Patterns of Fillings, Crowns, and Extractions in The Primary Dentition

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ABSTRACT

Objective: Early childhood caries (ECC) is a broad disease definition that includes restored and unrestored disease as well as varying levels of severity. Caries lesions are distributed according to clinically recognizable patterns but little is known about patterns of restorative and surgical ECC management. We aimed to identify patterns of fillings, crowns, and extractions in a large sample of preschool-age children.

Methods: We relied upon clinical surface and tooth-level information on restorations and extractions from a community-based sample of children ages 3-5 [N=6,404 of which 30% (n=1,940) from an epidemiologic study of early childhood oral health in North Carolina who had at least one restoration or extraction due to caries. To identify patterns of fillings, crowns and extractions in the primary dentition, teeth and individual surfaces were treated as binary latent class indicators of treatment and were entered in latent class analysis (LCA). Analyses were undertaken using Mplus v.8.8 (Muthén & Muthén, Los Angeles, USA).

Results: We identified 3 patterns of fillings, 5 patterns of crowns, and 3 patterns of extractions. The prevalence of patterns within each group ranged from 8-60%. The identified latent classes resembled recognizable patterns of surface- and tooth-specific carious lesion distribution (e.g., molars, maxillary incisors, and combinations) and exhibited a high degree of ipsilateral symmetry.

Conclusions: Identified patterns of restorations and extractions in the primary dentition resemble recognizable patterns of ECC experience. Upon replication and validation in future studies, these clinical patterns may prove informative for children's oral health trajectories in the mixed and permanent dentitions.

BACKGROUND

- ECC clinical presentation is **highly heterogeneous**
- Restorative treatment of caries-affected primary teeth usually involves fillings (F), crowns (C), and extractions (E)
- The patterns of restorations in the primary dentition are **not well understood.** They may be influenced by socio-demographic and more upstream factors
- We sought to identify patterns of fillings, crowns and extractions in the primary dentition

METHODS

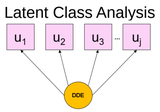
Cross-sectional study

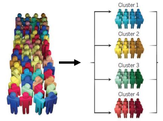
1

Ages 36 up to 71 months at enrollment
Head Start Centers in NC
Epidemiological study of oral health
(N=6,404)

Clinical exam using ICDAS criteria and surface-level presence of F/C/E
n=1,940 children w/restorations

3





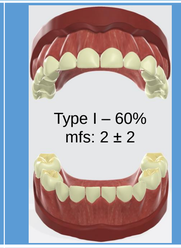
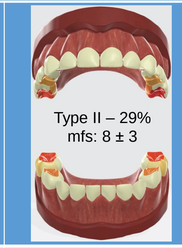
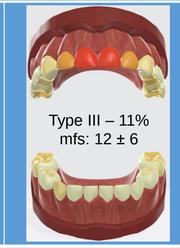
F
C
E

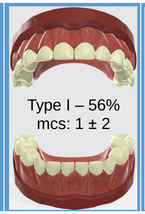
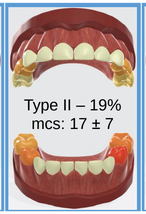
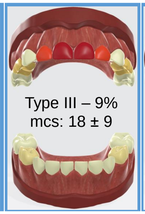
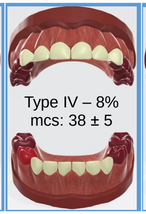
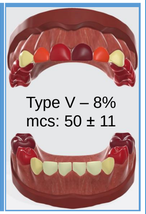
4

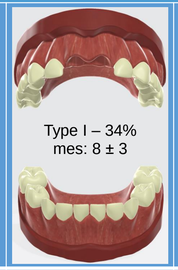
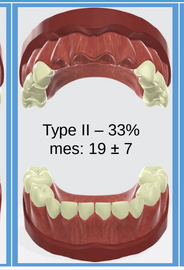
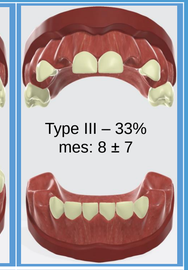
Pattern Prevalence
Mean count of f/c/m surfaces
Socio-demographic and behavioral factors

Mplus STATA 16

RESULTS

Fillings	 Type I – 60% mfs: 2 ± 2	 Type II – 29% mfs: 8 ± 3	 Type III – 11% mfs: 12 ± 6
Race/Ethnicity			
Non-Hispanic Black	59	31	10
Hispanic	60	27	13
Non-Hispanic White	58	31	11
4 or more SSB/day	5	6	6
Sub-optimal F water	57	54	52
Bed with Bottle	28	26	32
No Dental Home	13	11	9

Crowns	 Type I – 56% mcs: 1 ± 2	 Type II – 19% mcs: 17 ± 7	 Type III – 9% mcs: 18 ± 9	 Type IV – 8% mcs: 38 ± 5	 Type V – 8% mcs: 50 ± 11
Race/Ethnicity*					
NH-Black	62	15	8	8	7
Hispanic	50	21	10	8	10
NH-White	51	23	9	8	8
4 or + SSB/day	6	5	5	3	4
Su-opt F water	52	56	58	56	73
Bed w/ Bottle*	24	32	38	28	32
No Dent Home	10	14	13	14	11

Extractions	 Type I – 34% mes: 8 ± 3	 Type II – 33% mes: 19 ± 7	 Type III – 33% mes: 8 ± 7
Race/Ethnicity*			
Non-Hispanic Black	40	35	25
Hispanic	24	27	49
Non-Hispanic White	36	35	29
4 or + SSB/day	41	22	37
Sub-opt F Water	54	53	58
Bed with Bottle*	36	40	24
No Dental Home	11	21	17

CONCLUSIONS

- Patterns of restorations and extractions are informative as they suggest socio-demographic differences and possible influences of behavioral risk factors
- Future research seeking to validate these results must focus on:
  - Children's oral health trajectories in the mixed and permanent dentitions
  - Social and financial implications for families and the healthcare system

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