

# **Why Binghamton Should Stop Fluoridating its Water**

**Paul Connett, PhD**

**Senior Science Advisor,**

**Fluoride Action Network(FAN)**

**Binghamton, NY**

**August 8, 2024**

- I, Paul Connett, am a retired professor of chemistry, who specialized in environmental chemistry and toxicology.
- I have spent the last 28 years (since 1996) researching fluoride's toxicity and the water fluoridation debate.
- I helped to found the science-based organization Fluoride Action Network (FAN) in 2000 and was the Director for many years
- I co-authored the book *The Case Against Fluoride* (Chelsea Green, 2010)



.....  
**A New Look  
at the Scientific  
Evidence**  
.....

# **THE CASE AGAINST Fluoride**

**How Hazardous Waste  
Ended Up in Our Drinking Water  
*and* the Bad Science and  
Powerful Politics  
That Keep It There**

**PAUL CONNETT, PhD**

**JAMES BECK, MD, PhD | H. S. MICKLEM, DPhil**

Book published  
by Chelsea Green

October, 2010

Contains  
80 pages  
of references  
to the  
Scientific  
literature

# Outline

1. Factual information
2. Fluoridation is a BAD, irresponsible and dangerous medical practice
3. The strong scientific evidence of harm
4. A ringside seat on fluoride- IQ studies
5. The weak scientific evidence of benefit
6. A better strategy for fighting tooth decay

# 1. Background information on fluoride and fluoridation

# Background information

1. Fluoridation is the deliberate addition of compounds which release free fluoride ions into the public drinking water
2. Fluoridation is not treating the water. The water supply is being used as a delivery system to treat people, i.e. to medicate. The intended purpose is to fight tooth decay.

# Background information

3. Most countries in the world do not fluoridate their water
4. More than half of the people drinking fluoridated water live in North America.
5. Most (about 97%) European countries do not fluoridate their water.

## Background information

6. Fluoride is not a nutrient – no process in the human body needs fluoride to function.

7. Fluoride's benefit to teeth is predominantly TOPICAL (CDC, 1999).



CDC, MMWR, 48(41); 933-940,  
Oct 22, 1999

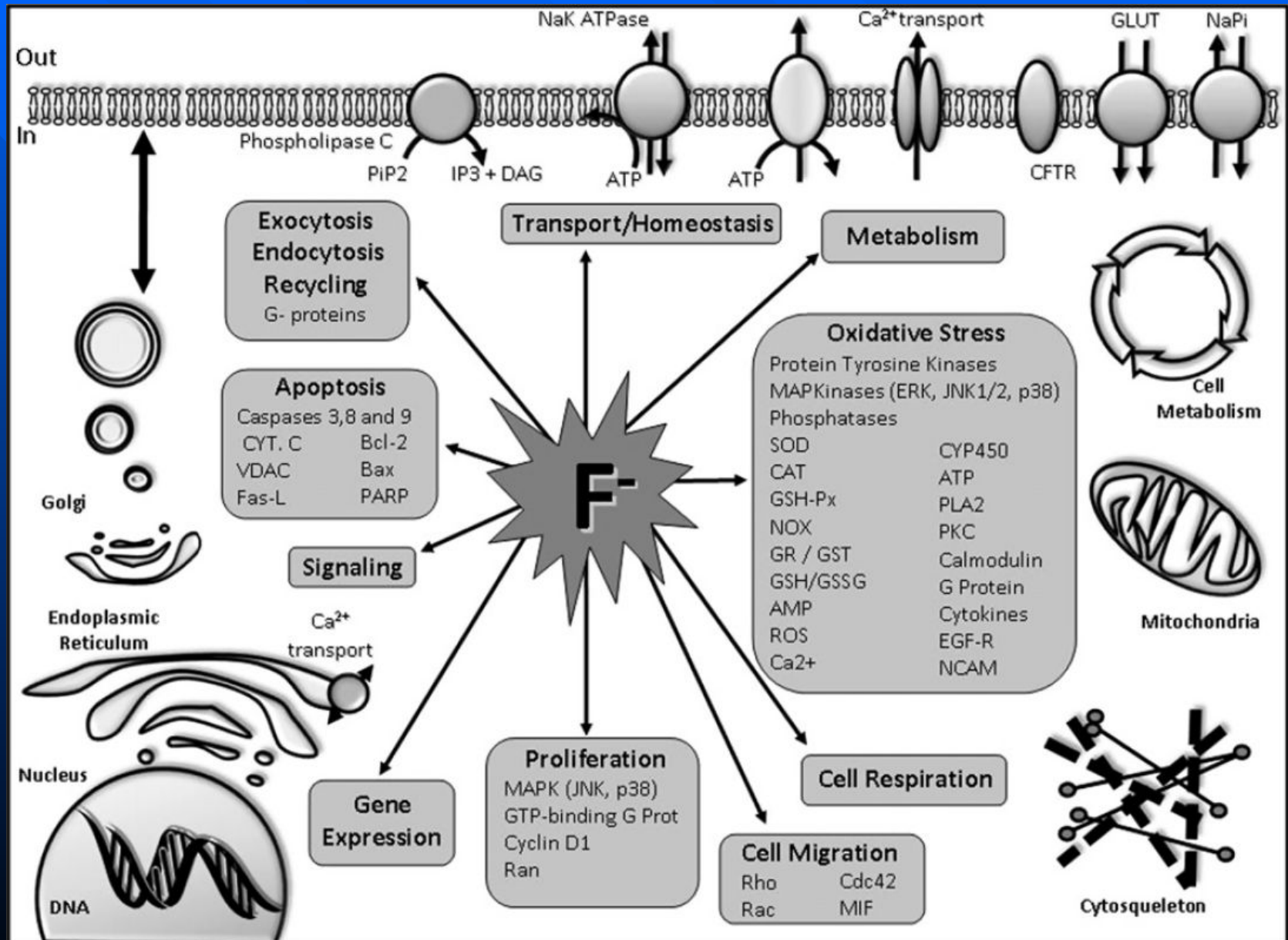
- “...laboratory and epidemiologic research suggest that fluoride prevents dental caries **predominantly** after eruption of the tooth into the mouth, and its actions primarily are topical...”

## Background information

8. The fluoride ion is very toxic. It interferes with many biochemical processes e.g. it inhibits many enzymes (see a review by Barbier et al., 2010).

9. In addition to being an enzyme inhibitor, Fluoride is an endocrine disruptor.

# Fluoride's effects on human cells



Barbier O, Arreola-Mendoza L, Del Razo LM.

Molecular mechanisms of fluoride toxicity. Chem Biol Interact. 2010 Nov 5; 188(2):319-33

# Background factual information

10. In mammals the kidneys excrete about 50% of ingested fluoride.

11. Remainder of fluoride rapidly taken up by the bones.

12. Mother's milk contains very little fluoride

**The level of fluoride in Mothers' milk is 0.004 ppm (NRC, 2006, p.40)**



**In effect, mothers' milk protects the infant from fluoride exposure**

# Water fluoridation removes that protection when babies are bottle-fed



Fluoridated water in USA = 0.7 ppm  
Over 100 times level in mothers'

milk

14. **However**, Nature does not protect the **fetus** from fluoride exposure, because the fluoride ion can cross the placental membrane.

15. Fetal cells and tissues (including the brain) are exposed to the biochemically active fluoride ion throughout pregnancy.

16. The Federal Drug Administration (FDA) does not regulate water fluoridation. This is left to the Environmental Protection Agency (EPA). **The FDA's position is that fluoride is an "unapproved drug."**

17. In 1986, the EPA set the safe drinking water standard for fluoride (i.e. the maximum contaminant level, MCL) at 4 ppm, based on protecting against crippling skeletal fluorosis.



18. The Oral Health Division at the Centers for Disease Control and Prevention (CDC) recommends a level of 0.7 ppm for reducing tooth decay.

19. The mandate of the CDC's Oral Health Division is to promote fluoridation, which it has done vigorously for decades. However, there is no comparable division at the CDC that is carefully monitoring health concerns associated with Fluoride.

20. Another body that vigorously promotes fluoridation is the American Dental Association (ADA).

21. The chemicals used to fluoridate are not pharmaceutical grade but industrial waste products. The main chemical used in fluoridation is hexafluorosilicic acid ( $\text{H}_2\text{SiF}_6$ ) obtained from the scrubbing systems of the phosphate fertilizer industry.

# 2. Propaganda Versus Science

# The Center for Disease Control and Prevention (CDC)

In October 1999, the CDC cited water fluoridation as “One of the top 10 public health achievements of the twentieth century” a statement which is quoted by fluoridation promoters all over the world. (CDC, 1999)

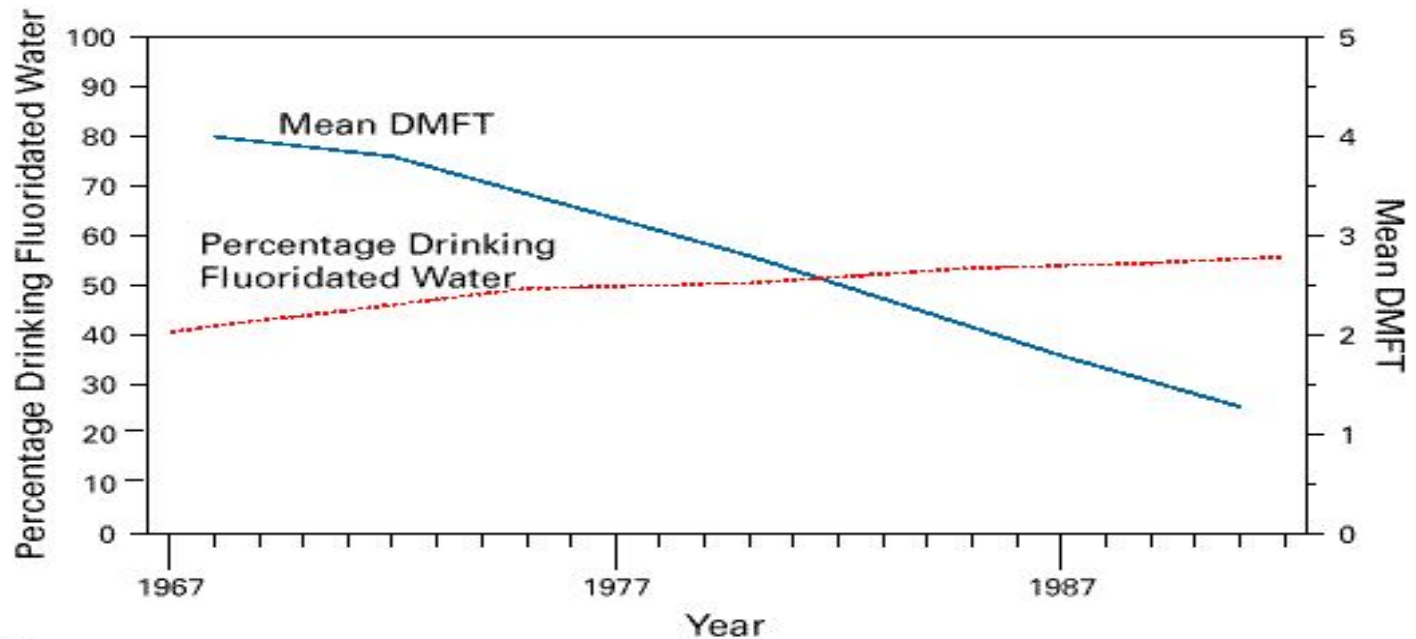
# The CDC (1999) review

- Was published in Mortality and Morbidity Weekly Report (MMWR), which is not externally peer reviewed
- The review was authored by Scott Tomar and Susan Griffin
- Scott Tomar is a dental researcher whose research prior to this paper was on smokeless tobacco. He had not published on fluoridation before .
- Susan Griffin is an economist.

Tomar and Griffin provide this  
graphic as evidence of  
fluoridation's effectiveness

Question: What is missing?

**FIGURE 1. Percentage of population residing in areas with fluoridated community water systems and mean number of decayed, missing (because of caries), or filled permanent teeth (DMFT) among children aged 12 years — United States, 1967–1992**



*Sources:*

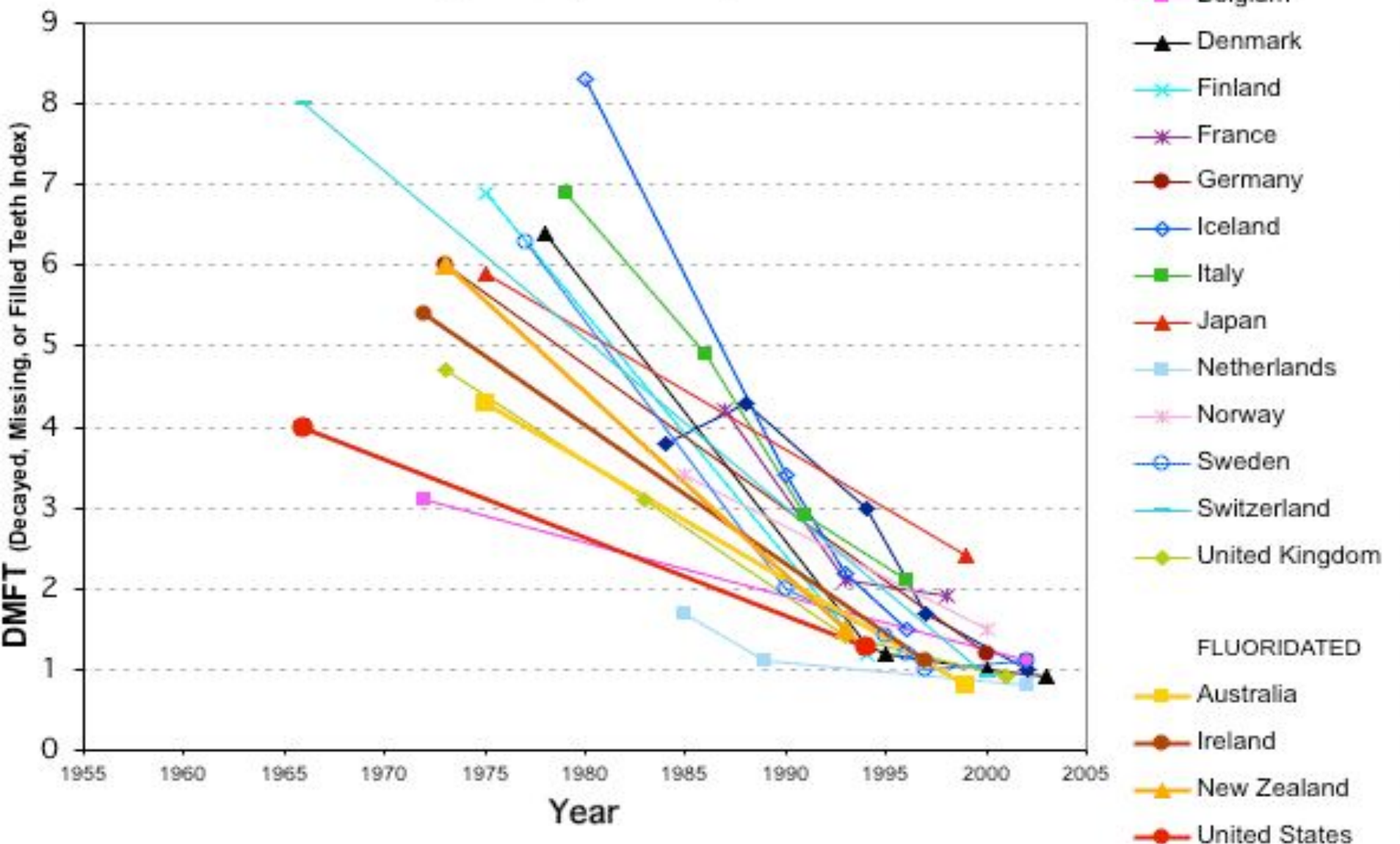
1. CDC. Fluoridation census 1992. Atlanta, Georgia: US Department of Health and Human Services, Public Health Service, CDC, National Center for Prevention Services, Division of Oral Health, 1993.
2. National Center for Health Statistics. Decayed, missing, and filled teeth among youth 12–17 years—United States. Rockville, Maryland: US Department of Health, Education, and Welfare, Public Health Service, Health Resources Administration, 1974. Vital and health statistics, vol 11, no. 144. DHEW publication no. (HRA)75-1626.
3. National Center for Health Statistics. Decayed, missing, and filled teeth among persons 1–74 years—United States. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, Office of Health Research, Statistics, and Technology, 1981. Vital and health statistics, vol 11, no. 223. DHHS publication no. (PHS)81-1673.
4. National Institute of Dental Research. Oral health of United States children: the National Survey of Dental Caries in U.S. School Children, 1986–1987. Bethesda, Maryland: US Department of Health and Human Services, Public Health Service, National Institutes of Health, 1989. NIH publication no. 89-2247.
5. CDC, unpublished data, third National Health and Nutrition Examination Survey, 1988–1994.

According to WHO data  
tooth decay in 12-year-olds  
is coming down as fast  
in F as NF countries



# Tooth Decay Trends: Fluoridated vs. Unfluoridated Countries

Data from the World Health Organization - <http://www.whocollab.od.mah.se/>  
 Graph produced by Chris Neurath, FAN



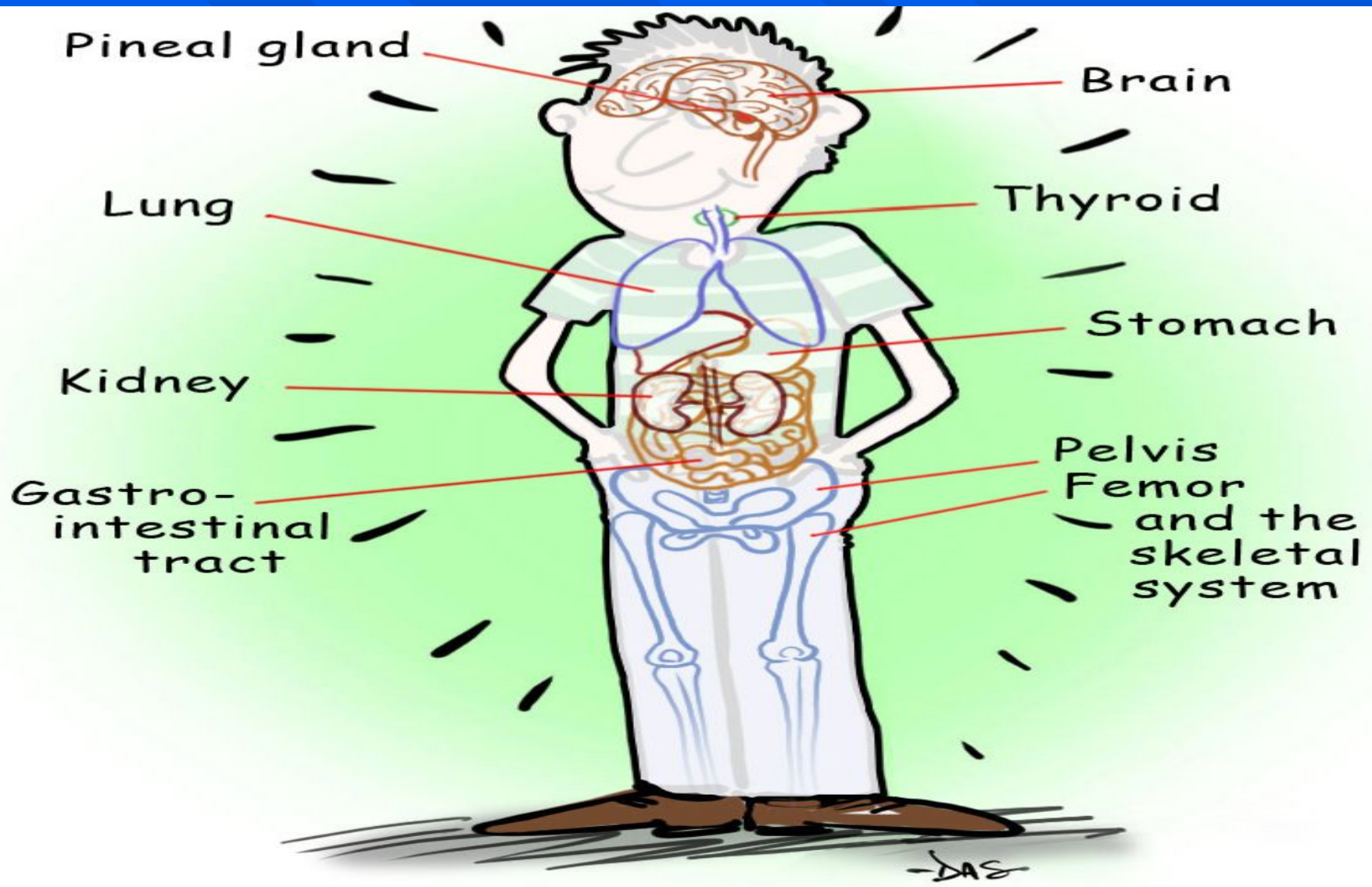
SOURCE: World Health Organization. (Data online)

For over 70 years the fluoridation debate has been controlled largely by the dental profession. This profession has a single focus on “teeth” with little or no expertise on other health issues.

# How fluoridation promoters see us!



# How fluoridation opponents see us



# American Dental Association White Paper – 1979 On Fluoridation

Excerpt, Pg. 10-11

“Individual dentists must be convinced that they need not be familiar with scientific reports of laboratory and field investigations on fluoridation to be effective participants in the promotion program and that nonparticipation is overt neglect of professional responsibility.”

**3. Fluoridation  
is a bad  
medical  
practice**

# Fluoridation is a bad medical practice

1. We can control the concentration of the fluoride added to the water (mg F/L), but we cannot control the DOSE (mg/day) [or DOSEAGE [mg/kg bodyweight per day] people get, because people drink different amounts of water and get fluoride from other sources.
2. It defies pharmaceutical principles: ONE DOSE DOES NOT FIT ALL. In this case, even the dose can vary arbitrarily. Do people who drink more water need more fluoride?
3. Once it is in the water it goes to everyone regardless of their age, health and nutritional status.

# It is a bad medical practice.

4. It violates the individual's right to informed consent to medical treatment.

This is UNETHICAL – a community is done to everyone what a doctor can do to no one!

5. None of the agencies that endorse and promote fluoridation are monitoring the fluoride levels in citizens' urine, blood or bones.

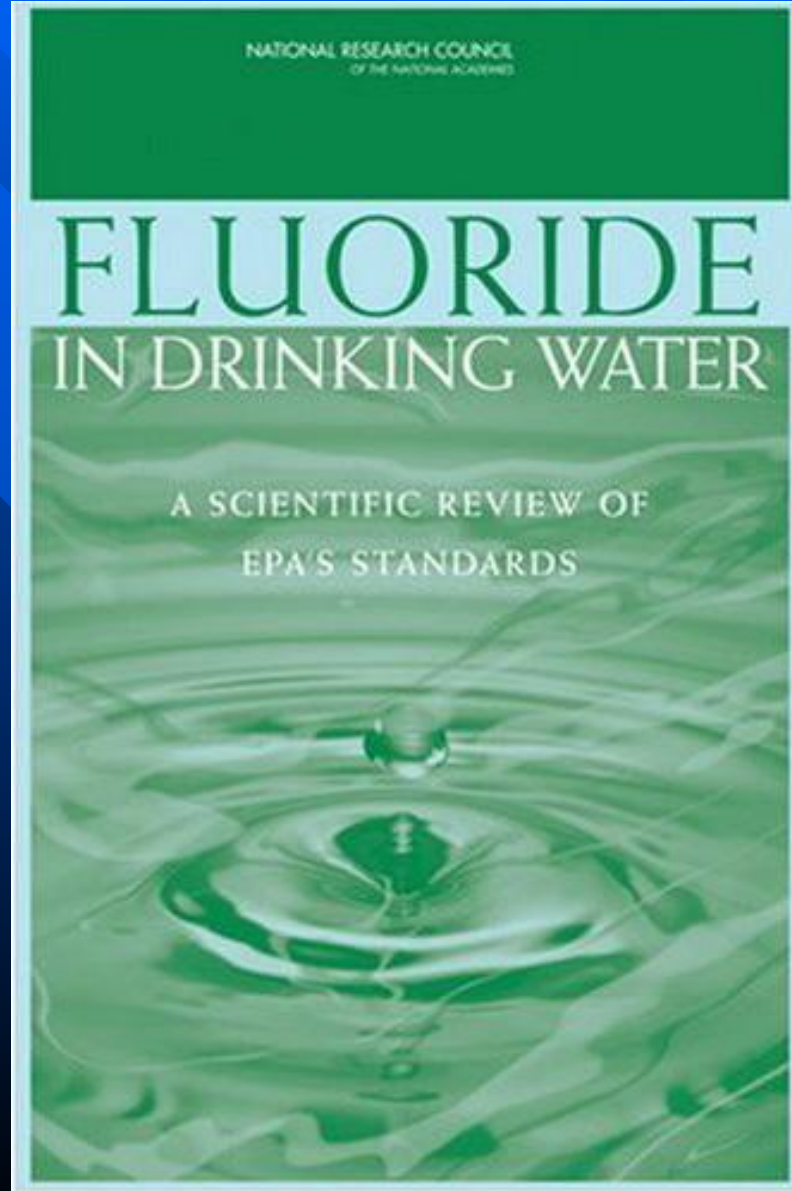
6. No medical personnel are monitoring citizens' health for side effects.



# 4. The science on fluoride's threat to different tissues

*A good place to start*

# National Research Council NRC (2006)



# Fluoride harms many tissues

1. Fluoride damages teeth (dental fluorosis)
2. Fluoride damages bones (skeletal fluorosis -first symptoms identical to arthritis; further exposure leads to brittle bone)
3. Fluoride is an endocrine disruptor
4. Fluoride lowers thyroid function
5. Fluoride accumulates in the human pineal gland
6. Fluoride damages the brain...

## *National Research Council (2006): Fluoride & Skeletal System*

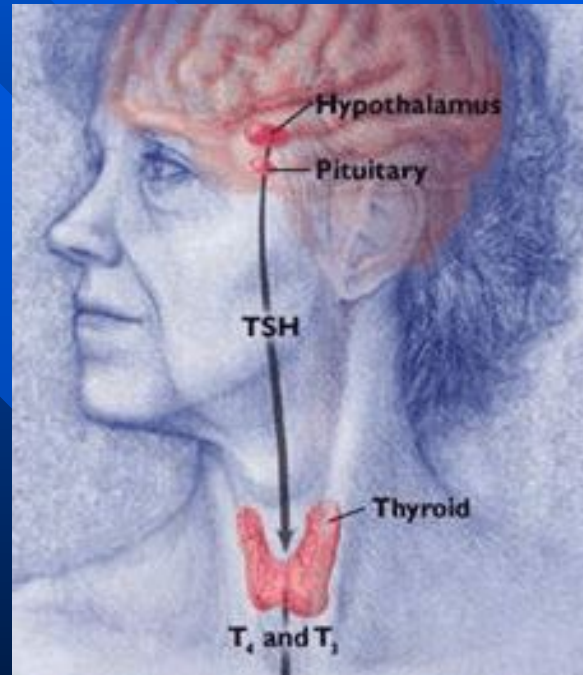


"All members of the committee agreed that there is scientific evidence that, under certain conditions, fluoride can weaken bone and increase the risk of fractures."

## Helte et al., 2021

*A high quality study from Sweden showed that the risk of hip fracture in post-menopausal women increased with increased fluoride exposure, in the range of zero to 1 ppm (note: Sweden is not fluoridated.) In other words, this risk was seen at levels at and below the 0.7 ppm recommended by the EPA for drinking water.*

*National Research Council (2006):*  
**Fluoride & the Thyroid**



“several lines of information indicate an effect of fluoride exposure on thyroid function.”

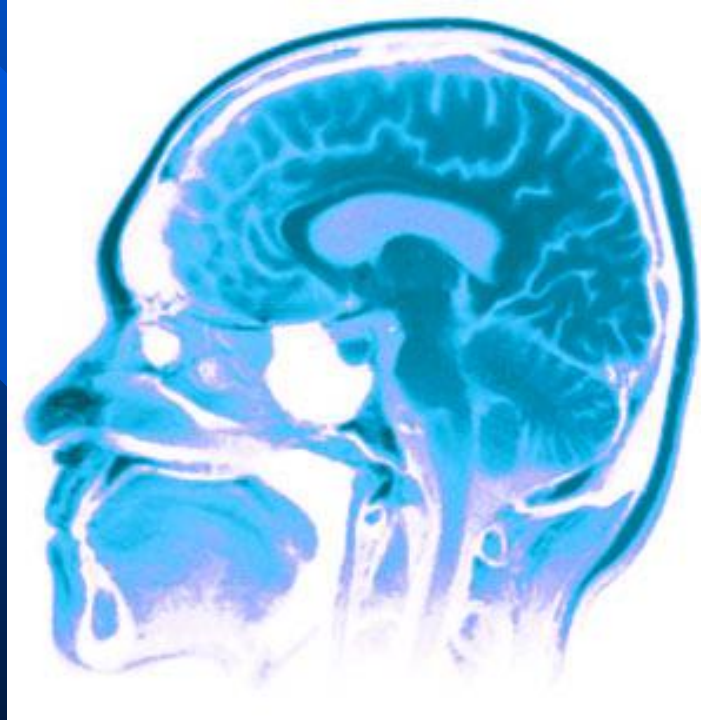
## Malin et al., 2018

Found that fluoride exposure increased TSH levels (a biomarker of hypothyroidism – underactive thyroid) in those already compromised by low iodine intake

*A pregnant woman with lowered thyroid function has a greater risk of producing a child with lowered IQ*



*National Research Council (2006):*  
**Fluoride & the Brain**



“it is apparent that fluorides have the ability to interfere with the functions of the brain.”

## NRC in 2006 concluded:

*That the MCL of 4 ppm was unprotective of health and the EPA (that paid for and requested their review) should conduct a new health risk assessment to determine a safer level – yet, after 18 years the EPA has failed to do this! Many of the end points discussed by the NRC occur at levels far lower than cause crippling skeletal fluorosis. The EPA is failing to protect our environmental health.*

5) Fluoride  
Lowers IQ –  
A ring-side seat

Since 2000 FAN has been posting  
links to all the studies on  
fluoride's ability to lower IQ on  
its website

[FluorideALERT.org](http://FluorideALERT.org)

As of 2022 FAN has listed 76  
human studies indicating fluoride  
lowers IQ

# FAN has described each study

## The 76 IQ Studies:

### **IQ Study #76 (Goodman 2022)**

Citation:

Goodman CV, Hall M, Green R, Chevrier J, Ayotte P, Matinez-Mier EA, McGuckin T, Krzeczkowski J, Flora D, Hornung R, Lanphear B, Till C. 2022. **Iodine Status Modifies the Association between Fluoride Exposure in Pregnancy and Preschool Boys' Intelligence.** Nutrients.

- Many of these studies were carried out in rural areas of China which are endemic for dental and skeletal fluorosis.

- An important meta-analysis of 27 of these studies was published in 2012 (Choi et al., 2012).

# Harvard Meta-analysis of IQ studies

## Review

### Developmental Fluoride Neurotoxicity: A Systematic Review and Meta-Analysis

Anna L. Choi,<sup>1</sup> Guifan Sun,<sup>2</sup> Ying Zhang,<sup>3</sup> and Philippe Grandjean<sup>1,4</sup>

<sup>1</sup>Department of Environmental Health, Harvard School of Public Health, Boston, Massachusetts, USA; <sup>2</sup>School of Public Health, China Medical University, Shenyang, China; <sup>3</sup>School of Stomatology, China Medical University, Shenyang, China; <sup>4</sup>Institute of Public Health, University of Southern Denmark, Odense, Denmark

**BACKGROUND:** Although fluoride may cause neurotoxicity in animal models and acute fluoride poisoning causes neurotoxicity in adults, very little is known of its effects on children's neurodevelopment.

**OBJECTIVE:** We performed a systematic review and meta-analysis of published studies to investigate the effects of increased fluoride exposure and delayed neurobehavioral development.

**METHODS:** We searched the MEDLINE, EMBASE, Water Resources Abstracts, and TOXNET databases through 2011 for eligible studies. We also searched the China National Knowledge Infrastructure (CNKI) database, because many studies on fluoride neurotoxicity have been published in Chinese journals only. In total, we identified 27 eligible epidemiological studies with high and reference exposures, end points of IQ scores, or related cognitive function measures with means and variances for the two exposure groups. Using random-effects models, we estimated the standardized mean difference between exposed and reference groups across all studies. We conducted sensitivity analyses restricted to studies using the same outcome assessment and having drinking-

Registry 2003). Fluoride exposure to the developing brain, which is much more susceptible to injury caused by toxicants than is the mature brain, may possibly lead to permanent damage (Grandjean and Landrigan 2006). In response to the recommendation of the NRC (2006), the U.S. Department of Health and Human Services (DHHS) and the U.S. EPA recently announced that DHHS is proposing to change the recommended level of fluoride in drinking water to 0.7 mg/L from the currently recommended range of 0.7–1.2 mg/L, and the U.S. EPA is reviewing the maximum amount of

Environmental Health Perspectives,  
2012 Oct;120(10):1362-8.

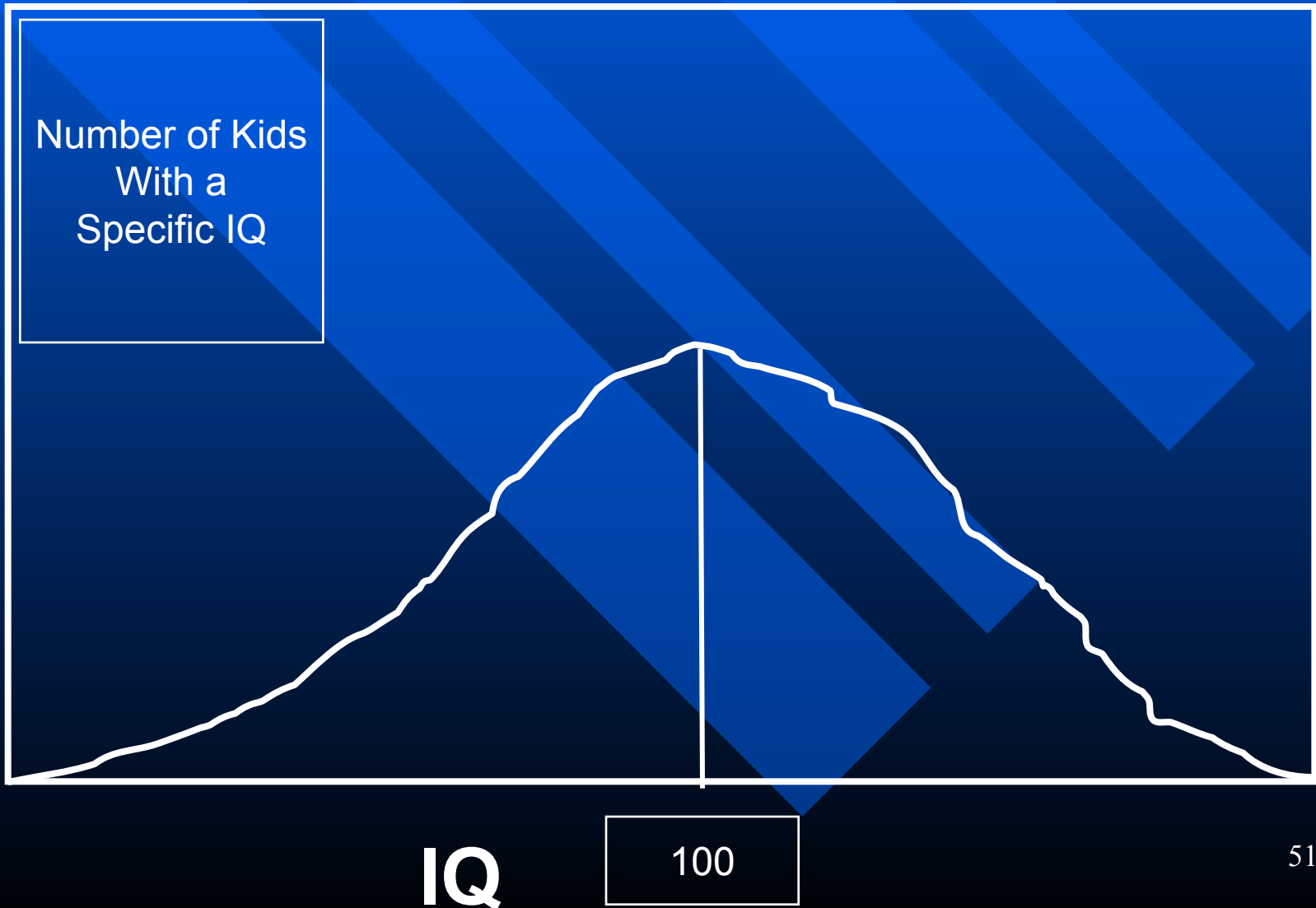


# Harvard meta-analysis of 27 studies

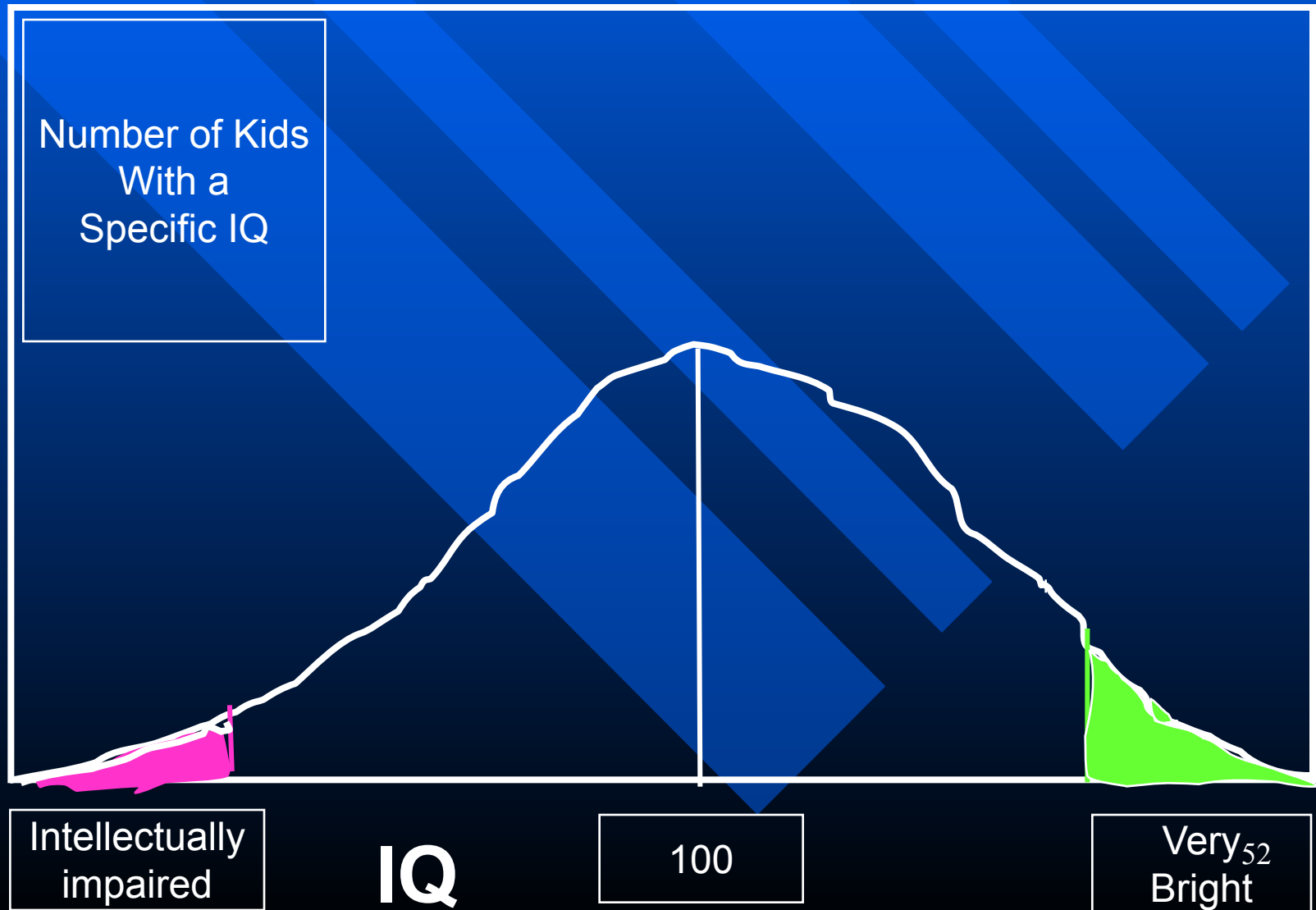
- The Harvard team acknowledged that there were weaknesses in many of the studies
- However, they stressed that the results were remarkably consistent
- In *26 of the 27 studies* average IQ in the “high fluoride” village was lower than the “low fluoride village
- Average lowering was half a standard deviation or **7 IQ points**

Why a loss of 5  
IQ points is so  
serious at the  
population level

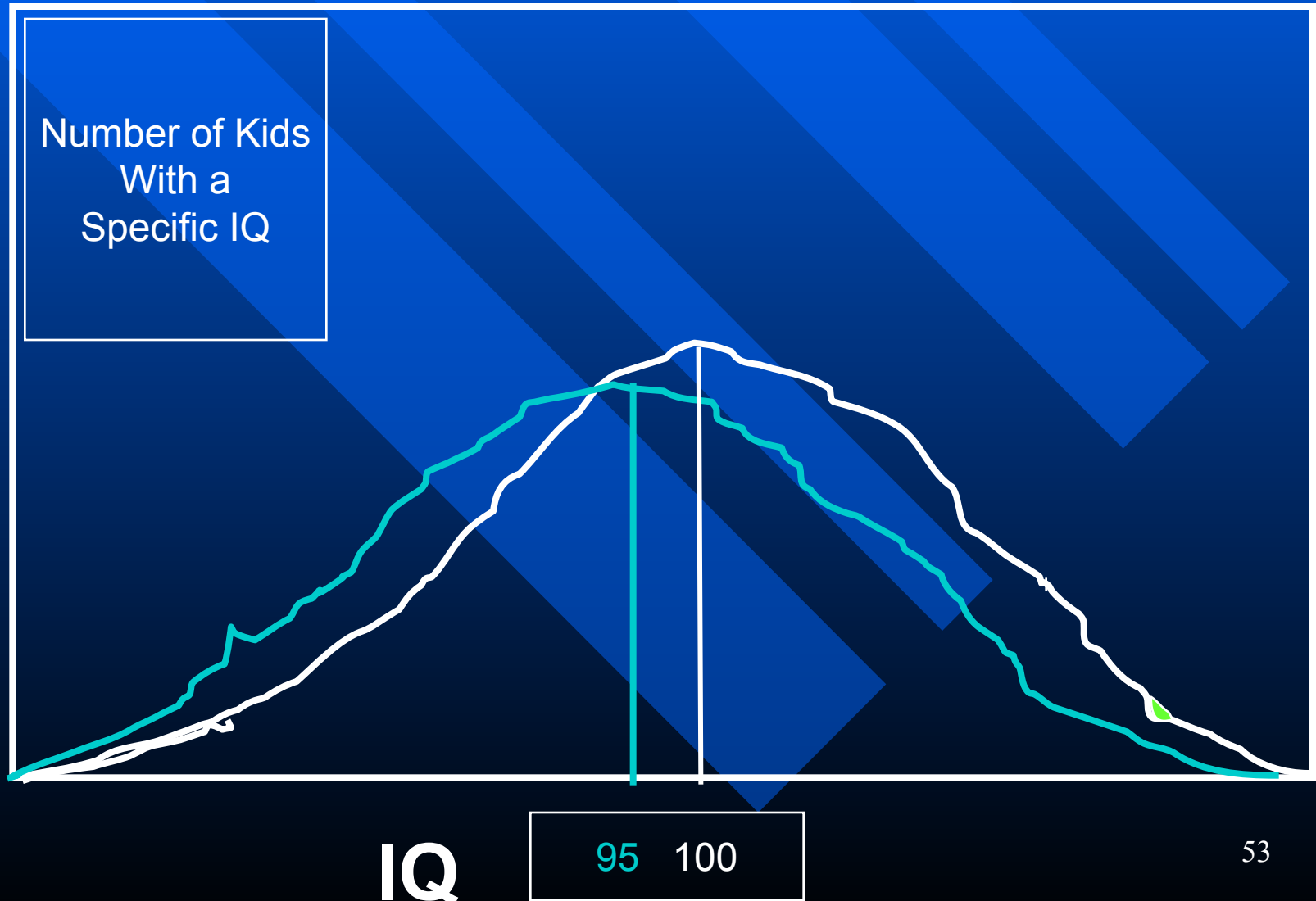
# IQ and population



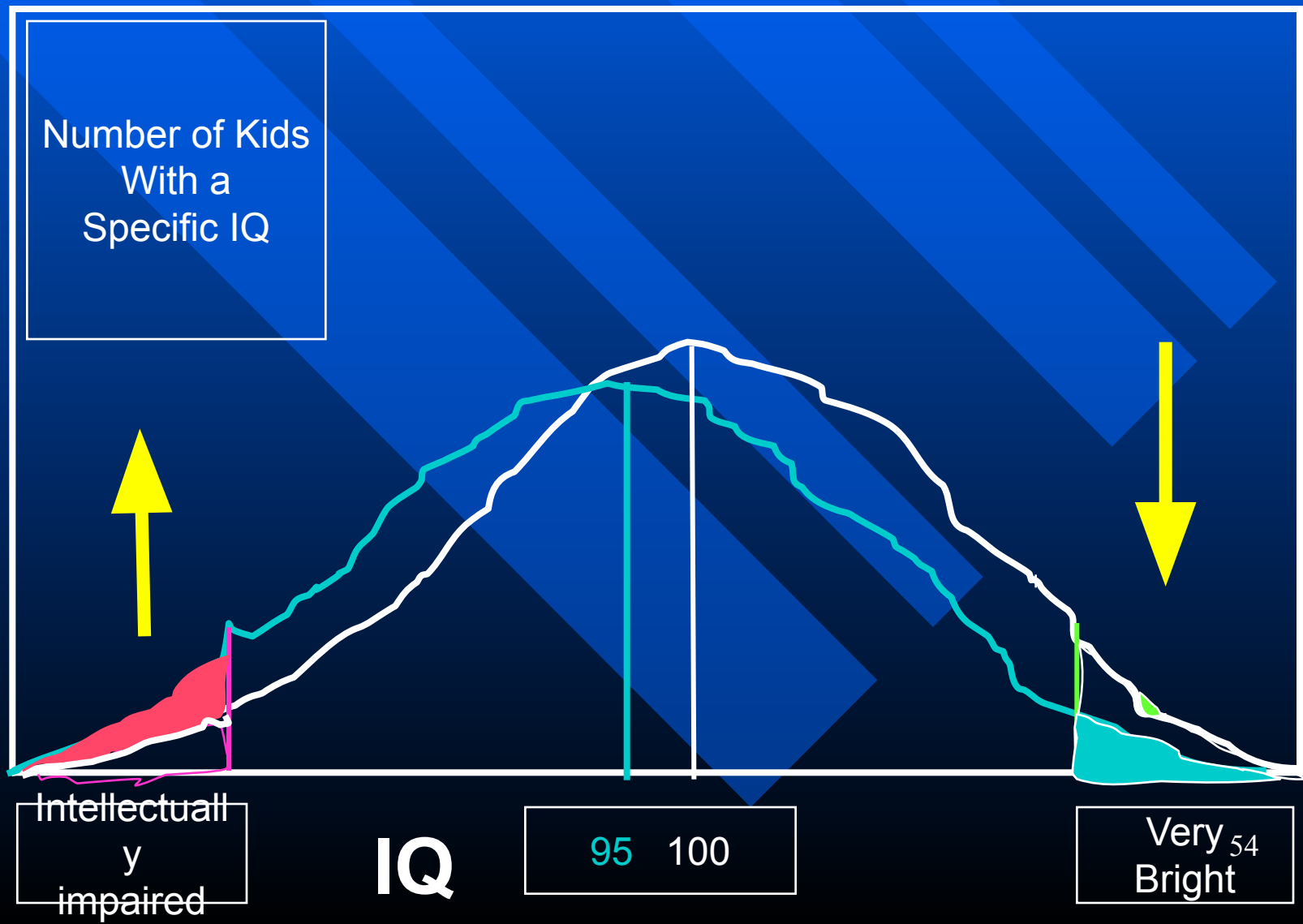
# IQ and population



# IQ and population



# IQ and population



**Bashash 2017**

(the first of the

**BIG THREE**

**NIEHS –funded studies)**

# The Bashash et al., 2017 study



*Environ Health Perspect*; DOI:10.1289/EHP655

## Prenatal Fluoride Exposure and Cognitive Outcomes in Children at 4 and 6–12 Years of Age in Mexico

Morteza Bashash,<sup>1</sup> Deena Thomas,<sup>2</sup> Howard Hu,<sup>1</sup> E. Angeles Martinez-Mier,<sup>3</sup> Brisa N. Sanchez,<sup>2</sup> Niladri Basu,<sup>4</sup> Karen E. Peterson,<sup>2,5,6</sup> Adrienne S. Ettinger,<sup>2</sup> Robert Wright,<sup>7</sup> Zhenzhen Zhang,<sup>2</sup> Yun Liu,<sup>2</sup> Lourdes Schnaas,<sup>8</sup> Adriana Mercado-García,<sup>9</sup> Martha María Téllez-Rojo,<sup>9</sup> and Mauricio Hernández-Avila<sup>9</sup>



## The Bashash et al., 2017 study

- This was a 12-year multi-million dollar study – funded by EPA, NIH and NIEHS.
- Well-experienced authors controlled for many possible confounding variables.

# Bashash 2017

Many potential confounders adjusted for:

## Child characteristics:

1. gestational age
2. weight at birth
3. sex
4. parity (being the first child)
5. age at outcome measurement

## Maternal characteristics:

6. smoking history (ever smoked vs. nonsmoker)
7. marital status (married vs. others)
8. age at delivery
9. maternal IQ
10. education,
11. cohort (Cohort 3-Ca, Cohort 3- placebo and Cohort 2A)

## 12. HOME score

13. child's urine F at outcome assessment
14. SES (Socio-Economic Status)
15. maternal bone lead
16. maternal blood mercury
17. calcium supplement

## Excluded from study if:

18. history of psychiatric disorders
19. high-risk pregnancies
20. gestational diabetes

## reported current use of:

21. daily alcohol
22. illegal drugs
23. continuous prescription drugs

## were diagnosed with:

24. preeclampsia
25. renal disease
26. circulatory diseases
27. hypertension
28. seizures during the index pregnancy

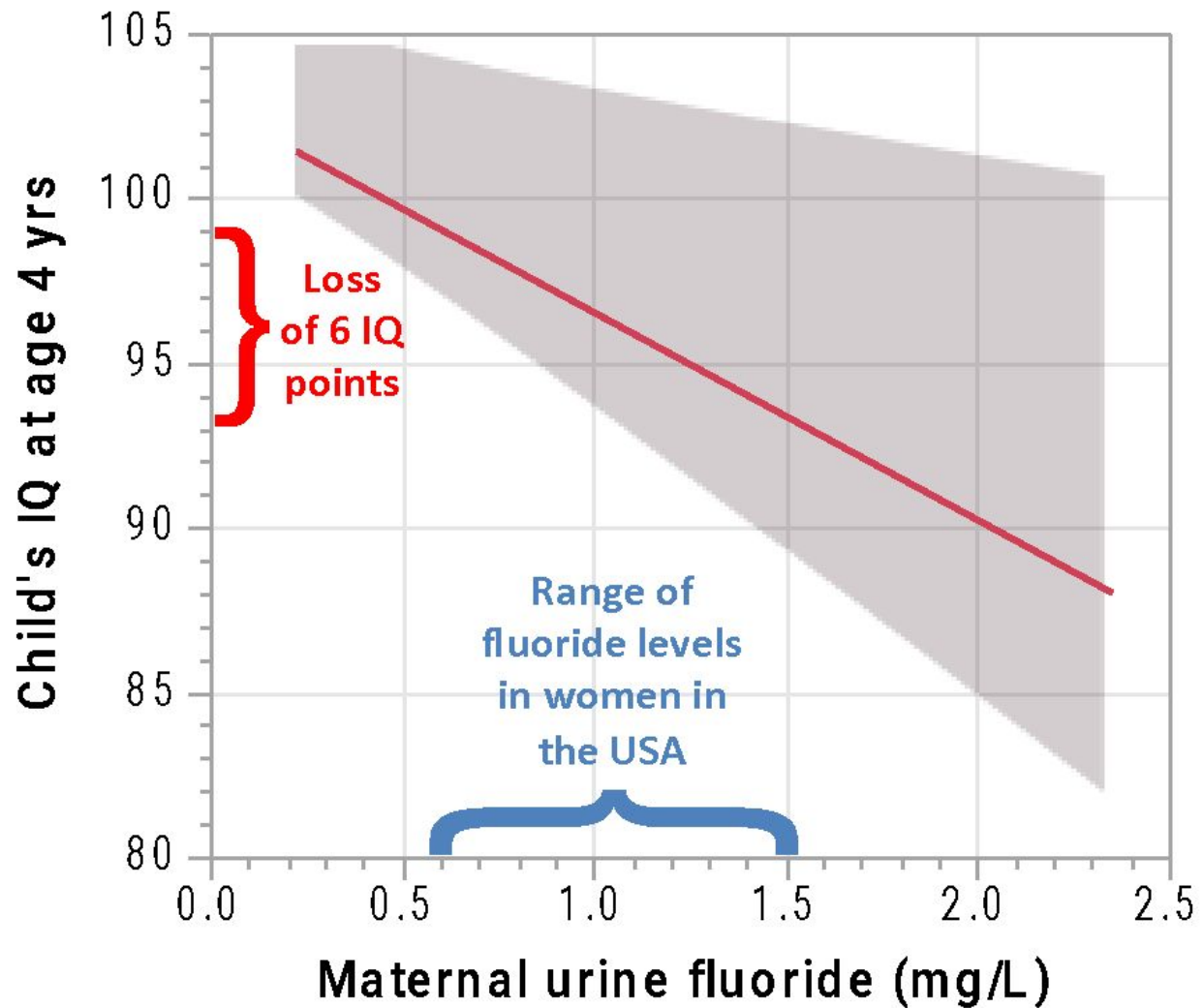
## The study

- Examined approximately 300 mother-offspring pairs.
- Both exposure and outcomes were determined on an **individual** basis.
- The mothers' exposure to fluoride during pregnancy was determined via analysis of their urine (**a measure of total fluoride exposure regardless of source**).

# The study results

- The IQ of the women's children was measured at age 4 and again at 6-12 years
- For every 1 mg/L increase in the mother's urine F level the children lost an average of **5-6 IQ points**, a very large effect.

## Relationship between fluoride and IQ found in new study (Bashash et al. 2017)

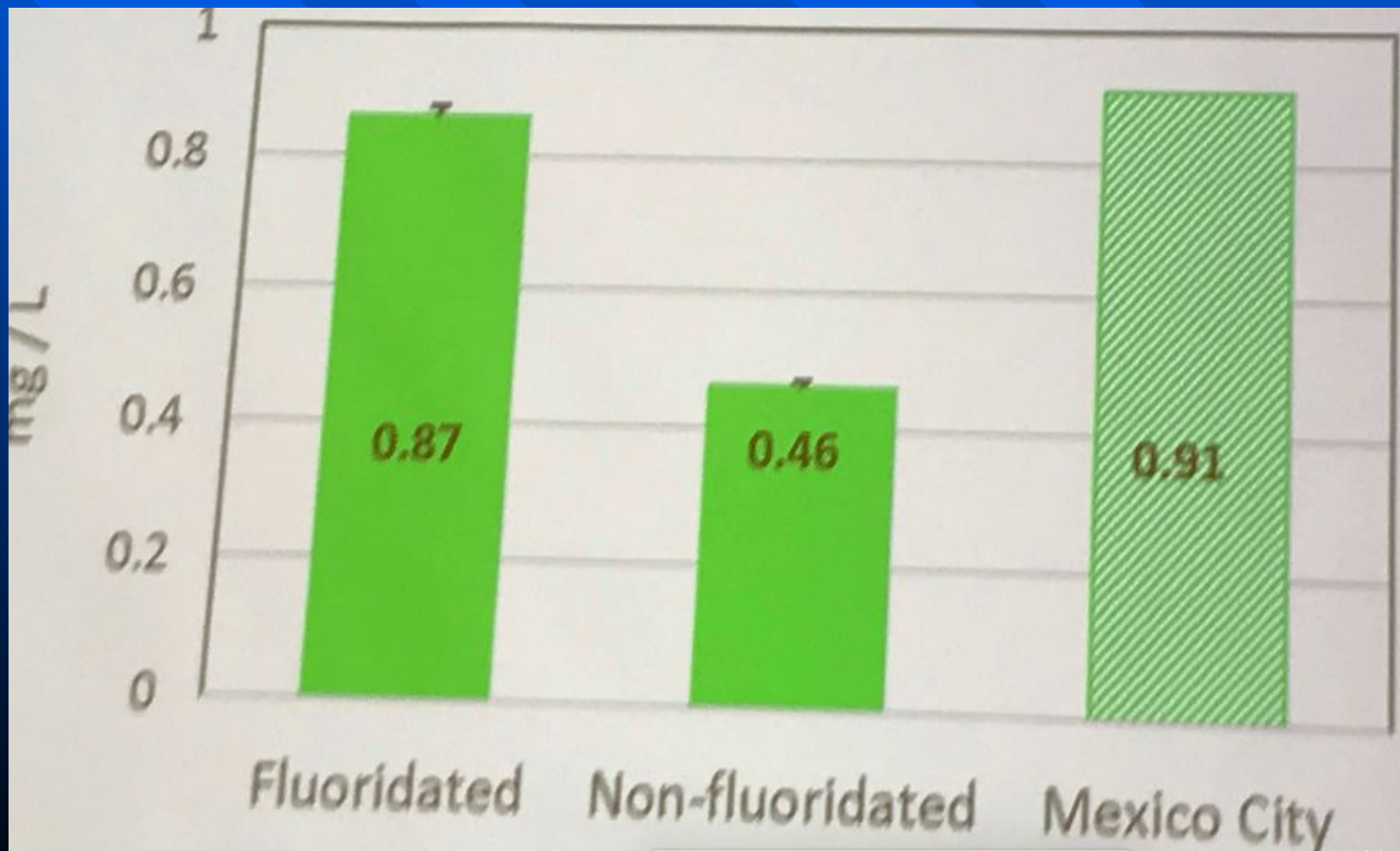


- ADA argued that this study was not relevant to USA because Mexico does not fluoridate its water – there the source is fluoridated salt

## Till et al., 2018

Found levels of fluoride in the urine of pregnant women in **fluoridated communities in Canada** that were approximately the same as the levels in the Bashash study done in Mexico City.

# Urinary fluoride levels in pregnant women in Canada (Till, 2018)





**Green 2019**  
(the second of the  
**BIG THREE**  
NIEHS –funded  
studies)

# Green 2019

Research

JAMA Pediatrics | [Original Investigation](#)

## Association Between Maternal Fluoride Exposure During Pregnancy and IQ Scores in Offspring in Canada

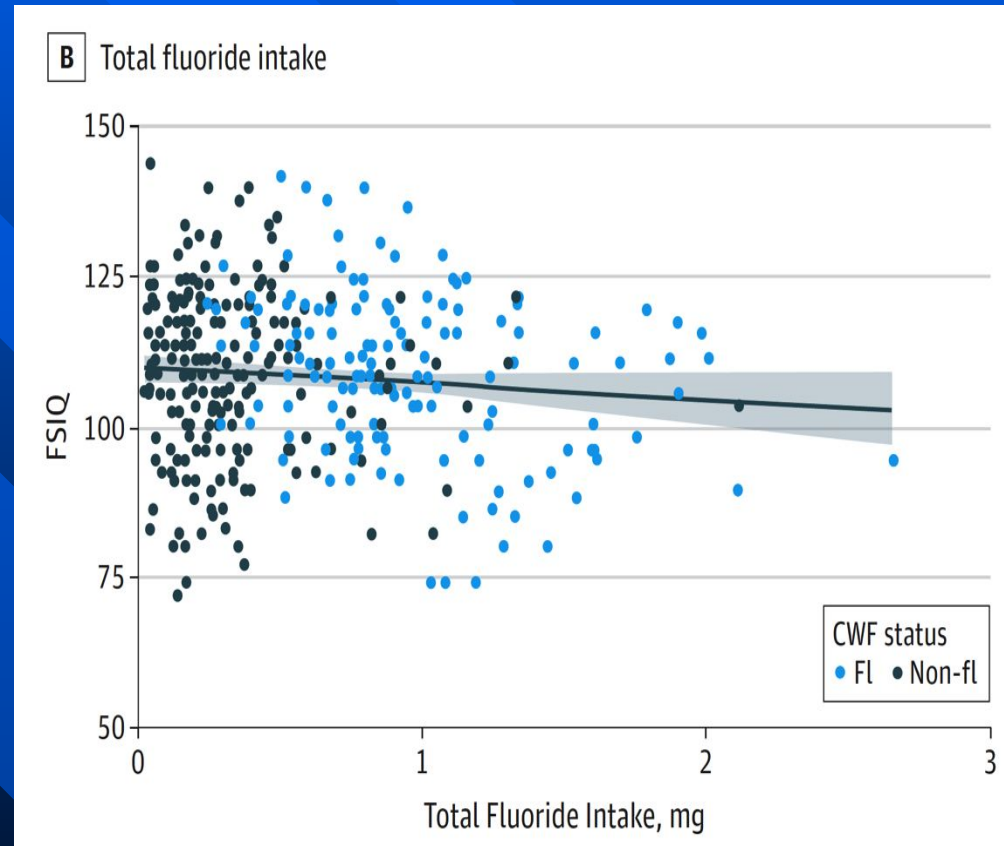
Rivka Green, MA; Bruce Lanphear, MD; Richard Hornung, PhD; David Flora, PhD; E. Angeles Martinez-Mier, DDS;  
Raichel Neufeld, BA; Pierre Ayotte, PhD; Gina Muckle, PhD; Christine Till, PhD

# Green 2019

- Average IQ loss of 4.5 points in **boys** for each 1 mg/L increase in mother's urine.

- Average IQ loss of 3.7 points for each 1 mg/day increase in mother's F ingestion (for boys **AND** girls)

## F and IQ



**Till 2020**  
(the third of the  
**BIG THREE**  
**NIEHS –funded**  
**studies)**

# Till 2020

Environment International 134 (2020) 105315



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Environment International

journal homepage: [www.elsevier.com/locate/envint](http://www.elsevier.com/locate/envint)



## Fluoride exposure from infant formula and child IQ in a Canadian birth cohort



Christine Till<sup>a,\*</sup>, Rivka Green<sup>a</sup>, David Flora<sup>a</sup>, Richard Hornung<sup>b</sup>, E. Angeles Martinez-Mier<sup>c</sup>, Maddy Blazer<sup>a</sup>, Linda Farmus<sup>a</sup>, Pierre Ayotte<sup>d,e</sup>, Gina Muckle<sup>d,f</sup>, Bruce Lanphear<sup>g,h</sup>

Till, 2020

Children who were Bottle-fed as babies in **fluoridated communities** in Canada had lower IQ than children who were Bottle-fed in **non-fluoridated communities** (a 9 IQ point difference)

# Till 2020

***Recomendation: no fluoridated water for infants***

“After adjusting for fetal exposure, we found that fluoride exposure during infancy predicts diminished non-verbal intelligence in children. In the absence of any [dental] benefit from fluoride consumption in the first six months, it is prudent to limit fluoride exposure by using non-fluoridated water or water with lower fluoride content as a formula diluent.”

# Two important FAN initiatives

1. In 2016 FAN requested that the National Toxicology Program (NTP) review the neurotoxicology of Fluoride.
2. In 2017 FAN (and other groups) sued the EPA (under provisions in TSCA) to ban the deliberate addition of fluoride to the drinking water because it posed an unreasonable risk to the brain development of children



**National Toxicology Program (NTP)  
systematic review and health assessment  
of the neurotoxicity of fluoride:**

**“Conclusions:** NTP concludes that fluoride is presumed to be a cognitive neurodevelopmental hazard to humans. This conclusion is based on a consistent pattern of findings in human studies across several different populations showing that higher fluoride exposure is associated with decreased IQ or other cognitive impairments in children.”

# NTP State of Science Report.

Based on FOIA requests, FAN discovered that the NTP science team was ready to publish its State of the Science report on May 18, 2022, but the dental lobby (ADA, AFS and NIDCR) applied pressure on NIH assistant director Rachel Levine, who prevented the publication of this May 18 report.

However, the **Law judge in TSCA case required NTP to make the report public – and it appeared on its website March 15, 2023 and was the basis for part 2 of the TSCA trial which ended in Feb 2024. We are waiting on the judge's verdict.**

6. The evidence that swallowing fluoride lowers tooth decay is extremely weak

# Little difference in tooth decay between F and non-F communities

- Leverett, Science, 1982
- Colquhoun, 1984, 1985, 1987
- Diesendorf, Nature, 1986
- Gray, 1987
- Brunelle & Carlos, 1990

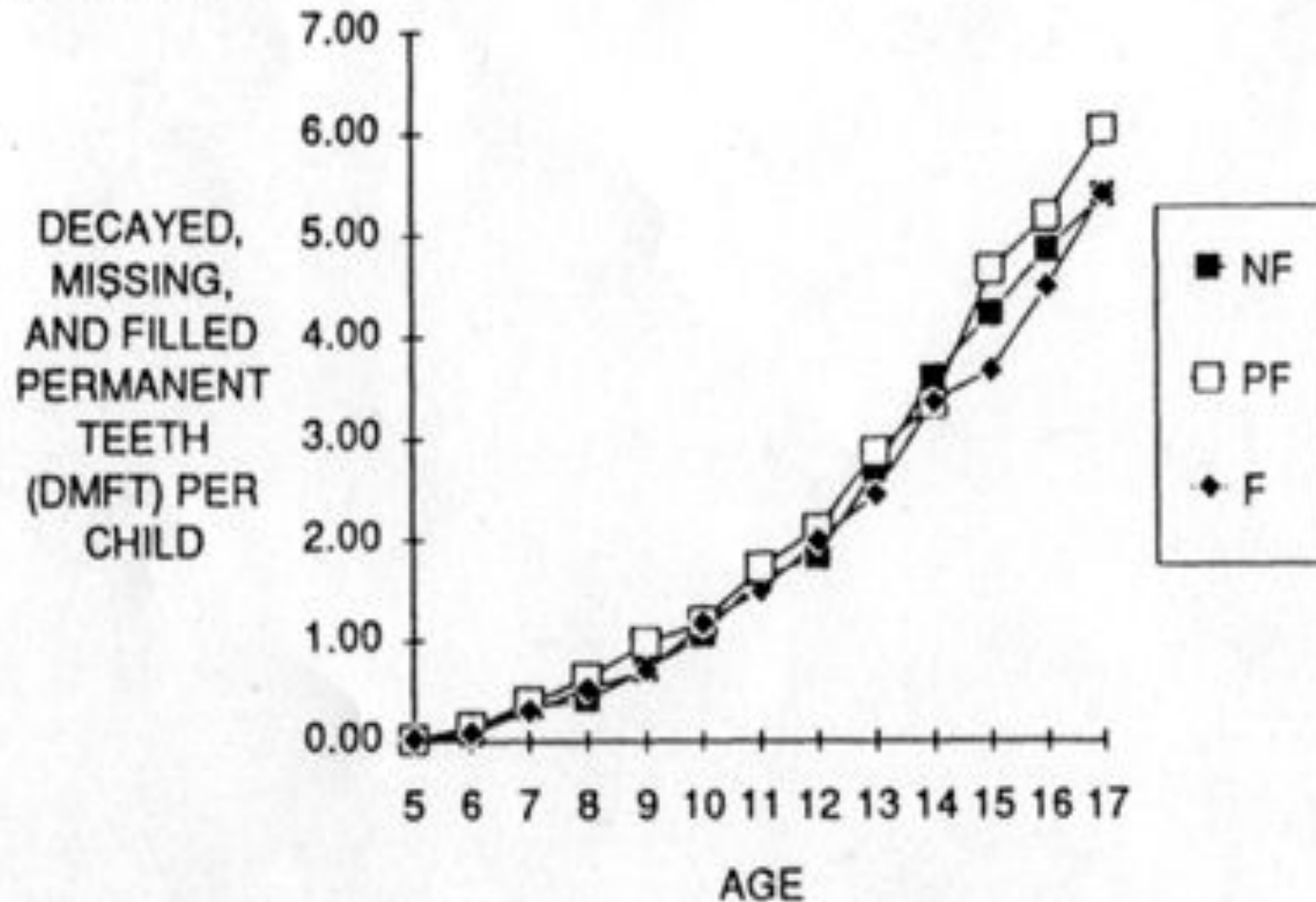
# Brunelle and Carlos (1990)

- Largest dental survey ever carried out in the US.
- Commissioned by the National Institute for Dental Research (NIDR).
- The teeth of over 39,000 children in 84 communities were examined.
- Independent analysis by John Yiamouyiannis of the raw data indicated no statistically significant difference in average **DMFT (= decayed, missing and filled permanent TEETH)**, between children living in fluoridated and non-fluoridated communities

# Yiamouyiannis, 1990

Figure 2A

Tooth decay in residents of fluoridated (F), nonfluoridated (NF), and partially fluoridated (PF) areas who lived their entire life in the same household.



## Brunelle and Carlos (1990)

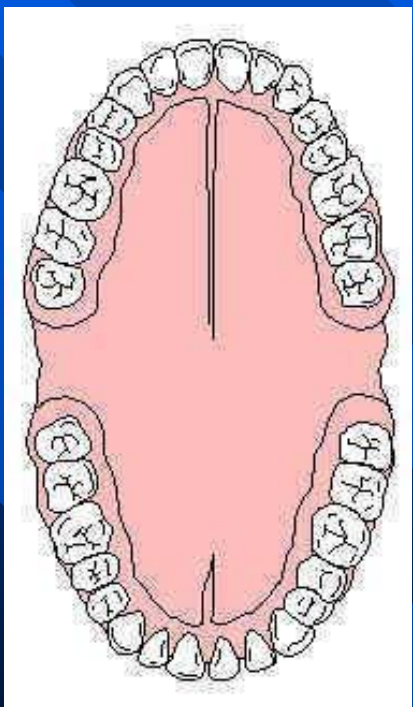
- Brunelle and Carlos increased sensitivity by factor of five (approximately) by comparing **DMFS** (= decayed, missing and filled permanent **SURFACES** - 5 surfaces to most teeth, 4 in top and bottom front six)

In the US, the largest survey of tooth decay found very little benefit.

3.4

DMFS

NF



2.8

DMFS

F

Average **difference** (for 5 - 17 year olds) in DMFS

= **0.6 tooth surfaces (5 surfaces to a tooth)**



# Australia

- Spencer et al. (1996) reported an average difference of 0.12 - 0.3 permanent tooth surfaces. Which is even less than the US (0.6)!

# New Zealand de Liefde (1998)

In NZ, de Liefde reported a difference in tooth decay between children in F and non-F communities which she described as,  
“clinically meaningless.”

# In Ontario



Ministry of  
Health and Long-Term Care

“The magnitude of [fluoridation’s] effect is not large in absolute terms, **is often not statistically significant, and may not be of clinical significance.**”

SOURCE: **David Locker** for the Ontario Ministry of Health & Long Term Care, 1999

# Tooth decay in third graders in NY state - average by county

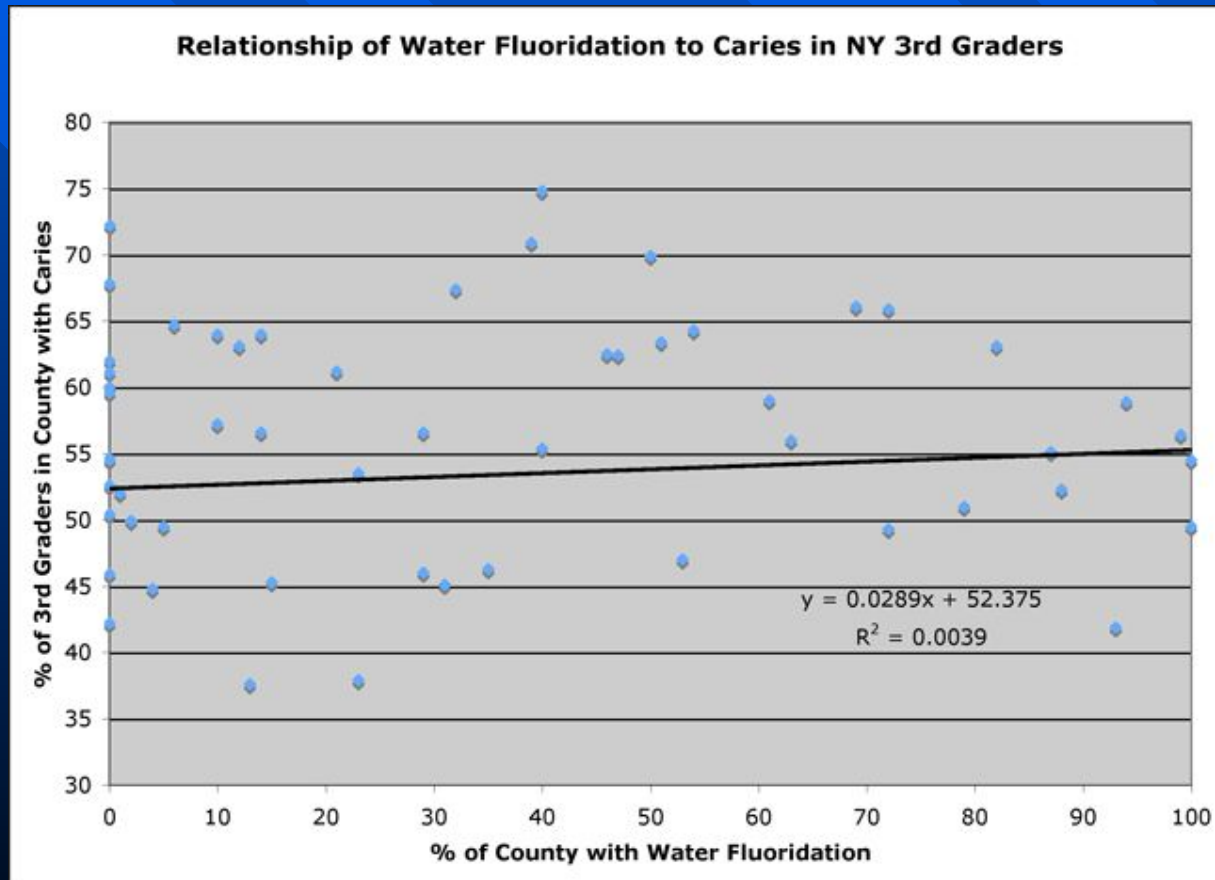


Slide from Michael Connett (2007, unpublished)

Data from: New York State Oral Health Survey  
(2002-2004)

NY Bureau of Dental Health

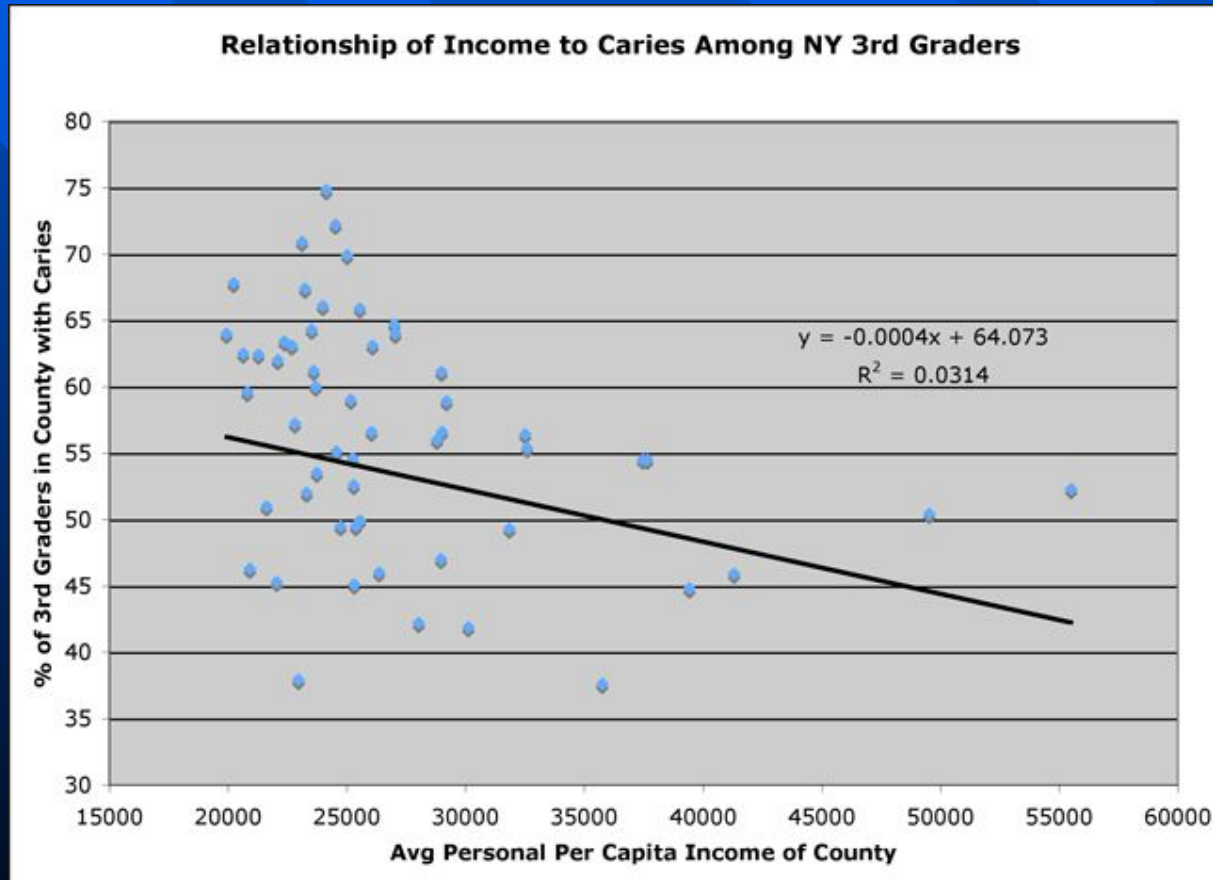
# Relationship of Fluoridation to Caries Among NY State 3rd Graders



Data from: New York State Oral Health Survey  
(2002-2004)

NY Bureau of Dental Health

# Relationship of Income to Caries Among NY State 3rd Graders



Data from: New York State Oral Health Survey  
(2002-2004)

NY Bureau of Dental Health

# Important study from Iowa

- Warren et al., 2009, measured tooth decay as a function of individual exposure to fluoride (estimated grams F ingested per day)
- They found no relation between tooth decay and amount of fluoride ingested.

# Important study from Iowa

- “These findings suggest that achieving a caries-free status
- may have relatively little to do with fluoride intake...”
- (Warren et al., 2009)



In June 2015, The Cochrane Collaboration reported on a review of fluoridation's benefits

The Cochrane Collaboration is acknowledged internationally as the gold standard in evidenced based reviews of health science.

# The Cochrane Review (June 2015)

**The authors could find NO high quality research that showed that:**

- 1) It provided any benefit to adults
- 2) It provided additional benefits over and above topically applied fluoride
- 3) It reduced inequalities among children from different socio-economic groups or that
- 4) Tooth decay increased in communities when fluoridation is stopped.

# The Cochrane Review (June, 2015)

- In addition, the Cochrane team was not convinced that studies showing that water fluoridation reduces decay in children are applicable to today's society, as nearly all the studies reviewed (dating back to the 1940's – 1960's) had a **high risk of bias** and were conducted prior to the availability of fluoride toothpaste and other sources of fluoride which we have today.

# Two recent UK government funded studies

## ■ **The Catfish Study (2022)**

- Goodwin et al, *Public Health Res.* 2022; 10(11)

## ■ **The Lotus Study (2024)**

- Moore et al. *Community Dent Oral Epidemiol.* 2024; Jan 8.

# The Catfish study (UK, 2022)

- “...reduction in effectiveness is likely to be due to the low caries prevalence seen following the widespread use of fluoride toothpaste”

# The Lotus study (2024)

- “Receipt of optimal water fluoridation 2010–2020 resulted in very small positive health effects which **may not be meaningful** for individuals.”

# 7. The probable explanation for weak evidence

The probable explanation for this lack of difference in tooth decay between F and NF communities is:

- a) Fluoride works topically  
(CDC, 1999)
- b) Fluoridated toothpaste is readily available



If fluoride works primarily  
on the outside of the tooth  
**why swallow it?**

Why put it in the drinking  
water and **force it on**  
**people who don't want it?**



“In pharmacology, if the effect is local (topical), it's awkward to use it in any other way than as a local treatment. I mean this is obvious. You have the teeth there, they're available for you, why drink the stuff?”

-Dr. ARVID CARLSSON,  
NOBEL LAUREATE in MEDICINE 2000



**Arvid Carlsson**

Nobel Prize for Medicine in 2000

“Sweden rejected fluoridation in the 1970s...Our children have not suffered greater tooth decay ...and in turn our citizens have not borne the other hazards fluoride may cause..” (2010)

8.

Safer and cheaper  
way of fighting tooth  
decay as practiced in  
Scotland

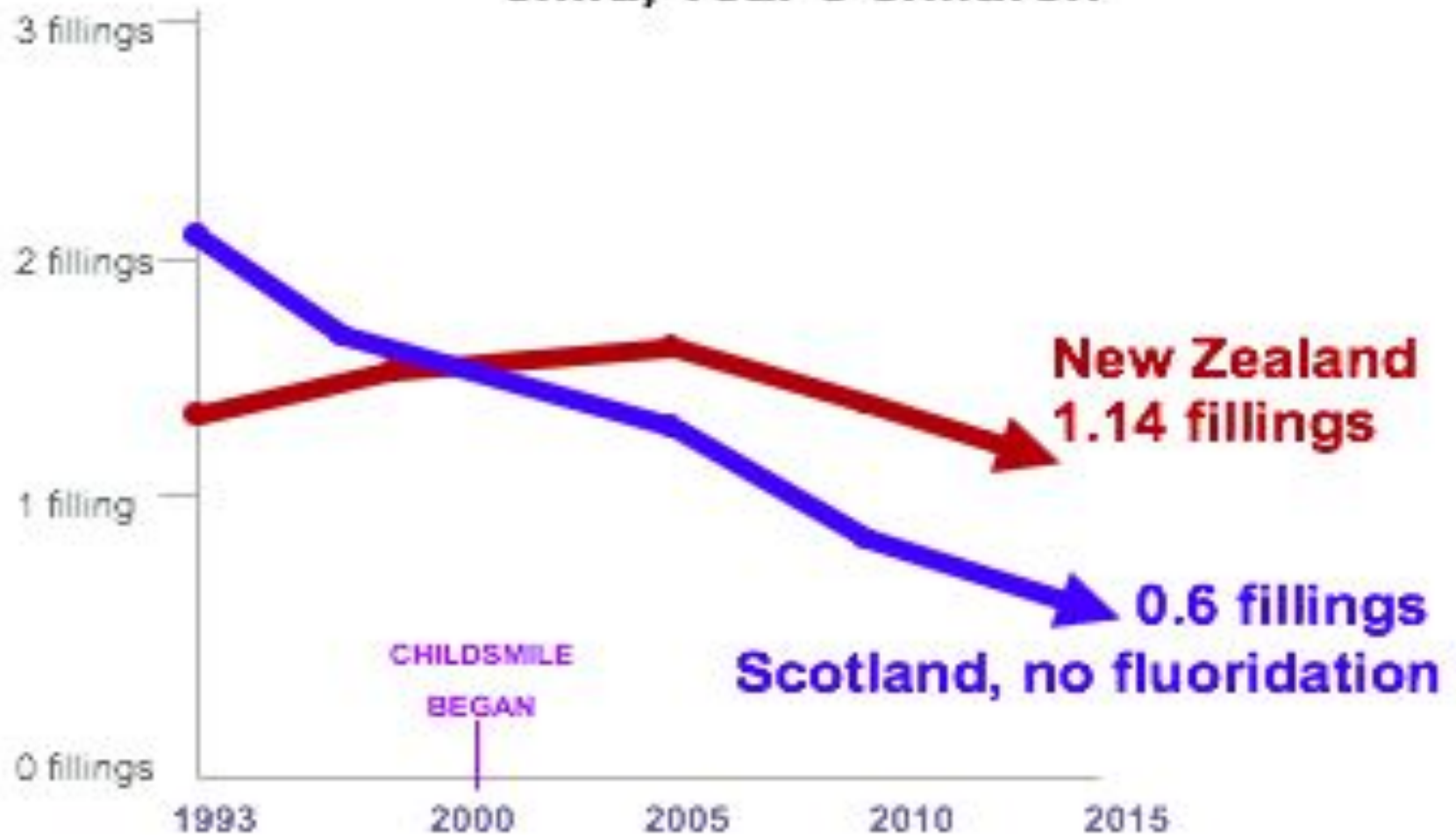
# The cause of tooth decay

- In my view, tooth decay is not caused by lack of fluoride but by a poor diet (especially too much sugar ) and poor dental hygiene. Both relate to poverty. In fact in nearly every survey on tooth decay you will find a greater relationship to family income than fluoridation status.

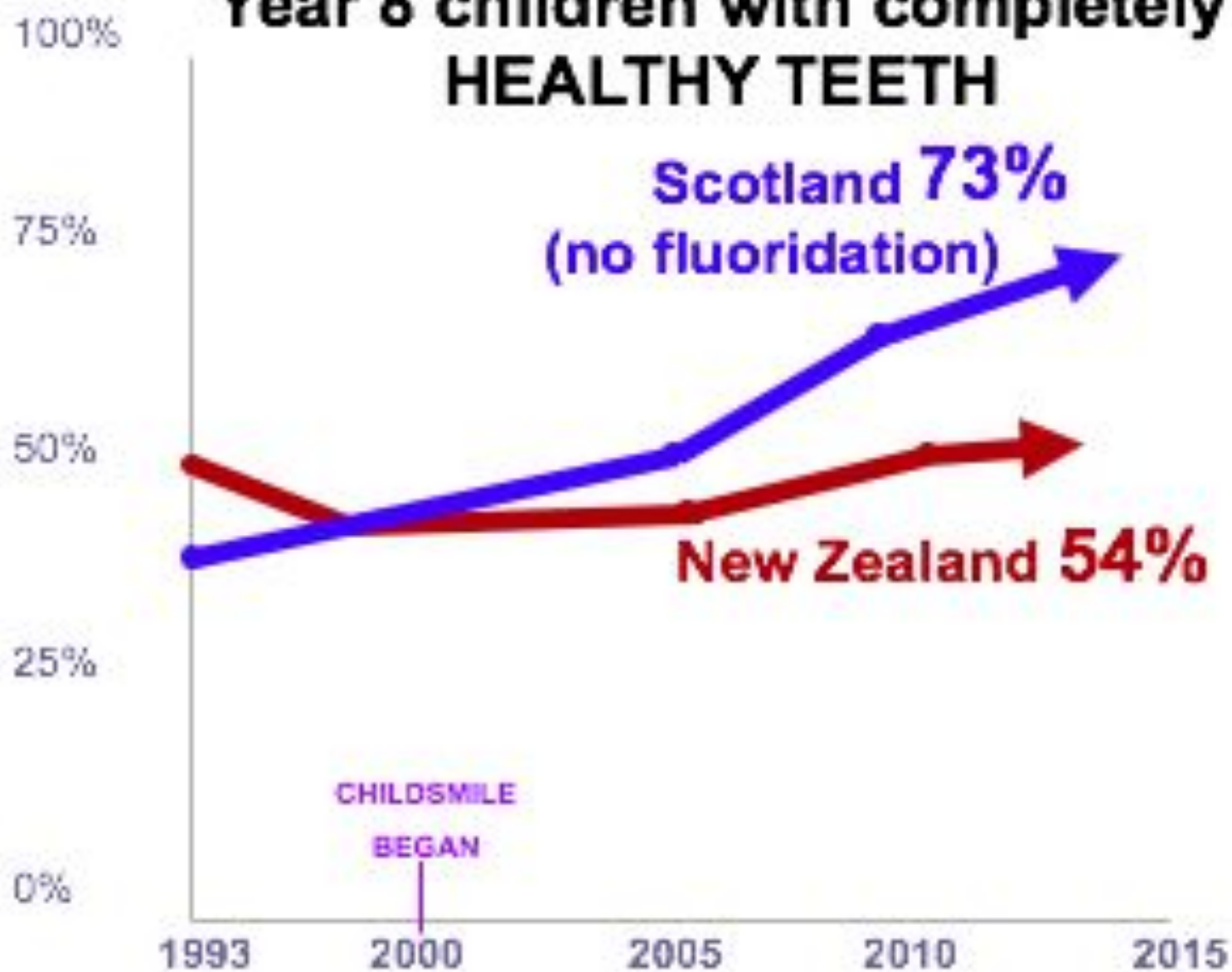
# Scotland

- Because of a court ruling, Scotland has no fluoridation. It has developed an alternative: the **Childsmile** program. This program:
  - a) teaches toothbrushing in nursery-schools;
  - b) provides healthy snacks & drinks in school;
  - c) provides dental health and dietary advice to both children and parents, and
  - d) provides annual dental check-ups and treatment if required including fluoride varnish applications.

## Average number of fillings per child, Year 8 children



# Year 8 children with completely HEALTHY TEETH





# Childsmile Cost savings

- *“Glasgow researchers found that the scheme had reduced the cost of treating dental disease in five-year-olds by more than half between 2001 and 2010.” (BBC, Scotland)*

# Childsmile Cost savings

One of the reasons Childsmile saves money is that with early access to parents it reduces the incidence of Baby Bottle Tooth Decay, which often leads to extractions under general anaesthesia which are very expensive.

# SUMMARY AND CONCLUSION

# Summary and Conclusions 1 of 3

- More than 70 human studies including three high quality studies funded by the NIEHS indicate that fluoride lowers IQ during fetal and infant exposure at levels experienced in fluoridated communities.
- A high quality study also indicates an association between fluoride exposure and increased hip fracture in post-menopausal women (Helte, 2021) at doses experienced in fluoridated communities.

# Summary and Conclusions 2 of 3

- The scientific evidence that fluoride causes harm is far superior to the evidence that ingesting fluoride substantially lowers tooth decay.
- Science does not justify denying informed consent & forcing this practice on people who do not want it and may be harmed by it.
- The CDC and most researchers admit that the predominant benefit of fluoride is TOPICAL.
- There is little reason to swallow fluoride, when fluoridated toothpaste is readily available.
- Most countries do not fluoridate. Tooth decay is coming down as fast in NF countries as in F countries.

# Summary and Conclusions 3 of 3

- Tooth decay is more likely caused by poor diet (too much sugar) and poor dental hygiene than lack of fluoride in the water or diet.
- Education offers a more rational and practical approach than fluoridation.
- An excellent model of this approach is the **Childsmile** program in Scotland which is cost effective and offers the added benefit of enhancing health, reducing obesity and prevalence of diabetes.
- I urge Binghamton to end fluoridation as soon as possible. It is not mandated by the state.

**Annual Water Quality Report for 2023**  
**Binghamton Water Department**  
Binghamton, New York 13903  
Public Water Supply ID# NY0301651

**INFORMATION ON THE ADDITION OF FLUORIDE**

Our system is one of many in New York State that provides drinking water with a controlled, low level of Fluoride for consumer dental health protection. Fluoride is added to your water by the Water Filtration Plant and is monitored no less than every four hours by water plant operators and laboratory personnel. According to the Center for Disease Control, Fluoride is very effective in preventing cavities when present in drinking water at an optimal range from 0.6 – 0.8 mg/L. During 2023 monitoring showed Fluoride levels in your water were in the optimal range 100% of the time

The City of Binghamton follows recommendation of CDC, which follows the EPA, which is outdated and does not follow the overwhelming science of recent years.

At the very least, the research suggests that the “optimal range of 0.6 - 0.8 mg/L” poses an increased risk of hip fractures among post-menopausal women, plus a risk to infants drinking infant formula made with fluoridated water – an environmental justice issue. Other elevated risks may include those to the developing fetus, children, adolescents, diabetics, athletes, and people with hypothyroidism.