



Pediatric Outreach Programs: Patient Education and Minimally Invasive Dentistry

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Introduction

Purpose: To evaluate the longitudinal impact of pediatric community-based caries prevention strategies and advocate for increased efforts in underserved communities. This study reviews the caries prevalence outcomes of prevention education and minimally invasive dentistry efforts within a school-based global outreach program in La Romana, Dominican Republic across four consecutive years. Data was collected by participants in the NYU Global Outreach Program. This study is a case-controlled study of a charter school with a near 100% retention rate. While individual patients were not followed over time, students were examined and treated multiple times over the four years of the program operating at the school.

Hogar del Niño 1800 Students 600 preschool 600 elementary 500 high school	Financial Constraints: The average parent in Hogar Del Niño earns approximately \$60 USD per month, making dental treatments unaffordable. For example, a basic cleaning (prophylaxis) costs \$25 USD, nearly half of a family's monthly income.	Infrastructure Challenges: Many children come from communities with limited or no access to water and electricity, further complicating their ability to maintain oral hygiene.	Geographical Barriers: Some families live in areas where dental services are not available or easily accessible.	Limited Dental Providers: Hogar Del Niño has only one on-site dentist, which is insufficient to meet the needs of the large population of children requiring care.	No Large-Scale Dental Initiatives: Outside of these institutions, there were no major local programs capable of addressing the widespread need for dental care, particularly among children. Furthermore, water fluoridation is not present in the Dominican Republic.	Unmet Demand: Due to financial and logistical challenges, many children lacked access to regular dental checkups and treatments, leading to worsening oral health issues.
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Methods

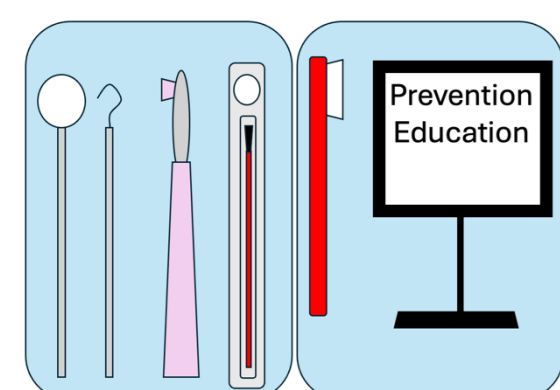
Preventive Interventions and Data Collection Process:

Collector: NYU Dentistry Global Outreach Program

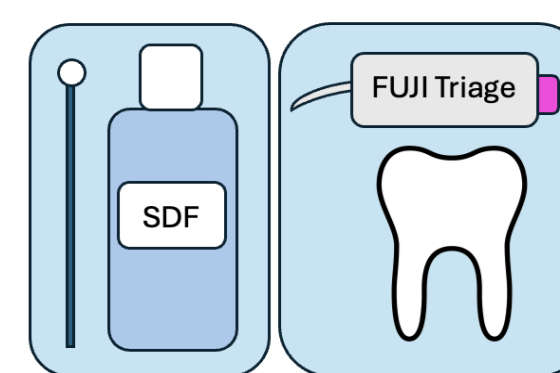
Collection Years: 2023, 2024, 2025, 2026

Collection Site: Hogar Del Niño School (La Romana, Dominican Republic)

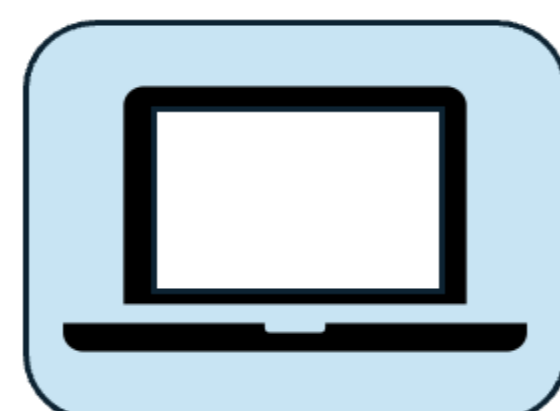
Patient ages: 3-11



Every patient received an exam, prophylaxis, and fluoride varnish. All patients and school associates participated in the patient education presentation and received oral health supplies to take home.



Patients received glass ionomer FUJI Triage Sealants and/or Silver Diamine Fluoride (SDF) therapy where indicated. Patients with significant needs received a referral to partner providers.

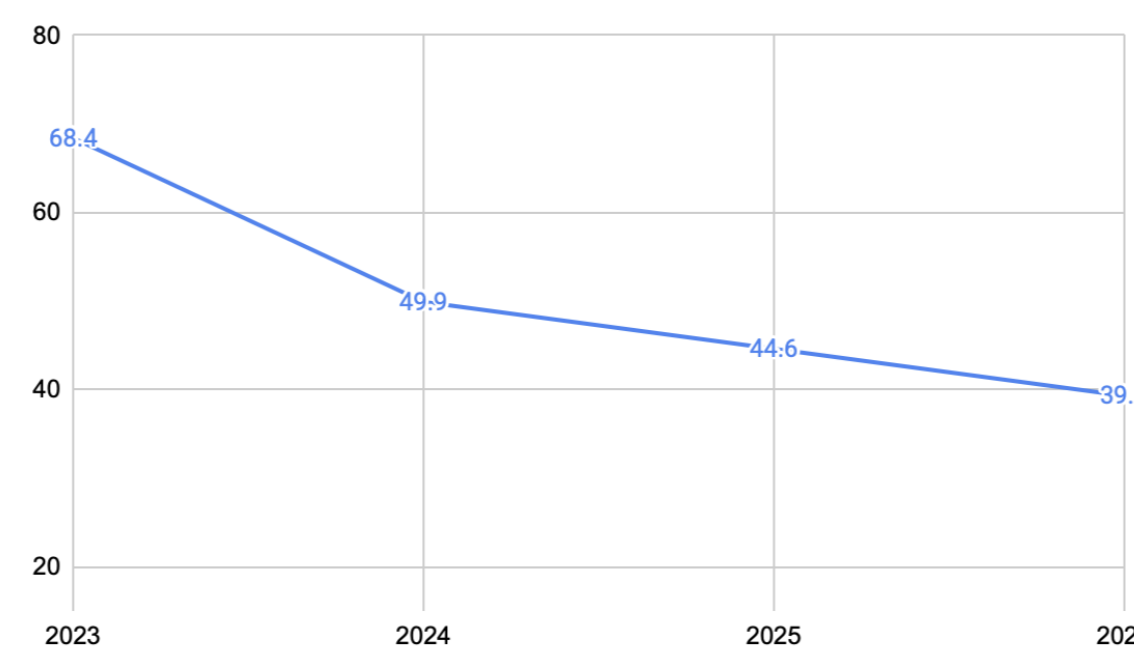


Global Outreach Participants input exam and treatment data into the online collection form. No patient identifying information was input into the form.

Data Analysis:

Data was evaluated and input into IBM Statistical Package for the Social Sciences (SPSS) software. Chi square and Cramér's V tests were used to analyze the caries prevalence overall by year and by age group.

Year	Age Interval	Caries	No Caries	Total
2023	3-5 Years	80	80	160
	6-7 Years	53	149	202
	8-11 Years	48	162	210
	All Ages	181	391	572
2024	3-5 Years	118	69	187
	6-7 Years	65	108	173
	8-11 Years	13	18	31
	All Ages	196	195	391
2025	3-5 Years	8	2	10
	6-7 Years	79	49	128
	8-11 Years	138	130	268
	All Ages	225	181	406
2026	3-5 Years	47	22	69
	6-7 Years	112	67	179
	8-11 Years	77	57	134
	All Ages	236	146	382
All Years	3-5 Years	253	173	426
	6-7 Years	309	373	682
	8-11 Years	276	367	643
	All Ages	839	913	1751



Carries Prevalence by Year

Overall caries prevalence over time. Caries prevalence measured as binary outcome in subjects aged three to eleven and converted to percentage of population. Population sizes differed across years (2023: n= 572; 2024: n = 391; 2025: n = 406; 2026: n=382).

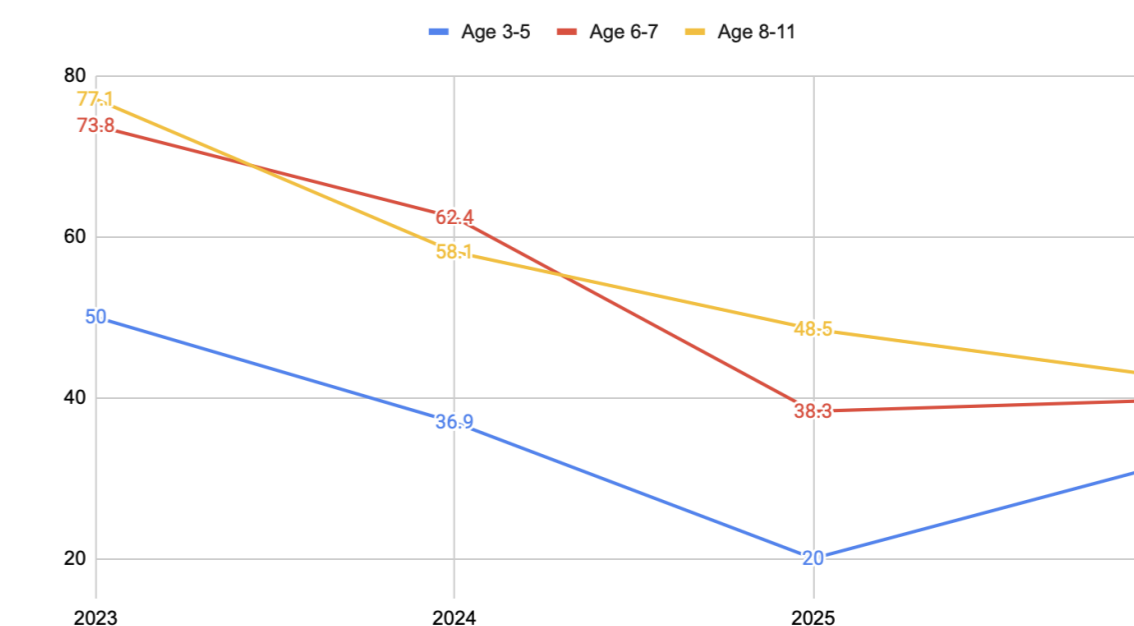
YEAR	Chi-Square Tests			Asymptotic Significance (2-sided)
	Value	df		
2023	Pearson Chi-Square	35.149*	2	<.001
	Likelihood Ratio	33.941	2	<.001
	N of Valid Cases	572		
2024	Pearson Chi-Square	24.331*	2	<.001
	Likelihood Ratio	24.599	2	<.001
	N of Valid Cases	391		
2025	Pearson Chi-Square	6.174*	2	.046
	Likelihood Ratio	6.413	2	.040
	N of Valid Cases	406		
2026	Pearson Chi-Square	2.278*	2	.320
	Likelihood Ratio	2.294	2	.318
	N of Valid Cases	382		
Total	Pearson Chi-Square	30.752*	2	<.001
	Likelihood Ratio	30.836	2	<.001
	N of Valid Cases	1751		

YEAR	Symmetric Measures			Approximate Significance
	Nominal by Nominal	Phi	Value	
2023	Nominal by Nominal	Phi	.248	<.001
		Cramer's V	.248	<.001
	N of Valid Cases		572	
2024	Nominal by Nominal	Phi	.249	<.001
		Cramer's V	.249	<.001
	N of Valid Cases		391	
2025	Nominal by Nominal	Phi	.123	.046
		Cramer's V	.123	.046
	N of Valid Cases		406	
2026	Nominal by Nominal	Phi	.077	.320
		Cramer's V	.077	.320
	N of Valid Cases		382	
Total	Nominal by Nominal	Phi	.133	<.001
		Cramer's V	.133	<.001
	N of Valid Cases		1751	

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 203.88.
 b. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 50.63.
 c. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 15.46.
 d. 1 cells (16.7%) have expected count less than 5. The minimum expected count is 4.46.
 e. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 26.37.

Chi square and Cramér's V test analysis of caries prevalence by time and by age groups 3-5, 6-7, and 8-11. The primary goal of this analysis is to determine if age is a factor at each year time point. Over time, age group no longer predicted whether the child would have caries. In 2023 and 2024, there was a moderately strong, statistically significant association between age group and caries (2023: p<.001, V=.248; 2024: p<.001, V=.249). This became a weak and less significant association in 2025 (p=0.046, V=.123) and a weak non-significant association in 2026 (p=.320, V=.077). This analysis shows that age group as a predictor for caries prevalence was no longer valid by 2026.

Results



Carries Prevalence by Year and Age Group

Caries prevalence over time, stratified by age group. Caries prevalence measured as binary outcome in subjects aged three to eleven and converted to percentage of population. Population sizes differed across years (2023: n= 572; 2024: n = 391; 2025: n = 406; 2026: n=382). Age groups determined by stage of dentition (age 3-5 is proxy for primary dentition, age 6-7 is proxy for early transitional dentition, age 8-11 is proxy for late transitional dentition).

AGE INTERVAL	Chi-Square Tests			Asymptotic Significance (2-sided)
	Value	df		
"3 - 5"	Pearson Chi-Square	10.857*	3	.013
	Likelihood Ratio	11.000	3	.012
	Linear-by-Linear Association	7.874	1	.005
	N of Valid Cases	426		
"6 - 7"	Pearson Chi-Square	69.260*	3	<.001
	Likelihood Ratio	70.836	3	<.001
	Linear-by-Linear Association	63.936	1	<.001
	N of Valid Cases	682		
"8 - 11"	Pearson Chi-Square	54.121*	3	<.001
	Likelihood Ratio	56.476	3	<.001
	Linear-by-Linear Association	52.005	1	<.001
	N of Valid Cases	643		
Total	Pearson Chi-Square	100.044*	3	<.001
	Likelihood Ratio	101.902	3	<.001
	Linear-by-Linear Association	91.891	1	<.001
	N of Valid Cases	1751		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 182.82.
 b. 1 cells (12.5%) have expected count less than 5. The minimum expected count is 4.06.
 c. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 57.99.
 d. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 13.31.

AGE INTERVAL	Symmetric Measures			Approximate Significance
	Nominal by Nominal	Phi	Value	
"3 - 5"	Nominal by Nominal	Phi	.160	.013
		Cramer's V	.160	.013
	N of Valid Cases		426	
"6 - 7"	Nominal by Nominal	Phi	.319	<.001
		Cramer's V	.319	<.001
	N of Valid Cases		682	
"8 - 11"	Nominal by Nominal	Phi	.290	<.001
		Cramer's V	.290	<.001
	N of Valid Cases		643	
Total	Nominal by Nominal	Phi	.239	<.001
		Cramer's V	.239	<.001
	N of Valid Cases		1751	

Chi square and Cramér's V test analysis of caries prevalence by age groups 3-5, 6-7, and 8-11 and by time.

The primary goal of this analysis is to determine if time is a factor within each age group. The weakest association and least significant change was in the 3-5 age group (p=.013, V=.160), which was expected, as we assume this age group

is being seen for a first visit. Notably, there was a considerably higher number of 3-5 patients seen in 2026 compared to other years which does affect the overall data set. There was weak-to-moderate statistically significant association in the 8-11 age group (p<.001, V=.290) and a moderate statistically significant association in the 6-7 age group (p<.001, V=.319). The most significant changes in prevalence are seen in the age groups that we can confidently assume have been seen multiple times in the program.

Conclusions

- The most significant changes in prevalence are seen in the older age intervals (6-7, 8-11). Given the retention of the school, this is the strongest indication that multiple preventive interventions over time by this program have a cumulative effect in reducing community caries prevalence. This is confirmed by the first analysis, where age group no longer was a valid predictor for caries prevalence after four years of intervention.
- There was a weak but statistically significant decrease in caries prevalence in the 3-5 age group, suggesting that, while this group was meant to represent a quasi-baseline for the community since this was the age group assumed to be there for first visits, overall education of parents and educators is likely influencing the prevalence within this age group prior to the Global Outreach Program direct preventive intervention, representing a whole-community shift.
- Caries is a preventable disease, and a multi-pronged prevention approach provides an opportunity to make a significant impact in underserved communities. This study provides further justification for sustainable, long-term global outreach programs.

References

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World Health Organization (WHO). (2022). Oral Health Country Profile Dominican Republic. Retrieved from https://cdn.who.int/media/docs/default-source/country-profiles/oral-health/oral-health-dom-2022-country-profile.pdf?sfvrsn=e20b3320_5&download=true

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