

The Impact of Changes in Medicaid Provider Fees on Provider Participation and Enrollees' Care: a Systematic Literature Review



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BACKGROUND: Changing Medicaid fees is a common approach for states to address budget fluctuations, and many currently set Medicaid physician fees at levels lower than Medicare and private insurers. The Affordable Care Act included a temporary Medicaid fee bump for primary care providers (PCPs) in 2013–2014 that recently led to both an increase and then subsequent decrease in PCP fees in many states.

OBJECTIVE: To conduct a systematic literature review on the effects of changing Medicaid fees on provider participation and enrollees' access to care and service use.

METHODS: We searched PubMed/Medline and JSTOR and identified 18 studies that assessed the longitudinal impact of provider fee changes in Medicaid on the outcomes of interest. We summarized information on study design, methods, and findings.

RESULTS: Seven studies examined the impact of fee changes on provider participation in Medicaid. Of these, three studies found that fee increases were associated with positive effects on providers' likelihood of accepting Medicaid patients or on their Medicaid caseloads. Five studies that examined the impact of fee changes on Medicaid enrollees' access to care found a positive association with one or more access measure, such as having a usual source of care or appointment availability. Lastly, eight of 14 studies that examined service use found positive associations between fee changes and at least one measure of use, such as changes in the probability of enrollees having any visit, the number of visits, and shifts in the site of care toward office-based care; others largely did not find significant associations.

CONCLUSIONS: There is mixed evidence on the impact of changing Medicaid fees on provider participation and enrollees' service use; however, increasing fees appears to have more consistent positive effects on access to care. Whether these improvements in access translate into better health outcomes or downstream cost savings are critical questions.

KEY WORDS: Medicaid; health policy; access to care; utilization.

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INTRODUCTION

Controlling growth in Medicaid spending is a persistent challenge for states, and lowering provider fees has been a common approach for reducing Medicaid spending.¹ Many states set Medicaid provider fees at levels that are lower than Medicare and private insurance payments, and low fees have been commonly cited by providers as a reason for not accepting Medicaid patients.^{2, 3} In 2016, Medicaid paid primary care providers (PCPs) an average of 72% of Medicare fees and there is wide variation across states ranging from 38 to 126%.² The Affordable Care Act (ACA) included a temporary Medicaid fee bump for primary care providers (PCPs) to Medicare levels in 2013–2014 to address potential shortages of PCPs for Medicaid enrollees, especially as many states adopted Medicaid expansion for low-income adults (37 states to date). As of 2018, only 17 states have continued this fee increase fully or partially, with most other states returning to lower pre-ACA fee levels.

A number of cross-sectional studies have found that in states with higher Medicaid payment rates, provider participation levels are higher, for example, as measured by their willingness to accept new Medicaid patients in their practice.^{3–8} Cross-sectional studies also suggest that access to care could be greater for enrollees living in higher- vs. lower-fee states, such as enrollees being more likely to report having a usual source of care⁹ and having higher rates of outpatient visits and receipt of certain preventive services.^{6, 9, 10} To the extent that higher fees increase the likelihood that enrollees receive appropriate medical care in the outpatient setting, raising fees could also improve health outcomes and reduce Medicaid spending, such as by decreasing inappropriate use of the emergency department or preventable hospitalizations. Studies that rely on cross-sectional comparisons across states with higher vs. lower fee levels, however, could be confounded by other differences, such as differences in state Medicaid coverage policies, benefit generosity, and program eligibility criteria.

We sought to systematically review the literature that examines the longitudinal impact of increasing or decreasing fees for outpatient providers, which provides stronger evidence on the potential causal effects of fee changes on providers and enrollees. We focused on three major categories of outcomes:

provider participation, enrollee access to care, and service utilization.

METHODS

Search

We iteratively developed a search query that broadly identified studies through 2018 that examined the role of Medicaid provider fees. Our final search term was “Medicaid AND (provider* OR physician* OR doctor* OR (primary and care) OR specialist) AND (reimburs* OR pay OR payment OR fee OR charge OR fees OR charges OR payments),” which we conducted in two primary databases: PubMed/Medline and JSTOR. Our initial search of these databases identified 7081 unique titles (Fig. 1). We examined bibliographies of the studies selected for full article review, which yielded no additional articles for review through January 2019.

Title and Abstract Review

Two study team members independently screened the titles identified from the search for relevance to Medicaid fees and the following outcomes: provider participation, access to care, utilization or quality, health outcomes, and Medicaid spending. Because of the small number of articles that examined the latter two outcomes, we subsequently excluded these studies from our review after the full article review stage. At the conclusion of title review, there was a high level of agreement, with any discrepancies (60 of the 7081 titles) resolved by consensus. A total of 652 articles were selected for abstract review (Fig. 1); during this stage, two study team members reviewed the abstracts to identify empirical studies that assessed the impact of Medicaid fees on the outcomes of interest and identified 161 studies for full article review.

Inclusion Criteria

All articles selected for full article review were abstracted to determine whether they examined one or more of our outcomes of interest and matched other inclusion criteria. We excluded studies that used cross-sectional vs. longitudinal designs and those that focused on the impact of changing the payment mechanisms (e.g., fee-for-service vs. capitation or pay-for-performance) vs. changes in provider fee levels. We also excluded non-empirical studies (e.g., perspectives, commentaries) and those not published in peer-reviewed journals, including reports and working papers. We further limited our sample to studies focused on Medicaid and changes in provider payment in the outpatient setting and excluded those examining dental care, as there is greater variability across states in coverage of dental services.

We identified a total of 22 studies that examined the impact of changes in fees over time. Among these studies, we further restricted our review to studies that met criteria set by the

Cochrane Collaborative for observational studies, which we slightly modified.¹¹ The Cochrane Collaborative recommends requiring pre-post studies to have at least two intervention and two control groups; however, we relaxed this criterion slightly to include studies that had just a single intervention and control state. For interrupted time series studies, we excluded four studies that did not have at least three pre- and three post-intervention time periods but retained studies with only a single pre- or post-fee change year if their primary unit of analysis was a quarter or month and thus included three or more pre- and post-intervention time periods.^{4, 12–14} Because the studies included in the review varied in their measurement of fee changes, outcome definitions, and study designs, we did not attempt to combine and summarize the results using a meta-analysis. Our final sample included 18 studies (Fig. 1).

Content Abstraction and Synthesis

We abstracted the following information from the studies in the review using a structured form: research question and hypotheses, study design, primary data sources, predictor variable measurement (i.e., operational definition of fees and fee changes), outcome measures, findings, implications, and limitations. We classified studies as having one of four basic study designs, which vary in their methodological approaches and ability to address potential unobserved confounding. From most to least susceptible to potential confounding, the designs included: (1) interrupted time series designs with no concurrent control group (ITS); (2) dose-response (DR) model designs, which leveraged differential changes in provider fees over time across states to identify the effects of fee changes; (3) difference-in-difference (DD) designs, which compared enrollees in states with fee changes vs. a control group without fee changes (e.g., Medicaid enrollees in other states without fee changes, or individuals in the same state with different insurance types); or (4) triple difference or difference-in-difference-in-difference (DDD) designs, which leveraged both comparisons of Medicaid enrollees in states with different levels of fee changes over time and within state comparisons of Medicaid enrollees to those with different insurance types that did not face fee changes (e.g., privately insured or Medicare).

In cases where studies reported both univariate and multivariate findings, we report the multivariate findings. Where studies perform cross-sectional and longitudinal analyses, we report only the longitudinal results.

RESULTS

Study Characteristics

Table 1 describes the 18 studies included in the review. Six were published between 1980 and 1999,^{15–20} five between 2000 and 2009,^{9, 21–24} and seven between 2010 and 2018.^{25–31} In total, seven studies examined the effects of payment

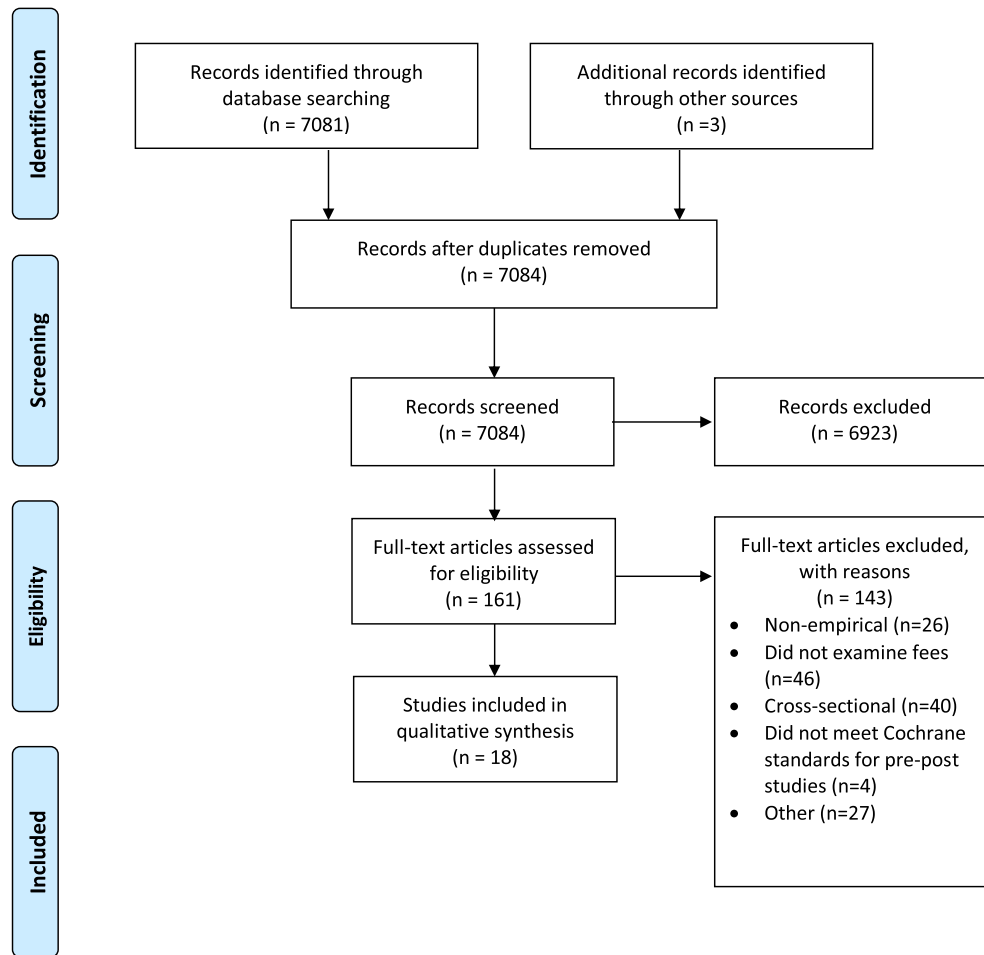


Figure 1 PRISMA flow diagram.

Table 1 Summary of Studies Examining the Effects of Changing Medicaid Provider Fees

Author(s)	Publication Year	Location		Study Design	Study Outcomes		
		National	States		Provider Participation	Access	Service Use
Shwartz et al.	1981		MA	ITS			✓
Cohen	1989	✓		DR			✓
Fanning and de Alteriis	1993		NY	ITS	✓		✓
Fox and Phua	1994		MD	ITS	✓		✓
Gruber, Adams, and Newhouse	1997		TN, GA	DD			✓
Coburn, Long, and Marquis	1999		ME, MI	ITS	✓		✓
Baker and Royalty	2000	✓		DR	✓		
Adams	2001		CA, GA, MI, TN	DR	✓		✓*
Mitchell and Haber	2004		AK, IN, CA, CO, KS, NJ, WI, AL, MI	DDD			✓
Shen and Zuckerman	2005	✓		DDD		✓	✓*
Decker	2009	✓		DDD			✓
White	2012	✓		DR		✓	✓
Atherly and Mortensen	2014	✓		DDD			✓*
Polsky et al.	2015		AR, GA, IL, IA, MA, MT, NJ, OR, PA, TX	DD		✓	
Callison and Nguyen	2018	✓		DDD		✓	✓*
Candon et al.	2018		AR, GA, IL, IA, MA, MT, NJ, OR, PA, TX	DR		✓	
Decker	2018	✓		DR	✓		
Mulcahy, Gracner, and Finegold	2018	✓		ITS	✓		✓
Total (n=18)		9	9		7	5	14

NOTES: ITS- Interrupted Time Series. DR- Dose-response. DD- Difference-in-Difference. DDD- Triple Difference. ✓* indicates studies that include receipt of preventive care services as a utilization measure.

changes on provider participation in Medicaid, five on enrollee access, and fourteen on service use. All studies used quasi-experimental methods, of which five used a triple difference (DDD) design. Two studies used a difference-in-difference (DD) design, six studies used a dose-response (DR) model that examined changes in outcomes for states with larger vs. smaller fee changes over time, and five studies used an interrupted time series (ITS) design without a concurrent control group.

Provider Participation

Of the studies examining the effects of Medicaid fees on provider participation,^{17, 18, 20–22, 30, 31} there were two primary measures (Table 2): changes in the likelihood of accepting any or new Medicaid enrollees (“any participation”) and changes in the number of Medicaid enrollees or appointments per provider (“caseload”). Four studies examined changes among PCPs specifically.^{17, 20, 30, 31} Among the five studies examining the probability of any Medicaid participation by providers, only one study found positive effects of fee increases on the probability of participation¹⁷ and one found a slightly negative effect.¹⁸ Three studies found no significant association between fee changes and participation, including two studies that examined the effects of the ACA PCP fee bump specifically.^{30, 31}

Of the six studies that examined changes in Medicaid caseload, two found positive associations. Using a national survey of young physicians, Baker and Royalty (2000) estimated that a 10% increase in Medicaid-to-private insurance fee ratio for obstetricians was associated with a 2.5 percentage point (pp) increase in the percent of poor patients per physician panel.²¹ Adams (2001) estimated that a 10pp increase in the Medicaid-to-private fee ratio was associated with an increase of eight Medicaid children per physician per year using Medicaid claims data on children in four states.¹⁹ The remaining studies found no significant association.

Enrollee Access to Care

We classified measures of access to care into three primary categories (Table 3): having a usual source of care, having unmet need (e.g., reports of going without or delaying care), and appointment availability (probability of getting a new appointment and wait times until the next available appointment).

Two studies by the same research team used an audit (“secret shopper”) approach to assess changes in appointment availability after the ACA PCP fee bump. Polsky et al. (2015) found a significant 8.3pp increase in the probability of getting an appointment for Medicaid enrollees vs. privately insured enrollees across 10 states following the implementation of the ACA fee bump (2014 vs. 2012–2013), but no changes in wait times.²⁷ In a follow-up study, Candon et al. (2018) used a DR approach (with no comparison group of privately insured enrollees) and estimated that \$10 increases in PCP fees were associated with a significant 1.7pp increase in the probability of getting a new appointment for Medicaid enrollees.²⁹

The three remaining studies used earlier data (pre-ACA fee bump) and enrollee reports from surveys; these studies also found positive effects of fee increases on at least one measure of access.^{9, 25, 28} For example, Shen and Zuckerman (2005) used a DDD design and found an increase of 1.5pp in the proportion of Medicaid vs. privately insured enrollees reporting a usual source of care with a 1 unit change in the county-level Medicaid-to-national capitation rate; however, this study did not find significant changes in the proportion of Medicaid enrollees reporting unmet need.⁹ Callison and Nguyen (2018) used a similar DDD design and found that a 10pp increase in the Medicaid-to-Medicare fee ratio was associated with a 1.9pp increase in the proportion of Medicaid vs. low-income privately insured enrollees having a usual source of care, but not with other measures of unmet need, including delaying use of medical care or prescription drugs.²⁸

Enrollee Service Use

We classified service use outcomes into four main subcategories (Table 4): (1) any use (e.g., at least one office visit per year); (2) service volume (e.g., total number of visits or procedures or number of visits or procedures per enrollee or provider); (3) use by site of care (e.g., office vs. emergency department); and (4) use of preventive care as a quality process measure (e.g., receipt of mammogram).

Of the seven studies that examined whether fee changes affect the probability of having any service use (e.g., outpatient visits), four studies found a positive association,^{9, 16, 23, 24} and three studies using weaker study designs (DR and ITS) did not find significant associations.^{17, 20, 25} Two of eight studies that examined the impact of fee changes on service volume found positive associations,^{24, 28} and six found no significant association.^{15, 18, 20, 23, 25, 31}

Three of seven studies examining the association between fee changes and shifts in site of care for Medicaid enrollees found increases in visit rates in outpatient office settings and decreases in visit rates in more expensive sites of care, such as emergency or hospital outpatient departments.^{18, 19, 24} In contrast, Callison and Nguyen (2018) found significant increases in utilization across all sites of care (ED, hospital outpatient departments, and office-based visits) associated with increases outpatient Medicaid-to-Medicare fee ratios between 2008 and 2012.²⁸ The three remaining papers found no significant associations across any site of care.^{9, 20, 25}

Three of the four studies that examined changes in receipt of preventive care used survey data and a DDD study design; these studies did not find a significant effect of changes in Medicaid fees on the likelihood of receiving preventive services. Both Atherly and Mortensen (2014) and Callison and Nguyen (2018) used the Medical Expenditure Panel Survey to examine changes in receipt of blood pressure and cholesterol testing, cancer screenings, and flu vaccinations.^{26, 28} Shen and Zuckerman (2005) used three waves of the National Survey of America’s Families to examine the probability of receiving a

Table 2 Studies Examining Medicaid Fee Changes and Provider Participation

Study	Primary Data Source & Sample	Year(s)	Study Design & Predictor Measure	Fee Change	Measure of Outcome	Findings
Fanning and de Alteriis 1993	Medicaid claims data on all physicians in NY	1982-1986	ITS based on increases in Medicaid fees for primary care services	+30% in 1985	Any participation: Monthly trend in # of physicians seeing any Medicaid patients: PCPs Non-PCPs	Change in trend: -0.009 PCPs per month (directionally inconsistent) NS
Fox and Phua 1994	Medicaid claims data on births in MD	1985-1988	ITS based on increases in Medicaid fees for births	\$265 to \$550 in 1986 then to \$795 in 1987 (Medicaid to private levels)	Any participation: # of providers with any Medicaid births per county per quarter Caseload: # of Medicaid births per provider per year	+1.9 providers/quarter NS
Coburn, Long, and Marquis 1999	Medicaid claims data on women and children in ME, MI	1987-1992 ME, 1989-1992 MI	ITS based on increases and decreases in Medicaid:charges (private proxy) ratio	Varied changes across years ranging from -20% to +71.5% over 1987-1992	Any participation: # of PCPs and OB/GYNs with any Medicaid visits per month Caseload: # of physicians with at least 15 Medicaid visits per month	Largely NS and not directionally consistent Largely NS and not directionally consistent
Baker and Royalty 2000	Survey of young physicians providing obstetrical care, nationally representative	1987, 1991	DR based on state variation in Medicaid:private fee ratio for obstetrical care	Increase in 1980s, magnitude not stated	Caseload: % of poor patients per private physician % of poor patients per public physician % of poor patients per all physicians	+10% fee → +3.4% +10% fee → -3.0% +10% fee → +2.5%
Adams 2001	Medicaid claims data on children <21 y.o. in CA, GA, MI, TN	1989, 1992	DR based on state variation in Medicaid:private fee ratio overall and for preventive services	Varied changes ranging -5pp to +8pp in 1989-1992	Caseload: # of Medicaid children per physician per year	+10% ratio → +8 Medicaid children per physician per year
Decker 2018	National Electronic Health Records Survey; included PCPs (general/ family practice, internal medicine, pediatrics), nationally representative	2011, 2013-2015	DR based on state variation in Medicaid:Medicare fee ratio	Varied changes in fee bumps from >35 pp, 25-34 pp, <25 pp	Any participation: Accepts new Medicaid patients >1% of patients on Medicaid Caseload: % of patients on Medicaid if accepts new Medicaid patients % of patients on Medicaid if >1% of patients on Medicaid	NS NS NS NS
Mulcahy, Gracner, and Finegold 2018	IMS Health medical claims and encounter data; includes PCPs, all states except AK and HI	2012-2015	ITS based on state-level change in Medicaid:Medicare fee ratios for primary care services	Varied changes in fee bumps, magnitude not stated	Any participation: Monthly visits with any Medicaid patient Monthly visits with >5 Medicaid patients Caseload: Medicaid share of total patients each month	NS NS NS

Note: ITS=Interrupted time series; DR=Dose-response; DD=Difference-in-difference; DDD=Difference-in-difference-in-difference (triple difference); PCP=primary care physician.

clinical breast examination, pap smear, or making at least one well-child visit in the last 12 months.⁹ In contrast, Adams (2001) used Medicaid claims data for children in four states in 1989 and 1992 with a DR study design, and found a positive association between Medicaid fees and the likelihood that physicians provided any preventive care services to children during the year; the magnitude was not stated.²²

DISCUSSION

Our systematic review of the literature on the impact of Medicaid fees changes yielded a number of findings. First, our

review suggests that the evidence that increasing Medicaid fees leads to increases in provider participation in the program is weak. Nevertheless, there was consistent evidence that fee increases were associated with improvements in certain measures of enrollee access to care, such as having a usual source of care or appointment availability. Although many studies have investigated changes in outpatient visits associated with fee changes, the evidence is largely mixed, and it is difficult to make generalizable conclusions with respect to the effect of fee changes on utilization. There was also little evidence that increasing primary care fees was associated with increases in receipt of preventive care.

Table 3 Studies Examining Medicaid Fee Changes and Enrollee Access to Care

Study	Data Source & Sample	Year(s)	Study Design & Predictor Measure	Fee Change	Measure of Outcome	Findings
Shen and Zuckerman 2005	Surveys of Medicaid adults and children and county capitation rates, nationally representative	1997, 1999, 2002	DDD comparing Medicaid vs. privately insured (control) combined with DR based on county-level Medicaid:national capitation rate	Variation across counties in Medicaid: national capitation rates	Usual source of care: Have usual source of care Same provider at usual source of care Unmet need: Avoiding or delaying medical care, prescription drugs	+1 unit → +1.5pp NS NS
White 2012	National Health Interview Survey; included children, nationally representative	1997-2008	DR based on state variation in Medicaid:Medicare fee ratio	+15% in 1997	Unmet need: Report having non-cost related access problems	-2%
Polsky et al 2015	Audit study: phone calls to primary care offices as hypothetical patients, 10 states	2012-2013 vs. 2014	DD comparing Medicaid vs. privately insured (control) pre- vs. post- PCP payment increases	Varied increases ranging +7% to +109% in 2013-2014; mean of +57%	Appointment availability: Probability of getting an appointment for new patient # of days until next appointment for new patient	+8.3pp overall; larger increases in states with larger fee increases NS
Callison and Nguyen 2018	Medical Expenditure Panel Survey; included adult respondents with Medicaid or private insurance, nationally representative	2008, 2012	DDD comparing Medicaid vs. low-income privately insured (control) combined with DR model based on state-level changes in Medicaid:Medicare fee ratio	Varied changes (mostly decreases), magnitude not stated	Usual source of care: Have usual source of care Unmet need: Unable to access medical care Unable to access medication Delayed medical care Delayed medication fill Delayed dental care	+10pp in ratio → +1.9pp NS NS NS NS
Candon et al 2018	Audit study: Same as Polsky et al. 2015	2012 vs. 2014, 2014 vs. 2016	DR based on state variation in Medicaid fees	Varied increases (2012-2014) and decreases (2014-2016)	Appointment availability: Probability of getting an appointment for new patient	+\$10 change → +1.7pp

NOTES: ITS=Interrupted time series; DR=Dose-response; DD=Difference-in-difference; DDD=Difference-in-difference-in-difference

The lack of strong evidence that increasing provider fees influences provider participation in the program is concerning given that this is the underlying mechanism through which potential improvements in care access and outcomes in Medicaid are posited to be achieved. It is notable that the only study to find an impact of fee increases on extensive participation, or the probability that more providers accept Medicaid enrollees, was in the context of a single state (Maryland) that raised their fees for obstetrical care to the level of private insurers.¹⁸ This is consistent with the economic model developed by Sloan et al. (1978) that suggests that when providers have a choice of accepting patients from multiple markets (e.g., private insurance and Medicaid), they prefer patients from market from which expected revenues are greater.³² Thus, the magnitude of Medicaid fee changes relative to other local payers including Medicare and private insurers is likely to moderate the impact of Medicaid fee changes. A number of studies measured changes in provider fees by indexing Medicaid fees relative to private insurance or Medicare fees, but most did not examine variation in the effects of fee changes that occurred at the lower vs. higher end of the index.

In contrast, two studies that investigated the impact of the ACA PCP fee bump, which raised Medicaid fees to Medicare

levels, found no effect on participation. The temporary nature of the fee increase, which was federally funded for only two years (2013–2014), could have reduced providers' willingness to accept new Medicaid patients, especially if there were administrative hurdles or burdens associated with entering the program. Reports also note operational issues in many states with implementing the payment bump, including delays in notifying or reimbursing providers, and lack of provider awareness of the program, which could have further discouraged participation.^{33, 34}

A research team that used a secret shopper approach to assess the effect of the ACA PCP fee bump on appointment availability for Medicaid enrollees found increases in the probability of getting a new appointment, but not appointment wait times, for Medicaid enrollees. Polsky et al. focused on physicians in 10 states that were already accepting Medicaid enrollees, so increases in appointment availability reflect increases in physician participation on the intensive margin. This contrasts with findings from Decker (2018), who used a nationally representative survey to examine changes in both the extensive and intensive participation of providers before vs. after the ACA bump and found no changes. One possible explanation for these seemingly divergent findings is that

Table 4 Studies Examining Medicaid Fee Changes and Service Use

Study	Data Source & Sample	Year(s)	Study Design & Predictor Measure	Fee Change	Measure of Outcome	Findings
Shwartz et al 1981	Aggregate data on # of surgical procedures per month for Medicaid enrollees in MA	1975-1978	ITS based on decreases in Medicaid fees	-30% for eight procedures in 1976	Service volume: # of procedures per eligible enrollee per month	NS for 7 of 8 procedures; for tonsillectomy/adenoidectomy -25% to -34% decrease in volume
Cohen 1989	Aggregate data on Medicaid expenditures and recipient counts by service and eligibility category in each state	1979-1984	DR based on state variation in Medicaid:Medicare ratio with state fixed effects	Varied across states	Any use: # of physician service recipients per capita	+1% fee ratio → +0.25%
Fanning and de Alteriis 1993	Medicaid claims data on all physicians in NY	1982-1986	ITS based on increases in Medicaid fees for primary care services	+30% in 1985	Any use: Change in monthly trend in ratio of service recipients to eligible enrollees	NS
Fox and Phua 1994	Medicaid claims data on births in MD	1985-1988	ITS based on increases in Medicaid fees for births	\$265 to \$550 in 1986 then to \$795 in 1987 (Medicaid to private levels)	Service volume: average # of prenatal visits per woman Site of care: ratio of prenatal visits in a hospital outpatient vs. clinic setting	NS -0.31 percentage points
Gruber, Adams, and Newhouse 1997	Medicaid claims data on all primary care services in TN, GA	1985, 1987	DD comparing Medicaid enrollees in TN vs. GA (control) pre vs. post Medicaid:Medicare fee increases in TN	+27% (0.7 to 0.89) in TN in 1986	Site of care: % of patients with dominant site of care at (based on spending): Office-based settings Free-standing clinics Hospital outpatient departments Emergency room	+21% in TN vs. GA -21% in TN vs. GA NS NS
Coburn, Long, and Marquis 1999	Medicaid claims data on women and children in ME, MI	1987-1992 ME, 1989-1992 MI	ITS based on changes in Medicaid:charges (private proxy) ratio	Varied changes across years ranging from -20% to +71.5% over 1987-1992	Any use: Any physician visits per month by patient subpopulation Service volume: # of ambulatory physician visits per month Site of care: % of enrollees receiving care in physicians' offices	Largely NS and not directionally consistent Largely NS and not directionally consistent Largely NS
Adams 2001	Medicaid claims data on children <21 y.o. in CA, GA, MI, TN	1989, 1992	DR based on state variation in Medicaid:private fee ratio overall and for preventive services	Varied changes ranging -5pp to +8pp in 1989-1992	Preventive care use: Probability of a physician providing care to any Medicaid children providing preventive care services (services not specified) Any use: Probability of outpatient physician visit	+10% ratio → significant increase, magnitude not stated Directionally consistent changes in probability of visit: e.g., decreased in 4 of 4 states with large fee decreases (range: -2.2% to -4.9%)
Mitchell and Haber 2004	Medicaid and Medicare claims data on all physicians providing outpatient care in nine states	1996, 1998	DDD comparing duals vs. non-duals (control) combined with DR model based on state-level changes in the amount Medicaid pays of the Medicare cost-sharing for duals	Varied changes in provider payments for duals between 1996-1998	Service volume: # of outpatient physician visits among patients with visit Specialty care: Probability of specialist visit among patients with any outpatient visit	NS NS

Medicaid physicians increased their time to see patients (and therefore could offer more appointments) with the fee bump but did not change the overall composition of their patient panels. Growth in the workforce of nurse practitioners and physician's assistants could also help increase primary care appointment availability.³⁵ Importantly, most studies

examining provider participation focused on physician participation and not other provider types.

Similarly, despite the weak evidence linking Medicaid fees with provider participation, two studies found positive effects of Medicaid fee increases on having a usual source of care. Having a usual source of care has been associated with

Shen and Zuckerman 2005	Surveys of Medicaid adults and children and county capitation rates, nationally representative	1997, 1999, 2002	DDD comparing Medicaid vs. privately insured (control) combined with DR model based on county-level Medicaid:national capitation rate	Variation across counties in Medicaid: national capitation rates	Any use and site of care: Probability of doctor/health professional visit Probability of ED visit Preventive care use: Probability of receiving preventive care	+1 unit → +1.6pp NS NS
Decker 2009	National Health Interview Survey, included respondents <65 years old without Medicare insurance; nationally representative	1993, 1998, 2003	DDD comparing Medicaid vs. privately insured (control) combined with DR model based on state-level changes in Medicaid:Medicare fee ratios	Varied changes (mostly decreases) across states in 1993 vs. 1998 vs. 2003	Any use: % of patients with no (0) visits to a doctor's office in past year Service volume: % of patients with at least 13 visits to a doctor's office in past year Site of care: Probability visit takes place in hospital outpatient department vs. physician's office Probability visit takes place in emergency department (ED) vs. physician's office	Ratio decrease from 1.0 ("high fee") to 0.64 ("low fee") → +17.3% -17.2% +107% +23.6%
White 2012	National Health Interview Survey; included children, nationally representative	1997-2008	DR based on state variation in Medicaid:Medicare fee ratio	+15% increase in fee ratio in 1997 CHIP	Any use and site of care: Probability of PCP, pediatric, or ED visit in past 12 months Service volume: # of visits per child per year	Largely NS NS
Atherly and Mortensen 2014	Medical Expenditure Panel Survey (MEPS); included adult Medicaid respondents, nationally representative	2003, 2008	DDD comparing Medicaid vs. privately insured (control) combined with DR model based on state-level changes in Medicaid:Medicare fee ratio	Varied increases of Medicaid:Medicare fee levels for preventive care	Preventive care use: Probability of receiving recommended set of five preventive services (e.g., cancer screenings)	NS
Callison and Nguyen 2018	Medical Expenditure Panel Survey; included adult respondents with Medicaid or private insurance <200% FPL, nationally representative	2008, 2012	DD comparing Medicaid vs. low-income privately insured (control) using DR model based on state-level changes to Medicaid:Medicare fee ratio	Varied changes (mostly decreases), magnitude not stated	Service volume and site of care: # of office visits per year # of outpatient visits per year # of prescription fills per year # of ED visits per year # of hospital discharges per year # of dental visits per year Preventive care use: Any blood pressure checks, cholesterol checks, flu vaccinations, and Pap smear tests in last 1-3 years	For Medicaid vs. private patients, +10pp in fee ratio → +0.63 visits (+11%) +0.11 visits (+21%) +1.50 fills (+11%) +0.05 visits (+14%) NS NS All NS
Mulcahy, Gracner, and Finegold 2018	IMS Health medical claims and encounter data; includes PCPs, all states except AK and HI	2012-2015	ITS based on state-level change in Medicaid:Medicare fee ratios for primary care services	Varied changes in fee bumps, magnitude not stated	Service volume: # of visits by new Medicaid patients # of visits by existing Medicaid patients	NS NS

Note: ITS=Interrupted time series; DR=Dose-response; DD=Difference-in-difference; DDD=Difference-in-difference-in-difference (triple difference); PCP=primary care physician.

increased likelihood of receiving recommended care, such as preventive care or guideline-consistent chronic care.^{36, 37} However, in both of these studies, they did not find significant changes in unmet need as measured by reports of avoiding or delaying needed care. This could suggest that there are other important barriers that mediate Medicaid enrollees' care access outside of provider availability, such as lack of transportation, difficulties getting time off from work, or poor health literacy.³⁸

There was not strong evidence among the studies in this review that overall utilization increased with fee increases. The mixed findings could be related to heterogeneity in the study time periods, settings, study designs, and underlying data sources of the studies included in the review, although we did not find obvious patterns in study findings related to these factors. There is also substantial heterogeneity across state Medicaid programs in their eligibility criteria, benefits (e.g., coverage for or limits on certain services), and local area

characteristics including local demand for services relative to the supply of providers, which could moderate the effects of fee changes on outcomes for Medicaid enrollees.

There was a small body of evidence on the impact of fee changes on use of preventive services. The findings from these studies suggest that fee increases, on their own, could be insufficient to increase use of high-value or cost-effective preventive care, especially in the context of traditional fee-for-service (FFS) reimbursement. A number of states are currently implementing Accountable Care Organizations as a means of reforming payment and care delivery within their Medicaid programs, which could provide greater incentives for quality improvement.

Importantly, the majority of Medicaid enrollees nationally are currently enrolled in comprehensive managed care plans, which could also have greater incentives for increasing use of high-value preventive services (65% in 2015).³⁹ The fee changes that are the focus of this review primarily applied to Medicaid FFS payments, which now represent a minority of enrollees but the majority of Medicaid spending because FFS enrollees are more likely to be elderly and disabled.⁴⁰ Moreover, many states require that rates within Medicaid managed care match FFS rate changes, at least in part.⁴¹ We did not find evidence, however, on whether FFS fee changes had spill-over effects on Medicaid managed care enrollees. This could be, in part, due to the difficulty obtaining reliable and comprehensive encounter data for Medicaid managed care enrollees.^{42, 43}

This review highlights the broader challenge of studying the Medicaid program and the critical need for timely and consistent data. There is about a 4-year lag to availability of Medicaid Analytic Extract (MAX) data from the Centers for Medicare and Medicaid Services (CMS) for many states, in part due to the effort needed to standardize and validate data across states. CMS efforts to improve the quality, comparability, and timeliness of Medicaid data through the Transformed Medicaid Statistical Infrastructure System (T-MSIS) could serve as an important building block for improving the Medicaid research infrastructure. Improving the ability to link these data with additional information, such as vital statistics, local and national disease registries, and electronic health records would improve our ability to study the impact of Medicaid policy on health outcomes, for which there is currently limited evidence.

Limitations

Our review is subject to limitations. We did not include a start date for our review, which spans nearly four decades. During this time the Medicaid program has undergone numerous changes, including large increases in the number of beneficiaries enrolled in managed care plans and expansions in the populations eligible for Medicaid; these changes could impact the effects of fee changes on provider participation and beneficiary access to care.

Conclusion

In summary, this review did not find strong evidence that increasing Medicaid provider fees positively affects provider

participation in the program, although some measures of enrollee access improved with higher fees. Fee changes should be accompanied with careful monitoring of changes in access to care and downstream outcomes. Attention is also needed to identify and implement other strategies that could have more consistent effects on care utilization and quality.

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