

Why we doubt the benefits of swallowing fluoride.

Paul Connett, www.fluoridealert.org, March, 2009

Introduction

One of the surprises waiting for someone who decides to review the literature on the issue of water fluoridation is the discovery that, despite the impression conveyed by the promoters, the evidence that swallowing fluoride actually reduces tooth decay is very weak. In this bulletin we will begin to review the evidence that the benefits of swallowing have been wildly exaggerated and no grade A study has ever been published to support the claims of "massive" benefit.

1. Fluoride is not an essential nutrient

Fluoride is not an essential nutrient (NRC 1993 and IOM 1997). No disease has ever been linked to a fluoride deficiency. Humans can have perfectly good teeth without fluoride. This is not surprising when one notes the level of fluoride in mothers' milk. This is only 0.004 ppm (NRC, 2006, [p. 36](#) and [Table 2-6, p. 40](#)). If the infant needed fluoride to develop strong health teeth then clearly evolution messed up on this requirement.

2. No "Randomized Controlled Trials" demonstrating effectiveness

In the 60 years (plus) of this practice there has never been a study of the quality required by the FDA and other national regulatory bodies when approving new drugs for efficacy. Such trials require random selection of the individuals tested (exposed and unexposed) and examinations should be "double blind." Double blind means that neither the person examining the subject nor the person being tested should know whether the substance given is the drug or a placebo. The modern terminology for this testing is "Randomized Controlled Trial."

The York Review (McDonagh et al. 2000) after an exhaustive review of the literature could identify NO "Randomized Controlled Trials" of either fluoridation's effectiveness, or safety.

3. No controls for delayed eruption of teeth

Not one single study purporting to demonstrate fluoridation's effectiveness has ever controlled for a possible delayed eruption of teeth caused by fluoride, for which there is some evidence (Feltman and Kosel 1961; Komarek et al. 2005).

4. Primary versus secondary dentition

Those promoting fluoridation usually do so using the data on primary dentition (deciduous teeth) rather than secondary dentition (permanent teeth). However, it is the latter which are more important since these are the teeth we hope to have for the rest of our lives.

5. Cross-sectional versus Longitudinal studies

The York Review (McDonagh et al. 2000) only looked at longitudinal studies (these compare the same community over a period of time). Cross-sectional studies (these compare 2 or more communities at the same point in time) are much larger and more convincing in indicating no or little benefit from ingesting fluoride. Some of these studies are discussed below.

6. Baby bottle tooth decay

Even promoters of fluoridation have conceded that fluoridation cannot prevent baby bottle tooth decay (BBTD) and this is the cause of the most distressing examples of tooth decay in infants often leading to extractions under anesthesia. BBTD is caused by babies sucking on sugared water, fruit juice (and even coca cola) for hours on end (Kelly et al. 1987; Barnes et al. 1992; Weinstein et al. 1992; Von Burg et al. 1995; Febres et al. 1997; Tang et al. 1997; Blen et al. 1999 and Kong 1999).

Promoters are being intellectually dishonest when they use pictures of BBTD to promote fluoridation. But this has become a standard ploy of many promoting fluoridation.

7. Pit and fissure decay

Since 1950, it has been found that fluorides do little to prevent pit and fissure tooth decay, a fact that even the dental community has acknowledged (Seholle 1984; Gray 1987; PHS 1993; and Pinkham 1999).

This is significant because pit and fissure tooth decay represents up to 85% of the tooth decay experienced by children today (Seholle 1984 and Gray 1987). Pit and fissure decay is best prevented with sealants.

8. Decay rates have been coming down before fluoridation began and after the" benefits" would have been maximized

Modern research (e.g. Diesendorf 1986; Colquhoun 1997, and De Liefde 1998) shows that decay rates were coming down before fluoridation was introduced and have continued to decline even after its benefits would have been

maximized (see discussion on Diesendorf's 1986 paper below).

Many other factors influence tooth decay. Some recent studies have found that tooth decay actually increases as the fluoride concentration in the water increases (Olsson 1979; Retief 1979; Mann 1987, 1990; Steelink 1992; Teotia 1994; Grobleri 2001; Awadia 2002; and Ekanayake 2002).

9. Little difference between fluoridated and non-fluoridated communities

There is very little evidence which demonstrates a significant difference in the permanent teeth when comparing children living in fluoridated and non-fluoridated communities (Leverett 1982; Diesendorf 1986; Gray 1987; Yiamouyiannis 1990; Brunelle and Carlos 1990; Spencer et al. 1996; deLiefde 1997; Locker 1999; Armfield & Spencer 2004; and Pizzo et al. 2007).

10. Benefits topical not systemic.

Even ardent supporters and promoters of fluoridation like the Centers for Disease Control and Prevention (CDC), now admit that the benefits of fluoride are largely topical not systemic (CDC 1999, 2001). In other words fluoride works on the outside of the tooth not from inside the body. The fact that fluoridated toothpaste is universally available today, coupled with an increasing standard of living, are more likely explanations for declines in tooth decay in industrialized societies than the availability of fluoridated drinking water.

11. World Health organization (WHO) data

According to WHO data there is no significant difference in the rates of decline in decay in the teeth of 12-year olds between fluoridated and non-fluoridated countries, over the period from the 1960s to the present. The same set of data shows no significant difference today. See the [figure](#) which presents this data graphically. See also a similar graph presented in the article by Cheng et al. 2007, in the *British Medical Journal*.

12. Comparing WHO data with CDC claims.

It is interesting to compare the figure based on the WHO data and the figure used by the CDC in 1999, which can also be observed at <http://www.FluorideAlert.org/who-dmft.htm> . This figure was used by the CDC in 1999 to "demonstrate" the effectiveness of fluoridation. They inferred that tooth decay was coming down over the period 1960 to the 1990's in the US because the percentage of the American population drinking fluoridated water had gone up over this same period (CDC, 1999).

It is disturbing that the CDC authors appear to have been unaware of the WHO data which clearly refutes the claim for such a simplistic causal relationship.

This CDC graph was used in the report which was supposed to substantiate their claim that fluoridation is "One of the top ten public health achievements of the 20th Century" (CDC, 1999).

This famous statement is quoted nearly every day somewhere in the world by some unsuspecting editor, journalist or public health official as the final word on fluoridation's safety and effectiveness. As far as an attempt to demonstrate effectiveness is concerned this graph remains a total embarrassment to any genuine scientist at the CDC - or it should be.

13. US Department of Human Health Services (DHHS) survey

Dr. Bill Osmunson has showed that according to the results of a questionnaire administered to parents in all 50 states in the US by the DHHS, there is absolutely no relationship in the percentage of parents who responded "my child has very good or excellent teeth" and the percentage of the population in the state drinking fluoridated water (Osmunson, 2007). However, there is a very strong relation in all 50 states between the percentage of parents giving that answer and their income levels. Across the board 80% of high income parents gave that answer, but only about 60% of low income parents did so (Osmunson, 2007).

Linear regression lines plotted for these answers versus the percentage of the population in each state fluoridated were quite flat for both high income and low income families. This indicates no correlation between the answers and the fluoridation status of each state.

14. Tooth decay and income levels.

What the findings in the DHHS and NY surveys show is that there is a much stronger relationship between tooth decay and parent's income level than community fluoridation status.

15. The weakness of comparing two towns (or regions).

Frequently promoters will produce surveys comparing the tooth decay between two towns: one fluoridated the other not. However, you can get any result you want comparing two towns (or regions) unless confounding variables are controlled very carefully (i.e. income levels, delayed eruption, diet, genetic, ethnic, cultural and educational differences, parental oversight, as well as the dental services available).

Often, these comparisons look more like a self-serving and self-fulfilling prophesy on behalf of fluoridation promoters, than a genuine comparison of

the effects of ingesting fluoride between two towns. That is why the surveys should be part of a bona fide externally peer-reviewed published study. This way it can be ascertained if controls were attempted for these confounding variables. Most importantly it is necessary to compare how much money was spent on dental services in each community as well as the number of interventions administered. There is some evidence in the US and the UK that commensurate with the introduction of fluoridation in some cities (e.g. San Antonio, TX; Wolverhampton, UK) the measure has been accompanied with other measures to fight tooth decay. This can create or inflate whatever benefit of fluoridation is being claimed.

16. When fluoridation is discontinued

Contrary to claims from proponents that when fluoridation is discontinued tooth decay goes up, several modern studies indicate the very opposite. Where fluoridation has been discontinued in communities from Canada, the former East Germany, Cuba and Finland, dental decay has not increased but in some cases actually decreased (Maupome 2001; Kunzel and Fischer, 1997, 2000; Kunzel 2000 and Seppa 2000).

It is possible that other preventive measures were stepped up when fluoridation was ceased in these communities, but that gives weight to the notion that there are ways of fighting tooth decay other than forcing fluoride on people in their water supply.

17. A dental crisis has been reported in many fluoridated cities in the US

There have been numerous press reports over the last few years of dental crises in US cities and states (e.g. Boston, Cincinnati, Concord, NH, New York City, Pittsburg, Connecticut, South Bronx, Detroit) which have been fluoridated for over 20 years. The fact that these crises are occurring in the low income areas of the cities again reflects the fact that there is a far greater (inverse) relationship between tooth decay and family income levels than with water fluoride levels. It also demonstrates that the disparities in tooth decay caused by income levels is not being corrected by fluoridation programs. Here is a sampling of these newspaper reports:

Cincinnati - Fluoridated since 1979

"City and regional medical officials say tooth decay is the city's No. 1 unmet health-care need. 'We cannot meet the demand,' says Dr. Larry Hill, Cincinnati Health Department dental director. 'It's absolutely heartbreaking and a travesty. We have kids in this community with severe untreated dental infections. We have kids with self-esteem problems, and we have kids in severe pain and we have no place to send them in Cincinnati. People would

be shocked to learn how bad the problem has become."

Solvig E. 2002. Special Report: Cincinnati's dental crisis, Cincinnati Enquirer (Ohio). October 6. Available at <http://www.fluoridealert.org/media/2002d.html>

Concord, NH - Fluoridated since 1978

"It's overwhelming," said Deb Bergschneider, dental clinic coordinator at the Concord center. "Because we serve the uninsured, we see the lower level of the community and the need is just astronomical. ... By the time they get to us, their mouths are bombed out. They are all emergency situations. It's a severe, severe, problem. It's sad."

Gerth U. 2005. Nothing to smile about. Fosters Daily Democrat (Connecticut). May 22. Available at <http://www2.fluoridealert.org/Alert/United-States/New-Hampshire/Nothing-to-smile-about>

Boston - Fluoridated since 1978

"With a study estimating that the number of untreated cavities among Boston students greatly exceeds the national average, public health officials are about to launch an offensive against what they say is a growing dental crisis in the city... According to statistics cited in the city's latest annual health report, "The Health of Boston 1999": Eighteen percent of children 4 years old and younger who were seen in the pediatric program at Tufts University School of Dental Medicine in 1995 had baby-bottle tooth decay, a painful condition that arises when a baby is given a bottle of juice or milk at bedtime. Treatment can cost up to \$4,000 per child. About 90 percent of 107 Boston high school students were found to need dental treatment, according to a 1996 unpublished study. That report also estimated that the city's students had four times more untreated cavities than the national average..."

Kong D. 1999. City to launch battle against dental 'crisis'. Boston Globe (Massachusetts). November 27. Available at <http://www.fluoridealert.org/f-boston.htm>

Connecticut - Statewide mandatory fluoridation since 1960s

"Dental decay remains the most common chronic disease among Connecticut's children. Poor oral health causes Connecticut children to lose hundreds of thousands of school days each year. One in four Connecticut children is on Medicaid, but two of three Connecticut children receive no dental care. And DSS continues to exploit the seriously stretched public health providers and the few remaining private providers. There is an oral health crisis in Connecticut."

Slate R. 2005. State must fund plan to provide oral health care for the poor. New Haven Register (Connecticut). May 5. Available at <http://www2.fluoridealert.org/Alert/United-States/Connecticut/Fluoridated-Connecticut-experiencing-Oral-Health-Crisis>

South Bronx, New York - Fluoridated since 1965

"Bleeding gums, impacted teeth and rotting teeth are routine matters for the children I have interviewed in the South Bronx. Children get used to feeling constant pain. They go to sleep with it. They go to school with it. Sometimes their teachers are alarmed and try to get them to a clinic. But it's all so slow and heavily encumbered with red tape and waiting lists and missing, lost or canceled welfare cards, that dental care is often long delayed. Children live for months with pain that grown-ups would find unendurable. The gradual attrition of accepted pain erodes their energy and aspiration. I have seen children in New York with teeth that look like brownish, broken sticks. I have also seen teen-agers who were missing half their teeth. But, to me, most shocking is to see a child with an abscess that has been inflamed for weeks and that he has simply lived with and accepts as part of the routine of life. Many teachers in the urban schools have seen this. It is almost commonplace."

Kozol J. 1991. *Savage Inequalities. Children in America's Schools.* Crown Publishers, Inc.(New York). Harper Perennial / Harper Collins (New York).

Pittsburgh, PA - Fluoridated since 1953

"Nearly half of children in Pittsburgh between 6 and 8 have had cavities, according to a 2002 state Department of Health report. More than 70 percent of 15-year-olds in the city have had cavities, the highest percentage in the state. Close to 30 percent of the city's children have untreated cavities. That's more than double the state average of 14 percent."

Law V. 2005. Sink your teeth into health care. *Pittsburgh Tribune-Review* (Pennsylvania). February 13. Available at http://www.pittsburghlive.com/x/pittsburghtrib/s_303168.html

Washington DC - Fluoridated since 1952

"Washington DC has "one of the highest decay rates in children in the country." The "typical new patient, age 6, has five or six teeth with cavities -- a 'staggering' number"" at the Children's National Medical Center."

Morse S. 2002. Dentists Push for Fluoride in Bottled Water. *Washington Post* (DC). March 5. Available at <http://www2.fluoridealert.org/Alert/United-States/National/Dentists-Push-for-Fluoride-in-Bottled-Water>

18. Early trials and Dean's 21-city study.

A great deal of the conviction that fluoridation works has been derived from two sources: Dean's famous 21-city study (Dean, 1942) and the early fluoridation trials in the US, Canada and New Zealand. However, both the legitimacy and the quality of the methodologies used in these have been questioned.

19. Dean's study has been questioned.

In describing Dean's early work the CDC states that:

"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 (10). This cross-sectional relation was confirmed in a study of 21 cities in Colorado, Illinois, Indiana, and Ohio (11)." (CDC, 1999).

This raises the question: if Dean had access to data from 26 states, why did he end up using data from ONLY 21 cities?

Rudolf Ziegelbecker, an Austrian statistician, who sadly passed away a few weeks ago, pursued this issue. When he added in all the data he could find from the US and Europe, which related tooth decay with fluoride levels in the water, the inverse relationship reported by Dean disappeared. However, when he examined the same data for dental fluorosis he found a very robust relationship. (Ziegelbecker, 1981). Thus one relationship (between fluoride levels and dental fluorosis) holds up over the "background noise", the other (fluoride levels and dental decay) does not.

20. The early trials.

The trials conducted in 1945 -1955 in the US, and Canada, which helped to launch fluoridation, have been heavily criticized for their poor methodology and poor choice of control communities (De Stefano 1954; Sutton 1959, 1960 and 1996; Ziegelbecker 1970). According to Dr. Hubert Arnold, a statistician from the University of California at Davis, the early fluoridation trials:

"are especially rich in fallacies, improper design, invalid use of statistical methods, omissions of contrary data, and just plain muddleheadedness and hebetude (hebetude is mental lethargy or dullness, PC)." (Arnold, 1980)

Some examples of poor methodology in the early trials.

In two trials the control communities were fluoridated before the trial had been completed.

Furthermore, when the Grand Rapids trial began in 1945, children from all 79 schools in Grand Rapids were examined. By 1949, however, examiners observed children from only 25 of these 79 schools. Meanwhile in Muskegon, children from ALL the schools were still being examined.

Such problematic changes and inconsistencies in sampling size is further illustrated by the fact that when the Grand Rapids study commenced, the number of 12 to 16 year olds being examined was 7,661, but by the final year of the study, the number of 12 to 16 year olds being studied had dropped to just 1,031 (Sutton 1996).

Along with these arbitrary changes in the study's sampling methods, the study employed multiple examiners to assess the children's teeth. But as was known at the time, studies from the American Journal of Public Health (Boyd et al., 1951) as well as the Journal of the American Dental Association (Radusch, 1934), there is a considerable variability between each dentists' assessment of a person's teeth.

Despite these enormous weaknesses, these early studies are cited again and again to support the success of fluoridation. As Benjamin Nesin, Director of the New York State Water Laboratories, stated at the time,

"It must be emphasized that the fluoridation hypothesis in its entirety rests on a very narrow base of selected experimental information. It is this very base which is vulnerable to scientific criticism. And it is upon this very narrow base that the impressive array of endorsement rests like an inverted pyramid (Nesin 1956)."

Sutton's monographs on this matter (Sutton, 1959, 1960) have never been successfully refuted by proponents, even though they have tried. Sutton's work was re-published in book form shortly before he died in 1996. The book also contains some of the letters and articles which attempted to rebut Sutton's work and his responses.

21. The Hastings-Napier trial a fraud.

The Hastings-Napier trial was conducted in the 1950s and was used to successfully promote fluoridation throughout New Zealand. However, it has now been shown to be fraudulent (Colquhoun and Mann, 1986; Colquhoun PhD thesis, 1987). The control community (Napier) was dropped two years after the trial began and the huge drop in tooth decay found in Hastings was found to be due to an artifact involving a change in methodology used to characterize tooth decay before and after the trial (i.e. diagnosing tooth decay was less stringent at the end of the trial than at the beginning). The fact that the methodology had been changed was NOT acknowledged by the authors when they published their report - which in our book constitutes fraud (Ludwig, 1958, 1959, 1962, 1963, 1965, 1971; Colquhoun, 1987).

22. Modern Studies.

If we shift to more modern times, a major development occurred in 1980. This was when Dr. John Colquhoun was sent by his superiors in New Zealand on a four month world tour to investigate tooth decay in several different continents, including Australia, Asia, North America and Europe. He was expected to bring back with him evidence that would prove once and for all that fluoridation worked. He failed to do so.

23. Colquhoun's work (1980- 1997).

In 1980 Colquhoun was the principal dental officer for Auckland, NZ's largest city. Both as a dental officer and as a city councilor he had avidly and successfully promoted fluoridation throughout the country.

When Colquhoun went on his world tour, to his dismay, researchers reported to him - behind the scenes - that they were not finding the difference in tooth decay between fluoridated and non-fluoridated communities that they had expected - in fact they were finding very little difference at all.

When Colquhoun returned to NZ he was given a summary of tooth decay for the whole of the country. NZ is a little unusual in this respect since under their national health service they monitor tooth decay for ALL children at the ages of 5 and 12. So this was not a sample survey but a complete record.

When Colquhoun looked at the complete record of tooth decay in NZ, he found no difference in tooth decay between the fluoridated and non-fluoridated cities. If anything, the teeth were slightly better in the non-fluoridated communities.

When Colquhoun's assistants reported to him the extensive amount of dental fluorosis occurring in fluoridated Auckland, he risked his pension by deciding to make the lack of fluoridation's effectiveness public. To his enormous credit he spent the rest of his life trying to undo the damage he had done by reversing his position on fluoridation, and opposing it in any scientific way he could.

Paul Connett interviewed Colquhoun on videotape in Auckland in 1997 shortly before he died (see Colquhoun videotape, Connett, 1997).

Colquhoun wrote up his findings in several published papers (Colquhoun 1984, 1985, 1987, 1990, 1992 and 1995) and after he retired he obtained a PhD (1987). His research thesis examined the history of fluoridation in New Zealand. He offered Thomas Kuhn's famous analysis: "The Structure of Scientific Revolutions" to explain the reluctance of the dental community to change its paradigm on fluoridation's safety and effectiveness in NZ . In his thesis Colquhoun also exposed the rigged nature of the Hastings-Napier fluoridation trial (discussed above).

Colquhoun summarized his evolution from being an ardent supporter of fluoridation to one of its most articulate critics in, "Why I changed My Mind on Fluoridation" a paper published in 1997.

Most references can be found at <http://www.fluoridealert.org/health/biblio.html>