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*J Public Health Dent.* 2018 September ; 78(4): 360–364. doi:10.1111/jphd.12287.**FACTORS AFFECTING THE AFFORDABLE CARE ACT  
MARKETPLACE STAND-ALONE PEDIATRIC DENTAL PLAN  
PREMIUMS****Nan Qiao, MPH<sup>1</sup>, Aaron E. Carroll, MD, MS<sup>2</sup>, and Teresa Maria Bell, PhD<sup>3</sup>**<sup>1</sup>Department of Economics, Indiana University-Purdue University Indianapolis<sup>2</sup>Department of Pediatrics, Center for Health Policy and Professionalism Research, Indiana University School of Medicine<sup>3</sup>Department of Surgery, Indiana University School of Medicine**Abstract**

**Background:** Children from lower income families have inadequate dental insurance coverage and poorer dental health in the United States. The Affordable Care Act (ACA) created Health Insurance Exchange Marketplaces to increase competition among health insurers and to provide low-income families with less costly health plans. The study examined Marketplace pediatric stand-alone dental plans (SADPs) and factors that affect their premiums.

**Methods:** The data used were 2016 Federal-Facilitated and State-Partnership Marketplace pediatric SADP data. Ordinary least squares regressions were applied to estimate contributing factors' effects on SADP premiums.

**Results:** Great premium variation was found among low and high coverage level SADPs, respectively. Premiums of Health Maintenance Organization (HMO) SADPs were significantly less expensive than Preferred Provider Organization (PPO) SADPs. SADPs charged significantly higher premiums for more types of services covered. SADPs also charged higher premiums in states where there are larger proportions of low-income people who report poor dental health, more dentists per capita, or higher dentists' wages. The number of insurance companies offering pediatric SADPs in a Marketplace was negatively associated with premiums.

**Conclusion:** The current Marketplace pediatric SADPs may have limited effects on increasing economically disadvantaged children's access to quality dental care. Marketplaces can promote competition among its pediatric dental insurers on providing lower-cost pediatric SADPs.

**Keywords**

Pediatric Dental Insurance; Dental Insurance Premiums; Affordable Care Act

## INTRODUCTION

Large disparities in dental health exist among children from different socioeconomic backgrounds in the United States.<sup>1-3</sup> A major cause of this disparity is that children from lower income families have inadequate dental insurance coverage and less access to dental care.<sup>2-4</sup> Literature has reported that the odds of not having dental insurance for children from families with income less than 100% Federal Poverty Level (FPL) was 61% higher compared to children from families with income greater than 400% FPL; while the odds of having unmet dental care needs for children without dental insurance coverage was 166% higher compared to children with dental insurance coverage.<sup>5</sup> It has also been reported that public dental coverage offered by Medicaid or the State Children's Health Insurance Program often reimburse lower than costs of services provided, and therefore cannot be fully translated to access.<sup>4</sup>

The Affordable Care Act (ACA) set up Health Insurance Exchange Marketplaces to increase insurers' competition in providing less costly and better quality health plans and to help lower income families who are not yet eligible for Medicaid coverage to purchase less costly or government-subsidized health care plans. The ACA mandates Marketplace insurers to offer pediatric dental plans; however, parents are not required to purchase dental plans for their children, and government subsidies are not allowed to be used on dental plan purchases.<sup>6</sup> Therefore, premiums become an important factor in parents' decision-making on whether or not to purchase dental coverage for their children.

The lack of an ACA pediatric dental insurance mandate has led to many stand-alone dental plans (SADPs), i.e., dental plans that are not attached to health plans,<sup>7</sup> entering Marketplaces. Different from dental plans embedded within health plans, SADPs might have higher price elasticity of demand compared to dental plans embedded within health plans. In this study, we focused on examining the premiums of this special type of dental plans in Marketplaces and exploring factors that affect their premiums. This is the first study that has examined this specific topic. Several publications were found that studied the ACA Marketplace SADP premiums from different perspectives. Orynich et al. (2015) found no significant differences of pediatric SADP premiums among state-based, state-partnered, and federal-facilitated insurance exchanges.<sup>9</sup> Vujcic and Yarbrough (2017) found that pediatric SADPs led to higher premium and out-of-pocket expenses compared to embedded dental plans.<sup>10</sup> Therefore, this study contributes to the existing literature on the Marketplace SADP premiums. Findings from the study may help to answer whether the ACA Marketplace SADPs help improve economically disadvantaged children's access to dental care.

## METHODS

This study analyzed publicly available 2016 Federal-Facilitated and State-Partnership Marketplace pediatric SADP data that were extracted from Marketplace insurer filing systems on November 9<sup>th</sup>, 2015.<sup>11</sup> The data covered all SADPs (N = 42,192) to be sold in Federal-Facilitated and State-Partnership Marketplaces across 34 states in 2016. The data provided information on SADPs' issued insurers, coverage levels, plan types, covered services, premiums, and geographic locations. Marketplace pediatric SADPs are grouped

into two categories by the government, namely high and low coverage levels based on their premiums and copayments.<sup>8</sup> Low coverage level SADPs charge low premiums but high copayments, and high coverage level SADPs charge high premiums but low copayments. As the two coverage levels are heterogeneous in their premium settings, the analysis was stratified on the plan levels, as comparing the two plan levels is not an objective of the study.

Ordinary least squares regressions were applied to estimate different potential contributing factors' effects on SADP premiums. The dependent variable was SADP premiums. The independent variables included dental insurer type, SADP design, and several state level variables. There are four types of insurers providing pediatric SADPs in Marketplaces: Indemnity, Preferred Provider Organization (PPO), Exclusive Provider Organization (EPO), and Health Maintenance Organization (HMO). Indemnity is the traditional pay-for-services plan that does not constrain enrollees' choice of dentists; PPO plans allow enrollees to use out-of-network dentists with a higher copay; EPO plans only reimburse the use of within-network dentists; and HMO plans only reimburse the use of contracted dentists.<sup>12</sup> SADPs cover some or all of the following four types of services: 1) dental checkups, 2) basic dental procedures, 3) major dental procedures, and 4) orthodontia. According to National Association of Dental Plans, dental checkups "usually includes an annual or twice yearly office visit for an exam, cleaning, x-rays and sealants;" "basic procedures are office visits for dental problems, extractions, fillings, root canals, and treatment for gum disease;" "major procedures are crowns, bridges, inlays, and dentures;" and orthodontia includes retainers and braces.<sup>13</sup> Binary variables were created for each service type to measure whether it is covered or not by a dental plan. Several state level variables were included as measures for dental care insurance market environment, which included the number of pediatric dental insurance companies participating in each state's Marketplace, the proportion of low-income population who self-reported to have poor dental health in each state, the number of dentists per 100,000 state population, and general dentist hourly wage rates in each state. The proportion of low-income population with poor dental health measured the dental care needs of adults whose household income were less than or equal to 138 percent of the federal poverty level (FPL).<sup>14</sup> It was used as a proxy for children's dental care needs. This variable, as well as the number of dentists per 100,000 state population, were obtained from the American Dental Association.<sup>15,16</sup> General dentist hourly wage rates were extracted from the Bureau of Labor Statistics website.<sup>17</sup> The regression model was expressed in the following:

$$premium_i = \alpha + \beta_1 plan\_type_i + \beta_2 coverage_i + \beta_3 X_s + state_s + u_i$$

Where  $i$  stood for each Marketplace SADP and  $S$  stood for the state where the plan is to be sold.  $X_s$  was a vector of state level dental market variables.  $state_s$  was the state fixed effect, which was included to control for other state-level factors, such as state average household income and state dental care/insurance regulations. To control within-state correlation of the SADPs, cluster-robust standard errors were estimated.

## RESULTS

Table 1 displays descriptive statistics of all the SADP and state level variables by coverage levels. Low and high coverage level SADPs accounted for 54.68% and 45.32% of the total Federal-Facilitated/State-Partnership Marketplace SADPs. The mean premiums of low and high coverage level SADPs were \$26.05 [Range: \$8.27 – \$55.24] per month and \$33.87 [Range: \$13.70 – \$71.38] per month respectively. PPOs were the most common plan form, accounting for over 90% of SADPs. Indemnity plans were the least common form, accounting for only 1.1% of high coverage level plans and 0.5% of low coverage level plans. All SADPs covered dental checkups. Most SADPs covered basic dental procedures, major dental procedures, and orthodontia (n = 41,989, 41,951, and 40,474, respectively). Comparing to high coverage level plans, a smaller percentage of low coverage level plans covered basic and major dental procedures, and a greater percentage of low coverage level plans covered orthodontia. In each state on average, 20.696% [Range: 9%–32%] of the low-income population reported to have poor dental health; 53.380 [Range: 40.93–81.52] dentists provided care per 100,000 population; general dentists had a wage rate of \$82.015 [Range: 58.34–109.21] per hour; and 7.809 [Range: 2–12] insurers provided SADPs in a Marketplace.

Table 2 displays estimates of different factors' effect on Marketplace SADP premiums using regressions not controlling for (Columns 1 and 3) and controlling for state fixed effects (Columns 2 and 4). After controlling for state fixed effects, some estimation results changed significantly in either magnitudes or significance, indicating controlling for state fixed effects was necessary to reduce bias caused by unobserved state level confounders. After controlling state fixed effects, premiums of indemnity and EPO SADPs were not significantly different from PPO SADPs. HMO low and high coverage SADP monthly premiums were \$7.360 (P = 0.003) and \$11.568 (P = 0.015) cheaper than PPO ones. Low coverage SADPs with basic dental coverage were \$9.018 (P < 0.001) more expensive than low coverage plans without basic dental coverage. SADPs with major dental procedure coverage were not significantly more expensive compared to plans without major procedure coverage. Low and high coverage plans with orthodontia coverage were \$7.303 (P < 0.001) and \$6.481 (P = 0.001) more expensive compared to SADPs without orthodontia coverage. When the proportion of the low income population who reported having poor dental health in each state increased by 100%, low coverage SADP premiums increased by \$0.362 (P < 0.001), and high coverage SADP premiums increased by \$0.410 (P < 0.001). When the number of dentists per 100,000 state population increased by one, low coverage SADP premiums increased by \$0.646 (P < 0.001) and high coverage SADP premiums increased by \$0.761 (P < 0.001). Low and high coverage SADP premiums increased by \$0.060 (P = 0.002) and \$0.503 (P < 0.001) per one-dollar increase in general dentist hourly wage rates. Low and high coverage SADP premiums decreased by \$0.962 (P < 0.001) and \$1.002 (P < 0.001) when one more insurance company participating in the Marketplace. All the examined factors plus state fixed effects explained 31.6% of premium variations among low coverage level plans and 36.5% among high coverage level plans.

## DISCUSSION

Large premium variations existed in pediatric SADPs sold in the ACA Federal-Facilitated and State-Partnership Marketplaces, ranging from \$8.27 per month to \$71.38 per month. Higher SADP premiums were associated with larger provider networks and greater service coverage. They were also associated with a larger proportion of low income people with poor dental health in an area. Children from low income families are more likely to have poorer dental health and need better dental insurance coverage and more flexibility in selecting dentists. Their parents face higher premiums to meet children's needs and may decide not to enroll in any SADPs. The take-up of Marketplace SADPs is low. For example, on February 1<sup>st</sup>, 2014, only 15.9% of children who are enrolled in marketplace health plans also purchased SADPs.<sup>18</sup> The low-take up of SADPs limited their role in increasing economically disadvantaged children's access to dental care and reducing pediatric dental health disparities. Dentist-to-population ratios were found to be positively associated with SADP premiums. It suggested that a larger number of dentists operating in a state may bring them greater power to bargain higher ADP reimbursement for the services they provide. Alternatively, it might reflect larger networks covered by SADPs or higher utilization of dental care due to supply-induced demand in states with more dentists. Prior studies have reported that the measure was also positively associated with children's access to preventive dental care.<sup>15</sup> Dentists' average wages in a state were also positively associated with SADP premiums, reflecting higher dental costs lead to higher dental insurance premiums. More insurers in a Marketplace was associated with lower SADP premiums, which might suggest that the ACA Marketplace increased insurers' competition on providing lower costs dental plans.

This is the first empirical study using dental plan level data to explore factors affecting Marketplace pediatric SADP premiums. Due to data limitations, SADP premium influencing factors were only roughly measured by variables available. Important factors that may explain premium variations, such as insurer administrative overhead, state cost-of-living, or state dental insurance regulations were not included. In addition, due to data limitations, our analyses only focused on how different factors affect Marketplace SADP premiums, we did not explore further how changes in these factors would affect Marketplace pediatric SADPs enrollment rates, children's access to dental care, and their dental health. These topics can be addressed examined in future studies.

In conclusion, the ACA Marketplace pediatric SADPs charge higher premiums for more covered services, higher dental care needs, larger supply of dentists, and higher dental care costs. Economically disadvantaged children may have less access to services that are only covered by high-premium SADPs, especially when they live in areas with greater needs and supply of dental care and higher dental care costs. On the other hand, the ACA Marketplace stimulates competition among dental insurers in providing lower costs dental plans, which is beneficial for economically disadvantaged children to access dental insurance coverage. To improve children's access to dental care and their dental health, the government may consider subsidizing Marketplace SADP premiums to encourage more insurers' participation in the Marketplace. We found no previous publications providing the estimates of the effects of changing Marketplace pediatric SADPs' premiums on enrollment rates. A

review conducted by Saloner et al. (2016) summarized a 10-dollar increase in CHIP premiums leads to 1.4–3.9 percentage points decrease in public insurance enrollment rates. If we assume the effects in Marketplace pediatric SADPs are similar, one more insurer entering the market will reduce the premium of Marketplace SADP premiums by approximately one dollar, which will yield around 0.14–0.39 percentage points increases in Marketplace SADP enrollment rates.

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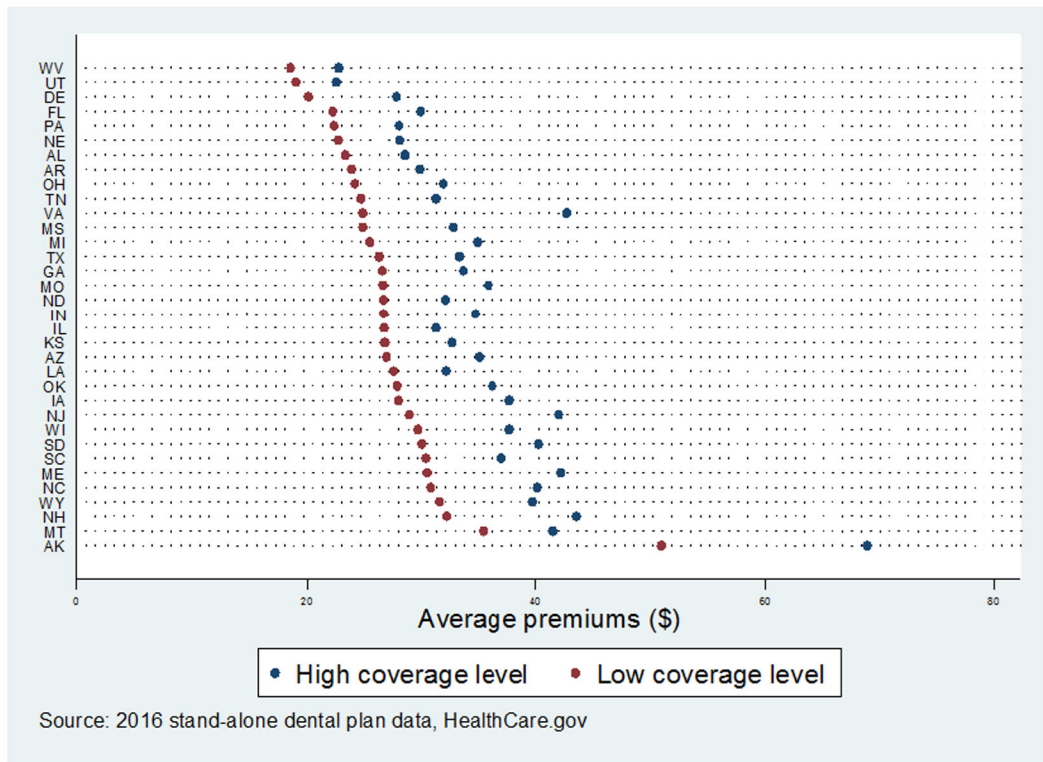
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**Figure 1.** Average premiums of stand-alone individual Marketplace child dental plans in each state



**Table 1.**

## Descriptive Statistics

Variable	Low Coverage Level (N = 23,072)		High Coverage Level (N = 19,120)	
	Mean	Std. Dev.	Mean	Std. Dev.
Premiums	26.051	5.991	33.872	8.412
Indemnity	0.005	0.071	0.011	0.102
PPO	0.924	0.265	0.908	0.290
EPO	0.035	0.184	0.046	0.210
HMO	0.036	0.186	0.036	0.185
Checkup covered	1.000	0.000	1.000	0.000
Basic dental covered	0.994	0.079	0.997	0.055
Major dental covered	0.992	0.089	0.997	0.055
Orthodontia covered	0.960	0.195	0.958	0.201
% low income reported poor dental health	0.207	0.052	0.207	0.055
Number of dentist per 100,000 population	53.407	7.068	53.347	7.068
Dentist average hourly wage	82.155	8.460	81.847	8.783
Number of insurers in a state	7.920	2.949	7.675	2.976

**Table 2.**

Ordinary Least Squares Estimation of Different Factors' Effects on Marketplace Stand-alone Pediatric Dental Insurance Premiums

	Low Coverage Level		High Coverage Level	
	(1)	(2)	(1)	(2)
Indemnity	8.298 <sup>***</sup> (1.239)	1.166 (3.799)	6.166 (4.056)	-0.328 (4.065)
EPO	-3.73 (2.756)	-2.836 (2.588)	-2.498 (2.037)	-2.107 (1.547)
HMO	-7.923 <sup>**</sup> (2.505)	-7.360 <sup>**</sup> (2.311)	-11.573 <sup>**</sup> (4.496)	-11.568 <sup>**</sup> (4.503)
Basic dental covered	6.895 <sup>***</sup> (1.287)	9.018 <sup>***</sup> (1.402)	4.461 (3.455)	1.766 (1.304)
Major dental covered	-2.811 (2.264)	1.509 (1.131)	- -	- -
Orthodontia covered	4.360 <sup>***</sup> (0.720)	7.303 <sup>***</sup> (1.077)	6.436 <sup>***</sup> (1.540)	6.481 <sup>**</sup> (1.731)
% low income reported poor dental health	0.150 (0.093)	0.362 <sup>***</sup> (0.063)	0.420 <sup>**</sup> (0.178)	0.410 <sup>***</sup> (0.033)
Number of dentist per 100,000 population	0.13 (0.077)	0.646 <sup>***</sup> (0.026)	0.313 <sup>**</sup> (0.148)	0.761 <sup>***</sup> (0.019)
Dentist average hourly wage	0.130 <sup>*</sup> (0.066)	0.060 <sup>**</sup> (0.018)	0.221 <sup>**</sup> (0.107)	0.503 <sup>***</sup> (0.035)
Number of insurers in a state	-0.181 (0.151)	-0.962 <sup>***</sup> (0.115)	-0.244 (0.239)	-1.002 <sup>***</sup> (0.063)
N	23,072	23,072	19,120	19,120
R-squared	0.149	0.316	0.155	0.365

\* , P < 0.10;

\*\* , P < 0.05;

\*\*\* , P < 0,001.

(1) Not controlling for state fixed-effects; and (2) Controlling for state fixed-effects. Robust standard errors clustering on states were listed in parenthesis.