

FLUORIDATION BRIEFING

Austin Public Utility and Health and
Human Services CommitteesYau26pon

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Fluoride is Naturally Occurring

- **Soil**
 - 13th most abundant element in the earth's crust
- **Air**
 - 50% volcanic
 - 25% wind erosion
 - 25% from human activities
- **Water**
 - Surface water – 0.1 mg/L
 - Ground water – zero to 5 mg/L
 - Ocean water – 0.8 to 2.4 mg/L
- **Food, Plants**

Fluoridation Definition

- Fluoridation: Adjustment of fluoride to a level beneficial for reduction of tooth decay



$$\begin{array}{ccccc} \text{Natural F in} & & & & \\ \text{Water} & + & \text{Added F} & = & \text{0.7 mg/L} \\ & & & & \text{Optimal} \end{array}$$

- 0.7 parts per million (ppm) is the same as 0.7 milligrams per liter (mg/L)

Is Fluoridation Still Important?

- For the past 70 years, fluoride has been a principal contributor to reduction in tooth decay and loss. Community water fluoridation has played a major role in this dramatic decline in tooth decay across all age groups
- Despite dramatic declines, tooth decay is still the most common childhood chronic disease afflicting two-thirds of children
- Inexpensive, and does not depend on access to professional care

The problem in Texas: Too many with tooth decay

Table 3. Dental Caries Experience and Untreated Dental Decay Among 6- to 8-year-old Children: U.S. and Texas

	Caries Experience		Untreated Decay	
	U.S. ^b (%)	Texas ^c (%)	U.S. ^b (%)	Texas ^c (%)
TOTAL	50	68	26	44
Race/Ethnicity				
White	46	61	21	39
Black	56	67	39	44
Hispanic	69	72	42	47
Other	N/A	63	N/A	40
Sex				
Male	50	68	28	45
Female	49	68	24	44
Medicaid				
Yes	N/A	70	N/A	38
No	N/A	67	N/A	48

^b Data source: *Healthy People 2010, Progress Review 2000*. U.S. Department of Health and Human Services. Available at www.cdc.gov/nchs/ppt/hpdata2010/focus_areas/fa21.xls

^c Data source: Basic Screening Survey, Texas Department of State Health Services, Oral Health Program 2004–2006.

- More 6-8 year-olds in Texas have experienced caries or have untreated decay than in the US
- For all groups
 - By race/ethnicity
 - Gender
- Poverty in Texas – 17.6%
- Poverty in US – 15.4%

Scientific Reviews

- US Public Health Service (July/August 2015)
- The Cochrane Collaboration – Water fluoridation for the prevention of dental caries (2015)
- Ireland Health Research Board (2015)
- Royal Society of New Zealand and the Office of the Prime Minister's Chief Science Advisory (2014)
- US Community Preventive Services Task Force (October 2000, Updated April 2013)
- US EPA, Fluoride Risk Assessment and Relative Source Contribution (2010)
- European Commission of the European Union Scientific Committee on Health and Environmental Risks (2010)
- Fluoride in Drinking Water – Guidelines for Canadian Drinking Water Quality for Public Consultation, Canada (2009)
- National Health & Med Research Council, Australia (2007)
- Finding and Recommendations of the Fluoride Expert Panel (January 2007)
- National Research Council, USA (2006)
- ATSDR Toxicological Profile for Fluorides, Hydrogen Fluoride, and Fluorine (2003)
- Forum on Fluoridation, Ireland (2002)
- Medical Research Council, U.K. (2002)
- CDC Fluoride Recommendations (2001)
- University of York, UK (2000)
- U.S. Surgeon General's report (2000)
- Institute of Medicine, USA (1999)
- World Health Organization (1994)
- National Research Council, USA (1993)
- PHS Report, USA (1991)

US Task Force on Community Preventive Services

- The Task Force is an independent, nonfederal, volunteer body of experts in public health and prevention research, practice and policy to:
 - Oversee systematic reviews done for the Community Guide .
 - Develop evidence-based recommendations on the basis of the systematic review results .
 - Identify areas in need of further research

US Task Force on Community Preventive Services: Community Water Fluoridation

Summary of Task Force Recommendations & Findings

The Task Force on Community Preventive Services recommends community water fluoridation based on strong evidence of effectiveness in reducing tooth decay.

Results from the Systematic Reviews

- Twenty-one studies qualified for review.
- Decay rates measured before and after water fluoridation: median decrease of 29.1% among children ages 4 to 17 years when compared with control groups (21 study arms).
- Decay rates measured after water fluoridation only: median decrease of 50.7% among children ages 4 to 17 years when compared with control groups (20 study arms).
- Fluoridation was found to help decrease tooth decay both in communities with varying decay rates and among children of varying socioeconomic status.

US Task Force on Community Preventive Services: Community Water Fluoridation

Results from the Systematic Reviews (Cont.)

- Nine studies qualified for review of the economic efficiency of community water fluoridation programs.
- Median cost per person per year for 75 water systems receiving fluoridated water: \$2.70 among 19 systems serving ≤ 5000 people to \$0.40 among 35 systems serving $\geq 20,000$ people (7 studies).
- Community water fluoridation was cost saving (5 studies).
- In smaller communities (5000 to 20,000 residents), fluoridation was estimated to be cost-saving where decay incidence in the community exceeds 0.06 tooth surfaces per person annually.



Systemic vs Topical Benefits

Systemic

- Earliest researchers - hypothesized fluoride incorporated into developing enamel
- Continued evidence supports of systemic benefit

Topical

- Predominant effect is topical post-eruptive
- Right amount, right place, right time
- Small amounts consistently in the mouth
- All people, all ages benefit with topical fluoride

Organizations That Support Fluoridation

- Academy of Dentistry International
- Academy of General Dentistry
- Academy for Sports Dentistry
- Alzheimer's Association
- America's Health Insurance Plans
- American Academy of Family Physicians
- American Academy of Nurse Practitioners
- American Academy of Oral and Maxillofacial Pathology
- American Academy of Orthopaedic Surgeons
- American Academy of Pediatrics
- American Academy of Pediatric Dentistry
- American Academy of Periodontology
- American Academy of Physician Assistants
- American Association for Community Dental Programs
- American Association for Dental Research
- American Association for Health Education
- American Association for the Advancement of Science
- American Association of Endodontists
- American Association of Oral and Maxillofacial Surgeons
- American Association of Orthodontists
- American Association of Public Health Dentistry
- American Association of Women Dentists
- American Cancer Society
- American College of Dentists
- American College of Physicians—American Society of Internal Medicine
- American College of Preventive Medicine
- American College of Prosthodontists
- American Council on Science and Health
- American Dental Assistants Association 11

Organizations That Support Fluoridation (Cont.)

- American Dental Association
- American Dental Education Association
- American Dental Hygienists' Association
- American Dietetic Association
- American Federation of Labor and Congress of Industrial Organizations
- American Hospital Association
- American Legislative Exchange Council
- American Medical Association
- American Nurses Association
- American Osteopathic Association
- American Pharmacists Association
- American Public Health Association
- American School Health Association
- American Society for Clinical Nutrition
- American Society for Nutritional Sciences
- American Student Dental Association
- American Water Works Association
- Association for Academic Health Centers
- Association of American Medical Colleges
- Association of Clinicians for the Underserved
- Association of Maternal and Child Health Programs
- Association of State and Territorial Dental Directors
- Association of State and Territorial Health Officials
- Association of State and Territorial Public Health
- Nutrition Directors
- British Fluoridation Society
- Canadian Dental Association
- Canadian Dental Hygienists Association

Organizations That Support Fluoridation (Cont.)

- Canadian Medical Association
- Canadian Nurses Association
- Canadian Paediatric Society
- Canadian Public Health Association
- Child Welfare League of America
- Children's Dental Health Project
- Chocolate Manufacturers Association
- Consumer Federation of America
- Council of State and Territorial Epidemiologists
- Delta Dental Plans Association
- FDI World Dental Federation
- Federation of American Hospitals
- Hispanic Dental Association
- Indian Dental Association (U.S.A.)
- Institute of Medicine
- International Association for Dental Research
- International Association for Orthodontics
- International College of Dentists
- March of Dimes Birth Defects Foundation
- National Association of Community Health Centers
- National Association of County and City Health Officials
- National Association of Dental Assistants
- National Association of Local Boards of Health
- National Association of Social Workers
- National Confectioners Association
- National Dental Assistants Association
- National Dental Association
- National Dental Hygienists' Association
- National Down Syndrome Congress
- National Down Syndrome Society
- National Foundation of Dentistry for the Handicapped

Organizations That Support Fluoridation (Cont.)

- National Head Start Association
- National Health Law Program
- National Healthy Mothers, Healthy Babies Coalition
- Oral Health America
- Robert Wood Johnson Foundation
- Society for Public Health Education
- Society of American Indian Dentists
- Special Care Dentistry
- Academy of Dentistry for Persons with Disabilities
- American Association of Hospital Dentists
- American Society for Geriatric Dentistry
- The Children's Health Fund
- The Dental Health Foundation (of California)
- U.S. Department of Defense
- U.S. Department of Veterans Affairs
- U.S. Public Health Service
- Health Resources and Services Administration (HRSA)
- Centers for Disease Control and Prevention (CDC)
- National Institute of Dental and Craniofacial Research (NIDCR)
- World Federation of Orthodontists
- World Health Organization

Top 50 Cities

44 of the 50 largest cities in the United States have fluoridated water



Fluoride Issues

- **Benefits of Community Water Fluoridation**
- **Dental Fluorosis**
- **Concerns about other health effects - 2006 National Research Council Report**

“The Committee did not evaluate the risks or benefits of the lower fluoride concentrations (0.7 to 1.2 mg/L) used in water fluoridation. Therefore, the committee’s conclusions regarding the potential for adverse effects from fluoride at 2 to 4 mg/L in drinking water do not apply at the lower water fluoride levels commonly experienced by most U.S. citizens.”

- **IQ**
- **Cancer**
- **“Fertilizer Byproduct”**