

Hudson River HealthCare's School-Based Preventive Dentistry Sealant and Fluoride Rinse Programs: 20 years of Success

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January 10, 2007



Webcast Outline

■ Overview

- History of HRHC School-Based Fluoride Rinse and Sealant Program
- Oral Health/Caries Risk Assessment of Community
- Outreach & Funding
- Portable Equipment, Dental Materials, and Staffing
- Clinical Findings, Data Analysis, and Reports



History of Hudson River HealthCare's School-Based Dental Preventive Program

■ Our Mission:

- To offer excellent quality dental preventive care to the children of our community.

■ Our Goal:

- To prevent the development of new dental problems by raising the dental IQ of our community if we can educate both parent and child about the value of good oral health.



Hudson River HealthCare's School-Based Dental Preventive Program

■ Current Staff

- Clifford Hames, DDS
 - Dental Director/Supervising Dentist
- Ivette Alicea, RDH
 - 2003-2004 Dental Hygienist/Program Coordinator
- Arlene Swankie, DA
 - Dental Assistant & Program Manager



Hudson River HealthCare's School-Based Dental Preventive Program

Prior Staff

- ❑ Georgina Zabos, DDS, MPH
Dental Director 1983-1993
- ❑ Elaine Amato, RDH
Dental Hygienist &
Sealant Coordinator 1986-1996
- ❑ Jonna Granata, RDH
Dental Hygienist &
Sealant Coordinator 1996-2003
- ❑ Dental Assistants:
Karen Tilly
Marisol DeLatorre



Hudson River HealthCare's School-Based Dental Preventive Program

■ Communication with Community prior to project implementation

- A “Town Hall” meeting was held in the community to answer questions from community residents, private practice dentists, etc.
- NYSDOH provided assistance to FAQs.



Hudson River HealthCare's School-Based Dental Preventive Program

■ Program Background

- NYSDOH Bureau of Dental Health 1983 RFP for Needs Assessment for School-Based Fluoride Rinse Program.
- PAHC (now HRCH) received grant funding in 1984 for project to screen teeth of school children for DMFS.



Hudson River HealthCare's School-Based Dental Preventive Program

■ **Brief History** con't.

- Peekskill water has NO fluoride.
- Needs Assessment conducted in 1984 in Peekskill public schools.
- Program started in 1985 with school-based fluoride rinse program (NYSDOH grant)
- Addition of Dental Sealant component in 1986 (NYSDOH grant)

Why we do what we do....





**Sealants
HARD!**

h Department
lant Program



**Dental Sealants
Work HARD!**

N.Y.S. Health Department
Dental Sealant Program



**Sealants
HARD!**

Some little known facts....

- Although dental caries (tooth decay) is largely preventable, it remains the most common chronic disease of children aged 5 to 17 years—5 times more common than asthma (59% versus 11%).
- Once established, the disease requires treatment. A cavity only grows larger and more expensive to repair the longer it remains untreated.
- Fewer than 1 in 5 Medicaid-covered children received at least one preventive dental service in a recent year.

The “Silent” Caries Epidemic

- Cavity reduction through:
 - Water fluoridation
 - Dietary modification (what are they eating and how often?)
 - Behavior modification (how often do they brush, floss, or fluoride rinse?)



The “Silent” Caries Epidemic

- Treating the disease will not reduce the incidence of infection.
 - Vertical Transmission (Parent to Child)
 - Horizontal Transmission (Siblings, Classmates)



The Culprit.....

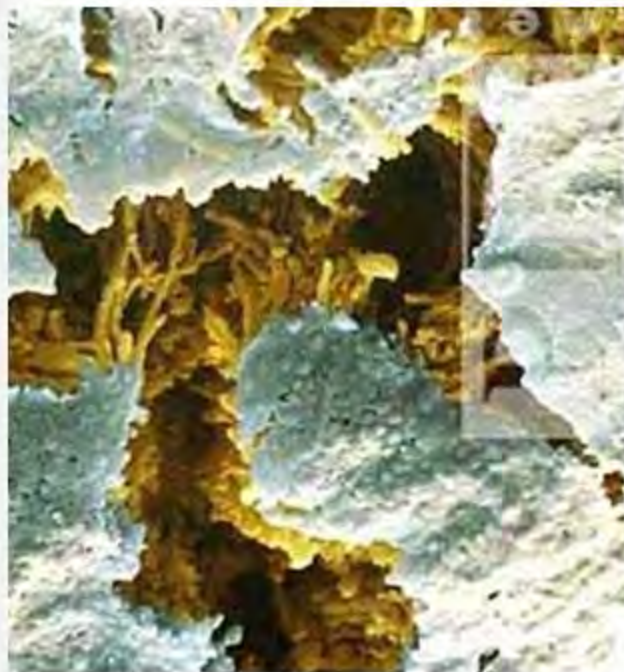


Streptococcus Mutans Bacteria (Colored SEM) adhering to the enamel of a tooth. Gram Positive, Non-Motile, Spherical Bacteria.

Did you know????

- **Streptococcus mutans** is a major cause of tooth decay and one of the principal bacteria that cause plaque formation on teeth.
- It produces **dextran**, the adhesive glucose that makes up plaque.
- Within plaque, bacteria produce large amounts of **lactic acid**, causing demineralization of the tooth enamel and dentine, resulting in caries (tooth decay).

The Damage Inflicted.....



Tooth bacteria in a hole
resulting from tooth decay
(Magnification=4500x)

Credit: Eye of Science /
© Photo Researchers



tooth decay bacteria
(colored SEM of bacteria and
plaque found in a decaying tooth)



Did you know????

- Tooth decay is caused by the action of bacteria on the sugars in plaque.
- Bacteria in the plaque feed on sugars in the food particles producing acid as a waste product.
- This acid corrodes the enamel coating of the teeth, causing cavities (holes) to develop.
- When the sensitive region within the tooth is exposed, toothache occurs.
- Cavities are prevented by regular brushing.



Did you know????

- There are more strep mutans in a drop of plaque than there are humans inhabiting the earth.

The Damage from Decay....





ORAL HEALTH/CARIES RISK ASSESSMENT AND DENTAL SEALANTS

■ Background

- #1 Dental Public Health Achievement: Community Water Fluoridation
- #2 Dental Public Health Achievement: Dental Sealants

■ Question:

- Given limited grant dollars and high caries prevalence in underserved, economically disadvantaged communities, how do we best serve our pediatric dental patients with this preventive dentistry service?

Caries Risk Assessment

- Family History Caries Risk Assessment
- Child's Medical History
- Child's Dental History
- Child's and Family's Nutrition and Dietary Histories/Analyses
- Oral Hygiene





Dental Caries

- Dental Caries is an infection of the oral cavity caused by a group of bacteria, primarily Strep Mutans, and transmitted primarily from:
 - Mom to Child
 - Child to Child

Family Caries Risk Assessment

- Questionnaire to Parents to participate whose children participate in the program.
 - Has Mom been told she has tooth decay in the last 5 years? During pregnancy?
 - When was the last time Mom visited the dentist?
 - Has any found tooth decay been treated?
 - Did Mom, Dad, or siblings experience tooth decay as a child?



Child Caries Risk Assessment

- 1. Questionnaire to Parents to participate whose children participate in the program.
 - a. What was the age your child was first evaluated by a dentist?
 - b. Has your child had tooth decay in baby teeth?
 - c. Was the decay in your child's baby teeth treated?
 - d. When was your child's last dental check-up with x-rays? And Fluoride?

Dental Caries Risk Assessment (visual screening)

- #DMFS (decayed, missing, filled surfaces) on primary and secondary dentition.
- #Teeth with frank decay.
- Reason(s) for missing teeth?
(congenitally absent? Abscess?)
- # Filled Surfaces:
 - Overtreatment?
 - Occlusal Caries versus Interproximal Caries versus SSC's



Child and Family's Nutrition and Dietary Analysis

- Any history of BBTD or ECC?
Resource of bacterial substrate?
- Amount of refined sugar (carbohydrates) intake?
 - Soda vs. Juice vs. Milk vs. Water
- Frequency of Candy (esp. sticky)
 - Sugared gum, ring pops, jumbo pixie sticks, etc.





Oral Hygiene


■ Brushing Frequency

- How long? (2-4 minutes vs. 4+ minutes)
- Frequency (# times per day): at least upon awakening and before bed

■ Flossing Frequency

- A. OHE

■ Fluoride Rinsing



Put this all together to decide WHO to seal and WHAT to seal.....

- Children are sent home with permission slips for parents to sign and return indicating consent to participate in the fluoride rinse and/or sealant program(s).
- General assemblies and classroom group sessions are arranged with video tape demonstrations on sealant application and the importance of good oral hygiene.
- We screen patients with just our eyes, a mirror, an explorer. No radiographs.




Hudson River HealthCare's School-Based Dental Preventive Program

- **Five Essential Elements** that need to be in place **before** you can start:
 - Parental Consent Forms
 - Parent and Teacher Education
 - “Tell, Show, Do” for Students
 - Returned Written Permission to Participate
 - Positive Reinforcement

Children who gain the most from a school-based sealant program application:

- Children with newly erupted permanent molars and frank caries in primary teeth.
- Children with newly erupted permanent molars and evidence of multi-surface restorations and/or missing teeth.
- Children with newly erupted permanent molars and a number of teeth needing restorative treatment.





Children who gain the most from a school-based sealant program application:

- Children with newly erupted permanent molars and known parent or sibling histories of active tooth decay.
- Children with newly erupted permanent molars and known history of poor nutrition.
- Children with newly erupted permanent molars and known history of poor OH.
- Children with newly erupted permanent molars and no history of fluoride products such as varnish, gel, supplements, or water.



Outreach and Funding Sources

- Make the community aware of your presence.
- Approach Sealant Manufacturers for program sponsorship.
- Apply for funding from NYSDOH and CDC for health promotion/wellness
- Approach local PTAs, Lions Clubs, Kiwanas Clubs, Elks Club, local synagogues and churches.

**We don't want our patients to
feel like guinea pigs....**



Our staff are truly our greatest asset!

Portable Equipment, Dental Materials, and Staffing

- INVEST IN GOOD QUALITY, COMFORTABLE EQUIPMENT TO PRESERVE YOUR OVERALL HEALTH!



Portable Dental Equipment



Experience-based Equipment Recommendations

■ Portable Patient Chairs:

- DNTL (<http://www.dntlworks.com/>)
- A-dec (<http://www.a-dec.com/>)



DNTL
Model
4025



DNTL
Model
4015



A-dec
Portable
Chair

Experience-based Equipment Recommendations

■ Portable Operatory Light:

- DNTL (<http://www.dntlworks.com/>)



DNTL
ProBrite
Halogen
Model
6034

Experience-based Equipment Recommendations

■ Portable All-In-1 UNIT:

- DNTL (<http://www.dntlworks.com/>)



DNTL
Model 2000

Experience-based Equipment Recommendations

■ Portable Delivery Unit:

- A-dec (<http://www.a-dec.com>)



Pac 1 Institutional Unit

Experience-based Equipment Recommendations

- Portable Air Compressor:



Sil-Air 50-10-S

Experience-based Dental Materials Recommendations

■ Fluoride Rinse Unidose Packs

<http://www.medicalproductslaboratories.com/products/nafrinse/premixunitdose.html>





Benefits/Challenges experienced with our School-Based Fluoride Rinse Program

■ Benefits:

- Captive Audience
 - Best Compliance Possible
 - Done Weekly INSIDE the classroom

■ Challenges

- Educating Teachers on the Benefits of the Program (less sick days taken; better student focus)
- Overcoming unfounded fears of teachers around disease transmission
- Resistance to supervision of process
- Intrusion on limited learning time

Current Fluoride Supplement Dosage Recommendations

PPM Fluoride Ion In Drinking Water	DAILY DOSAGE (Fluoride ion)		
	AGE 6 mo. to 3 yrs.	AGE 3 to 6 yrs.	AGE 6 to 16 yrs.
Less than 0.3 ppm	0.25 mg.	0.50 mg.	1.0 mg.
0.3 to 0.6 ppm	NONE	0.25 mg.	0.50 mg.
Over 0.6 ppm	NONE	NONE	NONE

Dental Sealant Concept

- What is it?
- We wanted something for the future that would offer the ultimate protection.



Dental Sealant Concept

- Something that would shield the tooth, like a force field, from the damaging elements of the oral cavity.



Hudson River HealthCare's School-Based Dental Preventive Program

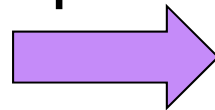
■ What exactly is a dental sealant?

- A thin, plastic coating that mechanically and chemically adheres to the chewing surface of the tooth.
- Dental sealants evolved from a technique called enamel bonding that was first reported in the mid-1950s by Dr. Raphael L. Bowen.
- Dental sealants were introduced in 1967 and their effectiveness was recognized by the American Dental Association in 1971.
- Current sealant materials are either chemically activated or light polymerized and come in various colors, including clear, white, yellow, green, and pink.



Hudson River HealthCare's School-Based Dental Preventive Program

- Chewing
Surface of
Human Molar
under a
Scanning
Microscope

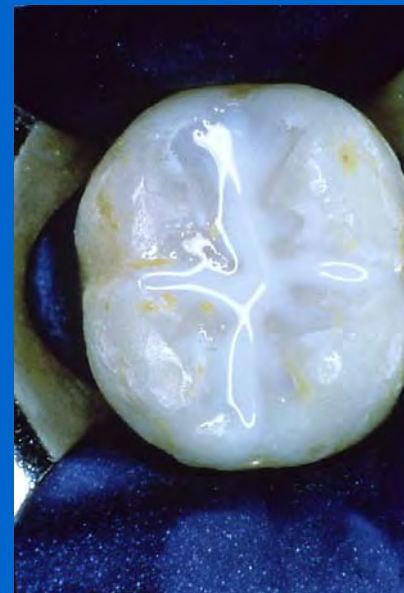


Over 80% of our community children participate in our Fluoride rinse program; over 50% participate in our Sealant program.

Unsealed



Sealed



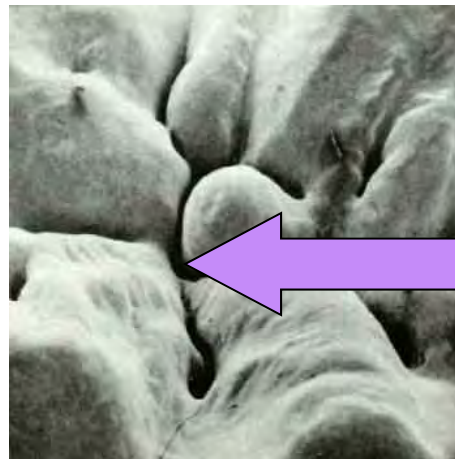


Hudson River HealthCare's School-Based Dental Preventive Program

- **Why do teeth need sealants?**
 - There are areas on the chewing surfaces of teeth that cannot be reached by a toothbrush but can be reached by decay-causing bacteria.

Hudson River HealthCare's School-Based Dental Preventive Program

- Close up of one of the grooves of a human molar



Hudson River HealthCare's School-Based Dental Preventive Program

- So, we want to
go from THIS:



- To THIS:





Hudson River HealthCare's School-Based Dental Preventive Program

■ How are dental sealants applied to teeth?

- The teeth are first cleaned, then treated with a weakly acidic gel, followed by rinsing with water, air drying, and coating the teeth with a light sensitive sealant.
- The sealant is then hardened with a bright light.
- No pain is felt from the procedure. No local anesthetic is needed.

Hudson River HealthCare's School-Based Dental Preventive Program



Fig. 1 Preoperative occlusal view of tooth 19.

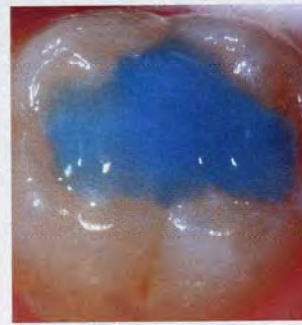


Fig. 2 Use 37% phosphoric acid to demineralize tooth surface.



Fig. 3 After rinsing, air dry tooth surface.



Fig. 4 Occlusal view of sealed tooth after application of Aegis pit and fissure sealant.

fissures. Leave it on the enamel surface for 15 seconds (Fig. 2).

Fig. 4 shows an occlusal view of the sealed tooth after application of the sealant. **DPR**



Hudson River HealthCare's School-Based Dental Preventive Program

■ Why do we apply sealants....?

- To protect the outer chewing surface of the tooth (enamel) from the acid attacks of bacterial plaque.
 - The acid will eventually decalcify the enamel to a point where it is weakened enough for bacteria to further invade the softer, inner sections of the tooth.

.....To Seal Out Decay!



Photography

AcclaimImages.com

Photography

Experience-based Dental Materials Recommendations

■ Sealants



3M Espe ClinPro Sealant

Also consider:
Pulpdent's Embrace Wet Bond as well as
Ultradent's Ultraseal XT Plus.



Helioseal

Sealant Filler Content discussion

- Most sealants today contain some % of filler (Average: 30's%).
- The higher the filler content, the greater resistance of the sealant to occlusal wear.
- The lower the filler content, the thinner the sealant viscosity, and therefore the more deeply the sealant can penetrate, with the greater the likelihood of mechanical retention.



Retention Studies comparing dental sealants

- Ideally want a dental sealant with maximum longevity.
- **A comparative study of two fissure sealants: a 2-year clinical follow-up** E. Yildiz, C. Dörter, B. Efes & F. Koray
summary The aim of the study was to compare the fluoride-containing fissure sealants (Helioseal F) with the conventional (Concise Light Cure White Sealant) fissure sealants in their retention and caries-prevention capabilities in young population.
- The total loss of Helioseal F (16.4, 19.7, 18, 23% at 3rd, 6th, 12th and 24th months, respectively) was **more** than the total loss of Concise Light Cure White Sealant (8.2, 9.8, 11.5, 18%, respectively); meaning that the retention rate of Helioseal F was lower than for Concise Light Cure White Sealant. No caries was detected at 3rd and 6th months in all sealant-treated teeth. The incidence of caries in Helioseal F treated teeth at 12 and 24 months was 11.5% and 0% in Concise Light Cure White Sealant treated teeth. The incidence of caries in all fissure-sealant-treated-teeth after 24 months was 5.7% and 25.4% in control group.
- The results underline that the application of fissure sealants to young people in this sample is an effective method for the prevention of fissure caries.



Benefits/Challenges experienced with our School-Based Sealant Program

■ Benefits:

- Captive Audience
 - Best Compliance Possible
 - Done OUTSIDE the classroom

■ Challenges

- Educating Teachers on the Benefits of the Program (less sick days taken; better student focus)
- Intrusion on limited learning time



STAFFING

- Behind every great leader is an even greater staff!

Demographic data verification before the dental exam....



Gathering clinical data with the dental exam....



Clinical Findings.....

- **What we see when we screen children's teeth.....**

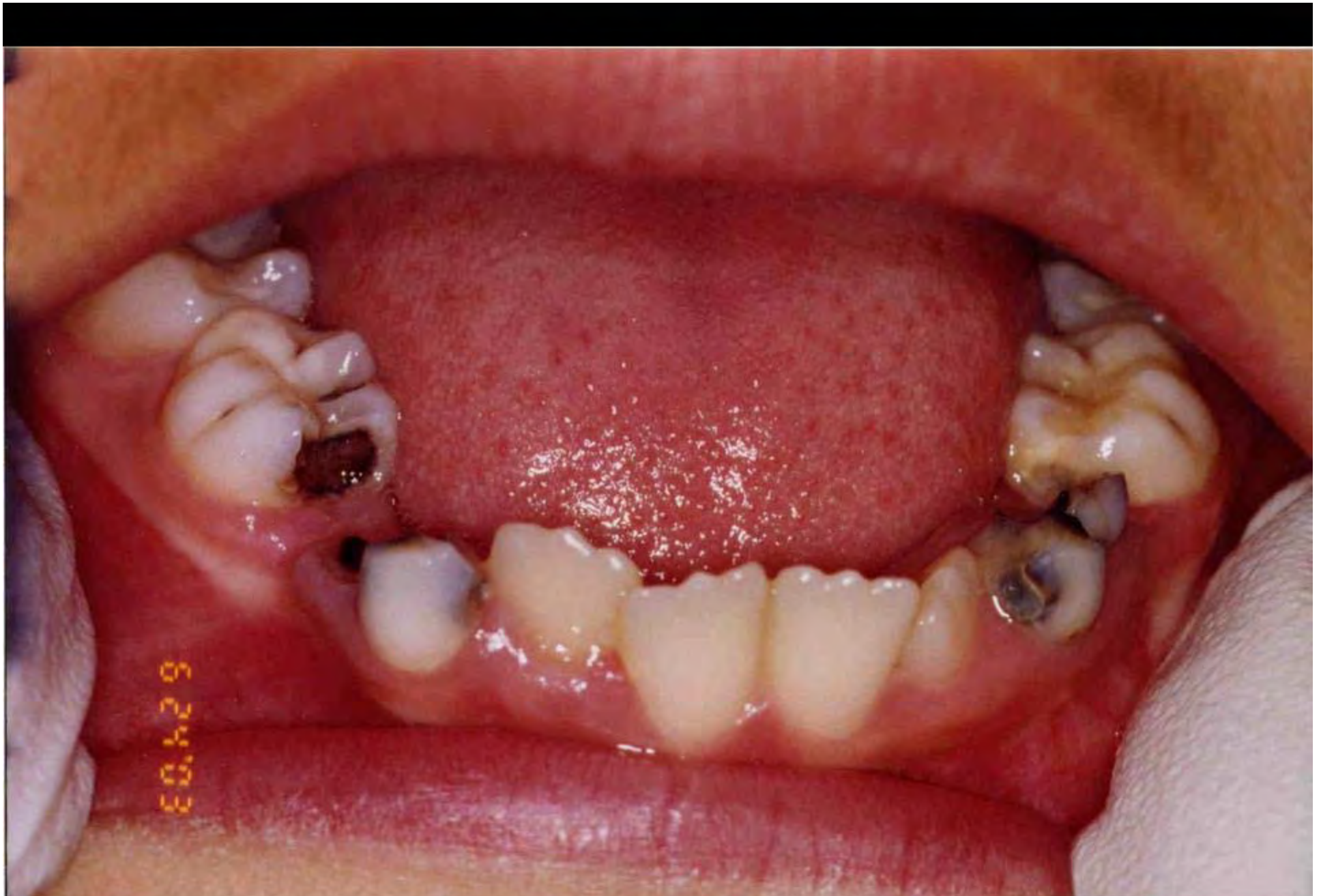




2003 Clinical Slides

- Significant Number of Children with Dental Caries (about 80% of those screened).
- Significant Number of Dental Malocclusions (about 25% of those screened).
- Significant Number of Oral Infections of Dental Origin (about 10% of those screened).





2004 Clinical Slides

- More of the same problems.....many of them unresolved or untreated..
- Untreated dental problems contribute to days out sick from school, and lack of focus while in school.



Orthodontic Concerns

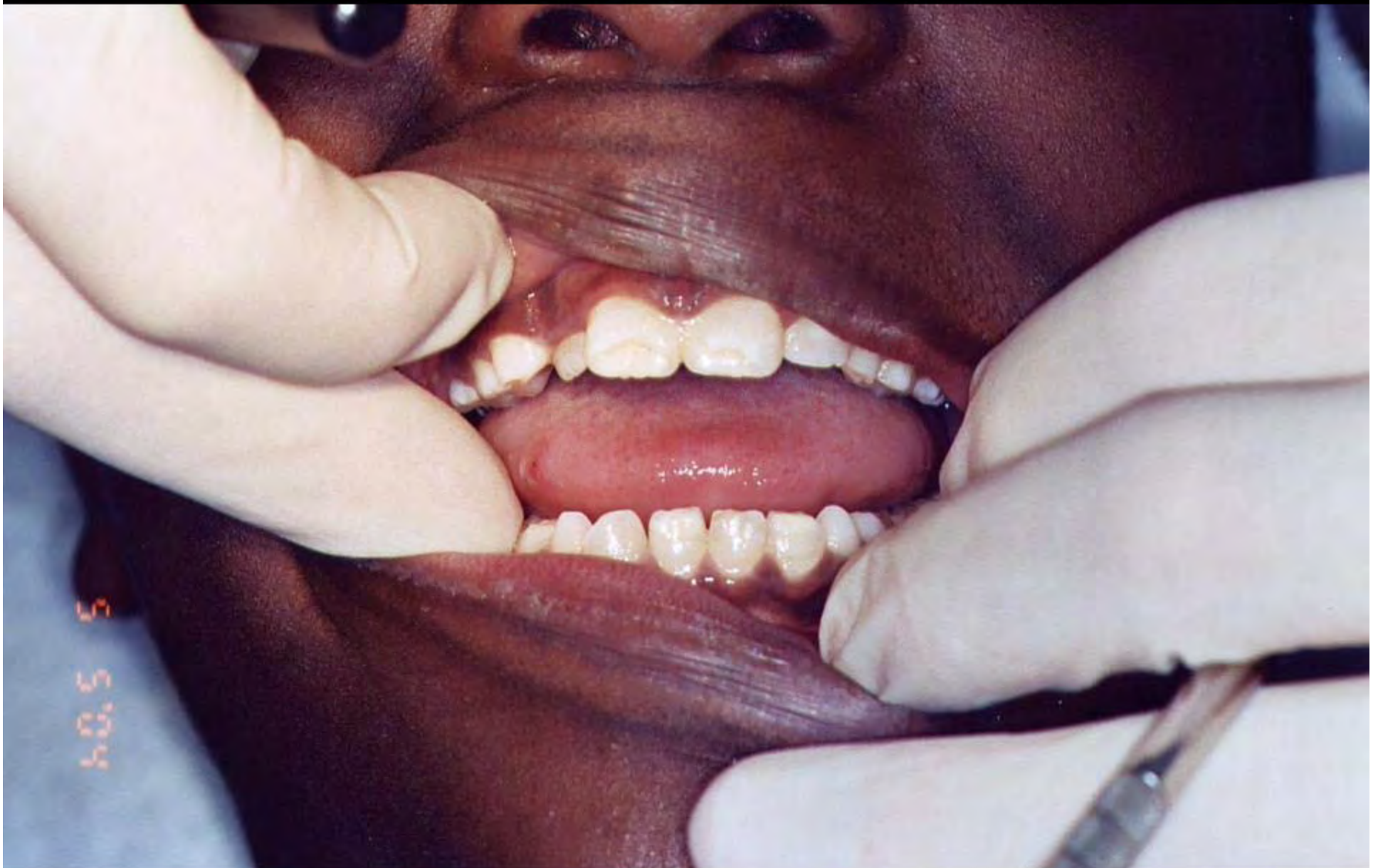
- Affects growth and development of mandible and maxilla.
- Early loss of primary teeth from caries reaching the nerve or pulp can lead to secondary teeth being blocked from natural eruption if space not maintained.













The Healthy Dentition....

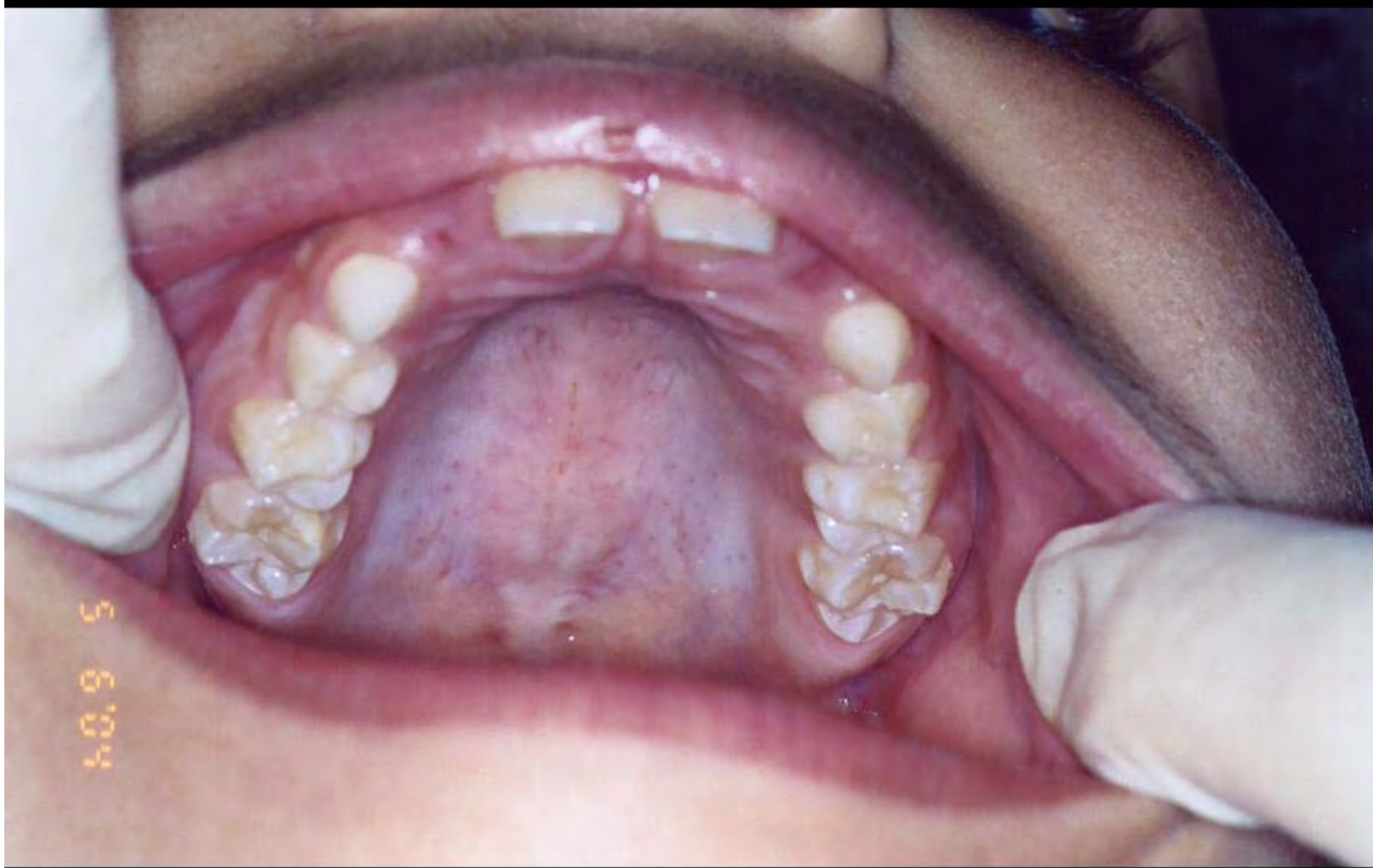
- Without Restorations....
- And With Restorations....





5 6'04





3 6'04"

Children with Dental Caries....

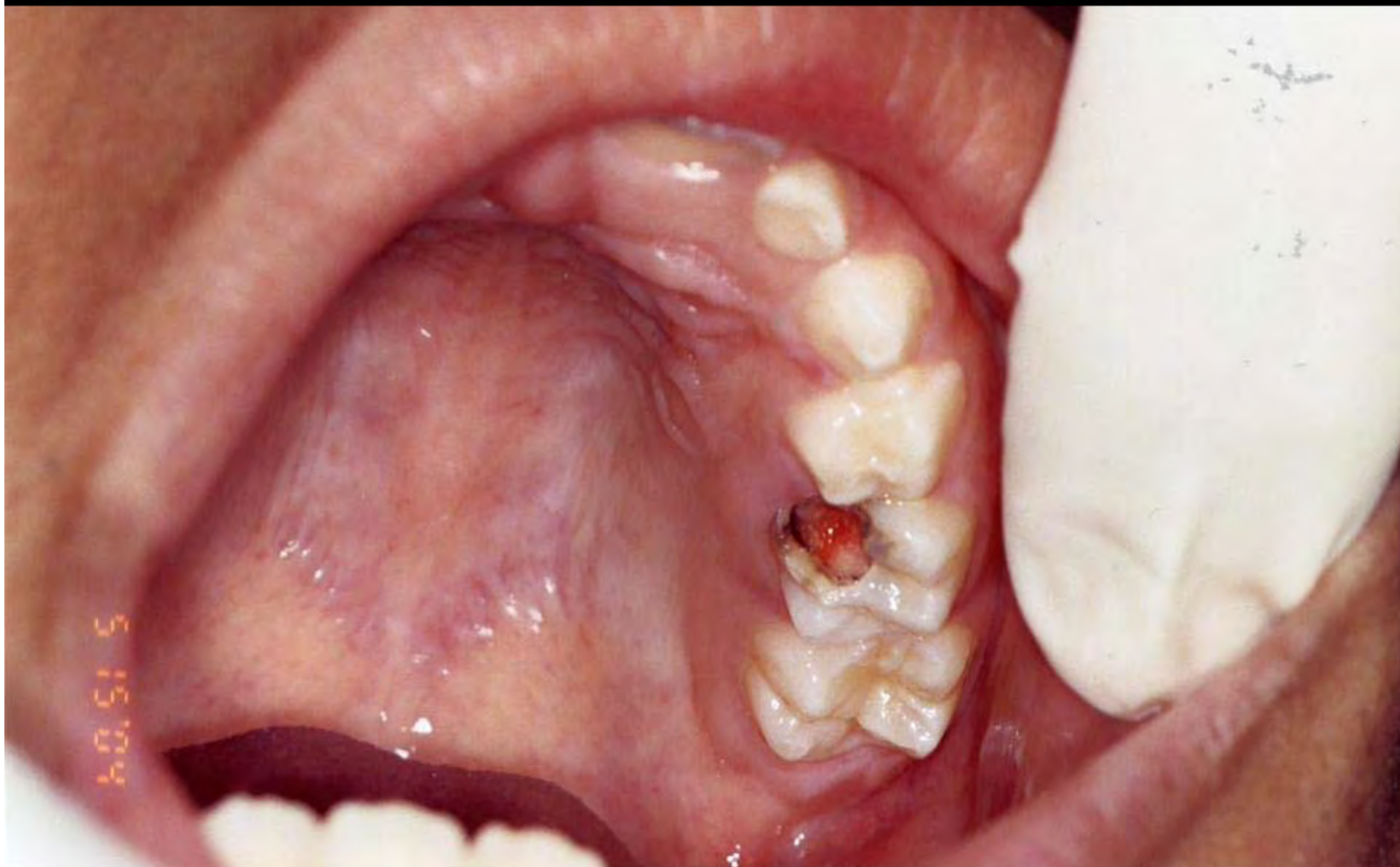
- FACTS:
- 80% of today's tooth decay in children resides in 20% of the pediatric population.
- We treat that population!







5 6'04



Rampant Caries....sometimes
the infection can spread too far
and wide.



Try and remember.....
Lift the lip!











Data Analysis, and Reports:

■ Data Collection

- Initial study by G. Zabos, DDS, MPH (Cost-effectiveness analysis of a school-based dental sealant program for low-socioeconomic-status children: a practice-based report; Zabos, G.P., Glied, S.A., Tobin, J.N., Amato, E., Turgeon, L., Mootbar, R.N., Nolon, A.K.; J Health Care Poor Underserved. 2002 Feb;13(1):38-48)

⑩ showed 50% caries reduction in children who participated in program.

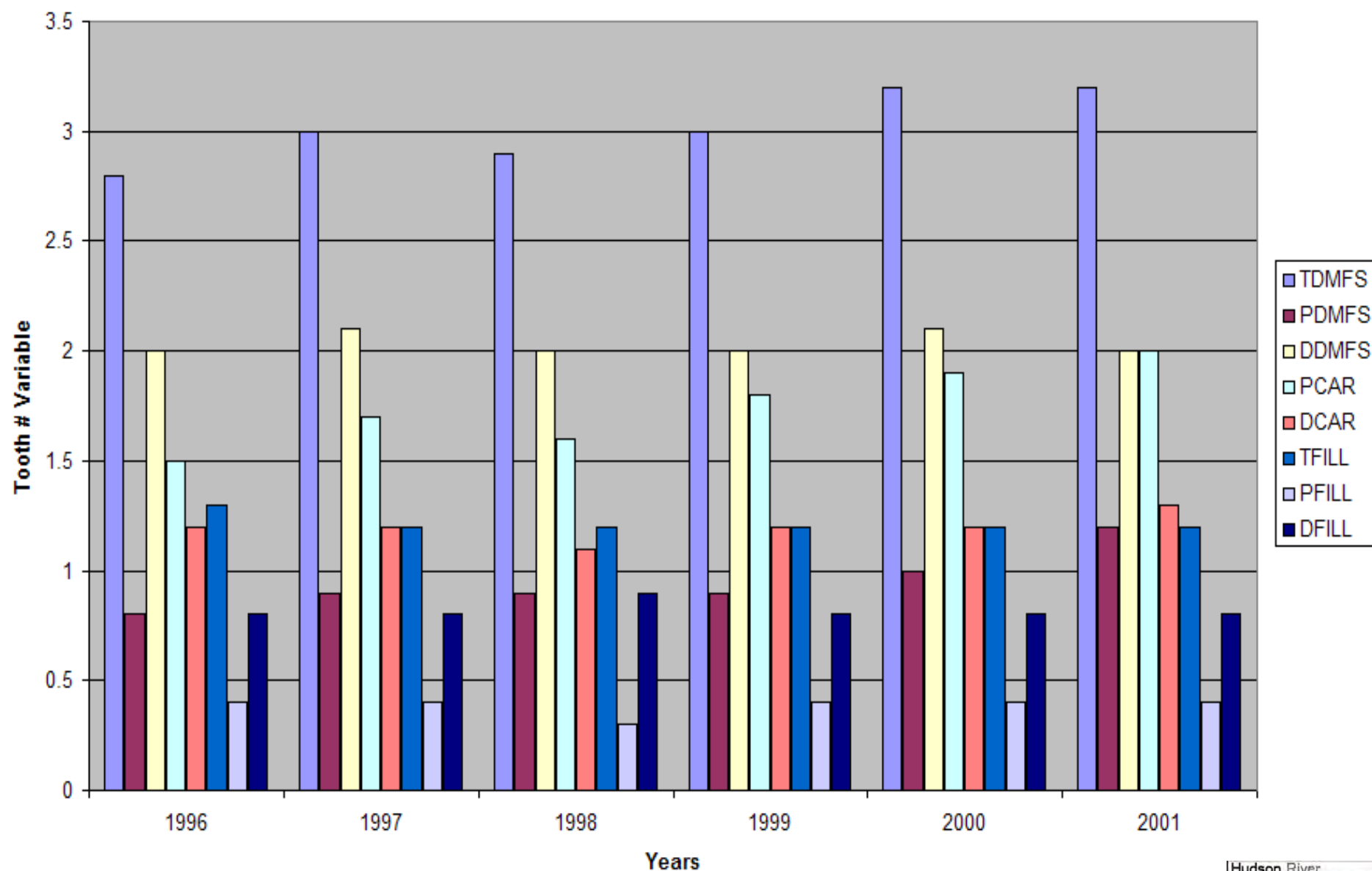
- Data from 1996-2001 shows similar 50% caries reduction as well as reduction in teeth needing fillings over a 5 year period.



Data Analysis & Reports:

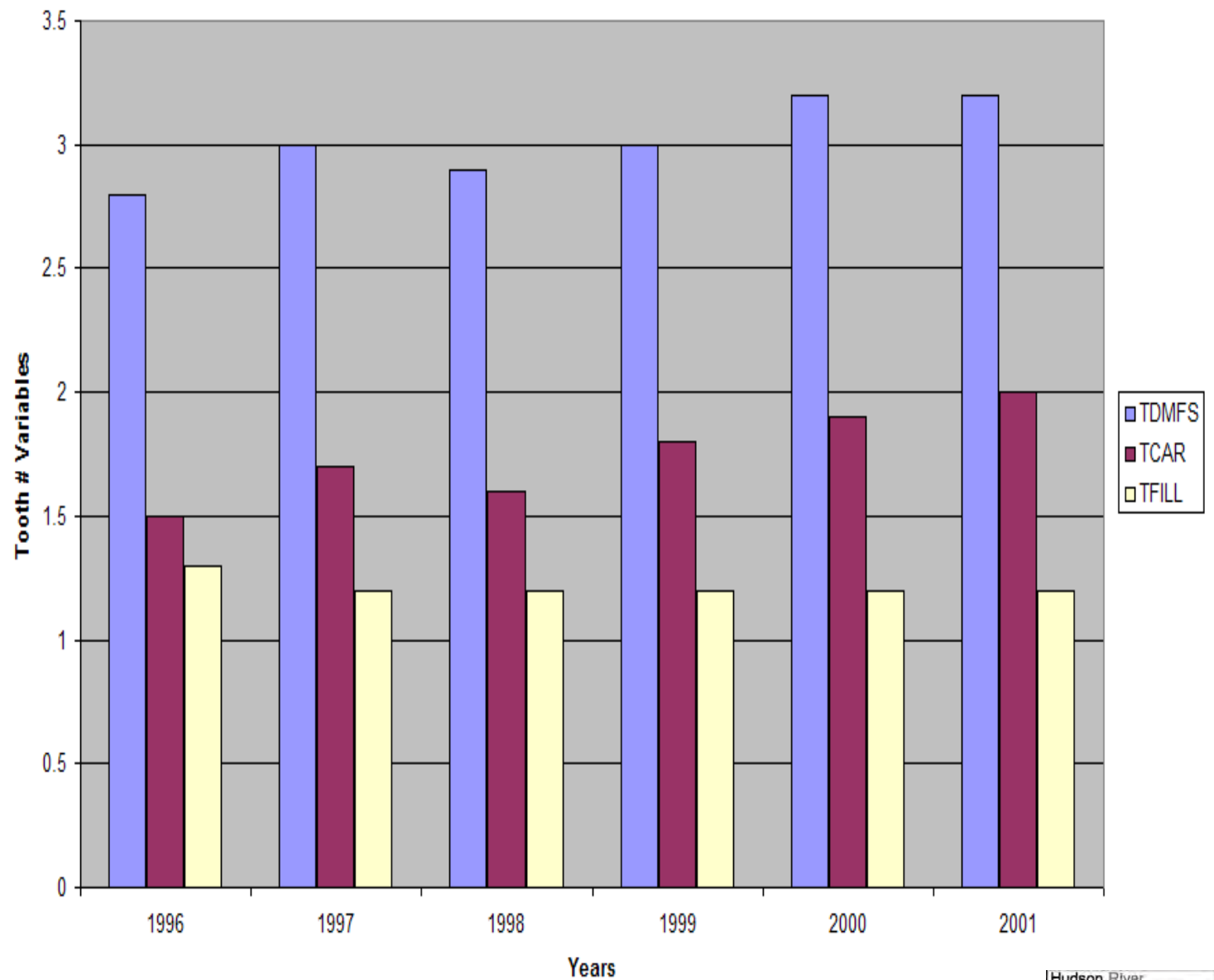
- Total # Teeth Sealed from 1988-2006: 33,170
- Of the over 1000 children who participate in our program every year, 140 children participated in the program continuously from 1996-2001.
- These children after 6 years had half the number of cavities, fillings, and missing teeth compared to when they started.
- Other children who were examined but did not participate continuously in the program saw no changes in their respective rates of cavities, filling, etc.

HRCH School-Based Sealant Program Data for ALL Children in the Sealant Program
1996-2001 Avg. N=1000; Avg Age=9.5



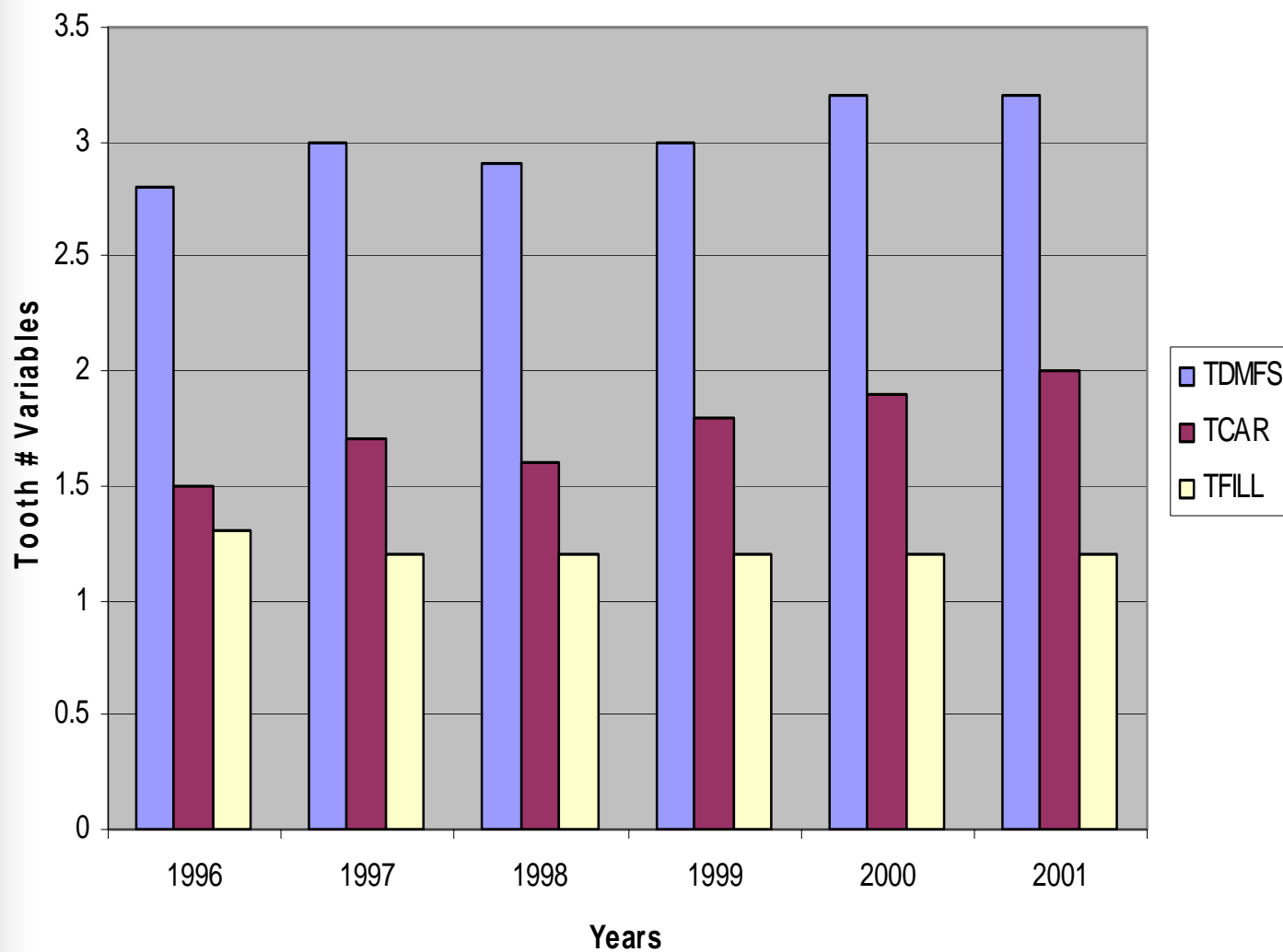


HRCH School-Based Sealant Program from 1996-2001 for ALL children (N=1000) in Sealant Program





HRHC School-Based Sealant Program from 1996-2001 for ALL children (N=1000) in Sealant Program

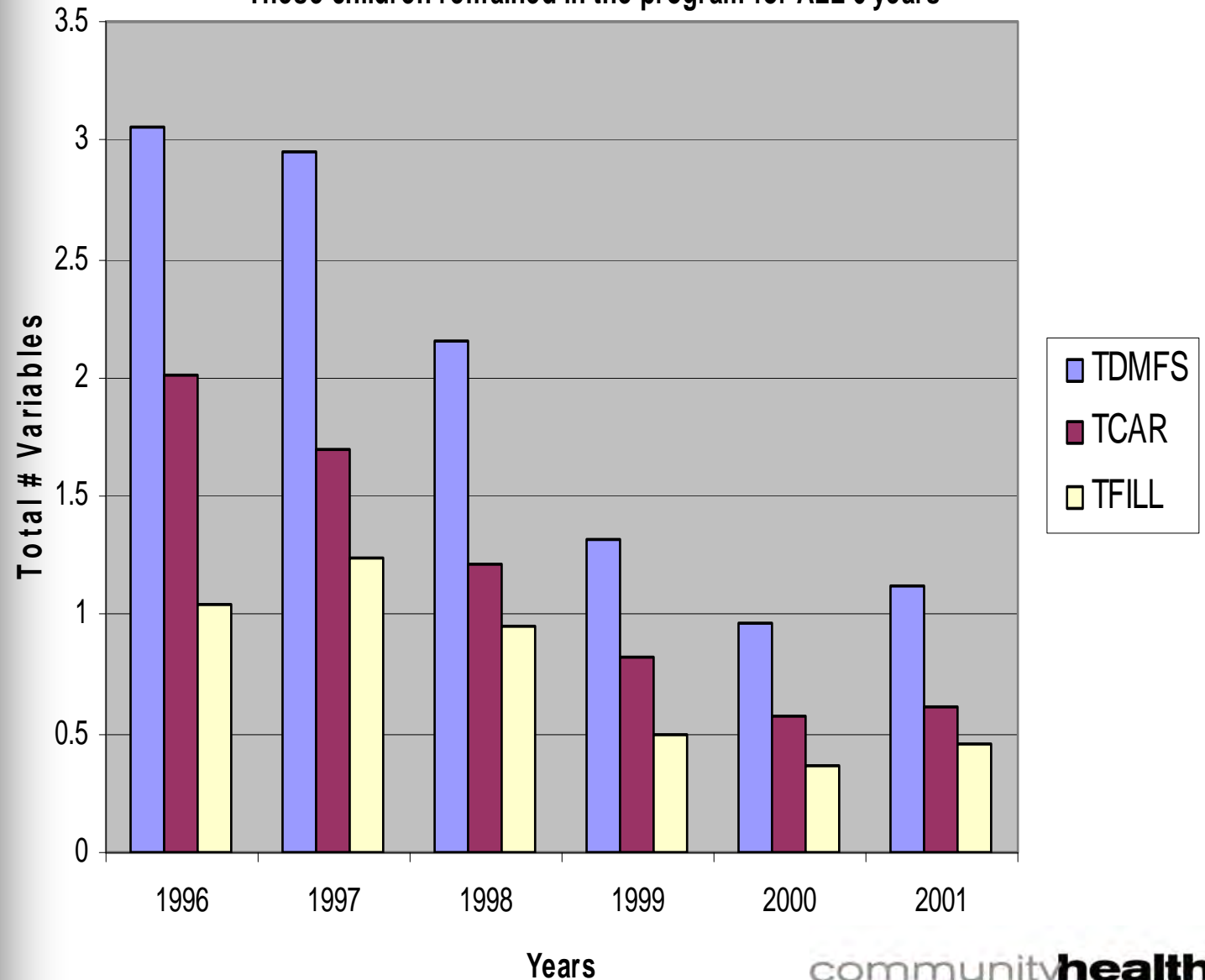




HRCH School-Based Sealant Program 1996-2001

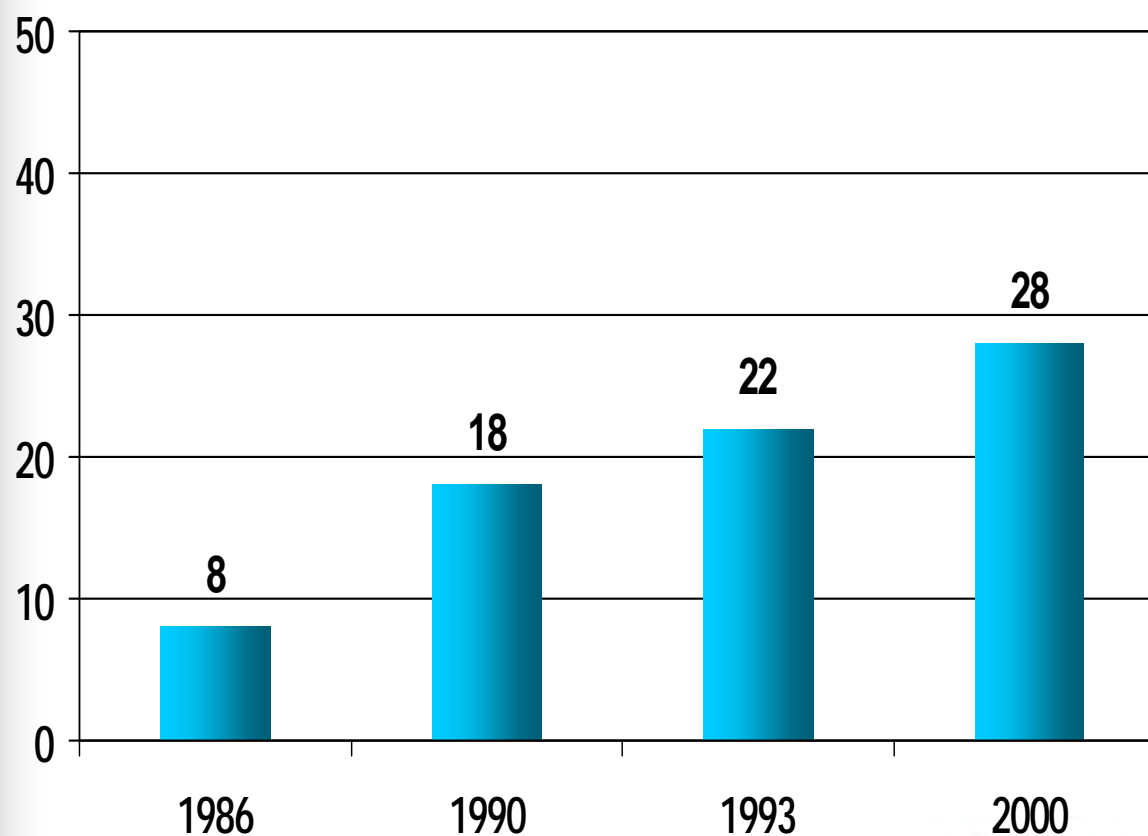
Sample Size N = 140 Children

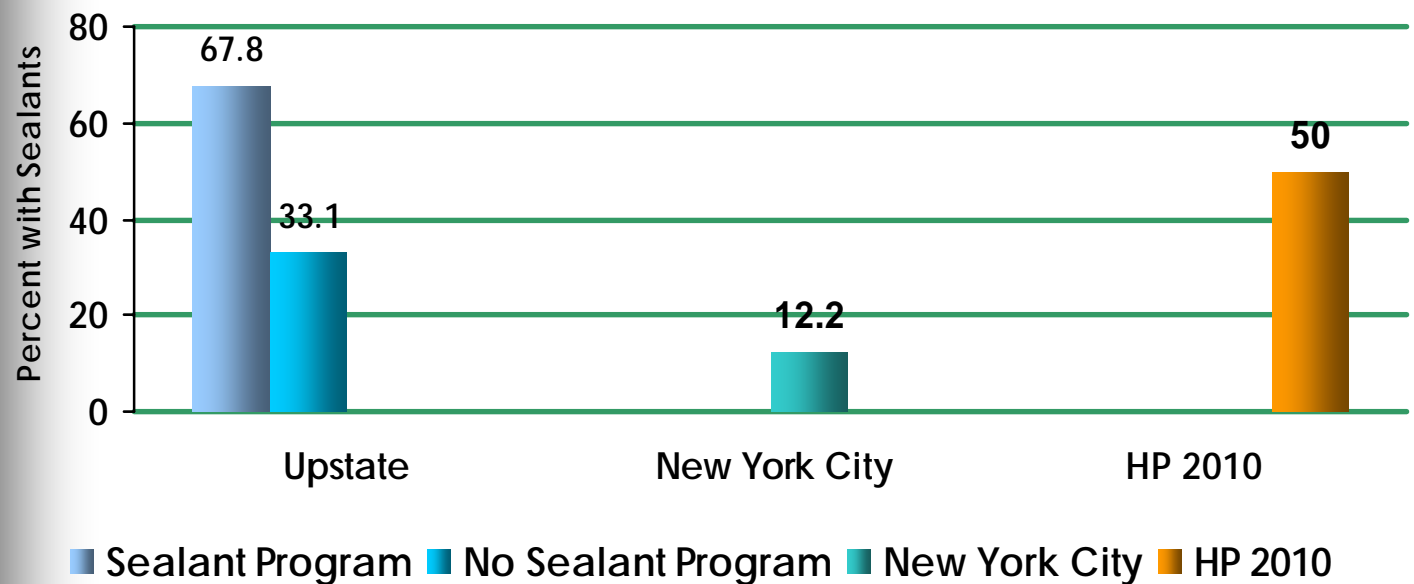
These children remained in the program for ALL 6 years





Dental Sealant Prevalence National Trend

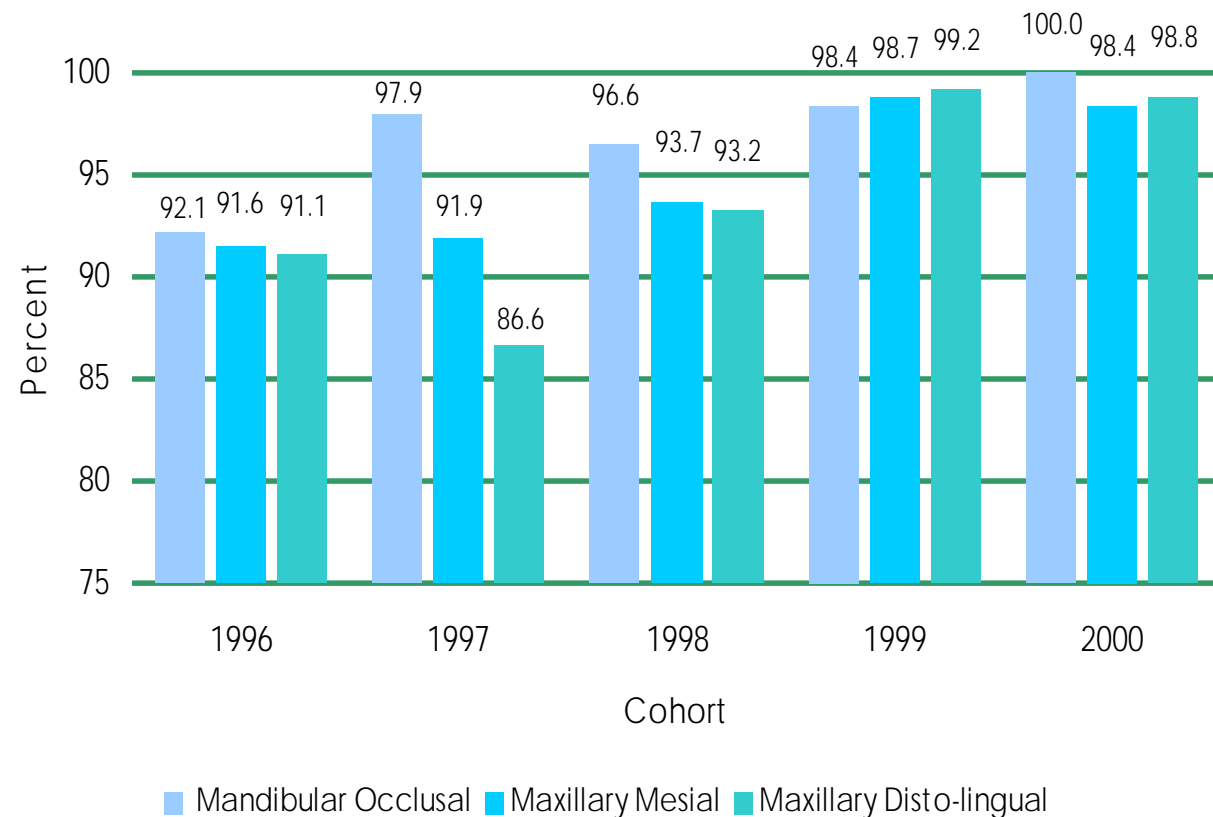




Percent of 3rd grade children with a dental sealant by school-based sealant program in upstate New York, New York City and Healthy 2010 Objective.
New York State 2002 – 04.

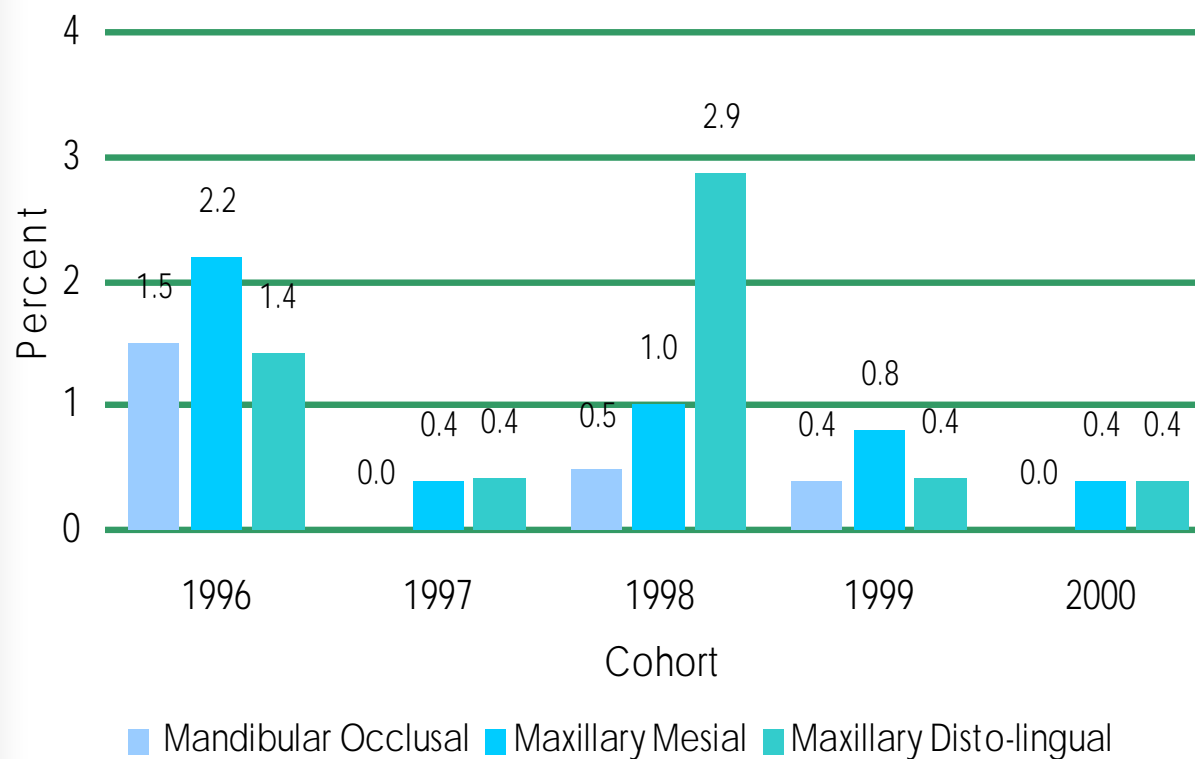
Retention rates after 1 year of placement:

Sealant Retention rates after 1 year of placement



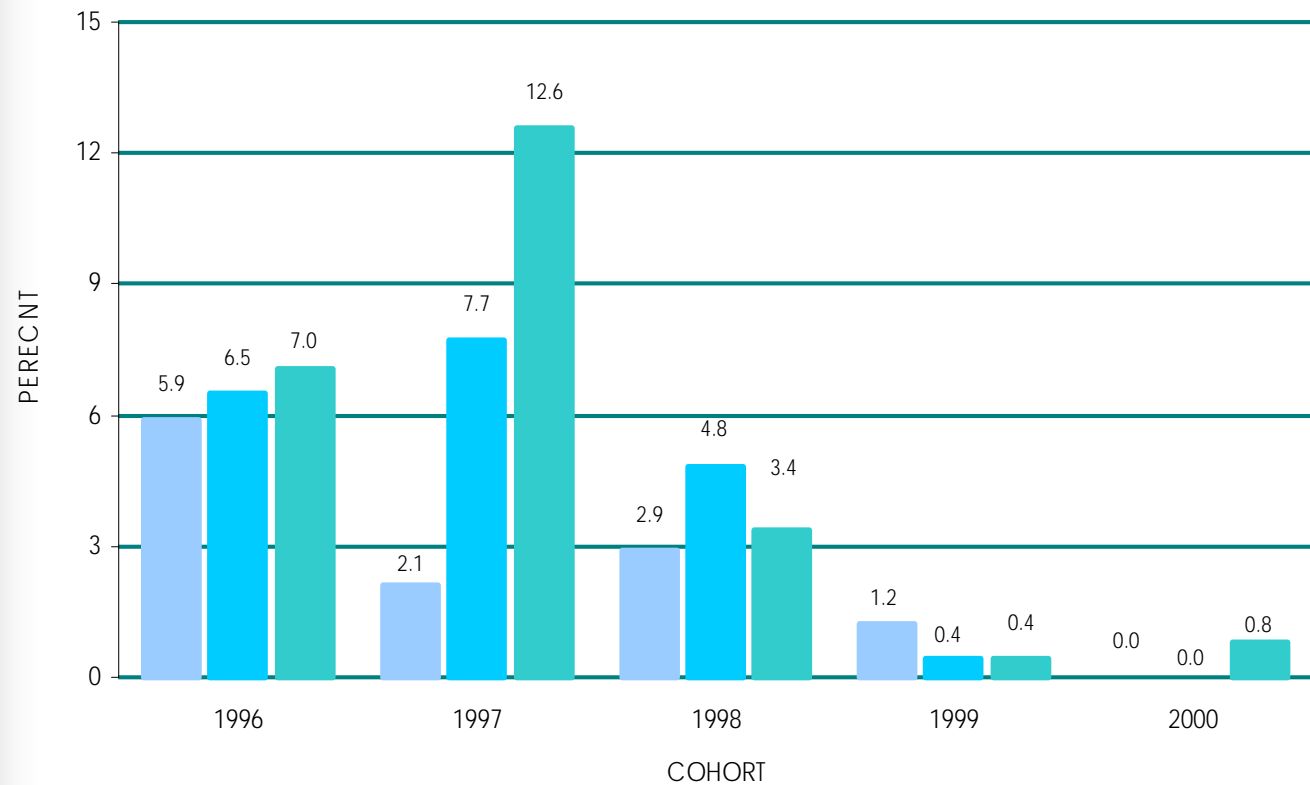
Failure rates after 1 year of placement:

Sealant Failure Rates after 1 year placement



Reseal rates after 1 year of placement:

Sealant reseal rates after 1 year of placement



■ Mandibular Occlusal ■ Maxillary Mesial ■ Maxillary Disto-lingual



Discussion:

- These retention rates are consistent with what has been reported in the literature
- We concluded that the quality of the sealants placed was high
- However, this method of data analysis is not feasible at the local level
- This method of data processing is complex
- Laborious procedure using SAS.
- Personnel at the program site need to have SAS skills .
- Cost of providing sealant is not captured



Recommendations:

- A simple software by program personnel to record, analyze

and report dental sealant data is recommended

- SEALS software (Developed by the Centers for Disease

Control and Prevention)

Advantages

- Excel-based
- Can generate reports

- Event Report

Child level data

- Program Report

Costs, Estimates of the amount of
decay averted



Acknowledgements:

Dr. Jayanth Kumar, Assistant Director

Donna L Altshul, RDH, BS
Coordinator, NYS Oral Health Initiative

Kiran Ranganath, BDS MPH

Bureau of Dental Health,
New York State Department Of Health, Albany, New York.



Marie Forsyth, Executive Administrator

Hudson River HealthCare, Inc.
Peekskill, NY



Anne K. Nolon, MPH

President & CEO
Hudson River HealthCare, Inc.
Peekskill, NY



Thank You!