



# Impact of Child and Parent Characteristics on Dental Healthcare Utilization and Outcomes



## Background

- The American Academy of Pediatrics (AAP) and the American Academy of Pediatric Dentistry (AAPD) support medical-dental integration, including the inclusion of oral health guidance in medical well-child visits (WCV) to promote early intervention in oral disease, reduce barriers to care, and optimize dental home establishment.
- Parents' knowledge, behaviors, and socioeconomic status influence children's oral health, with low socioeconomic status of the family and parents' poor oral health habits contributing to the development of children's oral disease.
- The aim of this study is to explore the effect of various child-level characteristics (including patient sex, patient age, number of child dental prevention visits, and child comorbidities) on pediatric claims for dental pain, extractions, treatment under anesthesia, and emergency visits. The study also explores parent-level variables (including parent employment, family size, parent comorbidities and number of parent dental prevention visits) on pediatric dental claims.

## Study Population

198,433 children (aged 0-6 years old) that had a WCV and at least one dental visit from 2019-2021.

## Methods and Results

- Data Source:** The Merative Commercial Claims and Encounters Database contains de-identified, patient specific health data of reimbursed healthcare claims for employees, retirees, and their dependents. The individuals in the database are covered under private insurance plans from over 250 medium and large employers and health plans.
- Statistical Analysis:** Descriptive and regression analyses were used to evaluate different models. The subsampling technique SMOTE (Synthetic Minority Oversampling Technique) was used to balance class distribution in certain variables with an uneven distribution of observations. A logistic regression model and a random forest model were built and evaluated using resampling. These models were then compared against each other.

**Table 1: Dental Pain Claims**

Characteristic	OR	95% CI
Patient Gender		
Female	—	—
Male	1.13	1.02, 1.25
Patient Age		
	1.18	1.12, 1.24
Child Prevention Visits		
0	—	—
1	0.21	0.15, 0.30
2	0.29	0.21, 0.40
3	0.35	0.25, 0.48
4	0.4	0.29, 0.55
5	0.39	0.28, 0.54
6+	0.63	0.46, 0.88
Parent Employment		
Hourly	—	—
Salary	0.88	0.78, 0.99
Family Size		
6+	0.73	0.56, 0.95

**Table 2: Extraction Claims**

Characteristic	OR	95% CI
Patient Age		
	1.74	1.61, 1.90
Child Prevention Visits		
0	—	—
6+	1.88	1.09, 3.49
Parent Employment		
Hourly	—	—
Salary	0.82	0.71, 0.95
Parent Dental Prevention Claims		
0	—	—
3	0.77	0.61, 0.97
4	0.60	0.47, 0.75

**Table 3: Anesthesia Claims**

Characteristic	OR	95% CI
Patient Gender		
Female	—	—
Male	1.150	0.008, 17.302
Patient Age		
	1.291	0.004, 67.835
Child Prevention Visits		
0	—	—
1	0.750	0.034, -8.563
2	1.195	0.033, 5.372
3	1.445	0.033, 11.159
4	1.651	0.033, 15.190
5	1.764	0.033, 17.178
6+	2.748	0.033, 30.267
Child Comorbidities		
0	—	—
2	0.513	0.111, -6.017
Parent Employment		
Hourly	—	—
Salary	0.529	0.009, -69.744
Unknown	0.528	0.013, -51.037
Family Size		
2	—	—
3	0.790	0.021, -11.217
4	0.834	0.019, -9.298
5	0.858	0.020, -7.557
6+	0.840	0.023, -7.608
Parent Dental Prevention Claims		
0	—	—
1	0.585	0.014, -39.131
2	0.564	0.014, -40.218
3	0.380	0.015, -62.407
4	0.364	0.015, -67.918
5	0.370	0.013, -74.942
6+	0.368	0.016, -62.325

**Table 4: Emergency Claims**

Characteristic	OR	95% CI
Patient Gender		
Female	—	—
Male	0.951	0.008, -6.312
Patient Age		
	1.270	0.004, 64.873
Child Prevention Visits		
0	—	—
1	0.075	0.025, -104.252
2	0.079	0.025, -102.049
3	0.108	0.025, -90.336
4	0.118	0.025, -85.978
5	0.118	0.025, -85.757
6+	0.173	0.026, -68.762
Child Comorbidities		
0	—	—
1	0.638	0.099, -4.540
2	0.599	0.105, -4.896
Parent Employment		
Hourly	—	—
Salary	0.846	0.009, -17.897
Unknown	0.726	0.013, -25.133
Family Size		
2	—	—
3	0.724	0.021, -15.679
4	0.681	0.019, -20.021
5	0.630	0.020, -22.962
Parent Comorbidities		
0	—	—
2	0.629	0.118, -3.917
3+	0.605	0.119, -4.235
Parent Dental Prevention Claims		
0	—	—
1	0.760	0.014, -19.788
2	0.687	0.015, -25.627
3	0.662	0.015, -27.655
4	0.739	0.014, -21.626
5	0.615	0.013, -37.230
6+	0.654	0.015, -27.503

## Conclusions

- Male children had higher odds of dental pain and anesthesia claims.
- Older children had higher odds of claims for dental pain, anesthesia, extractions, and emergency visits.
- Preventative dental visits (PDV) decreased odds of claims for dental pain and emergency visits.
- Parent salaried employment lowered odds of claims for dental pain, extractions, anesthesia, and emergency visits.

## Implications

- This is the first study that explores the interplay of child- and parent-level characteristics affecting dental healthcare utilization and outcomes.
- This study establishes a trend in decreased dental service claims for children with a PDV indicating that the PDV is valuable in reducing oral health burden of disease.
- Further research should target preventive programs and policies to expand interventions that work to decrease oral disease burden.

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