CDC's Expert Panel on School-based Sealant Programs

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Presentation Overview

- Explain CDC's decision to convene an expert panel
- Describe objectives and methods
- Present major questions addressed

Presentation Overview

- Review findings of existing systematic reviews of sealant effectiveness
- Examine studies included in Task Force review of school sealant programs for:
  - Caries assessment criteria prior sealant placement
  - Caries risk in study populations

Reasons for Convening Panel

- Request from ASTDD
- Current guidelines last revised in 1994
- New information available
  - Effectiveness of sealants in clinical and school programs (Systematic reviews)
  - Caries assessment techniques
  - Prevalence of caries and sealants in the U.S.

MMWR™

Morbidity and Mortality Weekly Report

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http://www.cdc.gov/mmwr/PDF/ss/ss5403.pdf

Surveillance for Dental Caries, Dental Sealants, Tooth Retention, Edentulism, and Enamel Fluorosis — United States, 1988–1994 and 1999–2002

Reasons for Convening Panel

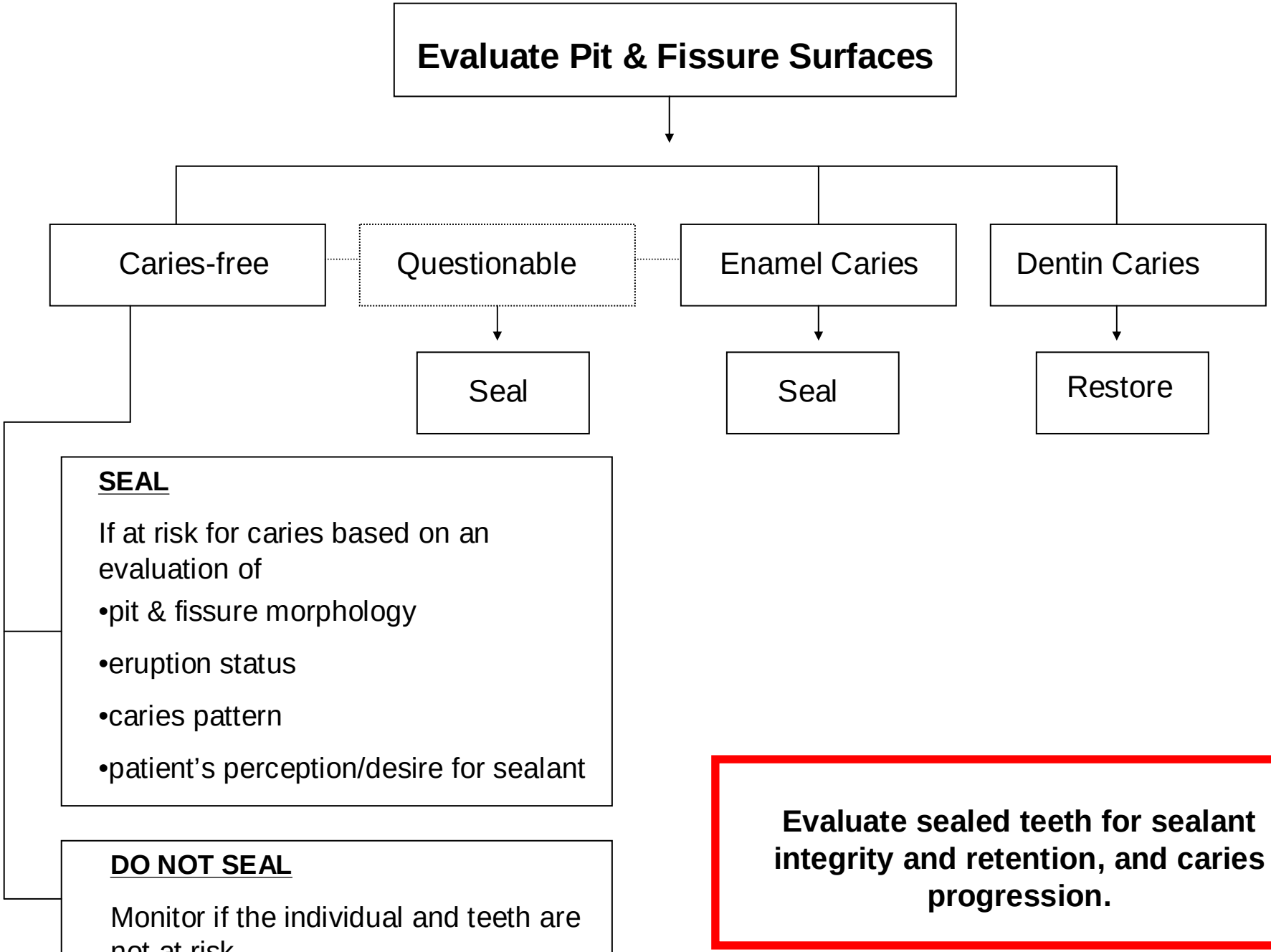
- Caries prevalence is still high in children.
- Percent of children with sealants has increased, but disparities remain.
- Susceptibility of molars is much greater than for other teeth.
  - Macek MD *et al.* J Public Health Dent 2003;63(3):174-82.

Objectives

- To review guidelines and best practices for school-based sealant programs
  - Guidelines from Albany Workshop, *J Public Health Dentistry* (Suppl), 1995
- To ensure that guidelines and best practices
  - Reflect current science
  - Support practices that are appropriate in school settings

Objectives

- **Review focuses on:**
  - Methods of assessing tooth surface status
  - Indications for sealant application based on findings of the assessment
  - Placement techniques
  - Evaluation of sealed teeth


Evaluate Pit & Fissure Surfaces
Caries-free
Questionable
Enamel Caries
Dentin Caries
Seal
Seal
Restore
SEAL
If at risk for caries based on an evaluation of
•pit & fissure morphology
•eruption status
•caries pattern
•patient's perception/desire for sealant
DO NOT SEAL
Monitor if the individual and teeth are not at risk
Evaluate sealed teeth for sealant integrity and retention, and caries progression.

Panel Members

Chair –

- **Gary Rozier, DDS, MPH**
  University of North Carolina at Chapel Hill

Panelists –

- **Diane Brunson, RDH, MPH**
  Colorado Dept. of Public Health/Environ
- **David K. Curtis, DMD**
  American Academy of Pediatric Dentistry
- **Margherita Fontana, DDS, PhD**
  Indiana University School of Dentistry
- **Harold Haering, DMD**
  American Dental Association
- **Larry Hill, DDS, MPH**
  Cincinnati Health Department
- **Jayanth Kumar, DDS, MPH**
  New York State Department of Health

Panelists (continued) –

- **Mark Mallatt, DDS, MSD**
  Indiana State Department of Health
- **Daniel M. Meyer, DDS**
  American Dental Association
- **Wanda R. Miller, RN, MA, NCSN, FNASN**
  National Association of School Nurses
- **Susan M. Sanzi-Schaedel, RDH, MPH**
  Multnomah County Health Department
- **Mark Siegal, DDS, MPH**
  Ohio Department. of Health
- **Richard Simonsen, DDS, MS**
  Arizona College of Dentistry and Oral Health
- **Benedict I. Truman, MD, MPH**
  Centers for Disease Control and Prevention
- **Domenick T. Zero, DDS, MS**
  Indiana University School of Dentistry

Methods

- **Expert Panel convened twice**
  - Focused review of state of science and practice
  - Engaged in discussions
  - Drafted recommendations based on science and expert opinion

Methods

- **Strength of evidence documented for each draft recommendation**
  - Rely on findings of published systematic reviews
  - Await findings of ongoing review of sealant effectiveness in managing caries
  - Document specific attributes of included studies in major systematic reviews

Outcomes

- To revise guidelines to reflect current state of the science
- To identify information gaps
- To determine reporting and dissemination strategies

Major Questions:

1. What is the effectiveness of sealants in preventing:
   - Caries initiation on sound surfaces?
   - Caries progression on surfaces with early, non-cavitated or frank, cavitated lesions?
2. Which surfaces (sound; carious – early; carious – frank) are indicated for sealant placement?

Major Questions:

3. What caries assessment methods are necessary to determine which surfaces should be sealed?
4. Are additional procedures, such as enameloplasty, indicated during placement?
5. Are current protocols adequate for monitoring sealant retention?

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Sealant Effectiveness Caries Initiation

Llodra JC *et al*. Community Dent and Oral Epidemiol 1993;21:261-8.

- Meta-analysis of 14 studies of autopolymerized sealant
- *Prevented Fraction = 71% (95% CI = 69, 71)*
  - 78% at 1yr; 59% at >4 yrs

Sealant Effectiveness Caries Initiation

Rozier RG. J Dent Educ 2001;65:1063-72.

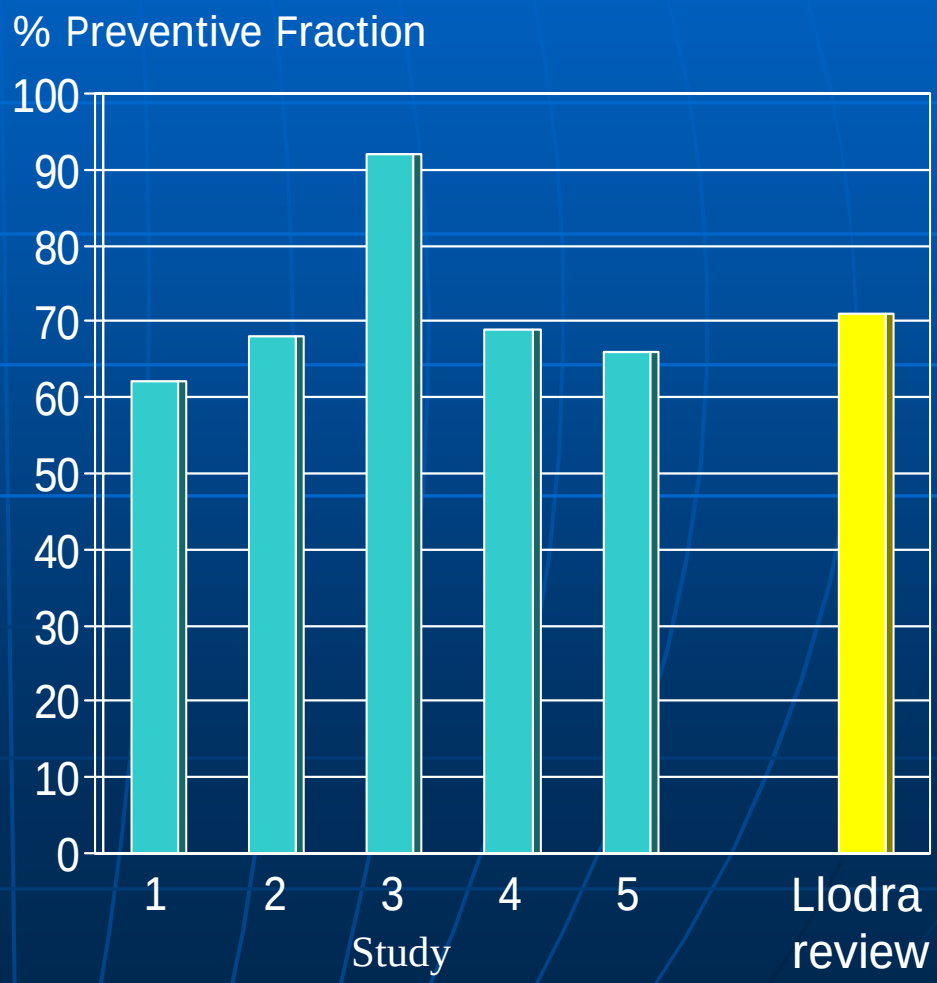
- Updated Llodra review
- Added 5 studies:
  - Heterogenous in design; materials (3 auto; 2 visible light)
  - Magnitude of effect – similar to Llodra

NIH Consensus Development Conference on Diagnosis and Management of Dental Caries Throughout Life, March 26-28, 2001

Sealant Effectiveness Update of Llodra, 1993

5 studies (Rozier, 2001)

- Simonsen ’91 (1)
- Heller et al. ’95 (2)
- Songpaisan et al. ’95 (3)
- Bravo et al. ’96, ’97 (4)
- Leal et al. ’98 (5)



Sealant Effectiveness
Caries Initiation

- Ahovuo-Saloranta A *et al*. (Cochrane Review) In: The Cochrane Library, Issue 3, 2004.

  -Relative decrease in caries (children, 5 – 10 years) (5 studies):

  12 months: 86%

  48 – 54 months: 57%

  -Recommended procedure; Consider caries prevalence

  -Included application on sound or enamel lesions

Effectiveness
School Sealant Programs

- Task Force on Community Preventive Services (2002)
  - Found strong evidence that school sealant delivery programs are effective (10 studies)
  - Median reduction: 60%
  - Strongly recommended to prevent caries
- Am J Prev Med 2002; 23(1S):21-54.
- www.thecommunityguide.org

Questions:

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Sealant Effectiveness Caries Progression

- Direct evidence:
  - Ongoing systematic review (S Griffin)

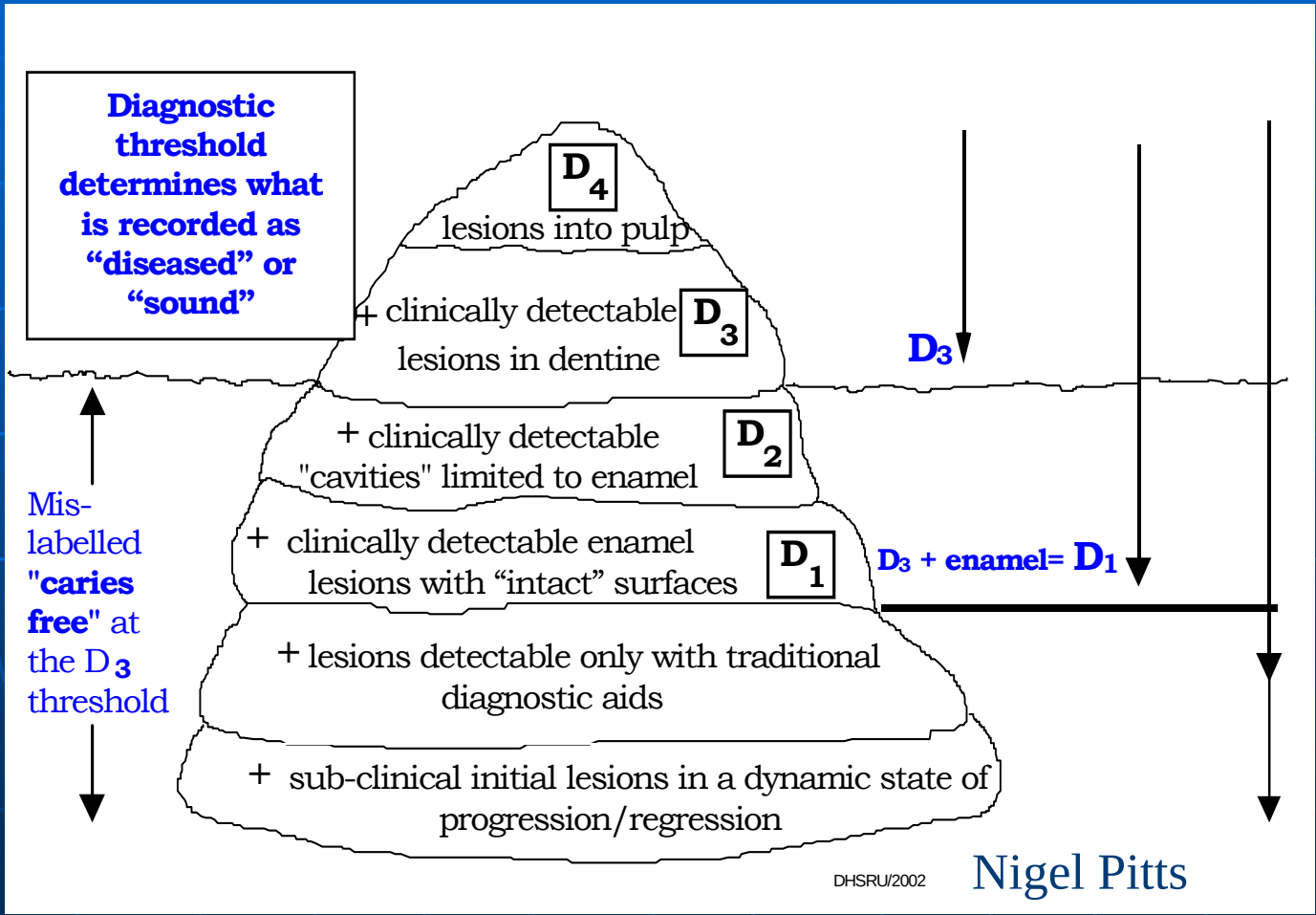
- Indirect evidence - Individual studies
  - Caries assessment criteria prior to sealant placement
    - "What is the likelihood that early carious lesions were classified as sound?"
  - Indicators of caries risk in study population
    - "What is the prevalence of early carious lesions?"

Common Caries Indices

- WHO (1987, 1997) and Radike (1968)
- Focus on cavitation or “softness” for caries determination
- “When in doubt, call it sound”

World Health Organization (WHO)

“Iceberg of Dental Caries”



Included Studies – Caries Criteria

Task Force on Community Prev Svcs (2002)

Bagramian 1982 USA	
Bravo 1997 Spain	
Burt 1977 UK	
Horowitz 1977 USA	
Klein 1985 USA	
McCune 1979 Colombia	
Messer 1997 Australia	
Selwitz 1995 USA	
Songpaison 1995 Thailand	
Sterritt 1994 Guam	

Included Studies – Caries Criteria

Task Force on Community Prev Svcs (2002)

Bagramian 1982 USA	Radike
Bravo 1997 Spain	
Burt 1977 UK	
Horowitz 1977 USA	Radike
Klein 1985 USA	Radike
McCune 1979 Colombia	
Messer 1997 Australia	
Selwitz 1995 USA	Radike
Songpaison 1995 Thailand	
Sterritt 1994 Guam	Radike

Included Studies – Caries Criteria

Task Force on Community Prev Svcs (2002)

Bagramian 1982 USA	Radike
Bravo 1997 Spain	WHO
Burt 1977 UK	Stain or explorer catch
Horowitz 1977 USA	Radike
Klein 1985 USA	Radike
McCune 1979 Colombia	
Messer 1997 Australia	
Selwitz 1995 USA	Radike
Songpaison 1995 Thailand	WHO
Sterritt 1994 Guam	Radike

Sealant Effectiveness Caries Progression

- Indirect evidence - Individual studies
  - Caries assessment criteria prior to sealant placement
    - “What is the likelihood that early carious lesions were classified as sound?”
  - Indicators of caries risk in study population
    - “What is the prevalence of early carious lesions?”

Included Studies – Caries Risk Indicators
Task Force on Community Prev Svcs (2002)

Bagramian 1982 USA	
Bravo 1997 Spain	
Burt 1977 UK	
Horowitz 1977 USA	
Klein 1985 USA	
McCune 1979 Colombia	
Messer 1997 Australia	
Selwitz 1995 USA	
Songpaison 1995 Thai	
Sterritt 1994 Guam	

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Burt 1977 UK	
Horowitz 1977 USA	
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McCune 1979 Colombia	
Messer 1997 Australia	
Selwitz 1995 USA	
Songpaison 1995 Thai	
Sterritt 1994 Guam	

Included Studies – Caries Risk Indicators Task Force on Community Prev Svcs (2002)

Bagramian 1982 USA	
Bravo 1997 Spain	
Burt 1977 UK	
Horowitz 1977 USA	
Klein 1985 USA	
McCune 1979 Colombia	Subjects ≥ 1 DMFT
Messer 1997 Australia	
Selwitz 1995 USA	
Songpaison 1995 Thai	
Sterritt 1994 Guam	Limited access to care

Included Studies – Caries Risk Indicators
Task Force on Community Prev Svcs (2002)

Bagramian 1982 USA	DMFS = 0.3 (1st gr); 5.6 (6th gr) (1983)
Bravo 1997 Spain	DMFS = 0.6 (1st gr) (1990)
Burt 1977 UK	
Horowitz 1977 USA	
Klein 1985 USA	DMFS = 1.0 (1st/ 2nd gr); 4.1 (5th gr) (1978)
McCune 1979 Colombia	
Messer 1997 Australia	
Selwitz 1995 USA	
Songpaison 1995 Thai	DMFS = 0.41(7-8 yo); 3.0 (13 yo) (1991)
Sterritt 1994 Guam	DMFS = 5.3 (6 – 14 yo) (1984)

Conclusions

- Strong evidence for sealant effectiveness for prevention of caries initiation on “sound” surfaces
  - Effect of large magnitude
  - Positive effect across included studies

Conclusions

- Systematic reviews likely captured evidence for sealant effectiveness on “sound” and early, non-cavitated surfaces
  - “Sound” surfaces included “early, non-cavitated” lesions (caries assessment criteria)
  - Early carious lesions were prevalent (caries risk indicators)

Conclusions

- Unique effect of sealants on early carious lesions cannot be estimated from these studies of primary prevention.

www.cdc.gov/oralhealth