

MINUTES OF THE SENATE PUBLIC HEALTH AND WELFARE COMMITTEE

The meeting was called to order by Chairperson Susan Wagle at 1:30 p.m. on March 3, 2004 in Room 231-N of the Capitol.

All members were present except:

Ms. Emalene Correll, Legislative Research - excused

Committee staff present:

Ms. Terry Munchmore, Legislative Research  
Mr. Norm Furse, Revisor of Statutes  
Mrs. Diana Lee, Revisor of Statutes  
Ms. Margaret Cianciarulo, Committee Secretary

Conferees appearing before the committee:

Dr. Michael Easley, DDS, MPH and President of International Health Management and Research Association and National Fluoridation Director for Oral Health America, from Ohio  
Dr. Phil Zivnuska, Past President of the Kansas Dental Association (KDA) and Fluoridation Spokesperson for KDA  
Dr. Dennis Cooley, MD and Past President, American Academy of Pediatrics, Kansas Chapter  
Dr. Paul Kittle, Dentist, Leavenworth  
Ms. Sally Finney, Executive Director, Kansas Public Health Association  
Ms. Teresa Schwab, Executive Director of Oral Health Kansas, Inc.  
Mr. Ron Gashes, Lobbyist for Kansas Dental Hygienists Association  
Ms. Linda Kenney, Director, Bureau for Children, Youth, and Families

Others attending:

Please See Attached List.

### Recognition

Upon calling the meeting to order, the Chair recognized and welcomed the Ottawa University's Social Policy Class and their teacher, Ms. Tonia Salvini to the Senate Public Health and Welfare Committee meeting.

### Handout

The Chair then directed the Committee to their first handout, written testimony from Ms. Sherry Smith, a Kansas citizen from Leon, who provided comments in opposition to the bill including: its history (introduced to the public in the 1950's) and stating there as never been an environmental impact study on what happens where there is a discharge of the sewage treated water in a fluoridated community, but there has been an instance of an accidental spill of 50 ppm of fluoride in the Anapolis, Maryland water supply on November 11, 1979 poisoning 10,000 people. Her testimony was received today. A copy of her written testimony is (Attachment 1) attached hereto and incorporated into the Minutes as referenced.

### Continued Hearing on SB 530 - an act concerning public water supply; requiring fluoridation in certain public water supply systems

The Chair then announced that today would be a continuance of yesterday's hearing beginning with the first of seven proponents of SB530. She called upon Dr. Michael Easley, President of International Health Management and Research Association, and National Fluoridation Director for Oral Health American, from Ohio. Dr. Easley offered his educational credentials and offered a handout that contains information about the safety and efficacy of community water fluoridation and focused on a few points he felt might help the Committee address some of the allegations heard yesterday (included the definition of, history of, description of, its benefits, status, support, and opposition.) A copy of his testimony and handout are (Attachment 2) attached hereto and incorporated into the Minutes as referenced.

CONTINUATION SHEET

MINUTES OF THE SENATE PUBLIC HEALTH AND WELFARE COMMITTEE at 1:30 p.m. on March 3, 2004 in Room 231-N of the Capitol.

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The second proponent to testify was Dr. Phil Zivnuska, past president of the Kansas Dental Association (KDA) and currently serves as fluoridation spokesperson for the KDA, who stated that the Centers for Disease Control has indicated that as a result of fluoridation, dental decay rates had dropped 40-70 percent in the last 40 years and regard it as one of the ten greatest public health achievements of the 20<sup>th</sup> Century. He also stated that there are currently 1.5 million Kansans who are being served by fluoridated public water systems throughout the state and that all drinking water contains fluoride at some level, with the community water fluoridation programs adjusting the naturally occurring levels of fluoride to the optimum level for greatest health benefits. A copy of his testimony is (Attachment 3) attached hereto and incorporated into the Minutes as referenced.

The third proponent to testify was Dr. Dennis Cooley, past president of the American Academy of Pediatrics, Kansas Chapter, who stated that dental disease can cause serious complications that involve more than the teeth, it can result in infections that extend to the bone and blood stream, problems with nutrition due to chewing difficulties, and severe pain that involves the entire face. He also stated that recent studies have suggested associations between dental infections and diabetes and heart disease. A copy of his testimony is (Attachment 4) attached hereto and incorporated into the Minutes as referenced.

Dr. Paul Kittle, a dentist from Leavenworth and the fifth conferee, stated that fluoride works two ways:

- 1) It is incorporated into the enamel of developing teeth that have not yet erupted into the mouth, making them more resistant to decay, and
- 2) It is secreted in minute amounts in the saliva, bathing the teeth already present in the mouth and making them also more resistant to cavity formation by a process called remineralization.

A copy of his testimony is (Attachment 5) attached hereto and incorporated into the Minutes as referenced.

The next proponent was Ms. Sally Finney, Executive Director, Kansas Public Health Association, who stated that tooth decay is an infectious disease that has been linked to such serious health conditions as heart and lung disease, premature delivery, and low birth weight infants and although there is no cure for this disease, there are interventions that reduce its severity, one being fluoridation. She also stated that in FY 2003, SRS Estimates that public spending to provide dental services in Sedgwick County exceeded \$4 million. A copy of her testimony is (Attachment 6) attached hereto and incorporated into the Minutes as referenced.

The sixth proponent was Ms. Teresa Schwab, Executive Director of Oral Health Kansas, Inc. who gave a brief history of her organization and offered information regarding a Louisiana study of water fluoridation and Medicaid costs, hospital reports due to primary dental needs, a Kansas Health Institute study regarding caries rates, and facts about fluoride offered by the American Association of Public Health Dentistry. A copy of her testimony is (Attachment 7) attached hereto and incorporated into the Minutes as referenced.

The seventh proponent to testify was Mr. Ron Gashes, Lobbyist for the Kansas Dental Hygienists Association, who stated the dental Hygienists see every day results in inadequate oral health care including: loss of school time, loss of work time, unnecessary expense for avoidable medical care, and accelerating Medicaid and private insurance costs. He also offered for review, current Fact Sheets from the CDC including:

- 1) Using Fluoride to Prevent and Control Dental Caries in the United States;

CONTINUATION SHEET

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2) Cost Savings of Community Water Fluoridation; and,

3) Community Water Fluoridation: Surgeon General's Statement, 2001

A copy of his testimony and the Fact Sheets are (Attachment 8) attached hereto and incorporated into the Minutes as referenced.

And lastly, Ms. Linda Kenney, Director for Bureau for Children, Youth, and Families who stated that dental caries remains a common and often serious concern with possible long-term health and developmental consequences for many children and their families as found at the Kansas Dental Association's Mission of Mercy (KMOM) at the fairgrounds in Garden City and at the racetrack in Kansas City. She also stated that: many children remain without dental insurance; are eligible but unenrolled in or not served by Medicaid; or live in areas where there is a drastic shortage of dental care providers. A copy of her testimony is (Attachment 9) attached hereto and incorporated into the Minutes as referenced.

As there was no further proponent testimony, written proponent testimony was offered, including:

1) Ms. Kim Moore, President, United Methodist Health Institute Fund

2) Ms. Cindy D'Encole, Senior Policy Analyst, Kansas Action for Children

3) Ms. Chris Collins, Director of Government Affairs, Kansas Medical Society

A copy of these written testimonies are (Attachment 10) attached hereto and incorporated into the Minutes as referenced.

The Chair then asked for questions or comments from the Committee. Senators Brownlee, Salmans, Barnett, and Wagle asked questions for Ms. Finney, Dr. Zivnuska, and Dr. Easley ranging from: are there any studies to compare Sedgwick to Johnson County regarding dental health, similar demographics, quality, and lower rates for insurance.

**Adjournment**

As there was no further discussion, the Chair announced that tomorrow the Committee would be hearing neutral testimony. The meeting was adjourned. The time was 2:33 p.m.

The next meeting is scheduled for Thursday, March 4, 2004

# SENATE PUBLIC HEALTH AND WELFARE COMMITTEE

## GUEST LIST

DATE: Wednesday, March 3, 2004

NAME	REPRESENTING
Terree Walker	Ottawa University
<del>Steve ...</del>	Ottawa University
Erik ...	Ottawa University
Alicia Bailey	Ottawa University
Jasbie Fuller-Woodster	Ottawa University
Debra Marmen	Ottawa University
Angela Vohs	Ottawa University
Melanie Bulstey	Ottawa University
Nessa Gaurt	Ottawa University
Paul K. Me	K.D.A. (+ kids)
Dennis Cooley MD	KAAP
Austin Lowry	self
Albert W. Burgstahler	self
MELODY SCHEEL	FLUORIDE AWARENESS TEAM OF KANSAS
DEANNA HAVENS, Editor BoD.	FLUORIDE ACTION NETWORK (FAN) FLUORIDE AWARENESS TEAM (FATKS)
Joni Harland	self
Viccie Burgess	Burgess & Assoc.
Kim Kimminan	Kansas Health Institute
KEVIN ROBERTSON	KANSAS DENTAL ASSN



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To the Members of the Senate Public Health and Welfare Committee

Once again some state legislator has enrolled a bill to force Kansas communities to put a poison in their water supply. Fluorine is considered more poisonous than lead and slightly less poisonous than arsenic. Fluorine is so highly reactive that it is virtually never found in its elemental state, is always attached to another element as a fluoride. The reason put forth to put this in the water supply is that it prevents tooth decay in children, originally the benefit is for children up to 12 years old. This theory does not hold out from the studies that have been done comparing the tooth decay rates in fluoridated and non-fluoridated communities. The studies have been conclusive, it really doesn't make any difference in tooth decay rates whether or not the water supply is not fluoridated, naturally fluoridated or artificially fluoridated. There are other health problems that have become more prevalent in communities that artificially fluoridated their water supply, besides the obvious dental fluorosis, there is a higher incidence of hip fracture in older people, a condition that quite often requires nursing home care and commonly leads to pneumonia and death from the immobilization from the injury. There has been shown to be a increased incidence in bone cancer in young males and cancer overall in fluoridated communities, as well as an increase in diabetes, heart, kidney, thyroid problems and chromosomal damage. And there are studies that show an increase in arthritic conditions with the increased ingestion of fluoride.

With science not on the side of fluoridation, why do the public health service agencies keep trying to force this on a unwilling public. At the state and local level I suspect it is just government employees that haven't bothered to research any of the arguments against fluoridation and have been promised federal money to fluoridate water supplies. But at the federal level it is political; the real scientists at the EPA and other branches of the government dealing with public health have come out against it after reviewing the science, but it is the political appointees that are pushing this nefarious policy. Fluoridation was originally foisted on the public in the 1950's through the efforts of Oscar Ewing, a formally well paid lawyer for ALCOA who then took a position as head of the Federal Security Agency that was over the US Public Health Service. Originally sodium fluoride, the active ingredient in rat poison,( it works by killing enzyme activity) and is a hazardous waste of the aluminum smelting industry, very toxic & very hard to dispose of safely, was the source of the fluoride to put in the water. The

Senate Public Health & Welfare Committee  
Attachment 1-1  
Date: March 3, 2004

mastermind behind the public relations campaign to promote fluoridation was none other than Edward L. Bernays, nephew of Sigmund Freud and generally regarded as "The Original Spin Doctor", author of a book titled "Propaganda". Without real scientific proof behind the assertion that fluoridated water prevented tooth decay, and ignoring what was known at the time about the health problems where the water supplies were naturally fluoridated, this horrendous policy was pushed through. I suspect the money spent on the propagandizing and bribery was way less than what it was and would cost to dispose of this poison properly. Another source of fluoride used in public water supplies is hydrofluosilicic acid, a byproduct / hazardous waste of turning phosphate rock into superphosphate fertilizer and is now the more commonly used source. Industries such as the production of steel, glass, brick and turning uranium into a usable form for nuclear reactors also produce hazardous wastes containing fluorides.

Putting fluoride in the water supply in not even the cost effective way to reach the target population that it is supposed to help, and it puts at risk hundred of thousands of Kansans and it would be contaminating people without their permission. Once fluoride is put into the water supply it is very difficult to remove, regular carbon filtration will not take it out and it is very hard on reverse osmosis membranes. There has never been an environmental impact study on what happens where the discharge of the sewage treated water in a fluoridated community, but there has been instance of an accidental spill of 50 ppm of fluoride into the Annapolis, Maryland water supply on Nov. 11, 1979, poisoning 50,000 people. The late Dr. John Yiamouyiannis was asked to investigate the damage by the local newspaper, the Annapolis Evening Capital. "He conducted an epidemiological study and found that approximately 10,000 people exhibited acute symptoms of fluoride poisoning. His findings were subsequently confirmed by the Maryland State Department of Health. While the Maryland State Department of Health refused to disclose the number of number of citizens that died of heart failure due to the spill, Dr. Yiamouyiannis found that more than five times the normal number of people died of heart failure during the week that followed the spill." There were also other health problems already reported to be problems associated with fluoridation that increased with this occurrence. (From Dr. Yiamouyiannis book, "Fluoride The Aging Factor"p. 16) In the climate of increased fear of terrorism and the call for enhanced security are you willing to vote for something that in has the potential to poison the water supply if

clandestinely metered out, deadly amounts of fluoride to cause acute illness are virtually undetectable in taste.

In looking at the arguments for and against fluoridation, and the educated public generally voting against fluoridation, when voting machines aren't involved, why does "The Government" keep trying to force this on us. One reason might be that to stop or concede to public opposition would tacitly expose the fraud or admit guilt leaving it open to distrust or even legal action. But there has been such a longstanding push to fluoridate I can't help but feel there is more than that. In researching the history for fluoridation one comes across some obscure information, a statement attributed to Charles Eliot Perkins, a industrial chemist sent by the US Government to help take charge of the giant I.G. Farben chemical plants in Germany at the end of WW II, saying in essence that the Germans real purpose for fluoridating the water supply was to reduce the resistance of the people to domination and control and loss of liberty. There are also statements alluding to Soviet studies to using increasing doses of fluoride to make people more docile. These of course are relegated to the realm of conspiracy theory. But I have also found so information that may support that. I read of a Dutch study of major tranquilizers and that 25% of those listed had a fluoride component. While not having researched that myself for verification I do know that Prozac, generic name fluoxetine, has fluorine in it. I have read that fluoride has been shown to negatively effect the production of important neurotransmitters and it also has a negative effect on blood sugar regulation.

This is a matter of health freedom. The Government has no right to pollute the public water supply with a known toxin.

Sherry Smith  
c/o 656 Southeast 90th Street  
Leon, Kansas



mg

Testimony Presented to the  
Senate Committee on Public Health and Welfare  
Topeka, Kansas  
March 3, 2004

Chairman Wagle and members of the committee, thank you for allowing me to appear before you today. My name is Michael Easley. Because this is my first appearance before you, I would like to take a moment to introduce myself.

I am the National Fluoridation Director for Oral Health America, a national non-profit organization dedicated to increasing public awareness of oral health's importance to total health. My educational credentials include a doctorate in dentistry from Ohio State University and a master's degree in dental public health administration from the University of Michigan. I am a former Director of Environmental Health and Community Safety for the Commonwealth of Kentucky and former Commissioner of Health and environment for the Middletown [Ohio] City Department of Health and Environment. Previously, I have held academic appointments as associate professor in the College of Health Sciences at Eastern Kentucky University and associate professor at both the School of Medicine and School of Dental Medicine of the State University of New York at Buffalo. Currently, I am President and Chief Executive Officer of International Health Management & Research Associates, a public health consulting firm and Director of the National Center for Fluoridation Policy & Research.

I am here today to urge your support of Senate Bill 530. Community water fluoridation has been an important tool in the fight against dental disease, supported by a wide variety of respected health and scientific organizations throughout the United States and the world.

The attached handout contains information about the safety and efficacy of community water fluoridation. In the interest of time, I will not review the entire document. Rather, I will focus on a few points which I think may help you address some of the allegations you heard yesterday.

Again, I appreciate the opportunity to appear before you today and will be happy to respond to any questions you may have.

Senate Public Health & Welfare Committee  
Attachment 2-1  
Date: March 3, 2004

## **Community Water Fluoridation**

**Michael W. Easley, DDS, MPH  
National Fluoridation Director  
Oral Health America**

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## ***Community Water Fluoridation: An Important Public Policy Issue***

**Fluoridation was recently listed  
by the U.S. Centers for Disease  
Control as one of the 10  
greatest public health  
achievements in the 20<sup>th</sup>  
Century.**

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## ***Community Water Fluoridation: Definition***

**Fluoridation is the precise  
adjustment of the existing naturally  
occurring fluoride levels in  
drinking water to a safe level that  
has been determined to be ideal for  
the prevention of dental cavities in  
children & adults.**

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## ***Community Water Fluoridation: History***

**Fluoridation has been practiced in  
the U.S. for more than 58 years.**

**Grand Rapids, Michigan, fluoridated  
its public water supply on January  
25, 1945.**

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## Community Water Fluoridation: History



Described by U.S. Surgeon General Luther Terry (1964-1965) as one of the four great advances in public health

Dr. Terry described the "Four Horsemen of Public Health" as:

- Chlorination.
- Pasteurization.
- Immunization.
- Fluoridation.

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## Community Water Fluoridation: History



"Fluoridation is the single most important commitment a community can make to the oral health of its children and to future generations."

- Dr. C. Everett Koop  
U. S. Surgeon General, 1981-1989

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## Community Water Fluoridation: History



"Fluoridation remains an ideal public health measure based on the scientific evidence in preventing dental decay and its impressive cost effectiveness."

David Satcher, MD, PhD;  
Assistant Secretary for Health  
& Surgeon General of the U.S.

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## Community Water Fluoridation: History



".....one of my highest priorities as Surgeon General is reducing disparities in health that persist among our various populations. Fluoridation holds great potential to contribute toward elimination of these disparities."

David Satcher, MD, PhD; Assistant  
Secretary for Health & Surgeon  
General of the U.S.

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### **Community Water Fluoridation: Description**

- A 20th Century adaptation of a naturally occurring process.
- All sources of drinking water in the U.S. contain some fluoride.
- Fluoridation is merely an upward adjustment of existing fluoride levels to that which is optimum for health.

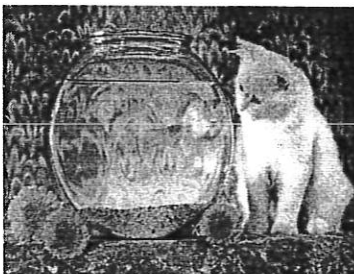
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### **Community Water Fluoridation: Description**

- Fluoridation is nutritional supplementation.
- Adding fluoride to drinking water is no different than adding:
  - Vitamin C: Fruit Drinks (prevents scurvy).
  - Vitamin D: Milk & Breads (prevents rickets).
  - Iodine: Table Salt (prevents goiter).
  - Folic Acid: Grains, cereals, & pastas (prevents birth defects).
  - Vitamins & Minerals: breakfast cereals (promotes normal growth & development).

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### **Community Water Fluoridation: Description**



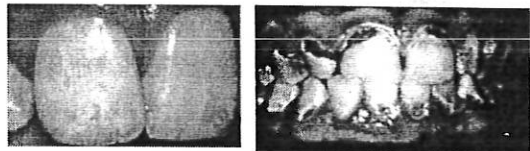
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Fluoridation is:

- Safe.
- Effective.
- Efficient.
- Economical.
- Socially Equitable.
- Environmentally Sound.
- Good Public Policy.

### **Community Water Fluoridation:**

Comparing the two extremes: The worst that can happen with fluoridation (mild fluorosis, but no dental cavities) and what can happen to the teeth of children and adults without fluoridation (rampant dental decay).



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**Community Water Fluoridation:  
Description**

**Why public water supplies as the vehicle?**

- Treatment of water for public consumption - a tool used by public health agencies to prevent disease as far back as the 1840's.
- Water treatment for disease prevention is a primary public health activity.

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**Community Water Fluoridation:  
Description**

**Example of a perfect public health intervention:**

- Does not discriminate against any group.
- Large groups protected continuously with no conscious effort on their part to participate.
- Works without requiring individuals to gather in a central location.

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**Community Water Fluoridation:  
Description**

**Example of a perfect public health intervention:**

- Does not require costly services of health professionals to deliver.
- No daily dosage schedules to remember.
- No foul-tasting oral medications to endure.

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**Community Water Fluoridation:  
Description**

**Example of a perfect public health intervention:**

- No painful inoculations to experience.
- Safe & effective for everyone, harms no one.
- All the public has to do is go about their normal daily routine to be protected.

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**Community Water Fluoridation:  
Benefits**

Extremely cost effective:

- U.S. average cost = \$0.50 / person / year.
- Assume a 75 year life span, that is \$37.50 for a lifetime of protection for one person.

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**Community Water Fluoridation:  
Benefits**

2002 national dental cost survey (*Dental Economics*) –

- National mean charge of \$100.00 for one small filling on one tooth (two surface silver amalgam restoration).
- Costs less for a lifetime of protection for one individual than it costs for one small dental filling for that same individual (\$37.50 Vs. \$100.00).

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**Community Water Fluoridation:  
Benefits**

- Fluoridation has benefit-to-cost ratios that are between 38:1 & 80:1 depending on local conditions.
- On average, for every \$1 spent on fluoridation, between \$38 & \$80 in dental treatment costs are saved.

- U. S. Centers for Disease Control

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**Community Water Fluoridation:  
Benefits**

**Cost-Effectiveness of Fluoridation:**

- \$100,000 investment prevents 440,000 cavities (*Indiana Department of Health*).

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**Community Water Fluoridation:  
Benefits**

Those fortunate enough to have had access to community water fluoridation experience 40 - 60 % fewer dental cavities.

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**Community Water Fluoridation:  
Benefits**

**Fluoridation benefits:**

- Infants.
- Children.
- Adolescents.
- Adults.
- Senior citizens.

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**Community Water Fluoridation:  
Benefits**

**Who benefits from dental treatment cost savings?**

- Taxpayers who support public programs.
- Employers who pay prepaid dental care fringe benefits for their employees.
- Employers who normally absorb costs for employees missed days from work.

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**Community Water Fluoridation:  
Benefits**

**Who benefits from dental treatment cost savings?**

- Consumers who will pay lower prices for consumer goods because of lower employer costs for insurance & employee absences.
- Patients who will pay lower health care bills & lower insurance premiums because of fewer numbers of hospital emergency room visits for dental emergencies.

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## Community Water Fluoridation: Benefits

### Who benefits from dental treatment cost savings?

- Patients who will pay lower health care bills, lower dental care costs, & lower insurance premiums because of lower costs incurred by providers for uncompensated care.

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## Community Water Fluoridation: Benefits

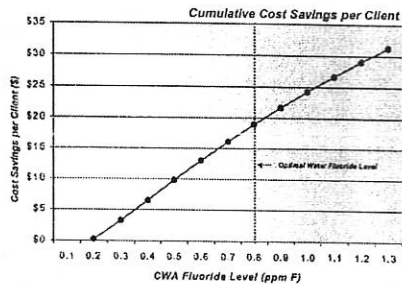
### Fluoridation promotes:

- Lower health care costs.
- Lower Insurance costs.
- Lower tax-supported costs for public programs.
- Lower business costs for employers.
- Lower costs for consumer goods & services.

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### Texas Study On Medicaid Saving Related to Fluoridation

Cumulative Treatment Cost Savings per THSteps Dental Client



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## COMMUNITY WATER FLUORIDATION



"As one of the nation's largest dental benefits systems, we fully believe fluoridation significantly helps offset dental benefits utilization, which in turn drives down premiums we charge companies & businesses offering our programs to their employees in fluoridated areas." - Jeff Album, Director of Public Affairs, Delta Dental Plan of California & chief spokesperson for the parent holding company of the system that includes Delta Dental Plan of California, Delta Dental of Pennsylvania, & affiliates in 16 states & the District of Columbia, with 17.6 million enrollees.

**DELTA DENTAL**  
Delta Dental Plan of California

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## **COMMUNITY WATER FLUORIDATION**

### **U. S. Dental Schools:**

- 7 Dental Schools have closed since 1985
- Enrollment reductions in the remaining dental schools since 1980 are equivalent to the closure of another 20 average size dental schools

- Institute of Medicine, 1995

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## **Community Water Fluoridation: Status**

### **Currently in the United States:**

162 million Americans drinking water from community water systems with optimal fluoride levels.

Represents 65.8% of the population having access to a community water supply.

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## **Community Water Fluoridation: Status**

### **Currently in the United States:**

14,300 community water systems fluoridate.

These systems serve 10,500 American communities.

46 of the 50 largest U.S. cities.

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## **Community Water Fluoridation: Status**

### **Fluoridation Legislative Mandates:**

California	Minnesota
Connecticut	Nebraska
Delaware	Nevada
Georgia	Ohio
Illinois	South Dakota

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District of Columbia	Puerto Rico
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**Community Water Fluoridation:  
Status**

**Fluoridation Regulatory Mandates:**

**Kentucky**

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**Community Water Fluoridation:  
Status**

**U. S. Surgeon General's Year 2010  
Health Objectives for the Nation**

- Fluoridation Objective = 75 % of the population by the year 2010
- U.S. currently at 65.8 %

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

**1998 National Gallup Poll of Consumers' Opinions on Whether Community Water Should be Fluoridated:**

Yes	70%
No	18%
Don't Know	12%

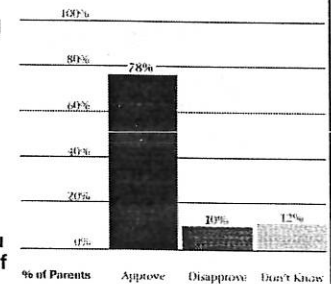
Source: ADA, Survey Center: 1998 Consumers' Opinions Regarding Community Water Fluoridation,  
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**Community Water Fluoridation:  
Support**

**Approval of Fluoridating Drinking Water- Survey of Parents, Gallup Organization, December 1991.\***

**Question Asked:**

- Whether or not you presently have fluoridated water, do you approve or disapprove of fluoridated drinking water?



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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- American Medical Association (1847)  
296,000 members
- American Dental Association (1859)  
141,000 members
- American Dietetic Association (1917)  
70,000 members

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- American Academy of Pediatrics (1930)  
49,000 members
- American Acad. of Family Physicians (1947)  
84,000 members
- American Public Health Association (1872)  
50,000 members

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- National Academy of Sciences (1863)  
Institute of Medicine
- U.S. Public Health Service (1798)
- National Institutes of Health (1891)
- Centers for Disease Control (1946)
- World Health Organization (1946)

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**Community Water Fluoridation:  
Support**

**Who supports  
fluoridation ?**

- American Water  
Works Association  
(1881)  
(52,000 members)



Dedicated to Safe Drinking Water  
American Water Works  
Association MEMBER

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- American Association for the Advancement of Science
- American Council on Science & Health
- American Diabetes Association
- American Hospital Association

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- National Cancer Institute
- National Heart, Lung, & Blood Institute
- Consumer Federation of America
- A.F.L.-C.I.O.

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- American Pharmaceutical Association
- American Academy of Allergy
- American Nurses Association
- American Dental Hygienists' Association
- American Osteopathic Association

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- American Veterinary Medical Association
- American Society of Clinical Nutrition
- Center for Science in the Public Interest
- Health Insurance Association of America

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- Mayo Clinic
- American School Health Association
- National Institute of Municipal Law Officers
- Food & Drug Administration (F.D.A.)

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**Community Water Fluoridation:  
Support**

**Who supports fluoridation ?**

- Credible & respected scientific & professional organizations that have been around for a long time;
- Organizations with real offices & peer reviewed journals; and
- Organizations that can be found in the phone book !

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**Community Water Fluoridation:  
Support**

**Who also supports  
fluoridation ?**

**Elected officials whom have  
taken the time to become  
informed on the issues !**

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**COMMUNITY WATER FLUORIDATION**



**"We're the healthiest state in the country, except for our teeth. Our children have the poorest teeth in the country, & we're going to propose that our water be fluoridated."**

**- The Honorable Benjamin Cayetano,  
Governor of Hawai'i, 1995-2003,  
State of the State Address,  
December 22, 1999.**

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**COMMUNITY WATER FLUORIDATION**



**"More than 70% of Texans drink community fluoridated water, but tooth decay is twice as high in San Antonio as in any other Texas city. Fluoride should be put in the drinking water because it will prevent tooth decay & save money in medical costs....."**

**- The Honorable Ed Garza, Mayor of San Antonio, Texas**

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**COMMUNITY WATER FLUORIDATION**

**Support**

**Who Also Supports Fluoridation?**

**National Governors' Association**

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**Community Water Fluoridation:  
Opposition**

**According to CDC's Division of Oral Health, "opponents of fluoridation often make unsubstantiated claims about adverse health effects of fluoridation in attempts to influence public opinion..."**

**- MMWR 1999; 48:933-940**

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**Community Water Fluoridation:  
Opposition**

**They further go on to say that, "To overcome the challenges facing this preventive measure, public health professionals at the national, state & local level will need to enhance their promotion of fluoridation & commit the necessary resources for equipment, personnel & training."**

**- MMWR 1999; 48:933-940**

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2-14

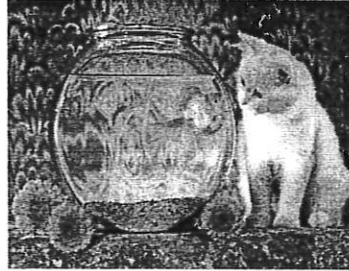
**Community Water Fluoridation:  
Status**

Substantial increase in the numbers of people being provided the benefits of fluoridation in the last 12 years:

	1990	2003
U.S.	145 million	162+ million

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**Community Water Fluoridation:  
Description**



Fluoridation is:

- Safe.
- Effective.
- Efficient.
- Economical.
- Socially Equitable.
- Environmentally Sound.
- Good Public Policy.

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2-15



KANSAS DENTAL ASSOCIATION

To: Senate Public Health and Welfare Committee  
From: Dr. Phil Zivnuska, Kansas Dental Association  
Date: March 3, 2004  
Re: Support of SB 530

Chairman Wagle, members of the committee, I am Dr. Phil Zivnuska. I'm a past president of the Kansas Dental Association (KDA) and currently serve as fluoridation spokesperson for the KDA.

Dr. C. Everett Koop, the United States Surgeon General from 1981-1989, stated that Fluoridation is the "single most important commitment a community can make to the oral health of its children and to future generations."

Drinking fluoridated water saves the cost of repairing damaged teeth at a fraction of the cost an individual would otherwise spend on dental care for fillings, crowns, root canals or extraction. The Centers for Disease Control has indicated that as a result of fluoridation, dental decay rates had dropped 40-70 percent in the last 50 years and regard it as one of the ten greatest public health achievements of the 20<sup>th</sup> Century.

First, it is important to recognize that water fluoridation is not something new. Fluoridating community water supplies, including Kansas water, has been occurring, uneventfully, for over 50 years. Currently there are nearly 1.5 million Kansans who are being served by fluoridated, public water systems throughout the state.

Secondly, all drinking water contains fluoride at some level. Fluoride is nature's way of preventing tooth decay. Community water fluoridation programs adjust the naturally occurring levels of fluoride to the optimum level for greatest health benefits.

The rate of dental cavities could decrease by up to 40-60 percent if fluoride is added to the water in non-fluoridated cities in Kansas. This will result in fewer painful trips to the dentist's office; stronger, healthier teeth; and less health care costs. Further, the business community will benefit as well. Less cavities mean less medical care costs to employers, potentially lower insurance costs, less time parents will spend away from work while taking themselves and their children to the dentist and an overall healthier workforce.

Cost estimates have shown that \$3 million would have been saved in dental costs if Wichita had fluoridated five years ago.

Right now, the best way for the children in these areas to receive the recommended level of fluoride is to buy fluoride tablets at about \$20 for a three-month supply. That amounts to a cost to parents of about \$80 per year per child. If this bill passes and funding comes

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Date: March 3, 2004



available, the same parents will pay less than one-dollar per year for the recommended daily level of fluoride. It makes sense economically to fluoridate.

The American Dental Association, the American Medical Association, the American Cancer Society, the National Research Council and every Surgeon General for over 50 years, all recognize water fluoridation as a safe and effective means of preventing oral disease.

A recent survey conducted by the Kansas Public Health Association in Kansas revealed that 74-percent of the Kansas population supports a state law requiring fluoridation and 73-percent are willing to even accept a 10-50 cent increase in their water bill in exchange for a tremendous reduction in long term dental care. The citizens of Kansas, in a great majority, support water fluoridation and understand the true health benefits that it offers. By passing this bill, the state of Kansas would be taking a positive step toward improving the health of its citizens and reducing the cost of dental care significantly.

This affects real people. My staff and I volunteer to perform dental health screenings in schools during February. At Cloud Elementary in Wichita, 646 students were screened. Of those, 290 had decay that was visible, not in a detailed full examination in a dental office, but readily visible with just a wooden tongue depressor. Sadly, 33 children had teeth that were infected to the point where the infection in the jaws had burrowed out through the gums and pus was draining into the mouths of these kids. That's why I'm here today. That's why this is worth doing. The method and the money are both available to improve health and reduce suffering. We need only the will to do so. I ask that you pass this bill.

Thank you.

Philip S. Zivnuska

2424 N. Woodlawn #119

Wichita, KS 67220

316-683-0411

TESTIMONY ON SENATE BILL 530  
Senate Committee on Public Health and Welfare

Senator Wagle and Members of the Committee:

My name is Dr. Dennis Cooley and I am a pediatrician in private practice in Topeka. I am here on behalf of the Kansas Chapter of the American Academy of Pediatrics which represents over ninety-five percent of the practicing pediatricians in the state. I want to thank the committee for allowing me to testify and want to speak in support of Senate Bill 530.

Dental disease has been a major problem in this country during the last century. For example one of the major causes of rejection for military service in World War I and World War II was that potential candidates didn't pass the dental exam. What was required to pass this exam? Only that the candidates have six opposing teeth and yet many still failed this. (1).

We have witnessed a decline in tooth decay over the last fifty years. The fluoridation of community water supplies in the last half of the twentieth century has been a major factor in this decline. The effectiveness of fluoridation has been shown in many studies with the reduction rates of dental caries between 45 and 50 %. This has been so important to public health that recently the CDC included this as one of the top ten achievements in public health in the last 100 years. (1)

It may surprise some of you that pediatricians are concerned about this issue. Oral health issues are major factors in a child's well being. Dental disease can cause serious complications that involves more than the teeth. Dental caries can result in infections that extend to the bone and blood stream, problems with nutrition due to chewing difficulties, and severe pain that involves the entire face. Recent studies have suggested associations between dental infections and diabetes and heart disease. Even more interesting have been studies that have seen a relationship between maternal dental disease and preterm and low birth weight infants. (3) Finally dental disease can cause problems that extend beyond physical problems as children may experience school absences due to illnesses related to dental diseases. These absences can affect school performance.

Is dental disease still a problem in this country? Many of you are no doubt aware of concerns about the increase of asthma in children in this country. Yet the prevalence of tooth decay in childhood is five times more common than asthma. Seven percent of seventeen-year olds in this country have lost at least one permanent tooth as a result of decay. Tooth decay remains the most common chronic disease in children aged 5-17. (4) (7) While much has improved we still have a long way to go.

*Senate Public Health & Welfare Committee  
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With most health problems prevention is more cost effective than treatments and indeed this is the case with dental disease. According to the CDC the savings per person in communities with fluoridated water systems is between \$16 and \$19 per year. (5) The rate of caries in children and adolescents in poverty is two times as much as affluent children and they are more likely to go untreated and suffer from the previously mentioned complications. When these complications occur the medical cost that society must bear also increases. The advantage of water fluoridation is that all people regardless of socio-economic status can receive the health benefits just by drinking water.

The American Academy of Pediatrics which represents the majority of pediatricians in this country has developed Practice Guidelines that endorse community water fluoridation. (6) The Kansas Chapter agrees with these guidelines and strongly supports Senate Bill 530.

I would like to end with a quote from the Surgeon General Dr. David Satcher:

“Fluoridation is the single most effective public health measure to prevent tooth decay and improve oral health over a lifetime, for both children and adults.”(8)

For the health of our children I urge you to pass SB530.

Thank you.

Respectfully submitted,

Dennis M Cooley MD

References:

1. Achievements in Public Health. MMWR: 48(41);933-940
2. Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. MMWR, 50(RR14); 1-42
3. Links Between Oral and General Health. Office of Surgeon General, U.S. Department of Health and Human Services, May 2000
4. Children's Oral Health. Office of Surgeon General, U.S. Department of Health and Human Services, May 2000
5. Cost Saving of Community Water Fluoridation. CDC; August, 2001
6. Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States, American Academy of Pediatrics Practice Guideline Endorsement
7. Preventing Dental Caries. CDC Fact Sheet; October, 2003
8. Community Water Fluoridation. Surgeon General Statement; 2001

March 3, 2004

Madam Chair and members of the Senate Public Health and Welfare Committee:

Thank you for the opportunity to speak to you today as a proponent for SB 530. By way of reference, I am a practicing pediatric dentist in Leavenworth and have been in practice there for almost ten years. Prior to that, I practiced pediatric dentistry in the U.S. Army for twenty years including a four year tour as the Co-Director and Director of the U.S. Army Postgraduate Pediatric Dental Residency Program. I am one of only 1200 Board Certified pediatric dentists in America and one of only seven in Kansas. I last formally spoke to the Kansas Legislature in 1999, asking for your support of the legislation requiring insurance companies to cover hospitalization costs for young children whose teeth were so decayed and often abscessed that they could only be treated in the operating room. I thank you for that vital piece of legislation that you passed - - it has made a significant difference in treating some very young children - and I ask you now for your support of a much broader public health issue.

Community water fluoridation is a safe, highly beneficial, and very importantly, a cost-effective measure for reducing and preventing dental cavities. Fluoride works in two ways - it is incorporated into the enamel of developing teeth that have not yet erupted into the mouth, making them more resistant to decay, and, secondly, it is secreted in minute amounts in the saliva, bathing the teeth already present in the mouth and making them also more resistant to cavity formation by a process called remineralization. Small amounts of fluoride occur naturally in water. What we are asking for is your support of water fluoridation - the process of adjusting the natural fluoride level to optimal concentrations for protection against tooth decay and promoting remineralization.

The Center for Disease Control and Prevention has listed community fluoridation as One of the Ten greatest public health achievements of the 20<sup>th</sup> century. Included in this list are pasteurization, chlorination and immunization. Dr C. Everett Koop, former Surgeon General of the United States labeled fluoridation as the "single most important commitment a community can make to the oral health of its children and future generations". Fluoridated water has been shown time and time again, in scientific study after study, over the past 50 years, to cut cavity levels by 40-65%.

Fluoride is safe. The U. S. Public Health Service recently completed an extensive analysis of the benefits and risks of fluoride. They concluded that the "the benefits are great" and that "optimal fluoridation of drinking water does not pose a detectable cancer risk to humans". More than 70 national and international organizations support fluoridation of community water supplies, including the American Cancer Society, the American Academy of Pediatrics, the World Health Organization, the American Medical Association and the Canadian and American Dental Associations.

Cost has to be a big factor! Look at what we are trying to do! Prevention of disease is the answer. The average national cost of providing fluoridated water to residents within a community is 51cents (not dollars) a year! Since fluoridation just became available in

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Leavenworth, its benefits have not yet been realized. Every day in my pediatric dental practice in Leavenworth, I put in filling, after filling, after crown, on multiple children! This costs someone a lot of money, be it the parent, an insurance company, or the State of Kansas as it tries to pay its Medicaid bills. The U. S. Centers for Disease Control estimates that for every \$1 spent on fluoridation, \$80 is saved in dental treatment. A large majority of cavities are preventable – a major key is fluoridation!

In Leavenworth, it took three elections. Fluoridation of the water was on the ballot in 1967 and in 1971, and was defeated both times. “Scare Tactics”, like those heard yesterday, were loudly employed by opponents. A small group of organized public opposition fueled strong emotions and fear. Poorly controlled scientific research studies were cited to scare people. The Air Force General in the movie, Dr Strangelove, in 1964, cited fluoride as a commie plot! Today, instead, people cite web sites like fluoridation/atomicbomb as the reason to oppose fluoridation! Like many of my colleagues in Wichita and Hutchinson, the dental community had all but given up trying to pass water fluoridation. But a final, broad –based, community effort was begun in 1999, lead again by the dental community. We were fortunate to have dedicated dental assistants, hygienists and local dentists who knew the benefits of fluoridation and non-fluoridation, because they saw the results every day. Most importantly, however, was the inclusion of members of the public with political acumen and professional standing who strongly supported the effort. A former mayor, Joel Grodberg, was of immense help in advising the oral health coalition how to politically approach the issue through the Water Board, the City Attorney, the City Commission and City Clerk. A former State Senator, Don Biggs was vocal in his support. The pediatricians supported the effort. The assistance of the United Methodist Health Ministry Fund was invaluable. Newspaper and TV coverage, public debate, house to house campaigning and political signs in yards and on high visibility streets were used to educate the public to the benefits. The fluoridation issue was put on the ballot, and in 2000, the citizens voted for implementation, 60% to 40%. Since then, there has been no outcry of opposition. My colleagues in Wichita and Hutchison have not been as fortunate.

I am here today asking for your political support for water fluoridation. I am embarrassed that Kansas received the only “F” in the 50 states on the Surgeon Generals Oral Health Report Card in 2000. The Kansas dental professions, including the assistants, the hygienists, the dentists, and their professional organizations, have worked long and hard to make life better for Kansas citizens. Millions of dollars of charitable dental care have been donated through projects like KMOM and donated dental services. We now need your political help so that Kansas can become a national leader when it comes to the oral health care of our citizens.

Thank you for your time and consideration.

Paul Kittle, D.D.S.

**KANSAS  
PUBLIC  
HEALTH  
ASSOCIATION, INC.**

**Kansas Public Health Association, Inc.**

*AFFILIATED WITH THE AMERICAN PUBLIC HEALTH ASSOCIATION*

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March 3, 2004

Testimony presented to  
Senate Committee on Public Health and Welfare  
by Sally Finney, M.Ed, CAE

Chairman Wagle and members of the committee, I appreciate the opportunity to appear before you today on behalf of the Kansas Public Health Association to express our enthusiastic support for Senate Bill 530.

Community water fluoridation is recognized by the Centers for Disease Control and Prevention as one of the top 10 public health achievements of the 20<sup>th</sup> century. Tooth decay is an infectious disease that has been linked to such serious health conditions as heart disease, lung disease, premature delivery and low birth weight infants. Although there is no cure for this disease, there are interventions that reduce its severity. Of those, community water fluoridation has consistently been found by reputable health and scientific organizations to be safe, cost-beneficial, and effective. I have attached a list of those organizations that recognize the benefits of community water fluoridation for preventing tooth decay. You will hear from representatives of the state affiliates of a number of these entities who can vouch for this claim of support.

Preventing dental disease is not only good for the health of Kansas, it makes economic sense as well. While some argue that the decision to fluoridate a city's public water system affects only the local jurisdiction. In fact, every Kansas taxpayer is paying to treat preventable dental disease that could otherwise be prevented through community water fluoridation. This makes fluoridation a matter of concern for the Kansas Legislature.

In FY 2003, SRS estimates that public spending to provide dental services in Sedgwick County exceeded \$4 million - \$3.99 million through Kansas Medicaid and \$101,000 through HealthWave. In addition to dental services, SRS covers the cost of fluoride vitamins, which are prescribed by physicians and dentists treating patients in low-fluoride areas. Total cost for Medicaid and HealthConnect for the past three years was \$77,851. (According to SRS, expenditures for fluoride vitamins for HealthWave beneficiaries is not tracked in MMIS for HealthWave beneficiaries and was, therefore, not available for me to share with you today.)

While I cannot say for certain how much Kansas taxpayers would save if Wichita, the major water supplier for Sedgwick County, and Hutchinson were to implement community water fluoridation, I can say there would be a savings, not just to taxpayers but to Kansas businesses

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and employees bearing the burden of increased costs resulting from treating preventable dental disease.

Since 1920, the Kansas Public Health Association has been working to improve the health of Kansans. Our members strongly support community water fluoridation and ask your support of SB 530.

Thank you.

National & International Organizations that  
Recognize the Public Health Benefits of Community  
Water Fluoridation for Preventing Dental Decay\*

\*[From: *Fluoridation Facts*, © 1999, American Dental Association]

Academy of Dentistry International  
Academy of General Dentistry  
Academy of Sports Dentistry  
Alzheimer's Association  
American Academy of Allergy, Asthma & Immunology  
American Academy of Family Physicians  
American Academy of Oral & Maxillofacial Pathology  
American Academy of Pediatrics  
American Academy of Pediatric Dentistry  
American Academy of Periodontology  
American Association for the Advancement of Science  
American Association for Dental Research  
American Association of Community Dental Programs  
American Association of Dental Schools  
American Association of Endodontists  
American Association of Oral & Maxillofacial Surgeons  
American Association of Orthodontists  
American Association of Public Health Dentistry  
American Cancer Society  
American College of Dentists  
American College of Physicians  
American Society of Internal Medicine  
American College of Prosthodontists  
American Council on Science & Health  
American Dental Assistants Association  
American Dental Association  
American Dental Hygienists' Association  
American Dietetic Association  
American Federation of Labor / Congress of Industrial Organizations  
American Hospital Association  
American Medical Association  
American Nurses Association  
American Osteopathic Association  
American Pharmaceutical Association  
American Public Health Association  
American School Health Association  
American Society of Clinical Nutrition  
American Society of Dentistry for Children  
American Society for Nutritional Sciences  
American Student Dental Association  
American Veterinary Medical Association  
American Water Works Association  
Association for Academic Health Centers  
Association of Maternal & Child Health Programs  
Association of State & Territorial Dental Directors  
Association of State & Territorial Health Officials  
British Dental Association  
British Fluoridation Society  
British Medical Association  
Canadian Dental Association



Canadian Dental Hygienists Association  
Canadian Medical Association  
Canadian Nurses Association  
Canadian Paediatric Society  
Canadian Public Health Association  
Chocolate Manufacturers Association  
Consumer Federation of American  
Delta Dental Plans Association  
European Organization for Caries Research  
FDI World Dental Federation  
Federation of Special Care Organizations in Dentistry  
Academy of Dentistry for Persons with Disabilities  
American Association of Hospital Dentists  
American Society for Geriatric Dentistry  
Health Insurance Association of America  
Hispanic Dental Association  
International Association for Dental Research  
International Association for Orthodontics  
International College of Dentists  
Institute of Medicine  
National Academy of Sciences  
National Alliance for Oral Health  
National Association of County & City Health Officials  
National Association of Dental Assistants  
National Confectioners Association  
National Council Against Health Fraud  
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  
National Kidney Foundation  
National PTA  
National Research Council  
Society of American Indian Dentists  
The Dental Health Foundation (of California)  
U.S. Department of Defense  
U.S. Department of Veterans Affairs  
U.S. Public Health Service  
U.S. Centers for Disease & Prevention (CDC)  
U.S. Health Resources & Services Administration (HRSA)  
U.S. Indian Health Service (IHS)  
National Institute of Dental & Craniofacial Research (NIDCR)  
World Federation of Orthodontists  
World Health Organization

Testimony before the Senate Public Health & Welfare Committee

SB 530

March 3, 2004

Provided by: **Teresa Schwab, Executive Director  
Oral Health Kansas, Inc.**

Chairman Wagle and Members of the Committee:

Thank you for the opportunity to provide testimony to you today in support of SB 530, a bill that would require certain non-fluoridated communities to fluoridate their water systems. My name is Teresa Schwab, and I am the Executive Director of Oral Health Kansas, Inc.

Oral Health Kansas is a newly established coalition of over 130 organizations and individuals who are committed to improving the oral health status of all Kansans. With support from major contributors, the coalition's advocacy, public education and awareness efforts focus on prevention, access to oral health care, oral health leadership, oral health status and developing an oral health work force.

Treatment costs for dental decay can be substantial. Because decay disproportionately affects low-income children, the cost burden often falls on the state's Medicaid program. In a 1996 Louisiana study of water fluoridation and Medicaid costs, the results showed that Medicaid-eligible children living in non-fluoridated communities were **three times more likely** than Medicaid-eligible children in fluoridated communities to receive dental treatment in a hospital operating room, and **the cost of treatment was approximately twice as high.**

The high cost for treatment of dental disease of individuals living in non-fluoridated communities has also been observed here in Kansas.

Hospitals in Sedgwick County report over **3,000 emergency room visits occur each year due to primary dental need.** In addition, 2003 county dental surveillance studies showed that among Wichita public school children, **47% had decay in primary and/or permanent teeth. Of those children, 20% had decay so bad that they required emergency care** (meaning numerous, large areas of decay and/or abscesses).

In a study released in 2000, the Kansas Health Institute concluded that in Wichita alone, **caries rates would be reduced by approximately 20%**, a conservative estimate according to the study, if the city implemented community water fluoridation. This decrease would represent an approximate **cost savings of more than \$2.9 million** in the number of decayed teeth and fillings avoided in children.

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All individuals of low socioeconomic status have a disproportionate burden of dental decay. In Kansas, the Medicaid program does not cover comprehensive dental care for adults, so dental need in this population must be paid for out-of-pocket, ignored, or the burden shifted to already over-stressed safety net clinics or emergency rooms.

The Centers for Disease Control endorse water fluoridation as especially beneficial to this population of individuals, especially because they have less access to dental care services and other more costly sources of fluoride.

American Association of Public Health Dentistry offers the following facts about fluoride:

- Fluoridation is the least expensive and most effective way to reduce tooth decay.
- Fluoridation benefits children and adults when they drink fluoridated water and consume foods and beverages prepared with it.
- Fluoridation is safe.
- Fluoridation provides benefits that continue for a lifetime.
- Fluoridation reduces the need for dental treatment and its costs.

Once again, thank you for the opportunity to provide you with this testimony today. I would be happy to stand for questions.

Respectfully submitted,  
Teresa R. Schwab, LMSW  
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mez

# Gaches, Braden, Barbee & Associates

## Governmental Affairs & Association Management

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**Senate Public Health and Welfare Committee  
Testimony of Kansas Dental Hygienists Association  
Regarding SB 530: Fluoridation of Public Water Supply  
Presented by Ron Gaches  
Wednesday, March 3, 2004**

Thank you Senator Wagle and members of the committee for this opportunity to express the support of the Kansas Dental Hygienists Association for passage of Senate Bill 530.

Other conferees have spoken to the public policy merits of this bill. Kansas's dental hygienists join them in enthusiastic support of fluoridation of our public water supply. Notwithstanding the comments expressed Tuesday in opposition to the proposal, water fluoridation has been clearly proven to reduce the onset of cavities, is cost effective, and continues to have the support of the U.S. Center for Disease Control (CDC) and the U.S. Surgeon General.

Attached for your review are current Fact Sheets from the CDC including:

1. Using Fluoride to Prevent and Control Dental Caries in the United States
2. Cost Savings of Community Water Fluoridation
3. Community Water Fluoridation: Surgeon General's Statement, 2001

Dental Hygienists see every day the results of inadequate oral health care. These results include loss of school time, loss of work time, unnecessary expense for avoidable medical care and accelerating Medicaid and private insurance costs.

The chief reason to support passage of SB 530 is that all of these results could be significantly reduced with universal fluoridation of our public water supplies.

Several opponents have suggested that the bill should be rejected because it is effectively a mandate on local communities. While this is an argument that normally stirs great emotion among Kansas legislators, I urge you reject it in this instance. The State of Kansas has a legitimate interest in protecting the health and welfare of all citizens and has deemed it appropriate to adopt numerous mandates. We set maximum local speed limits, we require young hunters to pass Hunter Safety class, we require licensure of restaurants, we require medical exams of school age kids, and we prohibit smoking in public buildings among many other mandates.

Fluoridation of our public water supplies is an effective, sensible and cost effective solution to a well-recognized oral health problem. We urge your adoption of SB 530.

Senate Public Health & Welfare Committee  
Attachment 8-1  
Date: March 3, 2004



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## Fact Sheet

### Using Fluoride to Prevent and Control Dental Caries in the United States

[Back to Fact Sheets and FAQs](#)

August 2001—The Centers for Disease Control and Prevention (CDC) has issued new recommendations on using fluoride to prevent dental caries (tooth decay). The recommendations provide guidance to health care providers, public health officials, policymakers, and the general public on how to achieve maximum dental decay protection while efficiently using dental care resources and minimizing any cosmetic concerns. In 1999, CDC profiled the wide-spread practice of fluoridating community drinking water to prevent dental decay as one of 10 great public health achievements of the 20th Century.

#### Fluoride Facts

- Fluorine, from which fluoride is derived, is the 13th most abundant element and is released into the environment naturally in both water and air.
- Fluoride is naturally present in all water. Community water fluoridation is the addition of fluoride to adjust the natural fluoride concentration of a community's water supply to the level recommended for optimal dental health, approximately 1.0 ppm (parts per million). One ppm is the equivalent of 1 mg/L, or 1 inch in 16 miles.
- Community water fluoridation is an effective, safe, and inexpensive way to prevent tooth decay. Fluoridation benefits Americans of all ages and socioeconomic status.
- Children and adults who are at low risk of dental decay can stay cavity-free through frequent exposure to small amounts of fluoride. This is best gained by drinking fluoridated water and using a fluoride toothpaste twice daily.
- Children and adults at high risk of dental decay may benefit from using additional fluoride products, including dietary supplements (for children who do not have adequate levels of fluoride in their drinking water), mouthrinses, and professionally applied gels and varnishes.

- Good scientific evidence supports the use of community water fluoridation and the use of fluoride dental products for preventing tooth decay for both children and adults.
- Fluoride was first used purposefully to prevent tooth decay in Grand Rapids, Michigan, in 1945 by adjusting the level of fluoride in drinking water. Fluoridation of drinking water has been used successfully in the United States for more than 50 years.
- Fluoridation of community water has been credited with reducing tooth decay by 50%-60% in the United States since World War II. More recent estimates of this effect show decay reduction at 18%-40%, which reflects that even in communities that are not optimally fluoridated, people are receiving some benefits from other sources (e.g., bottled beverages, toothpaste).
- Fluoride's main effect occurs after the tooth has erupted above the gum. This topical effect happens when small amounts of fluoride are maintained in the mouth in saliva and dental plaque (the film that adheres to tooth enamel).
- Fluoride works by stopping or even reversing the tooth decay process. It keeps the tooth enamel strong and solid by preventing the loss of (and enhancing the reattachment of) important minerals from the tooth enamel.
- Of the 50 largest cities in the United States, 43 have community water fluoridation. Fluoridation reaches 62% of the population on public water supplies—more than 144 million people. (These data are from the [Water Fluoridation Fact Sheet, 1992](#). See more recent data in the [Water Fluoridation Fact Sheet, 2000](#)).
- Water fluoridation costs, on average, 72 cents per person per year in U.S. communities (1999 dollars).
- Consumption of fluids—water, soft drinks, and juice—accounts for approximately 75 percent of fluoride intake in the United States.
- Children aged 6 years or less may develop enamel fluorosis if they ingest more fluoride than needed. Enamel fluorosis is a chalk-like discoloration (white spots) of tooth enamel. A common source of extra fluoride is unsupervised use of toothpaste in very young children.
- Fluoride also benefits adults, decreasing the risk of cavities at the root surface as well as the enamel crown. Use of fluoridated water and fluoride dental products will help people maintain oral health and keep more permanent teeth.

## Related Links

- [Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. \*MMWR\*, Vol. 50, No. RR14;1-42. \(August 17, 2001\)](#)
  - [Water Fluoridation Fact Sheet, 2000](#)
  - [Water Fluoridation Fact Sheet, 1992](#)
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## Fact Sheet

### Cost Savings of Community Water Fluoridation

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August 2001—Two recently published studies conducted by CDC reaffirm the benefits of community water fluoridation. Together, the studies continue to show that widespread community water fluoridation prevents cavities and saves money, both for families and the health care system. In fact, the economic analysis found that for larger communities of more than 20,000 people where it costs about 50 cents per person to fluoridate the water, every \$1 invested in this preventive measure yields \$38 savings in dental treatment costs.

"An Economic Evaluation of Community Water Fluoridation," published in the spring issue of the *Journal of Public Health Dentistry*, presents the results of an economic analysis of water fluoridation under modern conditions of widespread availability of fluorides. Researchers from CDC and Terry College of Business, University of Georgia, found that under typical conditions, the annual per person cost savings in fluoridated communities ranged from \$16 in very small communities (<5,000) to nearly \$19 for larger communities (>20,000). The analysis takes into account the costs of installing and maintaining necessary equipment and operating water plants, the expected effectiveness of fluoridation, estimates of expected cavities in non-fluoridated communities and treatment of cavities, and time lost visiting the dentist for treatment.

A related analysis found that children living in non-fluoridated communities in states that are highly fluoridated receive partial benefits of fluoridation from eating foods and drinking beverages processed in fluoridated communities. This second study, "Quantifying the Diffused Benefit from Water Fluoridation," was published in the March issue of *Community Dentistry and Oral Epidemiology*. The study reports that 12-year-old children living in states where more than half of the communities have fluoridated water will have 26% fewer decayed tooth surfaces per year than 12-year-old children living in states where less than one-quarter of the communities are fluoridated.

"Widespread community water fluoridation prevents cavities even in neighboring communities that are not fluoridated," according to Dr. Susan Griffin, the study's main author. "For instance, a 12-year-old child who has lived in a non-fluoridated community in a



highly fluoridated state would typically have one fewer cavity than a child in a low-fluoridated state."

The CDC Division of Oral Health currently provides support to 10 states and one Native American tribe to expand their community water fluoridation systems and operates a national fluoridation training and quality assurance program. CDC seeks to improve the oral health of communities by extending the use of proven strategies to prevent oral diseases, enhancing monitoring of oral diseases, strengthening the nation's oral health capacity, and guiding infection control in dentistry.

### Related Links

- [Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States. MMWR, Vol. 50, No. RR14;1-42. \(August 17, 2001\)](#)
- [Water Fluoridation Fact Sheet, 2000](#)
- [Water Fluoridation Fact Sheet, 1992](#)

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## Fact Sheet

### Community Water Fluoridation: Surgeon General's Statement, 2001

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Since the 1950s, each U.S. Public Health Service Surgeon General has committed his or her support for community water fluoridation. Below is the most recent endorsement supporting community water fluoridation from Surgeon General, David Satcher, MD, PhD.

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December 3, 2001—For more than half a century, community water fluoridation has been the cornerstone of caries prevention in the United States. As noted in my May 2000 report, *Oral Health in America: A Report of the Surgeon General*, community water fluoridation continues to be the most cost-effective, practical and safe means for reducing and controlling the occurrence of tooth decay in a community. In thousands of communities in the United States where naturally-occurring fluoride levels are deficient, small amounts of fluoride have been added to drinking water supplies with dramatic results. More than 50 years of scientific research has found that people living in communities with fluoridated water have healthier teeth and fewer cavities than those living where the water is not fluoridated.

Almost two-thirds of the United States population served by public water supplies consume water with optimal fluoride levels. Of the 50 largest cities in the country, 43 are fluoridated. A significant advantage of water fluoridation is that anyone, regardless of socioeconomic level, can enjoy these health benefits during their daily lives—at home, work, or at school or play—simply by drinking fluoridated water or beverages prepared with fluoridated water. Water fluoridation is a powerful strategy in our efforts to eliminate health disparities among populations. Unfortunately, over one-third of the United States population (100 million people) is without this critical public health measure.


The U.S. Centers for Disease Control and Prevention has recognized the fluoridation of drinking water as one of ten great

public health achievements of the twentieth century. Water fluoridation has helped improve the quality of life in the United States through reduced pain and suffering related to tooth decay, reduced time lost from school and work, and less money spent to restore, remove, or replace decayed teeth. Fluoridation is the single most effective public health measure to prevent tooth decay and improve oral health over a lifetime, for both children and adults.

Water fluoridation continues to be a highly cost-effective strategy, even in areas where the overall caries level has declined and the cost of implementing water fluoridation has increased. Compared to the cost of restorative treatment, water fluoridation actually provides cost savings, a rare characteristic for community-based disease prevention strategies.

While we can be pleased with what has already been accomplished, it is clear that there is much yet to be done. I join previous Surgeons General in acknowledging the continuing public health role for community water fluoridation in enhancing the oral health of all Americans.

**David Satcher, MD, PhD**  
*Surgeon General*

 This statement is also available as a [PDF file](#) (PDK - 90K). Learn about viewing PDF files with [Adobe Acrobat](#)

## Related Links

- [Fact Sheets from the Office of the Surgeon General](#)
- [Surgeon General's Statement on Community Water Fluoridation, 1995](#)

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Community Water Fluoridation, SB 530  
to  
Senate Public Health and Welfare

Linda Kenney  
Director, Bureau for Children, Youth & Families

March 3, 2004

Thank you Madame Chairperson and Members of the Committee for the opportunity to comment on the SB 530 and the public health benefits of community water fluoridation.

The KDHE mission is to promote and protect the health of all Kansans. We would be remiss in our mission if we did not step forward at this time to talk about the health benefits of community water fluoridation, particularly for children in the community. Children are the real beneficiaries because fluoride strengthens the enamel of their developing teeth making them more resistant to decay.

During the last decade, a new awareness of the importance of children's dental health as part of their overall wellbeing has emerged among our families, professionals, schools and communities. Despite significant improvements in prevention, treatment and dental science, dental caries remain a common and often serious concern with possible long-term health and developmental consequences for many children and their families. At the same time, both the public and private health sectors have been slow to respond to their oral health needs. As we found in the Kansas Dental Association's Mission of Mercy (KMOM) at the fairgrounds in Garden City and at the racetrack in Kansas City, many children remain without dental insurance; are eligible but unenrolled in or not served by Medicaid; or live in areas where there is a drastic shortage of dental care providers. Many Kansas children of all socioeconomic circumstances live in communities without fluoride in the community water supply.

While we are sensitive to the fiscal constraints faced by local governments in considering community water fluoridation, we urge them to recognize the significant benefits for children and their families at a cost of about 55 cents per individual per year. As you work the bill, KDHE is available to assist by offering a bill markup with suggestions to facilitate implementation.

I would be happy to answer any questions

Senate Public Health & Welfare Committee  
Attachment 9.  
Date: March 3, 2004



100 East First Avenue P.O. Box 1384 Hutchinson, Kansas 67504-1384 (620) 662-8586 Fax: (620) 662-8597 www.healthfund.org

February 24, 2004

Senate Public Health and Welfare Committee  
Kansas Statehouse  
Topeka KS 66612

RE: Senate Bill 530

Dear Senator Wagle and Members of the Committee:

We would like to share our testimony by letter concerning Senate Bill 530 which will be considered by your Committee during the first week of March. This bill provides for the fluoridation of large water systems in Kansas.

Since 1998, the United Methodist Health Ministry Fund has offered water systems in Kansas grants to pay for all or substantially all of the start-up costs of water fluoridation. To date, eight communities have been approved for grants and implemented water fluoridation. We knew our decision to make these grants would not be without controversy, but there are two primary reasons we have continued to work on community water fluoridation.

1) The high, but often invisible, need for dental services in several Kansas population groups is the first reason. Many community and state leaders do not experience the problem of tooth decay and associated health problems in their families or in their neighborhoods. Recent Kansas Mission of Mercy events in Garden City and Kansas City, Kansas, have highlighted the pent-up need for dental services by many Kansans. I worked at those events. Hundreds were served but hundreds more could not be admitted. An exit survey, by the Kansas Health Institute, showed that 49% of those served in Kansas City had been in pain before coming. Seventeen percent of those attending were seeing a dentist for the first time. Ten percent of patients drove two hours or more to attend the clinic. In the largest non-fluoridated city in Kansas--Wichita, one pediatric dentist reported to us that he alone puts more than 300 young children under anesthetic in the hospital each year for major removal of teeth. Hospitals in Wichita report that oral problems are among the top five reasons for emergency room visits. Medicaid provides almost no adult dental benefits, and access by children to Medicaid dental services is problematic in most areas of the state.

2) Community water fluoridation prevents decay, is safe and is cost-effective. The CDC reports significant drops in tooth decay rates both for children and older adults in fluoridated communities. The CDC also noted that "Since 1950, opponents of water

Senate Public Health & Welfare Committee  
Attachment 10-1  
Date: March 3, 2004

February 24, 2004

fluoridation have claimed it increased the risk for cancer, Down Syndrome, heart disease, osteoporosis and bone fracture, acquired immunodeficiency syndrome, low intelligence, Alzheimer disease, allergic reactions, and other health conditions. *The safety and effectiveness of water fluoridation have been re-evaluated frequently, and no credible evidence supports an association between fluoridation and any of these conditions.*” Our staff reviewed the evidence about fluoridation’s safety before announcing the Request for Proposals. Later, after a few meetings where opponents raised a wide variety of concerns, we would return to the office and review the literature again. We have learned that the CDC’s conclusion is the right one: fluoridation is safe.

Our experience also has demonstrated that fluoridation is cost effective. The CDC again has noted that water fluoridation costs range from 31 cents per year per person in communities greater than 50,000 persons to \$2.12 per person in communities of less than 10,000. Costs for implementation of water fluoridation in the eight communities we have funded have ranged from \$7,000 to \$194,000. The CDC states, “Compared with other methods of community-based dental caries prevention, water fluoridation is the most cost effective for most areas of the United States in terms of cost per saved tooth surface.”

All of the CDC quotes in this letter are from MMWR, October 22, 1999, “Achievement in Public Health, 1900-1999; Fluoridation of Drinking Water to Prevent Dental Caries.”

Our belief is that without high use of prevention techniques such as community water fluoridation we cannot turn the tide of growing dental care issues in Kansas. Community water fluoridation provides the foundation of support for all other prevention efforts. Frequently, those opposing water fluoridation suggest other alternatives that work to prevent tooth decay. We have funded several of these as well—fluoride varnishes, sealants, oral health education, etc. They are not as cost effective or as sustainable as community water fluoridation for reaching the population (really all of us).

We would be pleased to work with KDHE and other partners in assisting larger Kansas communities in obtaining the benefits of community water fluoridation under the provisions of SB 530 if enacted.

Sincerely,



Kim Moore  
President

MKM/kkd

10



**WRITTEN TESTIMONY ONLY**

March 3, 2004

To: Kansas Senate Committee on Public Health and Welfare  
From: Cindy D'Ercole, Sr. Policy Analyst  
Re: Senate Bill 530

Kansas Action for Children supports enactment of Senate Bill 530.

Although dental carries, or cavities, is the most common chronic childhood disease in America, it also clear that prevention and early treatment are extremely effective. You will hear testimony today on how fluoride is an effective, efficient and safe component of such a prevention strategy.

As a state-wide child advocacy organization, we believe the issue before you today is of primary importance to ensuring a healthy start and future for our youngest citizens. **Children's oral health is basic to overall health and well-being.** Children with serious oral health problems have trouble eating and sleeping, paying attention to parents and concentrating in school.

Early childhood carries not only dramatically increase a child's risk of future decay, but also increases the likelihood that will develop other severe problems that will affect their ability to succeed in school. Young children with untreated early childhood carries may develop:

- Poor eating habits
- Failure to thrive
- Impaired speech development

**When children's oral health suffers, so does their ability to learn.** Children with dental pain are more likely to miss school and have difficulty with learning activities. In fact, more than 51 million school hours are lost each year to dental-related illness.

It is clear that learning and health are linked, and that a comprehensive oral health strategy is an important part of making sure that all Kansas children enter school with the skills to succeed.

Kansas Action for Children, Inc.  
3360 SW Harrison | Topeka, KS 66611  
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kac@kac.org | www.kac.org

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**TO:** Senate Committee on Public Health and Welfare

**FROM:** Christina Collins *Christina Collins*  
Director of Government Affairs

**DATE:** March 3, 2004

**RE:** Fluoridation of Drinking Water

Ladies and Gentlemen of the Committee:


Thank you for considering my written comments on required fluoridation of drinking water in cities having more than 10,000 connections to the public water supply.

The Kansas Medical Society strongly supports such measures, as does the American Medical Association. Fluoridation is quite simply one of the most efficient and effective means of minimizing the prevalence of dental caries in the population. These conclusions are based in sound, scientific research that is generally accepted by the medical community and is well-documented in peer reviewed scientific and medical journals. Attached to my testimony you will find a Resolution of the American Medical Association encouraging health departments to require fluoridation as appropriate and two articles in support published in the *The Journal of the American Medical Association*.

I would be pleased to provide any other such research that the committee may wish. Thank you for considering my comments supporting fluoridation of municipal water supplies.



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### H-440.972 Statewide Fluoridation.

The AMA urges state health departments to consider the value of requiring statewide fluoridation (preferably a comprehensive program of fluoridation of all public water supplies, where these are fluoride deficient), and to initiate such action as deemed appropriate. (Sub. Res. 9, I-86; Reaffirmed: Sunset Report, I-96)

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Vol. 283 No. 10, March 8, 2000

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From the Centers for Disease Control and Prevention: Morbidity and Mortality Weekly Report

**Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries****Article C**

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JAMA. 2000;283:1283-1286.

MMWR. 1999;48:933-940

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*1 figure omitted*

**Fluoridation** of community drinking water is a major factor responsible for the decline in dental (tooth decay) during the second half of the 20th century. The history of water **fluoridation** is an example of clinical observation leading to epidemiologic investigation and community-based public health intervention. Although other fluoride-containing products are available, water **fluoridation** remains the most equitable and cost-effective method of delivering fluoride to all members of most communities regardless of age, educational attainment, or income level.

**Dental Caries**

Dental caries is an infectious, communicable, multifactorial disease in which bacteria dissolve the surface of a tooth.<sup>1</sup> Unchecked, the bacteria then may penetrate the underlying dentin and progress into the soft pulp tissue. Dental caries can result in loss of tooth structure and discomfort. Untreated dental caries lead to incapacitating pain, a bacterial infection that leads to pulpal necrosis, tooth extraction and loss of dental function, and may progress to an acute systemic infection. The major etiologic factors for dental caries are specific bacteria in dental plaque (particularly *Streptococcus mutans* and lactobacilli), susceptible tooth surfaces and the availability of fermentable carbohydrates.

At the beginning of the 20th century, extensive dental caries was common in the United States and in most developed countries.<sup>2</sup> No effective measures existed for preventing this disease, and the most frequent treatment was tooth extraction. Failure to meet the minimum standard of having six or more teeth was a leading cause of rejection from military service in both world wars.<sup>3-4</sup> Pioneering oral epidemiologists developed an index to measure the prevalence of dental caries using the number of decayed, missing, or filled teeth (DMFT) or decayed, missing, or filled tooth surfaces (DMFS)<sup>5</sup> rather than the mere presence of dental caries, in part because nearly all persons in most age groups in the United States had evidence of the disease. Application of the DMFT index in epidemiologic surveys throughout the United States in the 1930s and 1940s allowed quantitative distinctions in dental caries experience among communities—an innovation that proved critical in identifying a preventive agent and evaluating

effects.

## History of Water Fluoridation

Soon after establishing his dental practice in Colorado Springs, Colorado, in 1901, Dr. Frederick McKay noted an unusual permanent stain or "mottled enamel" (termed "Colorado brown stain" by area on the teeth of many of his patients.<sup>6</sup> After years of personal field investigations, McKay concluded that the agent in the public water supply probably was responsible for mottled enamel. McKay also observed that teeth affected by this condition seemed less susceptible to dental caries.<sup>7</sup>

Dr. F. L. Robertson, a dentist in Bauxite, Arkansas, noted the presence of mottled enamel among children after a deep well was dug in 1909 to provide a local water supply. A hypothesis that something in the water was responsible for mottled enamel led local officials to abandon the well in 1927. In 1930, W. C. Churchill, a chemist with Aluminum Company of America, an aluminum manufacturing company, used a newly available method of spectrographic analysis that identified concentrations of fluoride (13.7 parts per million [ppm]) in the water of the abandoned well.<sup>8</sup> Fluoride ion of the element fluorine, almost universally is found in soil and water but generally in very low concentrations (<1.0 ppm). On hearing of the new analytic method, McKay sent water samples from Churchill from areas where mottled enamel was endemic; these samples contained high levels of fluoride (2.0-12.0 ppm).

The identification of a possible etiologic agent for mottled enamel led to the establishment in 1930 of the Dental Hygiene Unit at the National Institute of Health headed by Dr. H. Trendley Dean. Dean's responsibility was to investigate the association between fluoride and mottled enamel (see sidebar). Adopting the term "fluorosis" to replace "mottled enamel," Dean conducted extensive observational and epidemiologic surveys and by 1942 had documented the prevalence of dental fluorosis for much of the United States.<sup>9</sup> Dean developed the ordinaly scaled Fluorosis Index to classify this condition. Very mild fluorosis was characterized by small, opaque "paper white" areas affecting  $\leq 25\%$  of the tooth surface; in mild fluorosis, 26%-50% of the tooth surface was affected. In moderate dental fluorosis, all enamel surfaces were involved and susceptible to frequent brown staining. Severe fluorosis was characterized by pitting of the enamel, widespread brown stains, and a "corroded" appearance.<sup>9</sup>

Dean compared the prevalence of fluorosis with data collected by others on dental caries prevalence among children in 26 states (as measured by DMFT) and noted a strong inverse relation.<sup>10</sup> This sectional relation was confirmed in a study of 21 cities in Colorado, Illinois, Indiana, and Ohio.<sup>11</sup> Dental caries among children was lower in cities with more fluoride in their community water supplies; at concentrations >1.0 ppm, this association began to level off. At 1.0 ppm, the prevalence of dental fluorosis was mostly very mild.

The hypothesis that dental caries could be prevented by adjusting the fluoride level of community water supplies from negligible levels to 1.0-1.2 ppm was tested in a prospective field study conducted in 14 pairs of cities (intervention and control) starting in 1945: Grand Rapids and Muskegon, Michigan; Newburgh and Kingston, New York; Evanston and Oak Park, Illinois; and Brantford and Sarnia, Canada. After conducting sequential cross-sectional surveys in these communities over 13-15 years, dental caries was reduced 50%-70% among children in the communities with fluoridated water.<sup>12</sup> The prevalence of dental fluorosis in the intervention communities was comparable with what had been observed in control communities where drinking water contained natural fluoride at 1.0 ppm. Epidemiologic investigations of patterns of water consumption and caries experience across different climates and geographic regions in the United States led in 1962 to the development of a recommended optimum range of fluoride concentrations.

1.2 ppm, with the lower concentration recommended for warmer climates (where water consumption is higher) and the higher concentration for colder climates.<sup>13</sup>

The effectiveness of community water **fluoridation** in preventing dental caries prompted rapid implementation of this public health measure in cities throughout the United States. As a result, dental caries declined precipitously during the second half of the 20th century. For example, the mean DMFT among people aged 12 years in the United States declined 68%, from 4.0 in 1966-1970<sup>14</sup> to 1.3 in 1988-1994 (unpublished data, 1999). The American Dental Association, the American Medical Association, the World Health Organization, and other professional and scientific organizations quickly endorsed water **fluoridation**. Knowledge about the benefits of water **fluoridation** led to the development of other modalities for delivery of fluoride, such as toothpastes, gels, mouth rinses, tablets, and drops. Several countries in Europe and Latin America have added fluoride to table salt.

### Effectiveness of Water Fluoridation

Early studies reported that caries reduction attributable to **fluoridation** ranged from 50% to 70%. In the mid-1980s the mean DMFS scores in the permanent dentition of children who lived in communities with fluoridated water were only 18% lower than among those living in communities without fluoridated water.<sup>15</sup> A review of studies on the effectiveness of water **fluoridation** conducted in the United States during 1979-1989 found that caries reduction was 8%-37% among adolescents (mean: 26.5%)

Since the early days of community water **fluoridation**, the prevalence of dental caries has declined in both communities with and communities without fluoridated water in the United States. This trend has been attributed largely to the diffusion of fluoridated water to areas without fluoridated water through bottled and processed foods and beverages in areas with fluoridated water and widespread use of fluoride toothpaste.<sup>17</sup> Fluoride toothpaste is efficacious in preventing dental caries, but its effect depends on frequency of use by persons or their caregivers. In contrast, water **fluoridation** reaches residents of communities and generally is not dependent on individual behavior.

Although early studies focused mostly on children, water **fluoridation** also is effective in preventing dental caries among adults. **Fluoridation** reduces enamel caries in adults by 20%-40%<sup>16</sup> and prevents caries on the exposed root surfaces of teeth, a condition that particularly affects older adults.

Water **fluoridation** is especially beneficial for communities of low socioeconomic status.<sup>18</sup> These communities have a disproportionate burden of dental caries and have less access than higher income communities to dental-care services and other sources of fluoride. Water **fluoridation** may help reduce such dental health disparities.

### Biologic Mechanism

Fluoride's caries-preventive properties initially were attributed to changes in enamel during tooth development because of the association between fluoride and cosmetic changes in enamel and a theory that fluoride incorporated into enamel during tooth development would result in a more acid-resistant mineral. However, laboratory and epidemiologic research suggests that fluoride prevents dental caries predominately after eruption of the tooth into the mouth, and its actions primarily are topical for adults and children.<sup>1</sup> These mechanisms include (1) inhibition of demineralization, (2) enhancement of remineralization, and (3) inhibition of bacterial activity in dental plaque.<sup>1</sup>

Enamel and dentin are composed of mineral crystals (primarily calcium and phosphate) embedded in an organic protein/lipid matrix. Dental mineral is dissolved readily by acid produced by cariogenic bacteria when they metabolize fermentable carbohydrates. Fluoride present in solution at low levels, which becomes concentrated in dental plaque, can substantially inhibit dissolution of tooth mineral by adsorbing to the tooth surface and attracting calcium ions.

Fluoride enhances remineralization by adsorbing to the tooth surface and attracting calcium ions in saliva. Fluoride also acts to bring the calcium and phosphate ions together and is included in the chemical reaction that takes place, producing a crystal surface that is much less soluble in acid than the original tooth mineral.<sup>1</sup>

Fluoride from topical sources such as fluoridated drinking water is taken up by cariogenic bacteria when they produce acid. Once inside the cells, fluoride interferes with enzyme activity of the bacteria, leading to a loss of control of intracellular pH. This reduces bacterial acid production, which directly reduces the dissolution rate of tooth mineral.<sup>19</sup>

### Population Served by Water Fluoridation

By the end of 1992, 10,567 public water systems serving 135 million persons in 8573 U.S. communities had instituted water **fluoridation**.<sup>20</sup> Approximately 70% of all U.S. cities with populations of >1 million used fluoridated water. In addition, 3784 public water systems serving 10 million persons in 192 communities had natural fluoride levels  $\geq 0.7$  ppm. In total, 144 million persons in the United States (62% of the population) were receiving fluoridated water in 1992, including 62% of those served by public water systems. However, approximately 42,000 public water systems and 153 U.S. cities with populations  $\geq 50,000$  have not instituted **fluoridation**.

### Cost Effectiveness and Cost Savings of Fluoridation

Water **fluoridation** costs range from a mean of 31 cents per person per year in U.S. communities with populations >50,000 persons to a mean of \$2.12 per person in communities of <10,000 (1988 dollars).<sup>21</sup> Compared with other methods of community-based dental caries prevention, water **fluoridation** is the most cost-effective for most areas of the United States in terms of cost per saved tooth surface.<sup>22</sup>

Water **fluoridation** reduces direct health-care expenditures through primary prevention of dental caries and avoidance of restorative care. Per capita cost savings from 1 year of **fluoridation** may range from negligible amounts among very small communities with very low incidence of caries to \$53 among communities with a high incidence of disease (CDC, unpublished data, 1999). One economic analysis estimated that prevention of dental caries, largely attributed to **fluoridation** and fluoride-containing toothpaste products, saved \$39 billion (1990 dollars) in dental-care expenditures in the United States during 1989.<sup>23</sup>

### Safety of Water Fluoridation

Early investigations into the physiologic effects of fluoride in drinking water predated the first controlled field trials. Since 1950, opponents of water **fluoridation** have claimed it increased the risk for conditions such as Down syndrome, heart disease, osteoporosis and bone fracture, acquired immunodeficiency syndrome, low intelligence, Alzheimer disease, allergic reactions, and other health conditions.<sup>24</sup> The safety and effectiveness of water **fluoridation** have been re-evaluated frequently, and no credible evidence

an association between **fluoridation** and any of these conditions.<sup>25</sup>

## 21st Century Challenges

Despite the substantial decline in the prevalence and severity of dental caries in the United States during the 20th century, this largely preventable disease is still common. National data indicate that 67% of persons aged 12-17 years<sup>26</sup> and 94% of persons aged  $\geq 18$  years<sup>27</sup> have experienced caries in their permanent teeth.

Among the most striking results of water **fluoridation** is the change in public attitudes and expectations regarding dental health. Tooth loss is no longer considered inevitable, and increasingly adults in the United States are retaining most of their teeth for a lifetime.<sup>12</sup> For example, the percentage of persons aged 54 years who had lost all their permanent teeth decreased from 20.0% in 1960-1962<sup>28</sup> to 9.1% in 1994 (CDC, unpublished data, 1999). The oldest post-World War II "baby boomers" will reach age 54 years in the first decade of the 21st century, and more of that birth cohort will have a relatively high level of dentition at that age than any generation in history. Thus, more teeth than ever will be at risk for decay among persons aged  $\geq 60$  years. In the next century, water **fluoridation** will continue to help prevent dental caries among these older persons in the United States.

Most persons in the United States support community water **fluoridation**.<sup>29</sup> Although the proportion of the U.S. population drinking fluoridated water increased fairly quickly from 1945 into the 1970s, the rate of increase has been much lower in recent years. This slowing in the expansion of **fluoridation** is attributable to several factors: (1) the public, some scientists, and policymakers may perceive that dental caries is no longer a public health problem or that **fluoridation** is no longer necessary or effective; (2) the adoption of water **fluoridation** can require political processes that make institution of this public health measure difficult; (3) opponents of water **fluoridation** often make unsubstantiated claims about its health effects in attempts to influence public opinion<sup>24</sup>; and (4) many of the U.S. water systems that are not fluoridated tend to serve small populations, which increases the barriers to **fluoridation**. These barriers present serious challenges to expanding **fluoridation** in the United States in the 21st century. To overcome the challenges facing this preventive measure, public health professionals at the national, state, and local level will need to enhance their promotion of **fluoridation** and commit the necessary resources for equipment, personnel, and training.

### Reported by:

Div of Oral Health, National Center for Chronic Disease Prevention and Health Promotion, CDC.

### H. TRENDLEY DEAN, DDS

In 1931, dental surgeon and epidemiologist H. Trendley Dean (August 25, 1893-May 13, 1962) was sent to study the harm that too much fluoride could do; however, his work demonstrated the good that a little fluoride could do.

Henry Trendley Dean grew up in East St. Louis, and received his D.D.S. from the St. Louis University School of Dentistry in 1916. After 1 year in private practice, Dean joined the Army, serving in

number of military camps stateside before going to France. In 1919, Captain Dean returned to practice, but 2 years later joined the Public Health Service as acting assistant dental surgeon. In the next 10 years he served in Marine hospitals around the country, studied for a year at Boston University, and developed a reputation as both a skilled dental surgeon and researcher. In 1931 he became the first dental scientist at the National Institute of Health, advancing to director of the research section in 1945. After World War II, he directed epidemiologic studies for the Army in Germany. When Congress established the National Institute of Dental Research (NIDR) in 1948, he was appointed its director, a position he held until retiring in 1953.

The National Institute of Health (NIH) had hired Dean in 1931 to conduct a major study of mottled enamel. The team that Dean assembled reflected an interdisciplinary approach. The study required accurate assays of fluoride in water, so he enlisted Dr. Elias Elvove, senior chemist at NIH, who developed a technique for measuring the presence of fluoride in water to an accuracy of 0.1 ppm. He also hired experts in animal dentistry, dental pathology, and water chemistry. As accurate data on the incidence of fluorosis emerged, the apparent correlation between mottled teeth and lower caries rates grew more compelling. As early as 1932, Dean observed that individuals in an area where mottled teeth was endemic demonstrated "a lower incidence of caries than individuals in some nearby non-endemic area." By 1938, determining the prophylactic properties of fluoride became the study's primary focus.

Dean's legacy comes almost entirely from his association with the introduction of **fluoridation** of public water. Fluoride constituted only a small part of his professional activities. He also studied the effects of lead poisoning on alveolar bone; developed a program to study the prevention and cure of Vincent's disease (trench mouth); and undertook various studies of the causes, prevention, and cure of dental caries. More important, he played a major role in shaping federal participation in basic dental science at the NIDR, integrating investigations of dental health into mainstream medical research. As he said in a national radio address in 1950: "We can't divorce the mouth from the rest of the body."

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The 2000 and 2010 national health goals include objectives (13.9 and 21.9, respectively)<sup>7-8</sup> to increase the percentage of the U.S. population served by community water systems that receive water with optimal levels of fluoride (0.7-1.2 ppm depending on the average maximum daily air temperature of the area). The U.S. Environmental Protection Agency (EPA) does not regulate the addition of fluoride to water, and the National Drinking Water Information System (SDWIS) actively tracks fluoride concentrations only in water with naturally occurring fluoride levels above the established regulatory limits ( $\geq 2.0$  ppm).

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