

Pediatric Oral Health Services in Medicaid Managed Care and Fee for Service

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Over the past few decades, states have increased enrollment in Medicaid comprehensive managed care (CMC).¹ Unlike when care is paid fee for service (FFS), CMC plans receive a capitated amount per enrollee and negotiate rates with providers for care delivered. Because CMC plans are at risk for costs, in theory they have an incentive to improve access to preventive care for enrollees.^{2,3} CMC programs frequently tie provider payment to health outcomes as part of value-based purchasing initiatives, which may encourage receipt of care.⁴ At the same time, CMC programs may try to curb utilization and expenditures by restricting the number of in-network providers and lowering reimbursement rates paid to those providers,⁵ potentially deterring receipt of care.

There is mixed evidence about the impact of CMC on pediatric Medicaid enrollees' access to and quality of care. Positive impact from past research includes higher likelihood of annual dental visits, well-child medical visits, and primary care visits among Medicaid-enrolled children under CMC compared with children under Medicaid FFS.⁶ Evidence also suggests that among children with asthma and chronic illnesses, a transition from Medicaid FFS to CMC was associated with reductions in emergency department visits.^{3,7} A study in rural Minnesota found no significant differences between children with Medicaid FFS and those with Medicaid CMC in terms of health care use or satisfaction with care.⁸ However, another study demonstrated that states with higher Medicaid CMC enrollment had higher rates of children having delayed care and lower satisfaction with care.³

Given this mixed evidence, it is important to understand how Medicaid payment models may influence children's receipt of a newly authorized preventive service. In 2008, Florida's Medicaid program began reimbursing medical providers for preventive oral health services (POHS) delivered to children aged 6 months to 42 months.^{9,10} This service bundle is recommended to be delivered during well-child medical visits and includes fluoride varnish application, oral evaluation and risk assessment, anticipatory guidance, and referral to a dentist. Fluoride varnish reduces dental caries in young children and is reimbursed by all state Medicaid programs.^{11,12} In Florida, Medicaid FFS paid less than 40% of what

ABSTRACT

OBJECTIVES: In 2008, Florida's Medicaid program began reimbursing medical providers for preventive oral health services (POHS) delivered to children aged 6 months to 42 months. We examine whether Medicaid comprehensive managed care (CMC) and fee for service (FFS) had different rates of POHS during pediatric medical visits.

STUDY DESIGN: Observational study using claims data (2009-2012).

METHODS: Using repeated cross-sections of 2009-2012 Florida Medicaid data for children 3.5 years or younger, we examined pediatric medical visits. We estimated a weighted logistic regression model to compare POHS rates among visits reimbursed by CMC and FFS Medicaid. The model controlled for FFS (vs CMC), years Florida had a policy allowing POHS in medical settings, an interaction between these 2 variables, and additional child- and county-level characteristics. Results are presented as regression-adjusted predictions.

RESULTS: Among 1,765,365 weighted well-child medical visits in Florida, POHS were included in 8.33% of CMC-reimbursed visits and 9.67% of FFS-reimbursed visits. Compared with FFS, CMC-reimbursed visits had a nonsignificant 1.29-percentage-point lower adjusted probability of including POHS ($P = .25$). When examining differences over time, although the POHS rate was 2.72 percentage points lower for CMC-reimbursed visits after 3 years of policy enactment ($P = .03$), rates were similar overall and increased over time.

CONCLUSIONS: POHS rates among pediatric medical visits in Florida were similar for visits paid via FFS and CMC, with low rates that increased modestly over time. Our findings are important because more children continue to be enrolled in Medicaid CMC.

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commercial insurers paid for pediatric dental services in 2013,¹³ increasing the importance of fluoride varnish application in medical settings. Evidence suggests that higher payment for POHS in medical settings is associated with higher rates.¹⁴ Studies have documented variation of fluoride varnish rates in medical settings across states and over time,^{15,16} including in Florida.¹⁰ However, the Florida study excluded CMC enrollees,¹⁰ and it remains unknown whether rates are higher or lower for CMC Medicaid enrollees. Using Medicaid data from Florida during 2009 to 2012, this study explored differences in POHS rates during pediatric medical visits paid by Medicaid FFS and CMC.

METHODS

Data and Sample

We used repeated cross-sections of annual Medicaid data from Florida to estimate differential effects of a Medicaid policy on POHS delivery for visits paid by CMC and FFS. Florida provides an ideal setting for this study due to its racial and ethnic diversity among children,¹⁷ varying penetration of CMC, and high-quality encounter data.^{18,19} A pilot CMC program was first implemented in 2 counties in 2006, and by December 2011 the program was operating in all counties in Florida.²⁰ We used Medicaid Analytic eXtract (MAX) Personal Summary and Other Therapy files obtained from the Research Data Assistance Center. Data were obtained for all children who received POHS in medical settings before their sixth birthday and a stratified random sample of children younger than 6 years who never received POHS in medical settings during 2009 to 2012. We limited the analytic sample, as described in [eAppendix Table 1](#) (eAppendix available at [ajmc.com](#)), to children aged 6 months to 42 months in the main analysis because Florida's POHS reimbursement policy targeted children in this age group.^{10,21} The sample was weighted to be representative of all children enrolled in Florida Medicaid and aged 6 months through 3.5 years in our sampled years. Our final sample included 442,514 well-child medical visits during 2009 to 2012 (weighted N = 1,765,365).

Our unit of analysis was the well-child medical visit because the Bright Futures/American Academy of Pediatrics periodicity schedule encourages fluoride varnish applications during these visits.²² A strength of this approach is that the number and frequency of recommended well-child visits vary by age, and using the well-child medical visit as the unit of analysis gives each visit an equal weighting in our analysis. For example, well-child medical visits are recommended at the following intervals: 6, 9, 12, 15, 18, 24, 30, and 36 months.²² Given that Florida's Medicaid program reimbursed fluoride varnish applications in medical settings every 3 months,¹⁰ it is reasonable for a child to receive fluoride varnish at every well-child medical visit from ages 6 months to 42 months. In addition, parents and caregivers of some children may be

TAKEAWAY POINTS

- ▶ In Florida (2009-2012), preventive oral health services were performed in less than 10% of well-child medical visits reimbursed by Medicaid.
- ▶ Rates of preventive oral health services among pediatric medical visits increased over time and were similar for visits paid via Medicaid comprehensive managed care and fee for service.
- ▶ Our findings provide evidence for policy makers about the lack of negative impact of Medicaid comprehensive managed care on children for a newly authorized preventive service, because many state Medicaid programs are expanding comprehensive managed care programs to children.

more likely to adhere to well-child visit recommendations. If the analysis is not at the well-child visit level, we would capture the impact of CMC/FFS on the number of well-child visits instead of the impact on fluoride varnish rates in medical settings. Therefore, we account for the differences in adherence to well-child visit recommendations by calculating the percentage of well-child visits that included a fluoride varnish application. We identified visits for new and established patients using *Current Procedural Terminology (CPT)* codes (99381-99383, 99391-99393). The outcome variable was a dichotomous indicator that POHS was provided during a well-child medical visit, identified using *CPT* code 99499 with modifier SC.⁹

The key explanatory variable was an indicator that the visit was paid by CMC (vs FFS). Visits were identified as paid by FFS if the "type of claim" variable indicated FFS. Visits were identified as paid by CMC if the "managed care type of plan code" variable indicated CMC. Because new policies can take time to have an impact,¹⁶ we categorized time since policy enactment into the following groups, calculated using the policy enactment date (April 15, 2008) and date of visit: less than 1 year, 1 year, 2 years, 3 years, and 4 years.

We controlled for children's sex, age, and a dichotomous indicator of annual Medicaid enrollment of 9 or more months (reference group: 6-8 months). Race/ethnicity was categorized as non-Hispanic White, non-Hispanic Black, Hispanic, and all other race groups. We used county-level information from the Area Health Resources Files to construct several variables: 2 indicators of whether a child lived in a county that was a full primary care or dental health professional shortage area (HPSA) and a continuous measure of the percentage of the county population younger than 18 years living at or below 100% of the federal poverty level. County rurality was categorized as metropolitan, nonmetropolitan adjacent to metropolitan areas, and nonmetropolitan not adjacent to metropolitan areas using 2013 Rural-Urban Continuum Codes.²³

Analysis

To test whether the distribution of characteristics varied for visits paid by FFS and CMC, we used χ^2 tests for categorical variables and *t* tests for continuous variables. We estimated a multivariable logistic regression model that included interaction terms of visits paid by CMC and dummy variables of years since POHS policy enactment to examine the differential impact of FFS and CMC by policy duration.

TRENDS FROM THE FIELD

TABLE. Characteristics of Study Sample: Pooled Sample of Well-Child Visits for Medicaid-Enrolled Children Aged 6 Months to 3.5 Years in Florida, 2009-2012^a

	Visits paid by FFS	Visits paid by CMC
Outcome		
% who received POHS in a well-child visit	9.67	8.33***
Policy characteristics		
Time since medical POHS policy enactment, %		
< 1 year	5.23	7.42***
1 to <2 years	24.74	29.19***
2 to <3 years	27.07	25.66***
3 to <4 years	24.99	20.40***
≥4 years	17.97	17.33**
Child characteristics		
Female, %	50.59	50.65
Race/ethnicity, %		
White, non-Hispanic	31.12	30.56
Black, non-Hispanic	27.45	35.36***
Hispanic or Latinx	40.12	32.50***
Other race/ethnicity groups	1.31	1.58***
Age in years, %		
< 1 year	29.20	29.28***
1 to <2 years	42.42	41.54**
2 to <3 years	18.02	18.51
3.0-3.5 years	10.36	10.68**
Children with 9-12 months of Medicaid eligibility, % (vs 6-8 months)	92.97	94.09***
County characteristics		
Lived in full primary care HPSA, %	88.31	96.26***
Lived in full dental HPSA, %	98.00	98.09
Rurality, %		
Metropolitan	91.49	99.32***
Nonmetropolitan adjacent to metropolitan	8.46	0.68***
Nonmetropolitan not adjacent to metropolitan	0.05	0.00***
% of children aged 0-17 years in poverty	25.18	23.56***
Weighted N	1,059,628	705,737

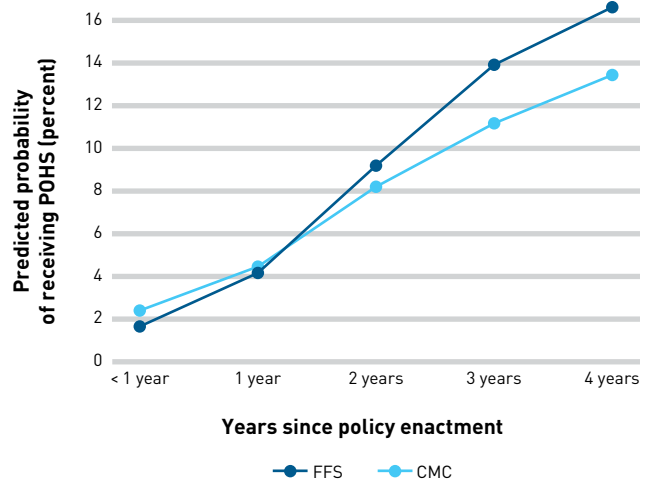
CMC, comprehensive managed care; FFS, fee for service; HPSA, health professional shortage area; POHS, preventive oral health services.

** $P < .01$; *** $P < .001$.

^aOther race/ethnicity groups are inclusive of American Indian, Alaskan Native, Asian, Native Hawaiian, other Pacific Islander, other racial groups, and multiracial, and were combined because of small sample sizes. To test whether the distribution of characteristics varied for visits paid by FFS and CMC, we used χ^2 tests for categorical variables and t tests for continuous variables.

We present results as adjusted predicted probabilities of receiving POHS during a well-child medical visit for visits paid via CMC (vs FFS) and by years since policy enactment. Adjusted predicted probabilities were derived from regression results and generated using Stata's margins command. Probabilities were calculated for each year since the policy was enacted by assigning all visits to be

FIGURE. Predicted Probabilities of a Well-Child Medical Visit Including POHS for Visits Paid via CMC and FFS by Policy Duration^a



CMC, comprehensive managed care; FFS, fee for service; POHS, preventive oral health services.

^aPredictions are derived from the logistic regression model described in eAppendix Table 2. P values to test differences in predicted probabilities of POHS during visits paid by CMC and FFS by length of policy enactment are as follows: < 1 year, .16; 1 year, .78; 2 years, .43; 3 years, .03; 4 years, .12.

paid via FFS (and then to be paid by CMC) while keeping all other covariates at their observed values. We also calculated differences in probabilities for CMC (vs FFS) for each year since the policy was enacted. SEs were clustered at the county level and obtained by the delta method. All analyses were conducted using Stata/MP version 16.1 (StataCorp). The RAND Corporation's Institutional Review Board approved this study.

RESULTS

The weighted sample included 1,059,628 FFS-reimbursed visits and 705,737 CMC-reimbursed visits, among which POHS were delivered during 9.67% of FFS visits and 8.33% of CMC visits (Table). Compared with FFS-reimbursed visits, CMC-reimbursed visits were more likely to be received by children who were Black and enrolled in Medicaid for more than 9 months annually.

As illustrated by regression-adjusted predictions (Figure), POHS rates increased over time for visits paid by both CMC and FFS. POHS rates among visits paid via FFS grew from 1.66% after less than 1 year of policy enactment to 16.51% after 4 years of policy enactment, whereas POHS rates during visits paid via CMC rose from 2.40% to 13.37% during the same times. eAppendix Table 2 shows the differences in regression-adjusted predicted probabilities for visits paid via CMC vs FFS. There were no significant differences in the probabilities of receiving POHS between visits reimbursed CMC and FFS when the POHS policy was enacted for less than 3 years (< 1 year: 0.74 percentage points; 95% CI, -0.55 to

2.02 percentage points; $P = .16$; 1 year: 0.29 percentage points; 95% CI, -1.70 to 2.28 percentage points; $P = .78$; 2 years: -0.97 percentage points; 95% CI, -3.45 to 1.52 percentage points; $P = .43$). There was weak evidence that the predicted differences in POHS rates were lower among CMC-reimbursed visits at least 3 years after policy enactment (3 years: -2.72 percentage points; 95% CI, -5.27 to -0.17 percentage points; $P = .03$; 4 years: -3.14 percentage points; 95% CI, -7.00 to 0.73 percentage points; $P = .12$).

DISCUSSION

Past research shows mixed evidence about the impact of CMC on Medicaid-enrolled children's receipt of care. Using Florida Medicaid data, our study demonstrates that following the enactment of a policy to support POHS delivery in medical settings, POHS rates among well-child visits increased gradually over time, although POHS rates remained low. Although the rate of POHS was slightly higher for visits paid FFS after 3 years of policy enactment, rates were similar overall and during all other points in time, suggesting similar POHS rates for visits paid via CMC and FFS.

Although the impact of transitioning to CMC on access to care has been studied extensively among adults,²⁴ the results may not generalize to children, who are a relatively healthy population with needs centering on preventive care. Our findings are important because enrollment in Medicaid CMC continues to grow. Florida transitioned nearly all Medicaid beneficiaries into managed care in 2014. Additionally, North Carolina, an early adopter of providing POHS in medical settings and a state with one of the highest POHS rates among children enrolled in Medicaid,²⁵ began transitioning to CMC in July 2021. Our findings provide evidence for policy makers that rates of delivery of POHS may be similar across visits paid by FFS and CMC.

Limitations

Study limitations include that managed care plans can vary widely in their structure. Without looking deeply into the financial incentives placed on the providers, it may be difficult to generalize findings to other states. Second, one challenge in studying the impact of managed care is the nonrandom selection of participants, namely that plans may seek to enroll healthier patients and encourage less healthy patients to seek help elsewhere.²⁶ Third, although the utilization rate of POHS conditional on having a well-child visit did not differ between children under Medicaid FFS and those under Medicaid CMC, we could not measure whether unmet need varied in these groups. We also did not investigate whether there were different frequencies of well-child visits or dental visits between children under Medicaid CMC and FFS. We believe that receipt of dental visits should not affect our conclusions for several reasons. First, the US Preventive Services Task Force recommends fluoride varnish be applied by primary care clinicians to all children regardless of receipt of dental visits.²⁷ Second, Florida's Medicaid program pays for fluoride varnish in medical settings every 3 months, regardless

of dental visits received.¹⁰ Finally, previous research shows that fluoride varnish in medical settings likely adds to POHS rather than replaces it in pediatric dental visits.²⁸

Our study period is immediately after the Great Recession, and past studies find mixed results about the impact of the recession on health care utilization for Medicaid enrollees.^{29,30} However, our study examined receipt of POHS conditional on having a well-child medical visit, meaning our findings are conditional on having some utilization. Although total visits may vary, the POHS rate should be unaffected. Next, although we analyzed older data (2009-2012), our study period captures an important time frame immediately following Florida's coverage of POHS and before nearly all Florida Medicaid enrollees were moved into CMC. As of 2019, more than 99% of children enrolled in Medicaid in Florida were enrolled in managed care plans, meaning that our findings related to the impact of CMC are highly relevant today.³⁰ Finally, we provide new information about the impact of Medicaid CMC on children, as many studies were conducted using data from the late 1990s.^{3,6-8,31}

CONCLUSIONS

Our findings highlight the low rate of POHS during pediatric medical visits, which has received attention from a new learning collaborative sponsored by CMS.³² This study found similar rates of a newly authorized preventive service among pediatric medical visits in Florida paid via FFS and CMC—findings that would be of interest to all state Medicaid programs, including those expanding CMC. Future research should examine the number of children receiving fluoride varnish in medical settings and the number of applications each child receives, as study findings have suggested that multiple applications of fluoride varnish or other preventive dental care be performed on children to reduce caries and caries-related treatment.^{33,34} ■

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eAppendix Table 1. Exclusion Criteria

	Total weighted visits	Number of weighted visits dropped
Count of visits in Florida during study period	2,060,270	
After dropping visits with eligibility < 6 months	1,984,802	75,468
After dropping visits with missing sex	1,984,790	12
After dropping visits with missing county ID	1,980,680	4110
After dropping visits with missing race/ethnicity	1,765,365	215,315*
Final sample	1,765,365	

** We conducted a sensitivity analysis by estimating a regression model including visits with missing race/ethnicity. The results for our key explanatory variables were unchanged in terms of direction and statistical significance.*

eAppendix Table 2. Differences in Predicted Probabilities of a Well-Child Medical Visit, Including Preventive Oral Health Services for Visits Paid CMC and FFS by Policy Duration

	Percentage-point differences in probabilities for visits paid via CMC (vs FFS) including POHS
Average difference across all years	-1.29 (-3.45, 0.88)
Differences by years since policy enactment	
< 1 year	0.74 (-0.55, 2.02)
1 year	0.29 (-1.70, 2.28)
2 years	-0.97 (-3.45, 1.52)
3 years	-2.72* (-5.27, -0.17)
4 years	-3.14 (-7.00, 0.73)

CMC, comprehensive managed care; FFS, fee for service; POHS, preventive oral health services.

Note. Weighted sample includes 1,765,365 well-child visits for children aged 6 months to 3.5 years in Florida during 2009-2012. Results are presented as differences in predicted probabilities (percentage point differences) and derived from a logistic regression model that also adjusted for sex, age, race/ethnicity, rurality, and county rates of child poverty, and primary care and dental health professional shortage areas. The model also included sampling weights, and standard errors were clustered at the county level. * $P < .05$.