12)
Difficulty/delay in access due to lack of availability in area	-1.50	-0.25	0.98	1.23
	(2.11)	(0.88)	(2.64)	(2.37)
Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability				
Did not get needed routine care	-2.98 *	-0.75	-0.66	0.09
	(1.53)	(0.45)	(0.64)	(0.66)
Did not get needed specialty doctor care	-15.67 **	-1.98 *	-4.76	-2.79
	(5.88)	(1.16)	(2.84)	(2.41)
Did not get needed mental health care	-7.49	-2.25	-3.77	-1.52
	(4.88)	(1.76)	(4.27)	(4.31)
Did not get needed therapy	-2.30	-0.09	-2.74 **	-2.65
	(3.32)	(1.66)	(1.30)	(1.82)
Panel D: Inadequacy of health insurance coverage				
Costs covered by insurance never or sometimes reasonable	-0.15	0.90	-9.13 **	-10.03 ***
	(7.19)	(1.55)	(4.30)	(3.38)
Insurance never or sometimes covers needed providers	-0.17	0.49	-6.07 *	-6.56 ***
	(6.89)	(1.61)	(3.04)	(2.02)
Insurance benefits/coverage never or sometimes meet needs	-3.24	-0.03	-10.98 ***	-10.95 ***
	(6.14)	(1.00)	(2.65)	(2.59)

		Panel E: Family affected by child's health		
Spent over $500 out of pocket	-1.17	-2.41	-9.07 **	-6.66 *
	(4.13)	(1.78)	(4.43)	(3.91)
Child's health care caused financial problem	0.20	1.30	-1.87	-3.17
	(5.17)	(0.79)	(3.32)	(3.47)
Stopped working due to child's health	3.81	-0.31	1.35	1.66
	(5.35)	(0.78)	(2.83)	(2.88)
Had to cut work hours to care for child	-7.91	-0.19	-3.43	-3.24
	(6.40)	(1.31)	(4.73)	(5.05)
Provided health care at home for child	-3.94	-1.71	0.32	2.03
	(7.65)	(1.30)	(2.73)	(3.47)

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to children with parental education less than high school, and “with control group” where the sample also includes children with parental education of at least high school. Table shows estimated coefficients on three variables only: fee ratio is 0.90 or higher; sum of fee ratio is 0.90 or higher and interaction between parental education is less than high school and fee ratio is 0.90 or higher; interaction between parental education is less than high school and fee ratio is 0.90 or higher. Models also include child age, female, race/ethnicity, household size, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. The sample size is 48,405 for all outcomes, except for those in Panel C: not getting needed routine care (40,624), specialty doctor (24,676), mental health care (11,712), and therapy (10,884). * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Table 5: Effects of Medicaid physician fees by subgroup, with control group

	Age Group			***Gender***	
	Ages 0-5	Ages 6-11	Ages 12-17	Female	Male
Outcome	(1)	(2)	(3)	(4)	(5)
			Panel A: Not having a usual source of care		
No usual source of care	-1.53	1.29	-2.89 *	-1.19	-0.32
	(2.08)	(2.13)	(1.65)	(1.16)	(1.36)
		0.273	*0.669*		*0.670*
No usual source of care in doctor's office	-3.58	-6.15 **	-7.12 **	-7.97 ***	-4.49 *
	(5.45)	(2.65)	(2.99)	(2.37)	(2.41)
		0.679	*0.517*		*0.190*
No regular health care provider	-0.33	-4.26 ***	-1.66	-5.14 ***	-0.84
	(1.80)	(1.54)	(3.54)	(1.72)	(1.60)
		0.081	*0.759*		*0.013*
			Panel B: Having difficulties/delays accessing services		
Difficulty/delay in access due to cost	3.30	-5.08 ***	-1.54	-0.95	-2.54
	(2.63)	(1.42)	(1.82)	(1.34)	(2.33)
		0.002	*0.101*		*0.613*
Difficulty/delay in access due to waiting lists/backlog	-2.57	-2.43	-1.19	-5.22 **	0.17
	(2.05)	(3.41)	(2.33)	(2.33)	(1.36)
		0.975	*0.646*		*0.066*
Difficulty/delay in access due to lack of availability in area	4.31	0.37	-2.54	0.27	0.22
	(3.48)	(1.94)	(1.66)	(1.55)	(1.46)
		0.160	*0.098*		*0.971*
			Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability		
Did not get needed routine care	-0.30	0.24	-0.87 **	-0.53	-0.15
	(0.44)	(0.53)	(0.42)	(0.35)	(0.46)
		0.371	*0.414*		*0.574*
Did not get needed specialty doctor care	-0.34	-5.53 ***	-0.47	-2.80 **	-2.53 *
	(1.39)	(2.03)	(2.33)	(1.18)	(1.44)
		0.038	*0.969*		*0.885*
Did not get needed mental health care	-9.07	-7.64 *	3.13	0.18	-4.64 *
	(7.55)	(3.87)	(3.97)	(5.66)	(2.53)
		0.884	*0.187*		*0.414*
Did not get needed therapy	-0.33	-1.33	-6.24	-2.08	-2.11
	(5.89)	(3.09)	(4.82)	(5.08)	(2.77)
		0.877	*0.357*		*0.995*

	Panel D: Inadequacy of health insurance coverage				
Costs covered by insurance never or sometimes reasonable	-13.32 ***	-8.45 ***	-2.13	-7.33 **	-6.81 ***
	(4.33)	(2.97)	(3.50)	(3.13)	(1.81)
		0.367	*0.123*		*0.875*
Insurance never or sometimes covers needed providers	-3.71	-4.27 ***	1.07	-4.10 *	-0.99
	(2.53)	(1.38)	(2.37)	(2.03)	(2.47)
		0.844	*0.173*		*0.461*
Insurance benefits/coverage never or sometimes meet needs	-6.05	-8.15 ***	-2.42	-3.35 **	-6.67 ***
	(3.86)	(1.98)	(2.54)	(1.43)	(1.90)
		0.597	*0.428*		*0.011*
	Panel E: Family affected by child's health				
Spent over $500 out of pocket	-13.29 ***	-10.63 ***	-7.44 **	-9.52 ***	-10.46 ***
	(3.18)	(3.64)	(3.13)	(2.45)	(1.91)
		0.617	*0.194*		*0.740*
Child's health care caused financial problem	3.31	-1.66	-2.59	-1.29	-1.03
	(3.46)	(2.44)	(3.31)	(2.44)	(2.22)
		0.273	*0.183*		*0.935*
Stopped working due to child's health	8.34 ***	-0.79	1.31	-2.12	4.13 *
	(2.96)	(2.54)	(1.88)	(1.55)	(2.12)
		0.020	*0.062*		*0.011*
Had to cut work hours to care for child	-4.59	-2.17	-2.00	-3.91 **	-2.00
	(3.59)	(1.92)	(2.58)	(1.78)	(2.12)
		0.570	*0.578*		*0.406*
Provided health care at home for child	-2.82	4.30	2.59	-3.60	6.53 *
	(5.19)	(2.93)	(3.75)	(2.63)	(3.58)
		0.190	*0.322*		*0.036*
N	8,548	18,920	20,937	19,362	29,043

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Table shows estimated coefficient on the main variable of interest only: sum of fee ratio is 0.90 or higher and interaction between child has public insurance and fee ratio is 0.90 or higher. For each outcome variable, the bottom row reports p-values for differences from the baseline group. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Table 5: (Continued) Effects of Medicaid physician fees by subgroup, with control group

	Race				***Parental Education***			***Severity of Conditions***			
	White		Nonwhite		At least HS		Less than HS	Not severe		Severe	
Outcome	(1)		(2)		(3)		(4)	(5)		(6)	
Panel A: Not having a usual source of care											
No usual source of care	-2.10	**	1.68		-0.06		-16.48	0.14		-4.79	*
	(0.92)		(2.19)		(0.76)		(16.40)	(0.95)		(2.43)	
			0.134				*0.331*	*0.095*			
No usual source of care in doctor's office	-5.52	**	-7.61		-5.62	**	-21.81	-4.56	***	-15.50	**
	(2.58)		(4.55)		(2.28)		(14.14)	(1.35)		(7.63)	
			0.718				*0.309*	*0.128*			
No regular health care provider	-3.75	***	-0.86		-2.91	***	-0.16	-1.57		-6.36	**
	(1.16)		(3.64)		(1.03)		(5.30)	(1.62)		(2.37)	
			0.452				*0.597*			*0.177*	
Panel B: Having difficulties/delays accessing services											
Difficulty/delay in access due to cost	-0.61		-4.56		-0.90		-9.81	-1.75		-4.47	*
	(1.40)		(3.40)		(1.57)		(8.38)	(1.35)		(2.33)	
			0.315				*0.327*	*0.282*			
Difficulty/delay in access due to waiting lists/backlog	-0.61		-4.11	*	-1.26		-3.52	-0.50		-15.20	***
	(1.59)		(2.25)		(1.27)		(9.00)	(1.67)		(5.62)	
			0.236				*0.802*	*0.025*			
Difficulty/delay in access due to lack of availability in area	0.36		-0.67		0.35		-10.68	0.36		-2.80	
	(1.02)		(2.84)		(1.41)		(12.62)	(1.60)		(3.56)	
			0.748				*0.376*			*0.438*	
Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability											
Did not get needed routine care	-0.95	***	0.92		-0.39		-0.98	-0.40		0.34	
	(0.28)		(0.57)		(0.30)		(2.98)	(0.32)		(1.60)	
			0.013				*0.851*	*0.683*			
Did not get needed specialty doctor care	-2.20		-4.07	*	-2.28	**	-4.05	-3.23	**	0.47	
	(1.56)		(2.32)		(1.08)		(5.03)	(1.28)		(1.34)	
			0.559				*0.748*	*0.090*			
Did not get needed mental health care	-2.20		-4.22		-3.28		5.30	-1.73		-3.86	
	(3.51)		(5.08)		(2.42)		(3.65)	(3.34)		(7.76)	
			0.761				*0.062*	*0.815*			
Did not get needed therapy	-1.77		-5.09		-1.96		2.40	-2.55		-2.19	
	(3.64)		(5.28)		(3.44)		(3.25)	(2.28)		(5.53)	
			0.607				*0.327*			*0.923*	

Panel D: Inadequacy of health insurance coverage												
Costs covered by insurance never or sometimes reasonable	-5.98	***	-11.43	***	-5.35	***	-11.23		-7.07	***	-6.39	*
	(1.85)		(2.94)		(1.61)		(13.14)		(2.28)		(3.68)	
			0.051				*0.665*		*0.896*			
Insurance never or sometimes covers needed providers	-1.26		-4.17	***	-0.62		1.99		-1.56		-6.61	*
	(1.34)		(1.35)		(0.94)		(4.83)		(1.61)		(3.35)	
			0.113				*0.588*		*0.234*			
Insurance benefits/coverage never or sometimes meet needs	-4.09	***	-9.45	***	-2.60		-17.81	*	-6.05	***	-2.64	
	(1.31)		(3.47)		(2.08)		(10.29)		(1.59)		(3.23)	
			0.095				*0.159*				*0.260*	
Panel E: Family affected by child's health												
Spent over $500 out of pocket	-9.96	***	-9.22	***	-9.77	***	0.91		-10.45	***	-5.97	*
	(2.36)		(2.01)		(1.75)		(13.12)		(1.56)		(3.14)	
			0.823				*0.408*		*0.177*			
Child's health care caused financial problem	-0.65		-3.77		-0.56		-4.45		-1.28		-1.69	
	(1.92)		(2.92)		(1.47)		(14.93)		(2.35)		(6.70)	
			0.434				*0.792*		*0.960*			
Stopped working due to child's health	3.78		-2.07		1.96		-3.73		0.23		9.91	*
	(2.94)		(3.25)		(1.81)		(7.02)		(1.62)		(5.45)	
			0.280				*0.425*		*0.101*			
Had to cut work hours to care for child	-2.03		-5.92	**	-1.63		-19.85		-2.43		-0.32	
	(2.35)		(2.58)		(1.31)		(14.17)		(1.62)		(5.81)	
			0.342				*0.201*		*0.708*			
Provided health care at home for child	4.37		-2.20		1.71		5.33		2.90		1.63	
	(4.50)		(4.72)		(2.19)		(12.89)		(2.63)		(7.64)	
			0.419				*0.784*				*0.873*	
N	38,231		10,174		45,716		2,689		43,813		4,592	

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Table shows estimated coefficient on the main variable of interest only: sum of fee ratio is 0.90 or higher and interaction between child has public insurance and fee ratio is 0.90 or higher. For each outcome variable, the third row reports p-values for differences from the baseline group. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 1: Covariate balance using low parental education (less than high school) as a proxy for Medicaid

	No control group	With control group		
Outcome	Fee effect on public	Fee effect on private	Fee effect on public	Difference
Age 0-2	2.52	0.37	-1.96	-2.33
	(2.33)	(1.25)	(1.59)	(2.36)
Age 3-5	-4.88	-3.61 ***	-3.77 *	-0.16
	(4.91)	(0.71)	(1.98)	(1.85)
Age 6-8	10.29 **	0.22	2.29	2.06
	(4.79)	(1.17)	(4.02)	(3.91)
Age 9-11	-7.16	2.01	-3.64	-5.64 *
	(5.65)	(1.34)	(3.30)	(3.19)
Age 12-14	8.27	1.95 *	9.17 ***	7.22 **
	(5.54)	(1.11)	(2.82)	(2.99)
Age 15-17	-9.03 **	-0.95	-2.09	-1.14
	(4.33)	(1.47)	(2.42)	(2.86)
Female	-0.62	-0.71	-10.32 **	-9.61 *
	(4.95)	(1.34)	(4.75)	(4.81)
White	1.79	0.56	-3.24	-3.80
	(5.62)	(1.23)	(3.28)	(3.56)
Latino	2.70	0.83	-2.99	-3.82
	(3.82)	(1.96)	(5.89)	(5.31)
African-American	-5.87	-1.32	-0.28	1.05
	(4.15)	(1.08)	(4.15)	(4.67)
Other	4.08	0.77	3.52	2.75
	(5.71)	(0.89)	(3.43)	(3.74)
Household size 2	-4.39 ***	-0.30	-3.29 ***	-2.99 *
	(1.46)	(0.68)	(1.20)	(1.52)
Household size 3	-6.15	-0.87	-5.58 **	-4.71
	(6.16)	(1.72)	(2.47)	(3.26)
Household size 4	10.36	0.08	2.06	1.98
	(10.48)	(1.85)	(6.54)	(7.22)
Household size 5	-1.62	-1.85	8.40	10.25 **
	(8.30)	(1.32)	(5.17)	(4.81)
Household size 6 or more	1.81	2.94 *	-1.59	-4.53
	(6.45)	(1.51)	(4.87)	(5.30)

Child's health/behavioral conditions greatly affect life	5.74	-0.66	3.41 **	4.08 **
	(4.27)	(0.96)	(1.58)	(1.66)

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: "no control group" where the sample is restricted to children with parental education less than high school, and "with control group" where the sample also includes children with parental education of at least high school. Table shows estimated coefficients on three variables only: fee ratio is 0.90 or higher; sum of fee ratio is 0.90 or higher and interaction between parental education is less than high school and fee ratio is 0.90 or higher; interaction between parental education is less than high school and fee ratio is 0.90 or higher. Models also include, where appropriate, child age, female, race/ethnicity, household size, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. The sample size is 48,405. * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 2: Effects of Medicaid physician fees using 0.80 as the cutoff for a high fee

	No control group		**With control group**					
	Fee effect on public		Fee effect on private		Fee effect on public		Difference	
Outcome	(1)		(2)		(3)		(4)	
			Panel A: Not having a usual source of care					
No usual source of care	-2.21		-1.25		-1.76		-0.51	
	(2.15)		(1.10)		(1.53)		(0.90)	
No usual source of care in doctor's office	-3.60		1.58		-3.65		-5.23	***
	(5.22)		(1.86)		(2.50)		(1.91)	
No regular health care provider	-4.68	**	-1.07		-3.28	**	-2.21	*
	(1.76)		(0.86)		(1.44)		(1.11)	
			Panel B: Having difficulties/delays accessing services					
Difficulty/delay in access due to cost	-0.24		0.66		0.20		-0.46	
	(1.69)		(1.01)		(1.34)		(1.31)	
Difficulty/delay in access due to waiting lists/backlog	-3.50	**	-0.40		-2.68	***	-2.28	*
	(1.60)		(0.71)		(0.90)		(1.14)	
Difficulty/delay in access due to lack of availability in area	1.25		1.12		1.28		0.16	
	(1.71)		(0.71)		(1.06)		(1.18)	
			Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability					
Did not get needed routine care	-0.74		-0.18		-0.23		-0.05	
	(1.13)		(0.36)		(0.40)		(0.18)	
Did not get needed specialty doctor care	0.22		1.63		1.16		-0.47	
	(2.52)		(0.97)		(1.73)		(1.71)	
Did not get needed mental health care	-0.20		-1.80		-1.91		-0.10	
	(2.47)		(2.56)		(2.43)		(2.23)	
Did not get needed therapy	4.47	*	0.77		1.99		1.23	
	(2.44)		(1.35)		(1.68)		(1.79)	
			Panel D: Inadequacy of health insurance coverage					
Costs covered by insurance never or sometimes reasonable	-2.34		1.89		-5.09	***	-6.98	***
	(3.14)		(1.64)		(1.81)		(1.61)	
Insurance never or sometimes covers needed providers	8.18	**	3.04	**	1.71		-1.33	
	(3.26)		(1.41)		(1.03)		(1.24)	
Insurance benefits/coverage never or sometimes meet needs	4.56		2.98	***	-2.23		-5.21	***
	(3.30)		(0.95)		(1.37)		(1.40)	

	Panel E: Family affected by child's health					
Spent over $500 out of pocket	0.51	1.33	-6.48	***	-7.81	***
	(1.57)	(1.35)	(1.70)		(1.91)	
Child's health care caused financial problem	0.23	0.17	-0.99		-1.16	
	(1.88)	(1.09)	(1.24)		(1.02)	
Stopped working due to child's health	1.86	-0.38	0.25		0.63	
	(2.39)	(0.75)	(1.14)		(1.17)	
Had to cut work hours to care for child	-3.57	-1.16	-4.85	***	-3.69	***
	(2.23)	(1.01)	(1.22)		(1.29)	
Provided health care at home for child	-4.68	-0.93	0.96		1.89	
	(4.07)	(1.68)	(1.73)		(2.12)	

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to publicly-insured children, and “with control group” where the sample also includes privately-insured children. Table shows estimated coefficients on three variables only: fee ratio is 0.80 or higher; sum of fee ratio is 0.80 or higher and interaction between child has public insurance and fee ratio is 0.80 or higher; interaction between child has public insurance and fee ratio is 0.80 or higher. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. The sample size is 48,405 for all outcomes, except for those in Panel C: not getting needed routine care (40,624), specialty doctor (24,676), mental health care (11,712), and therapy (10,884). * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 3: Effects of Medicaid physician fees using a linear measure of the fee ratio

	No control group	**With control group**		
	Fee effect on public	Fee effect on private	Fee effect on public	Difference
Outcome	(1)	(2)	(3)	(4)
Panel A: Not having a usual source of care				
No usual source of care	-15.33 **	-4.84	-7.44	-2.60
	(7.24)	(4.30)	(4.76)	(3.35)
No usual source of care in doctor's office	-22.65	3.13	-15.79 *	-18.92 ***
	(18.81)	(7.75)	(8.31)	(3.36)
No regular health care provider	-15.83 *	-3.04	-7.07	-4.02
	(8.10)	(3.36)	(4.32)	(4.07)
Panel B: Having difficulties/delays accessing services				
Difficulty/delay in access due to cost	-3.07	0.44	-0.54	-0.98
	(6.79)	(3.79)	(4.02)	(2.98)
Difficulty/delay in access due to waiting lists/backlog	-14.09 ***	-4.52 **	-8.82 ***	-4.30 **
	(4.57)	(1.95)	(2.27)	(2.06)
Difficulty/delay in access due to lack of availability in area	5.28	6.25 ***	4.47	-1.78
	(7.16)	(2.17)	(2.77)	(2.04)
Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability				
Did not get needed routine care	-8.88 *	-2.24	-3.04 *	-0.80 **
	(4.57)	(1.61)	(1.62)	(0.35)
Did not get needed specialty doctor care	-8.33	-0.11	1.10	1.21
	(4.98)	(1.93)	(3.22)	(3.93)
Did not get needed mental health care	-1.54	3.50	0.90	-2.60
	(8.68)	(8.26)	(8.63)	(4.99)
Did not get needed therapy	7.98	0.11	-0.32	-0.43
	(5.23)	(3.20)	(3.65)	(3.85)
Panel D: Inadequacy of health insurance coverage				
Costs covered by insurance never or sometimes reasonable	4.19	5.12	-10.81 *	-15.94 ***
	(11.87)	(5.15)	(6.42)	(5.66)
Insurance never or sometimes covers needed providers	20.43	7.31 *	1.00	-6.31 ***
	(13.73)	(3.64)	(4.41)	(1.92)
Insurance benefits/coverage never or sometimes meet needs	14.04	10.06 **	-6.53	-16.59 ***
	(15.45)	(4.20)	(4.31)	(2.66)

	Panel E: Family affected by child's health					
Spent over $500 out of pocket	7.77	1.79	-21.14	***	-22.93	***
	(5.21)	(5.44)	(5.89)		(3.71)	
Child's health care caused financial problem	-1.59	2.57	-6.23	*	-8.80	***
	(7.07)	(2.78)	(3.26)		(2.53)	
Stopped working due to child's health	7.77	-0.40	-1.24		-0.84	
	(11.31)	(3.73)	(4.86)		(3.58)	
Had to cut work hours to care for child	-10.31	-3.97	-9.83	*	-5.86	
	(9.44)	(3.61)	(4.90)		(4.22)	
Provided health care at home for child	-9.88	-0.01	4.09		4.10	
	(18.24)	(5.54)	(6.74)		(5.04)	

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to publicly-insured children, and “with control group” where the sample also includes privately-insured children. Table shows estimated coefficients on three variables only: fee ratio; sum of fee ratio and interaction between child has public insurance and fee ratio; interaction between child has public insurance and fee ratio. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. The sample size is 48,405 for all outcomes, except for those in Panel C: not getting needed routine care (40,624), specialty doctor (24,676), mental health care (11,712), and therapy (10,884). * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 4: Effects of Medicaid physician fees (including Public Ins x Survey Year and Public Ins x State FEs)

	No control group	**With control group**		
	Fee effect on public	Fee effect on private	Fee effect on public	Difference
Outcome	(1)	(2)	(3)	(4)
	Panel A: Not having a usual source of care			
No usual source of care	-1.12	-1.27	-1.35	-0.08
	(1.20)	(1.68)	(2.15)	(2.27)
No usual source of care in doctor's office	-1.37	-0.57	-1.61	-1.03
	(2.81)	(1.69)	(3.95)	(3.46)
No regular health care provider	1.49	0.80	-1.35	-2.16
	(1.26)	(1.53)	(1.96)	(2.66)
	Panel B: Having difficulties/delays accessing services			
Difficulty/delay in access due to cost	-1.24	0.49	-2.53	-3.02
	(1.77)	(0.83)	(2.16)	(2.13)
Difficulty/delay in access due to waiting lists/backlog	-3.97 *	-0.38	-4.62 ***	-4.24 **
	(2.05)	(1.00)	(1.52)	(1.65)
Difficulty/delay in access due to lack of availability in area	-0.53	0.04	-0.82	-0.86
	(1.69)	(0.90)	(1.75)	(1.88)
	Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability			
Did not get needed routine care	-0.31	-0.09	-2.45 *	-2.36 *
	(0.27)	(0.30)	(1.29)	(1.28)
Did not get needed specialty doctor care	-5.20 ***	-1.24	-3.49 *	-2.25
	(1.65)	(1.13)	(1.90)	(1.74)
Did not get needed mental health care	-0.77	-1.61	-2.50	-0.89
	(2.24)	(2.75)	(2.07)	(3.60)
Did not get needed therapy	-0.27	1.27	-2.63	-3.90
	(3.40)	(1.56)	(3.11)	(3.93)
	Panel D: Inadequacy of health insurance coverage			
Costs covered by insurance never or sometimes reasonable	0.84	1.30	0.02	-1.27
	(2.08)	(1.55)	(3.66)	(3.65)
Insurance never or sometimes covers needed providers	-0.08	-0.02	1.15	1.17
	(1.47)	(1.32)	(4.15)	(3.87)
Insurance benefits/coverage never or sometimes meet needs	-1.84	-0.34	0.07	0.41
	(1.99)	(1.08)	(3.05)	(3.29)

	Panel E: Family affected by child's health			
Spent over $500 out of pocket	1.45	-1.88	-2.09	-0.21
	(1.13)	(1.34)	(2.41)	(2.29)
Child's health care caused financial problem	2.34	0.67	2.62	1.95
	(1.56)	(1.06)	(2.20)	(2.73)
Stopped working due to child's health	0.93	-1.33 *	3.26	4.59
	(1.18)	(0.77)	(2.77)	(3.06)
Had to cut work hours to care for child	-0.76	1.09	-1.18	-2.26
	(1.69)	(1.23)	(2.62)	(2.90)
Provided health care at home for child	-0.03	-0.75	-4.73 *	-3.97
	(1.57)	(1.18)	(2.80)	(2.72)

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to publicly-insured children, and “with control group” where the sample also includes privately-insured children. Table shows estimated coefficients on three variables only: fee ratio is 0.90 or higher; sum of fee ratio is 0.90 or higher and interaction between child has public insurance and fee ratio is 0.90 or higher; interaction between child has public insurance and fee ratio is 0.90 or higher. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, state-level controls, and interactions between public insurance and 2010 survey indicator, and between public insurance and state fixed effects. The sample size is 48,405 for all outcomes, except for those in Panel C: not getting needed routine care (40,624), specialty doctor (24,676), mental health care (11,712), and therapy (10,884). * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 5: Effects of Medicaid physician fees using low parental education (less than high school) as a proxy for Medicaid (including Public Ins x Survey Year and Public Ins X State FEs)

	No control group	**With control group**		
	Fee effect on public	Fee effect on private	Fee effect on public	Difference
Outcome	(1)	(2)	(3)	(4)
	Panel A: Not having a usual source of care			
No usual source of care	-1.45	-0.77	-6.56	-5.79
	(3.22)	(1.37)	(4.10)	(3.62)
No usual source of care in doctor's office	2.98	-1.24	-6.55	-5.31
	(4.71)	(1.86)	(6.47)	(5.29)
No regular health care provider	5.59	0.07	-0.27	-0.34
	(4.09)	(1.62)	(4.82)	(6.05)
	Panel B: Having difficulties/delays accessing services			
Difficulty/delay in access due to cost	-3.35	-0.29	-3.36	-3.07
	(2.96)	(1.08)	(2.99)	(2.72)
Difficulty/delay in access due to waiting lists/backlog	-5.45 **	-1.44	-7.33 **	-5.89
	(2.67)	(1.07)	(2.92)	(3.53)
Difficulty/delay in access due to lack of availability in area	-0.33	-0.36	1.04	1.39
	(3.16)	(0.87)	(2.50)	(2.27)
	Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability			
Did not get needed routine care	0.24	-0.48	-3.12	-2.65
	(0.83)	(0.42)	(2.03)	(2.06)
Did not get needed specialty doctor care	-11.50 **	-1.56	-9.88 ***	-8.32 **
	(4.69)	(1.32)	(3.46)	(3.59)
Did not get needed mental health care	-1.12	-1.84	-8.89 **	-7.06
	(4.03)	(1.84)	(3.56)	(4.20)
Did not get needed therapy	0.49	0.32	-3.96	-4.28
	(2.18)	(1.90)	(2.71)	(3.93)
	Panel D: Inadequacy of health insurance coverage			
Costs covered by insurance never or sometimes reasonable	-1.01	0.00	-0.55	-0.55
	(4.14)	(1.43)	(5.89)	(5.33)
Insurance never or sometimes covers needed providers	-2.82	-0.17	0.59	0.76
	(2.91)	(1.40)	(4.96)	(4.11)
Insurance benefits/coverage never or sometimes meet needs	-2.48	-0.31	-6.10	-5.79
	(3.60)	(0.92)	(3.85)	(3.96)

	Panel E: Family affected by child's health			
Spent over $500 out of pocket	1.40	-2.65	-3.96	-1.31
	(4.18)	(1.78)	(3.64)	(3.09)
Child's health care caused financial problem	1.27	1.04	0.64	-0.40
	(4.22)	(0.75)	(4.32)	(4.53)
Stopped working due to child's health	2.19	-0.98	5.81	6.80
	(3.94)	(0.75)	(4.65)	(4.80)
Had to cut work hours to care for child	-5.31	0.09	-6.22	-6.30
	(4.22)	(1.32)	(5.91)	(6.30)
Provided health care at home for child	2.95	-1.38	-4.64	-3.26
	(2.66)	(1.03)	(4.72)	(4.89)

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to children with parental education less than high school, and “with control group” where the sample also includes children with parental education of at least high school. Table shows estimated coefficients on three variables only: fee ratio is 0.90 or higher; sum of fee ratio is 0.90 or higher and interaction between parental education is less than high school and fee ratio is 0.90 or higher; interaction between parental education is less than high school and fee ratio is 0.90 or higher. Models also include child age, female, race/ethnicity, household size, severity indicator, state fixed effects, an indicator for 2010 survey, state-level controls, and interactions between low parental education and 2010 survey indicator, and between low parental education and state fixed effects. The sample size is 48,405 for all outcomes, except for those in Panel C: not getting needed routine care (40,624), specialty doctor (24,676), mental health care (11,712), and therapy (10,884). * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 6: Effects of Medicaid physician fees by subgroup, no control group					
	Age Group			***Gender***	
	Ages 0-5	Ages 6-11	Ages 12-17	Female	Male
Outcome	(1)	(2)	(3)	(4)	(5)
	Panel A: Not having a usual source of care				
No usual source of care	-4.87	-0.85	-3.75	-3.36	-2.88
	(4.61)	(2.13)	(3.22)	(2.23)	(2.51)
		0.416	*0.832*		*0.861*
No usual source of care in doctor's office	1.69	-8.44	-6.50	-9.32	-2.62
	(7.60)	(7.10)	(7.32)	(8.41)	(3.77)
		0.250	*0.361*		*0.359*
No regular health care provider	-3.21	-0.01	-3.34	-0.94	-3.43
	(3.11)	(2.94)	(5.04)	(3.32)	(2.46)
		0.400	*0.986*		*0.568*
	Panel B: Having difficulties/delays accessing services				
Difficulty/delay in access due to cost	5.99	-6.05 **	-6.89 **	-4.72 *	-2.41
	(5.11)	(2.80)	(2.81)	(2.70)	(3.12)
		0.034	*0.019*		*0.547*
Difficulty/delay in access due to waiting lists/backlog	-1.94	-7.62 **	-8.03 **	-8.82 ***	-4.96 **
	(3.58)	(2.92)	(3.13)	(2.29)	(2.05)
		0.245	*0.296*		*0.165*
Difficulty/delay in access due to lack of availability in area	9.01 *	-0.79	-5.28 *	0.87	-0.87
	(4.79)	(2.40)	(2.88)	(2.84)	(2.08)
		0.038	*0.018*		*0.500*
	Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability				
Did not get needed routine care	-2.59	0.31	-5.09 **	-2.28	-2.08 **
	(1.57)	(0.67)	(2.50)	(2.12)	(0.83)
		0.078	*0.236*		*0.906*
Did not get needed specialty doctor care	-1.89	-11.69 ***	-7.87 *	-6.40 *	-6.82 ***
	(1.85)	(4.11)	(4.22)	(3.70)	(2.05)
		0.031	*0.182*		*0.917*
Did not get needed mental health care	-10.44	-11.15 ***	2.81	-2.74	-7.97 ***
	(10.50)	(3.61)	(4.28)	(4.78)	(2.76)
		0.945	*0.314*		*0.383*
Did not get needed therapy	-2.00	0.25	-11.74	-0.28	-1.72
	(4.83)	(3.60)	(7.23)	(5.14)	(4.22)
		0.545	*0.158*		*0.817*

	Panel D: Inadequacy of health insurance coverage				
Costs covered by insurance never or sometimes reasonable	-4.70	0.16	0.92	-3.37	2.81
	(6.22)	(3.85)	(5.31)	(6.31)	(3.87)
		0.356	*0.507*		*0.338*
Insurance never or sometimes covers needed providers	1.54	-5.38	8.94 *	0.58	1.62
	(7.72)	(5.25)	(4.54)	(3.48)	(7.20)
		0.238	*0.265*		*0.878*
Insurance benefits/coverage never or sometimes meet needs	4.34	-3.80	-3.04	-1.57	-0.43
	(6.36)	(5.31)	(3.38)	(3.45)	(5.41)
		0.171	*0.288*		*0.813*
	Panel E: Family affected by child's health				
Spent over $500 out of pocket	6.77 **	-1.93	0.37	0.37	2.27
	(3.29)	(3.17)	(4.24)	(2.27)	(3.48)
		0.016	*0.325*		*0.699*
Child's health care caused financial problem	4.57	0.60	4.32	-2.22	5.58 *
	(4.90)	(3.01)	(5.56)	(4.69)	(3.03)
		0.532	*0.975*		*0.179*
Stopped working due to child's health	17.72 ***	-3.43	0.98	5.01	3.27
	(4.46)	(4.09)	(3.44)	(3.45)	(2.86)
		0.003	*0.003*		*0.676*
Had to cut work hours to care for child	-4.53	-0.47	8.09	4.51	0.14
	(5.24)	(2.79)	(5.81)	(4.29)	(2.84)
		0.559	*0.113*		*0.362*
Provided health care at home for child	-2.27	-1.26	-2.30	-12.45	4.36
	(6.73)	(5.88)	(7.20)	(8.04)	(4.41)
		0.922	*0.998*		*0.043*
N	8,548	18,920	20,937	19,362	29,043

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Table shows estimated coefficient on the main variable of interest only: fee ratio is 0.90 or higher. For each outcome variable, the bottom row reports p-values for differences from the baseline group. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 6: (Continued) Effects of Medicaid physician fees by subgroup, no control group						
	Race		***Parental Education***		***Severity of Conditions***	
	White	Nonwhite	At least HS	Less than HS	Not severe	Severe
Outcome	(1)	(2)	(3)	(4)	(5)	(6)
	Panel A: Not having a usual source of care					
No usual source of care	-1.63	-6.48 **	-1.28	-7.45	-1.61	-8.95 **
	(1.66)	(2.88)	(2.04)	(5.05)	(1.84)	(4.02)
		0.084		*0.297*	*0.043*	
No usual source of care in doctor's office	-1.57	-12.71	-3.41	-9.99	-3.41	-11.78
	(3.97)	(8.59)	(4.92)	(6.97)	(4.63)	(9.20)
		0.164		*0.300*	*0.299*	
No regular health care provider	-5.72 ***	3.85	-1.97	-1.36	-2.05	-2.47
	(2.07)	(2.42)	(2.02)	(5.46)	(1.96)	(4.16)
		0.001		*0.923*		*0.925*
	Panel B: Having difficulties/delays accessing services					
Difficulty/delay in access due to cost	-2.96	-5.80 *	-1.90	-9.74 **	-4.52 **	-1.65
	(2.74)	(3.39)	(3.07)	(4.28)	(1.96)	(5.29)
		0.449		*0.154*	*0.545*	
Difficulty/delay in access due to waiting lists/backlog	-6.48 ***	-6.75 **	-4.08	-12.93 ***	-5.74 **	-10.84 **
	(1.89)	(2.86)	(2.51)	(4.62)	(2.47)	(5.05)
		0.933		*0.165*	*0.459*	
Difficulty/delay in access due to lack of availability in area	-3.34 *	4.27	0.13	-1.04	-1.69	5.62
	(1.90)	(4.24)	(2.24)	(2.49)	(2.09)	(6.15)
		0.106		*0.543*		*0.270*
	Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability					
Did not get needed routine care	-2.38	-1.54	-1.92	-2.40	-1.66	-4.16 *
	(2.23)	(0.94)	(1.53)	(1.62)	(1.67)	(2.32)
		0.766		*0.829*	*0.462*	
Did not get needed specialty doctor care	-2.48	-16.71 ***	-3.02	-19.11 **	-7.47 **	-3.06
	(2.30)	(4.27)	(2.42)	(7.15)	(3.28)	(3.31)
		0.005		*0.038*	*0.458*	
Did not get needed mental health care	-6.42 **	-6.32	-3.43	-9.05	-2.23	-10.29
	(3.06)	(3.99)	(2.22)	(6.86)	(2.97)	(7.22)
		0.984		*0.439*	*0.343*	
Did not get needed therapy	-3.89	0.67	-1.51	-1.48	-1.17	-6.58
	(2.66)	(6.55)	(4.87)	(4.09)	(3.04)	(5.52)
		0.463		*0.996*		*0.180*

			Panel D: Inadequacy of health insurance coverage			
Costs covered by insurance never or sometimes reasonable	-5.20	9.37	-1.37	-0.22	-0.04	-2.23
	(3.16)	(6.28)	(2.52)	(9.28)	(5.09)	(8.97)
		0.032		*0.891*	*0.859*	
Insurance never or sometimes covers needed providers	-4.43	10.78	0.12	0.65	0.15	4.61
	(3.53)	(7.55)	(3.84)	(9.59)	(5.56)	(8.08)
		0.011		*0.946*	*0.615*	
Insurance benefits/coverage never or sometimes meet needs	-5.97	7.99	-0.96	-3.97	-3.46	5.24
	(3.88)	(4.82)	(3.32)	(8.08)	(3.44)	(7.90)
		0.004		*0.691*		*0.184*
			Panel E: Family affected by child's health			
Spent over $500 out of pocket	1.36	1.57	-0.10	4.78	-0.39	11.95
	(2.59)	(2.83)	(2.04)	(4.01)	(1.24)	(9.70)
		0.953		*0.220*	*0.222*	
Child's health care caused financial problem	-0.52	7.29	2.61	2.47	1.67	5.57
	(4.45)	(5.40)	(2.40)	(6.57)	(3.22)	(7.45)
		0.343		*0.984*	*0.664*	
Stopped working due to child's health	5.12	0.57	1.94	10.06	2.74	9.45
	(3.79)	(4.31)	(2.37)	(6.16)	(2.34)	(7.96)
		0.466		*0.201*	*0.416*	
Had to cut work hours to care for child	-0.37	0.61	2.89	-3.58	0.79	5.39
	(3.44)	(4.74)	(2.76)	(7.18)	(3.62)	(9.68)
		0.890		*0.448*	*0.707*	
Provided health care at home for child	-3.25	0.55	-1.75	-3.43	1.79	-16.72 *
	(4.80)	(8.68)	(3.58)	(8.80)	(4.32)	(9.42)
		0.702		*0.832*		*0.054*
N	38,231	10,174	45,716	2,689	43,813	4,592

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Table shows estimated coefficient on the main variable of interest only: fee ratio is 0.90 or higher. For each outcome variable, the third row reports p-values for differences from the baseline group. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, an indicator for 2010 survey, and state-level controls. * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.

Appendix Table 7: Effects of Medicaid physician fees (including all three waves)

	No control group	With control group		
	Fee effect on public	Fee effect on private	Fee effect on public	Difference
Outcome	(1)	(2)	(3)	(4)
Panel A: Not having a usual source of care				
No usual source of care	-0.90	-0.29	-0.42	-0.12
	(1.32)	(0.85)	(0.90)	(0.69)
No usual source of care in doctor's office	-3.02	0.79	-4.46 **	-5.25 ***
	(3.35)	(1.09)	(2.12)	(1.90)
No regular health care provider	0.27	1.25	-0.01	-1.26
	(1.28)	(1.14)	(0.78)	(1.07)
Panel B: Having difficulties/delays accessing services				
Difficulty/delay in access due to cost	-1.68	0.57	-0.77	-1.34
	(1.58)	(0.59)	(1.16)	(0.90)
Difficulty/delay in access due to waiting lists/backlog	-2.32	-0.13	-1.50	-1.38
	(1.54)	(0.76)	(1.08)	(1.10)
Difficulty/delay in access due to lack of availability in area	0.21	-0.03	0.56	0.59
	(1.14)	(0.45)	(1.07)	(1.08)
Panel C: Not getting needed services due to cost, insurance, waiting times, or lack of availability				
Did not get needed routine care	-1.07 **	-0.24	-0.62 ***	-0.38
	(0.44)	(0.29)	(0.18)	(0.24)
Did not get needed specialty doctor care	-3.26 *	-0.13	-2.36 **	-2.23 **
	(1.62)	(0.49)	(1.05)	(0.95)
Did not get needed mental health care	-1.91	0.64	-2.77 **	-3.40 *
	(1.93)	(1.85)	(1.24)	(2.01)
Did not get needed therapy	-2.67	0.60	-0.55	-1.15
	(2.23)	(1.21)	(2.28)	(3.02)
Panel D: Inadequacy of health insurance coverage				
Costs covered by insurance never or sometimes reasonable	-1.60	2.54 **	-4.56 ***	-7.10 ***
	(1.94)	(1.16)	(1.32)	(1.46)
Insurance never or sometimes covers needed providers	-0.06	1.15	-1.18	-2.33 **
	(2.59)	(0.86)	(1.19)	(1.02)
Insurance benefits/coverage never or sometimes meet needs	-0.19	1.12	-3.97 ***	-5.09 ***
	(2.43)	(0.85)	(1.32)	(1.61)

	Panel E: Family affected by child's health							
Spent over $500 out of pocket	2.11		2.03		-6.17	***	-8.20	***
	(1.62)		(1.32)		(1.75)		(1.18)	
Child's health care caused financial problem	3.68	**	2.23	***	0.70		-1.53	
	(1.61)		(0.73)		(1.06)		(1.18)	
Stopped working due to child's health	1.12		-0.44		-0.05		0.39	
	(1.87)		(0.72)		(0.95)		(0.95)	
Had to cut work hours to care for child	3.45	*	1.10		0.72		-0.38	
	(1.76)		(1.02)		(1.42)		(1.50)	
Provided health care at home for child	-1.99		-1.40		-0.28		1.11	
	(2.97)		(1.53)		(1.16)		(2.00)	

Notes: Table shows estimated coefficients and robust standard errors clustered at the state level in parentheses from linear probability model. Two sets of regressions are estimated: “no control group” where the sample is restricted to publicly-insured children, and “with control group” where the sample also includes privately-insured children. Table shows estimated coefficients on three variables only: fee ratio is 0.90 or higher; sum of fee ratio is 0.90 or higher and interaction between child has public insurance and fee ratio is 0.90 or higher; interaction between child has public insurance and fee ratio is 0.90 or higher. Models also include child age, female, race/ethnicity, household size, parental education, severity indicator, state fixed effects, year fixed effects, and state-level controls. The sample size is 75,285 for all outcomes, except for those in Panel C: not getting needed routine care (62,012), specialty doctor (38,985), mental health care (18,071), and therapy (16,505). * Significant at 10 percent. ** Significant at 5 percent. *** Significant at 1 percent.