

# Opinions & Politics vs Fluoride Science

A closer look at recent research and legal decisions related to community water fluoridation





# **An overview of community water fluoridation**

# Fluoride: A naturally occurring mineral



- 13th most abundant mineral in the earth's crust
- **Surface water** (rivers)—typically low concentrations, 0.2 mg/L (ppm) or less
- **Groundwater** (wells)—higher concentrations, 0.1 mg/L to over 15 mg/L
- **Ocean** is typically 0.8 to 1.4 mg/L

# A fluoride timeline

1874

A German doctor conducts an animal test and finds that fluoride protects tooth enamel.

1901

Dr. Frederick McKay, a dentist, moves to Colorado and learns of a city where many people's teeth have "brown spots" but cavities are rare.

1945

Studies begin to learn whether fluoride cuts the cavity rate. Cavities fall dramatically.

1956

Crest starts selling fluoride toothpaste to the consumer market.

1995

The U.S. Surgeon General calls fluoridation "the cornerstone" of dental prevention.

1999

CDC names fluoridation one of 10 great public health achievements.

# For more on the history

## Timeline for Community Water Fluoridation:



1901

Dentists in the United States and Italy separately observe lower rates of dental decay in populations with distinctively stained teeth. Dr. Frederick S. McKay of Colorado Springs, Colorado, notes that many residents have what locals call "Colorado brown stain" and devotes his career to



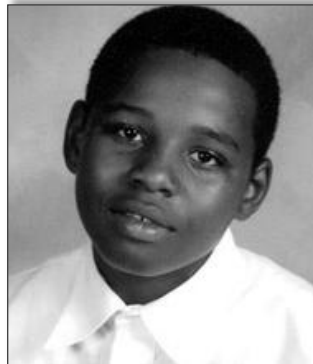
Colorado Brown Stain



# Why Oral Health Matters

Dental cavities are the **most common chronic disease** for adults and children. It's significantly more common than *asthma, obesity, and diabetes*. **Infectious and Transmissible**

- Severe pain (toothaches)
- Difficulty in chewing
- Poor weight gain
- Difficulty concentrating
- Predictor of cavities later in life
- Costly to treat
- Deaths



# Cavities are unevenly distributed



- Cavities affect everyone, regardless of age, SES, race, ethnicity, level of education, or access to dental care.
- Low-income kids are more than **twice** as likely to experience cavities.
- Over 78,000 North Dakotans live in poverty.

# How fluoride works



## Systemically – Fluoridated water

- Fluoride helps strengthen the developing permanent teeth before they come through the gums.



## Topically – Fluoridated water, toothpaste, mouth rinse, and varnish

- Continuous exposure to small amounts of fluoride helps *both* adults and children by remineralizing the tooth enamel.

(Source: Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries, MMWR, October 22, 1999, 48:41; as this scientific article notes, "Fluoride from topical sources such as fluoridated drinking water is taken up by cariogenic bacteria when they produce acid.")



# Both forms of fluoride are needed

**“If I’m using fluoride toothpaste, do I still need to drink fluoridated water?”**



Centers for Disease Control and Prevention  
CDC 24/7: Saving Lives, Protecting People™

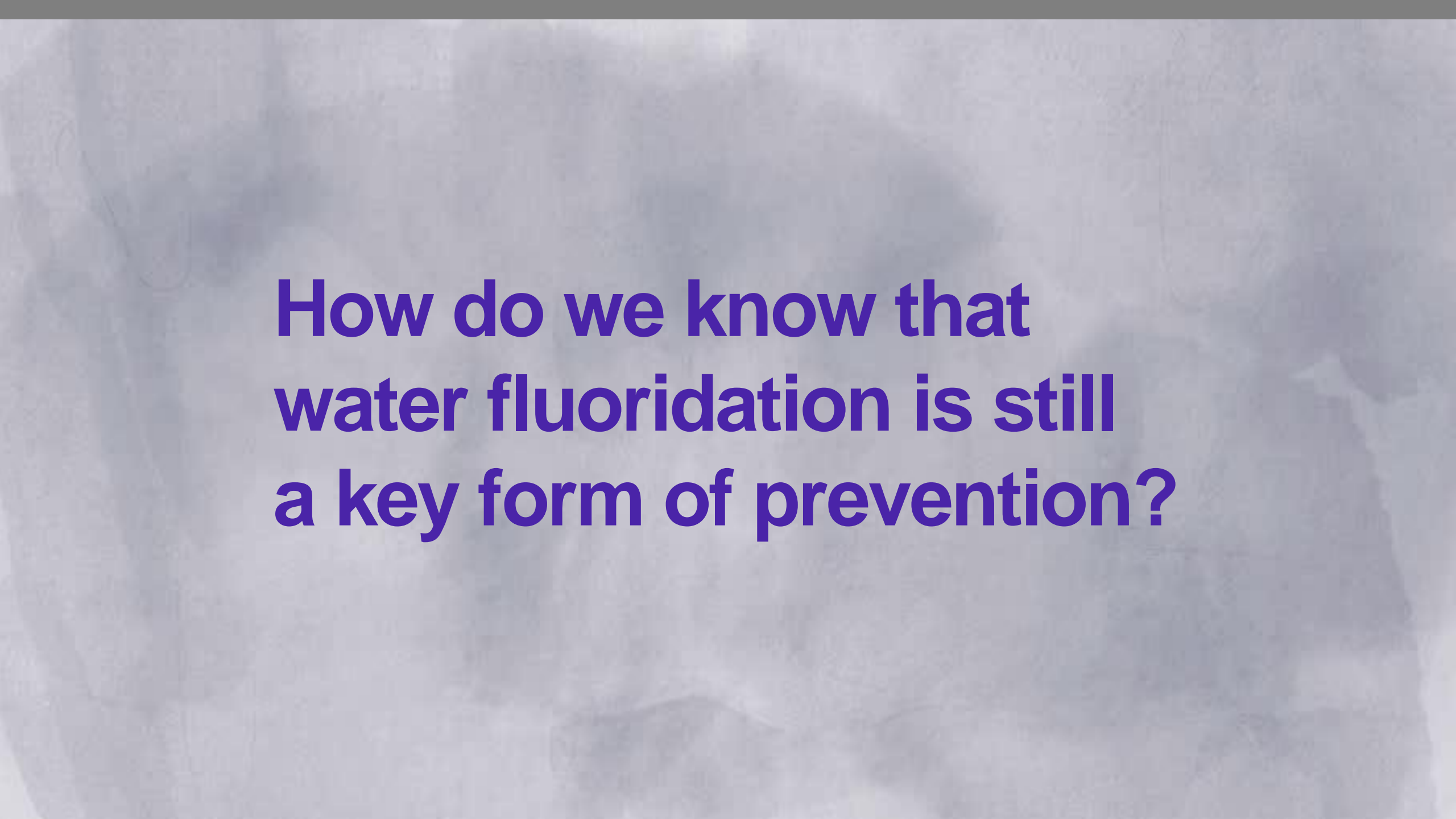
Both drinking water and toothpaste with fluoride provide important and complementary benefits. Fluoridated water keeps a low level of fluoride in saliva and dental plaque all day. The much higher concentration of fluoride in toothpaste offers additional benefit. Fluoride slows the activity of bacteria that cause decay and combines with enamel on the tooth surface to make it stronger and better able to resist decay. Together, the two sources offer more protection than using either one alone.

# Research shows the need for fluoridation

## The conclusion of Australian researchers:

“Opponents of water fluoridation claim that the benefits of fluoride are due to its post-eruptive (topical) action on teeth so that alternative fluoride vehicles can provide benefit without fluoride being ingested.”

But our findings “indicated the importance of a pre-eruptive exposure to fluoridated water **without which there was no significant prevention of [tooth decay].**”



**How do we know that  
water fluoridation is still  
a key form of prevention?**

# Hidden costs: Older adults' quality of life

- Receding gums are common in older adults — exposing the roots of their teeth and raising the risk of “root cavities”.
- Many prescription drugs can cause **dry mouth**, which raises the risk of cavities.
- Fluoridation is proven to help reduce cavities in adults, enabling them to eat nutritious foods to stay healthy, speak properly, and enhance their quality of life.



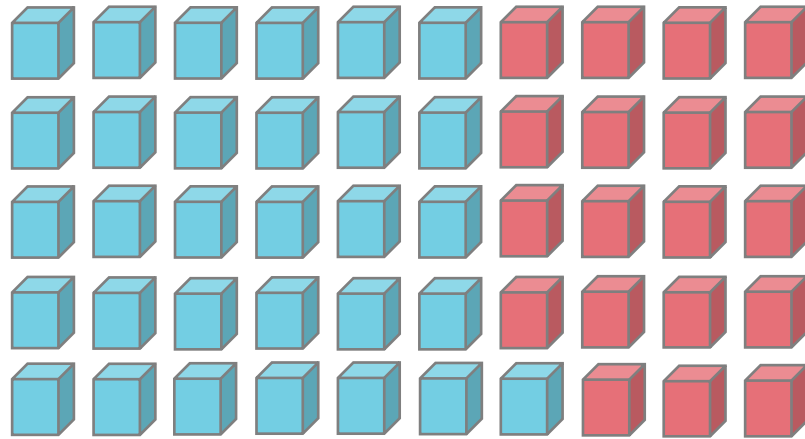
(Sources: Medline Plus, “Aging changes in teeth and gums,” National Library of Medicine, Feb. 8, 2021; S.O. Griffin, et al. “Effectiveness of fluoride in preventing caries in adults,” Journal of Dental Research, 2007, 86:5, pp. 410-415.)



# The impact of fluoride in water and toothpaste

Over a 50-year period, a major drop in the share of U.S. adults who had lost all of their teeth (edentulous):

**38% of adults** (aged 55-64) were edentulous during 1957-1958



Lost all of their teeth

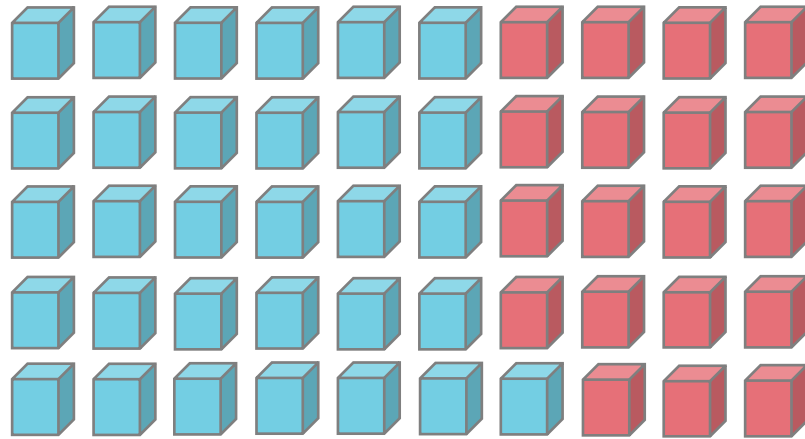


Retained some or all of their teeth

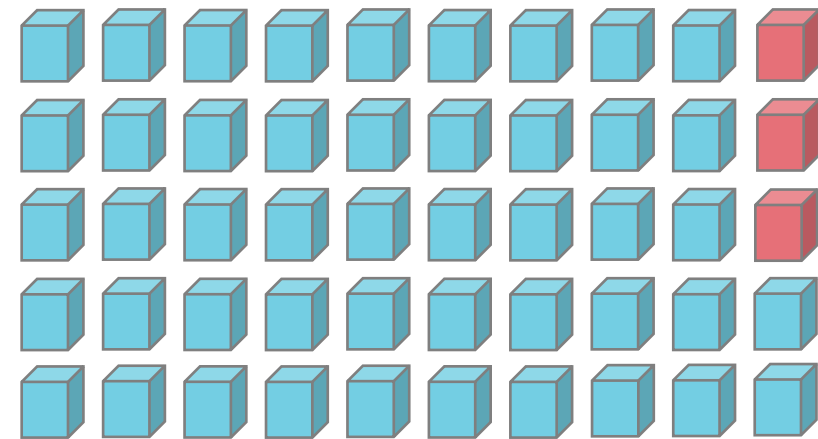
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**38% of adults** (aged 55-64) were edentulous during 1957-1958



**Only 6% of adults** (aged 55-64) were edentulous during 2009-2012



Lost all of their teeth



Retained some or all of their teeth

# A study demonstrates fluoridation's impact

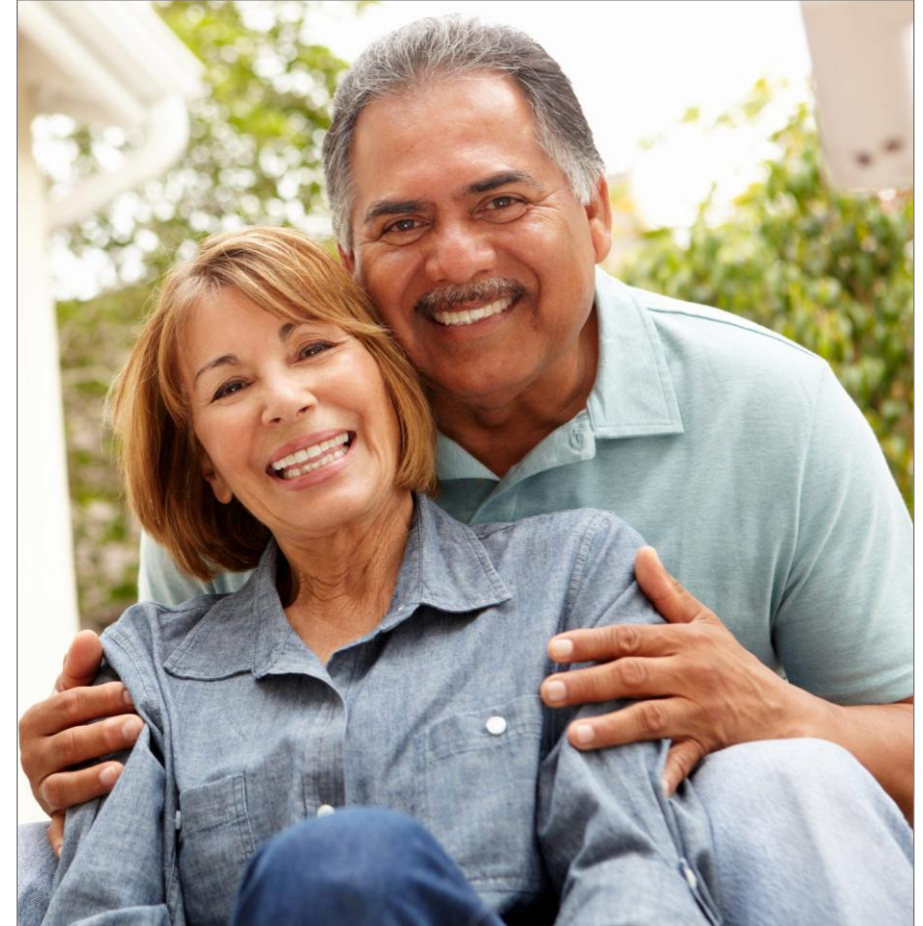
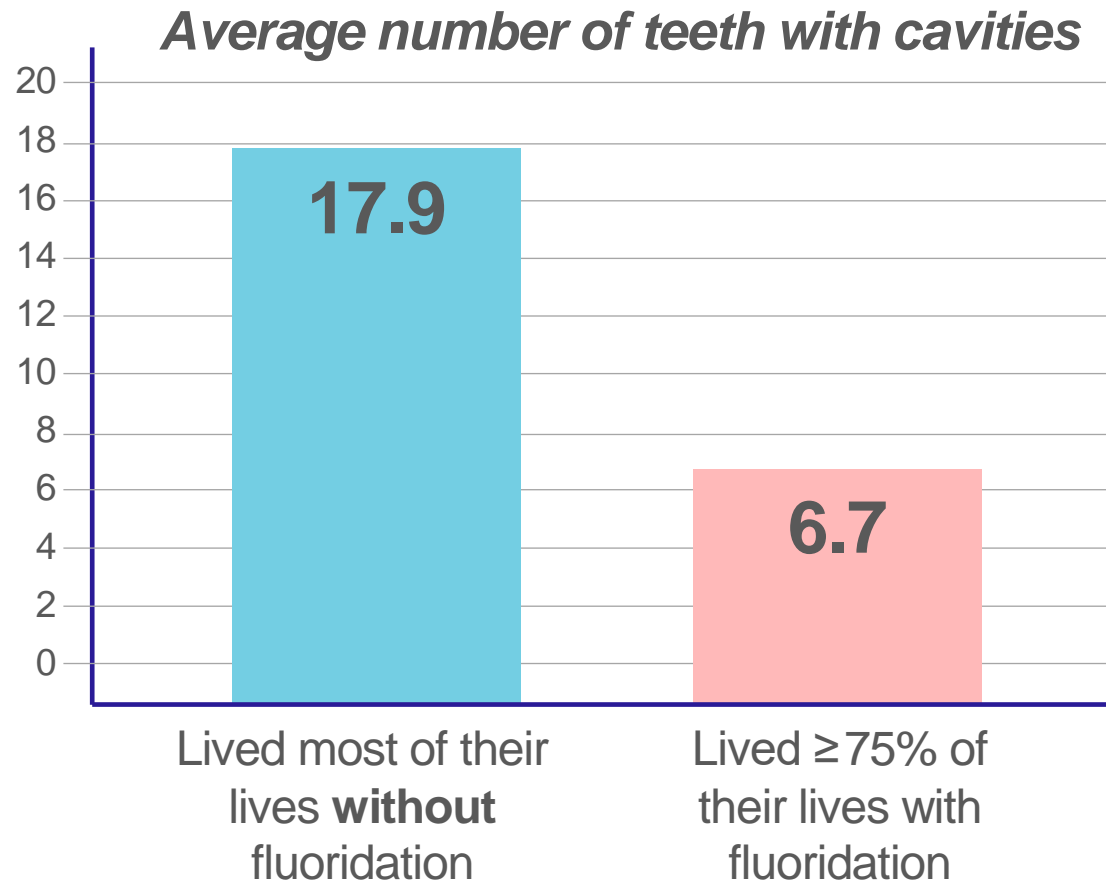


## Study of U.S. children (2018)

- Consider a classroom of 30 children in a fluoridated city.
- On average, these children would have **39 fewer tooth surfaces with cavities** in their primary teeth than the same number of students in a non-fluoridated city.

# Adults also benefit from fluoridation

## A study of adults in Brazil (2016)



(Source: M.A. Peres, P.R. Barbato, et al. "Access to fluoridated water and adult dental caries: A natural experiment. *Journal of Dental Research*, July 2016, 95:8, pp. 868-874.)



**What did a federal judge  
decide in a lawsuit about  
the safety of fluoride?**

# The court decision in the EPA lawsuit

**Who brought the lawsuit?** Groups opposed to water fluoridation filed this lawsuit in federal court against the Environmental Protection Agency.

**What did the court decide?** The federal judge in California wrote that fluoridated water had “an unreasonable risk,” but the judge said he did *not* conclude with certainty that fluoridated water is harmful.



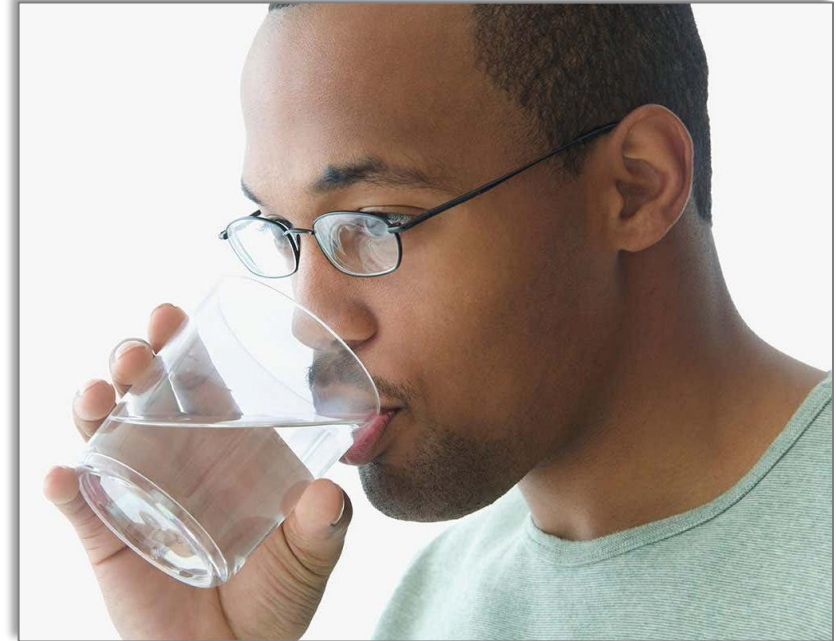
# Key points about the EPA decision

- NTP asked the **National Academies of Sciences** to conduct peer review of its fluoride report.
- The National Academies said the report did not provide “a clear and convincing argument to support its assessment” about fluoride.
- In addition, the National Academies wrote this:

The NTP report “cannot be used to draw conclusions regarding low fluoride exposure concentrations (less than 1.5 mg/L), including those typically associated with drinking water fluoridation.”

# Key points about the EPA decision

- The California judge cited a recent National Toxicology Program (NTP) report **over 120 times**, making it a key basis for its decision.
- Yet the judge ignored a key point:
  - NTP said its report was not an evaluation of fluoridated water.



**“This Monograph and Addendum do not address whether the sole exposure to fluoride added to drinking water in some countries (i.e., fluoridation, at 0.7 mg/L in the United States and Canada) is associated with a measurable effect on IQ.**



# Key points about the EPA decision

The NTP report is not based on high-quality research.

- **More than half of the studies** that NTP analyzed were published in low-quality journals that are not indexed by the National Library of Medicine.
- Many of the studies in NTP's report used *spot urine samples* — a **flawed method** to measure fluoride exposure. For this reason, the results are unreliable.
- The NTP said it had only “**moderate confidence**” in its findings about higher levels of fluoride.



# Leading health experts support fluoridation

- The California judge did not instruct the EPA to ban fluoridation.
- After reading the judge's decision, several medical, dental, and scientific organizations have reaffirmed their view that fluoridated water is safe. These organizations include:
  - ✓ *American Water Works Association*
  - ✓ *American Academy of Pediatrics*
  - ✓ *American Dental Association*
  - ✓ *American Association for Dental, Oral and Craniofacial Research*

**NO COUNTRY IN THE WORLD HAS STOPPED FLUORIDATION  
over court case, NTP, "recent IQ studies, or Cochrane review.**

# The NTP meta-analysis is being misinterpreted

January 6, 2025

## Fluoride Exposure and Children's IQ Scores

### A Systematic Review and Meta-Analysis

Kyla W. Taylor, PhD<sup>1</sup>; Sorina E. Eftim, PhD<sup>2</sup>; Christopher A. Sibrizzi, MPH<sup>2</sup>; [et al](#)

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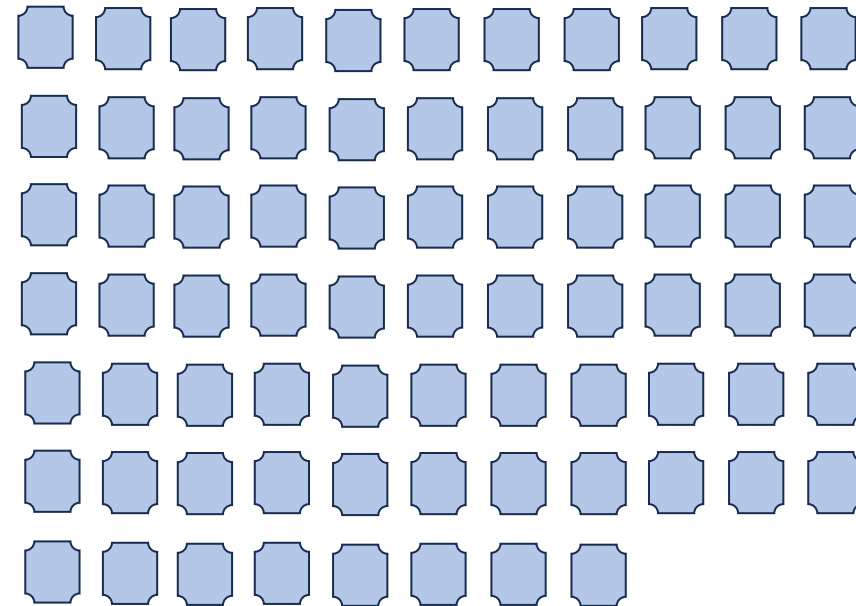
*JAMA Pediatr.* Published online January 6, 2025. doi:10.1001/jamapediatrics.2024.5542

### Key Points

**Question** Is fluoride exposure associated with children's IQ scores?

**Findings** Despite differences in exposure and outcome measures and risk of bias across studies, and when using group-level and individual-level exposure estimates, this systematic review and meta-analysis of 74 cross-sectional and prospective cohort studies found significant inverse associations between fluoride exposure and children's IQ scores. For fluoride measured in water, associations remained inverse when exposed groups were restricted to less than 4 mg/L or less than 2 mg/L but not when restricted to less than 1.5 mg/L; for fluoride measured in urine, associations remained inverse at less than 4 mg/L, less than 2 mg/L, and less than 1.5 mg/L; and among the subset of low risk-of-bias studies, there were inverse associations when exposed groups were restricted to less than 4 mg/L, less than 2 mg/L, and less than 1.5 mg/L for analyses of fluoride measured both in water and in urine.

This meta-analysis by the National Toxicology Program was based on 74 studies.



# 70% of the NTP studies had serious flaws

January 6, 2025

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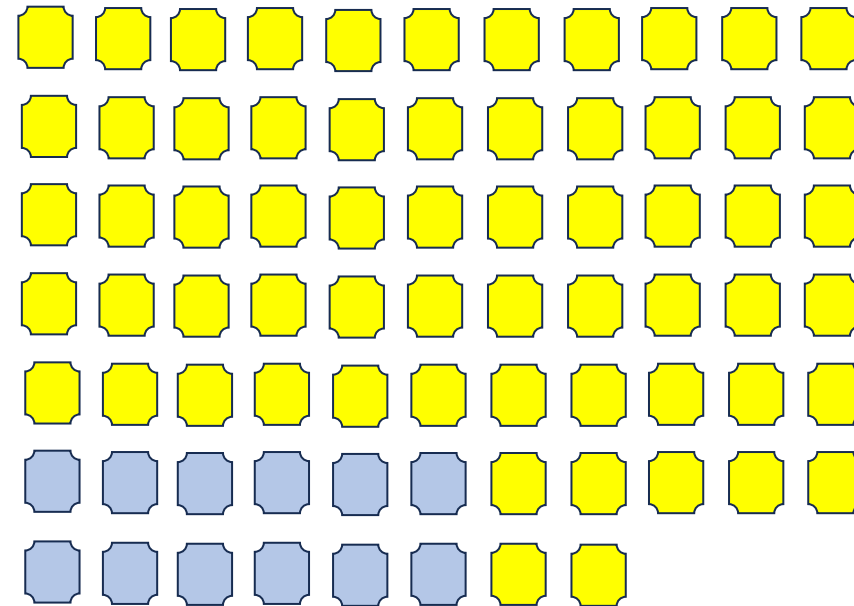
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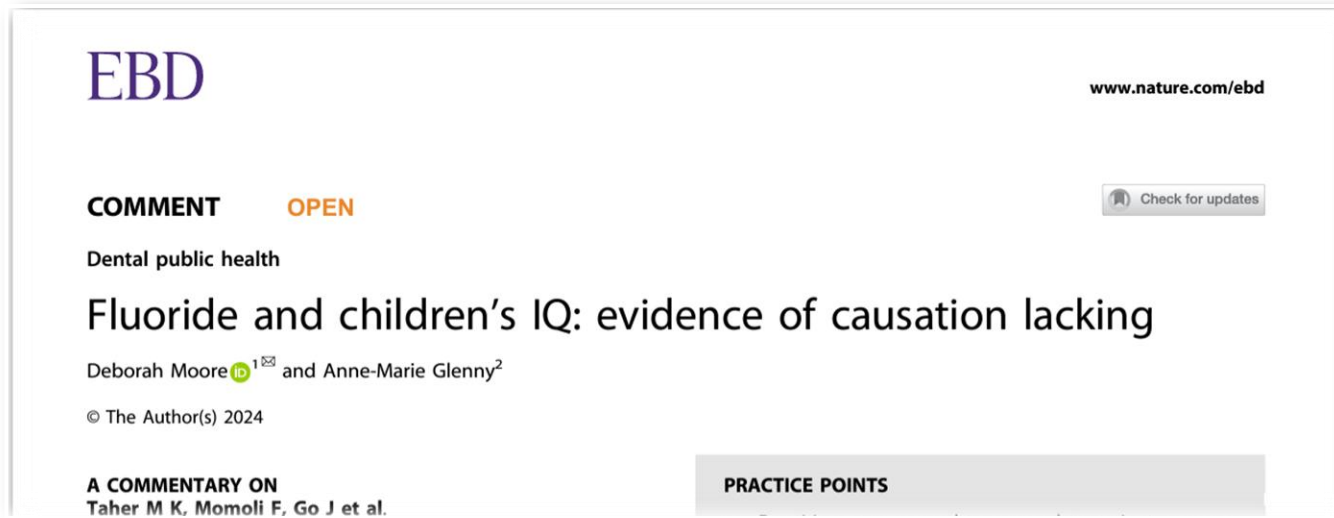
**PROBLEM:** 52 of the 74 studies (70%) were judged by the report authors to have a “**high risk of bias.**”





# Commentary on Taher et al./NTP review studies (2024)

- Main area of concern – risk of bias assessment and its application
- “Human evidence of Taher review overlaps with the draft of NTP review and neurological and health effects of fluoride in water, including recent Irish gov review and Canadian gov review”

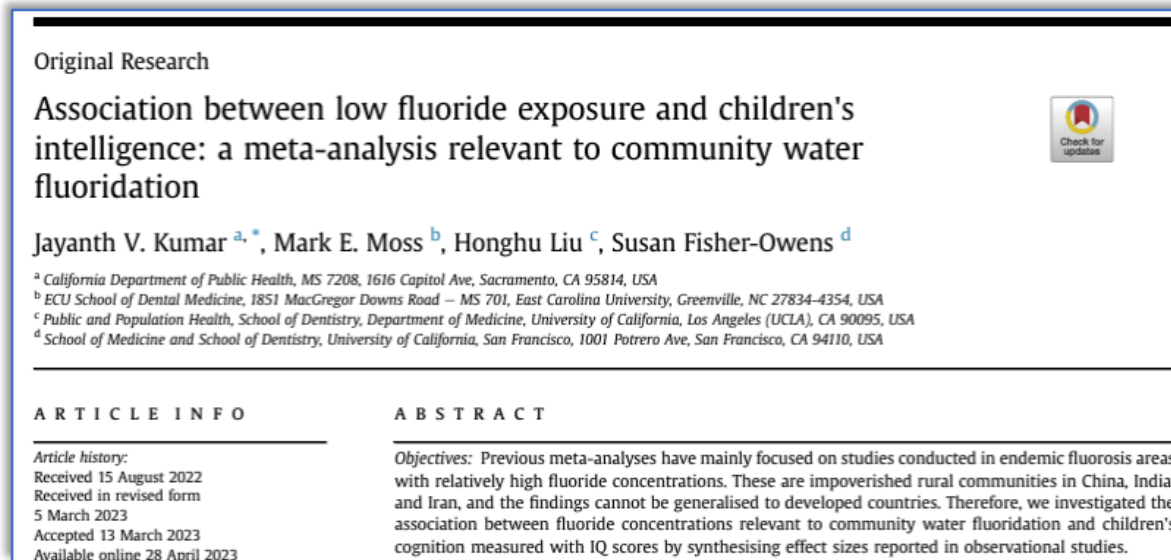


- Taher/NTP assessed studies as “*high quality/low risk of bias*”:
  - Till et al. (2020)
- Irish and Canadian reviews assessed studies as “**Low quality/high risk of bias**”
- **MIREC – not designed to evaluate fluoride (i.e. Till et al.)**

(Sources Moore, D and Glenny, A-M), “Fluoride and children’s IQ: Evidence of causation lacking”, Evidence-Based Dentistry (2024), 25:95-97, a Comment on Taher et al., Systematic review of epidemiological and toxicological evidence on health effects of fluoride in drinking water, 2024)

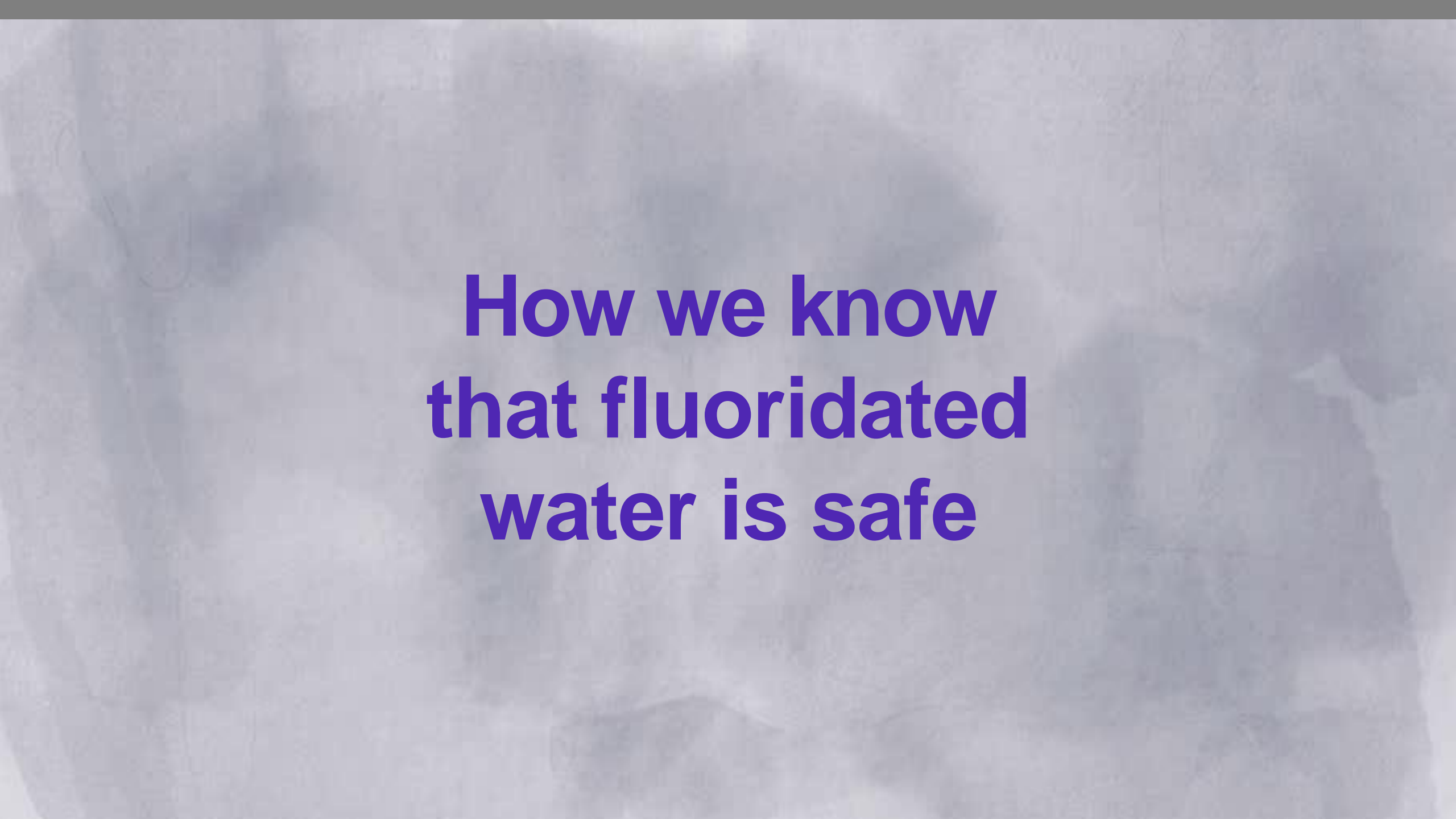
# Important meta-analysis of IQ studies (2023)

- A recent, high-quality meta-analysis that separately looked at fluoride and IQ scores.
- This meta-analysis compared IQ scores for children whose drinking water had less than 1.5 ppm of fluoride with those whose water had more than 1.5 ppm of fluoride.



- The authors found **no evidence** of a fluoride-IQ association below the level of 1.5 ppm. Fluoridated water is at 0.7 ppm.

(Sources: Kumar et al., Association between low fluoride exposure and children's intelligence: a meta-analysis relevant to community water fluoridation, Public Health, 2023)



**How we know  
that fluoridated  
water is safe**

# Several high-quality studies show no fluoride-IQ link

Peer-reviewed high-quality studies	Showed a link between fluoridation and IQ?	
Australia studies	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Spain study	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
Sweden study	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
New Zealand study	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>

(Sources: Do, L.D., et al. Early Childhood Exposures to Fluorides and Cognitive Neurodevelopment: A Population-Based Longitudinal Study, Journal of Dental Research, 2024, accepted for publication; Do, L.G., et al. Early Childhood Exposures to Fluorides and Child Behavioral Development and Executive Function: A Population-Based Longitudinal Study, Journal of Dental Research, 2022; Ibarluzea, J., et al. Prenatal exposure to fluoride and neuropsychological development in early childhood: 1-to 4 years old children, Environmental Research, 2021; Aggeborn, J., et al., The Effects of Fluoride in Drinking Water, Journal of Political Economy, 2021; Broadbent, J.M., Community Water Fluoridation and Intelligence: Prospective Study in New Zealand, American Journal of Public Health, 2015; the Swedish study used labor/workforce success as a proxy for intellectual performance.)

# Scientific panels have confirmed fluoride's safety

Intensive reviews have concluded that the levels of fluoride commonly found in Western countries are safe:

- ✓ Health Research Board (Ireland, [2022](#))
- ✓ Public Health England ([2018](#) / [2022](#))
- ✓ Food Safety Authority of Ireland ([2018](#))
- ✓ National Health & Medical Research Council of Australia ([2017](#))
- ✓ U.S. Public Health Service ([2015](#))
- ✓ Royal Society of New Zealand ([2014](#), [2021](#), [2024](#))
- ✓ CADTH (Canadian Agency for Drugs, Technology, and Health), ([2019](#), [2020](#))



Public Health  
England

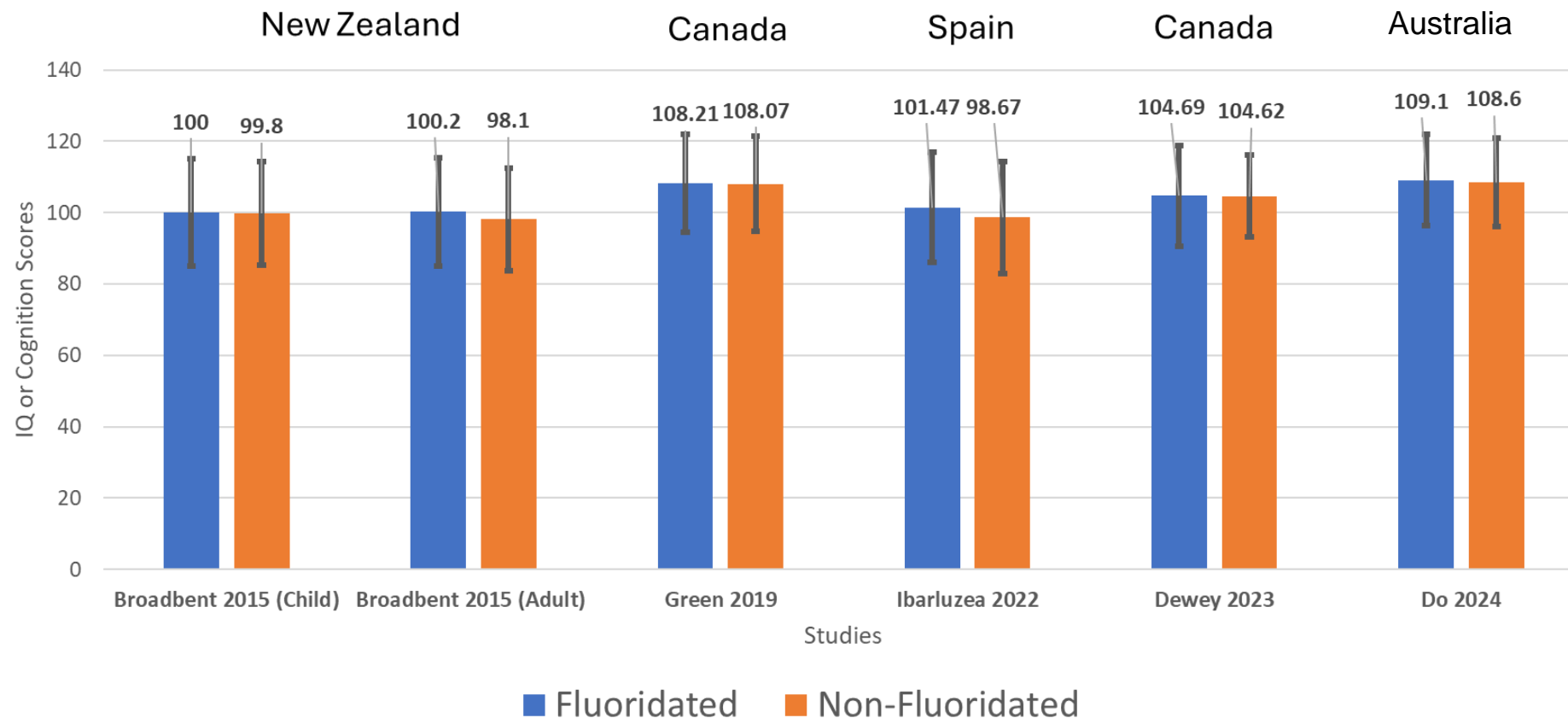


(Sources: Public Health England produced fluoridation monitoring reports in both of the years indicated; Food Safety Authority of Ireland, report issued 2018; National Health and Medical Research Council of Australia, policy statement issued 2017; U.S. Public Health Service report was published by Public Health Reports in 2015; Royal Society of New Zealand, conclusions released 2014, 2021, 2024; Health Research Board. Impact of community water fluoridation on systemic health excluding oral health: An evidence review, November 2022; Canadian Agency for Drugs, Technology and Health, 2019, 2020)



# Summary of IQ/Cognition scores of fluoride studies

## Mean IQ or Cognition Scores (unadjusted) by Fluoridation Status



**Note:** The Canadian study was the study published in the Journal of American Medical Association Pediatrics ([2019](#)). The overall IQ score was the “Main outcomes and measures” stated. **No differences were noted between fluoridated and non-fluoridated communities.**



# Not all research is high-quality research

**All studies are not equally credible.**

This is especially true for studies about fluoride.



## **Retraction Note: Fluoride exposure and intelligence in school-age children: evidence from different windows of exposure susceptibility**

[Kaihong Xu](#), [Ning An](#), [Hui Huang](#), [Leizhen Duan](#), [Jun Ma](#), [Jizhe Ding](#), [Tongkun He](#), [Jingyuan Zhu](#), [Zhiyuan Li](#), [Xuemin Cheng](#), [Guoyu Zhou](#)  & [Yue Ba](#) 

[BMC Public Health](#) **22**, Article number: 2044 (2022) | [Cite this article](#)

**3697** Accesses | **3** Citations | **335** Altmetric | [Metrics](#)

# It takes time to assess scientific quality

- The Lancet journal published the Andrew Wakefield vaccine study in 1998. **It took 12 years** before the evidence was gathered to retract that study.
- Before the study was retracted, many parents were needlessly frightened about vaccines.

TIME

## The Vaccine-Autism Myth Started 20 Years Ago. Here's Why It Still Endures Today

**A**nti-vaccination headlines—like “HPV vaccine leaves another 17-year-old-girl paralyzed”—populate the Internet. That, and “Mom researches vaccines, discovers vaccination horrors, goes vaccine free,” are just a few examples of the fake science news stories shared this month on Facebook.

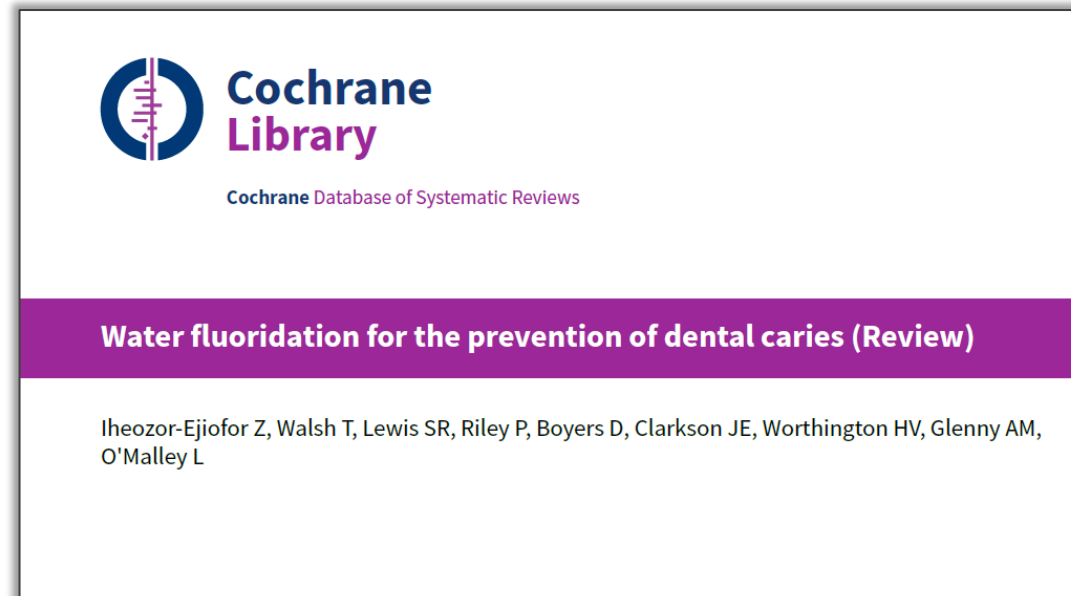
If you are a parent on social media, you’ve likely seen many posts just like these. Maybe you’ve even clicked on one, curious. What’s the harm, right? As a family physician with four decades of experience fighting preventable disease around the globe and a professor of anthropology, risk and decision science studying global vaccine confidence, we’ve seen the deadly harm that fraudulent

**What did the Cochrane  
review say about the  
benefits of fluoride?**

# The Cochrane review on fluoridation's benefits

**Who is Cochrane?** The British-based Cochrane Collaboration reviews the evidence for various oral health practices and then issues its reports.

**What did it report?** Cochrane reviewed the evidence about the benefits of water fluoridation and found that it reduces tooth decay “but with smaller effect sizes” than were shown in pre-1975 studies.





# The Cochrane review is no reason to stop

A co-author of the Cochrane review told NBC News that:

***“contemporary studies are showing that water fluoridation is beneficial.”***

(Source: Edwards, Erika, “Benefits to adding fluoride to water may be waning,” NBC News, Oct. 3, 2024.)



## ***Benefits to adding fluoride to water may be waning***

The widespread use of toothpaste and mouthwashes with added fluoride in recent decades appears to have diminished the known public health benefits of water fluoridation, a new study suggests.

But it would be a mistake for municipalities to interpret the findings as a reason to pull back on adding the cavity-fighting mineral to their water systems, researchers said.

“There’s no evidence to suggest that where water fluoridation programs are in place, that they should necessarily be stopped,” said Anne-Marie Glenney, a co-author of the study and a professor of

# The Cochrane review is no reason to stop

Researchers agree that the Cochrane review is **not** a good reason to stop fluoridation.



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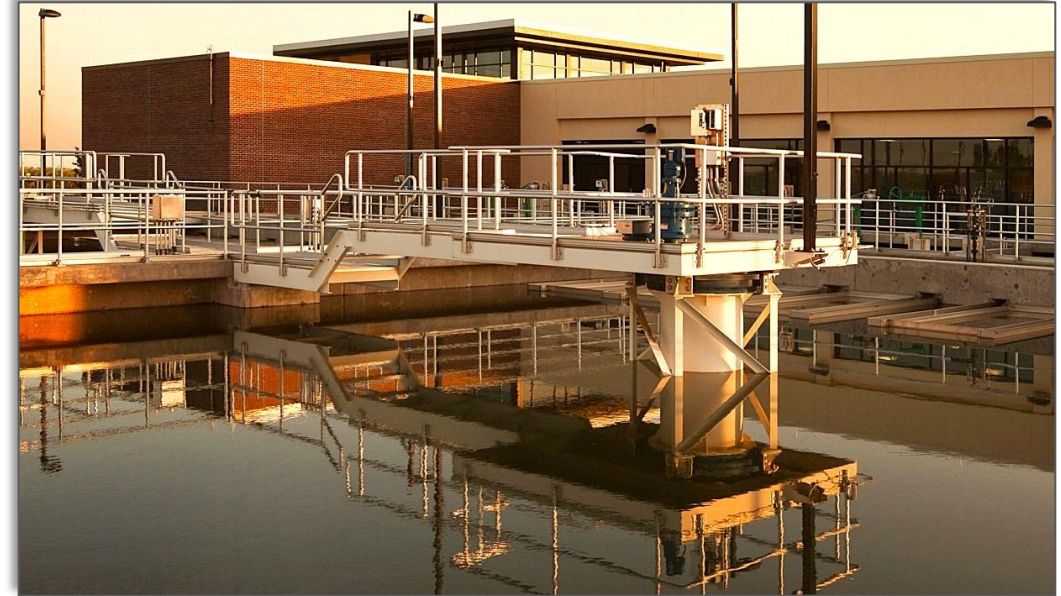
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# Key facts about the Cochrane review

## One new study that Cochrane included in its review: CATFISH

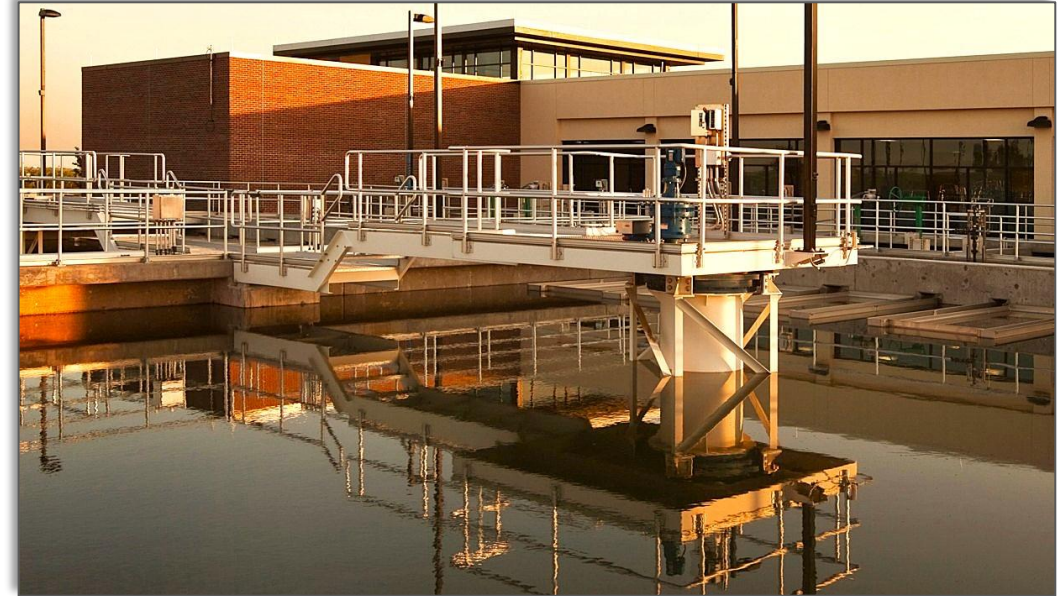
- Equipment problems caused a one-year interruption to fluoridation for **more than half** of the children living in the fluoridated area.
- The children in the fluoridated area were more likely to come from households at the highest poverty level. In other words, the fluoridated children began the study at a **higher risk of decay** than those in the non-fluoridated area.



# Key facts about the Cochrane review

## One new study that Cochrane included in its review: CATFISH

- Equipment problems caused a one-year interruption to fluoridation for **more than half** of the children living in the fluoridated area.
- **However**, “... dental decay experience was 29% lower for young children drinking fluoridated water.”
- Despite serious issues with the CATFISH study, *the cavities prevented mirrored contemporary studies.*





**What health impacts  
occur when fluoridation  
ends?**



# Alaska: Two cities were once fluoridated

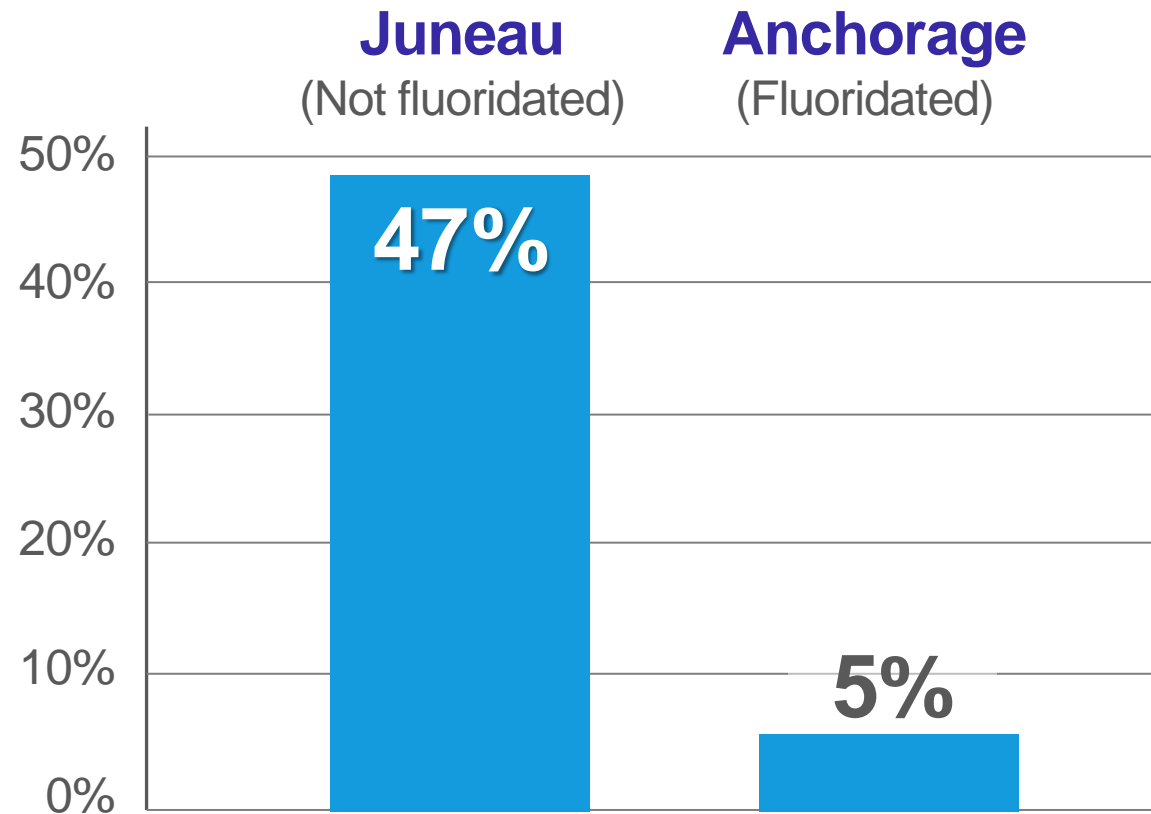
- When both cities were fluoridated, **Juneau** (\$344) and **Anchorage** (\$369) had similar average costs for treating cavities in **low-income children**.
- In 2007, Juneau officials ended water fluoridation. But the city of Anchorage continued fluoridation and still does so.
- Researchers studied what effect this might have had on children's dental health.



(Source: J. Meyer et al., "The Impact of Water Fluoridation on Medicaid-Eligible Children and Adolescents in Alaska," Journal of Primary Prevention, 2022; the costs provided on this slide are for 2003, a year when both cities engaged in water fluoridation.)

# Alaska: Dental costs soared in Juneau

9 years after Juneau ended fluoridation, look at changes in the **average per-child cost for cavity treatments**:



(Source: J. Meyer et al., "The Impact of Water Fluoridation on Medicaid-Eligible Children and Adolescents in Alaska," *Journal of Primary Prevention*, 2022; for this bar graph, the average Medicaid costs were rounded up or down to the nearest whole number.)

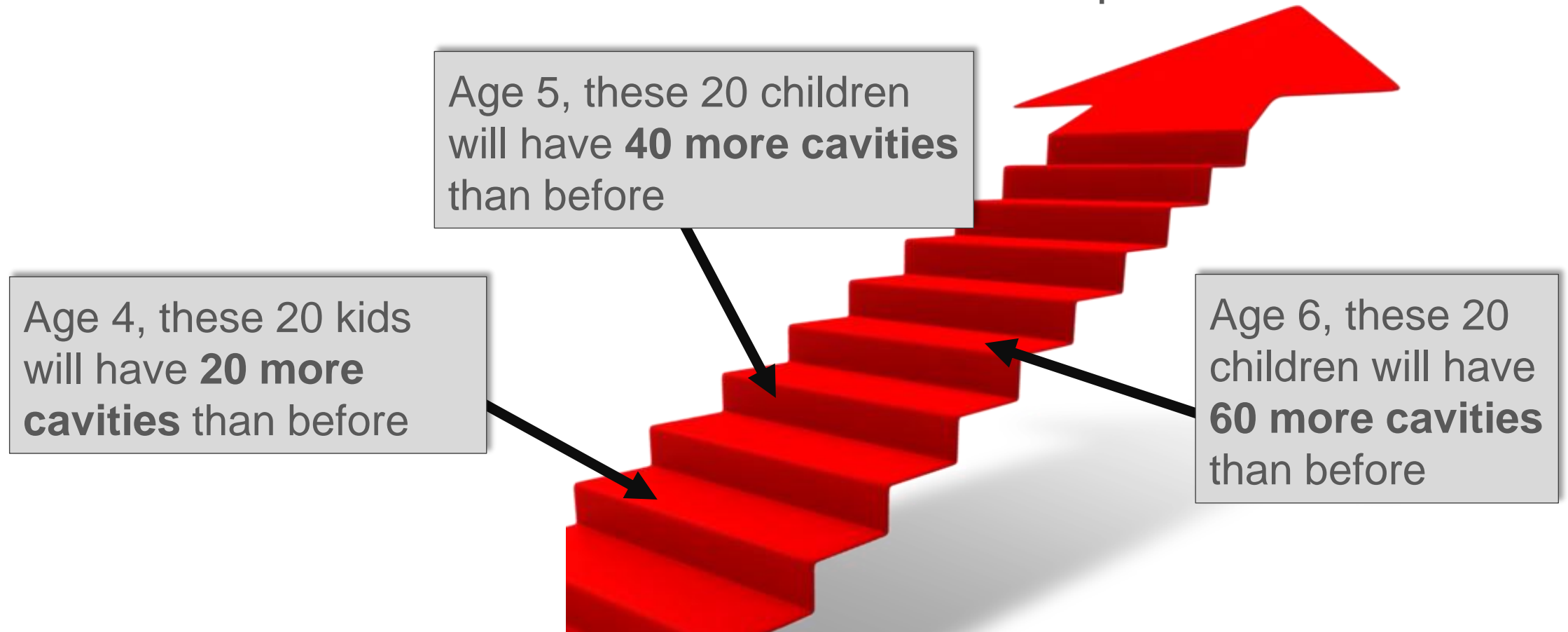
# Alaska: Preschoolers bore the brunt

- Preschool-age children (under age 6) in Juneau were especially hard hit by tooth decay.
- After fluoridation ended in **Juneau**, preschoolers needed an average of 1 additional cavity-related procedure *each year*.
- Meanwhile, in **Anchorage**, the average number of cavity procedures for preschool-age kids was unchanged.



# What the Alaska study shows

Imagine **20 children** who are in the same Head Start classroom when water fluoridation stops:



(Source: J. Meyer et al., "Consequences of community water fluoridation cessation for Medicaid-eligible children and adolescents in Juneau, Alaska," BMC Oral Health, 2018, 18:215.)

# What happens when fluoridation ends

In Canada, the city of **Windsor** voted to resume fluoridation after their public health unit released data showing a **51% increase** in cavities and emergency dental needs.



*(Source: "Oral Health 2018 Report," Executive Summary of a report by the Windsor-Essex County Health Unit, 2018.)*



# What happens when fluoridation ends – It Can Be Restarted!

Fluoride returns to Windsor, Tecumseh, LaSalle drinking water.

**“For the first time since 2013, there's fluoride in local drinking water again”**

1-11-2022

**Council votes 8-3 to resume fluoridating water**  
12-17-2019



(Sources: *Healthing*, accessed 2-13-2022 <https://bit.ly/3GZzmA1> *Windsor Star*, accessed 2-13-2022 <https://bit.ly/3l38kZT> )



# Israel: Fluoridation had a positive impact

- Israel passed a fluoridation law in 2002. But the law was discontinued in 2014.
- In place of fluoridation, Israel provided all children with free dental care.
- A 2023 study examined the impact of both approaches:

**Was it shown to reduce cavity treatment costs?**

*Water  
fluoridation:*  
**YES**

*Free dental  
services:*  
**NO**

(Source: Levy DH, et al. Association of Nationwide Water Fluoridation, changes in dental care legislation, and caries-related treatment needs: A 9-year record-based cross-sectional study, Journal of Dentistry, 2023; 134:104550.)

# Israel: Fluoridation had a positive impact

- Giving free dental care is suggested by opponents of fluoridation
- This data clearly demonstrates that free dental care does not replace prevention
- There is no substitute for water fluoridation

**Was it shown to reduce cavity treatment costs?**

*Water  
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**YES**

*Free dental  
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**NO**

(Source: Levy DH, et al. Association of Nationwide Water Fluoridation, changes in dental care legislation, and caries-related treatment needs: A 9-year record-based cross-sectional study, *Journal of Dentistry*, 2023; 134:104550.)

# Israel: In the process to resume fluoridation

Health Minister Yael German canceled fluoridation (2014)

New Health Minister Ya'acov Litzman (2017) promises to restore it

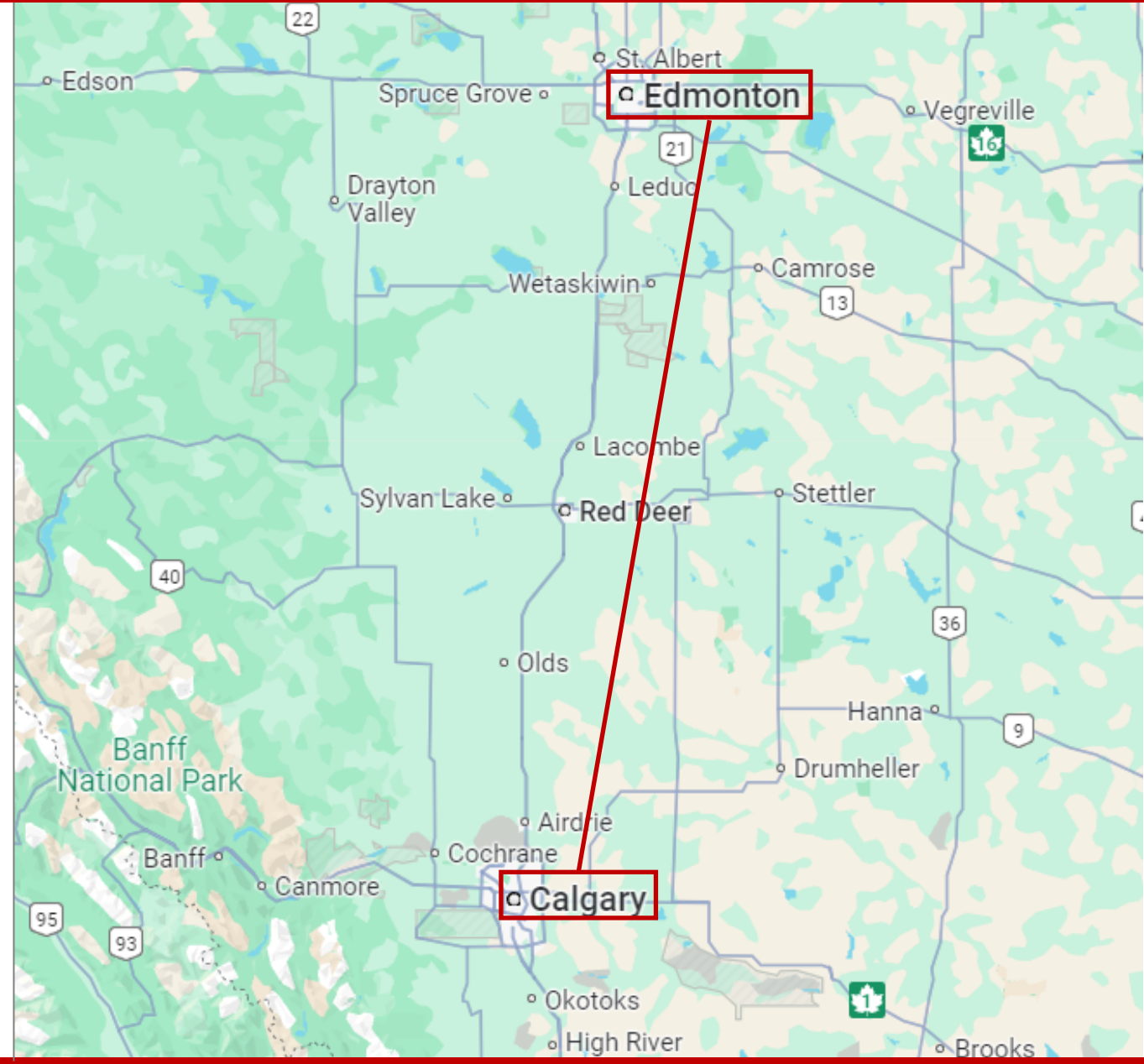
***It has not been banned as opponents have stated***



(Source: The Jerusalem Post, [August 22, 2017](#).)

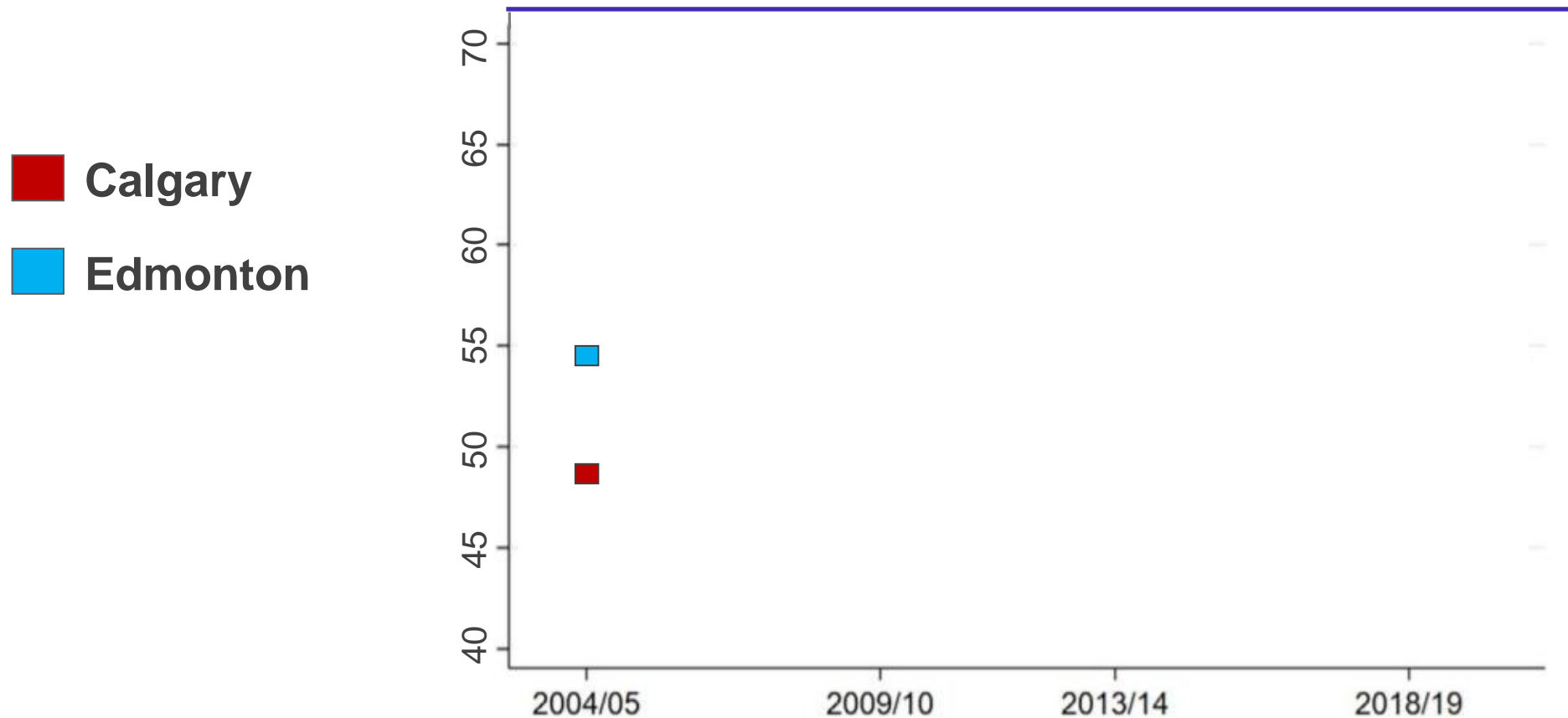
# Study on cavities and hospital treatment in two cities

- **Calgary**, one of the largest cities in Canada, ceased water fluoridation in 2011.
- But **Edmonton**, a major city to the north, has remained fluoridated for decades (and remained so while Calgary stopped).



# Canada: Comparing decay trends in two cities

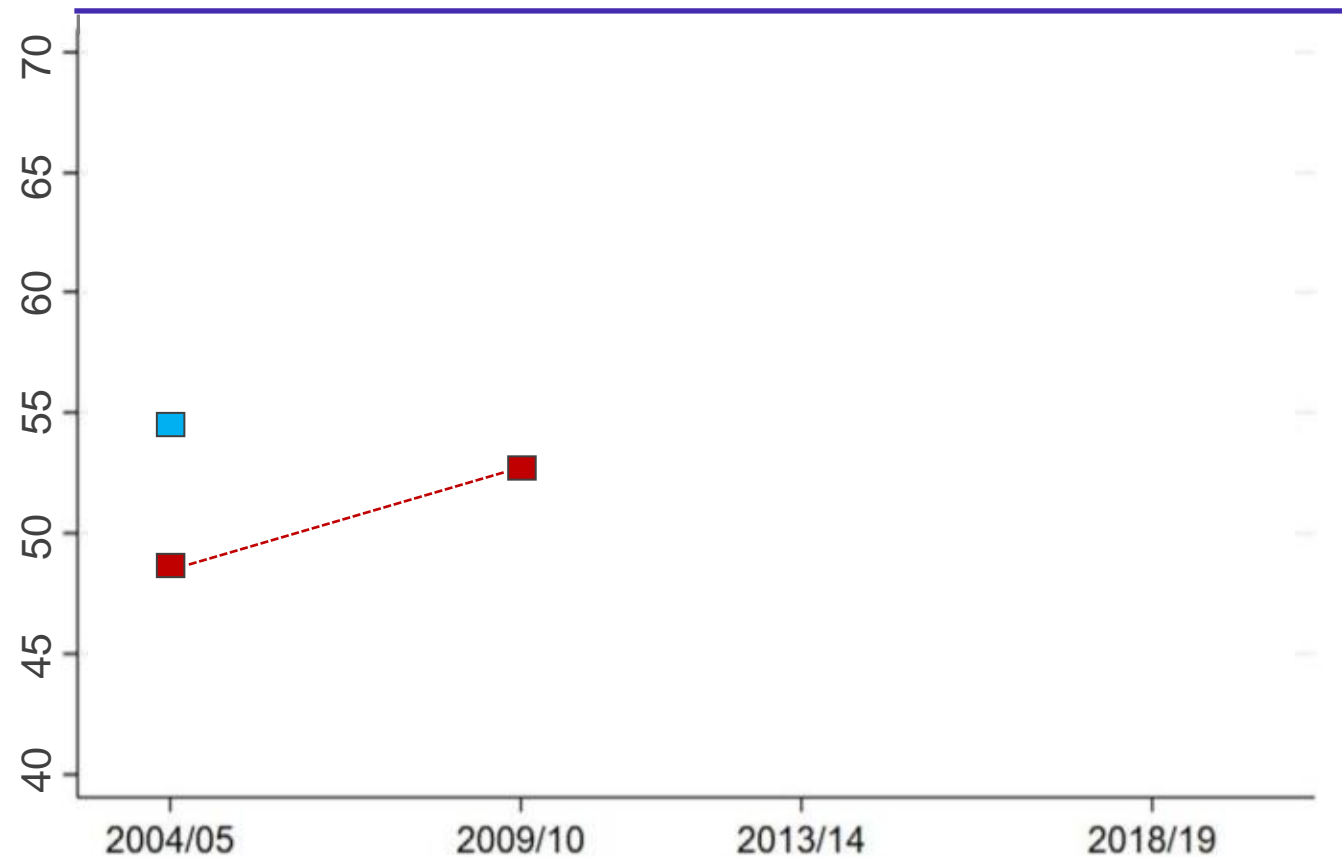
The % of 2nd grade children in each city who had experienced at least one cavity



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The % of 2nd grade children in each city who had experienced at least one cavity

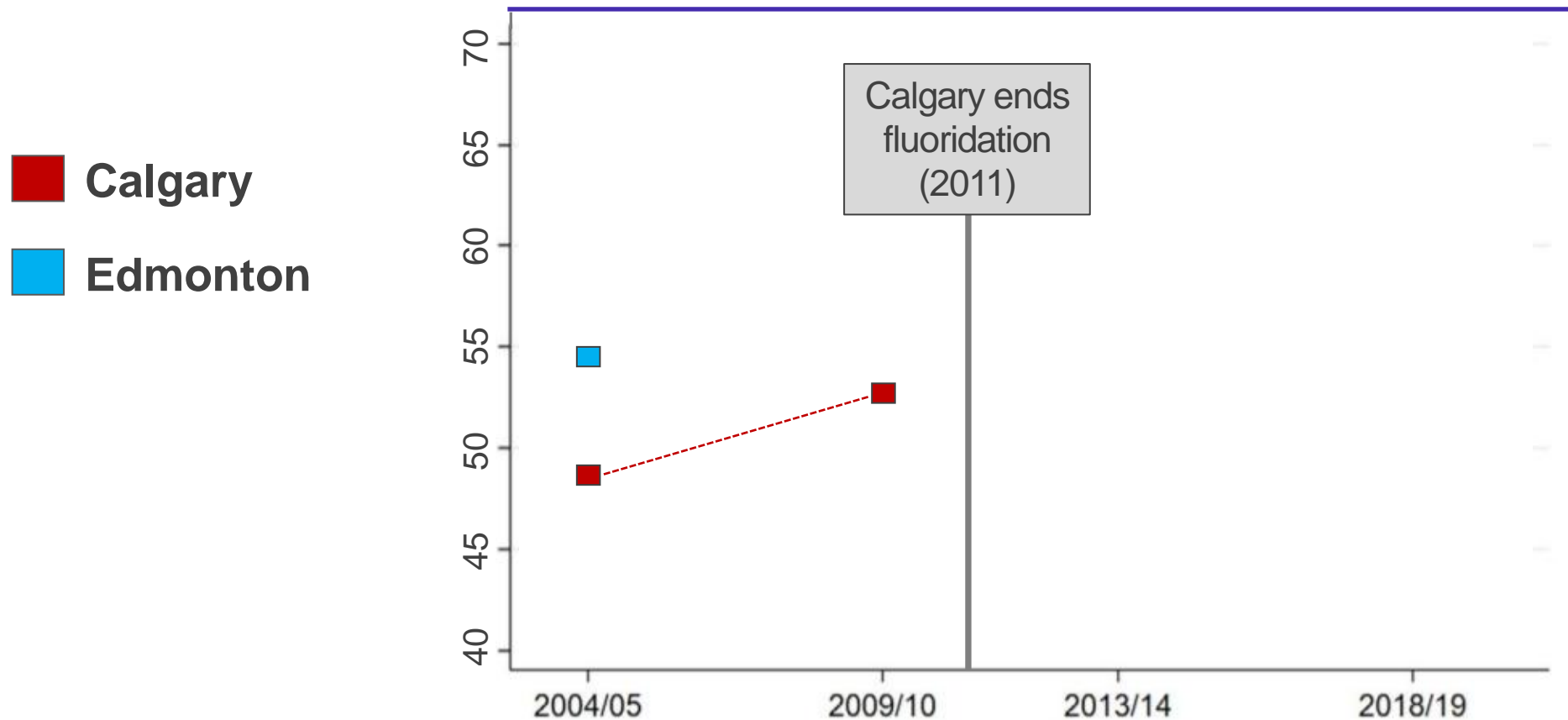
■ Calgary  
■ Edmonton





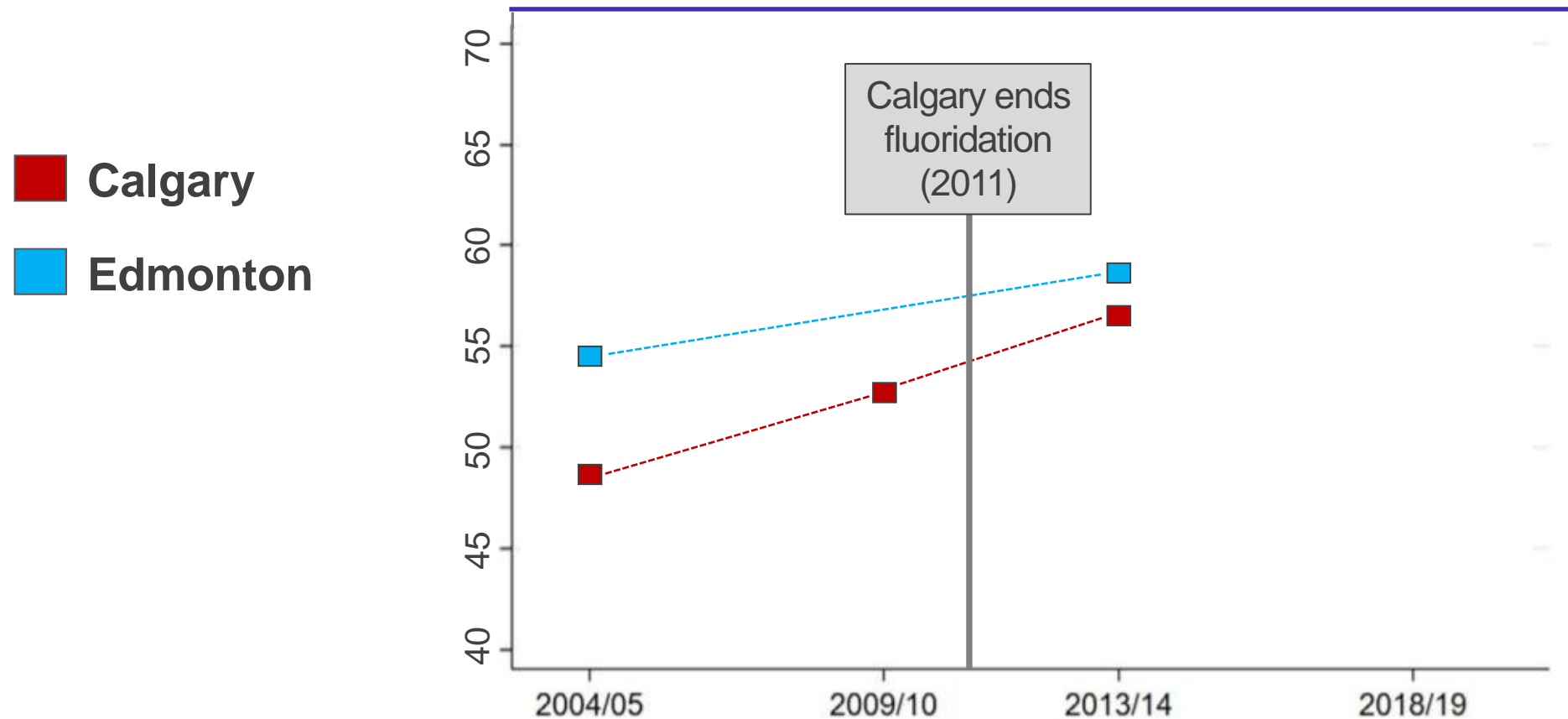
# Canada: Comparing decay trends in two cities

The % of 2nd grade children in each city who had experienced at least one cavity



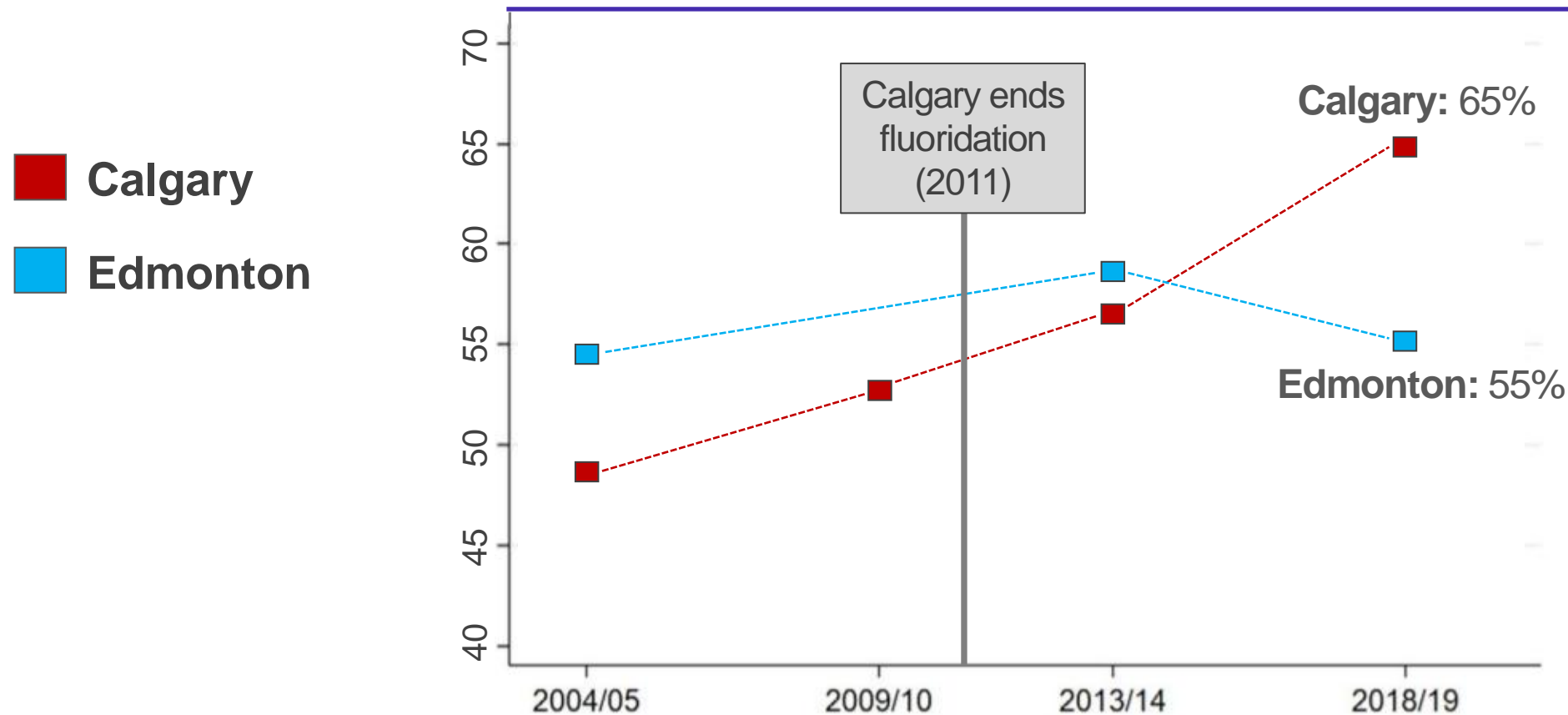
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# Canada: Comparing decay trends in two cities

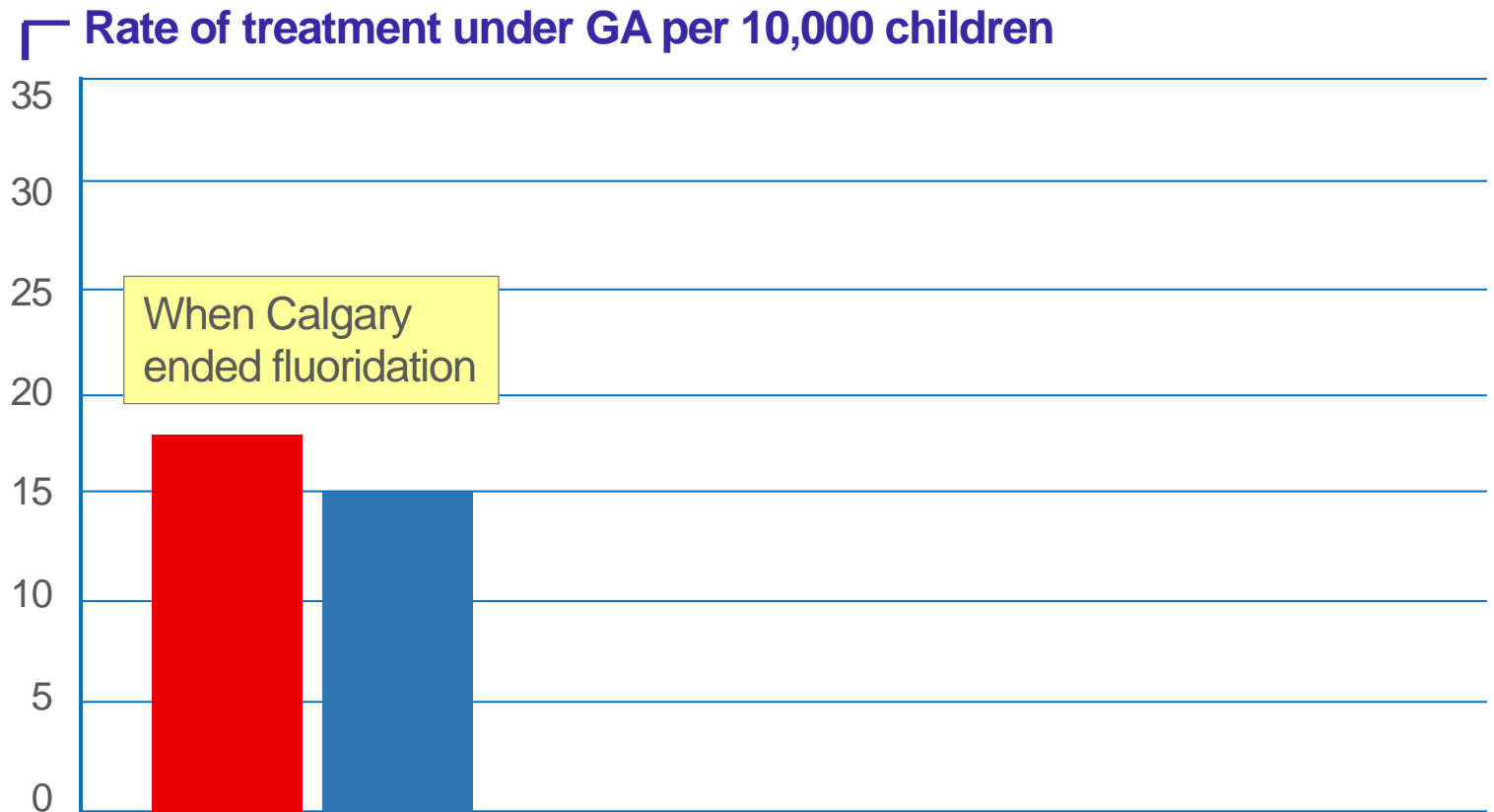
The % of 2nd grade children in each city who had experienced at least one cavity



# GA-related treatment rose steadily after cessation

- The Canadian city of **Calgary** ceased water fluoridation in 2011. Afterward, its rate of dental treatment with General Anesthesia (GA) steadily rose.
- The fluoridated city of **Edmonton** had a slightly lower GA rate back then.

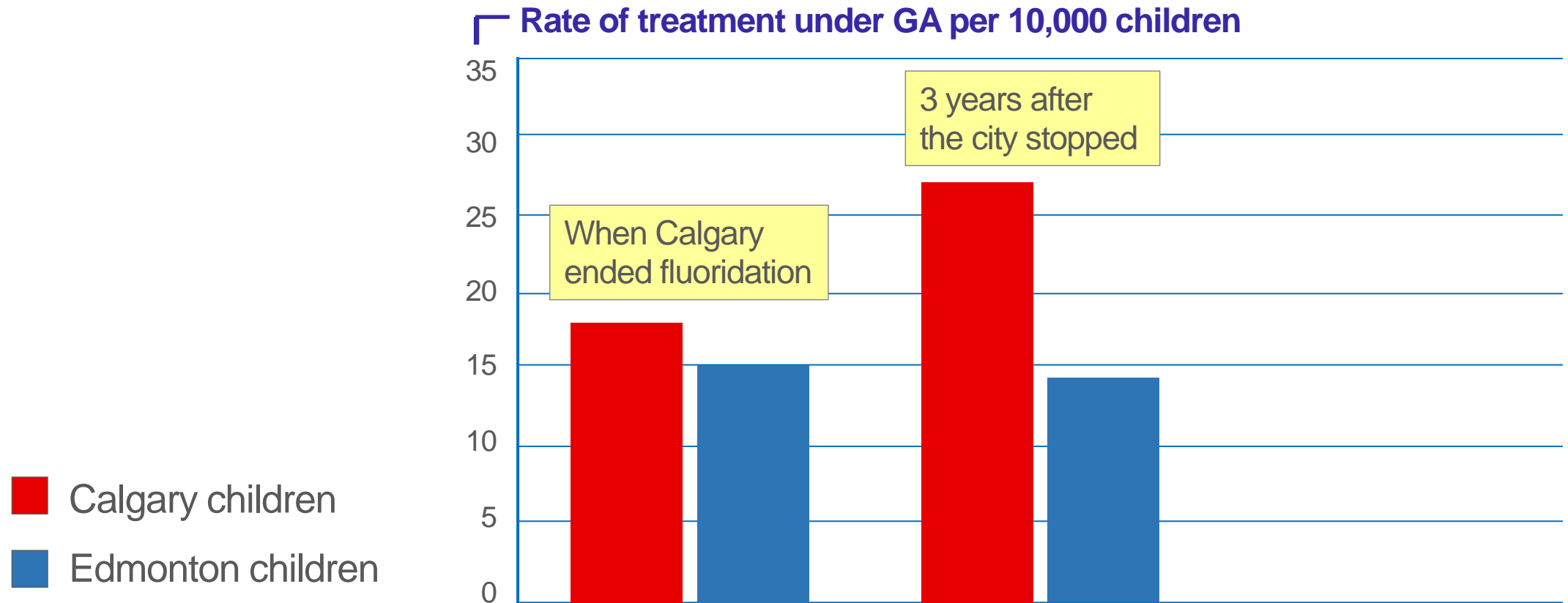
■ Calgary children  
■ Edmonton children



(Source: Yazdanbakhsh E, et al. Community water fluoride cessation and rate of caries-related pediatric dental treatments under general anesthesia in Alberta, Canada. Canadian Journal of Public Health, 2024 / doi: 10.17269/s41997-024-00858-w.)

# GA-related treatment rose steadily after cessation

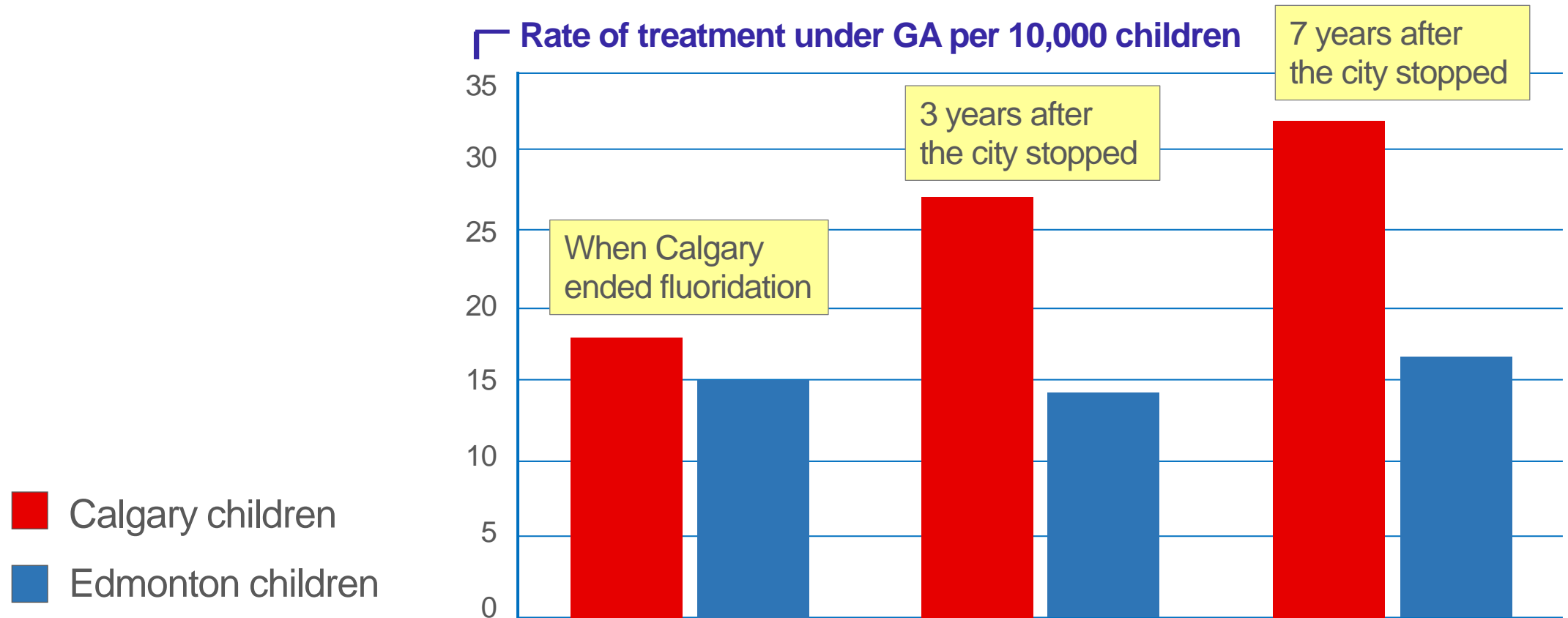
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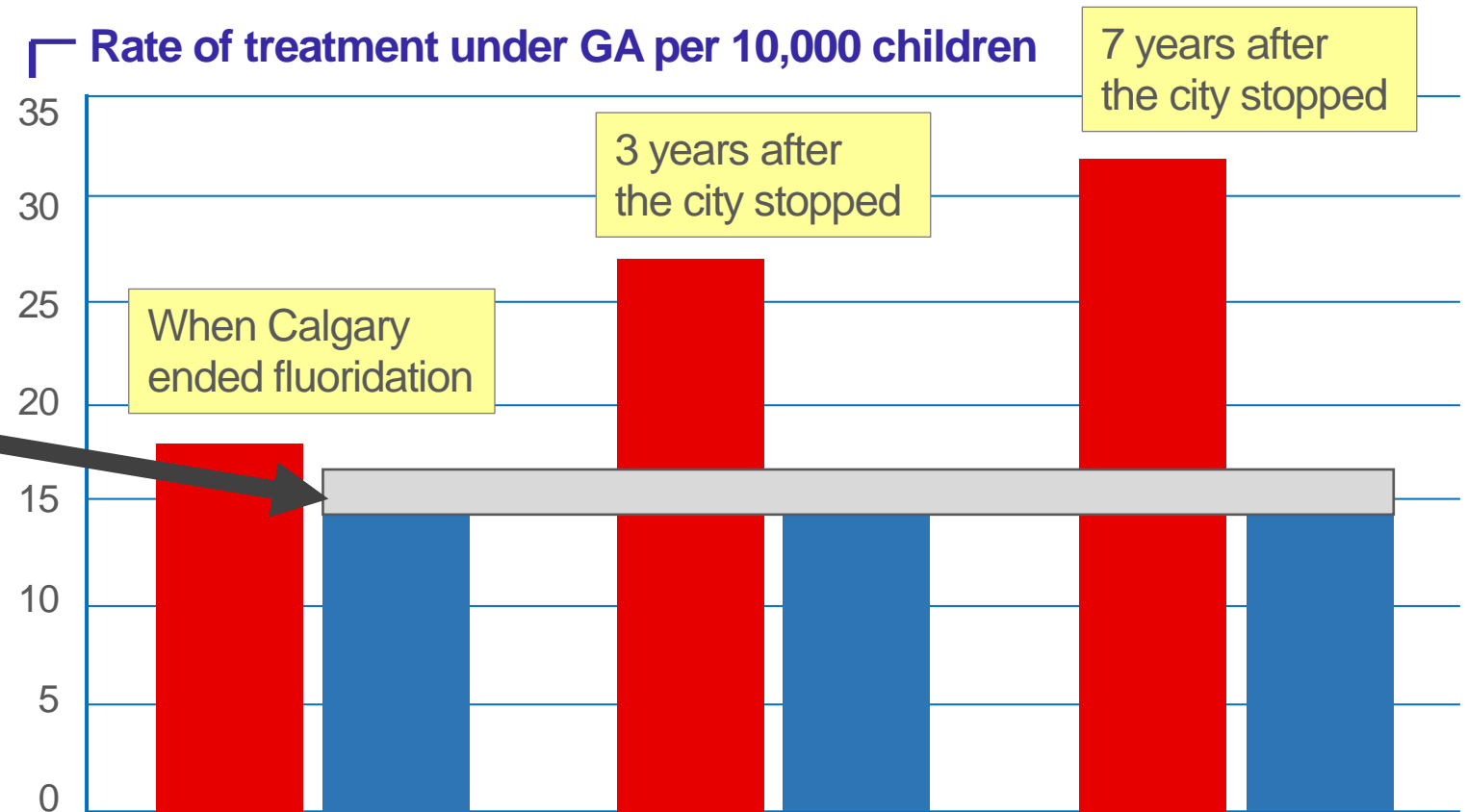


# GA-related treatment rose steadily after cessation

- The Canadian city of **Calgary** ceased water fluoridation in 2011. Afterward, its rate of dental treatment with GA steadily rose.

But the GA rate in **Edmonton** barely changed. It stayed in this narrow band.

■ Calgary children  
■ Edmonton children



(Source: Yazdanbakhsh E, et al. Community water fluoride cessation and rate of caries-related pediatric dental treatments under general anesthesia in Alberta, Canada. Canadian Journal of Public Health, 2024 / doi: 10.17269/s41997-024-00858-w.)

# How severe decay in children is treated

- A toddler's teeth can begin to suffer cavities (decay) soon after they appear in the mouth. Without fluoridated water and fluoride toothpaste, a child is at greater risk.
- Toddlers and young children with severe decay may not tolerate or cooperate for treatment in a dental office. The only option to safely treat them is under **general anesthesia** (GA) in a hospital.



# How severe decay in children is treated

- Although deaths from the use of GA are very rare, they **do** happen. And preschool-age children are the most vulnerable.
- GA-related treatment is also **very expensive**.



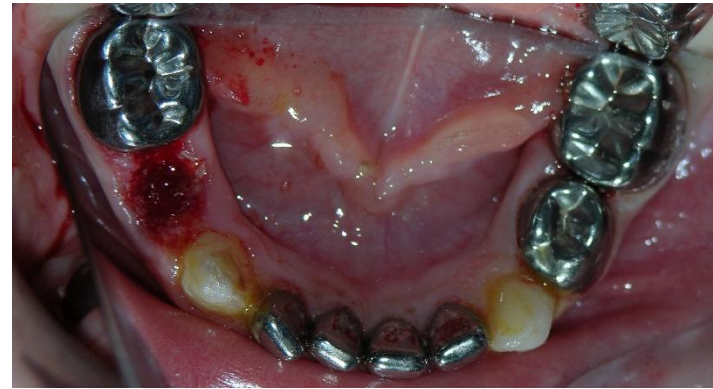
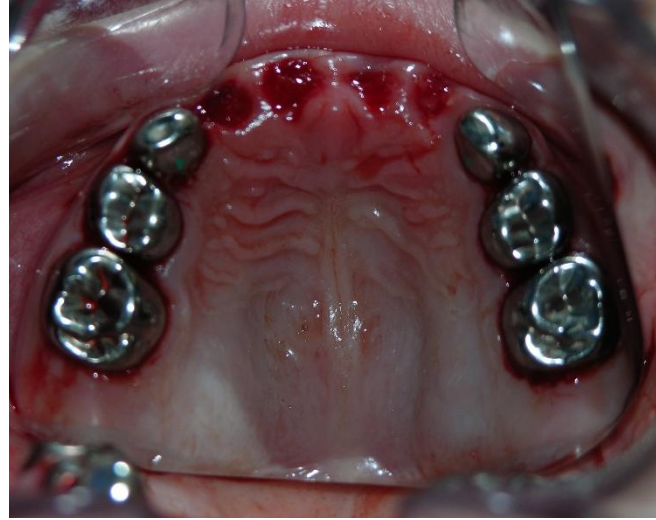
# How severe decay in children is treated



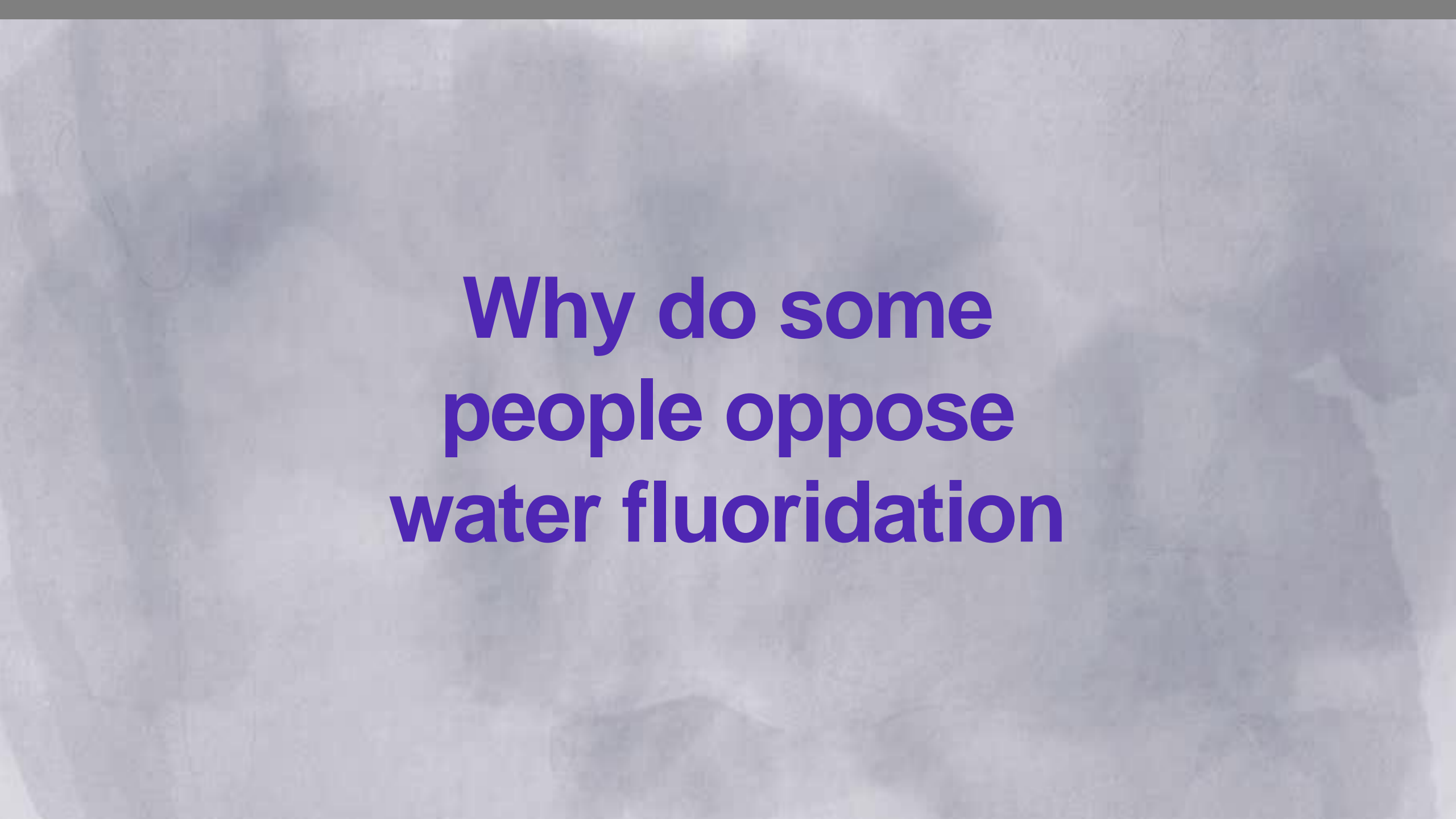
- The average cost of hospital treatment with GA ranges from **\$10,000 to \$15,000 *per child***.
- US and international studies show that water fluoridation helps **prevent 2/3<sup>rd</sup>** of hospital GA dental treatment.
- **Water operators prevent more cavities than all dentists could ever do in their lifetimes.**



# How severe decay in children is treated



*(Sources: An alternative marker for the effectiveness of water fluoridation: hospital extraction rates for dental decay, a two-region study, Elmer et al, British Dental Journal 2014; 216: E10; Klivitsky et al., "Hospitalizations for dental infections - Optimally versus non-optimally fluoridated areas in Israel," Journal of the American Dental Association.)*



# **Why do some people oppose water fluoridation**



# Current tactics of opponents and others

1. IQ deficits – (**nonexistent** at levels of fluoride in fluoridation)
2. Choice – “Personal choice to have fluoridated water...”
3. Skin absorption – “Largest organ system in the body”
4. Political climate – was Tea Party a decade ago; now extreme far right
5. Water operators and companies

# “97% of Western Europe has Rejected Fluoridated Water”



- ✓ **Fluoridated water** reaches 13 million people in England, Ireland and Spain.
- ✓ **Fluoridated salt** reaches over 75 million in Germany, France, Belgium and other countries.
- ✓ Nearly all European nations have **fluoride-rinse**, **fluoridated milk** or other targeted fluoride programs.

(Source: World Health Organization literature and “Salt Fluoridation in Europe and in Latin America,” Wirschaft, March 2011.)

# What haven't RCTs been conducted?

Opponents often say that **randomized controlled trials** (RCTs) have never been conducted to prove fluoridation is safe.

- RCTs are a type of study that is often not feasible for interventions that occur on a community level, such as fluoridation.
- Observational studies are commonly used for fluoridation and have been used for:
  - ✓ Smoking & lung disease
  - ✓ Sexually Transmitted Infections
  - ✓ Chronic Alcohol Use & Cirrhosis
  - ✓ Moderate Alcohol use and cancer

# Opponents misrepresent data

## Opponents use these misleading graphs

Figure 1: Data from WHO Database

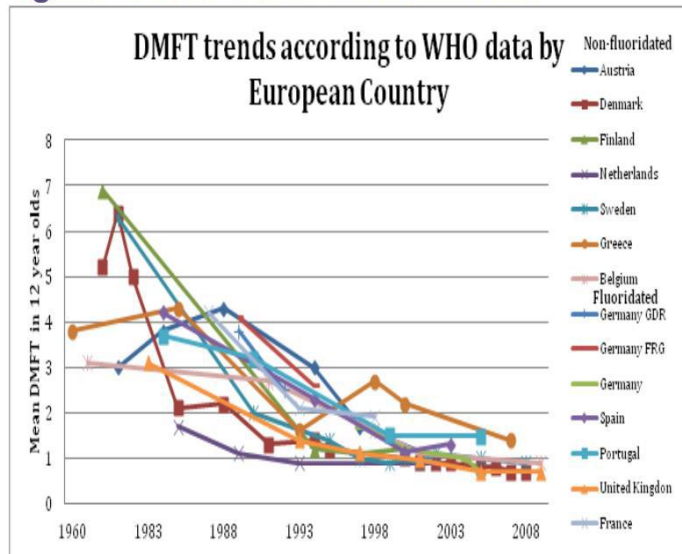
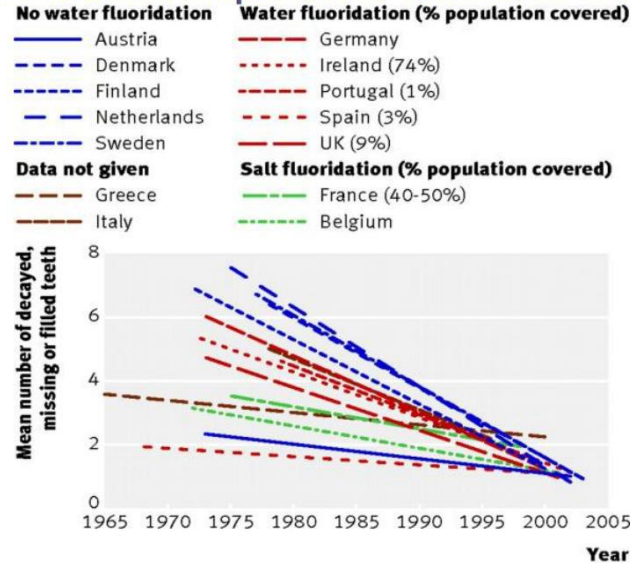


Figure 2: Data manipulated to show linear trend



Graphs created to depict declining trends in tooth decay

Figure 1. Source: Data from the World Health Organization database. Available at <http://www.mah.se/CAPP/Country-Oral-Health-Profiles/> ;

Figure 2. Source: Cheng, KK, Chalmers, I, Sheldon, TA. Adding Fluoride to water supplies. *BMJ*; 2007;335(7622):699-702.

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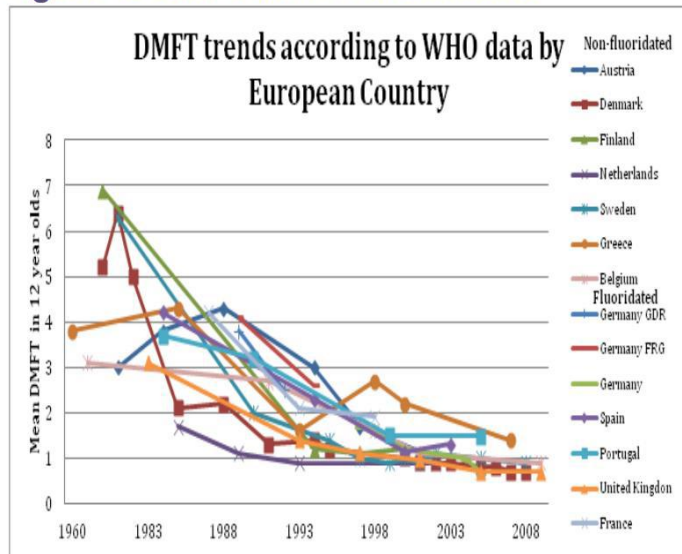
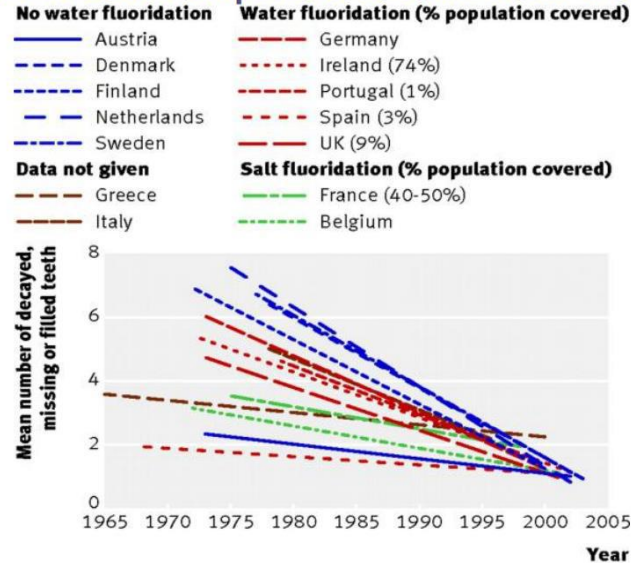


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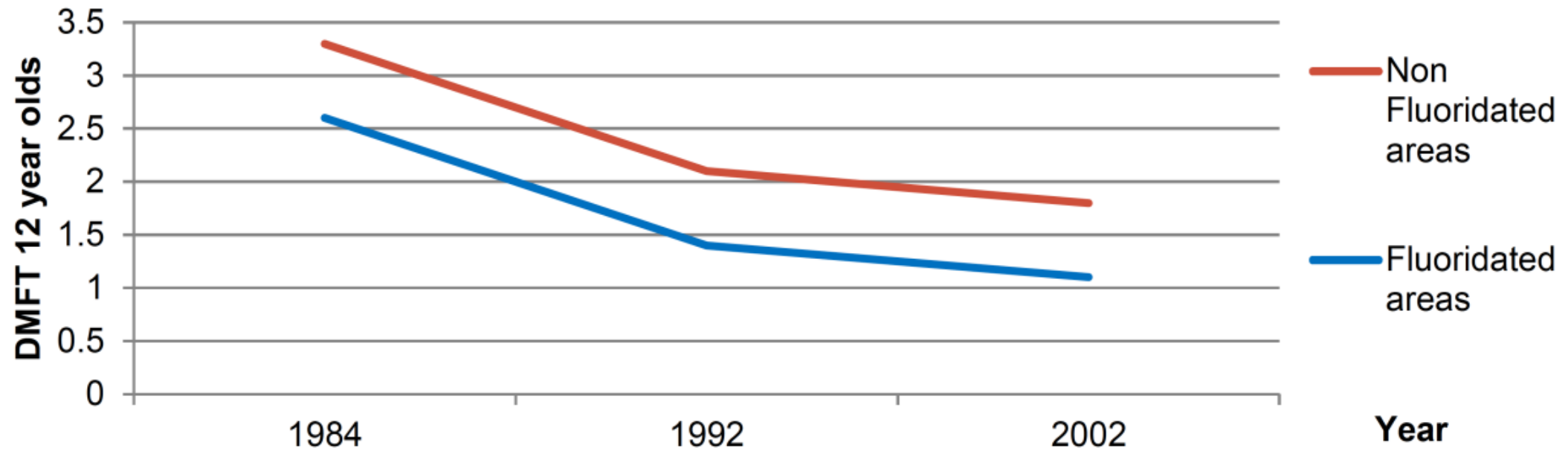
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- Their chart shows only 2 countries with **salt fluoridation**.  
*This is false.*
- **Germany** is shown as a country with water fluoridation.  
*This is false.*
- They omit the fact that some of these nations fund free dental services in schools.

# A clear benefit from fluoridation

A chart like this compares apples to apples. Children in Ireland who live in fluoridated areas have lower rates of cavities.





# “The FDA has Never Approved Fluoride for Use in Water”

1. The FDA *has* approved fluoride for use in bottled water for cavity reductions.
2. The EPA has jurisdiction over tap water, not FDA



# What about the additives used for fluoridation?

Opponents: *“Fluoride additives are not pharmaceutical grade.”*



**The CDC explains:**

“Some have suggested that pharmaceutical grade grade fluoride additives should be used for water fluoridation. **Pharmaceutical grading standards used in formulating prescription drugs are not appropriate for water fluoridation additives.** If applied, those standards could actually exceed the amount of impurities allowed by AWWA and NSF/ANSI in drinking water.”



# **What is dental fluorosis**

# What about dental fluorosis?

## What is dental fluorosis?

Dental fluorosis is a change in the appearance of tooth enamel. Caused by increased intakes of fluoride during the tooth-forming years (up to age 8)

(Sources: CDC's "Fluorosis" web page, updated June 1, 2016; R.K. Celeste et al., "Independent and Additive Effects of Different Sources of Fluoride and Dental Fluorosis," *Pediatric Dentistry*, Vol. 38, No. 3, May-June 2016; Curtis et al, Decline in Dental Fluorosis Severity during Adolescence: A Cohort Study", [JDR](#) 2020 Apr; 99(4): 388–394 )

# What about dental fluorosis?

## What effect does it have?

Dental fluorosis is a change in the appearance of tooth enamel. Caused by increased intakes of fluoride during the tooth-forming years (up to age 8)

In the U.S., fluorosis is typically a mild cosmetic effect:

- It does not cause pain or affect the health or function of teeth.
- It's so subtle most people don't notice it.

# What about dental fluorosis?

**Do the white spots fade?**

Dental fluorosis is a change in the appearance of tooth enamel. Caused by increased intakes of fluoride during the tooth-forming years (up to age 8)

In the U.S., fluorosis is typically a cosmetic effect:

- It does not cause pain or affect the health or function of teeth.
- It's so subtle most people don't notice it.

**Yes.** Research shows that the faint spots from fluorosis tend to fade during adolescence.



# What about dental fluorosis?

## Variations in tooth enamel (fluorosis)



Normal



Questionable

(Source: Information from the Centers for Disease Control and Prevention's website, accessed in July 14, 2023 at [http://www.cdc.gov/fluoridation/faqs/dental\\_fluorosis/index.htm](http://www.cdc.gov/fluoridation/faqs/dental_fluorosis/index.htm) )

# What about dental fluorosis?

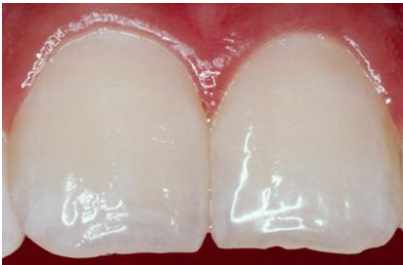
## Variations in tooth enamel (fluorosis)



Normal



Very Mild



Questionable



Mild

(Source: Information from the Centers for Disease Control and Prevention's website, accessed in July 14, 2023 at [http://www.cdc.gov/fluoridation/faqs/dental\\_fluorosis/index.htm](http://www.cdc.gov/fluoridation/faqs/dental_fluorosis/index.htm) )

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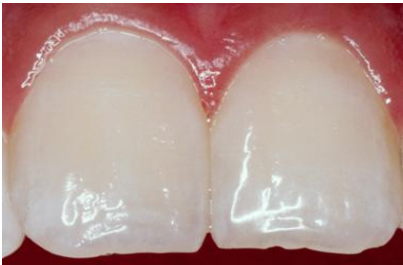
Normal



Very Mild



Moderate



Questionable



Mild



Severe

# What about dental fluorosis?

## Variations in tooth enamel (fluorosis)



Normal



Very Mild



Moderate

Improper  
use of  
fluoride  
products



Questionable



Mild



Severe

Not caused  
by  
fluoridation

# Opponents distort what dental fluorosis is

**Which would you rather have?**

**Cavities**



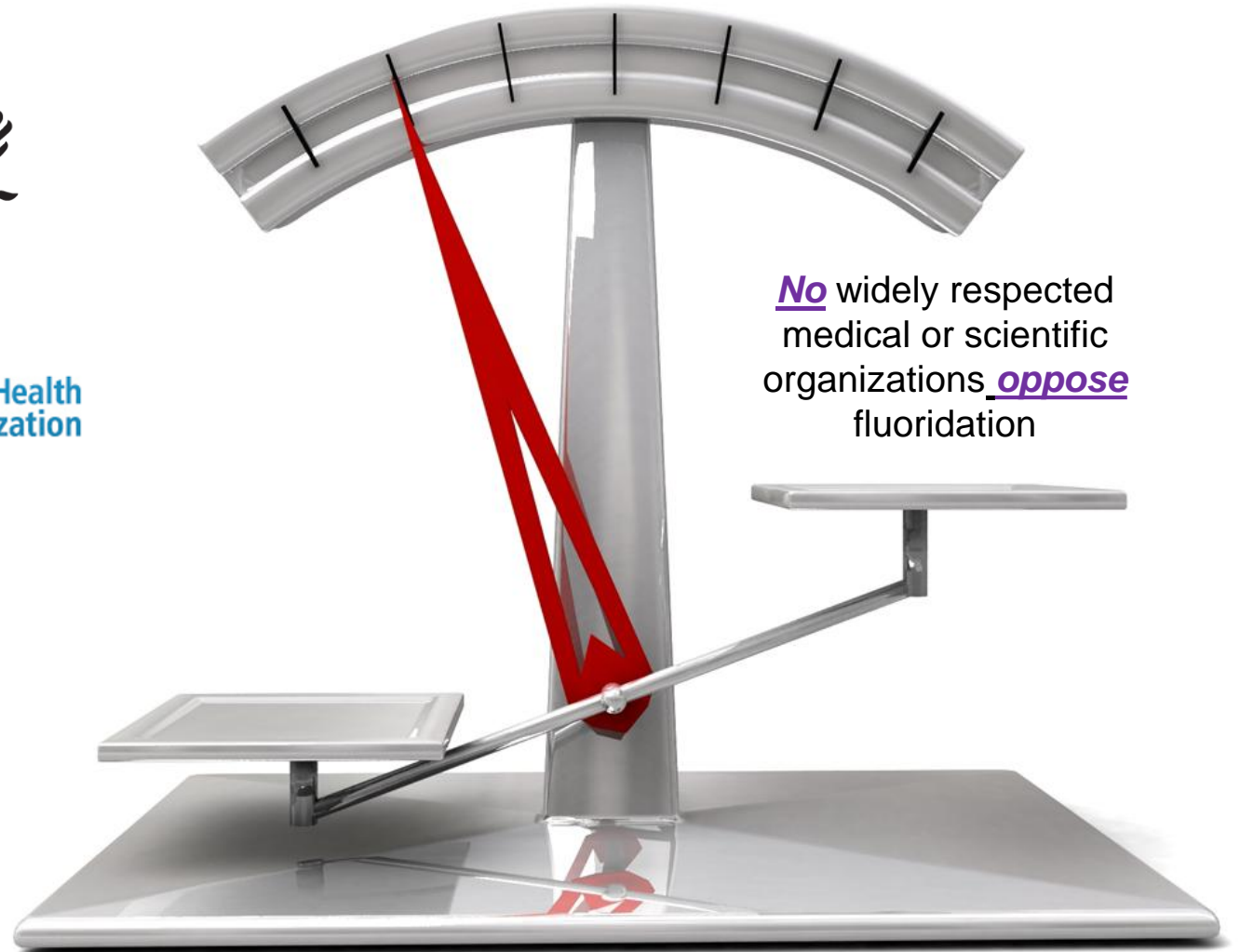
*OR*

**Mild fluorosis**





# The Weight of the Science



No widely respected  
medical or scientific  
organizations oppose  
fluoridation



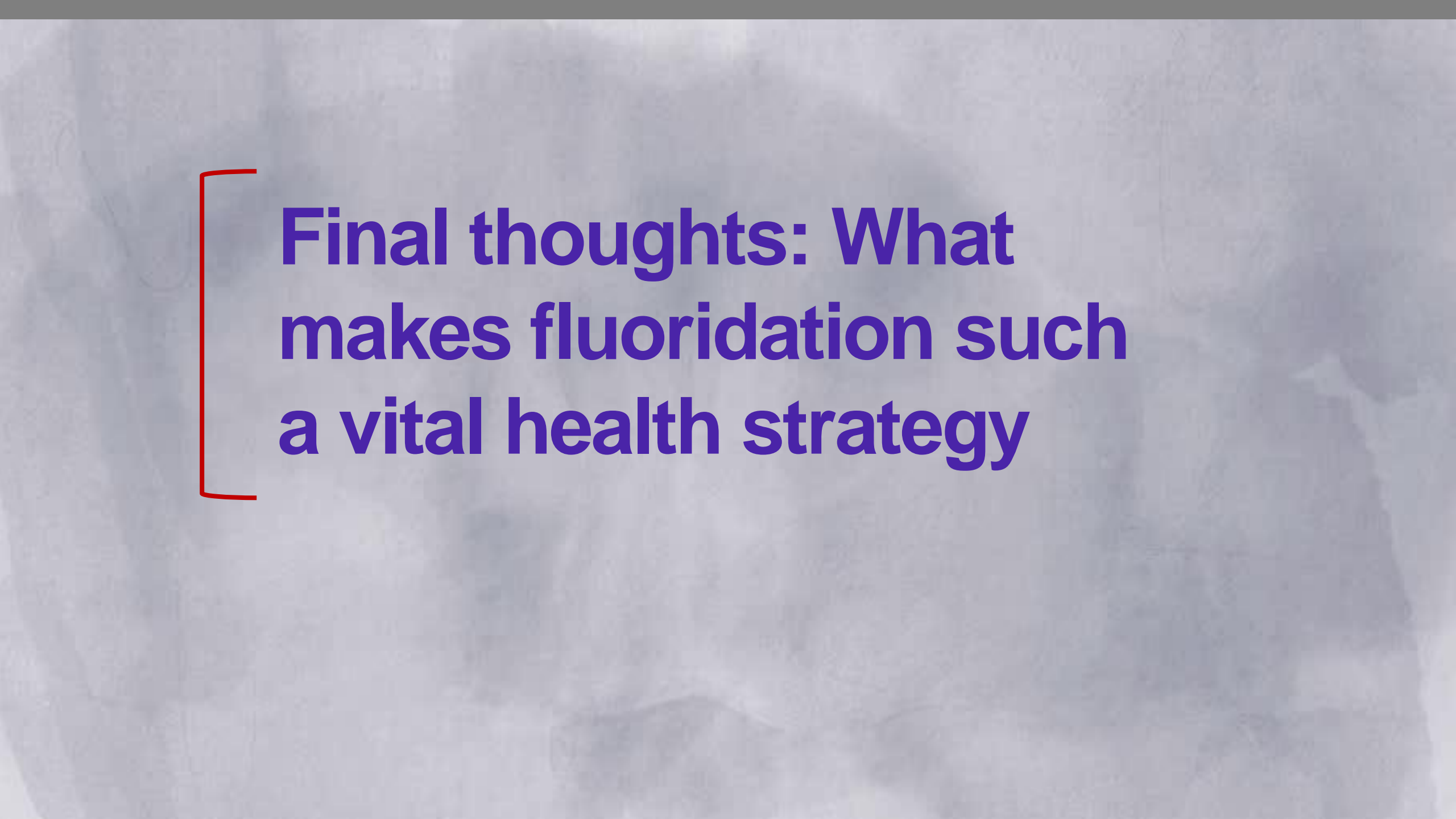
# Leading medical & scientific groups that **SUPPORT** fluoridation

1. American Water Works Association – over [51,000](#) active members
2. American Academy of Pediatrics – approximately [67,000](#) active members<sup>+</sup>
3. American Dental Association – over [159,000](#) active members
4. Centers for Disease Control and Prevention
5. American Academy of Family Practitioners – over [129,000](#) active members
6. American Nurses Association – [4 million](#) active members
7. American Medical Association – over [271,000](#) active members
8. Academy of General Dentistry – over [40,000](#) active members
9. American Dental Hygienists Association – over [226,000](#) active members
10. Department of Defense – [Memo](#) regarding fluoridation of military bases around the world
11. World Health Organization\*

(\*WHO Global oral health status [report](#) - Towards universal health coverage for oral health by 2030; Water fluoridation, section 3.3.2)

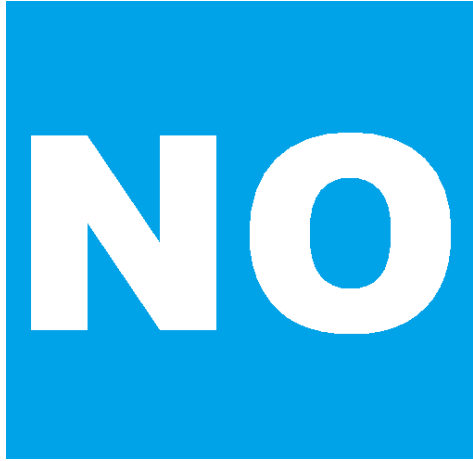
# Leading medical & scientific groups that **OPPOSE** fluoridation

0



**Final thoughts: What  
makes fluoridation such  
a vital health strategy**

# Are there good alternatives to fluoridation?



- Fluoridation is the single most cost-effective way to prevent cavities for adults and children
- Fluoride toothpaste is **not** a replacement for fluoridation. Both are needed
- Fluoride supplements: Compliance is a problem
- Supplements and school-based dental programs do not serve adults, whose oral health needs continue as they age

# The importance of a population health approach

Water fluoridation benefits adults/children without requiring them:

- To leave their home
- To change their schedule
- To wait in line
- To make a dental appointment
- To pay an insurance premium
- To get a prescription filled

► During the pandemic, people living in fluoridated communities had continuous access to a proven form of prevention.



**Dr. Johnny Johnson**

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**W:** [AmericanFluoridationSociety.org](http://AmericanFluoridationSociety.org)

**C:** 727-409-1770

# What questions do you have?

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