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Research Brief

An Analysis of Dental Spending Among Children with Private Dental Benefits

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Key Messages

- *More than one in four children ages 1 through 18 with private dental benefits do not have a single dental claim within the year.*
- *Fees paid to dentists through private dental benefits plans are significantly lower than market fees. This leads to substantial differences in total dental spending estimates based on "market" versus "actual" fees.*
- *For the majority of children, total copayments, coinsurance, and premiums exceed the "market" value of dental care.*

Introduction

The passage of the Affordable Care Act (ACA) brought many changes to the oral health sector in the United States. Chief among them was a continued focus on the importance of children's oral health. Child dental benefits are one of ten essential health benefits under the ACA.[1] While there are implementation challenges, children are gaining dental benefits through the new health insurance marketplaces,[2] and more medical plans are including dental coverage for children.[3]

Given all of these changes, the ADA Health Policy Institute (HPI) is examining the cost implications of alternative dental benefits options available for children within the health insurance marketplaces. To do this, it is necessary to first understand typical dental care utilization and spending patterns among children who currently have private dental benefits. This information could then be used to "predict" dental care utilization patterns of newly insured children. Based on predicted utilization patterns, costs associated with alternative dental benefits plans offered in the health insurance marketplaces could be simulated.

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In this research brief, we summarize our findings from the first step of this analysis. Specifically, we analyze dental care utilization and spending patterns among a very large sample of children with private dental benefits. We analyze utilization and spending by dental service category, age group and spending quartile. To our knowledge, this is the first analysis of dental spending patterns at the procedure level among a large sample of children with private dental benefits.

Results

Table 3 summarizes average annual dental spending valued at market fees. For ages 1 through 6, this is estimated to be $257 and ranges from $160 for children in the lowest quartile of spending to $996 among children in the highest quartile of spending. We find that 42.5 percent of children ages 1 through 6 who have private dental benefits do not have a single dental claim within the year.

Among children ages 7 through 12, average annual dental spending, valued at market fees, is estimated to be $828. This ranges from $247 among children in the lowest quartile of spending to $2,921 among children in the highest quartile of spending. It is important to note that average total dental spending in this age category is largely influenced by the spending on orthodontia services among children in the fourth quartile. Additionally, 20.9 percent of children ages 7 through 12 who have private dental benefits do not have a single dental claim within the year.

Among children ages 13 through 18, average annual dental spending, valued at market fees, is estimated to be $928. This ranges from $273 among children in the lowest quartile of spending to $3,580 among children in the highest quartile of spending. Similar to children ages 7 through 12, total dental spending among children ages 13 through 18 is largely influenced by spending on orthodontia services among children in the third and fourth spending quartiles. Furthermore, 27.6 percent of children ages 13 through 18 who have private dental benefits do not have a single dental claim within the year.

Among all children ages 1 through 18 who have private dental benefits in our sample, 28.8 percent do not have a single dental claim within the year.

Table 4 summarizes estimated average annual dental spending, valued at market fees, by age group and dental spending quartile, replicating the “total” rows from Table 3.

Table 5, in comparison, summarizes average annual dental spending valued at actual fees paid to dentists under dental benefits plans for children with private dental benefits. For children ages 1 through 6, this is estimated to be $182. This ranges from $95 among children in the lowest quartile of spending to $719 among children in the highest quartile of spending.

Average annual dental spending, valued at actual fees paid to dentists, among children with private dental benefits ages 7 through 12 is estimated to be $416. This ranges from $133 among children in the lowest quartile of spending to $1,321 among children in the highest quartile of spending.

Average annual dental spending, valued at actual fees paid to dentists, among children with private dental benefits ages 13 through 18 is estimated to be $505. This ranges from $134 among children in the lowest quartile of spending to $1,926 among children in the highest quartile of spending.

Table 6 summarizes estimated average annual dental spending, valued at actual fees paid to dentists, by age group and dental spending quartile, replicating the “total” rows from Table 5. Note, neither Table 5 nor Table 6 include spending on dental benefits plan premiums.

Table 7 summarizes average annual dental spending, valued at actual fees paid to dentists, by age group and dental spending quartile broken down by source of financing. Specifically, it summarizes the portion of dental spending that is paid by the insurer and the patient. We also calculate total outlays that incorporate estimated dental benefits plan premium costs.

Discussion

To our knowledge, this is the first comprehensive analysis of dental care utilization and spending patterns among children with private dental benefits. In our view, there are several findings with important implications for consumers and employers, the main purchasers of private dental benefits.

First, a significant portion of beneficiaries do not use any of their dental benefits. More than one in four children ages 1 through 18 who have private dental benefits do not have a single dental claim within the year. For children ages 1 through 6, this is much higher at 42.5 percent. Clearly, a significant portion of children are not receiving routine preventive dental care.

Second, it is clear that fees paid to dentists through private dental benefits plans are significantly lower than market fees. This leads to substantial differences in total dental spending estimates based on "market" versus "actual" fees, especially within the higher spending quartiles.

Third, and most significant in our view, for the majority of children, total spending after including premiums actually exceeds the "market" value of their dental care. This can be seen by comparing Table 1, Table 4 and the bottom panel in Table 7. It is important to note that this result holds for several age-spending quartiles as well as for all children taken together.

It is important to note that while we used ACA marketplace stand-alone dental plan premium estimates in our calculation of the total cost of dental benefits to the patient, we feel our analysis is very relevant for group dental benefits plans purchased by employers outside of the ACA marketplaces.

Employer-sponsored dental benefits plan information from the National Association of Dental Plans indicates that dental preferred provider organization plans (DPPOs) are by far the most common type of plan offered by employers.[4] Our estimate for premiums in our analysis is on par with typical premiums charged for DPPO products (for fully insured business lines) sold outside of the marketplaces.[5] Thus, we feel that observations regarding total spending on care versus total cost of premiums and patient out-of-pocket expenses hold true beyond the ACA marketplaces.

Looking forward, the ACA and other developments in the dental sector have the potential to reshape the dental benefits products available to consumers. The ADA Health Policy Institute will continue to study the impact of the ACA on dental benefits coverage, as well as other important outcomes.

Table 1: Total Number of Children in Sample by Age Group and Dental Spending Quartile

Ages	Total	No Spending	First	Second	Third	Fourth
1 through 6	497,082	211,079	71,558	71,789	71,085	71,571
7 through 12	720,583	150,625	142,085	142,475	142,904	142,494
13 through 18	837,691	230,814	152,067	151,368	151,684	151,758

Source: ADA HPI analysis of 2013 Truven data.

Table 2: Utilization Rate for the Top 25 Most Common Procedures

Ages 1 through 18		Ages 1 through 6		Ages 7 through 12		Ages 13 through 18	
D0120	0.950	D1120	0.854	D1120	1.264	D0120	0.952
D1120	0.764	D0120	0.677	D0120	1.137	D1110	0.804
D1208	0.568	D1208	0.485	D1208	0.759	D1208	0.454
D1110	0.332	D0272	0.251	D0272	0.527	D0274	0.373
D0272	0.307	D1206	0.185	D1351	0.526	D8670	0.315
D1351	0.306	D0150	0.185	D1206	0.229	D1120	0.281
D0274	0.196	D0220	0.150	D0220	0.200	D1351	0.246
D8670	0.185	D0230	0.138	D0230	0.170	D0272	0.151
D1206	0.182	D1351	0.089	D8670	0.161	D2391	0.150
D0220	0.167	D2392	0.079	D7140	0.160	D0230	0.148
D0230	0.153	D2150	0.075	D2392	0.120	D0220	0.148
D0150	0.123	D9230	0.054	D0274	0.115	D1206	0.139
D2392	0.108	D0240	0.051	D2150	0.110	D2392	0.116
D2391	0.103	D2930	0.046	D0150	0.109	D7240	0.111
D7140	0.085	D1203	0.046	D0330	0.098	D0330	0.100
D2150	0.084	D2391	0.043	D2391	0.090	D0150	0.098
D0330	0.082	D0140	0.039	D1203	0.086	D2140	0.096
D2140	0.071	D2140	0.038	D9230	0.075	D2150	0.068
D1203	0.057	D7140	0.034	D2140	0.066	D0140	0.062
D0140	0.055	D0145	0.032	D0140	0.057	D8080	0.056
D9230	0.048	D3220	0.030	D8060	0.046	D7140	0.052
D7240	0.046	D0330	0.028	D8080	0.031	D0210	0.040
D8080	0.034	D2330	0.019	D0210	0.031	D1203	0.039
D0210	0.030	D0274	0.016	D7111	0.024	D7230	0.036
D0240	0.021	D1330	0.012	D2930	0.022	D9220	0.036

Source: ADA HPI analysis of 2013 Truven data. **Notes:** Analysis is based on all children with private dental benefits regardless of their dental spending level (i.e. includes children with no spending).

Table 3: Estimated Average Annual Dental Spending, Valued at Market Fees (per FAIR Health), by Category of Dental Service, Age Group and Dental Spending Quartile in 2015 Dollars

	Category of Dental Service	All	First	Second	Third	Fourth
Ages 1 through 6	Preventive/Diagnostic	$168	$156	$255	$338	$420
	Basic	$80	$4	$8	$28	$513
	Major	$6	$0	$1	$2	$36
	Orthodontia	$4	$0	$1	$1	$27
	Total	**$257***	**$160**	**$265**	**$369**	**$996**
Ages 7 through 12	Preventive/Diagnostic	$280	$214	$338	$412	$452
	Basic	$125	$13	$36	$131	$452
	Major	$9	$1	$1	$5	$37
	Orthodontia	$414	$18	$24	$72	$1,981
	Total	**$828**	**$247***	**$399**	**$620**	**$2,921***
Ages 13 through 18	Preventive/Diagnostic	$239	$213	$338	$401	$366
	Basic	$201	$17	$47	$217	$828
	Major	$42	$3	$3	$17	$208
	Orthodontia	$447	$40	$46	$204	$2,178
	Total	**$928***	**$273**	**$434**	**$839**	**$3,580**

Source: ADA HPI analysis of 2013 Truven claims data, 2012 and 2013 FAIR Health procedure charges. **Notes:** Analysis for "All" includes all children with private dental benefits regardless of dental spending (i.e. includes children with no spending). Analysis for spending quartiles excludes individuals with no dental spending. *Spending categories do not sum to total due to rounding.

Table 4: Estimated Average Annual Dental Spending, Valued at Market Fees (per FAIR Health), by Age Group and Dental Spending Quartile in 2015 Dollars

Ages	All	First	Second	Third	Fourth
1 through 6	$257	$160	$265	$369	$996
7 through 12	$828	$247	$399	$620	$2,921
13 through 18	$928	$273	$434	$839	$3,580

Source: ADA HPI analysis of 2013 Truven claims data, 2012 and 2013 FAIR Health procedure charges. **Notes:** Analysis for "All" includes all children with private dental benefits regardless of dental spending (i.e. includes children with no spending). Analysis for spending quartiles excludes individuals with no dental spending.

Table 5: Estimated Average Annual Dental Spending, Valued at Actual Fees Paid (per Truven), by Category of Dental Service, Age Group, and Dental Spending Quartile in 2015 Dollars

	Category of Dental Service	All	First	Second	Third	Fourth
Ages 1 through 6	Preventive/Diagnostic	$127	$94	$175	$261	$357
	Basic	$52	$1	$3	$13	$342
	Major	$2	$0	$0	$0	$15
	Orthodontia	$1	$0	$0	$0	$5
	Total	**$182**	**$95**	**$178**	**$274**	**$719**
Ages 7 through 12	Preventive/Diagnostic	$209	$129	$232	$320	$377
	Basic	$81	$4	$16	$72	$317
	Major	$4	$0	$0	$1	$20
	Orthodontia	$121	$0	$1	$6	$606
	Total	**$416***	**$133**	**$248***	**$399**	**$1,321***
Ages 13 through 18	Preventive/Diagnostic	$176	$127	$235	$319	$289
	Basic	$132	$5	$19	$123	$584
	Major	$26	$1	$1	$6	$135
	Orthodontia	$171	$1	$2	$24	$917
	Total	**$505**	**$134**	**$257**	**$472**	**$1,926***

Source: ADA HPI analysis of 2013 Truven claims data, 2012 and 2013 FAIR Health procedure charges. **Notes**: Analysis for "All" includes all children with private dental benefits regardless of dental spending (i.e. it includes children with no spending). Analysis for spending quartiles excludes individuals with no dental spending. *Spending categories do not sum to total due to rounding.

Table 6: Estimated Average Annual Dental Spending, Valued at Actual Fees Paid (per Truven), by Age Group and Dental Spending Quartile in 2015 Dollars

Ages	All	First	Second	Third	Fourth
1 through 6	$182	$95	$178	$274	$719
7 through 12	$416	$133	$248	$399	$1,321
13 through 18	$505	$134	$257	$472	$1,926

Source: ADA HPI analysis of 2013 Truven claims data, 2012 and 2013 FAIR Health procedure charges. **Notes**: Analysis for "All" includes all children with private dental benefits regardless of dental spending (i.e. includes children with no spending). Analysis for spending quartiles excludes individuals with no dental spending.

Table 7: Estimated Average Annual Dental Spending, Valued at Actual Fees Paid (per Truven), by Age Group and Dental Spending Quartile in 2015 Dollars

	Ages	All	First	Second	Third	Fourth
Dental Spending Paid by Insurer	1 through 6	$161	$92	$172	$261	$592
	7 through 12	$317	$128	$235	$361	$880
	13 through 18	$359	$127	$242	$411	$1,200
Dental Spending Paid by Patient (Not Including Estimated Premium Cost)	1 through 6	$21	$3	$6	$13	$126
	7 through 12	$98	$5	$13	$38	$441
	13 through 18	$146	$7	$15	$61	$726
Dental Spending (Including Estimated Premium Cost)	1 through 6	$403	$385	$387	$395	$508
	7 through 12	$480	$387	$394	$420	$822
	13 through 18	$527	$388	$397	$442	$1,107

Source: ADA HPI analysis of 2013 Truven claims data, 2012 and 2013 FAIR Health procedure charges. **Notes**: Analysis for "All" includes all children with private dental benefits regardless of dental spending (i.e. includes children with no spending). Analysis for spending quartiles excludes individuals with no dental spending.

Data & Methods

Child dental benefits in dental plans offered in the federally-facilitated marketplace include four main categories of dental services: check-up, basic, major and orthodontia. For the purposes of this analysis, we used these four categories and renamed the category "check-up" as "preventive and diagnostic services."

We categorized children in our analysis based on two factors: age group and total dental spending within the year.

We created age groups based on tooth eruption patterns and potential dental needs. Eruption of permanent teeth occurs between 6 and 12 years of age, so we created three age groups: 1 through 6, 7 through 12, and 13 through 18.[6]

To calculate dental care utilization, we used data from the Truven Health MarketScan® Research Databases (Truven) for 2013.[7] Truven includes dental claims and enrollment data from large employers and health plans across the United States who provided private dental benefits to employees, their spouses and dependent children. In 2013, there were 10.7 million covered lives included in Truven. Based on the latest data from the 2012 Medical Expenditure Panel Survey (MEPS),[8] we estimate that as of 2012, Truven covered about 7.6 percent of privately insured individuals in the United States. Truven includes claims from a variety of fee-for-service (FFS), preferred provider organization (PPO) and capitated health plans.

We examined 11,423,879 dental claims across 2,055,356 children who were enrolled in a private dental benefits plan for 365 continuous days in our analysis.

Each Truven dental claim indicates the age of the child for which the claim was submitted, the American Dental Association Current Dental Terminology (CDT®) procedure code, and the total amount spent per procedure. Within each age group, we analyzed data across all children with private dental benefits, regardless of whether they had any dental spending. We also generated dental spending quartiles, separating those with no dental spending into a separate fifth group. Total dental spending includes payments made by consumers (e.g. copayments, coinsurance, etc.), insurers and other third parties. Truven captures all of these parameters.

See Table 1 for the total number of children in each age group and dental spending quartile included in our analysis, hereinafter referred to as "patient profiles."

With beneficiaries sorted into groups by their dental spending levels, we analyzed the utilization of specific dental procedures within each patient profile using CDT® codes. To determine the average number of times a child within each patient profile utilized a specific dental procedure within the year, we divided the total number of claims for a procedure by the total number of individuals within each patient profile. This generates an average utilization rate for each dental procedure that is specific to each age group and dental spending quartile (i.e. for each patient profile). We did this for every dental procedure. Table 2 summarizes the utilization rate for the 25 most frequently used procedures within each age group.

We calculated the average utilization rate slightly differently for three orthodontia procedures: D8070, D8080 and D8090. These procedures are comprehensive orthodontia procedures and should not be billed together or more than once per year. However, many dental benefits plans will disperse provider reimbursement for these procedures over the course of 12 to 18 months,[9] resulting in multiple paid

claims with the same procedure code per child. Indeed, we found this to be the case within the 2013 Truven data we analyzed. For our analysis, we needed to count each of these procedures only once per year per child. To accomplish this, we added up spending across procedure codes D8070, D8080 and D8090 in 2013 and when there were multiple instances of these procedures, we set the frequency to once per year. In other words, if a child had two or more claims for these procedures within a year, total spending was summed up and allocated to the procedure code used on the last claim paid in 2013. Had we not made this adjustment, we would be potentially overestimating the frequency of comprehensive orthodontia procedures.

We calculated total dental spending based on these dental care utilization profiles in two ways. Our first method used actual reimbursement amounts from the Truven database. It is important to note that Truven is a database of dental spending based on reimbursement rates to providers that have been negotiated with private dental benefits plans. Truven does not necessarily represent what providers would typically charge for dental procedures. We break down dental spending according to what is paid by the insurer and the patient. We also calculate total patient outlays, including estimated dental benefits plan premium costs. We used the Consumer Price Index (CPI) inflation calculator from the United States Bureau of Labor Statistics to adjust these 2013 average payments to 2015 dollars.[10] We use $381.36 as the estimated annual premium cost, which is the annualized average cost of a pediatric stand-alone dental plan in the federally-facilitated marketplace in 2015.[11,12] This premium estimate is also roughly in line with average premiums for dental PPO plans sold in the employer market.[4,5]

Our second method estimated dental spending based on "market fees." To determine how much dentists typically charge for each procedure, we obtained commercial dental benefits plan reimbursement charges from the 2012 and 2013 FAIR Health Dental Benchmark Module.[13] The most recent data contained within the FAIR Health database cover 125 million individuals with commercial dental benefits,[14] capturing approximately 80 percent[15] of the total commercial dental benefits market. The FAIR Health database provides charge data for dental procedures billed using CDT® codes, reporting reimbursement rates charged by providers before network discounts are applied. Thus, we use these charge data to estimate dental spending at market fees.

We used average national charges from the 2013 FAIR Health database, substituting data from the 2012 FAIR Health dataset when 2013 data were not available.

FAIR Health does not include average national charges for orthodontia procedures. We substituted average national charges from the ADA's 2013 Survey of Dental Fees for these procedures.[16] The ADA 2013 Survey of Dental Fees was sent to a simple random probability sample of 13,052 ADA member and non-member general practitioners and specialists. Specialists, such as orthodontists, were oversampled with respect to their proportion in the population. The response rate for the 2013 Survey of Dental Fees was 18.2 percent, and appropriate weights were applied to reflect the population.

We used the CPI inflation calculator from the United States Bureau of Labor Statistics to adjust FAIR Health and ADA 2013 Survey of Dental Fees charges to 2015 dollars.[10] We multiplied the 2015 procedure charges by the corresponding utilization rate to determine the average spending per dental procedure per beneficiary in each of our patient profiles.

For some procedure codes, Truven data indicated there were no insurer or consumer out-of-pocket

payments. We substituted in the charged amount for these procedures under the assumption that when there are no payments associated with a procedure, then it is not covered by a dental benefits plan and the consumer pays for the procedure out of pocket at the price charged by the provider. We recognize that in some cases, the provider may not charge the patient for procedures that are not covered by a dental benefits plan, instead providing such procedures free of charge. However, to be conservative, we maximized total average dental spending by consumers in assuming that providers do charge patients their market fee for non-covered services. We examined the total estimated value of these procedures and it was negligible; using the charged amount for these procedures did not change any of the results.

We grouped dental procedures and associated spending into broad categories. We reviewed 2013 and 2015 Federal Employee Dental and Vision Plan (FEDVIP) information to assign each procedure to a service category: preventive and diagnostic, basic, major and orthodontia.[17] Several procedures were not specifically referenced in any of the FEDVIP plans we reviewed. Additionally, several procedures were categorized as general services. For those procedures that were not specifically referenced in any of the FEDVIP plans we reviewed, we referenced dental benefits industry reports and reviewed several stand-alone dental plans offered in the 2015 federally-facilitated marketplace for potential categorizations. The majority of these procedures were crowns and oral surgery codes. After our review, we categorized crowns as major services[18] and oral surgery procedures as basic services.[19] While we understand that not all procedures are covered by every dental benefits plan, our goal was to include as many procedures in our patient profiles as possible in order to accurately reflect total spending on dental services by children in our sample.

The majority of the remaining uncategorized procedures were related to anesthesia or sedation. We reviewed a random sample of stand-alone dental plans offered through the 2015 federally-facilitated marketplace to understand how the dental benefits industry tends to classify these procedures.[20] For pediatric patients, a majority of these plans classified such procedures as basic services. We also solicited advice from the American Academy of Pediatric Dentists who explained that, in most situations, such services would be classified as basic services for pediatric patients.[21] However, in an effort to be conservative, we decided to split total spending on these procedures evenly between basic and major spending.

Finally, there were 56 non-orthodontia procedures for which there was no corresponding charge data in the FAIR Health database and 12 orthodontia procedures for which there was no corresponding charge data in the ADA 2013 Survey of Dental Fees. We dropped these procedures from our analysis. Additionally, if a procedure was not covered under the FEDVIP plan and we could not find supporting documentation for classification from another source, we dropped it from our analysis. This resulted in dropping an additional 38 procedures.[22] It is important to note that dropping these 38 procedures from the analysis had almost no effect on our dental spending calculations. In fact, the dental procedures retained in our analysis account for 99.9 percent of total dental spending across our sample.

A limitation in our analysis is that we do not capture the use of dental services for which no claims were submitted on behalf of the beneficiary. We have no way of identifying the extent to which providers for commercially insured children do not submit a claim to the child's dental plan. However, in our data, there are claims for which the insurer did not cover any of the

charged amount. This strongly suggests that the Truven data are indeed capturing utilization of procedures even in the case where the dental plan does not cover any of the cost.

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[19] Analysis available upon request. Conducted August 6, 2015.

[20] Analysis available upon request. Conducted August 6, 2015.

[21] Email communication with American Association of Pediatric Dentists. August 6, 2015.

[22] A total of 47 codes were dropped from the patient profiles among children ages 1 through 6, 80 codes were dropped from the patient profiles among children ages 7 through 12, and 93 codes were dropped form the patient profiles among children ages 13 through 18.

Suggested Citation

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