



Infant Oral Health and Early Childhood Caries: Issues & Promising Approaches from the Field

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Overview



- **Conceptual Overview of ECC (Early Childhood Caries)**
- **ECC Program Initiatives**
- **Challenges**

What we know about dental caries in young children:



- Dental caries is an infectious, transmissible disease.
- The mother is usually the primary source of the infection. (*“vertical transmission”*)
- Cariogenic bacteria generally are transmitted from mother to child and colonize the teeth shortly after they erupt.
- Transmissible – yes; but also a complex, chronic disease

ECC – Early Childhood Caries: A Chronic, Infectious Disease



- Common – prevalence / unmet need
- Chronic – risk varies over time
- Complex – multi-factorial etiology
- Consequential – general health / costs
- Controllable – balance risk factors & protective factors
- Poorly understood – emphasis on cavities, rather than disease
- Lack of systematic, risk-based approaches

Caries – a working definition:



Dental caries is a **COMPLEX** (multi-factorial), **CHRONIC DISEASE** of teeth:

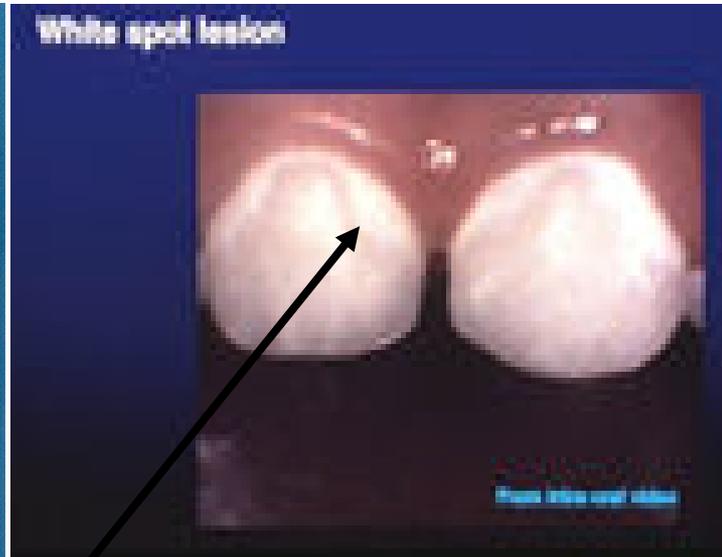
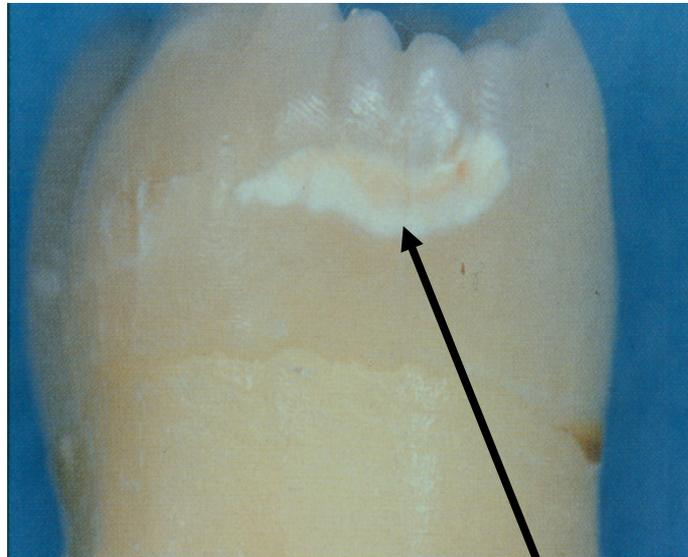
- ✓ infectious and transmissible
 - ✓ diet-dependent & salivary-mediated
 - ✓ dynamic and reversible (up to a threshold)
 - ✓ highly prevalent
- *a disease which may cause cavities in teeth*
- *and have significant consequences for general health and quality of life.*

'Caries' is NOT:



- A synonym for 'cavity'
 - 'Tooth decay' is a synonym for caries
- The plural of 'carie'
- *Think of it as being similar to diabetes!!!*
 - *A chronic disease → progressive absent lifestyle changes*
 - *Diet-related*
 - *Causes damage to structures of the body*
 - *A serious condition for many . . .*
 - *Not the plural of 'diabete'*

Dental Caries: Early Clinical Stages



Enamel Caries / "White-Spot" Lesions

Early Childhood Caries: Advanced Clinical Stages



**It's about much more
than 'baby teeth'!!!**

Epidemiologic Evidence: Highly Prevalent Condition

Tooth decay is the most common chronic disease of childhood in America.

- 56% of Grade 1 children have evidence of caries (*NIDR, 1995*)
- 85% of Grade 12 children have decayed or restored teeth (*NIDR, 1995*)
- Primary tooth decay is NOT declining – 14% increase in ECC in the past decade (*MMWR, August 26, 2005*)



Low-Income / Racial-Ethnic Minority Children & CSHCN Are at Higher Risk for ECC



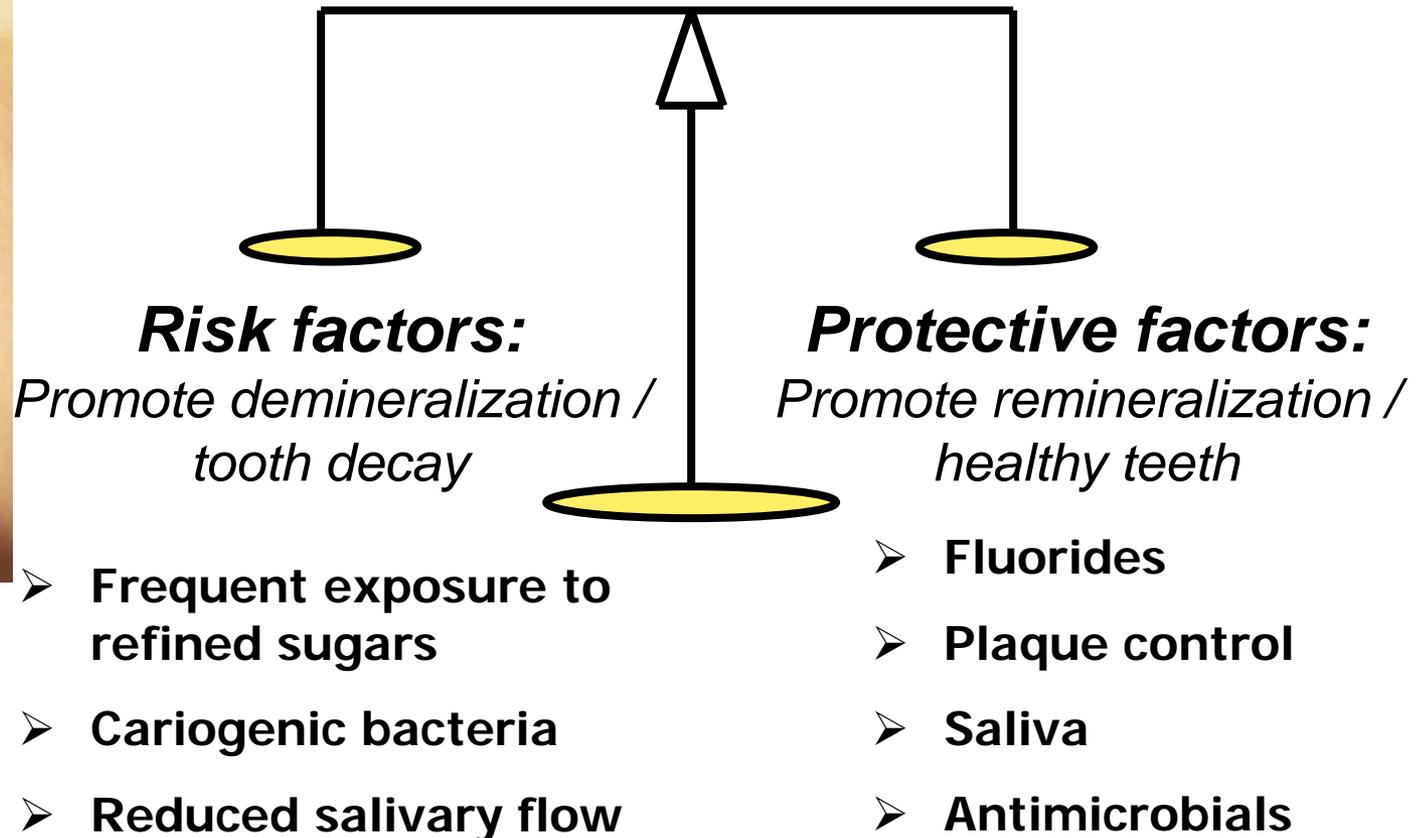
- 52% of children in MD Head Start centers had untreated tooth decay
 - 43% of 3 year-olds
 - 62% of 4 year-olds
- Over 5 decayed tooth surfaces per child with decay

Vargas CM, Monajemy N, Khurana P, Tinanoff N. Oral health status of preschool children attending Head Start in Maryland, 2000. *Pediatr Dent* 2002 May-Jun;24(3):257-63.

The Caries Balance

Adapted from Featherstone JDB: JADA 131:887-99, 2000

Dynamic Balance between Risk Factors & Protective Factors



Tool Kits Linked to Development



Prenatal tool kit	6-week tool kit	6-month tool kit	1 year tool kit
<ul style="list-style-type: none"> □ Healthy Mouth for Your Baby Brochure □ Immunization Schedule □ Tooth/Gum Brushing and Flossing Chart □ Baby T-shirt □ Adult Toothbrush □ Adult Fluoride Toothpaste □ Dental Floss □ Rx for Good Oral Health □ TUC Prenatal Educational Insert 	<ul style="list-style-type: none"> □ Preventing Nursing Bottle Mouth Brochure □ Immunization Schedule □ Tenders (finger toothbrush) □ Infant/Toddler Safety Toothbrush □ Adult Toothbrush □ Dental Floss □ Children's Fluoride Toothpaste □ Rx for Good Oral Health □ TUC 6-week Educational Insert 	<ul style="list-style-type: none"> □ Preventing Nursing Bottle Mouth Brochure □ Immunization Schedule □ Mouth Mirror □ Sippy Cup □ Adult Toothbrush □ Child Toothbrush □ Children's Fluoride Toothpaste □ Dental Floss □ Rx for Good Oral Health □ TUC 6-month Educational Insert 	<ul style="list-style-type: none"> □ Preventing Nursing Bottle Mouth Brochure □ Immunization Schedule □ Kick the Bottle Habit Brochure □ Teddy Bear □ Adult Toothbrush □ Child Toothbrush □ Children's Fluoride Toothpaste □ Dental Floss □ Rx for Good Oral Health □ TUC 1 year Educational Insert

Table 1: Contents of Oral Health Toolkits

Adapted from "Teeth Under Construction, Healthy Smiles in Progress". Cowlitz County Health Dept., Longview, WA.

Changing Paradigms for Controlling Dental Caries



- Old Paradigm --> Surgical / 'Drill & Fill'
(dealing with consequences of disease)



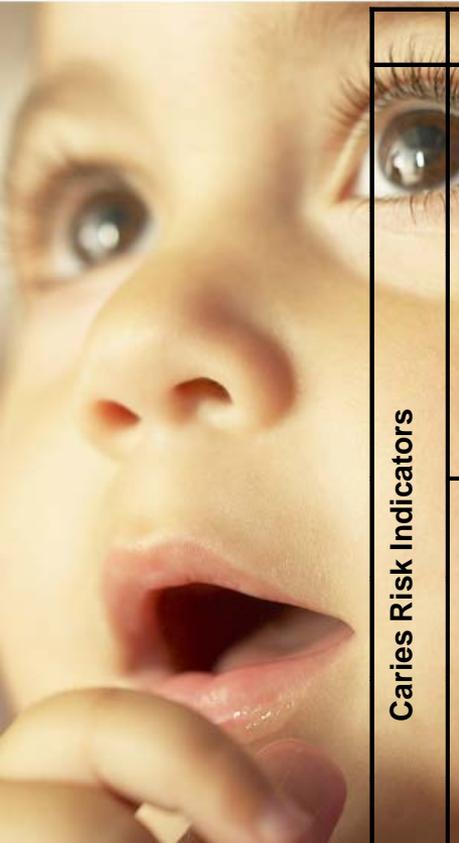
- Later Paradigm: Prevention!!!
(generally "one size fits all")



- "Current" Paradigm: Early Intervention,
Risk Assessment, Anticipatory
Guidance, Individualized Prevention
and Disease Management
(targeted, systematic approaches)

Caries Risk Assessment Tools

Source: American Academy of Pediatric Dentistry Reference Manual. Available at: www.aapd.org.



		Low Risk	Moderate Risk	High Risk
Caries Risk Indicators	Clinical Conditions	<ul style="list-style-type: none"> No decayed teeth in past 24 months No enamel demineralization (enamel caries “white-spot lesions”) No visible plaque; no gingivitis 	<ul style="list-style-type: none"> Decayed teeth in the past 24 months 1 area of enamel demineralization (enamel caries “white-spot lesions”) Gingivitis^A 	<ul style="list-style-type: none"> Decayed teeth in the past 12 months More than 1 area of enamel demineralization (enamel caries “white-spot lesions”) Radiographic enamel caries Visible plaque on anterior (front) teeth High titers of mutans streptococci Wearing dental or orthodontic appliances^B Enamel hypoplasia^C
	Environmental Characteristics	<ul style="list-style-type: none"> Optimal systemic and topical fluoride exposure^D Consumption of simple sugars or foods strongly associated with caries initiation^E primarily at mealtimes High caregiver socioeconomic status^F Regular use of dental care in an established Dental Home 	<ul style="list-style-type: none"> Suboptimal systemic fluoride exposure with optimal topical exposure^D Occasional (e.g., 1-2) between-meal exposures to simple sugars or foods strongly associated with caries Mid-level caregiver socioeconomic status (e.g., eligible for school lunch program or SCHIP) Irregular use of dental services 	<ul style="list-style-type: none"> Suboptimal topical fluoride exposure^D Frequent (e.g., 3 or more) between-meal exposures to simple sugars or foods strongly associated with caries Low-level caregiver socioeconomic status (e.g., eligible for Medicaid) No usual source of dental care Active decay present in the mother of a preschool child
	General Health Conditions			<ul style="list-style-type: none"> Children with special health care needs^G Conditions impairing saliva composition/flow^H

Population-Based Approach for ECC

ASSESSMENT PARAMETERS

- **RISK LEVEL** (low, high)
- **DISEASE STATUS** (none, initial, advanced)
- **NEED FOR TREATMENT** (urgent, basic, advanced)

○ **No Lesions**

○ **Low Risk**

○ **No Lesions**

○ **High Risk**

○ **Initial Lesions Only**

○ **Advanced Lesions**

○ **Recommend dental exam within 12 mos.**

○ **Counseling to maintain low risk**

○ **Anticipatory guidance**

○ **Recommend primary prevention (e.g., fluoride, sealants, if indicated)**

○ **Data entry / monitoring**

○ **Refer to dental home for dental examination & prevention within 6 months**

○ **Risk management program**

○ **Anticipatory guidance**
○ **Reassess compliance in 6 months**

○ **Data entry / monitoring**

○ **Refer to dental home for diagnosis & verify disease status ASAP**

○ **Initial disease mgt. program to control disease/reduce risk**

○ **Anticipatory guidance**
○ **Reassess in 3-6 months based on risk level**

○ **Data entry/monitoring**

○ **Refer to dental home for diagnosis & tx of lesions ASAP**

○ **Advanced disease management program to control disease and reduce risk**

○ **Anticipatory guidance**
○ **Reassess in 3-6 mos. based on risk level**

○ **Data Entry/Monitoring**

Developing Better Systems Based on Primary Care Principles

2005 COLLEGE OF DIPLOMATES SYMPOSIUM



Development and Integration of Oral Health Services for Preschool-age Children

James J. Crall, DDS, ScD¹

Abstract

The purpose of this paper was to highlight 6 important considerations for developing a comprehensive strategy for optimizing the oral health of preschoolers. These considerations are based on the nature of Early Childhood Caries and the strengths and limitations of various components of the pediatric health care delivery system. Emphasized are 3 strategies for optimizing oral health care delivery for young children within the context of primary care: (1) early establishment of dental homes; (2) risk-based approaches; and (3) integration of dental and medical components of the primary care delivery system. Additional considerations are noted concerning: (1) scope of services provided by medical care personnel; (2) care coordination and referrals; (3) terminology; and (4) unresolved issues likely to have significant implications for future oral health care delivery for infants and young children. (*Pediatr Dent* 2005;27:323-330)

KEYWORDS: ORAL HEALTH SERVICES, PRESCHOOL CHILDREN, PRIMARY CARE, DENTAL CARIES

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Children from low-income families, in general, and racial and ethnic minorities, in particular, have higher levels of untreated Early Childhood Caries (ECC) and limited access to oral health care. The problem of untreated dental disease is especially acute for infants and young children. Efforts organized by dental professionals to address these problems have focused on several strategies:

1. educating parents and caregivers about behaviors that promote oral health;
2. encouraging early establishment of "dental homes";
3. training dentists and allied dental personnel on how to provide recommended services to infants and young children;
4. improving Medicaid and State Children's Health Improvement programs.

Despite these efforts, substantial disparities in pediatric oral health and access to oral health services persist in US preschool-age children.¹

Growing concern over these disparities has prompted additional efforts to have other primary care providers (pediatricians, family physicians, physician assistants, nurse practitioners, etc) address this problem. A variety of initiatives, varying in scope and approach, have been

developed and implemented to expand the involvement of primary medical care providers. Relatively little consideration, however, has been directed to developing a comprehensive strategy for optimizing the oral health of preschoolers based on the nature of ECC and the strengths and limitations of various components of the pediatric health care delivery system.

Within that context, the purposes of this paper were to:

1. frame key issues that merit consideration in providing oral health services for preschool-age children;
2. underscore the importance of strategic approaches and systems development and integration to enhance oral health care delivery and oral health for young children;
3. comment on state programs that seek to involve pediatricians, family physicians, and their staffs in oral health care for high-risk infants and young children;
4. highlight key unresolved questions regarding future efforts to improve the oral health of vulnerable preschoolers.

Framing oral health services for preschool children within the context of primary care

Epidemiology and unmet treatment needs:
Magnitude of the problem

Data from a recent national survey of US children's oral health, the National Health and Nutrition Examination Survey (NHANES) III, show that roughly 60% of children

Crall JJ. *Ped Dent* 2005;27:323-330.

- Chronic disease
- Primary care model (continuous care)
- Service integration based on limits of current dental and primary care sectors
- Questions and considerations for improving systems

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Abstract

The purpose of this paper was to present information that underscores (1) the need for understanding the fundamental nature of dental caries, and (2) efforts to minimize its consequences in light of available scientific evidence, recent population trends, and persistent pressure to avoid expenditures in oral health to all children in the most cost-effective manner. The primary emphasis was placed on the importance of recognizing caries as a common, complex, chronic disease whose deleterious effects can be mitigated by such ongoing use of appropriate, risk-based preventive measures. Additional attention was given to current and emerging challenges along with considerations for aligning oral health promotion and delivery systems optimally with children's oral health care needs. (J Pediatr Dent 2006;28(96-101))

KEYWORDS: DENTAL CARIES, PREVENTION, CHILDREN, DEBITMENT

Dental caries (tooth decay) is a prevalent, age-old affliction that has been researched extensively. The underlying nature of the disease, however, and the steps necessary to avert its deleterious consequences continue to be poorly understood by large segments of the public, health professionals, health officials, and policy makers. Misperceptions and confusion about the underlying causes of caries and the anti-caries effects—or lack thereof—of common “oral hygiene” practices such as brushing of “dry toothbrushing” (ie, brushing without fluoride toothpaste or other therapeutic agents) abound. Similarly, the impact of dietary practices and various systemic health conditions on caries (and vice versa) are underappreciated or poorly understood. Establishing a broad, evidence-based understanding of the nature of caries and the methods which have been shown to be effective in averting or minimizing its deleterious consequences is essential for promoting healthy behavior and creating effective, efficient systems to deliver oral health services.

Numerous publications, including the Surgeon General's Report on Oral Health,¹ have highlighted declines in the overall levels of dental caries in US children over the past several decades. These overall declines and the concomitant improvements in children's oral health generally have been attributed to the application of multiple “preventive” measures. These include, but are limited to, increased exposure to and use of various types of fluoride, dental sealants, and efforts to educate the public about steps that individuals can take to enhance oral health.

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Rethinking Prevention

J Pediatr Dentistry • 2012, 28(9)

Rethinking Prevention: Broad Strategies / Goals

- Reduce the burden of disease through the efficient integration of:
 - Health promotion
 - Preventive services
 - Disease management
 - Treatment services
- Expand access to ongoing diagnostic, preventive and treatment services in “dental homes”
- Application of risk assessment and targeted interventions

**Crall JJ. Ped Dent
2006;28:96-101.**

Klamath County, OR

Early Childhood Caries Prevention Program: Community Partners



- Klamath County Health Department
- Advantage Dental Plan, Capitol Dental
- WIC
- Oregon Institute of Technology
- CHC and Medical Plans
- University of Washington
- Oregon State Department of Health

Key Objectives



- Develop community supported strategies to stop the transmission between mothers and children.
- Prevent caries expression in kids through parent education about risks and periodic application of fluoride varnish on erupting teeth.
- Provide a dental home for moms and kids at risk, ensuring success by utilizing a case management model for both clients and providers.

Prescription for good oral health

- All children and adults should use fluoridated toothpaste to brush their teeth just before bedtime...every night!
- Do not rinse the mouth...just spit out excess toothpaste.*
- Do not eat or drink after brushing.

Daily use of fluoridated toothpaste can reduce dental decay by 10%.
Mothers with healthy teeth are more likely to have healthy children.

Klamath County Early Childhood Carity Prevention Program

*.....teeth under construction,
healthy smiles in progress.....*

Source:
Dr. Peter Milgrom, 1998
Klamath County Public Health Division
American Academy of Pediatric Dentistry
A Pediatric Oral Health Initiative
American Dental Association
National Center for Children, Youth, & Families
*For a full list of dental services, visit
www.klamathcounty.gov

Program Goals

- 100% of 2-year old children on Medicaid will have no cavities.
- A sustainable program that grows and changes over time to meet the needs of the community

Program Components Based on Research / Evidence



- Home visits
 - Parent education on dental disease transmission/ECC.
 - Follow-up at WIC.
 - Tool Kits
- Case management to reduce barriers to dental care.
- Fluoride toothpaste provided to mother & child with instructions to apply daily from 1st tooth.
- Every pregnant woman and newborn assigned a dental home for necessary treatment.
- Chlorhexidine rinses during pregnancy and xylitol gum for new mothers. Fluoride varnish for children based on risk assessment.

Process



- Medicaid eligible pregnant women are referred through WIC or another partner. Home visits are made prenatally, when the child is 6-weeks, 6-months, 1-year, and 2-years of age.
- Case manager makes appointment(s) for pregnant women at hygiene school (OIT). Includes assessment, radiographs by protocol, cleaning and chlorhexadine therapy. Paid for by dental managed care organization.
- Pregnant women are assigned a dental home (managed care) and scheduled for treatment to reduce dental disease. There are enough dentists.
- Baby goes to the same dental home as the mother.

Challenge: Increase the proportion
of pregnant women who receive
anticipatory guidance at home



80.5%

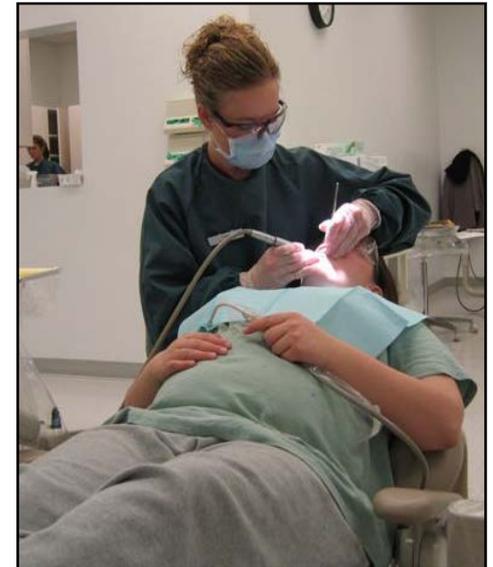
339/421*

* 2/2004 to 1/2006

Challenge: Increase the number of pregnant women using dental care



- 55.8% of eligibles
- 69.3% of those who received a prenatal visit
- No show rate = 9%



Challenge

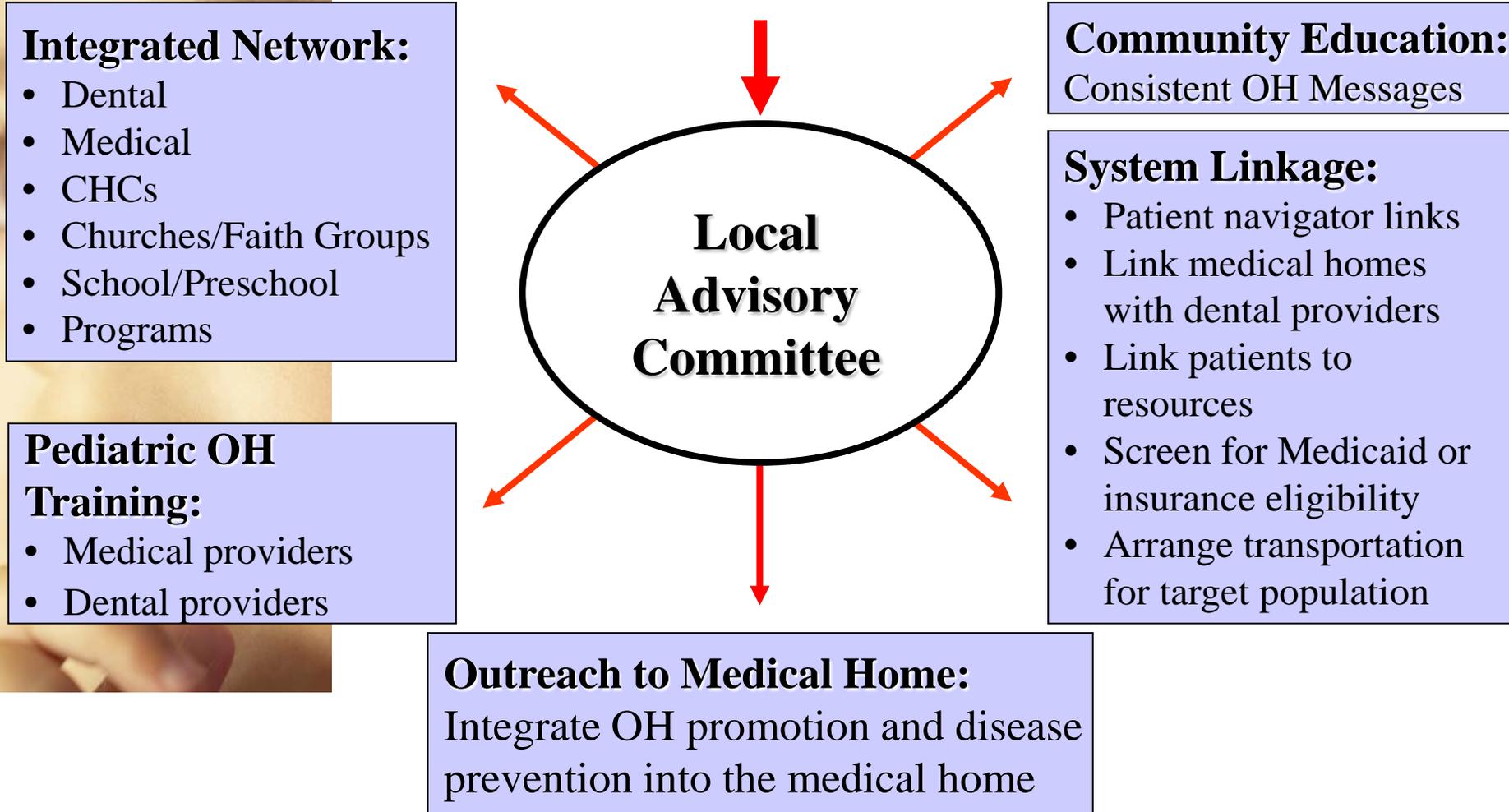


- Keep in contact with new moms and get babies in to dental homes

- Solution: Staff training, motivational interviewing, better contact information

Framework for SC More Smiling Faces Project

Combining Resources for Improved Oral Health for Children



SC More Smiling Faces Lessons Learned



- Pediatric Oral Health Training
 - Medical providers want to refer children under 3 to oral health providers in their community
 - Multiple barriers exist between medical and pediatric dental providers in implementing urgent need plans
 - Physicians welcome working with patient navigators
 - Physicians welcome development of stronger relationships with local dental community

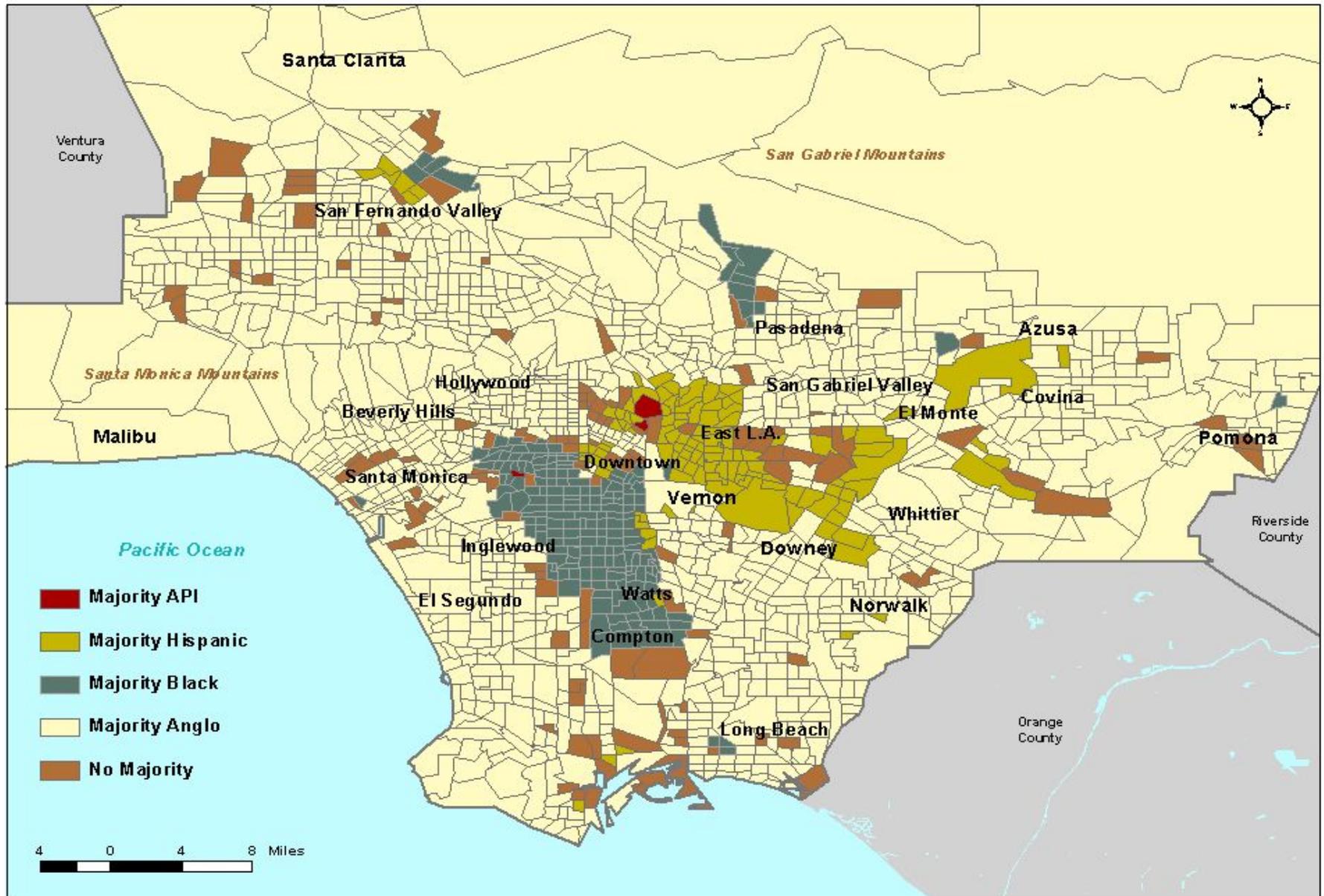
**Slide courtesy of
Christine Veschusio**

Emerging Challenges



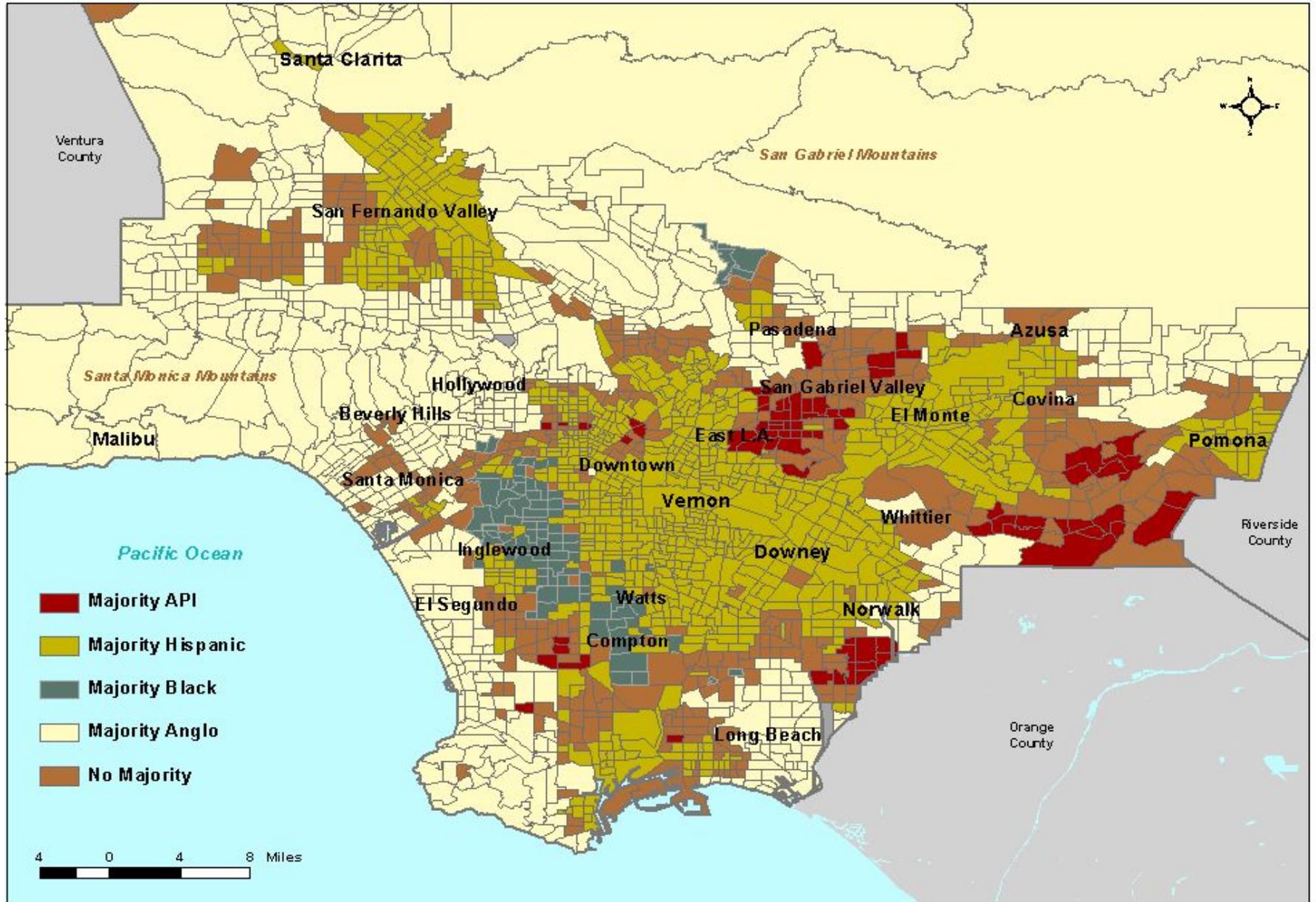
- Increase in poverty / lower SES
- Increasing population diversity
- Lack of attention / response
- Priorities?

Los Angeles County: Racial/Ethnic Diversity 1970



Data Assembled by Michela Zonta and Paul Ong, UCLA Lewis Center for Regional Policy Studies

Los Angeles County: Racial/Ethnic Diversity 2000



Data Assembled by Michela Zonta and Paul Ong, UCLA Lewis Center for Regional Policy Studies

Healthy Development for All Kids (& Moms)!

