Oral Health Inequity, Risk Assessment and Intervention

Nicholas G. Mosca, DDS, DrPH

LSU School of Dentistry

Nov. 17, 2023

Learning Objectives

- Explain oral health equity & inequity.

- Describe primary and secondary practices at the individual and community-level to improve oral health equity.

- Identify opportunities to engage interprofessional and transdisciplinary approaches to improve oral health equity.
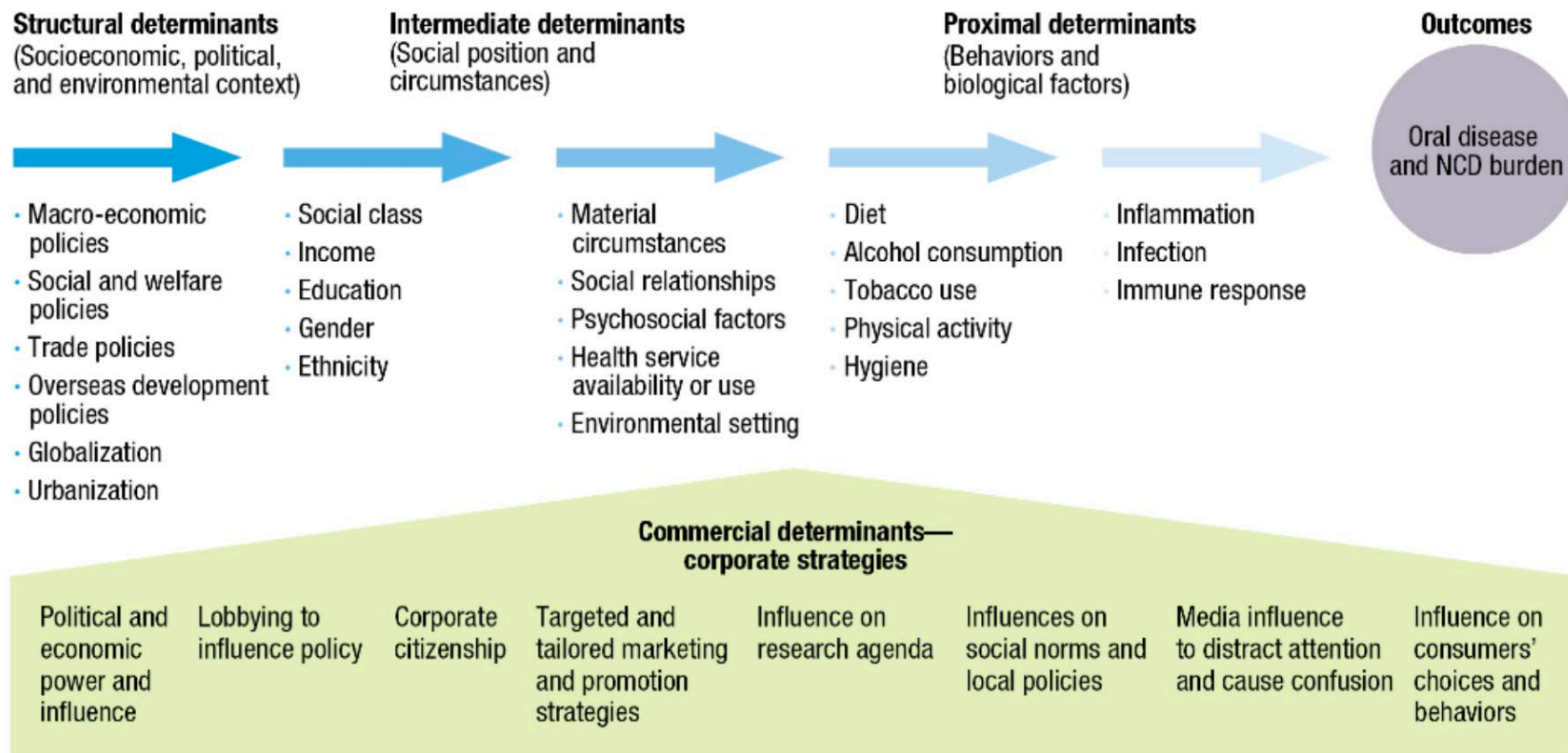
WELL·AHEAD

Project ECHO

Oral Health Equity

- Defined as the **fair and just opportunity** for every individual to achieve optimal oral health

- Social, economic and environmental factors drive the development of oral health disparities

- Psycho-social and physiological function modulate health and disease

EQUALITY   EQUITY

Copyright © 2021 Elsevier Inc. All Rights Reserved.
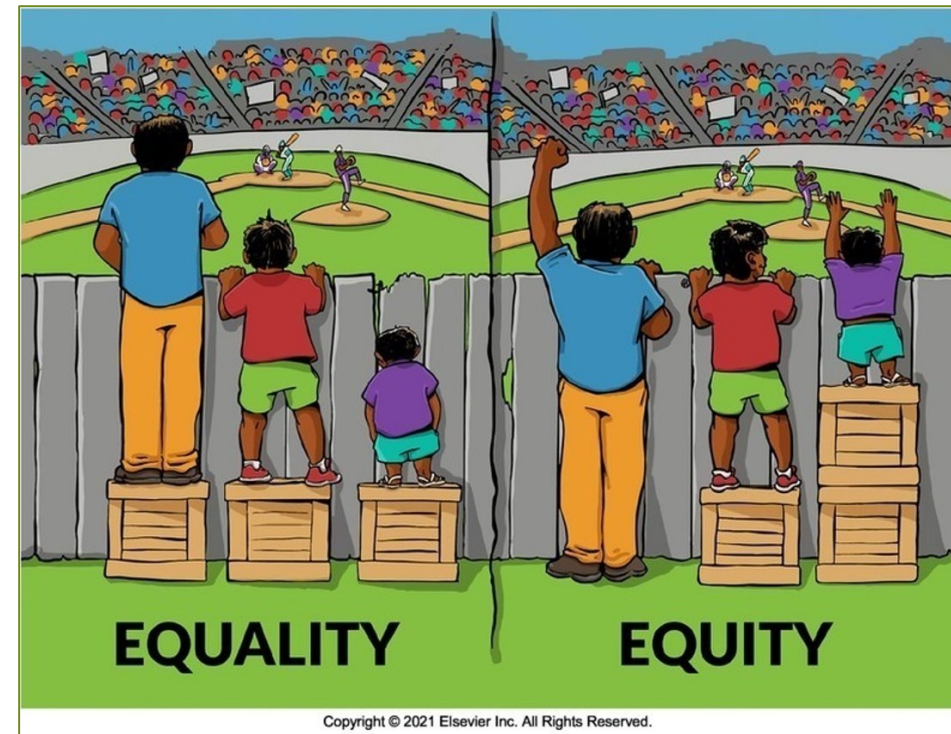
Determinants of Oral Health

Figure 2. Social and commercial determinants of oral health (Peres model)

Structural determinants (Socioeconomic, political, and environmental context)

- Macro-economic policies
- Social and welfare policies
- Trade policies
- Overseas development policies
- Globalization
- Urbanization

Intermediate determinants (Social position and circumstances)

- Social class
- Income
- Education
- Gender
- Ethnicity

- Material circumstances
- Social relationships
- Psychosocial factors
- Health service availability or use
- Environmental setting

Proximal determinants (Behaviors and biological factors)

- Diet
- Alcohol consumption
- Tobacco use
- Physical activity
- Hygiene

- Inflammation
- Infection
- Immune response

Outcomes

Oral disease and NCD burden

Commercial determinants— corporate strategies

| Political and economic power and influence | Lobbying to influence policy | Corporate citizenship | Targeted and tailored marketing and promotion strategies | Influence on research agenda | Influences on social norms and local policies | Media influence to distract attention and cause confusion | Influence on consumers' choices and behaviors |

Note: **NCD** = noncommunicable diseases.

Source: Peres et al. (2019). With permission from Elsevier.

https://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2819%2931146-8/fulltext

Prevention is preferable to cure

■ Prevention characterizes the actions that are taken to reduce the possibility that disease will happen (primary prevention) or to minimize the damage that may occur if disease does happen (secondary prevention)

– *Primary prevention activities may be implemented independently of healthcare*

– *Nutrition counseling and dietary food supplementation*

– *Daily toothbrushing requirement at early childcare facilities/Head Starts*

– *Secondary prevention relies on capacity building in other healthcare services*

– *Screening for early detection of cancer*

– *Chemotherapeutic agents (e.g., 5000 ppm Fluoride paste) prescribed for non-operative caries management*

The "Buckets" of Prevention Framework

Traditional Clinical Prevention
1
Increase the use of evidence-based services

Innovative Clinical Prevention
2
Provide services outside the clinical setting

Total Population or Community-Wide Prevention
3
Implement interventions that reach whole populations

Health Care   Public Health

Auerbach, J. 2016. The 3 buckets of prevention. Journal of Public Health Management and Practice, 1–4
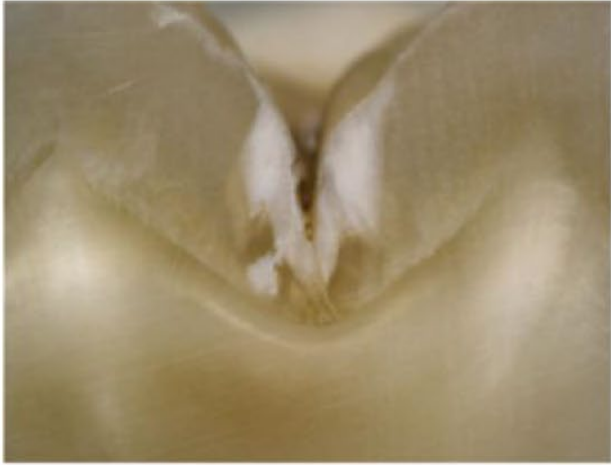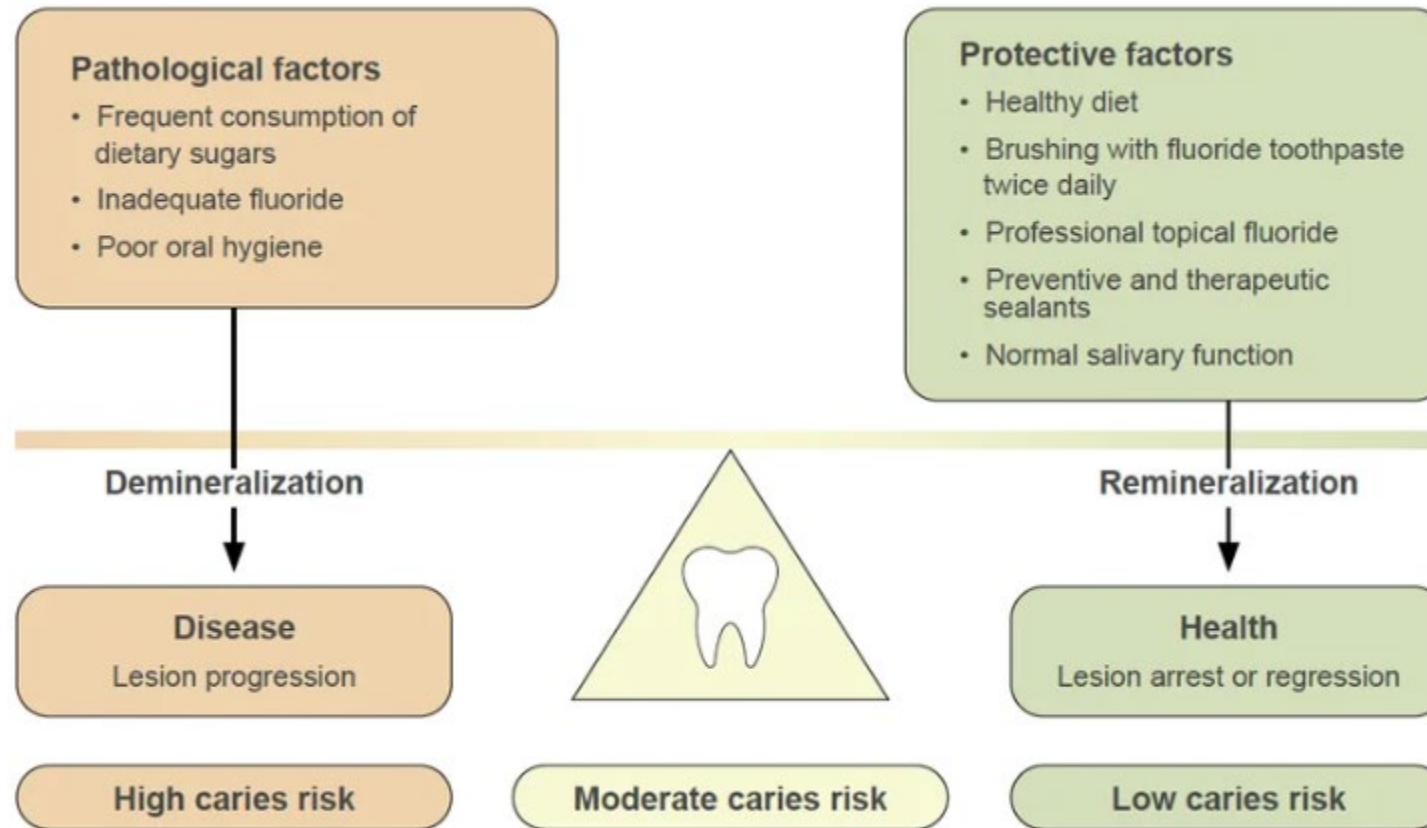
Etiology of Dental Caries

- A *"one pathogen, one disease"* paradigm shift to a holistic concept of a *"microbial community"* as the entity of pathogenicity for different clinical conditions
  - Biofilm are complex microbial colonies that adsorb to solid surfaces (enamel or cementum) in the mouth
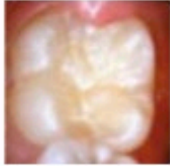   - Biofilm dysbiosis triggers disease

Pitts NB, Zero D, Marsh P, Ekstrand K, Weintraub J, Ramos-Gomez J, Tagami J, Twetman S, Tsakos G and Ismail A. Dental caries. Nat. Rev. Dis. Primers 3, (2017)

A

Enamel

DEJ

B

Enamel

DEJ

C

Enamel

DEJ
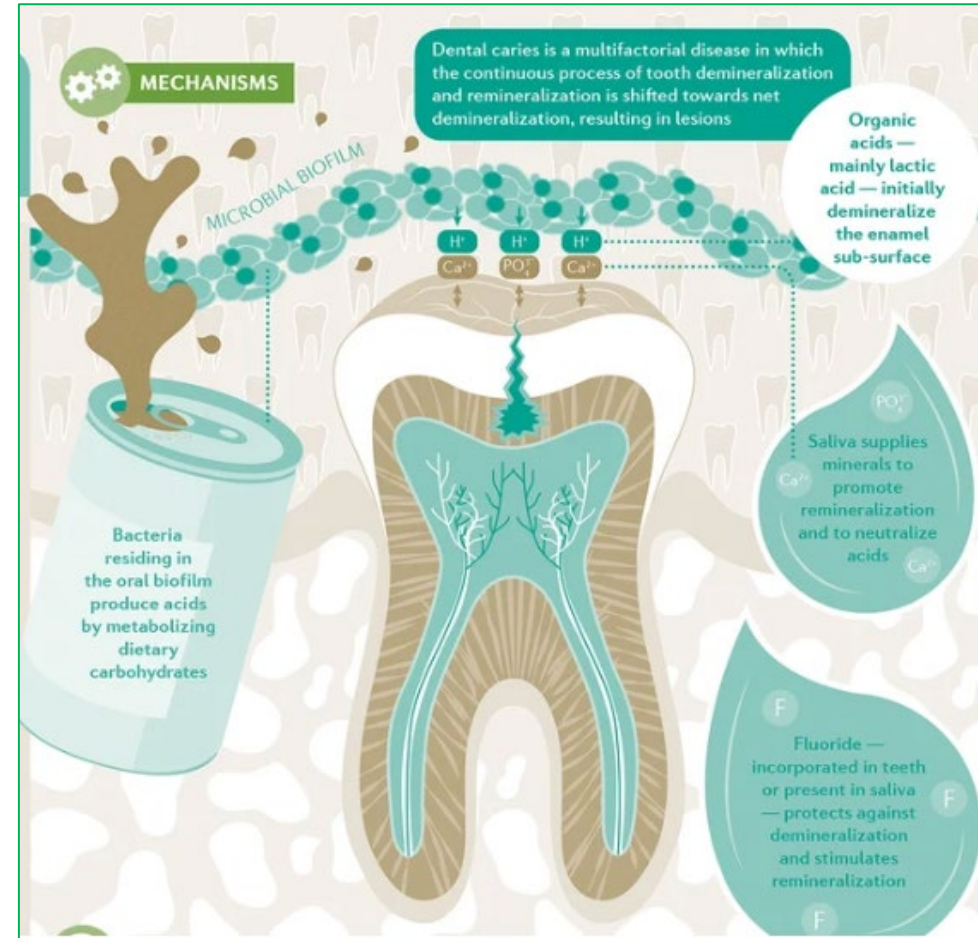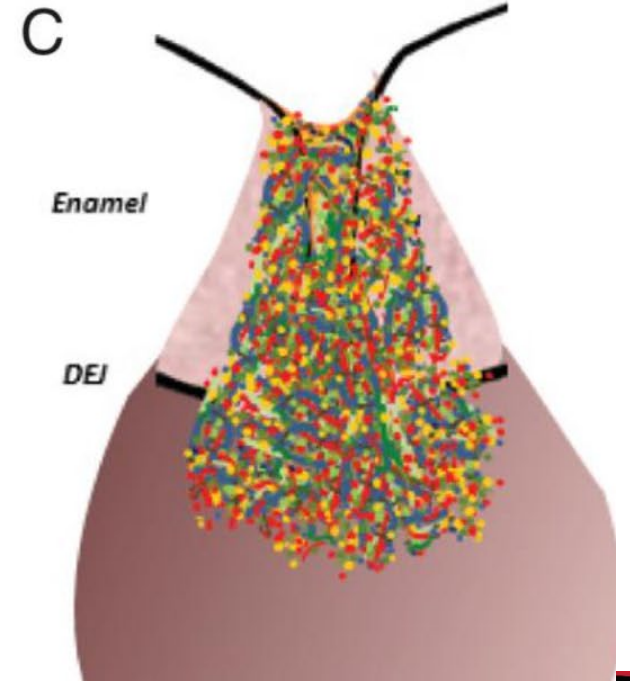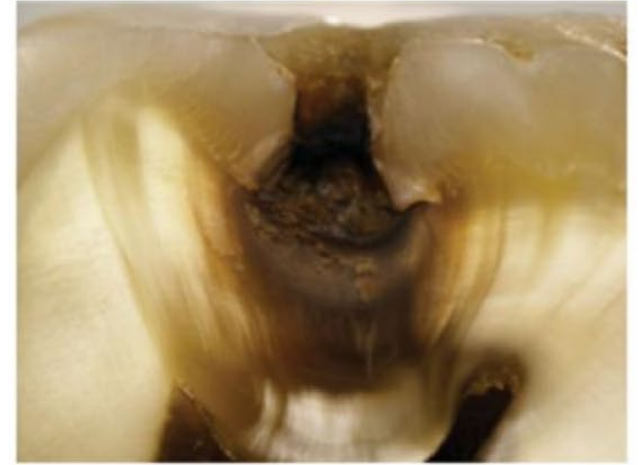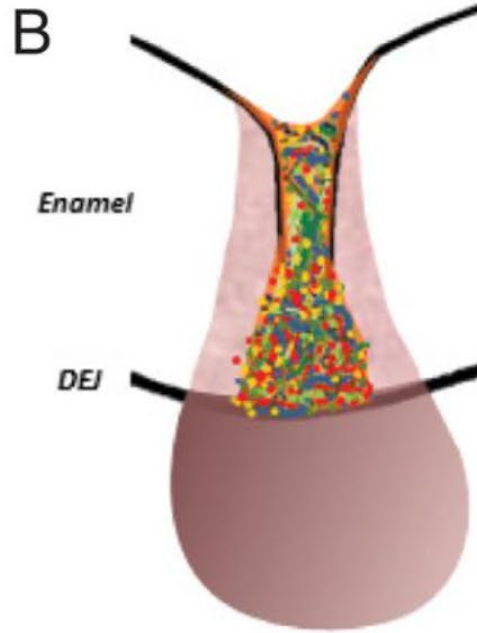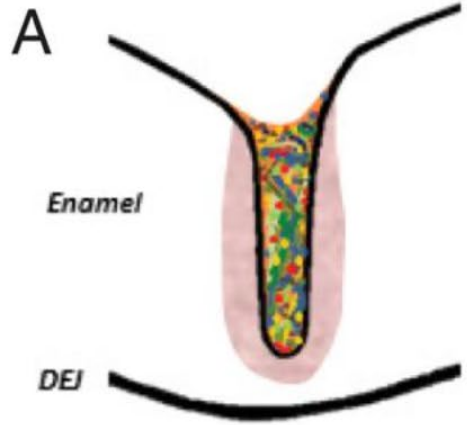
The Dental Caries "Balance"

Pathological factors
- Frequent consumption of dietary sugars
- Inadequate fluoride
- Poor oral hygiene

Protective factors
- Healthy diet
- Brushing with fluoride toothpaste twice daily
- Professional topical fluoride
- Preventive and therapeutic sealants
- Normal salivary function

Demineralization

Remineralization

Disease
Lesion progression

Health
Lesion arrest or regression

High caries risk

Moderate caries risk

Low caries risk

Individual-Level Prevention Methods

- Determine caries risk
  - Asses the probability for caries & the likelihood of disease progression
  - Categorize the risk as low, moderate, or high
- Detect & assess caries stage
  - Non-cavitated caries as active or inactive
  - Cavitated caries by depth (enamel, dentin, or pulp)

Sound (ICDAS 0)	
Initial caries lesions (ICDAS 1–2)	
Moderate caries lesions (ICDAS 3–4)	Moderate enamel breakdown (3)
	Moderate underlying dentinal shadow (4)
Extensive caries lesions (ICDAS 5–6)	

Individual-Level Prevention (Disease Control)

- Create a personalized caries risk management plan
  - Patient-level (home care)
    - Set dietary goals and reinforcements (break bad habits)
    - Mechanical removal of biofilm
    - Non-operative chemotherapeutics
  - Tooth-level (clinic care)
    - "Sealing" caries
    - Silver diamine fluoride use
    - Tooth preserving operative care
      - Selective caries tissue removal

- Active monitoring and reassessment
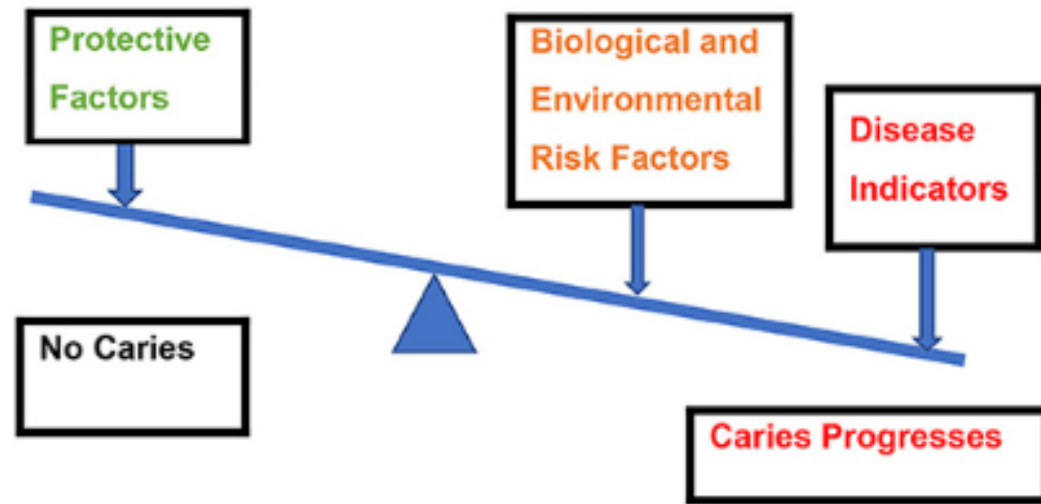 - Determine recall periodicity

WELL·AHEAD

Project ECHO

Example: Determine caries risk for adults

For ages 6 years to adult

	Score: −1	Score: +2	Score: +3
Protective factors – Question items	Check if Yes*		
1. Fluoridated water	✓		
2. F toothpaste at least once a day			
3. F toothpaste 2X daily or more	☐		
4. 5,000 ppm F toothpaste			
5. F varnish last 6 months			
6. 0.05% sodium fluoride mouthrinse daily			
7. 0.12% chlorhexidine gluconate mouthrinse daily 7 days monthly			
8. Normal salivary function			
Biological or environmental risk factors Question items		Check if Yes*	
1. Frequent snacking (>3 times daily)		✓	
2. Hyposalivatory medications		☐	
3. Recreational drug use		✓	
Biological risk factors – Clinical Exam		☐	
4. Heavy plaque on the teeth			
5. Reduced salivary function (measured low flow rate)**			
6. Deep pits and fissures			
7. Exposed tooth roots			
8. Orthodontic appliances			
Disease Indicators – Clinical exam			Check if Yes*
1. New cavities or lesion(s) into dentin (radiographically)			
2. New white spot lesions on smooth surfaces			
3. New non-cavitated lesion(s) in enamel (radiographically)			
4. Existing restorations in last 3 years (new patient) or the last year (patient of record)			✓
Column total score (Columns 2 + 3 −1):	Column 1	Column 2	Column 3
	Total:	Total:	Total:

2 + 2 + 3 − 1 = 6

Featherstone JDB, Crystal YO, Alston P, et al. Evidence-Based Caries Management for All Ages-Practical Guidelines. Front Oral Health. 2021; Published Apr 27, 2021.

Determine the Caries Risk

- Risk score allocation for adults
  - **Low = -8 to -2**
  - **Moderate = -1 to +2**
  - **High = +3 to +17**
  - **Very High = +18 to +30**

Develop the Caries Management Plan

- For **Low Risk**
  - Use over-the-counter fluoride toothpaste (1,000 – 1,450 ppm F)
  - Visit recall @ 12 months
- For **Moderate Risk**
  - Use over-the-counter fluoride toothpaste twice daily (1,000 – 1,450 ppm F)
  - AND 0.05% sodium fluoride rinse at night
  - OR prescription high fluoride toothpaste 5,000 ppm F twice daily

- For **Moderate Risk (cont.):**
  - Counseling on reducing between meal snacking with fermentable carbohydrates
  - Encourage self-management goals
  - Visit recall @ 6 months

WELL·AHEAD

Project ECHO®

Caries Management for **HIGH** Risk Adult

- Apply fluoride varnish in clinic
  - *Reapply every 4-6 months*
- Prescribe high fluoride toothpaste
  - 5,000 ppm F twice daily
- Counsel on reducing between meal snacking with fermentable carbohydrates
- Visit recall @ 4 - 6 months

- AND Rinse for 1 minute once daily for one week each month with a chlorhexidine gluconate (0.12%) mouth rinse
  - At least one hour apart from fluoride tooth brushing
  - Preferably last thing at night before bed
  - *Continue for 12 months (a total of 12 weeks)*

WELL·AHEAD

Project ECHO

Caries Risk Assessment Tool for Children
(Ages 0 to 6 Years)

	Score: −1	Score: +2	Score: +3
Biological or environmental risk factors** Question items		Check if Yes*	
1. Frequent snacking (more than 3 times daily)			
2. Uses bottle/non-spill cup containing other than water			
3. Parent/primary caregiver or sibling has current decay or a recent history of decay (see high risk description below)			
4. Family has low socioeconomic &/or low health literacy status			
5. Medications that induce hyposalivation			
Protective factors - Question items	Check if Yes*		
1. Lives in a fluoridated drinking water area			
2. Drinks fluoridated water			
3. Uses fluoride (F)-containing toothpaste at least two times daily-a smear for ages 0–2 years and pea size for ages 3–6 years of 1,000 ppm F.			
4. Has had fluoride varnish applied in the last 6 months			
Biological risk factors - Clinical exam**		Check if Yes*	
1. Heavy plaque on the teeth			
Disease indicators – Clinical exam			Check if Yes*
1. Evident tooth decay or white spots			
2. Recent restorations in last 2 years (new patient) or the last year (patient of record)			
Column total score (Columns 2 + 3 −1):	**Column 1 Total:**	**Column 2 Total:**	**Column 3 Total:**

Yes's in columns 1 and 2 only: use the caries balance-below
Yes or yes's in column 3 likely indicates high or very high risk

Featherstone JDB, Crystal YO, Alston P, et al. Evidence-Based Caries Management for All Ages-Practical Guidelines. Front Oral Health. 2021; Published Apr 27, 2021.

Community-Level Prevention

CPSTF Findings for Oral Health

The following is an alphabetical list of intervention approaches reviewed by the Community Preventive Services Task Force with summaries of the CPSTF finding for each (definitions of findings). Click a linked review title to read a summary of the evidence and access supporting materials. This table does not include inactive or archived reviews.

Intervention	CPSTF Finding
Dental Caries (Cavities)	
Community Water Fluoridation	🟢 Recommended (strong evidence) April 2013
Community-Based Initiatives to Promote the Use of Dental Sealants	🔶 Insufficient Evidence April 2013
School-Based Dental Sealant Delivery Programs	🟢 Recommended (strong evidence) April 2013
Craniofacial Injuries	
Community-Based Interventions to Encourage Use of Helmets, Facemasks, and Mouthguards in Contact Sports	🔶 Insufficient Evidence October 2013
Oral Cancers and Potentially Malignant Disorders	
Population-Based Interventions for Early Detection	🔶 Insufficient Evidence October 2013

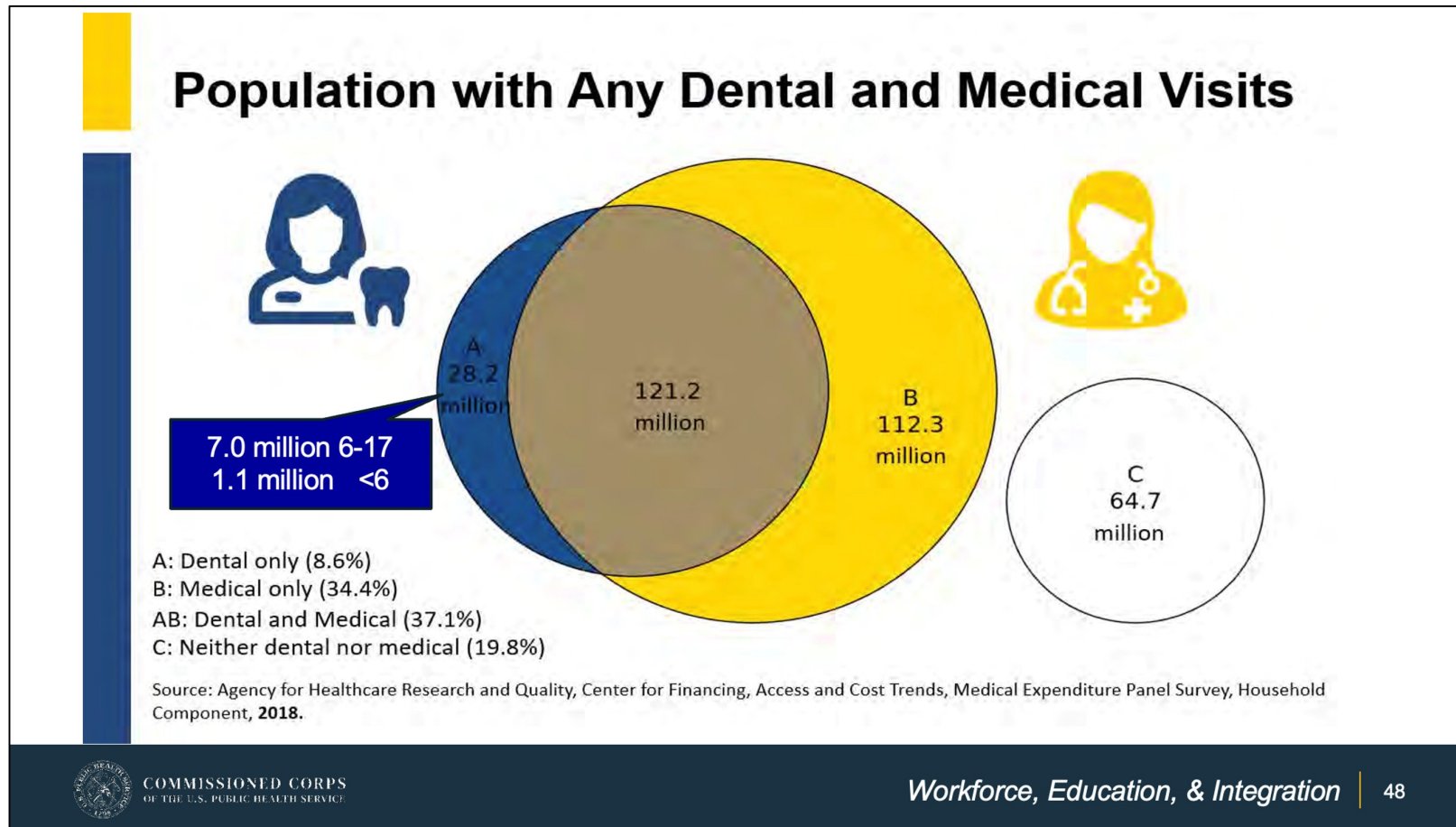# Community Water Fluoridation

Figure 3. Percentage of population served by community water system that received fluoridated water, 2018

Percent
%
US = 73.0

- < 25.0
- 25.0 - 49.9
- 50.0 - 79.5
- 79.6 - 100.0
- Data unavailable
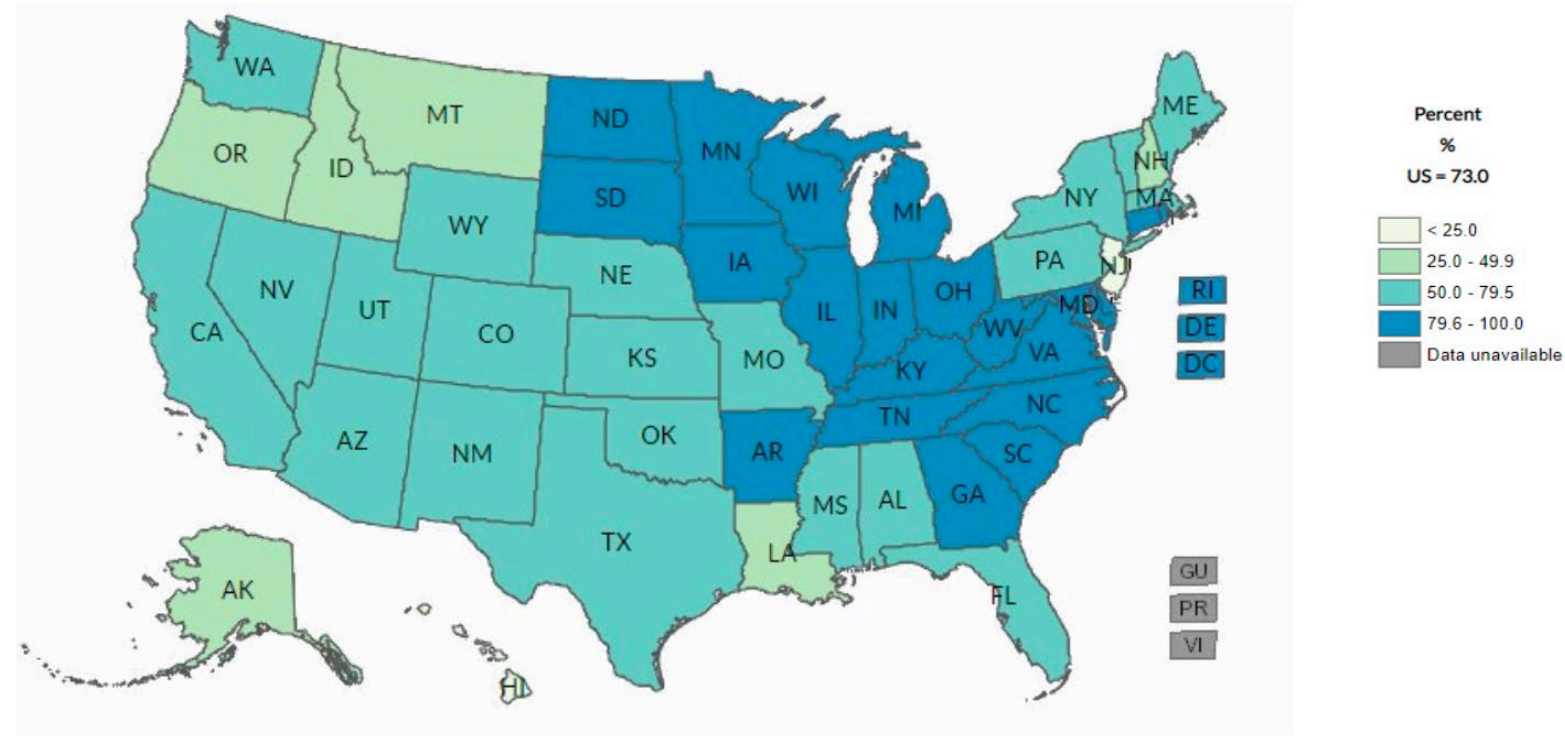
Source: Centers for Disease Control and Prevention, Oral Health Data, Water Fluoridation, 2018.

Interprofessional, Transdisciplinary, and Cross-sectoral Education

Population with Any Dental and Medical Visits

A 28.2 million

121.2 million

B 112.3 million

C 64.7 million

7.0 million 6-17
1.1 million <6

A: Dental only (8.6%)
B: Medical only (34.4%)
AB: Dental and Medical (37.1%)
C: Neither dental nor medical (19.8%)

Source: Agency for Healthcare Research and Quality, Center for Financing, Access and Cost Trends, Medical Expenditure Panel Survey, Household Component, **2018.**

COMMISSIONED CORPS
OF THE U.S. PUBLIC HEALTH SERVICE

Workforce, Education, & Integration   48

Teledentistry

Virtual Dental Home

Virtual Dental Home

A **COMPREHENSIVE SYSTEM** WHERE **EVERYONE** GETS THE SUPPORT **THEY NEED** TO ATTAIN THEIR **FULL HEALTH POTENTIAL**

Mobile Dentistry

Community Dental Coordinators
community-based prevention, care coordination, and patient navigation
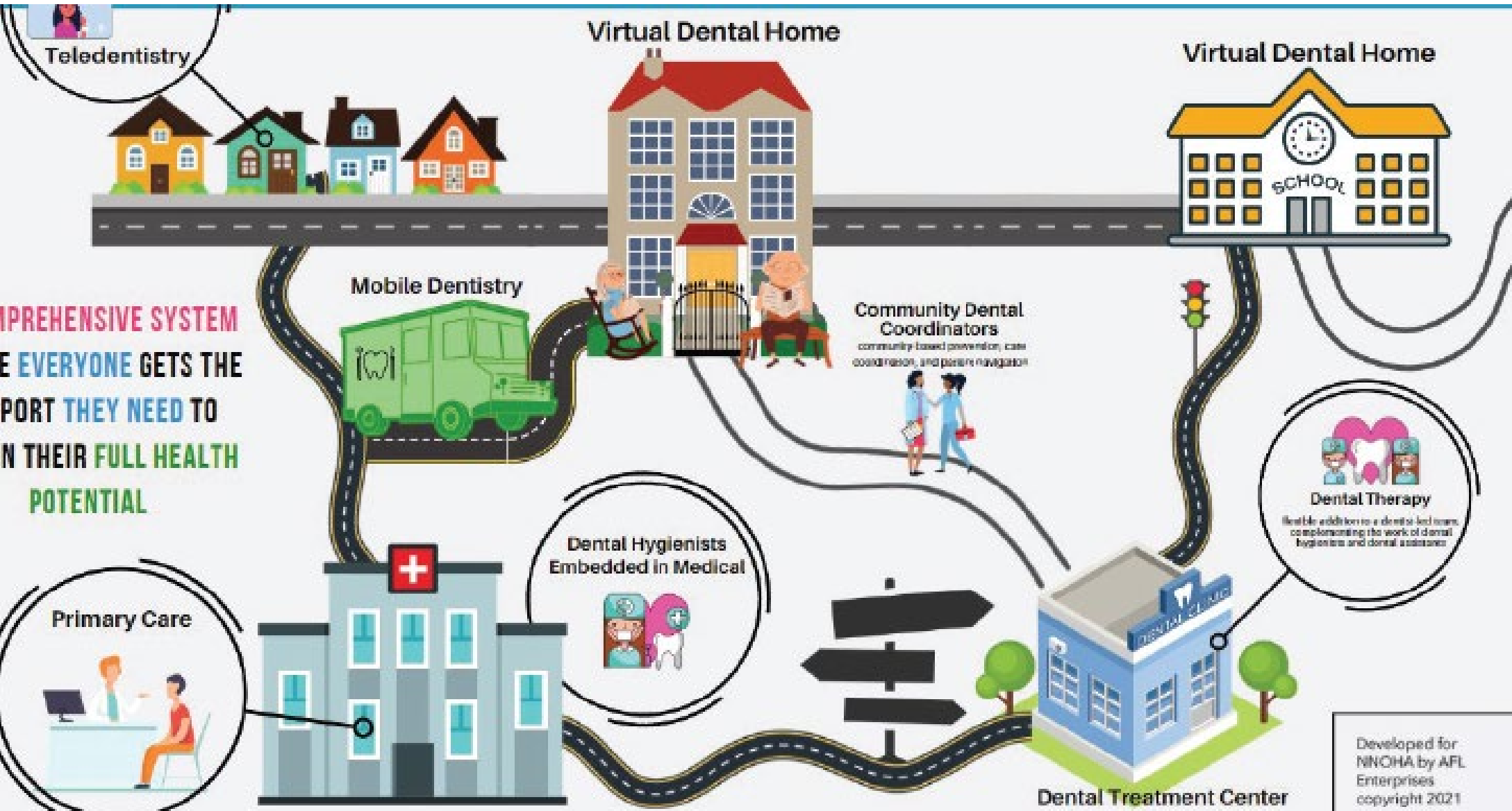
Dental Hygienists Embedded in Medical

Dental Therapy
flexible addition to a dental-led team complementing the work of dental hygienists and dental assistants

Primary Care

Dental Treatment Center

Developed for NNOHA by AFL Enterprises copyright 2021

U.S. Preventive Services Task Force Evidence

Population	Recommendation	Grade
Asymptomatic adults 18 years or older	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of routine screening performed by primary care clinicians for oral health conditions, including dental caries or periodontal-related disease, in adults.	I
Asymptomatic adults 18 years or older	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of preventive interventions performed by primary care clinicians for oral health conditions, including dental caries or periodontal-related disease, in adults.	I

Population	Recommendation	Grade
Asymptomatic children and adolescents aged 5 to 17 years	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of routine screening performed by primary care clinicians for oral health conditions, including dental caries, in children and adolescents aged 5 to 17 years.	I
Asymptomatic children and adolescents aged 5 to 17 years	The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of preventive interventions performed by primary care clinicians for oral health conditions, including dental caries, in children and adolescents aged 5 to 17 years.	I

US Preventive Services Task Force. Screening and Preventive Interventions for Oral Health in Children and Adolescents Aged 5 to 17 Years: US Preventive Services Task Force Recommendation Statement. *JAMA.* 2023;330(17):1666–1673.

WELL-AHEAD

Project ECHO

Proposed System Interventions in Louisiana

- Prioritize students from disparate areas/communities for admission to dental schools.

- Establish dental school curricula that emphasize equitable access & care.

- Recruit and retain dentists and other oral healthcare providers through financial and tax incentives, loan repayment/forgiveness, and community development programs.

- Establish programs that integrate oral and behavioral health services into primary care practices

- Enable a wider range of health professional roles to safely deliver oral healthcare services.

- Expand capacity to deliver teledental services, including building broadband internet infrastructure and amending licensing regulations.

WELL·AHEAD

Project ECHO®

Questions?

Nmosca@lsuhsc.edu

World Health Organization

Health Topics ∨ | Countries ∨ | Newsroom ∨ | Emergencies ∨ | Data ∨

Home / Publications / Overview / Draft Global Oral Health Action Plan (2023–2030)

Draft Global Oral Health Action Plan (2023–2030)

11 January 2023 | Technical document

Download (644.9 kB)

Overview

In the Political Declaration of the High-Level Meeting of the General Assembly on the Prevention and Control of Noncommunicable Diseases (2011), the United Nations General Assembly recognized that oral diseases are major global health burdens and share common risk factors with other noncommunicable diseases (NCDs). In the Political Declaration of the High-Level Meeting on Universal Health Coverage (2019), the General Assembly reaffirmed its strong commitment to the prevention and control of NCDs, including strengthening and scaling up efforts to address oral health as part of universal health coverage (UHC).

https://www.who.int/publications/m/item/draft-global-oral-health-action-plan-(2023-2030))