



North East Water  
Fluoridation Concerns

**PRESENTATION OPPOSING AN  
EXTENSION TO DURHAM COUNTY'S  
WATER FLUORIDATION PROGRAMME**

**by**

**The UK Freedom From Fluoridation Alliance**

**and**

**North East Water Fluoridation Concerns**

**at**

**DURHAM COUNTY COUNCIL'S**

**JOINT SCRUTINY COMMITTEE**

**6<sup>th</sup> February 2020**

**Presenting the case against Water Fluoridation:**  
**Joy Warren, BSc (Hons), Joint Coordinator, UKFFFA**

**Chapter Authors:**

**Executive Summary and Preface** Joy Warren, BSc. (Hons) Environmental Science.

**Ch. 1** Professor Paul Connett, PhD Chem, Emeritus Professor, St Lawrence University, Canton, New York State. Director, Fluoride Action Network and Chris Neurath, Research Director, Fluoride Action Network.

**Ch. 2** Joy Warren

**Ch. 3** Dave Forrest CEng and Joy Warren

**Ch. 4** Ellen Connett, Managing Director of Fluoride Action Network and Joy Warren

**Ch. 5** Dr Peter Lucas BA (Hons), MA, PhD. Principal Lecturer in Philosophy, School of Humanities and Social Sciences, University of Central Lancashire

**Ch. 6** Dr Hardy Limeback, PhD Bio-Chem, BDS/DDS/DMD, Emeritus Professor at University of Toronto and Joy Warren

**Ch. 7** Joy Warren

**Ch. 8** Joy Warren

**Ch. 9** Joy Warren

**Ch. 10** Paul Clein, B. Pharm., M.R. Pharm. S., G.Ph.C

**Conclusions** Dave Forrest

-----

# Contents

<b>Executive Summary</b>	<b>4</b>
<b>Preface</b>	<b>7</b>
<b>Chapter 1 Fluoridated water: a presumed developmental neurotoxin</b>	<b>10</b>
<b>Chapter 2 Oral Health Surveys and Flawed Conclusions</b>	<b>17</b>
<b>Chapter 3 The Financial Case Against Water Fluoridation</b>	<b>19</b>
<b>A Public Health England’s Return on Investment (RoI) of Oral Health Interventions and flawed conclusions</b>	<b>19</b>
<b>B The Waste of Public Finance – money down the drain</b>	<b>26</b>
<b>C Fluoridate the entire County of Durham! Why?</b>	<b>32</b>
<b>Chapter 4 Oral Health Programmes v Water Fluoridation. Which is more preferable and more versatile?</b>	<b>35-41</b> <b>46-52</b>
<b>Childsmile (Scotland)</b>	<b>42-45</b>
<b>Chapter 5 The Lack of Ethics in Water Fluoridation Practice</b>	<b>53</b>
<b>Chapter 6 Incisor Decay in County Durham</b>	<b>55</b>
<b>Chapter 7 Water Fluoridation is NOT Compatible with UK Primary Law?</b>	<b>58</b>
<b>Chapter 8 The ingredients of the fluoridating acid which are added to drinking water</b>	<b>60</b>
<b>Chapter 9 Water Fluoridation Does NOT Reduce Dental Health Inequalities Across Social Groups?</b>	<b>69</b>
<b>Chapter 10 A Pharmacist’s view of why WF is an unacceptable Public Health Measure.</b>	<b>76</b>
<b>Overexposure to Fluoride – WHO’s recommendations</b>	<b>82</b>
<b>Summary and Conclusions</b>	<b>83</b>
<b>Appendix 1 Extracts from Oral Health Surveys, 5-year-olds, North East of England, 2015 and 2017</b>	<b>87</b>
<b>Appendix 2 British Fluoridation Society – The Paradoxical Admission by the British Fluoridation Society in 2015</b>	<b>88</b>

## Executive Summary

Water Fluoridation (WF) was first trialled in the UK in 1952 and adopted by several health authorities from 1964 to 1988. Since 1988, there have been no new WF programmes and two have ceased (Anglesey in 1991 and Bedford Borough in 2016). Many proposals have been made to fluoridate drinking water throughout England but all have failed. In 2008, an attempt was made to fluoridate the drinking water of Southampton. Hampshire County Council (HCC) was caught up in this attempt because its water supply joined up with that of Southampton. After careful deliberation having received much evidence, HCC voted not to support WF in the County: “10. Until such time as the further work outlined above has taken place the County Council does not support any proposal for adding fluoride to the water of people living and working in Hampshire.” (HCC’s decision is in the public domain at <http://www.ffo-olf.org/files/fluoridationPanelHampshireUK.pdf> and we recommend that DCC’s Joint Scrutiny Committee accesses it.) Since 2008 no new evidence supporting WF has been published. Despite the Public Consultation (the first of its kind) returning a result of 72% against WF, the Strategic Health Authority (South Central SHA) decided that it was right and 7,200 people were wrong! However, opposition continued and eventually the proposal was dropped in 2013 without Southampton becoming fluoridated. The SHAs ceased to exist in 2013 but were replaced by Public Health England. SHA staff moved over to PHE and transferred WF policy to the new organisation.

In Chapter 1, we describe the situation in the USA where the National Academy of Sciences is peer reviewing research evidence written by the USA’s National Toxicology Program (NTP) researchers which has identified fluoride as being a ‘presumed’ developmental neurotoxin. The results of the peer review will be published this Autumn. We are privileged to have seen a description of the research evidence as well as the NTP paper which has reviewed the research evidence. The research is described by the Research Director of Fluoride Action Network. Although the brain of the unborn child is exposed to fluoride in the womb via the placenta and amniotic fluid, it is during infancy when the infant is fed baby formula made up with fluoridated tap water that the main insult to the child’s intelligence occurs.

Chapter 2 questions the validity of the oral health survey of 2015 when just 4.15% of 5-year-olds in County Durham were examined by PHE’s dental health examiners. The resultant figure of 82 children with dental decay was used by PHE to prompt Durham County Council’s Health and Well-Being Board to ‘explore’ WF even though the results were not statistically significant and not representative of the dental health of 5-year-olds in the County. The WF ‘exploration’ continued into 2018 even after the results of the 2017 oral health survey were known. The 2017 results are statistically significant since 45.4% of 5-year-olds were examined. Larger samples produce more robust results and the 2017 results were no exception. Just 25.8 of the children had dental decay. This is a little higher than the average for England and can be easily tackled with extra emphasis being put on reducing decay via tooth-brushing programmes in the towns and villages of concern.

In Chapter 3, Part A, we have examined the basis for PHE's Return on Investment Tool conclusion that WF was the most financially preferable of 5 dental health interventions. We found the model to be flawed: for the WF intervention, a whole fluoridated population figure was used and then compared against 5-year-old populations which were used to calculate financial benefits for the other 4 interventions. This was bound to show WF up in a favourable financial light. Should Durham County continue to 'explore' WF to the extent that the entire County becomes fluoridated it will find that far from being the most economical intervention, the County would be tied into WF for at least 20 years with increasing annual bills for revenue and capital replacement costs. In the meantime, children's oral health could have been improved by teaching behaviour change – something which we all have to go through in life.

Not only is the RoI flawed but most of the money spent on purchasing the fluoridating acid is wasted because it is lost in leaks or goes down the drain **without being drunk**. In Chapter 3B we determine the percentage of drinking water delivered to domestic premises and the amount actually drunk (1.3%) based on Southern Water statistics. With little children only drinking one-third of a litre of water a day, it is highly doubtful that WF is the most economical way of preventing dental decay. Moreover, the World has moved on, leaving the UK far behind: the consensus of opinion is that fluoride topically applied is the more effective way of preventing dental decay whilst, paradoxically, systemic (swallowed) fluoride was described by the British Fluoridation Society in 2015 as being the least important mechanism for the prevention of dental decay. (Appendix 2).

In chapter 3C we return to examining the Return on Investment calculation produced by Public Health England for Durham County. The same financial disparity between the 4 efficient and effective oral health programmes and WF is reproduced.

In Chapter 4 we list some of the successful oral health programmes in the UK which tackle dental decay on an individual level. Emphasis is placed on the Scottish *Childsmile* programme which has been running since 2001 with very pleasing results. Prior to Childsmile, dental decay in Scotland was alarmingly high but it has now been reduced to far less than that recorded in fluoridated New Zealand. In Scotland 73% of 8-year-olds are free of dental decay compared to 54% in New Zealand.

Fluoridated water is a medicine even though it doesn't come out of a bottle. It is added to water to have a prophylactic effect on the human body. It alters our physiology. In Chapter 5 we turn briefly to WF practice and its lack of medical ethics. We ask why the medical profession has to stick to a strict code of ethics when prescribing pharmaceutical medicines and why the same set of ethics is not applied to WF practice, particularly since the medicine is given in unlimited doses, is compulsory and its 'administration' undoubtedly violates the Nuremberg Code.

In Chapter 6, we return to reconsidering dental decay but this time as an issue of child neglect. Stamping out incisor decay would reduce the dental decay statistics to such a level that WF would never take flight.

An interesting legal point has been highlighted by us recently in that because of the presence of a third compound of fluorine in the fluoridating acid, WF appears not to comply with UK Primary law. Here, in Chapter 7, we discuss hydrofluoric acid for the first time and postulate that it might be the cause of the statistically significant higher percentage of patients in the West Midlands suffering from hypothyroidism when compared to patients with hypothyroidism in non-fluoridated Greater Manchester. The greater percentage of cases of hypothyroidism was mapped against WF status by a team at Kent University in 2014.

Referring to British Standard BSEN 12175:2013, we calculate the maximum concentration of heavy metals and carcinogens (including arsenic) added to drinking water when the fluoridating acid is used to increase the concentration of fluoride in treated water. We ask in Chapter 8 if WF practice is contrary to the UK Government's Committee on Toxicity's recommendation that the level of arsenic should be as low as reasonably practicable (the ALARP Principle) in order to prevent cancer.

The UK Government's 'York Review' of WF was published in 2000. One of the conclusions of the review team was that WF did **not** reduce dental health inequalities across social groups. This message was buried in 'noise' and the Review Team's principals had to repeat the message three times. It is still being ignored to this day by Government, PHE and Dental professionals even though in 2015 the Cochrane Collaboration confirmed the York Review's conclusions. We cannot understand why PHE is maintaining that WF reduces dental health inequalities when the research evidence is so inadequate. Chapter 9 reproduces the letters sent by the York Review principals to the Department of Health.

Pharmacy is the science of prescribing minute amounts of active substances and Pharmacists need to have an appreciation of the potency of small amounts. Our article in chapter 10 is by a practising pharmacist who has long held the view that WF is a most unwise practice.

We end with the Conclusions of the main points emphasised in this paper.

Throughout this paper, our central concern has been for the need to apply the Precautionary Principle to Water Fluoridation practice and for elected Councillors to observe their Duty of Care in respect of **all** their constituents – and particularly in respect of those unborn children and infants who are possibly destined to becoming exposed to a 'presumed' developmental neurotoxin. But in the Autumn, we confidently expect fluoride to be reclassified as a 'known' developmental neurotoxin and placed in the same category as lead.

## Preface

We invite the reader to peruse what Edward Bernays (American PR Expert – “Father of Spin”) had to say about his role in the promotion of Water Fluoridation when interviewed by Investigative Journalist Chris Bryson in 1993.

Bernays also persuaded Americans to add fluoride to water.

“I do recall doing that,” he said softly during another interview at his home in 1993. Although Bernays was then 102 years old, his memory was good. “Selling fluoride was child’s play,” Bernays explained. The PR wizard specialized in promoting new ideas and products to the public by stressing a claimed public health benefit. He understood that citizens had an often unconscious trust in medical authority. “You can get practically any idea accepted,” Bernays told me, chuckling. “If doctors are in favor, the public is willing to accept it, because a doctor is an authority to most people, regardless of how much he knows or doesn’t know ... By the law of averages, you can usually find an individual in any field who will be willing to accept new ideas, and the new ideas then infiltrate the others who haven’t accepted it.”

Verbatim excerpt from Chris Bryson’s book, *The Fluoride Deception* (2004), p. 159. Chris Bryson is an investigative journalist who worked for the BBC prior to writing this revealing book.

-----

In 1951, US dentists strategized ("[Proceedings 4<sup>th</sup> annual conference of state dental directors](#)") on how to sell fluoridation using misinformation and misdirection e.g. "We have told the public it works, so we can't go back on that." And "those research people, they can't get over their feeling that you have to have test tube and animal research before you start applying it to human beings."

*Quoted in CISION PR Newswire, Jan 15, 2020, 14:40 ET*

NEWS PROVIDED BY [New York State Coalition Opposed to Fluoridation, Inc.](#)

[https://www.prnewswire.com/news/new-york-state-coalition-opposed-to-fluoridation,-inc./](https://www.prnewswire.com/news/new-york-state-coalition-opposed-to-fluoridation,-inc/)

“History tells us that overturning myths is rarely easy. But we have been down this path before. The fluoride story is similar to the fables about lead, tobacco, and asbestos in which medical accomplices helped industry to hide the truth about these substances for generations. Fluoride workers share a tragic fate with the souls who breathed beryllium, uranium and silica in the workplace. Endless studies that assured workers that their factories and mines were safe concealed the simple truth that thousands of people were being poisoned and dying painful early deaths from these chemicals. So if this tale of how fluoride’s public image was privately laundered sounds eerily familiar, maybe it’s because the very same professionals and institutions who told us that fluoride was safe said much the same about lead, asbestos and DDT or persuaded us to smoke more tobacco”.

“Lulled by half a century of reassurances from supporters of fluoride in the public health establishment, many doctors today have no idea of the symptoms of fluoride poisoning. A silent killer may stalk us in our ignorance. “There is a black hole out there in terms of the public and scientific knowledge”, says former industry toxicologist, Dr Phyllis Mullenix.

“There is really no public health issue that could impact a bigger population. I don’t think there is an element of this society that is not impacted by fluoride. It is very far-reaching and it is very disturbing.”

“Fifty years after the U.S. Public Health Service abruptly reversed course during the darkest days of the cold war – and endorsed artificial water fluoridation – it is time to recognize the folly, hubris, and secret agendas that have shackled us too long, poisoning our water, choking our air, and crippling workers. It is time, as the Quakers ask in life, to speak truth to power. Good science can sharpen the tools for change, but it will be public opinion and citizen action that strike those shackles free.”

Verbatim excerpts from Chris Bryson’s book, *The Fluoride Deception* (2004), p. xx - xxi.

The “fluoride infection” spread to Ireland and to the UK.

#### **Grants given to Ireland and the UK by the USA Government to initiate Water Fluoridation**

	<b>1958</b>	<b>1960</b>	<b>1963</b>
<b>Ireland</b>	\$19,078	£62,250	\$78,730
<b>UK</b>	\$232,035	\$900,048	\$2,751,215

Source: Barry Groves (2001). *Fluoride: Drinking Ourselves to Death*, p.189

All WF schemes in existence in the UK (England) today were initiated by unelected health authorities. **No-one who was destined to drink fluoridated water was consulted.**

There have been no new WF schemes in England since 1988. In the intervening **32** years, scientists have produced a vast library of research , most of which has found that fluoride is injurious to the human body. We’re still waiting for research which disproves our research showing harm from swallowing fluoride. It is the responsibility of those who wish to add a presumed developmental neurotoxin to drinking water to **prove** that it is safe. It is not enough to parrot that it is safe without there being any evidence.

Let’s go back to the America of the 1950’s where Dr James D Sumner who was awarded a Nobel Prize for his work with enzymes, stated:

“We ought to go slowly. Everybody knows fluorine and fluorides are very poisonous substances and we use them in enzyme chemistry to poison enzymes, those vital agents in the body. That is the reason things are poisoned, because the enzymes are poisoned and that is why animals and plants die.”

At least 13 Nobel Prize winners in Chemistry and Medicine have either opposed fluoridation or expressed reservations about it. These include:

- Arvid Carlsson (2000, Medicine/Physiology)
- Giulio Natta (1963, Chemistry),

- Nikolai Semenov (Chemistry, 1956),
- Sir Cyril Norman Hinshelwood (Chemistry, 1956),
- Hugo Theorell (Medicine, 1955),
- Walter Rudolf Hess (Medicine, 1949),
- Sir Robert Robinson (Chemistry, 1947),
- James B. Sumner (Chemistry, 1946),
- Artturi Virtanen (Chemistry, 1945),
- Adolf Butenandt (Chemistry, 1939),
- Corneille Jean-François Heymans (Medicine, 1938),
- William P. Murphy (Medicine, 1934),
- Hans von Euler-Chelpin (Chemistry, 1929).

The influence of Edward Bernays lives on, however, with certain civil servants in Whitehall positively encouraging WF practice. We would like to know why HM Government are refusing to listen to our evidence. Why is the UK Government ignoring decades of research which questions the safety of swallowing fluoride? Where is the research which proves that WF is safe to swallow? After an exhausting search, we have been unable to find any.

Joy Warren, BSc. (Hons) Environmental Science  
 Joint Coordinator, UK Freedom From Fluoride Alliance

16<sup>th</sup> January 2020

## Chapter 1, Part 1 Fluoridated water: a presumed developmental neurotoxin

In the following Press Release, Paul Connett, Emeritus Professor of Chemistry and Toxicology, explains that 'presumed' is just small one step less than 'known'. The USA's National Toxicology Program (NTP) review is being peer reviewed at the moment by the USA's National Academy of Sciences and **the final classification regarding fluoride's developmental neurotoxicity will be published this Autumn (2020).**

The UK has traditionally followed the USA's lead on most issues relating to Water Fluoridation. We would hope, therefore, that PHE England will take heed of the USA's reclassification of fluoride and consequently stop sponsoring/urging WF onto local authorities as part of their Oral Health Strategy. The problem is that PHE, since 2013 when it was founded, has believed that fluoride is "safe and effective" and it is going to be difficult for that organisation to reverse its belief. But, it would have no choice since the news that fluoride is a known developmental neurotoxin and in the same category as lead will be widely publicised.

If fluoride and fluoridated water become "the new lead", that would call a halt to any attempts to fluoridate entire populations.

(Note that this Chapter has embedded live links which can only be accessed from the electronic copy which Stephen Gwilym will be able to provide.) However, we have provided the url's of these documents at the end of this Chapter. As an alternative, Councillors may have time to type these into their Search Bar.

-----

### **Fluoride Action Network (FAN) Press Release on NTP Study: "Fluoride is presumed to be a cognitive neurodevelopmental hazard to humans".**

---

NEWS PROVIDED BY  
[Fluoride Action Network](#)  
Oct 25, 2019, 14:07 ET

---

NEW YORK, Oct. 25, 2019 /PRNewswire/ -- On Oct 22, the [US] National Toxicology Program (NTP) published a [draft review](#) of fluoride's neurotoxicity concluding:

**"...fluoride is presumed to be a cognitive neuro-developmental 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."**

For years the [Fluoride Action Network](#) (FAN) has been drawing attention to fluoride's neurotoxicity. There are [61 human IQ studies](#) linking lowered IQ with fluoride exposure, many of which FAN had translated from the original Chinese.

FAN disagrees with NTP's conclusion that studies "with [fluoride] exposures in ranges typically found in the water distribution systems in the United States (i.e., approximately 0.03 to 1.5 ppm) ...*are inconsistent and therefore unclear* (our emphasis)."

FAN's director Paul Connett, PhD, says, "the studies funded by US government agencies (Bashash et al. [2017](#), [2018](#); [Green et al., 2019](#)) *were at exposure levels commonly experienced with fluoride water concentrations below 1.5 ppm*, and are consistent, very clear and stronger than the earlier Chinese studies at levels above 1.5 ppm ([Choi et al, 2012](#)) because they were based on individual exposures, with many confounding variables carefully controlled. In reality, it is the studies *with lower fluoride levels of exposure* that have provided the strongest evidence."

Connett continued, "We hope that, when the [National Academy of Sciences](#) completes its peer review, NTP will raise the classification of fluoride to a '*known*' from '*presumed*' neurodevelopmental hazard to humans. Whether they do or not, the weight of scientific evidence in the NTP review should be sufficient to force an end to fluoridation."

Dr. William Hirzy, former Environmental Protection Agency risk assessment specialist, says, "Fluoride at a concentration of 1.5 ppm in water offers no meaningful margin of safety to protect the brains of a whole population of infants drinking fluoridated water at 0.7 ppm. Without going into detailed calculations of total dose, a safety factor of ten (to account for the expected range of sensitivity in a large populations), would reduce the allowed level in water to less than 0.1 ppm in water."

Connett asks, "How can anyone now claim that community water fluoridation is safe? And why allow it to continue when safer and more effective oral health programs exist? (e.g., [Childsmile](#))."

<https://www.prnewswire.com/news-releases/fan-comments-on-ntp-study-fluoride-is-presumed-to-be-a-cognitive-neurodevelopmental-hazard-to-humans-300945698.html>

(SOURCE Fluoride Action Network)

(We discuss the Scottish *Childsmile* Programme in Chapter 4.)

**Expected US reclassification this Autumn 2020 of fluoride from being a 'presumed developmental neurotoxin' to a 'known developmental neurotoxin'.**



National Toxicology Program  
U.S. Department of Health and Human Services

**DRAFT NTP MONOGRAPH ON THE  
SYSTEMATIC REVIEW OF FLUORIDE EXPOSURE  
AND NEURODEVELOPMENTAL AND  
COGNITIVE HEALTH EFFECTS**

September 6, 2019

Office of Health Assessment and Translation  
Division of the National Toxicology Program  
National Institute of Environmental Health Sciences  
National Institutes of Health

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

URL: [http://fluoridealert.org/wp-content/uploads/2019.ntp\\_draft-fluoride-systematic-review.online-Oct-22.pdf](http://fluoridealert.org/wp-content/uploads/2019.ntp_draft-fluoride-systematic-review.online-Oct-22.pdf)

See also [https://articles.mercola.com/sites/articles/archive/2020/01/23/fluoride-health-risks.aspx?cid\\_source=dnl&cid\\_medium=email&cid\\_content=art1HL&cid=20200123Z1&et\\_cid=DM441022&et\\_rid=796131654](https://articles.mercola.com/sites/articles/archive/2020/01/23/fluoride-health-risks.aspx?cid_source=dnl&cid_medium=email&cid_content=art1HL&cid=20200123Z1&et_cid=DM441022&et_rid=796131654) for a useful summary of the neurotoxicity of fluoride

## Chapter 1, Part 2 Fluoride’s Harm to the Developing Brain: The Recent Science

by Chris Neurath, December 2019



*(Chris Neurath in front of the National Academy of Sciences building)*

**“THE RIGHT TO SEARCH FOR TRUTH IMPLIES ALSO A DUTY: ONE MUST NOT CONCEAL ANY PART OF WHAT ONE HAS RECOGNIZED TO BE TRUE”**

*“Several experts equated the harm found from fluoride to that from childhood lead poisoning.” (Green, 2019)*

### **This past year (2019)**

The past year has seen unprecedented new science from Canada and the USA showing fluoride harms the developing brain from exposures due primarily to artificial water fluoridation.

Two of the published studies found clear associations between water fluoridation and substantial loss of IQ, both from prenatal and infant exposures. Equally worrisome is a third study that found children in fluoridated areas have a 284% higher risk of ADHD compared to those in non-fluoridated areas. Finally, a fourth study found harm in adolescence as well, with altered sleep patterns. Three of these high-quality studies were funded by the US National Institute of Environmental Health Sciences.

## The 'wave' began in 2017

This 'wave' of new studies actually started in 2017 with two mother-child cohort studies of IQ loss in Mexico [[Valdez-Jimenez 2017](#) and [Bashash 2017](#)]. These two high-quality studies confirmed the evidence of fluoride's neurotoxicity that had been accumulating over 30 years in China, India, and elsewhere consisting of 60 human studies.

The high quality fluoride-IQ studies in 2017 were followed in 2018 with a study showing an association between fluoride and ADHD [[Bashash 2018](#)] and another showing an association between fluoride and reduced thyroid function (hypothyroidism) which was exacerbated by iodine deficiency [[Malin 2018](#)]. Hypothyroidism in pregnant women is a known cause of lowered IQ in their children.

The four studies published in 2019 are the strongest ever and are undeniably relevant to the levels of fluoridation [0.7 MG FLUORIDE/LITRE WATER] in the USA. I will discuss these in turn.

### 1) [Green 2019](#): in *JAMA Pediatrics*. Substantial IQ loss in Canadian children from prenatal exposure to fluoride from water fluoridation.

This year's first major study was from a research group based in Canada and published in the prestigious journal *JAMA Pediatrics* [[Green 2109](#)]. It received widespread media coverage, with articles in The Washington Post, CNN, NPR, Time Magazine, etc. The editors of *JAMA Pediatrics* even went so far as to say that the study reversed their previous (mis)conception that fluoridation was perfectly safe and only crazy people claimed it could be neurotoxic. The editor-in-chief said if his wife were pregnant he would advise her to avoid fluoridated water [[JAMA Pediatrics Christakis podcast](#)]. **Several experts equated the harm found from fluoride to that from childhood lead poisoning.**

### 2) [Riddell 2019](#): found almost 3 times higher risk of ADHD for those living in fluoridated areas in a national sample of Canadian children.

This study, also from Canada, found a strong association between home water fluoride concentration and much higher risk of ADHD diagnoses in children [[Riddell 2019](#)]. The data came from a government sponsored nationwide survey of health and nutrition (Canadian Health Measures Survey). The study found that children living in areas with fluoridated water had a 284% higher risk of having a diagnosis of ADHD as those who lived in non-fluoridated areas. This study confirmed two previous studies linking fluoride to ADHD from Mexico and the USA [[Bashash 2018](#), [Malin 2015](#)].

### 3) [Till 2020](#): (published ahead of print in Nov 2019) Children who were formula-fed and lived in fluoridated areas as babies have dramatically lower IQ compared to those who lived in non-fluoridated areas.

This study is arguably the most worrisome finding yet. Till and co-workers found that formula-fed infants in fluoridated areas had much lower IQ than formula-fed infants in non-fluoridated areas.

Formula-fed babies (with most of the powdered formula reconstituted with tap water) in fluoridated areas averaged 4 IQ points lower compared to formula-fed babies in non-fluoridated areas. Tests of non-verbal IQ showed even more dramatic effects, with an average loss of 9 points in the non-verbal component of IQ tests. When translated to typical water fluoridation levels in the USA of 0.7 mg/L, the Till 2020 findings suggest a loss of non-verbal IQ of 13 points for infants in fluoridated areas compared to those with low levels of fluoride in the water. This study was in a carefully monitored cohort followed from before birth through age 4 years. The study authors controlled for many factors. When they also adjusted for mothers' fluoride exposure during the pregnancy, that only accounted for a small part of the IQ loss. Thus, infancy may be at least as susceptible a period for neurotoxic harm as the prenatal period and exposure during both developmental periods may produce additive harm. Not just pregnant women should be advised to avoid fluoridated water, their children should as well.

These three studies were all within Canada, where the average water fluoridation level is 0.6 mg/L, while the current average in the USA is 0.7 mg/L (and in some communities still up to 1.2 mg/L). These studies are also relevant to the USA because socio-economic and other factors in Canada are arguably as similar to the USA as can be found anywhere.

A fourth study, published just last week, bursts any remaining quibbles about relevance to the USA because it studied children in the USA [[Malin 2019](#)].

#### **4) [Malin 2019](#): Altered sleep patterns in adolescents linked to levels of fluoride in the drinking water in the USA.**

This study used data from the rigorous, nationally representative, NHANES health and nutrition surveys conducted by the Centers for Disease Control (CDC). The authors found that in adolescents aged 16-19 years drinking fluoridated water, there was a doubling of symptoms indicative of sleep apnea, compared to those with low fluoride water. There were also significantly later bed times and waking times in the adolescents with higher water fluoride levels. The link between fluoride and sleep disturbances may be through fluoride's effect on the pineal gland. This gland, situated in the brain, regulates sleep-wake cycles through the hormone melatonin. The pineal gland accumulates high levels of fluoride, and previous studies in animals suggested fluoride may alter melatonin levels [[Luke 1997](#)]. Alteration of sleep patterns may be a neurotoxic effect of fluoride separate from the loss of IQ and increased risk of ADHD due to earlier life exposures.

It bears repeating that all four of these 2019 studies were performed in Canada or the USA where the majority of fluoride exposure comes from artificially fluoridated water. In other words, harm was found in children with average intakes of fluoride.

**The oft-repeated claim of fluoridation proponents, that studies finding neurotoxic harm are only from areas with "irrelevant" high fluoride levels, can now be roundly dismissed.**

**"Just one study" !**

Another criticism from fluoridation proponents that the JAMA *Pediatric's* study was "just one study" has been false for at least 30 years, since the first of now over 60 fluoride-IQ studies was published in China in the 1980s [[FAN 64 IQ studies webpage](#)]. Almost 15 years

ago the US National Research Council's comprehensive review noted several human neurotoxicity studies and many animal studies as clear evidence that fluoride could harm the brain [[NRC 2006](#)].

## Conclusion

The scientific evidence can now be considered overwhelming. This may be a big surprise to those were never aware of the many studies because they simply accepted the claim that fluoridation was "safe and effective". It may be a shock to fluoridation promoters who have tried to ignore or deny each accumulating piece of evidence. But the science is now undeniable. We don't know how long it will take for this truth to sink into mainstream science, medicine, and public health. It will likely take more hard work on the part of scientists conducting even more studies, and by individuals and groups like FAN reaching ordinary people and government officials.

An analogy to the history of "low-level" lead neurotoxicity can offer insights. Several experts have said that it now looks like fluoride poses a similar risk for the developing brain as lead poisoning. In fact, back when leading researchers first started voicing concern that "low-level" lead was causing neurobehavioral harm in children about 30 years ago, the existing scientific evidence to support that concern was weaker than what is now available for fluoride [[Needleman 1990](#)]. It took more than two decades for the Centers for Disease Control (CDC) to finally respond to the evidence on "low-level" lead and reduce the "level of concern" to the 5 ug/dL blood lead level it currently stands at. That delay might sound discouraging, but the CDC's decision to reduce the "level of concern" followed just months after a 2012 NTP report that concluded even levels below 5 ug/dL posed a risk. With fluoride, we now have a draft NTP report, backed by evidence as strong as available when alarms were first being raised for "low level" lead.

Chris Neurath  
Research Director, Fluoride Action Network

-----

In pregnancy, a woman's blood volume increases and she needs to drink more water, particularly since it is more quickly bioavailable than beverages. Her medical advisors do not advise her to avoid fluoridated tap water. Nor is she cautioned against drinking tea which, if an economy variety, contains worrying levels of fluoride. Thus, her cup of tea contains fluoride from water and from tea leaves. After the child is born and if she decides to bottle feed, NHS Choices cautions against using bottled water because it contains sodium and sulphates and because it is not sterile! This is strange advice: most bottled waters in England contain less sodium and sulphate than tap water but both need to be boiled in order to sterilise them. (<https://www.nhs.uk/conditions/pregnancy-and-baby/making-up-infant-formula/>) Until NHS Choices advice changes, an expectant fluoridated mum will continue to unknowingly cause her baby's intelligence to reduce.

## Chapter 2 Oral Health Surveys and Flawed Conclusions

Your Health and Well-Being Board's introduction to Public Health England's data from the 2015 Oral Health Survey for 5-year-olds began the attempt to include Water Fluoridation as part of the County's Oral Health Strategy. However, the number of children examined in summer 2015 was a very small percentage (4.15%) of the total number of 5-year-olds in County Durham. We do not have access to the names of the schools which were sampled but judging from the rather high level of dental decay, we assume that schools in deprived areas were visited by the dental team in 2015.

No notice seems to have been taken by DCC's Health and Well-Being Board of the 2017 statistics which provided a statistically significant sample of examined children and which produced a far more realistic and reliable set of statistics. In summer 2017, we see that the percentage of dental decay in Durham County was only a little higher than the England average.

Oral health surveys are in the public domain. We recommend that members of the Joint Scrutiny Committee study the entries for County Durham for 2015 and 2017 (See Appendix 1 for snipped extracts). Some of the relevant data is reproduced below. Incisor Caries is discussed in Ch. 6.

### Extracts from oral health surveys for Durham County and England

Year of survey	No. of 5-year-olds	No. examined	Av d <sub>3</sub> mft	% d <sub>3</sub> mft	% with plaque	% with sepsis	% with incisor caries
<b>2015</b> Durham County	5,657	<b>235 (4.15%)</b> (inadequate sample)	1.1	<b>35.1 (82 children)</b>	<b>6.5</b>	<b>2.4</b>	<b>8.4 (19 children)</b>
<b>2015</b> Eng.	673,956	111,500	0.8	24.7	1.7	1.4	<b>5.6</b>
<b>2017</b> Durham County	6087	<b>2763</b> ( <b>45.39%</b> ) (statistically significant sample)	<b>0.8</b>	<b>25.8 (712 children)</b>	<b>2.0</b>	<b>1.5</b>	<b>4.9 (135 children)</b>
<b>2017</b> Eng.	703755	96005	<b>0.8</b>	23.3	1.5	1.1	<b>5.1</b>

Source:

[https://webarchive.nationalarchives.gov.uk/20180801132949/http://www.nwph.net/dentalhealth/survey-results%205\(14\\_15\).aspx?id=1](https://webarchive.nationalarchives.gov.uk/20180801132949/http://www.nwph.net/dentalhealth/survey-results%205(14_15).aspx?id=1) (2015)

<https://www.gov.uk/government/statistics/oral-health-survey-of-5-year-old-children-2017> (2017)

25.8% dental decay is not acceptable but is easily tackled by oral health interventions at an individual level, i.e. toothbrushing in schools and nurseries, and increased health visitor involvement. **Note that in 2017, less than one tooth per child on average was decayed.**

**Even while the WF proposal was being developed between 2015 and 2018, tooth decay in County Durham had been recorded in 2017 as being unremarkable and less than that recorded in some fluoridated towns and cities in England. It seems clear that inadequate sample size (2015) gives an entirely wrong impression of dental health throughout the County.**

During the time that County Durham’s Health and Well-Being Board have been debating this issue, we ask if oral health programmes as recommended by the NICE *Guidance for Local Authorities and Partners* have been put on an unlit back burner, and if so, why?

We sincerely hope that the areas of deprivation which produced the 2015 statistics have been the subject of a concerted effort to (1) stamp out incisor decay and (2) to introduce tooth-brushing in nurseries and primary schools as advised by Public Health England’s David Landes in his Locality Supplement (2013):

“The dental decay identified in this study is likely to have developed over a period of time prior to the children entering schools. It is thus essential to use these data to support preventive oral health work amongst Early Years workers and locations to secure improvements in children’s oral health at a population level. The data should be used to inform the targeting of resources to those areas with the poorest oral health to secure improvements in the health of those children.”

<https://democracy.durham.gov.uk/documents/s49503/Item%2016%20-%20Appendix%20%20-%20Five%20Years%20Old%20Children%20Dental%20Health%20survey.pdf> , p.3

Since Interventions 1, 2 4 and 5 as described in the RoI Infographic (see Ch. 3A) are effective at reducing tooth decay as recommended by David Landes, one wonders why Public Health England is so keen on adding a neurotoxin to drinking water (Intervention C). If these oral health programmes haven’t been implemented it would be a matter of great concern. Constituents need to be made aware that targeted oral health programmes may have been put on the unlit back burner because PHE is expecting to be commissioned to initiate and manage Water Fluoridation.

Why waste money on WF when from the table we can see that it is not conclusive that fluoride is a silver bullet.

Countries that fluoridate, on average, do not have lower dental decay rates than countries that do not fluoridate

Country	Dental decay (DMFT in 12 yr. olds)*	% fluoridation
Germany	0.7	0
United Kingdom	0.7	10
Sweden	1.0	0
Canada	1.0	33
Australia	1.1	70
Finland	1.2	0
France	1.2	0
USA	1.3	75

## Chapter 3 The Financial Case Against Water Fluoridation

There are two ways of looking at this particular issue:

- A. **Return on Investment (RoI)** – how much money the NHS might save by not treating decayed teeth.
- B. The **waste of public finance** – how much of the fluoride is not swallowed by water company domestic customers.

### A. PUBLIC HEALTH ENGLAND – RETURN ON INVESTMENT OF ORAL HEALTH INTERVENTIONS: SOME INITIAL OBSERVATIONS

#### 3A.1.1 BACKGROUND

Public Health England (PHE) has produced a document “*Return on Investment of Oral Health Interventions*” <https://www.gov.uk/government/publications/improving-the-oral-health-of-children-cost-effective-commissioning> which is described as a “*decision-support tool to support Local Authorities investment decisions regarding their local commissioning of oral health improvement programmes for pre-school children*”. Accompanying this document is a “*flier*” [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/560973/ROI\\_oral\\_health\\_interventions.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/560973/ROI_oral_health_interventions.pdf) which shows relative cost/benefits for the five interventions, the most attractive of which appears to be that for water fluoridation - £1 spent gives a “benefit” of £12.71 after 5 years. So attractive does this seem, it is worthwhile looking at it in more detail.



### Return on investment of oral health improvement programmes for 0-5 year olds\*

Reviews of clinical effectiveness by NICE (PH55) and PHE (Commissioning Better Oral Health for Children and Young People, 2014) have found that the following programmes effectively reduced tooth decay in 5 year olds:



\*All targeted programmes modelled on population decayed, missing or filled teeth (dmft) index of 2, and universal programme on dmft for England of 0.8. The modelling has used the PHE Return on Investment Tool for oral health interventions (PHE, 2016). The best available evidence has been used in this tool and where assumptions are made these have been clearly stated  
PHE Publications gateway number: 2016321

© Crown copyright 2016

### 3A.1.2 APPROACH

This is not a forensic examination of the so-called “tool”; it refrains from delving into the jargon of ROI (Return on Investment), discounted savings, nett present value, etc. and is kept as simple as possible to help with understanding the underlying principles and data.

### 3A.1.3 COSTS

The headline from the PHE flier (and also appearing in the local newspapers) effectively says “Spend £1 and get £12.71 of savings”. Wow!! If I had £1 to invest, it would look an attractive proposition. It would be equivalent to a compound rate of interest of almost 65%. For comparison, if I invested my £1 in an ISA or NS&I Bonds at say 5%, after 5 years my £1 would only be worth £1.28. It all looks too good to be true – so is there a catch?

The PHE “tool” can be populated with data by any local authority who may want to use it in helping with their decision making. However, PHE has populated it with data to get the “Spend £1 and get £12.71 of savings”. PHE has used a cost figure of 50 pence per head of population to get the £1 figure - the common denominator across all 5 interventions.

Using data obtained under a Freedom of Information request (<http://www.wmaf.org.uk>) and data from the British Fluoridation Society BFS website (<https://www.bfsweb.org>) it is possible to see where this figure comes from:

Total spend on water fluoridation 2018 – 2019 (WMAF website) = £2,995,309

Number of people supplied with artificially fluoridated water (BFS website) = 5,797,000

Dividing these two numbers (£2,995,309 by 5,797,000) gives £0.52 per head of population for England so not far from the figure used by PHE

However, we have actual figures for fluoridated Northumberland:

Total spend on water fluoridation 2018 – 2019 (WMAF website) = £166,523.79

Number of people supplied with artificially fluoridated water (BFS website) = 101,000

Dividing these two numbers (£166,523.79 by 101,000) gives £1.65 per head of population for Northumberland - so this is already 3 times higher than the assumption used by PHE.

Looking a little bit further, most of this population (101,000) don't ‘need’ water fluoridation and probably may not want it. It is only the 0-5-year-old children who are being targeted for this “treatment”. Using UK census data, the age cohort of 0-5 years is only about 5% of the population, so re-doing the calculation where the **annual revenue cost (£166,523.79)** is spread over 5% of the 101,000 population (5,050) the cost per head (of those receiving the “treatment”) is a massive **£33 per child per annum**.

What is surprising is that the PHE “tool” uses costs per head of the 5-year-old population for 4 of the “oral health improvement programmes” illustrated in the infographic, but not for the 5<sup>th</sup> programme (WF). Thus it’s a case of comparing 4 apples with 1 pear which consequently provides a false financial conclusion. **It is unclear why PHE has used a different baseline for water fluoridation.**

£33 already dwarfs the so-called “benefits” of £12.71. Just think of the headline figures of “Spend £1 and get £12.71 of savings” as a ratio and not as absolute cost values.

**But it gets worse.** Strictly speaking, the capital costs for the proposed scheme should also be included to get a true cost picture. The capital costs for the proposed fluoridation scheme across County Durham, Sunderland and South Tyneside are £4.125 million (<https://democracy.durham.gov.uk/documents/g11300/Public%20reports%20pack%20Wednesday%2016-Oct-2019%2010.00%20Cabinet.pdf?T=10> para. 58, page 22). Since these initial costs (£4.125 million) are being borne by PHE they have been omitted from the “tool”. However, it matters not who picks up the final tab for initial capital equipment costs; the money is being spent on the scheme and capital costs must be included in the Return on Investment calculation. Another notable omission is the “Capital Equipment **Replacement Costs**”. Over the 20-year life of a water fluoridation scheme some of the equipment used to add and control the fluoride will wear out and need replacing. A recommendation is that mechanical and instrumentation equipment be replaced every 5 years and electrical and control equipment every 15 years.

It may be argued by PHE that that organisation will also bear these Capital Replacement Costs but there is evidence gleaned from FoI request replies that where they have done this in the past (e.g. Cornhow and Ennerdale in Cumbria and in Nottinghamshire) they have progressively recovered these costs at the same time as recovering annual revenue costs.

Taking a simplified and optimistic view, let us assume that the equipment only needs replacing once in its 20-year life:

$$\text{Capital Replacement Costs} = \text{£4.125 million} \div 20 = \text{£206,250 per year}$$

Again, this figure would need to be divided by the number of children who are being targeted for this “treatment”. Using data from (<https://democracy.durham.gov.uk/documents/g11300/Public%20reports%20pack%20Wednesday%2016-Oct-2019%2010.00%20Cabinet.pdf?T=10> Table 2 page 21):-

Total additional population for the WF programme in the North East = 809,481

But only 5% of these (40,474) are children under 5 years of age

So, the additional annual cost per child is  $\text{£206,250} \div 40,474 = \text{£5.10}$

Table 2: Population estimates

Local Authority	New Scheme	Existing Scheme	Other Addresses		
	Durham Group	Durham Group	WQZ's: Not part of proposals or existing schemes	Households not in WQZ's	Total
County Durham	356,556	154,807	20,163	1,793	21,956
Darlington	2,589	0	107,831	13	107,844
Gateshead District	2	30,941	0	858	858
Hartlepool	2	0	513	100,202	100,715
Northumberland	0	735	6,613	6,730	13,343
South Tyneside District	157,938	0	0	0	0
Stockton-on-Tees	31	0	205,301	965	206,266
Sunderland District	290,016	290	0	235	235
Newcastle	0	0	0	3,232	3,232
North Tyneside District	0	0	0	0	0
Cumbria	2,345	0	0	0	0
<b>Total Population</b>	<b>809,481</b>	<b>186,773</b>	<b>340,421</b>	<b>114,027</b>	<b>454,447</b>

In total, the local authority would have to spend £33 + £5.10 which is **£38.10 per child per year** for water fluoridation which is **73 times more** than the 52p assumed in Option 3 in the PHE “tool”. Decision makers may want to question if this represents good value for money or if other oral health interventions would be more cost beneficial. (Note that we do not have access to the Capital Replacement Costs for the currently fluoridated areas of Derwentside and Gateshead District.)

**The above calculations do NOT include the initial Capital costs which, when factored into the RoI calculation of £38.10 per child per annum makes WF financially unaffordable. (See Chapter 3C)**

### 3A.1.4 “BENEFITS”

“Benefits” or savings in the PHE “tool” accrue from reductions in dental treatment costs and a reduction of days lost at school and at work (for the carers). These reductions come from an assumed reduction in the dental decay (measured as decayed, missing and filled teeth - dmft) which each of the oral health interventions shown in the infographic can provide. These reductions in dental decay can be very subjective but we are assured by PHE that:

*“The programmes [1-5] included in the tool are those that have the **best available evidence of effectiveness** in reducing tooth decay” [my emphasis].*

*“This tool has been developed with reference to the **best available evidence**” [my emphasis]*

We are further reassured that:

*“Many of the programmes included in the tool may be targeted in relative deprived populations, allowing the tool to estimate **the impact in reducing these health inequalities**” [my emphasis]*

All very reassuring and the layman could be forgiven for taking it at face value. But looking at the last point more closely, in the section of the “tool” dealing with water fluoridation, the same PHE states:

*“**Insufficient evidence was found to determine whether fluoridation reduces differences in decay levels between deprived and affluent areas.....**” [my emphasis]*

*“Given the approach [water fluoridation] targets geographical areas rather than specific population groups, it may be **more difficult to target these kinds of programmes to benefit only children at high risk of disease.....**” [my emphasis]*

These contradictory statements appear to be a case of **PHE shooting itself in the foot** by admitting that water fluoridation does NOT reduce dental health inequalities !

Moving on to the “tool” using the “best available evidence” we are advised that:

*“The model [tool] has used the preventative fraction [0.35] from the most recent systematic review of the effectiveness of water fluoridation (Cochrane 2015)”*

Sounds good, but looking at the “Cochrane Review” more closely (“Water fluoridation for the prevention of dental caries” by Ihezor-Ejiofor Z et al:

<http://www.ncbi.nlm.nih.gov/pubmed/26092033>) the review’s conclusion states:

*“There is **very little contemporary evidence** ..... that has evaluated the effectiveness of water fluoridation for the prevention of caries” [my emphasis]*

*“The available data came predominately from **studies conducted prior to 1975**” [my emphasis]*

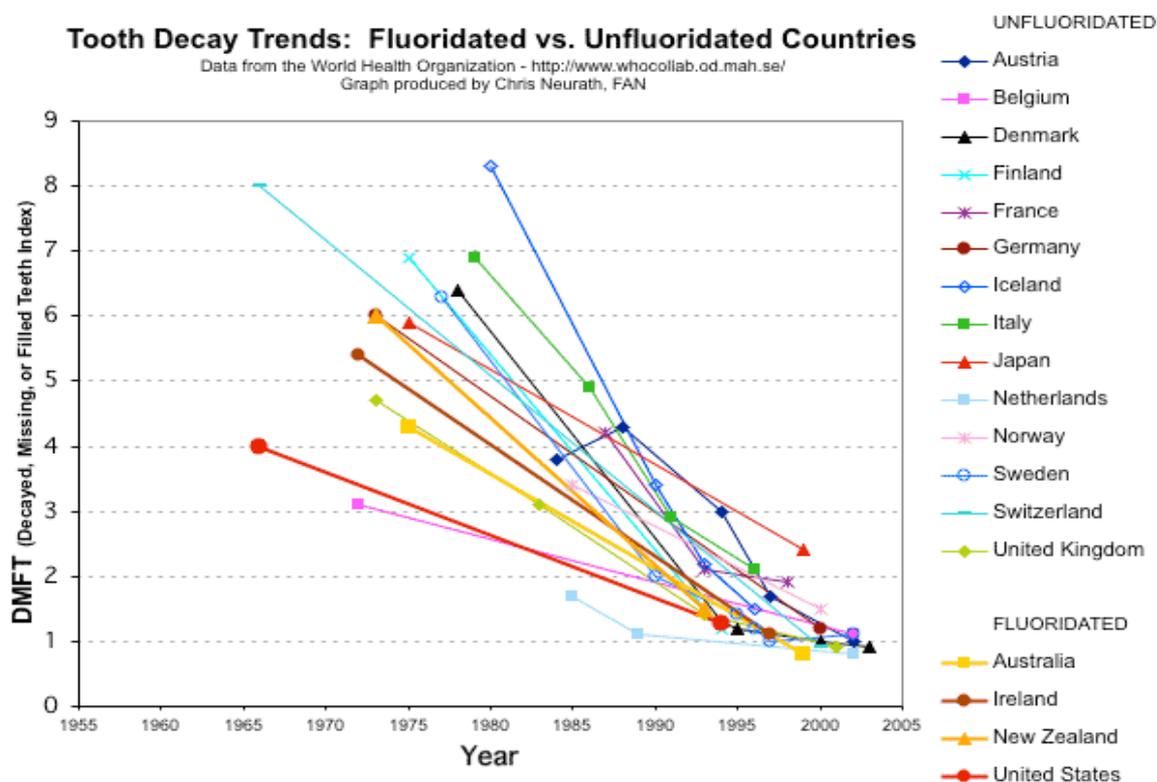
*“There is **insufficient evidence** to determine whether water fluoridation results in a change in disparities in caries levels across SES” [socio economic status] [my emphasis]*

*“There is **a significant association between dental fluorosis ..... and fluoride level**” [my emphasis]*

“The **evidence is limited** due to the high risk of bias within the studies and between study variation” [my emphasis]

It would appear that the evidence used in determining the “benefits” from water fluoridation is weak and in some cases contradictory. Starting with perhaps the most important – to any “benefits” – is the “preventative fraction” (0.35) used to calculate the reduction in tooth decay resulting from water fluoridation i.e. tooth decay will reduce by 35% for the duration of the programme.

The effectiveness of water fluoridation in reducing dental caries is much debated. The figure used in the PHE “tool” (35%) is from studies prior to 1975 mainly in the USA, where dental decay was much higher than it is today (typically 4.0 decayed missing filled teeth - dmft).

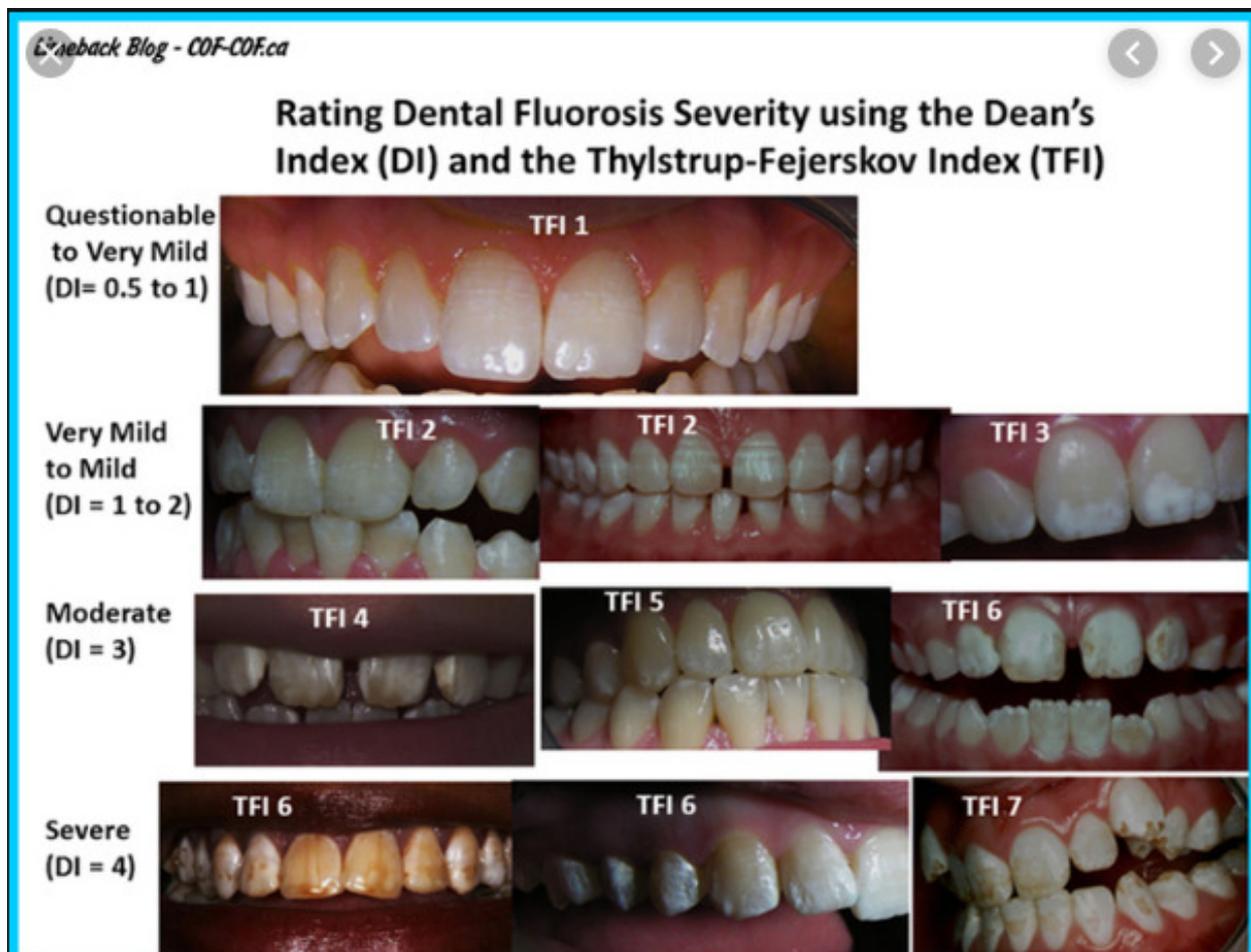


Today, dental decay rates are universally low, irrespective of fluoridation status (0.8 dmft for England and 0.8 in County Durham in 2017) and it is much more **unlikely** to get large reductions when starting from a low number than it is when starting from a high number. For reference, the best scientific evidence available (from the York Review <http://www.bmj.com/cgi/content/full/321/7265/855>) would suggest that **fluoridation could reduce dental caries by 15% - less than half that used in the PHE “tool”**.

The quoted “benefits” are therefore overstated.

The effect of Dental Fluorosis is not taken into account in the PHE “tool”. From the evidence used in producing the “tool” (“There is **a significant association between dental fluorosis ..... and fluoride level**” [my emphasis]) there will be some negative effect. The

York Review estimated the prevalence of dental fluorosis (mottling of the teeth) and fluorosis of aesthetic concern at around 48% and 12.5% respectively. The fluorosis of “aesthetic concern” corresponds to a Dean’s Fluorosis classification of “mild” or worse – see examples below.



The damage that dental fluorosis causes to the surface enamel and the internal matrix of teeth is permanent and irreversible. There is dental evidence that fluoride can affect the viability of dentine and the phrase “fluoride bomb” has entered dental research literature in the past 20 years. “Bomb” refers to the bombed-out appearance of dentinal decay with no hint of decay in the enamel. Fluoride weakens the mechanical properties of developing enamel and when the tooth is put under stress post-eruption, micro-fissures appear which allow the ingress of decay-causing bacteria into the dentine. A carious hollow forms under the enamel of the affected tooth and when a dental probe investigates the toothache, the unsupported enamel caves in revealing the “bomb crater”. It’s almost impossible to save the affected tooth.

If left untreated, dental fluorosis causes embarrassment, psychological stress and damaged self-esteem. Cosmetic dentistry can “hide” the damage but it is expensive, is only available through privately paid dental services and requires repeat treatments. This element of cost is not factored into the “benefits” side of the “tool” – much like the Capital Costs are omitted from the “cost” side of the “tool”.

### 3A.1.5 SUMMARY

The “tool” produced by Public Health England (PHE) “Return on Investment of Oral Health Interventions” is intended to help local authorities in making investment decisions regarding their local commissioning of oral health improvement programmes for pre-school children.

An examination of the data used in this “tool” for water fluoridation would seem to indicate that the “costs” are significantly **understated** by not taking into account the true operating costs of a fluoridation scheme. The “benefits” are **overstated** by taking too optimistic a view of the reduction in tooth decay attributable to water fluoridation and ignoring the negative effect of the cost of treating dental fluorosis.

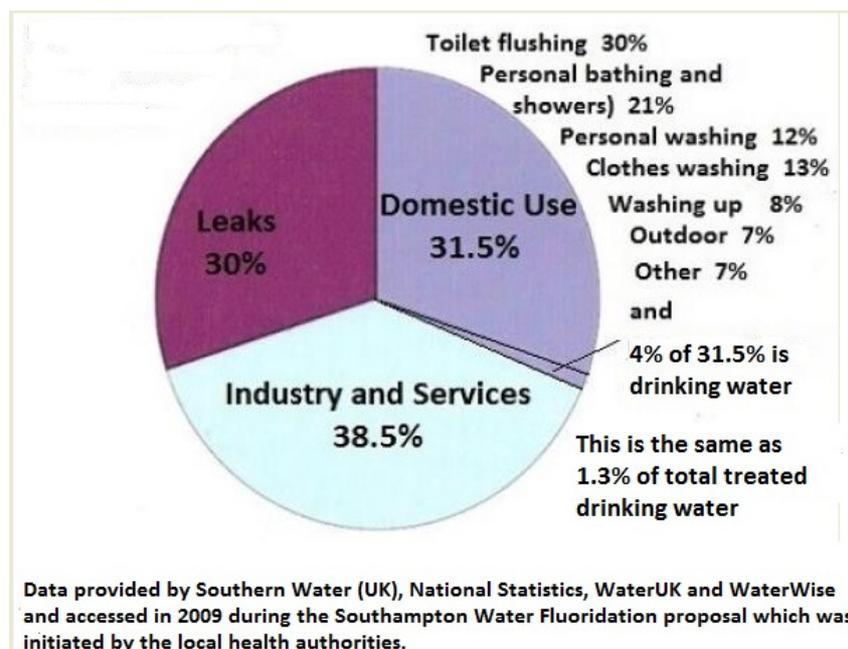
**Water fluoridation is acknowledged by PHE in the text accompanying its Rol tool as having no effect on reducing dental health inequalities.**

When data are provided by PHE in such a misleading way it makes it more difficult for local authorities to make the right investment decision.

### 3B. The waste of public finance – how much of the fluoridated water is not swallowed by a water company’s domestic customers.

#### 3B.1.1 Background

We start this section by reproducing a pie chart published by Southern Water in 2008.



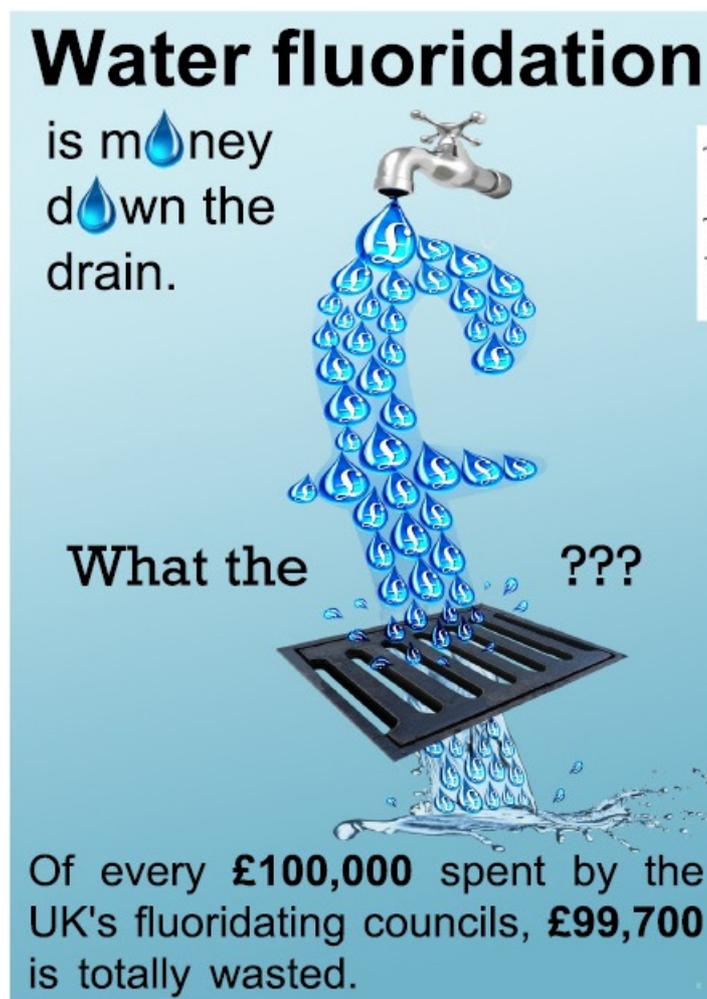
We are told that 31.5% of the 100% treated water is delivered to households.

4% of this 31.5% is used as drinking water and as water used in cooking, for example, vegetables, pasta and rice.

1.3% of total treated water released by Water Treatment Works is the same as 4% of the 31.5% water delivered to households as water which is drunk. We will be using the 1.3% figure.

**Therefore, 98.7% of treated water is not drunk in domestic premises.**

In the case of fluoridated water, this means that 98.7% of **all** the finance spent on fluoridating the water is wasted – it goes down the drain.



**In monetary terms, for every £1 spent on fluoridating the water, 98.7p is wasted because only 1.3p worth is drunk.**

We reason that the money spent on other revenue costs and on the capital cost of fluoridation is wasted because **it is nonsense to spend £3,000,000 revenue costs per annum to deliver fluoridated water to households in England which only drink water with the fluoride value of £39,000.**

**1.3% of £3,000,000 = £39,000.**

**Water costing £39,000 per annum to fluoridate was delivered to 6 million people as drinking water in fluoridated England in 2018-19 while the total annual revenue cost for England was £3 million.**

**That's hardly a good investment!**

Fluoridation Costs for England 2013 - 2019						
Excludes capital costs						
Cost Element	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19
Workforce	441016	515697	525342	531159	493343	489158
Sampling	39527	40853	40608	42548	36516	44314
Transport/Vehicle charge	38129	44012	33717	41618	35102	24,954
Materials and consumables	49300	49744	34509	41032	47665	26,522
Other costs	51717	42707	25209	25030	13292	72479
Electricity	43387	47123	49035	60773	54520	60970
Chemicals*	877336	853851	918595	1064262	1000601	1272559
Monitor maintenance and spare	158928	159536	178668	181655	129988	133439
Support Workforce/Hire and Cor	78397	91327	65683	257975	97506	86763
Training	9984	10000	10000	10,000	10000	10,000
Company overhead/Managemen	182412	175385	205580	257975	241981	268782
Insurance						6150
TOTAL Exc VAT	1970133	2030235	2086946	2350918	2166347	2496091
TOTAL Inc VAT	2364160	2436282	2504335	2821102	2599496	2995309

\* Chemical costs are for the fluoridating acid and computer monitor screen cleaners.

Figures provided by Public Health England after 6 Freedom of Information requests.

### **3B.1.2 Could it get any more financially profligate? YES**

We are told in the UK's *National Diet and Nutrition Survey 2014* that **young children only drink approximately one-third of a litre of water per day.**

Ref: <https://www.gov.uk/government/statistics/national-diet-and-nutrition-survey-results-from-years-1-to-4-combined-of-the-rolling-programme-for-2008-and-2009-to-2011-and-2012> , Chapter 5 Tables, Table 5.1.c )

Of the 1.3% which is drunk in households, a minuscule portion is drunk by small disadvantaged children who are the target group of WF. Using data for Northumbria, we are told that 5% of the Northumberland population comprises small children aged 0 – 5 years. **Disadvantaged children form a small percentage of the 5% - say, 0.5% of the total fluoridated population** (although that is probably too high a figure) and these children are the true target group for fluoridation.

“Tooth decay is more prevalent in disadvantaged families” (Chestnutt, 2013).

If we make an assumption that this is more or less the same for the whole of fluoridated **England**, then:

5% (small children) of 5,797,000 people each drink one-third of a litre of fluoridated per day.

0.5% (disadvantaged small children) of 5,797,000 people each drink one-third of a litre of fluoridated per day.

Therefore,

**289,850 small children drink** one third of a litre/day = **96,617 litres/day** and

**28,985 disadvantaged small children** drink one-third of a litre of water/day = **9662 litres/day**.

**Over the year, we can expect these disadvantaged small children to drink 9662 litres x 365 fluoridated water = 3,526,630 litres containing 3,526,630 mg fluoride.**

BSEN 12175:2013, p. 19 advises the addition of 6.3mg of the fluoridating acid in order to achieve a target concentration of 1 mg fluoride/litre water.

Thus **6.3 x 3,526,630mg = 22,2127,769 mg** of the fluoridating acid is used to fluoridate **28,985** small disadvantaged children in England.

**22,217,769 mg** fluoridating acid amounts to 22.218 kilos. (1 million mg = 1 kilo)

Based on the tender document inviting companies to respond to the invitation to provide the fluoridating acid for the English fluoridation programme, the approximate cost of the fluoridating acid in 2018-19 went up to 45p/kilo from a baseline of 41p/kilo in 2015.

Therefore 22.218 kilos x 0.45p = £9.9981 = £10

(Note: we realise that this seems incredible but the factor of converting milligrams into kilos appreciably alters the outcome.)

**The target group - small disadvantaged children in England - swallow £10 's worth of fluoride per annum whilst the combined total revenue cost of fluoridation is approx. £3 million per annum.**

In summary, the amount of revenue money wasted is out of all proportion to the amount of fluoride swallowed by the target group – young disadvantaged children – who don't even drink the 'optimal' concentration of 1mg/litre/day.

### 3B.1.3 Capital Costs

We haven't even begun to analyse the capital costs of WF. Although PHE initially pays for initial and replacement equipment, the expenditure is recovered by PHE from Local Authorities.

	2013-4	2014-5	2015-6	2016-7	2017-8	2018-9
9 Coventry City Council	138684	131112	187836	160278	160740	158775
10 Cumbria County Council	11491	29087	124943	56975	101128	144825
11 Derbyshire County Council	9582	9994	11458	12024	13115	14276

For example, PHE paid for replacement fluoridation equipment for two Water Treatment Works (Ennerdale and Cornhow) in West Cumbria in 2014. From the extract above, it can be seen that Cumbria County Council were invoiced for revenue **and** capital costs F/Y 2015/16 and for at least 3 subsequent years.

We also note that Nottinghamshire County Council has had to pay capital costs for replacement fluoridation equipment from 2015-6 to date

	2013-4	2014-5	2015-6	2016-7	2017-8	2018-9
Nottinghamshire County Council	58441	74383	154351	145150	113341	129495

PHE may have said that they will pay for the capital costs of **new** equipment BUT from a Drinking Water Inspectorate document we are told that:

**“Of particular note is that PHE is now responsible for initially meeting the costs of fluoridation but may recover such costs from local authorities.”**

“New fluoridation schemes require capital investment, as does the refurbishment upgrading or replacement of the fluoridation works in existing schemes. All such capital schemes have to be pre-agreed with PHE both in terms of content and cost through business processes which are periodically advised to water undertakers by PHE. **Capital funding for agreed schemes of works is provided to water undertakers by PHE, which with the approval of the SoS may elect to pass such costs on to those local authorities which are recipients of that fluoridation service.**” (my emphasis)

Ref. Drinking Water Inspectorate (2016) *Code of Practice on Technical Aspects of Fluoridation of Water Supplies 2016*. <http://www.dwi.defra.gov.uk/stakeholders/information-letters/2016/01-2016-annexa.pdf> , p.2

As discussed in Part A of this Chapter, the initial and replacement capital costs of WF do **not** form part of the Return on Investment (RoI) figure because they are supposed to be paid by PHE. But if PHE asks for a refund as they have done in West Cumbria and Nottinghamshire, then the RoI figure would need to be revised, thus making WF less attractive financially to local authorities in comparison with the cost of properly targeted oral health programmes as recommended by NICE.

In Hull's Oral Action Plan 2015-2016, Hull City Council was told the following:

"Hull City Council would be responsible for the proportion of running costs of a water fluoridation scheme for their population and may be responsible for the capital costs."

([http://www.hull.gov.uk/sites/hull/files/media/Editor%20-%20Environmental/Hull%20Oral%20Health%20Plan%202015-2020\\_0.pdf](http://www.hull.gov.uk/sites/hull/files/media/Editor%20-%20Environmental/Hull%20Oral%20Health%20Plan%202015-2020_0.pdf) , p.15).

From information in the recent Green Paper on the prevention of ill health, PHE is now proposing to 'reward' local authorities when dental decay reduces after WF has started. However, this reward is unlikely to be anywhere near the cost of each new set of fluoridation equipment which we are told by Northumbrian Water is £400,000 per installation (2017 figures taken from the draft desk study).

### **3B.1.4 Summary**

Most of the money spent by local authorities is wasted money because most of the fluoride goes down the drain without being drunk by small disadvantaged children – the target group of WF.

Local Authorities which embark on WF will have to reimburse PHE for the Revenue Costs **and** for the Capital Costs of new and replacement equipment.

Since most of the fluoridated water is not drunk, the finance spent wastefully on WF could be used to administer oral health programmes which do not waste scarce finance, which are successful and which do not deny constituents their right to choose which medicine they may wish to take for the rest of their lives.

We urge that County Durham County Council's Section 151 Officer scrutinises this proposed waste of money.

### **3C Fluoridate the Entire County of Durham! Why?**

**3C.1.1** This section is based on the draft desk study from Northumbrian Water which was written in winter 2017. We would have liked to have used more up-to-date information but our Freedom of Information requests for the final feasibility report have been blocked by Public Health England. The organisation's refusal to send us a copy is based on their statement that the current version of the Feasibility Study is still in its draft stage. We find this inexplicable because the Secretary of State has been asked for permission to go out to Public Consultation and it is unlikely that the SoS would have been sent a draft Feasibility Report. Read into this what you will!

In its desk study, Northumbrian Water proposed two schemes:

**Option A: Fluoridate the entire Durham County plus South Tyneside and Sunderland** by equipping three water treatment works with fluoridation equipment. It is only recently that we have learned that 2,600 people in Darlington and a small part of East Cumbria with 2400 residents are also included in these plans. **Total 2017 capital costs were £1.2 million plus revenue costs.**

**Option B: Local fluoridation scheme:** fluoridate the areas of concern (Bishop Auckland, the Wear Valley, Shildon, Spennymoor, Easington and Peterlee). This option would have necessitated the laying of water mains and re-valving and would have involved 1 Water Treatment Works with a total cost of £1.8 million.

**3C.1.2** Now, things may have moved on since the winter of 2017. What will not have changed however is the presence of natural fluoride in the drinking water supplied to Bishop Auckland, the Wear Valley, Shildon, Spennymoor, Easington and Peterlee

PHE's target "optimum" concentration of fluoride is currently 1 mg Fluoride/litre water. This is despite the USA having reduced the target concentration down to 0.7 mg fluoride/litre approximately 2 years ago. Much of the USA is at the same latitude as the UK, meaning that both populations have equal need to drinking water due to being in the same temperature range. The concentration of fluoride added to drinking water is largely temperature dependent.

The table below lists current natural fluoride concentrations in the groundwater supplied by Water Treatment Works to two of the 5 targeted areas of County Durham – Peterlee and Easington.

Average of Value	Year	2010	2011	2012	2013	2014	2015	2016	2017
DALTON WTW FINAL WATER		0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
HAWTHORN WTW FINAL WATER		0.9	0.8	0.8	1.0	1.0	1.0		
NEW WINNING WTW FINAL WATER		0.9	0.9	1.0	1.1	1.0	1.0	1.1	1.1
NORTH DALTON WTW FINAL WATER		0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5
PETERLEE WTW FINAL WATER		0.9	0.8	1.1	1.0	1.0	1.0	1.0	1.0
STONEYGATE WTW FINAL WATER		0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.3
THORPE WTW FINAL WATER			0.6	0.7	0.8	0.8	0.7	0.7	0.8

Table showing fluoride concentration measured in  $\text{mg l}^{-1}$  (ppm).

**3.C.1.3** In 2017, **Peterlee** was receiving groundwater from North Dalton containing **0.5 mg natural fluoride/litre**. **Easington** was receiving groundwater from Thorpe containing **0.8 mg natural fluoride/litre**. NW suggested that they could modify the water distribution system by revalving the network at an installation cost of **£5,000** in order to provide Peterlee with 1 mg natural fluoride/litre. However, this would also supply Horden and Blackhall with 1 mg natural fluoride/litre and these two villages were not targeted for WF. NW's suggestion for increasing the fluoride concentration for Easington from 0.8 to 1.0 mg natural fluoride was to instal a new main between Peterlee and Easington as a cost of **£300,000** ! That would have been a lot of money for 'treating' 114 children under the age of 5 ! (Based on there being 2171 total pop in Easington and where 5.28% are children under 5.) It is doubtful that oral health lessons for 114 children would have been anywhere near as costly as digging new mains. Also, note that the new optimum concentration of fluoride in the States is 0.7 mg F/litre so nothing needed to be done regarding WF in Easington if PHE decided to recommend lowering the concentration of fluoride from 1mg/litre to 0.7/litre.

In respect of **Bishop Auckland, Shildon and Spennymoor**, these areas are supplied from Mosswood WTW, from Wear Valley WTW and from Broken Scar WTW. NW suggested that the reservoir at North Ditchburn could be chosen to provide the raw untreated water and fluoride added at the principle main outlet together with a new pumping station to overcome hydraulic resistance to enable the three areas to be fluoridated from the same source. The scheme envisaged new mains in order to supply Shildon and Spennymoor and to ensure that other areas did not receive artificially fluoridated water. The Capital cost of this scheme would have been **£700,000** plus revenue costs.

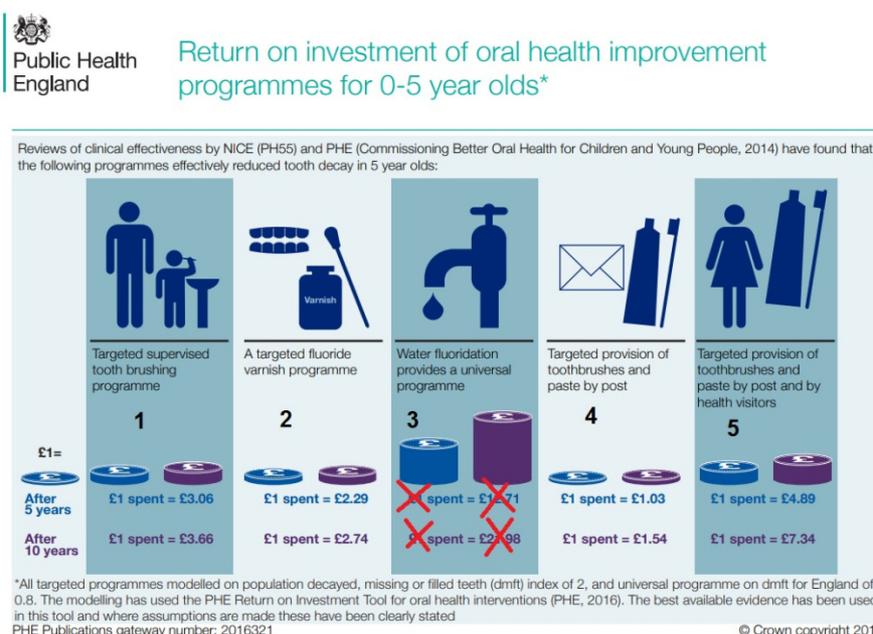
For the **Wear Valley** fluoridation scheme, NW suggested installing fluoridation equipment and a new pumping station at the Wear Valley WTW but in order to ensure that other customers did not receive fluoridated water, a new mains would have to be lain down the entire length of the Wear Valley. Total Capital cost would be **£800,000** plus revenue costs.

**Total cost for Option B = £1,805,000.**

It appears that Durham County Council has opted for **Option A** with a capital cost of **£1,200,000**.

**3C.1.4** We now need to calculate Capital cost per head of targeted children under 5 years. There are approximately 155,000 people in the targeted areas of Easington, Peterlee, Spennymoor, Bishop Auckland, The Wyre Valley and Shildon. 5.28% are children under 5 = 8184.

The capital cost per child under 5 years of age is  $\pounds 1,200,000/8184 = \pounds 146.63$ . To this we have to add equipment replacement costs and revenue costs of  $\pounds 38.10$  per child under 5 (see Chapter 3A), making  **$\pounds 184.73$  per child in year 1 and  $\pounds 38.10$  per child for each year thereafter**. This revised calculation is far in excess of PHE’s flawed RoI calculation of “for every  $\pounds 1$  spent, after 5 years, the NHS saves  $\pounds 12.71$ .”



## Summary

Whilst we can understand Durham County Council opting for what they think is best value and for a scheme which would cause the least traffic disruption due to the laying of water mains down the Wear Valley, WF is definitely not the least expensive because of **(a)** the use of a whole population figure of 6 million fluoridated people and revenue costs of  $\pounds 3$  million per annum for Water Fluoridation instead of consistently using the number of children under 5 years of age in the target group across all of the 5 interventions in the model (see Section 3A), **(b)** the omission of equipment replacement costs and **(c)** the omission of capital costs.

How can we have any faith in this Water Fluoridation proposal when the financial justification for opting for WF is so flawed? Was this flawed information sent to the Secretary of State for Health and Social Care as justification for proceeding with the WF proposal. We believe that this was indeed the case.

## Chapter 4 Oral Health Programmes v Water Fluoridation. Which is more preferable and versatile?

4.1 We begin this chapter with a press release from the Welsh Government:

### **PRESS RELEASE: Welsh Government scheme puts a smile on Children's faces**

**A scheme to improve children's teeth in Wales has helped to achieve 35,000 fewer fillings, 6,000 fewer extractions and an overall reduction in tooth decay.**

**First Published 19<sup>th</sup> September 2019**

Today we are marking the **10th anniversary of *Designed to Smile***, set up and funded by the Welsh Government to target children in areas where levels of tooth decay were highest. Tooth decay is one of the highest reasons for hospital admissions among young children with them undergoing tooth extractions under general anaesthesia.

Before *Designed to Smile* launched in 2009 half of 5 year olds in Wales had tooth decay. Since its introduction this has been reduced to a third – around 4,000 fewer 5 year olds having decay.

The programme has also seen a 35% reduction in the number of children undergoing dental procedures under general anaesthesia in the last 6 years. This has resulted in 3,200 less children a year having to undergo treatment to remove decayed teeth.

Tooth decay is a particular problem for children from disadvantaged areas. Dental disease levels in children in Wales continue to improve across the country. The latest survey shows a 13.4% reduction in the proportion of children with decay, with 15% drop in disadvantaged areas.

Each year over 90,000 children in 1,200 schools and nurseries take part in the tooth brushing scheme run by *Designed to Smile*.

Whilst procedures and tooth decay are falling, the number of children attending a dentist surgery is increasing. Maintaining regular visits to the dentist is essential to good oral health.

Minister for Health and Social Care, Vaughan Gething, said:

There is no doubt that prevention works, and results in less children suffering and having to take time off school due to tooth decay.

Studies show that children with tooth decay in their baby teeth are three times more likely to have decay in their adult teeth. We need to make every effort to keep children decay free by 5.

The last 10 years have shown what can be achieved through preventative measures. A scheme that was criticised by some when first introduced has brought about great changes and had a significant impact on children's dental health. Whilst we celebrate this milestone, we must strive to eradicate tooth decay completely.

Source: <https://gov.wales/welsh-government-scheme-puts-smile-childrens-faces>

**4.2** The following table compares and contrasts the two types of interventions which are intended to prevent dental decay

**Table 1 Oral Health: should it be achieved through personal choice or as a compulsory prophylactic?**

<b>Personal choice / oral health programmes in the home, nurseries and primary schools.</b>	<b>Compulsory prophylactic – Water Fluoridation</b>
Oral health programmes are ‘owned’ by the Community.	Once the decision is taken to fluoridate, the community and Local Authorities lose all control of the process. Monitoring of dental health and invoices are taken over by PHE.
Enables children to be caring about their hygiene and appearance.	There would be no effort to effect behaviour change, particularly if a Local Authority is reluctant to spend finance on WF in parallel with individualised oral health sub-programmes.
Oral health programmes are targeted interventions.	Water Fluoridation is universal with the intention of fluoridating everyone (including those with no teeth) just so that a minority of children might “benefit”.
Oral health programmes are sustainable: once children have learned to care for their teeth, this practice continues throughout life and on into following generations.	WF Programmes are not sustainable, particularly if there are no oral health programmes running in parallel.
There is probably a little wastage of scarce finance.	The waste of money in a WF programme is at least 98.7% of total expenditure
Feedback of results to Local Authority’s Oral Health Strategy can be as frequent as desired.	Feedback of progress every other year. Note, however, that every other oral health survey selects very inadequate numbers of children for the survey so progress may not be highly convincing. (Small samples do not produce robust statistics.)
Local Authorities have control of expenditure.	PHE has control of expenditure and invoices the Local Authority for revenue costs. Judging by the experience of Cumbria and Notts County Councils, PHE also invoices Local Authorities for Capital Costs spread over 5 or more years.
Local Authorities can cancel sub-programmes which are performing poorly and opt for other sub-programmes with very little notice being given.	Once Water Fluoridation starts, it has to continue for 20 years. This condition is written into Regulations. Even after 20 years, it’s difficult to cancel a programme. Judging by the length of time it takes to discontinue WF (and Bedford Borough Council has been in this process since 2015), the fluoridation programme for an area would last 25 years at least + 3-5 months for a public consultation.

Personal choice / oral health programmes in the home, nurseries and primary schools.	Compulsory prophylactic – Water Fluoridation
A very long list exists of all possible interventions in the NICE Guidelines and several documents produced by the COHIPB and PHE, all of which help Local Authorities to choose the best interventions for their particular locality and which treat children as autonomous individuals.	There is only one option – to fluoridate the drinking water
Oral health programmes depend on informed consent by parents who have to give positive approval.	Water Fluoridation is a compulsory programme which does not seek informed consent of the parents of children in the target group.

### 4.3 The Child Oral Health Improvement Programme Board (COHIPB)

The COHIPB was set up in September 2016 by Public Health England and was heralded as “England’s Answer to Childsmile [Scotland].

**Public Health England (PHE)** has Water Fluoridation as a policy and its efforts over the last 3 years have been to attempt to blanket the North East with more WF programmes **despite there being a sound framework operated by the COHIPB and NICE for the establishing of individualised oral health programmes.**

We are of the firm opinion that oral health programmes and WF should **not** run in parallel, since if there is an improvement in rates of dental decay how will we ever know which intervention has had the more positive effect?

An early prevention initiative for the new COHIPB Board was **Smile4Life** “which is a programme of initiatives to improve dental access and oral health in England, complemented by communication and engagement activities to raise awareness of oral health issues and promote healthy dental habits.” Thus “behaviour change” is being sponsored through the Smile4Life initiative.

In addition, COHIPB has had an input into the NHS’s “**Starting Well**” programme which is a “general dental practice-based initiative designed to promote early-years dental access and preventive care in England.”

**Starting Well 13** was launched in 2017 in 13 high priority areas. The 13 high priority areas are:

Blackburn with Darwen	Blackpool	Bolton	Ealing
Hull	Leicester	Luton	Middlesbrough
Oldham	Rochdale	Salford	Slough
Wakefield			

“These areas were chosen on the basis of decay experience at a local authority level, existing oral health improvement plans and trends in oral health.”

<https://www.england.nhs.uk/primary-care/dentistry/smile4life/starting-well-13/>

It would appear that Durham County was not offered a place on the *Starting Well 13* scheme because its 2015 dental decay rate of 35.1 was not concerning enough to warrant a place above those towns and cities which were selected.

By summer 2017, most of the above towns had reduced their dental decay rate in relation to 2015 although we have to add a caveat: some of the lower 2017 dental decay statistics were obtained from an inadequate sample size as in 2015.

These oral health surveys are meaningless if the sample size is small. It's difficult to compare statistics from inadequate sample size with statistics from adequate sample size. It's impossible to draw firm conclusions about upward and downward trends when we are not told where the children lived.

So we are left with the 2017 dental decay rate of 25.8% for Durham County which was derived from an adequate sample. 25.8% is not good but neither does it require special measures and WF is 'special measures'.

**4.4 The Starting Well Core** is “a commissioning approach which aims to reduce oral health inequalities and improve oral health for children aged 0-2 years through:

- Increasing **dental access and attendance** for children aged 0-2 years.
- Delivering **evidence-based preventive care** in practice (e.g. preventive advice, fluoride interventions, support for behaviour change).
- **Raising public and professional awareness** to promote early-years dental attendance, and support the British Society of Paediatric Dentistry's campaign for a *Dental Check by One.*”

The “**Core**” emphasises “evidence-based preventive care such as advice, fluoride interventions and **support for behaviour change.**” Since all three are included in the aim, fluoride interventions can only mean teeth brushing with fluoride toothpaste and fluoride veneers.

<https://www.england.nhs.uk/primary-care/dentistry/smile4life/starting-well-core/>

It does not seem that Water Fluoridation is a programme which **COHIPB and the NHS via the Starting Well 13** and the **Starting Well Core** are currently sponsoring.

**4.5 The National Institute for Clinical Excellence (NICE)** has published comprehensive guidelines for “Oral Health Programmes for Local Authorities and Partners”. **Water Fluoridation is not a recommended intervention.** In fact NICE has inserted a footnote explaining this: “Water fluoridation is outside the scope of this guideline.”

<https://www.nice.org.uk/guidance/ph55/chapter/What-is-this-guideline-about>

The emphasis by NICE is firmly on **Oral Health Programmes** which go out into the Community and which **aim for behaviour change.**

Only PHE would appear to be sponsoring the adoption of Water Fluoridation programmes. Their philosophy is to urge a “universal approach” and that may be advisable should we ever find

ourselves in a Small Pox epidemic situation, BUT dental decay amongst disadvantaged small children is hardly a disease which requires the medicating of entire communities using a 'presumed' developmental neurotoxin. (See Chapter 1 and Grandjean, P. and P. Landrigan (2014) "Neurobehavioural effects of developmental toxicity." *The Lancet Neurology*, Volume 13, Issue 3, Pages 330 – 338.)

Thus, the COHIPB has developed a number of resources which support a local authority's key role in the delivery of oral health improvement for children and these are printed in full below. There is no mention of Water Fluoridation.

## **4.6 Oral health improvement programmes commissioned by local authorities**

### **Appendix C Examples of Integration of Targeted Home Visits**

- oral improvement team works closely with Family Nurse Partnership
- oral health improvement team manage a scheme for 0-5 children and looked after children (all ages) where health visitors issue a 'dental voucher' to facilitate access to local general dental practices
- adopted changes to red book and consequently oral health now integrated into health visitor visits
- health visitors and family nurses give out oral packs, inform parents give top tips for oral health, leaflets, reinforce the need to go to the dentist during pregnancy and when child's teeth erupt
- oral health is highlighted in the neglect strategy • baby packs given out at 4 month assessment
- embedded in 0-19 service model.
- engagement with Early Help Workers and Children Centres.
- health visitors deliver free feeder and weaning cups, toothbrush, toothpaste and leaflet given at 3-4 month visit, free flow cup, toothbrush, toothpaste and toothbrush and leaflet at the 9 month visit and free toothbrush, toothpaste and leaflet at the 2 year visit
- Family Nurse Partnership receive training to provide toothbrushes and tooth paste with targeted oral health messages for their clients' babies
- early help hubs coordinators (troubled families) have been trained to deliver oral health messages and encourage early dental registration.
- domiciliary workers, social care staff have attended training sessions on oral health promotion • looked after children nurses in the 0-5 Healthy Child Programme service specification as part of Healthy Weight and expected to be raised in health reviews. For looked after children it is embedded within the review health assessment
- key professionals (e.g. health visitors, school nurses) are targeted to receive oral health promotion training and shown how to incorporate best practice messages into their work.
- oral health has been embedded into the universal contacts of health visitors
- oral health has been integrated into two of the high impact areas (breastfeeding and healthy weight). Health visitor pathways for contact points outline actions that should be taken, information to be provided and information to signpost to local services
- oral health improvement training for frontline staff to enable delivery of oral health messages
- oral health included in the healthy child programme by health visitors

- oral health included in social care plans
- oral health is integrated into health visitor brief on an informal good practice basis 27 Oral health improvement programmes commissioned by local authorities
- oral health messages are delivered by health visitors, early help staff and children's centre staff. Information on oral health is provided for foster carers. Special provision was made for the family nurse partnership with extra toothbrushes and toothpastes
- part of Making Every Contact Count - part of more intensive healthy early years support. Provided by all roles within the Public Health Early Years' Service and the Healthy Early Years Support (replacement for Family Nurse Partnership)
- Family Nurse Partnership (FNP) Team worked with dental students to develop training resources that have been adopted by the national Family Nurse Partnership Unit and embedded into the FNP programme
- Making Every Contact Count training for Housing Officers including oral health training
- targeted staff training in residential and nursing homes commissioned by local authorities, output to include oral health policy and champion
- oral health is included in social care statement of need
- training social workers, support workers, pre-school staff, schools, speech therapists, foster carers, child minders, children's centre staff and care homes.
- Long term care specification for residential settings contains oral health
- Making Every Contact Count training for Children's Social care staff and care home staff
- contract management of the health visitor service.
- e-Learning for multi professionals including health visitors
- Family Nurse Partnership team give toothbrushes and deliver key messages about oral hygiene to all clients
- children's centre family support workers and early help team give packs to identified families
- oral health messages are given in early year's visits; integrated by health visitors, midwives, school nurses, learning disabilities and autism workers, special schools staff, early year's workers and social workers
- part of core offer to health visitor teams, outreach and Sure Starts
- oral health promotion is in the health visitor specification

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/707180/Oral\\_health\\_improvement\\_programmes\\_commissioned\\_by\\_local\\_authorities.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707180/Oral_health_improvement_programmes_commissioned_by_local_authorities.pdf)

Many local authorities have "got the message" that programmes which treat children as individuals are preferable to a blanket non-targeted approach.

Table 2. Number of Programmes Commissioned by Local Authorities

Programmes	Number (%)
Oral health training of the wider professional workforce	N=103, 71%
Healthy food and drink policies	N=82, 57%
Supervised tooth brushing in early years or school settings	N=74, 51%
Targeted provision of toothbrushes and toothpaste	N=67, 46%
Integration of targeted home visits by health and social care workers	N=64, 44%
Local or national government policies to improve oral health	N=44, 30%
Fluoride varnish programmes	N=35, 24%
Community water fluoridation schemes	N=20, 14%
Peer support workers	N=7, 5%

“Supervised tooth-brushing programmes were commissioned by 51% (74/145) of local authorities and were often commissioned in multiple settings. Of the 109 settings detailed, just under half of programmes took place in early years settings (pre-school and nurseries (49%, 53/109), over a third in mainstream primary schools (35%, 38/109) and, less commonly, special schools (12%, 13/109).”

Source:

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/707180/Oral\\_health\\_improvement\\_programmes\\_commissioned\\_by\\_local\\_authorities.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/707180/Oral_health_improvement_programmes_commissioned_by_local_authorities.pdf)

**4.7** Below is a short list of UK Oral Health Programmes. We do not have room to list the 74 “Supervised tooth brushing” programmes and we recommend that Durham County Council requests this list from the authors of the above report.

**4.8** The **Leicester City** oral health programme ***Healthy Teeth, Happy Smiles*** was used as an example in the recent Green Paper consultation relating to ill-health prevention. The programme is succeeding in reducing dental decay.

**Children's oral health**

To give our children a good start in life, we need to do much better on oral health. Tooth decay is the most common oral disease among children in England – [affecting 1 in 4 children by the time they start school](#), and the most common reason for hospital admission for children aged 5 to 9 years old – yet it is largely preventable.<sup>126</sup> Improving the oral health of children is a PHE priority, and [a number of actions are already underway](#).

**Case study: Leicester's Healthy Teeth, Happy Smiles**

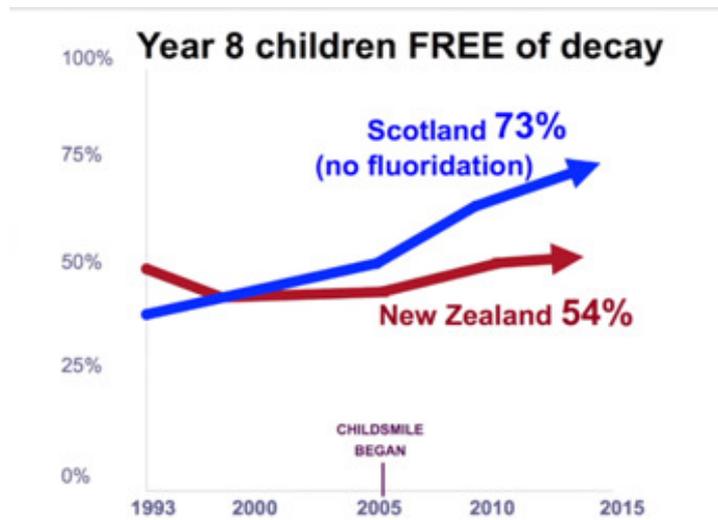
In 2012, Leicester City Council had the highest prevalence of tooth decay in 5 year olds across local authorities in England: 53%.<sup>127</sup> It responded by prioritising help for preschool children as part of Leicester's Healthy Teeth, Happy Smiles! programme. This evidence-based programme ensures that good tooth brushing behaviour with a fluoride toothpaste is established early in a child's life and becomes part of their normal daily routine.

Almost 900 members of staff have been trained to deliver supervised tooth brushing with almost 9,000 children benefiting from daily supervised brushing. By 2017, the prevalence of tooth decay in Leicester had significantly reduced, to 39%.<sup>128</sup>

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/819766/advancing-our-health-prevention-in-the-2020s-accessible.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/819766/advancing-our-health-prevention-in-the-2020s-accessible.pdf)

## 4.9 Scottish Childsmile

### Comparison of Results of Scottish Childsmile with New Zealand Water Fluoridation



**Scotland**  
healthier  
scotland  
SCOTTISH GOVERNMENT

**New Zealand**



#### A Successful Solution:

NON-FLUORIDATED Scotland's  
CHILDSMILE Programme  
has brought tooth decay rates  
far below New Zealand's rates.

CHILDSMILE Saves £5 Million  
PER YEAR  
in dental health costs for Scotland's  
population of 5 million



## COMPARISON of Age 5 children:

In 20 years, Scotland's rate of dental fillings* for age 5 children has been <b>cut by more than half</b> (2.93 to 1.27).	<b>New Zealand's rate</b> of dental fillings for age 5 children <b>unfortunately has INCREASED</b> in this time, from 1.71 to 1.88 average fillings per child.
Since CHILDSMILE began, the rate of age 5 Scottish children FREE of decay has gone from <b>45% to 68%</b> , national average. This is an improvement of 23%.	NZ has improved only by 3% in this time. Now, at 57%, we are far behind Scotland.
High decile areas of Scotland now have 83% of children FREE of decay.	Nowhere in NZ comes even close to this. Our top rated areas are <b>non-fluoridated</b> Wairarapa & Waitemata. (76% & 72%)

## COMPARISON of Year 8 children:

Since CHILDSMILE began, Scotland's rate of fillings* for Year 8 children has also been <b>cut by more than half</b> . A fantastic low rate of only 0.60 fillings per child now. Previously, it was 1.29	Year 8 Kiwis have nearly twice as many fillings as Year 8 Scots now. (1.14 fillings per NZ child)
In 20 years, the rate of Scottish Year 8 children FREE of decay has almost <b>doubled</b> . An improvement from <b>38% to 73%</b> .	NZ has improved only by 5% in this time. It is now 54%, which lags far behind Scotland.

\*Refers to fillings, decayed & missing teeth

Source: [https://www.youtube.com/watch?v=EZ4FHnW4e\\_0](https://www.youtube.com/watch?v=EZ4FHnW4e_0)

### 4.10 *Childsmile* in Scotland and its timeline by Ellen Connett

*Childsmile* has become the model program for the prevention of dental caries in young children in Scotland. Implemented in 2001 to target children from deprived areas, it has proven to be far more effective than the fluoridation of public drinking water in the U.S. and other fluoridating countries. Unlike fluoridation, it does not force children to swallow fluoride. However, *Childsmile* does target children at greatest risk of caries for fluoride sealants and they do encourage the use of toothpaste with fluoride. (There is a similarly successful program called the *Nexø Program* in Denmark that does not use fluoride toothpaste or sealants.)

According to a **BBC news report in 2013**:

- It's a programme to encourage nursery children to brush their teeth
- It involves staff at all Scottish nurseries offering free supervised tooth-brushing every day.
- It also helps parents establish a healthy diet from the earliest stage.

- According to Public Health Minister Michael Matheson, “**By this simple measure, NHS costs associated with the dental disease of five-year-old children have decreased dramatically.**”
- **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.**
- **It costs about £1.8m a year [US\$2,434,780 in Jan 2018].**
- **It has saved more than £6m in dental costs, according to a new study [US\$8,116,130 in Jan 2018].**

**The Scottish Government stated in a press release in September 2017:** “*The Childsmile programme, with its emphasis on prevention, rather than treatment, has resulted in significant improvements in children’s oral health across Scotland. Our aim is that every child has access to Childsmile.*”

We believe that the success of **Childsmile** is because from the government down, the Scottish people want health equality and they are willing to collaborate to achieve it. Secondly, the target of the program is prevention, not treatment.

#### 4.11 Background

In 2000, the **British Dental Health Foundation** called upon the Scottish Executive to implement fluoridation of the public drinking water “to combat tooth decay problems afflicting thousands of children.”

Four years later, in **November 2004**, the BBC reported that the Scottish Executive decided not to fluoridate its public drinking water and “was instead planning a range of other measures to improve the dental health of children.”

**Preceding this decision, opposition to fluoridation was “overwhelming.”**

- In **January 2002**, the Scottish Consumer Council warned that pressing ahead with the proposals [to fluoridate] could expose the public to ‘adverse health effects’;
- In **November 2002**, the Shadow Health Minister Nicola Sturgeon “rejected any plans to add fluoride to water supplies.”
- According to **The Scottish Herald** in March 2003, “Thousands have raised objections to any move by the Scottish Executive to introduce what has been described as mass medication...”
- In **September 2003**, the Green Party MSP [Member of the Scottish Parliament] Robin Harper stated “We [the Scottish Green Party] oppose water fluoridation on health and ethical grounds. Fluoridation breaches medical ethics and human rights by forcing people to take medication against their will, and has been linked to bone cancer and premature puberty.”
- A **2005 news article** reported that “97% of responses from the public” opposed fluoridation.

#### 4.12 On the Ethical Aspects of Childsmile

There is a 2009 published full-text paper on the web (which was also published in Bioethics) titled **Tackling socially determined dental inequalities: ethical aspects of Childsmile, the national child oral health demonstration programme in Scotland**. It’s a refreshing academic exploration of **Childsmile**, such as the “programme’s twin aims of improving oral health and reducing health inequalities; ... the rationale for making particular elements universal or targeted; ... an examination of the political values and evidence base in relation to the programme’s development; ... the area of cost-effectiveness of Childsmile and whether prevention should be

prioritised over treatment”; ... and the consideration of “how Childsmile ‘scores’ in terms of utility and justice...”

### 4.13 The Childsmile Programme

“Childsmile is the flagship national oral health improvement programme for Scotland. The overarching aims of Childsmile are to improve the oral health of children in Scotland and to reduce inequalities both in dental health and in access to dental services. There is also potential for other health impacts particularly with regard to diet and obesity. The Childsmile Programme is the main route to delivering the dental HEAT target.

“The Programme has three main arms:

**1.** Childsmile Core is a Scotland-wide initiative involving universal supervised nursery school toothbrushing provision extended to Primary 1 and 2 classes in most deprived areas [4-6 and 5-7 years of age respectively]; in addition to the free distribution of toothpaste and toothbrushes, oral health improvement packs are distributed to every child in Scotland on at least six occasions during their first five years.

**2.** Childsmile Practice targets children from birth and promotes oral health improvement and clinical caries prevention in dental practice, salaried primary care dental services and local community settings. This element has focused on reorientating dental practice to an anticipatory care and team approach to children’s dentistry, and integrating dental services with wider health services and community initiatives. There has been significant workforce development in creating Dental Health Support Worker roles within public health nursing teams, developing referral pathways, and training Dental Nurses ( DN) in clinical prevention including toothbrush demonstration, dietary advice and support, and as the child gets older the application of fluoride varnish.

**3.** Childsmile Nursery and School targets the most deprived 20% of nurseries and schools by identifying the 20% of establishments with the highest proportion of children living in the most deprived local quintile, as defined using SIMD. These nurseries and schools receive additional preventive initiatives in the form of twice yearly fluoride varnish applications to children’s teeth by Childsmile teams. These teams comprise DNs and DHSWs. The Childsmile teams also deliver oral health promotion advice to parents and carers. In addition, the Childsmile Nursery and School programme contributes to the creation of a health-promoting environment within nurseries and primary schools and provides additional pathways of referral into dental services for those who have not yet accessed dental care...” ***Read more of this longer article here. (Press Ctrl and click on the red text)***

**Source:** <http://fluoridealert.org/content/childsmile/>

**Below, we have added a few more UK oral health programmes**

#### 4.14 Designed to Smile (Wales – see also the Press Release on p. 32)



**Health in Wales** Search

Home | Contact | Site Map | Document Search | A-Z | Accessibility | Listen to this page | Cymraeg

Services > Find an NHS Dentist > Designed to Smile

### Designed to Smile

Designed to Smile is a targeted National Oral Health Improvement Programme.

Its primary focus is the improvement of the dental health of children in Wales. It is funded by Welsh Government and was initially launched in January 2008 in both North and South Wales as a pilot. Due to the success of the pilots the programme was enhanced and expanded to cover the whole of Wales.

By March 2012, 78,350 children from 1,121 schools and nurseries in the most deprived parts of Wales were taking part.

The programme's website provides a useful national resource for dental teams, parents, teachers and other health professionals.

[▶ Designed to Smile](#)



<http://www.wales.nhs.uk/ourservices/findannhsdentist/designedtosmile>

#### 4.15 Happy Smiles in Northern Ireland



Homepage > Our Work > Integrated Care > Dental Services >

Tweet Like 490 Share Print Email

### Happy Smiles Pre-School Oral Health Programme

- Commissioning
- Community Planning
- eHealth and External Collaboration
- Integrated Care
- Social Care and Children
- Tender Opportunities and Market Soundings
- encompass



Happy Smiles is an evidence-based programme which aims to improve the oral health of children in nursery education.

Research shows that three small steps can significantly improve child oral health. Brushing teeth and gums twice a day with fluoride toothpaste, reducing sugary foods and drinks especially between meals, and, regular check-ups at the dentist are the best ways of preventing dental decay and gum disease.

The three main elements of the Happy Smiles Programme are:

- Happy Smiles Tooth Brushing Programme
- Happy Smiles Healthy Snacks
- Happy Smiles Education Programme

<http://www.hscboard.hscni.net/our-work/integrated-care/dental-services/happy-smiles/>

## 4.16 Smile4Life, Lancashire and Cumbria



### Summary

Children in Lancashire and Cumbria have poorer dental health compared to children in other parts of England. The Smile4Life programme was developed in partnership with local authorities to address this problem.

The programme aims to reduce tooth decay in children, laying a solid foundation for their good oral health throughout life.

The approach focuses on sustained behaviour change, supported across the health and social care systems, involving everyone who has a role in the development of children and young people (CYP). The interventions are informed by [Delivering Better Oral Health: an evidence based toolkit for prevention](#).

4 major areas for action provide the framework for implementing the programme. These encourage:

- healthy eating and drinking
- regular tooth brushing
- promoting of a healthy lifestyle
- visiting a dentist regularly

<https://www.gov.uk/government/case-studies/smile4life-in-north-west-england>

## 4.17 Smiles of Mann

Public Health England recommends supervised toothbrushing in targeted childhood settings based on strong/sufficient evidence of effectiveness, and the National Institute for Health and Care Excellence recommends the consideration of supervised toothbrushing schemes for nurseries in areas where children are at high risk of poor oral health.

Childhood settings such as nurseries are able to provide a supportive, suitable environment for children to participate in a supervised toothbrushing programme. Skills developed at nursery can encourage and support home brushing, increasing the likelihood of sustained impacts.

The programme coincides with the development of an oral health needs assessment, which will then guide the development of a new oral health strategy focused upon children aged 0-11 years old.

We currently have [21 Nurseries](#) who have participated in Smile of Mann Programme since its launch in September 2018.



<https://www.gov.im/about-the-government/departments/health-and-social-care/guidance-centre/smile-of-mann-supervised-toothbrushing-programme/>

## “The approach focuses on sustained behaviour change ... “

(Smile4Life, Lancashire and Cumbria)

**4.18** The modern-day emphasis is on oral health programmes and only PHE seems to be out of step. There is no room in a modern democratic society for draconian, expensive, financially wasteful, one-size-fits-all interventions. The social policy of proportionate universalism is truly a misplaced and misguided policy which only appeals to academics and most definitely not to Durham County’s electorate. Note that 97% of resident responses to a Scottish newspaper poll voted against WF in 2005 (see p.38).

Water Fluoridation is really unpopular because it takes away one’s autonomy, violates our right to choose and draws criticism from thousands of scientists because the practice adds a ‘presumed’ developmental neurotoxin using a hazardous industrial waste to our drinking water.

Apart from fluoride, no-one has succeeded in persuading HM Government to add anything other than water treatment chemicals to raw water. Attempts to have Lithium and Statins added have fallen on deaf ears. Nor can water companies increase concentrations of beneficial minerals such as magnesium which would strengthen teeth against decay.

Why is fluoride – a non-beneficial, non-essential substance - the exception?

We end this chapter with the following paragraph from PHE’s *Improving oral health: A toolkit to support commissioning of supervised toothbrushing programmes in early years and school settings*.

“PHE have established a Child Oral Health Improvement Programme Board to provide national system leadership for the delivery of the ambition that every child grows up free of tooth decay as part of getting the best start in life. The board is working with partners across health, social care, education and the voluntary sector to deliver an ambitious programme to improve the oral health of children. **Commissioning programmes such as supervised brushing, that we know work, will be key in making progress towards that ambition.**” (My emphasis)

Author: Dr Sandra White, National Lead for Dental Public Health, Public Health England.

[https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/574835/PHE\\_supervised\\_toothbrushing\\_toolkit.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/574835/PHE_supervised_toothbrushing_toolkit.pdf)

**We are getting inconsistent messages from PHE.** On the one hand, PHE is supporting the commissioning of supervised brushing “that we know work” while on the other, that organisation is eager to administer a universal programme which forces everyone in an area to drink a presumed developmental neurotoxin which is an ingredient of pesticides and sarin gas used by terrorist organisations.

**4.19 Targeted interventions work** as stated by HM Government in a parliamentary question and answer on 4<sup>th</sup> November 2019:



## Lord Hunt of Kings Heath Labour

To ask Her Majesty's Government what plans they have to extend the supervised tooth brushing programme, as recommended by the [Royal College of Surgeons Faculty of Dental Surgery](#) in its report *The state of children's oral health in England*, published in August.



## Baroness Blackwood of North Oxford

The Parliamentary Under-Secretary for Health and Social Care

Evidence shows that targeted supervised toothbrushing schemes are effective at preventing tooth decay and produce the biggest impact in reducing inequalities in oral health.

The Government's [Green Paper \*Advancing our health: prevention in the 2020s\*](#), published in July, commits to consulting next year on options for rolling out a national school toothbrushing scheme in more pre-school settings and primary schools in England. These proposals will aim to reach the most deprived 3-5 year olds in all areas of the country, and will look to reach 30% by 2022.

Source: <https://www.theyworkforyou.com/wrans/?id=2019-10-22.HL296.h&s=speaker%3A13353#gHL296.q0>

“... the **biggest** impact” ! This is not what PHE has told DCC.

**4.20** Investing money now in more tooth-brushing programmes in County Durham will save money in the long-term because Durham County Council will have saved £millions over a minimum of 20 years by not initiating a financially wasteful Water Fluoridation programme when targeted interventions will have, in the meantime, been shown to work.

## 4.21 The Situation in Hull

### **THE YORKSHIRE POST**

#### **Unpopular fluoride scheme for Hull and East Yorkshire residents 'will not happen'**

ALEX WOOD Email Published: 15:15 Tuesday 31 July 2018

<https://www.yorkshirepost.co.uk/news/unpopular-fluoride-scheme-for-hull-and-east-yorkshire-residents-will-not-happen-1-9278339>

Photo caption: around 38 per cent of five-year-olds in Hull suffer from tooth decay. [from the summer 2015 oral health survey for 5-year-olds. By summer 2017, the figure was 32.8%. However, both surveys used inadequate samples of 251 and 261 respectively]

Controversial plans to add fluoride to the water supply of more than 340,000 people in Hull and the East Riding to address some of the worst rates of tooth decay in the country “will not happen”, according to a councillor. The proposals - which had the backing of former Health Secretary and Hull MP Alan Johnson and the British Dental Association - were mooted more than three years ago. It was championed as the best way of tackling poor dental health by the former chairman of the health and wellbeing board Coun Colin Inglis, who retired this year, but was opposed by campaigners, the Lib Dem opposition and some Labour councillors. Yorkshire Water is carrying out a £68,000 feasibility study, but **Cabinet member Phil Webster said he would not countenance the spending of “one more penny on this foolhardy scheme” and there was “no appetite for it whatsoever.” He said it was “too expensive, undemocratic and unproven,” adding: “I’ve always said I think it is forced medication by the State. To quote Monty Python the scheme is no more. I am in charge of finance and I can confidently say it won’t be happening.”**

New health and wellbeing chairwoman Coun Hester Bridges said fluoridation was “unlikely,” given the lack of “overwhelming” evidence and “massive” opposition. They also have to get East Riding Council to agree, as 87,000 residents would also get added fluoride. She said: “If there was a groundswell of people demanding fluoride I think we would be giving it more consideration - but there isn’t. People are saying very clearly they want (to make) that choice.”

[The rest of this long report can be read at:

<https://www.yorkshirepost.co.uk/news/unpopular-fluoride-scheme-for-hull-and-east-yorkshire-residents-will-not-happen-1-9278339> .]

#### **4.22 Is there a groundswell of opinion amongst Durham County Council's residents demanding WF? How many Councillors have received letters from Constituents asking to be fluoridated? If there is no 'groundswell' then why continue with this Public Consultation?**

**Note that Hull made the same decision against adopting WF back in 1970 when " ....Hull councillors perceived no 'public demand' for fluoridation." (Public Administration, Summer 1970, Vol. 48 )**

#### **4.23 Other local authorities have declined Water Fluoridation:**

"A telephone poll commissioned by the T&A in 1993 gave fluoridisation an overwhelming thumbs-down. Only 142 people wanted it - with a staggering 3,745 saying no." **(Bradford 1993)**

82% of those who took part in a poll said 'no' to the fluoridation proposal. **(Bolton 1968).**

In May 2014, Cllr Linda Thomas stated "This is not something we are actively considering at the present time. We will continue to secure programmes such as 'brushing for life' and oral health promotion support to schools, and we are currently reviewing all our oral health promotion work". **(Bolton 2014)**

"Research produced since 2007 persuaded the O&S Committee that the case for the safety and effectiveness of fluoridation had not been established by PHE. " **(Wakefield 2016)**

"...the Health Committee recommends that the Government investigate other means of targeted help to improve dental health before fluoridation is even considered." **(London Assembly 2003)**

"Jonathan Morgan AM, Conservative health spokesman, said, "We would not support fluoridation. We don't support mass medication without the support of those people who are to be given it. I buy toothpaste with fluoride in it because that's my choice. "I think it's a step that would not be welcome. We should be doing more to get dentists to set up in Wales." **(Wales 2005)**

#### **NHS Overview and Scrutiny Committee, 25<sup>th</sup> July 2005**

**Agreed** - (a) That there was not enough evidence available nationally to indicate that there would be any benefit from a Review Panel in relation to water fluoridation at this time ... **(East Riding of Yorkshire 2005)**

"The review group considers that although water fluoridation could benefit dental health (particularly for children in deprived communities), the long-term consequences are not sufficiently known. In addition, it is unhappy with the ethical implications of universally adding fluoride to the water supply, rather than offering fluoride supplements (and other preventative care) to those in greatest need – particularly as such an intervention would not be of universal benefit. This report therefore recommends that:

8.1.1 The Council's current policy of opposing water fluoridation be reaffirmed.

8.1.2 The Council supports the principle of targeted intervention to reduced dental health inequalities in those communities of greatest need.

8.1.3 That this report be included as part of the Council's response in any future formal consultation on proposals to fluoridate Rotherham's water. **(Rotherham 2007)**

"Of the 10,000 people who took part in the public consultation, 7,200 said they didn't want Water Fluoridation." **(Southampton 2009)**

"Attempts by the British Fluoridation Society to influence the outcome ended soon after a meeting in public in November 2007 where the IoM audience voted 127 to 3 against fluoridation. Also, the Island's police superintendant was most concerned about the transportation of a hazardous acid on the narrow roads of the Island." **(Isle of Man 2008)**

"After a thorough scrutiny, HCC highlighted several areas of the fluoridation proposal which the council required to be examined by South Central Strategic Health Authority before they would consider reviewing the issue again. None of their observations were taken on board by the SHA. HCC decided against fluoridation. **(Hampshire County Council 2008)**

"The Health Overview and Scrutiny Committee felt that the evidence in favour of water fluoridation "does seem to be extremely outdated ... A number of pieces of evidence showing the disbenefits of fluoride are not rigorous enough but we should observe the Precautionary Principle. There isn't strong evidence to reintroduce fluoridation." (not verbatim). The Full Council debated the recommendation to terminate fluoridation. A unanimous vote by Full Council means that fluoride will not be reintroduced to the water supply after fluoridation was 'temporarily' halted for technical reasons in 2009. **(Bedford 2016)**

Rather than spend money eliciting if residents either want or don't want Water Fluoridation via a Public Consultation, it would be far less expensive to initially discover the strength of feeling by a simple newspaper poll. Caution is advised however because polls have to ensure against multiple voting by individuals and organisations. Also, participants in the poll must be residents of County Durham, Sunderland and South Tyneside.

#### **4.24 Summary**

Many Local Authorities in England and in all of Wales, Northern Ireland, the Isle of Mann and Scotland have rejected calls to use fluoridated water as a possible means of reducing child dental decay. It is counter-intuitive for PHE to continue to sponsor WF when there are successful ethical ways of preventing dental decay amongst disadvantaged small children and which, according to Sandra White, PHE acknowledges as "key in making progress..." and which foster sustained behaviour change. Nowhere in the UK have we seen "a groundswell of opinion amongst residents to become fluoridated". A Public Consultation would therefore be a waste of scarce financial resources – resources which could be spent now on properly targeted oral health interventions at the individual level in areas of deprivation.

## Chapter 5 The Lack of Ethics in Water Fluoridation Practice

by Dr Peter Lucas BA (Hons), MA, PhD. Senior Lecturer in Philosophy, School of Humanities and Social Sciences, University of Central Lancashire

### Definition of a Medicinal Product

#### Directive 2004/27/EC on medicinal products for human use

- (a) Any substance or combination of substances presented as having properties for treating or preventing disease in human beings or
- (b) Any substance or combination of substances which may be used in or administered to human beings either with a view to restoring, correcting or modifying physiological function by exerting a pharmacological, immunological or metabolic action, or to making a medical diagnosis.

[https://ec.europa.eu/health/sites/health/files/files/eudralex/vol-1/dir\\_2004\\_27/dir\\_2004\\_27\\_en.pdf](https://ec.europa.eu/health/sites/health/files/files/eudralex/vol-1/dir_2004_27/dir_2004_27_en.pdf)

To clarify the distinction between ethical and safety and/or economic issues, ethics is concerned with what is right and wrong, with what we should not be doing, independent of questions of economic efficiency and safety.

So, for example, while it might be more cost-effective to devote all of our health care resources to the care of patients within a particular age band – say below the age of sixty-five – we don't do this because we think there are other relevant factors besides economic efficiency – such as the ethical principle of equality of access to health care. Whether a given policy makes sense in terms of treatment and the efficient use of resource is one thing, whether it makes ethical sense is another, and in a society such as our won it is important to appreciate that we can and should reject what us unethical, regardless of, e.g., how cost-effective it might be.

With this in mind, let's turn to look at the ethics of fluoridation.

Fluoridation amounts to a medical intervention in the terms of article 4 of the European Convention of Human Rights and Biomedicine. That is to say it is a "medical act" performed for the purpose of preventative care/treatment.

The pro-fluoridation lobby denies this. They argue that fluoridation is not a medical intervention, but the administration of a dietary supplement, akin to adding vitamins and minerals to refined flour, for example. This, however, is a mistaken view, based on a conceptual muddle about what should count as a dietary supplement.

The concept of supplementation is conceptually tied to that of deficiency. A dietary supplement is something that makes up for a dietary deficiency. Fluoridation cannot be

supplementation then, because it makes no sense to speak of a diet lacking in fluoride as deficient in any way.

Fluoride is not a necessary or even a helpful component of a normal human diet. It is not added to our diets (whether as tablets, in toothpaste, or by fluoridation of public water supplies) in order to remedy a dietary deficiency. It is added to remedy dental caries. And dental caries is not a deficiency disease. ('Deficiency disease' is a technical medical term used to refer to conditions like pellagra and beri beri – diseases caused by the lack of an essential or important substance in the diet.) Dental caries is not caused by a lack of fluoride but by an excess of sugar. Fluoride is added to diets in order to counteract the effects of this excess of sugar, not to make up any kind of deficiency.

Only substances that are added to diets to prevent or treat deficiency diseases or conditions can properly be called dietary supplements. To add something to our diets in order to counteract the presence of some harmful agent – such as excess sugar – is to engage in a straightforward medical intervention – it is a remedy for an unhealthy dietary factor, not a supplement for a dietary deficiency.

Since dental caries is not a deficiency disease, fluoridation is not supplementation but a 'medical act' in the terms of the European Convention on Human Rights and Biomedicine.

With respect to this 'medical act' two things are particularly striking.

Firstly it would be, again for a significant percentage of those affected (though perhaps not the majority), undesired. Many, many people don't want it. Now according to fundamental principles of medical ethics, accepted all around the globe, it is quite wrong to subject any individual to a medical intervention he or she neither needs nor wants.

For example, Article 5 of the European Convention on Human Rights and biomedicine states: "An intervention in the health field may only be carried out after the person concerned has given free and informed consent to it."

This principle of respect for the informed choices of the subjects of medical intervention is not the only important principle of medical ethics. The principle of acting in the patient's best interests is also important. However, where the patient is able to give (or withhold) informed consent, and where there is no serious risk or harm to others if they do not do so, obtaining their consent is considered to be an indispensable condition of ethical medical intervention.

Until such time as the proponents of fluoridation are able to obtain the consent of those affected then – not of a majority of them, but of all those who are competent to give their consent – fluoridation of public water supplies is straightforward unethical. It involves a clear breach of the requirement of the European Convention on Human Rights and Biomedicine that consent be obtained for all medical interventions involving competent adults.

## Chapter 6 Incisor Decay in County Durham

by Dr Hardy Limeback and Joy Warren

Incisor Decay, Baby Bottle Decay and Early Childhood Caries are the same.

**6.1** In 2017, 135 children of the 2763 who were examined in Durham County had early childhood caries (4.9% of 2763). This is an unacceptable figure and needs to be reduced.



Baby Bottle Tooth Decay, known as Ear...  
pinterest.com

### 6.2 Extracts from oral health surveys for Durham County and England

Year of survey	No. of 5-year-olds	No. examined	Av d <sub>3</sub> mft	% d <sub>3</sub> mft	% with plaque	% with sepsis	% with incisor caries
<b>2015</b> Durham County	5,657	<b>235</b> (inadequate sample)	1.1	35.1	<b>6.5</b>	<b>2.4</b>	<b>8.4</b> (19 children)
<b>2015</b> Eng.	673,956	111,500	0.8	24.7	1.7	1.4	<b>5.6</b>
<b>2017</b> Durham County	6087	<b>2763</b>	0.8	25.8	<b>2.0</b>	<b>1.5</b>	<b>4.9</b> (135 children)
<b>2017</b> Eng.	703755	96005	0.8	23.3	1.5	1.1	<b>5.1</b>

Source:

[https://webarchive.nationalarchives.gov.uk/20180801132949/http://www.nwph.net/dentalhealth/survey-results%205\(14 15\).aspx?id=1](https://webarchive.nationalarchives.gov.uk/20180801132949/http://www.nwph.net/dentalhealth/survey-results%205(14%2015).aspx?id=1) (2015)

<https://www.gov.uk/government/statistics/oral-health-survey-of-5-year-old-children-2017> (2017)

**6.3** Dentists tell us that swallowing fluoride has no chance whatsoever of stopping Incisor Decay (IC) which is caused by aggressive acid attack. This being the case, other methods need to be attempted.

## 6.4 Prevention

IC can only be prevented with education and behaviour change. There are too many unknowing people who think that primary teeth don't matter because they will fall out anyway. Others don't realise that leaving a toddler with a bottle of formula or sugared water stuck in its mouth for hours at a time in order to keep the child quiet will quickly rot its teeth.

This sort of child neglect is difficult to prevent unless a concerted effort is made by the oral health team to:

- Train health visitors to teach oral hygiene in the home environment, and to **strenuously** counsel against giving the toddler a bottle of formula or a bottled of sugared water as a comforter or as an aid to induce sleep.
- Teach the perils of baby bottle decay in post-natal classes and follow up with visits to hard to reach families at risk.
- Publish leaflets containing photographs of this decay – shock tactics.

## 6.5 Treatment

Early decay can be arrested with the use of Silver Diamine Fluoride, fluoride varnish and ozone and reduction in sugar in the diet. The small child must not be put to bed sucking on a bottle of sugary liquid. Once decay has reached the stage shown in the infographic below, extraction is the only 'remedy'.

### What can be done to manage Incisor Caries

**Caries Research** Systematic Review

---

Caries Res  
DOI: 10.1159/000504335 Received: May 29, 2019  
Accepted after revision: October 24, 2019  
Published online: January 7, 2020

### How to Intervene in the Caries Process: Early Childhood Caries – A Systematic Review

Julian Schmoedel<sup>a</sup> Kristina Gorseta<sup>b</sup> Christian H. Splieth<sup>a</sup> Hrvoje Juric<sup>b</sup>



Mishra A, BMJ Case Reports 2013; bcr2013010269.

**Treatment:** arrest early lesions with Silver Diamine Fluoride, fluoride varnish, ozone, stopping the sugar abuse

**Prevention:** education, improving hygiene with F toothpaste, better access to dental care, avoiding the bottle at bedtime, better food choices

ONLY the American Pediatric Dentist Association says fluoridation helps  
BUT IT DOES NOT MAKE A DENT ON THIS KIND OF DENTAL DECAY

6.6 It's too late to do anything when it gets to this stage and this implies that supervised toothbrushing is not taking place (if indeed there is any toothbrushing going on at all). Once it is noticed, could it be that the parent is ashamed to do anything about the situation? After all the teeth are going to drop out so why bother to go to the dentist?

6.7 That is a wrong assumption. Primary teeth are vitally important as place-markers for the permanent teeth. Their presence in the gum as they are about to shed is necessary for chemical signals to pass between the root of the primary tooth and the tip of the secondary tooth. If there is no primary tooth, there are no signals and eruption is delayed.

## **Incisor Decay: Stamp It Out!**



Baby Bottle Tooth Decay, known as Ear...  
pinterest.com

6.8 Stamping out IC would reduce the call to fluoridate Durham County.

6.9 It's a totally outrageous situation: 810,000 people in the North East are about to have their human rights violated because 19 and 135 children were found to have Incisor Caries in the summers of 2015 and 2017 respectively in Durham County and some other children with decayed teeth were not taught by their parents to clean their teeth.

6.10 We cannot blame those families who children have Amelogenesis imperfecta since primary and secondary teeth with thin enamel are more likely to become decayed and more quickly. However, we have an uneasy feeling that their decayed teeth are included in the oral health statistics, thus slightly increasing the percentage of children with decayed teeth and thereby unjustifiably prompting Public Health England to press for Water Fluoridation.

## Chapter 7 Water Fluoridation is Not Compatible with UK Primary Law

7.1 The Primary Law which is consulted by fluoridating water companies is *The Water Industry Act 1991*. (WIA 1991). The section on fluoridating water is derived from Primary Law – the *Water (Fluoridation) Act 1985*. This law quasi-legalised WF, not only for the reason stated in Section 7.3 but because the issue was “whipped”, the House of Commons was remarkably full and the number of abstentions were out of all proportion to the votes in favour and against legalising WF.

**For WF - 165;      Against WF - 82;      Abstentions – 399.**

Margaret Thatcher’s Government felt it was necessary to legalise WF because up until 1983 and prior to a Scottish judgement that ruled that fluoridated water was a medicine, WF practice would have been illegal although this needed to be tested in an English Court of Law. So the 1985 Act legalised WF to prevent any cases going to Court. However, the Medicines Act 1968 which defines the nature of medicines and which is Primary Law preceded the Water (Fluoridation) Act 1985 and had as much legal force as the later Act.

The WIA 1991 was amended by the *Health and Social Care Act, 2012*. In his White Paper, Andrew Lansley stated “no decision about me without me” and yet this aspiration was not mirrored by the subsequent *H&SC Act* in respect of Water Fluoridation!

s. 87c of the WIA 1991 states:

### **[F187C] Fluoridation arrangements: compliance**

(1) It shall be the duty of each water undertaker to comply with any arrangements entered into by it under section 87(1) above.

(2) Where, pursuant to any such arrangements, the fluoride content of any water is increased, the increase may be effected only by the addition of one or more of the following compounds of fluorine—

hexafluorosilicic acid ( $H_2SiF_6$ )

disodium hexafluorosilicate ( $Na_2SiF_6$ ).

7.2 The law is slightly incorrect regarding hexafluorosilicic acid. The acid is the medium which contains the fluorine compound hydrofluorosilicate. The acid doesn’t have a chemical formula as such because it’s a ‘soup’ of chemicals.

7.3 When we look at BSEN 12175:2013, we see on p.7 that the fluoridating acid contains another compound of fluorine – **hydrofluoric acid** with the chemical formula **HF**. This ‘impurity’ is present in the fluoridating acid at a concentration of up to 1.5%.

**Consequently, the practice of WF and the use of hexafluorosilicic acid is incompatible with Primary UK law in that it adds a third (and non-permissible) compound of fluorine to our drinking water.**

#### 7.4 HF is a Reportable Poison

From p. 19 of BSEN 12175:2013, we see that water companies typically add a maximum of 6.3mg of the fluoridating acid to treated water and this means that a maximum of 1.5% of 6.3 mg is added to treated water = 0.0945mg HF/litre.

0.0945 mg of HF is 9 times more than the permitted maximum of arsenic and lead in drinking water. HF is a poison and is listed in Primary Law: *Deregulation Act 2015, Schedule 21, Part 4*.

It is undoubtedly a poison because it was once used **successfully** as a treatment under medical supervision to **poison** thyroid function in patients with **hyperthyroidism**. A small concentration of HF was added to lukewarm bath water in a Viennese hospital before World War II (Gorlitzer 1932). It was also initially tested on tadpoles as a traditional way of determining the toxicity of a substance. Gorlitzer (1931) found that HF delayed metamorphosis in the amphibian study group compared to the control group which remained unaffected.

The **Precautionary Principle** should be observed: are people in fluoridated areas who take frequent hot baths being poisoned when their skins absorb the poison? Is this one of the reasons why there is almost double the number of diagnosed cases of hypothyroidism in fluoridated West Midlands compared to non-fluoridated Greater Manchester? (Peckham et al, 2015). The skin is part of the endocrine system and it is reasonable to assume that Fluoride with its hydrogen atom in tow is capable of crossing through cell membranes. After all, that's why fluoride is part of the chemical formula of some pharmaceuticals and hospital operating theatre anaesthetics.

Although the research demonstrates a very strong correlation, the DHSC has not commissioned research to investigate whether or not there is a causation. Since HM Government and their civil servants are in favour of WF, then it is highly unlikely that any research will be commissioned. We can't make them do the research.

Ref: Peckham, S., D. Lowery and S. Spencer (2015). "Are fluoride levels in drinking water associated with hypothyroidism prevalence in England? A large observational study of GP practice data and fluoride levels in drinking water." *J. Epidemiol Community Health* 2015; 0: 1-6

#### Summary

**7.5 Before 1985, WF practice was illegal because all the health authorities who undemocratically initiated WF programmes did not attempt to have WF legalised. In 1983, a Scottish judge ruled that fluoridated water was a medicine. The UK Government were then forced to legalise the practice if they wanted to continue fluoridating the West Midlands and parts of the North East of England but it now appears that WF has been incompatible with UK law since before 1985 due to the presence of a third non-permitted compound of fluorine - hydrofluoric acid - in the fluoridating acid. Hydrofluoric acid is a reportable poison – the Deregulation Act, 2015, Schedule 21, Part 4.**

## Chapter 8 What is added to drinking water when a water company is ordered to add fluoride?

8.1 Answer: It's not just elemental fluorine (fluoride) although that's bad enough!

1 mg fluoride is not the same as 1 atom of fluoride. 1 mg may seem to be an inconsequential amount BUT it contains **millions of atoms**, all of which are highly electro-negative (reactive). We drink 2 litres of water per day either as water, tea and coffee so that's even more reactive atoms being swallowed, particularly when we drink tea. Tea leaves contain fluoride. Habitual fluoridated tea drinkers are highly likely to be drinking more than 6 mg fluoride/day.

### 8.2 The contents of the fluoridating acid, hexafluorosilicic acid.

The fluoridating acid, **hexafluorosilicic acid**, takes its name from the major chemical compound in the acid which is  $\text{H}_2\text{SiF}_6$  – a hydrofluorosilicate. “Hexa” simply means “6” – that is 6 atoms of fluorine. We ought to refer to the acid as **hydrofluorosilicic acid** because hydrogen is a component in the acid and a component of the major compound of fluorine contained in the acid.

We really ought not to use the chemical formula to describe the fluoridating acid because the acid is a soup of other chemicals. However, over time,  $\text{H}_2\text{SiF}_6$  been used for both, even though it's confusing.

The fluoridating acid is an artificial construct. It does not appear in nature. It is an industrial hazardous waste which is used in WF because it contains a “cheaper to purchase” fluorine compound than other fluorine compounds which are on the market.

The major compound -  $\text{H}_2\text{SiF}_6$  - in the fluoridating acid, comprises about **20%** of the total acid. It is therefore described as a **20% solution**.

The chemical formula,  $\text{H}_2\text{SiF}_6$ , tells us that there are 2 atoms of hydrogen ( $\text{H}_2$ ), one atom of Silica (Si) and 6 atoms of Fluoride ( $\text{F}_6^-$ ) in each molecule.

Fluoride ( $\text{F}^-$ ) is fluorine gas (F) with an extra electron. The minus sign ( $-$ ) denotes more electro-negativity and reactivity due to the addition of one electron. (Electrons carry a negative charge.)

$\text{F}^-$  is more electronegative than fluorine (F) but both avidly bond with elements which have a positive charge such as hydrogen, calcium and magnesium.

Fluorine gas is reactive in its own right and it doesn't exist as a stand-alone element in nature. A split second after it forms deep down in the Earth's crust, it bonds with another

element (mainly calcium) to form a compound – **Calcium fluoride**. Thus, a really poisonous gas is sequestered and life on earth is protected. If our atmosphere contained fluorine, there would be no life on earth – well not life as we know it.



**Flurax, the monster**

by **Andreas Dihm (Elemonsters)**

**Calcium fluoride** is referred to as ‘**natural**’ fluoride.

When drinking water is dosed with industrial grade (‘artificial’) hydrofluorosilicic acid,  $F^-$  can either exist as a stand-alone entity in water when it dissociates or as a fluorosilicate compound. You will never see fluoride on its own as a solid. It always has to have another element bonded to it, e.g. sodium fluoride, calcium fluoride, potassium fluoride, magnesium fluoride, hydrogen fluoride, etc.

### **8.3 Hydrofluoric acid (aka Hydrogen Fluoride)**

In the previous chapter we described how WF using hydrofluorosilicic acid is incompatible with UK law because of the presence of the third fluorine compound – HF - which is not permitted in the Water Industry Act 1991, s.87.

HF can exist as a deadly gas – Hydrogen fluoride – or as a corrosive acid – Hydrofluoric acid. (Another compound which has two states is water, although water also has a 3rd state (ice) and scientists are in the process of postulating the existence of a 4<sup>th</sup> state.)

Hydrofluoric acid does not altogether dissociate in water. Those hydrogen and fluoride atoms which do dissociate can later become molecules (HF) in acidic conditions, particularly in our stomachs. So we say that some HF forms *de novo* when we drink a glass of tap water. This is because there is a reaction between hydrogen, fluoride and the hydrochloric acid (HCl) which is excreted by the stomach walls when we eat protein.

A scientist’s description of HF should give us a clue as to the inadvisability of swallowing artificially fluoridated water:

“Both HCl and HF are ionic compounds, which implies that they would both disassociate completely in an ionic solvent like water. HCl does indeed do this, and is therefore classified as a strong acid. HF does not and is classified as a weak acid. The fluoride ion is SO electronegative that not even the powerful ionic effect of water can completely pull it apart from its hydrogen atom. A certain percentage of the HF molecules will not disassociate.

Interestingly, even though HCl is a stronger acid than HF, HF is by far the more dangerous of the two. The danger comes from the fluoride ion. Because of its electro-negativity, it will react with just about anything it can get its electrons on. For this reason, it is always stored in chemically resistant plastic. It eats through glass. It has a special affinity for calcium ions, and this is the real danger of working with it. If you are unfortunate enough to get some on your skin, the fluoride ion will soak in quickly and start stripping away electrons from anything that it can find, especially calcium ions. It can't be washed off with soap and water, only neutralized with special calcium gluconate gel prepared just for that purpose. I always have some on hand when working with the stuff. A severe enough exposure can literally remove all of the calcium ions from your blood at the point of exposure, causing a heart attack.”

(Source: [Joel Ruggaber](https://www.quora.com/What-are-the-main-differences-between-hydrofluoric-and-hydrochloric-acid), MSc. Chemistry, Illinois State University, sourced from <https://www.quora.com/What-are-the-main-differences-between-hydrofluoric-and-hydrochloric-acid> )

**British Standard BSEN 12175:2013 (p.7)** tells us that hexa(hydro)fluorosilicic acid contains up to **1.5%** Hydrofluoric acid (HF). The British Standard also recommends adding up to 6.3 mg of hexafluorosilicic acid in order to add 1 mg fluoride/litre to drinking water. Remember that the acid is a 20% solution so adding 5 mg would normally suffice if the acid had the same density as water. But the acid is denser than water so **6.3 mg** is stipulated to compensate for this property.

**Therefore, 1.5% of 6.3 mg = 0.0945 mg HF/litre water maximum.**

So, what happens in our stomachs when we swallow a small amount of HF and/or when HF is created *de novo*. **The amount of 0.0945 mg HF/litre water is NOT enough to kill or to disable us even though it is corrosive, and even more so at higher concentrations.**

However, having drunk a glass of artificially fluoridated water and having eaten protein, there are some undesirable elements in the stomach all vying to become molecules and if the captured elements are contained within the cells of the stomach lining, then they too will be caught up in the “chemical frenzy”.

Extract from a World Health Organisation advisory published in 2010:

**PREVENTING DISEASE THROUGH HEALTHY ENVIRONMENTS  
INADEQUATE OR EXCESS FLUORIDE: A MAJOR PUBLIC HEALTH CONCERN**

**Adverse effects of excess fluoride**

The toxic effects of high **fluoride** intake are due to the fact that it is a **direct cellular poison**, which binds calcium and interferes with the activity of proteolytic and glycolytic enzymes.

Ingested fluoride reacts with gastric [hydrochloric] acid to produce hydrofluoric acid in the stomach.

Thus, **acute** exposure to high concentrations of fluoride results in immediate effects: abdominal pain, excessive saliva, nausea and vomiting. Seizures and muscle spasms may also occur. Death due to respiratory paralysis is a possibility.

The acute effects of inhalation of hydrogen fluoride are severe irritation of the respiratory tract, with coughing, choking and pulmonary oedema. Severe burns or prolonged visual defects may result from skin or eye contact. Inhalation or dermal exposure can be fatal.

Source: <https://www.who.int/ipcs/features/fluoride.pdf>

Note that, in the past, WHO has strongly supported WF. These days it is a little less enthusiastic.

**8.4** The following is an extract from a letter written in 1978 by Dr Hans Moolenburgh who was a GP in Haarlem (Holland) at the time that Holland's government fluoridated part of the country.

"Being familiar with the work of George Waldbott MD in the USA, I looked out for side effects and indeed these side effects were there, contrary to what the local health authorities had said. The very first complaints were dull to rather severe, sometimes colicky pains in the tummy. In all cases the patients either had not registered that their water supplies has been fluoridated, or did not believe that water could be the cause when I told them so. '[Auto]Suggestion' was out of the question. The cure was simple: no fluoridated water and in one day the complaints had subsided. But they immediately returned when the patients drank fluoridated water again, sometimes unknowingly.... Other complaints were sores in the mouth, these small very painful white lesions. Tablets against them were sold by the pound in Amsterdam as soon as fluoridation started. A third complaint was this: old allergies flared up. I had for instance several children in my practice whose allergic skin rash or allergic asthma was under control. As soon as they started to drink the water, complaints that had not been visible for over a year returned with a vengeance. Less

frequent were headaches, excessive thirst (fancy what happened then: they drank the water in excess that poisoned them), burning sensations when passing urine and troubles in mental concentration.

When fluoridation lasted longer, other complaints became more conspicuous. They were arthritis-like pains, especially in the lower spine. One woman became more or less crippled and as non fluoridated water was hard to come by she had to move house to a non fluoridated area some ten miles away to the south and was healed in a month.”

Dr Moolenburgh tells us that it wasn't difficult to diagnose fluoride poisoning because half his practice took patients from a non-fluoridated part of Haarlem and the other half from a fluoridated part of Amsterdam. Thus it was relatively easy to identify the patients with unusual symptoms as coming from the fluoridated area.

Letter by Dr Hans Moolenburgh to N. Brugge, Secretary of the NPWA, 13<sup>th</sup> February 1978

**8.5** Excess fluoride would be regarded as being more than 1.5 mg fluoride/litre of water which is the global allowable maximum. However, even at smaller concentrations, as occurred in Holland in the 1970s, the attack by HF on the stomach lining would still take place but not be life-threatening. The **Precautionary Principle** needs to be observed because the Margin of Safety is totally inadequate in respect of fluoride and its compounds.

The MoS ought to be at least 10 times less than the maximum allowable in order to protect every member of society. Thus, the Maximum allowable for fluoride is 1.5mg/litre while the MoS ought to be 0.15mg/litre water. The target concentration is 1mg/litre water which is way too high.

**8.6** If the fluoride gauges in the Water Treatment Works break down, there is a very real likelihood of overdosing as happened at the Dimmingsdale Water Treatment Works near Bridgnorth in June 2008 when double the amount of fluoride - 2mg - was added per litre. That meant that a maximum of  $2 \times 0.0945\text{mg}$  HF was added = 0.189 mg/litre. That's 18 times more than allowable for arsenic (a carcinogen) and lead (a developmental neurotoxin) at 0.01 mg/litre!

**Even though HF is a reportable poison (Deregulation Act, Schedule 21, part 4), there is no maximum allowable standard because HF is not found in raw water prior to water treatment and, as a reportable poison, it cannot be deliberately added to drinking water (even though it is!). When testing for compliance with standards, it is debatable if it can be aggregated with fluoride at the kitchen tap (the point of compliance) and subjected to the 1.5mg maximum allowable/litre of water because HF is not a chemical parameter while fluoride is.**

Accidents can happen, as occurred at Dimmingsdale, and we have to hope that equipment and technicians will get it right all the time. Meanwhile in the affected houses in Bridgnorth and Wolverhampton, infants were fed with baby formula made up with water containing excessive levels of fluoride and HF for one month. **Fluoride crosses the b-b-b and affects a child's intelligence.** HF at the concentration of (up to) 0.189 mg HF/litre would have caused colic-like symptoms. In the UK, GPs are not trained to detect fluoride poisoning.

**The Margin of Safety is totally inadequate in respect of fluoride and its compounds.**

**Even at so-called "optimum levels" (1mg/l) there is still 9 times more HF than the allowable maximum for arsenic and for lead and, with an upper limit of 1.5mg/l, 14 times more.**

**8.7 But it's only 1mg per litre! That's one-millionth of a litre/kilo.**

**Surely fluoride can't be that bad?**

**1 mg is NOT the same as 1 atom.**

It's worth repeating: if I managed to isolate 1 mg of fluoride and counted its atoms, even I would be incredulous at how many reactive atoms are present. That's the problem with dealing with things that are so small. We become disbelieving that such a small quantity as 1 mg could contain millions of atoms. Atoms cannot be seen with the naked eye and indeed, we can only calculate theoretically how many atoms of fluoride there are in 1mg.

**There are millions of atoms in 1mg of fluoride.**

**Each atom is capable of disrupting a single process in the body.**

**8.8 What else is added to drinking water when it is fluoridated?**

**British Standard 12175:2013** tells us on page 8 that the following "chemical parameters" as listed in Column 1 in the table below, are added when hexafluorosilicic acid is used. Columns 2 and 3 show the concentration of these chemical parameters in the 20% acid and the amount found in 1 litre of fluoridated water. Columns 4 and 5 show the maximum allowable per litre of water and the contribution made by that substance in percentage terms.

Chemical Parameter	Maximum allowable in the fluoridating acid	Maximum amount added to each litre of fluoridated water	PCV* (Max. allowable per litre of water)	% of PCV contributed by the fluoridating acid
Antimony	80 mg/kilo of the fluoridating acid	0.000504 mg	0.005 mg	11%
<b>Arsenic</b>	400 mg/kilo of the fluoridating acid	0.00252 mg	0.010 mg	<b>25%</b>
Cadmium	40 mg/kilo of the fluoridating acid	0.000252 mg	0.005 mg	5%
Chromium	400 mg/kilo of the fluoridating acid	0.00252 mg	0.05 mg	5%
<b>Lead</b>	400 mg/kilo of the fluoridating acid	0.00252 mg	0.010 mg	<b>25%</b>
Mercury	10 mg/kilo of the fluoridating acid	0.000063 mg	0.001 mg	6%
Nickel	400 mg/kilo of the fluoridating acid	0.00252 mg	0.02 mg	12.6%
Selenium	80 mg/kilo of the fluoridating acid	0.000504 mg	0.010 mg	5%

\* PCV = The [Prescribed Concentration or Value \(PCV\)](#) limits are legal thresholds for acceptable levels of contamination in Drinking Waters.

None, with the exception of Selenium, should be anywhere near Water Treatment Works. Although added in very small concentrations and although very much diluted, it's counter-intuitive to add heavy metals and cancer-causing substances to drinking water. In particular, **water companies have no business adding arsenic to drinking water**, especially since the ALARP principle as recommended by the UK Government's Committee on Toxicity should be observed in respect of that particular cancer-causing element. (ALARP = As Low as is Reasonably Practicable.) (Ref: [https://cot.food.gov.uk/sites/default/files/tox2016-05\\_0.pdf](https://cot.food.gov.uk/sites/default/files/tox2016-05_0.pdf), para 10). Since Arsenic causes bladder cancer and since the presence of Trihalomethanes in drinking water is responsible for bladder cancer, the two carcinogenic agents probably act in synergy to cause higher levels of bladder cancer in fluoridated areas. (Ref. Iro Evlampidou, *et al* (2020). Trihalomethanes in Drinking Water and Bladder Cancer Burden in the European Union. **Research Vol. 128, No. 1**, Open Access)

The British Standard stipulates the maximum allowable for each "chemical parameter" in hydrofluorosilicic acid - the fluoridating acid – but it does not develop the theme in order to tell us the percentage of the PCV which is actually added. Moreover, down the years, the factor of 6.3mg maximum of the fluoridating acid added to each litre of water has gone unnoticed by those promoting Water Fluoridation.

**8.9** Toxicologists tell us that there is a synergistic effect when two or more harmful chemicals in the fluoridating acid act in combination on our tissues. It has been observed

that the negative health effects of thousands of chemicals are more than just additive. (i.e.  $2 + 2 = 4 =$  additive whilst  $2 + 2 = 6 =$  enhanced negative effects.)

Even though water treatment may not be able to remove all the arsenic and lead from the raw water, there is no excuse whatsoever to ADD these injurious elements for the sake of trying to prevent dental decay in small disadvantaged children.

The Government Green Paper this Autumn is all about prevention of ill health. In which way can adding arsenic and lead to drinking water be construed as being in tune with this aspiration?

Although we find that up to 25% of the allowable concentration of arsenic and lead are added to drinking water, the adulterated water is drunk every day for a lifetime and arsenic and lead are bioaccumulative. People who drink lots of fluoridated tap water may be consuming 0.010 mg arsenic and 0.010 mg lead each day.

There could never be any justification for **adding** arsenic to drinking water. Since it is a carcinogen, any amount of arsenic is too much!

**The arsenic in 1 litre of fluoridated drinking water is up to 25% of the PCV for Arsenic. Anyone drinking 4 litres per day of artificially fluoridated water would be consuming up to an amount of Arsenic equivalent to the PCV for that carcinogen.**

### 8.10 Other observations

HM Government has approved the purchase of a cheap industrial hazardous waste in order to add fluoride to drinking water. The waste has never been clinically tested and it has no medicine marketing authorisation, even though it is clearly intended to prevent a human disease. Fluoridated water has been described by the MHRA as being a Borderline Medicine but when the MHRA decided not to insist on there being a medicine marketing authorisation, fluoridated water was consigned to a regulatory no-man's land.

Hexafluorosilicic acid is purchased by water companies from Industrial Chemical Group Limited (ICGL) which is headquartered in Grays, Essex. The acid is delivered to the UK by Israel Chemicals Limited. We do not know the country of its origin. It is shipped into a Thames Dockyard in tanks where it is offloaded and is distributed by road and rail, still in the same tanks, throughout England to fluoridating water companies' water treatment works.

Road tankers bear a Hazardous Chemicals badge. When there are spills, extreme caution is needed to prevent corrosive burns and inhalation. Even at 20%, the liquid is a fuming

noxious mixture of chemicals. "Fuming" implies that poisonous hydrogen fluoride gas (HF) is released into the atmosphere. This is the same gas which is produced from volcanoes.

### **8.11 Summary**

1 mg Fluoride contains millions of atoms and each atom is negatively charged and highly reactive. When fluoride is added to drinking water it is added as 6.3mg/litre of the fluoridating acid. The acid contains injurious elements. Of concern are fluoride, arsenic, lead and hydrofluoric acid. It is counter-intuitive to add a carcinogen (arsenic), a developmental neurotoxin (lead) and presumed developmental neurotoxins (fluoride and hydrofluoric acid) to drinking water just so small disadvantaged children might have their teeth protected from dental decay in the absence of parental supervision to ensure that they clean their teeth.

**To add up to 25% of the PCV for Arsenic and up to 25% of the PCV for Lead to drinking water is a bridge too far.**

## **Chapter 9 Water Fluoridation Does NOT Reduce Dental Health Inequalities Across Social Groups**

It is a worthy aspiration to reduce dental health inequalities. It is not a worthy aspiration to have faith in something which cannot “deliver the goods”.

The ‘hope’ that fluoridated water can reduce dental health inequalities has transmogrified into a ‘certainty’ without there being any sound research to justify the transition. In short, the efficacy of WF is a myth.

Since the beginning of the 21<sup>st</sup> Century there have been two Reviews in the UK which have looked at dental health inequalities. Neither have found any convincing proof that swallowing fluoride reduces dental health inequalities across social groups.

Alan Johnson MP, who was Secretary of State for Health between 2007 and 2009, was in that job when it was proposed by South Central Strategic Health Authority and the local PCT that Southampton needed to become fluoridated because of the high level of dental decay in the City. He was instrumental in allocating £14 million to be used for new fluoridation programmes, no doubt believing that there would be no insurmountable obstacles to the Southampton proposal. The money was never spent on Southampton because the opposition to WF was particularly strong and because by the time Southern Water was ready to sign the contract, the SHA had disappeared, to be replaced by Public Health England. Much of the earmarked finance was used by Severn Trent Water to replace some of its out-dated fluoridation equipment.

Undeterred, from 2015 onwards, we next see Alan Johnson, MP for Hull, pushing for Hull City to become fluoridated. In this he was aided by Councillor Colin Inglis, Chair of Hull’s Health and Well-Being Board. It was at this time that Alan Johnson was heard to utter on more than one occasion that “Water Fluoridation gives poor kids rich kids’ teeth”. These utterances coincided with the 2<sup>nd</sup> Review (Cochrane Collaboration, 2015) which found no proof of this aspiration.

So, to put the record straight and to prevent PHE repeatedly proclaiming the forlorn hope that swallowing fluoride reduces dental health inequalities, we have appended below the evidence that PHE is so unwilling to acknowledge.

We start with the conclusions of the York Review (2000) relating to inequalities and this is followed by letters written by the Principals of The York Review. The York Review was a Systematic Review commissioned by HM Government in response to a very large petition against Water Fluoridation which had been inspired by the National Pure Water Association in 1999.

## WHAT THE YORK REVIEW REALLY FOUND

**The York Review (2000) – Extracts of Conclusions relating to dental health inequalities.** Ref:: <http://www.york.ac.uk/media/crd/crdreport18.pdf>

### **Objective 3**

No level A or B studies examining the effect of water fluoridation on the inequalities of dental health between social classes were identified. However, because of the importance of this objective, level C studies conducted in England were included. A total of 15 studies investigating the association of water fluoridation, dental caries and social class in England were identified. The quality of the evidence of the studies was low, and the measures of social class that were used varied. Variance data were not reported in most of these studies, so a statistical analysis was not undertaken.

There appears to be some evidence that water fluoridation reduces the inequalities in dental health across social classes in 5 and 12 year-olds, using the dmft/DMFT measure. This effect was not seen in the proportion of caries-free children among 5 year-olds. The data for the effects in children of other ages did not show an effect. The small quantity of studies, differences between these studies, and their low quality rating, suggest *caution* in interpreting these results.

p. xii – xiii, McDonagh *et al* (2000).

### **Conclusions**

This review presents a summary of the best available and most reliable evidence on the safety and efficacy of water fluoridation.

Given the level of interest surrounding the issue of public water fluoridation, it is surprising to find that little high quality research has been undertaken. As such, this review should provide both researchers and commissioners of research with an overview of the methodological limitations of previous research conducted in this area.

The evidence of a benefit of a reduction in caries should be considered together with the increased prevalence of dental fluorosis. The research evidence is of insufficient quality to allow confident statements about other potential harms or whether there is an impact on social inequalities. This evidence on benefits and harms needs to be considered along with the ethical, environmental, ecological, costs and legal issues that surround any decisions about water fluoridation. All of these issues fell outside the scope of this review.

Any future research into the safety and efficacy of water fluoridation should be carried out with appropriate methodology to improve the quality of the existing evidence base.

p. xiv, McDonagh *et al*, (2000).

The small quantity of studies, differences between these studies, and their low quality rating, suggest *caution* in interpreting these results. There appears to be some evidence that water fluoridation reduces the inequalities in dental health across social classes in five and 12 year-olds, using the dmft/DMFT measure. This effect was not seen in the proportion of caries-free children among five year-olds. There were not sufficient data for the effects in children of other ages to be investigated fully.

p. 33, McDonagh *et al*, (2000)

Ref: McDonagh *et al* (2000). *A Systematic Review of Water Fluoridation*. NHS Centre for Reviews and Dissemination, University of York, ISBN 1 900640 16 3 .

**Next, we have three letters and the final section of a BMJ article.**

**DEPARTMENT OF HEALTH STUDIES**

Innovation Centre  
York Science Park  
University Road  
York YO10 5DG  
**Sheldon**

**3/1/2001**

**Professor Trevor A.**

**Head of Department**  
Tel: (01904) 435142

In my capacity of chair of the Advisory Group for the systematic review on the effects of water fluoridation recently conducted by the NHS Centre for Reviews and Dissemination the University of York and as its founding director, I am concerned that the results of the review have been widely misrepresented. The review was exceptional in this field in that it was conducted by an independent group to the highest international scientific standards and a summary has been published in the British Medical Journal. It is particularly worrying then that statements which mislead the public about the review's findings have been made in press releases and briefings by the British Dental Association, the British Medical Association, the National Alliance for Equity in Dental Health and the British Fluoridation Society. I should like to correct some of these errors.

- 1 Whilst there is evidence that water fluoridation is effective at reducing caries, the quality of the studies was generally moderate and the size of the estimated benefit, only of the order of 15%, is far from "massive".
- 2 The review found water fluoridation to be significantly associated with high levels of dental fluorosis which was not characterised as "just a cosmetic issue".
- 3 The review did not show water fluoridation to be safe. The quality of the research was too poor to establish with confidence whether or not there are potentially important adverse effects in addition to the high levels of fluorosis. The report recommended that more research was needed.
- 4 There was little evidence to show that water fluoridation has reduced social inequalities in dental health.
- 5 The review could come to no conclusion as to the cost-effectiveness of water fluoridation or whether there are different effects between natural or artificial fluoridation.
- 6 Probably because of the rigour with which this review was conducted, these findings are more cautious and less conclusive than in most previous reviews.
- 7 The review team was surprised that in spite of the large number of studies carried out over several decades there is a dearth of reliable evidence with which to inform policy. Until high quality studies are undertaken providing more definite evidence, there will continue to be legitimate scientific controversy over the likely effects and costs of water fluoridation.

(Signed) T.A. Sheldon,  
Professor Trevor Sheldon, MSc, MSc, DSc, FMedSci.

-----

Dear Minister,

We are scientists involved in the systematic review of evidence on the effects of water fluoridation, carried out by the NHS Centre for Reviews and Dissemination at the University of York. As far as we are aware, no other review of this topic is of comparable scientific standard, and we are concerned about some continuing misinterpretations of the evidence which could have implications for public policy. It is not for us to say whether the standard of evidence should be judged sufficient for a public health measure affecting whole populations, but we think it is important that decision makers are aware of what the review really found:

- Effectiveness of fluoridation in reducing caries  
We could discover no reliable, good-quality evidence in the fluoridation literature world-wide. What we found suggested that fluoridation was likely to have a beneficial effect, but in fact the range could be anywhere from a substantial benefit to a slight disbenefit to children's teeth.
- Effectiveness of fluoridation in reducing inequalities in dental health across social groups  
This evidence is weak, contradictory and unreliable.
- Safety of fluoridation  
Apart from an increase in dental fluorosis (mottled teeth) we found no clear pattern among the possible negative effects we examined, and we felt that not enough was known because the quality of the evidence is poor.

We append relevant extracts from the report of the review from which the conclusions under 1. and 2. can be substantiated. 3. covers too broad an area to summarise easily.

Since the report was published in September 2000 there has been no other scientifically defensible review that would alter the findings of the York review. As emphasised in the report, only high-quality studies can fill in the gaps in knowledge about these and other aspects of fluoridation. Recourse to other evidence of a similar or lower level than that included in the York Review, no matter how copious, cannot do this.

We think these matters are important enough to bring directly to your attention, as well as to the notice of others who have a stake in public health policy.

Yours sincerely,

(SIGNED) *Professor Jos Kleijnen*  
*Director, NHS Centre for Reviews and Dissemination*

(SIGNED) *Sir Iain Chalmers*  
*UK Cochrane Centre*

(SIGNED) *Professor Trevor Sheldon*

*Head of Department  
Department of Health Sciences, University of York*

*(SIGNED) Professor George Davey-Smith  
Department of Social Medicine  
University of Bristol*

[Source: [http://www.appgaf.org.uk/archive/archive\\_letter\\_york/](http://www.appgaf.org.uk/archive/archive_letter_york/) ]  
[appgaf is the All Party Parliamentary Group Against Fluoridation]

-----

## **What the 'York Review' on the fluoridation of drinking water really found**

Originally released : **28 October 2003**

A statement from the Centre for Reviews and Dissemination (CRD).

In 1999, the Department of Health commissioned CRD to conduct a systematic review into the efficacy and safety of the fluoridation of drinking water.

The review specifically looked at the effects on dental caries/decay, social inequalities and any harmful effects. The review was published on the CRD Fluoridation Review website and in the BMJ in October 2000.

We are concerned about the continuing misinterpretations of the evidence and think it is important that decision makers are aware of what the review really found. As such, we urge interested parties to read the review conclusions in full.

We were unable to discover any reliable good-quality evidence in the fluoridation literature world-wide. What evidence we found suggested that water fluoridation was likely to have a beneficial effect, but that the range could be anywhere from a substantial benefit to a slight disbenefit to children's teeth. This beneficial effect comes at the expense of an increase in the prevalence of fluorosis (mottled teeth). The quality of this evidence was poor.

An association with water fluoride and other adverse effects such as cancer, bone fracture and Down's syndrome was not found. However, we felt that not enough was known because the quality of the evidence was poor.

The evidence about reducing inequalities in dental health was of poor quality, contradictory and unreliable.

Since the report was published in October 2000 there has been no other scientifically defensible review that would alter the findings of the York review.

As emphasised in the report, only high-quality studies can fill in the gaps in knowledge about these and other aspects of fluoridation. Recourse to other evidence of a similar or lower level than that included in the York Review, no matter how copious, cannot do this.

The full report is available via the CRD website. <http://www.york.ac.uk/media/crd/crdreport18.pdf>

Source: <https://www.york.ac.uk/media/crd/Fluoridation%20Statement.pdf>

-----

In **2007**, three of the York Review Principals wrote a short **article** for the BMJ. Just the final section is reproduced below. The full report is in the public domain and can be accessed via <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2001050/>

Public and professional bodies need to balance benefits and risks, individual rights, and social values in an even handed manner. Those opposing fluoridation often claim that it does not reduce caries and they also overstate the evidence on harm.<sup>21</sup> On the other hand, the Department of Health's objectivity is questionable—it funded the British Fluoridation Society and, along with many other supporters of fluoridation, it used the York Review's findings<sup>9</sup> selectively to give an overoptimistic assessment of the evidence in favour of fluoridation.<sup>22</sup> In response to MRC recommendations,<sup>13</sup> the department commissioned research on the bioavailability of fluoride from naturally and artificially fluoridated drinking water. The study had only 20 participants and was too small to give reliable results. Despite this and the caveats in the report's conclusion,<sup>23</sup> this report formed the basis of a series of claims by government for the safety of fluoridation.<sup>24</sup>

Against this backdrop of one sided handling of the evidence, the public distrust in the information it receives is understandable. We hope this article helps provide professionals and the public with a framework for engaging constructively in public consultations.

Ref: K K Cheng, K.K., I. Chalmers and T. A. Sheldon (2007). “Adding fluoride to water supplies.” *BMJ* 2007; 335:699 (Published 04 October 2007).

-----

Finally, in 2015, a systematic review by a well-respected global research organisation:

**Cochrane Collaboration (2015). *Water Fluoridation to Prevent Tooth Decay.***

**“We found insufficient information to determine whether fluoridation reduces differences in tooth decay levels between children from poorer and more affluent backgrounds.”**

Ref: Ihezor-Ejiofor Z, Worthington HV, Walsh T, O'Malley L, Clarkson JE, Macey R, Alam R, Tugwell P, Welch V, Glenny A (18<sup>th</sup> June 2015). *Water Fluoridation to Prevent Tooth Decay.* Primary Review Group, Oral Health Group, **Cochrane Collaboration**  
[http://www.cochrane.org/CD010856/ORAL\\_water-fluoridation-prevent-tooth-decay](http://www.cochrane.org/CD010856/ORAL_water-fluoridation-prevent-tooth-decay)

The York Review was not commissioned to review all aspects of this controversial dental health intervention and even though the team did a thorough job, their conclusions were

artificially constrained by the limited remit. In the years following the York Review and the Cochrane Collaboration Review, more research has been published relating to the harm caused by swallowed fluoride. The time has come for a more open-handed Governmental review and for high quality research into the harms caused by swallowing this poison.

But why settle for more research? It's obvious that the WF programme has been damaging the prospects of millions of English children throughout the decades from 1964 to the present time and if it continues, more children will be classified as being special needs, ADHD or educationally sub-normal. Can Local Authority education departments cope with the extra call on their finances to set up more special units for the education of these children, some of whom have been cleaning their teeth?

## Chapter 10      **A Pharmacist's View of why WF is an Unacceptable Public Health Measure**

by Paul Clein, B. Pharm., M.R. Pharm. S., G.Ph.C. (no. 201691).

Paul Clein has been a practising pharmacist for over 45 years, an elected member of Liverpool City Council for 19 years and Cabinet Member for Education / Children's Services 1998-2008. He also served as one of the six core members of the Mayor of Liverpool's Education Commission, chaired by Baroness Estelle Morris, which operated between 2012 and 2014."

- 1 There have been NO long-term safety studies of the administration of this particular substance to humans**
- 2 The World Health Organisation states that **public health officials considering water fluoridation schemes should determine the pre-existing background fluoride exposure levels in their population.** That doesn't just mean the amount already naturally occurring in the water, it also means that derived from other sources. Apart from toothpastes and mouthwashes, it's in a number of foods, **tea** and certain Brassicas, for example. **What studies have been done for that in Durham County?**
- 3 **Is it compulsory medication?** One succinct dictionary definition of a medicine is that – in layman's terms - it is "a substance usually administered by mouth to treat a disease." Administering a dose of the uncontaminated form of certain silicofluorides to another person in, say, a cup of tea would rightly be an offence under both the Deregulation Act 2015 and s.24 of the Offences against the Persons Act 1861. Putting a silicofluoride in the public water supply as impure industrial waste is however allowable - applauded even – by Public Health England. The nonsensical legal fiction employed in this Alice in Wonderland situation is that dosing the entire population with this pesticide is NOT medication, although – remember our definition - it is administered in water (which is taken by mouth) to prevent dental caries (a disease). Miles north of Durham County in Scotland it was deemed to be medication after a long legal case in 1983. (Two other Judges in New Zealand in 2018 and in Canada in 1952 have also ruled that fluoridated water is a medicine.)
4. It is claimed by some that the silicofluoride is administered to counter or prevent a deficiency. Tooth decay is NOT caused by a "deficiency" of fluoride because there is no such thing. Tooth decay is usually caused by a number of factors, such as bad diet lacking in essential minerals and vitamins but with a surfeit of sugar, and poor dental hygiene. Have a look at the ingredients of any of the proprietary multivitamin and mineral products on the shelf of your local pharmacy or health shop. **If we are all**

**supposed to be so deficient in fluoride, one would think it logical to expect to see it included in products like this. It isn't there.**

It isn't there for one very good reason – it isn't essential **in any way whatsoever** for human health. Ask those in favour of this strategy – what is the essential metabolic function which fluoride mediates in the human body? I'll tell you: there isn't one.

5. This all illustrates that Fluoridation **is** undoubtedly **compulsory mass medication**. It represents the removal of freedom of choice from the consumer, **contravening the terms of the Nuremburg Convention and all subsequent medical ethics, Codes and Conventions**. Fluoride has no effect whatsoever on gum disease by the way, which is responsible for about 50% of adult tooth loss.
- 6 Every other substance administered to humans in the UK for medicinal purposes has to meet the stringent safety and purity standards of the Medicines and Healthcare Regulatory Agency - except this one. Why is that? It is irrelevant whether medication is given to treat tooth decay or to confer eternal life - it should meet the same licensing standards as every other medicinal substance.
- 7 Using unregistered substances for medicinal purposes is illegal under the Codified Pharmaceuticals Directive 2001/83/EC, updated and amended by the subsequent Directive 2004/27/EC, which has applied in the UK since October 2006. The **intent** to medicate renders any substance presented as having a beneficial effect on a medical condition as a medicinal substance under Article 1 of this Directive. All medicinal substances must be registered as such and subjected to full clinical testing for safety. Via Article 35 of the European Charter of Fundamental Rights, the right of the individual to health care also includes the **right** to refuse health care **for whatever reason**. It establishes the **rights** of the individual to prevent them having medical treatment against their wishes (6). This is also not just about mere civil liberties. It is about our Human Rights and those are not optional and not negotiable – they are absolute. The Lisbon Treaty established the European Charter of Fundamental Rights in UK law. After leaving the EU in the near future, the UK will still abide by most of these EU regulations.
- 8 It is incontestable that fluorides and silicofluorides **are** cumulative poisons. The agent used has also reportedly been found to raise lead levels in drinking water (7). This is one of a number of similar reports. Most major counties like Durham and its old mining towns still have a largely Victorian water system and therefore probably still have a number of lead water mains and water pipes. A number of places in the USA where fluoridation has been discontinued reported a subsequent reduction in lead levels in their drinking water.
9. There have been numerous allegations made against fluorides on safety grounds. I would recommend each member of the scrutiny committee to read "*Fluoride – Drinking Ourselves To Death?*" by Dr. Barry Groves, which is a comprehensive, fully referenced examination of every aspect of fluoridation including the safety aspects and which is

available from Durham County public libraries. One issue which has arisen since that book's publication is in regard to new evidence about the incidence of Osteosarcoma, a rare bone cancer in boys growing up in fluoridated areas. This is backed up other published research from the 1990s.

Only 50% of fluoride taken into the body is excreted. The rest is stored in the body, mostly in bone. There is a certain logic then in anticipating that any negative effects might well occur in bone - as osteosarcoma does. This is peer-reviewed research and formed the basis of a PhD from Harvard University for Elise Bassin. The DoH doesn't currently keep statistical track of the incidence of osteosarcoma in the UK, by the way.

How anyone can say that they are certain fluoridation is risk free after reading Bassin's thesis and Dr. Groves' book is beyond me.

- 10 If it is so safe, why did the American Dental Association issue advice in November 2006 that baby formula milk should not be made up with fluoridated water for children under 6 months of age? I would ask three questions amongst the many which must be addressed.

Firstly, bearing in mind that we are asked to fluoridate to help vulnerable groups of children, those advocating this must say, firstly, what they would do to provide unmedicated water to those people in our community who are allergic to fluorides at any level of exposure. One study estimated that cohort as being between 6 and 7% of people.

Secondly, the British National Formulary has a whole section about prescribing for patients with some degree of kidney impairment. There are a lot of those, especially amongst the elderly and they **cannot** metabolise fluoride as effectively as others. What will be done to assist those people especially if exposed to fluoridated water for long periods of time. The threshold between the proposed concentration and the level at which toxic effects are inevitable is so narrow? (1mg and 1.5mg) It is also reasonable to ask fluoridationists if they are so intent on helping vulnerable groups, why are they creating other different vulnerable groups in doing so and pretending there could never be any such problem?

Thirdly, in view of the clear advice of the American Dental Association, what provision of unfluoridated water will be made to families with bottle-fed children who are less than 6 months old?

- 11 In May 1999, Health Secretary Frank Dobson ordered a "once and for all" comprehensive review of water fluoridation from York University CRD. This would, we were told, be incontestable "by anyone who was at all interested in evidence"(9). However, following that announcement, the terms of reference of this "once and for

all” comprehensive review were gradually narrowed more and more so that any animal studies and any research papers showing the effects of fluoride not directly sourced from fluoridation schemes were excluded from the Review. Despite these limitations, the York Review (10) was properly carried out, yet its findings have been deliberately and repeatedly misquoted and used out of context over several years by Pro-fluoridationists. (11, 12, 13). I have cited three different documents from 2000, 2002 and 2003 to demonstrate how, despite the repeated protestations of the York Review scientists, their findings were and are still being misrepresented. (See Chapter 9) The literature was trawled worldwide and objectively assessed. Although the bar was set very low for the scientific quality of studies looked at, only 214 made it into the final Review.

The York Review commissioned by the Government was published in October 2000. The salient points were:

- \* The consistently claimed **50%+** reduction in caries turned out to be less than **15%** - an average **14.6%. It's not a lot, is it?**
- \* The overall evidence base for fluoridation was deemed "surprisingly weak" and "of poor quality". The latest comparable review carried out in Australia 2 years ago also didn't find any studies deemed being of more than "limited" quality yet still concluded that WF was "safe and effective"!!!
- \* No evidence was found of the claimed "lifelong benefits".
- \* Very little evidence emerged of any reduction in health inequalities - the *raison d'etre* of this policy - and what evidence there is was judged "**weak, contradictory and unreliable**". (See Chapter 9)
- \* The common claim of "**hundreds of studies**" showing the safety and efficacy of water fluoridation is shown to be based on 37 out of the 214 admitted into the Review – that is 214 studies in total that were deemed to have reached even moderate scientific standards; **no studies whatsoever in the Review were deemed of good scientific quality.**
- \* Long term safety could **NOT** be guaranteed
- \* No **clear** evidence of any of the alleged ill effects was found.....except that 48% of people in fluoridated areas suffer from dental fluorosis, the first visible sign of fluoride intoxication, i.e. fluoride poisoning. In a response in 1999 by Government Health Minister in the House of Lords, Baroness Hayman, she conceded that dental fluorosis is "a manifestation of systemic toxicity", (14) i.e. it's a sign you are being poisoned. This is not a mere cosmetic effect as claimed by dentists and fluoridationists. In a quarter of that 48%, this fluorosis would cause "concern". Thus

1 in 8 will get brown or pitted teeth which can only be disguised by application of veneers every 4-5 years. This treatment is only available privately and costs between £200-£500 per tooth. It can only be done a limited number of times as well.

\* There was an identified need for much more **high quality** research before any extension of fluoridation should be considered. That judgement was also endorsed by the subsequent MRC review of fluoridation which was also commissioned by the Government because, as we all know, if the “once and for all” review you’ve commissioned doesn’t come up with the result you want, then you commission another one with vaguer terms of reference to give you a more equivocal result. Where is this recommended “high quality” research? There has been none and PHE is sponsoring a practice which is not underpinned by the high quality research recommended by the York Review.

- 12 It is not enough just to say a blanket ‘no’ to something, even something as mad as fluoridation. It is necessary to propose viable, safer alternatives. Nationally, roughly **80%** of tooth decay is found in about **20%** of children, mainly living in poorer urban areas. This should tell you this problem should therefore be easily targetable and a targeted approach would be and should be the most effective way of dealing with it. This targeting could be done through Family Hubs. That is how this and other poverty-linked health issues in children were tackled successfully in Sweden, for example. Child dental health is already a high priority for every Children’s Centre in Liverpool for example which saw a 35% reduction in tooth decay in Liverpool’s 12-year-olds in the BDA 2013 survey compared with 10 years earlier.

If you work it out, I would suggest to you that about 99.9% of the “fluoride” put into our drinking water would not reach its target group. (See Chapter 1C) Such a wasteful scattergun strategy is not an efficient way to deal with this problem, especially when the Government’s latest Public Health Green Paper has as its very first stated principle that the 2020s will be an era of “targeted support” and individualized medicine!!

The British National Formulary, which is a Government publication, states that the topical effect of fluoride, i.e. using, for example, toothpastes, or mouthwashes or veneers is more effective than the systemic effect, i.e. water fluoridation. This all points up that this is a very wasteful, failed strategy.

- 13 There are other things which could be done for which there is existing evidence of efficacy to fight this problem.

For example, more NHS spending on under 18s dental care and local School Dental Services should be expanded. These services have been slashed in the past 20 years. Why? There should be a proactive drive to have all under-18s registered with a local NHS dentist and seen regularly. This is nominally already supposed to be the policy but is not promoted sufficiently. There was a successful pilot a few years ago in Greater

Manchester where free toothbrushes and toothpaste were given to primary school-aged children resulting in a 16% reduction in tooth decay. Compare that with the poor quality evidence of a 14.6% improvement using fluoridated water found by the York review. In other words, just ensuring that children adopted good dental hygiene practices in a targeted way immediately gave a better result than fluoridation, without any of the adverse toxicological, legal or ethical problems. This should become standard practice in poorer areas.

In some areas in the 1990s Health Authorities had proactive fissure sealant programmes when secondary teeth erupted. This reduced caries by **36%** - again, a far better result than from fluoridation. That practice should be expanded.

We **can** change public behaviour. We've seen it with past campaigns. How about an ongoing TV advertising health promotion campaign about the dangers to teeth of excessive sugar consumption aimed at parents and children? How about widespread provision of free dental hygienist services, especially to younger people?

It has long been known that deficiency of, for example, protein, iodide, calcium, magnesium, the Vitamin B complex and other nutrients in expectant mothers can result in health problems in their offspring, including higher vulnerability to dental caries. Providing Vitamin and food supplements during pregnancy to mothers in vulnerable groups would contribute to a long-term reduction in incidence of caries – and other conditions – and could be efficiently targeted through Children's Centres and has been done in some cities.

I am told the capital costs of each fluoridation plant would be in the region of £400,000+. How many plants would be needed for Durham County with significant ongoing annual revenue costs on top? Surely that money could be better spent on more effective, cheaper, **targeted** strategies which don't involve dosing everyone with a contaminated pesticide.

I hope I have demonstrated that there are a significant number of widely acceptable strategies which can be used to deal with this problem if the political will is there and adequate funding is provided. It is crazy that we have wasted so much time and effort fighting over this failed and illegal strategy when we should all be working together using strategies we can agree on to deal with what is a very real problem. Dosing the entire population every day for the rest of their lives with indiscriminate doses of a cumulatively toxic pesticide which is useless to nearly all of them, undoubtedly harmful to many of them, which many do not want and which is in any case illegal under several pieces of UK and EU legislation, is definitely not the way to do it.

Given that this applies to this situation, you have no choice – you should – you must reject fluoridation.

## References:

- (1) Product Data Sheet, Hexafluorosilicic Acid, Hydro Fertilizers Ltd.
- (2) Letter to Cllr. Paul Clein from Liverpool Trading Standards, Feb. 2004.
- (5) Product Data Sheet, 30 pack of Centrum tablets
- (6) Doug Cross "The Legal Status of Fluoridated Water in the European Community" May 2006.
- (7) International Journal of Environmental Studies, Autumn 1999.
- (8) "Age specific fluoride exposure in drinking water and Osteosarcoma", Elise Bassin et al, Cancer Causes Control, (2006) 17:pps. 421-428.
- (9) Guardian, May 29th 1999, p.7
- (10) "A Systematic Review of Public Water Fluoridation", York University CRD, September 2000.
- (11) Letter from Professor Trevor Sheldon of the York Review team clarifying its findings, December 2000. (see also Chapter 6)
- (12) Letter from York Review scientists to then Health Minister Hazel Blears, December 2002.
- (13) "What the York Review On Water Fluoridation Really Found", York University CRD, October 2003
- (14) Extract from proceedings of the House of Lords, April 1999, response of Baroness Hayman. (WA 158, 20/04/99).

**“We accept that Dental Fluorosis is a manifestation of systemic toxicity”<sup>(14)</sup>**

## **Overexposure**

On many occasions, fluoridation proponents have quoted the World Health Organisation as an authority for initiating WF. However, they fail to quote the following which provides an entirely different perspective:

*Guidelines for Drinking Water Quality*, 4<sup>th</sup> edition [WHO 2011, p. 371] recommends that:

---

*In setting national standards for fluoride or in evaluating the possible health consequences of exposure to fluoride, it is essential to consider the intake of water by the population of interest and the intake of fluoride from other sources (e.g. from food, air and dental preparations). Where the intakes from other sources are likely to approach, or be greater than, 6 mg/day, it would be appropriate to consider setting standards at concentrations lower than the guideline value.*

---

Since the Drinking Water Directive covers all mains water, skin absorption of fluoride from bath water must be added to the sources listed above. There are many foods and liquids which contain fluoride and lists of them are in the Public Domain. Indian tea is a very rich source of fluoride.

## **SUMMARY and CONCLUSIONS: USING PUBLIC WATER SUPPLIES FOR PUBLIC HEALTH MEASURES. AN EXAMINATION OF THE ISSUES SURROUNDING WATER FLUORIDATION.**

1. This short summary aims to present a broad synopsis of water fluoridation and the controversy surrounding it so that policy makers and individuals who are new to the subject can appreciate the arguments.

2. What is water fluoridation?

Water fluoridation is the practice of adding compounds containing fluoride to the water supply to produce a final concentration of one part per million – 1ppm – (1 milligram per litre). It is claimed to prevent the development of dental caries which is a disease that damages the structure of teeth and if left untreated, can lead to tooth decay and eventually tooth loss. The main “beneficiaries” of water fluoridation are intended to be children up to the age of 5 with older children’s newly erupted secondary teeth also “benefiting”.

3. Why does water fluoridation as a public health measure attract so much controversy?

Public health measures are intended to benefit the population as a whole and to improve general health and prevent illness. The public health problem or “disease” which water fluoridation aims to treat is dental caries (sometimes referred to as tooth decay) which:-

- is now universally low;
- is not a problem which affects entire populations;
- is neither highly infectious nor life threatening.

As a public health measure to combat a declining public health problem, water fluoridation raises another issue, namely, the use of the public water supply system for a public health measure. A significant precedent would be set in using the water supply system as a vehicle for conveying other medical treatments to individuals.

By its very nature, the water supply system precludes individual consent. It does not allow selective dwellings to be non-fluoridated in a fluoridated supply system. Entire populations would therefore be treated for the hoped-for “benefit” of a few.

4. The controversy of using the public water supply system as a vehicle for treating the population relates to:-

- Is fluoridated water an efficient and cost-effective way of delivering fluoride?
- Are there better alternatives?
- Is it ethical? Should the treatment of entire populations to prevent tooth decay in children, take precedence over an individual’s right to decide what treatments – and what risks – he or she will accept?

· Is fluoridated water a medicine and is its addition to the water supply compatible with UK Primary law?

· What degree of risk is acceptable in exchange for expected benefits? Does water fluoridation reduce dental health inequalities?

· Just what is being added to our water supply?

5. In these times of demanding monetary budgets, it is important that we get the best value for money in the oral health treatment of young children. The idea is to get a small, pea-sized amount of fluoride to the surface of children's teeth. Fluoride toothpaste and tooth brushes do this quite efficiently and effectively. The problem with fluoridated water is that most of it misses its intended target (young children). Only a very small amount of the treated water is drunk, and very little of this by small children. It is estimated that 98 – 99% of the treated water is wasted and doesn't get anywhere near children's teeth. **When the cost of this treated water is divided by the number of children who would get any benefit from it, the cost per child is very high and greater than alternative targeted oral health interventions.** The Return on Investment model used by Public Health England uses whole population figures to reduce the cost per head in order to justify WF. It reaches a flawed conclusion.

6. Water fluoridation is an archaic practice started in the USA over 70 years ago. It has been superseded by more modern, targeted and more effective oral health treatments as recommended by NICE. The widespread use of fluoride toothpaste is the main attributable reason for the worldwide reduction in tooth decay. Targeted tooth-brushing schemes, together with improvements in oral health education, better diet and reducing sugar consumption are showing many benefits throughout the country. It is much better to educate and change behaviours in young children which would stay with them for a lifetime and be passed on to future generations.

7. Individual rights and medical ethics are, to residents of an area, the all-important issues surrounding water fluoridation. However, other issues revolving around the legality and scientific evidence of benefits and harms are of equal importance

As stated in the British Standard 12175:2013, p. 19, adding fluoride to the water supply is intended to treat the individual – not the water. Once added, it is very difficult to avoid ingesting it. (Jug filters cannot remove fluoride.) This then becomes a medical intervention and raises the question of medical ethics where an individual has a right to decide what treatments – and what risks – he or she will accept. Under the principle of informed consent, anyone can refuse treatment via a drug or other intervention.

This is especially important for water fluoridation. Water is “the staff of life”. We drink it in one form or another, cook and prepare food with it. Fluoridation is not intended to provide a controlled dosage of fluoride. Those who drink one litre of water with 1ppm fluoride, swallow exactly one milligram of fluoride. But different people drink different volumes of water. So, whereas the concentration of the fluoride in the water can be specified and controlled, the dosage of fluoride to any individual is uncontrolled. Some fluoridated

individuals undoubtedly overdose on fluoride because they consume excessive cups of tea a day and tea leaves contain fluoride. If those tea-drinkers also swallow their fluoride toothpaste their exposure would be more than 6mg per day – the upper limit.

This would inevitably lead to an uncontrolled dose of fluoride being given for up to an entire lifetime to people whose medical histories are not known, regardless of the risk of dental caries. As a medical intervention without a right to choose, water fluoridation would, for a large percentage of those affected (perhaps the majority), be unnecessary. People don't "need" it, and for a significant percentage of those affected, be unwanted, particularly if they are one of the 6% of adults in the UK who have no teeth.

8. There seems very little point in progressing with a public health measure if the practice being promoted is unlawful. There are issues around the medicinal nature of fluoridation and that fluoridated water is seen to an unlicensed medical product. Its production, distribution and promotion should therefore be prohibited. Furthermore, the fluoridating acid added at the water treatment works contains hydrofluoric acid which is a reportable poison under the Deregulation Act 2015, Schedule 21, Part 4 and which is not permitted in the Water Industry Act 1991, s.87.

9. The scientific evidence on the "benefits" and "risks" are perhaps the most vociferously debated area of water fluoridation. It is characterised by claims and counterclaims of bias, misrepresentation and misinterpretation of the evidence. However, for many, there is uncertainty surrounding the "benefits", and concerns over the harmful effects of total fluoride exposure, lack of adequate safety margins and the need to protect the entire population.

The York Review (2000) and the Cochrane Collaboration (2015) found scant evidence that water fluoridation reduces dental health inequalities across social groups. (See Chapter 7)

10. Promoters of water fluoridation regard the practice as "topping-up" the natural fluoride (calcium fluoride) content of the water. Only two fluoridation compounds (hexa(hydro)fluorosilicate and disodium hexafluorosilicate) are allowed under current UK legislation. Both are by-products of the manufacture of phosphate fertiliser and should not be confused with pharmaceutical-grade sodium fluoride or naturally occurring calcium fluoride. These fluoridation chemicals are, or contain, prohibited poisons.

11. It is difficult to escape the conclusion that, this public health measure to treat the declining public health problem of dental caries, has several failings:

- **Fluoride is a "presumed" developmental neurotoxin. As such the Precautionary Principle (PP) ought to be observed. Failure to observe the PP implies a lack of duty of care. This Autumn (2020) we fully expect that fluoride will be reclassified as being a "known" developmental neurotoxin. Councils which then persevere with WF proposals and current WF schemes would become uninsurable.**

Moreover, Water Fluoridation:

- is an inefficient and costly means of delivering a treatment to ‘patients’;
- is the least financially favourable of the 5 dental health programmes in PHE’s Return on Investment tool;
- is financially wasteful;
- is surrounded by uncertainty over the benefits. Salford Royal NHS Trust currently has a research study in West Cumbria (Project Catfish) which is assessing the effectiveness of swallowed fluoride for controlling dental decay. This indicates that there is uncertainty over the benefits.
- causes Dental Fluorosis although swallowed fluoride toothpaste has a part to play in this tooth damage. Dental Fluorosis is a manifestation of systemic toxicity;
- is unnecessary because there are effective alternatives for preventing dental decay;
- provides medicine in uncontrolled doses;
- sets a precedent of using the public water supply system as a vehicle for delivering medication to individuals;
- breaches the fundamental rights of an individual to refuse medical treatment. Three Courts of Law since 1950 have ruled that fluoridated water is a medicine;
- its legality is questionable since the practice adds a non-permitted reportable poison (hydrofluoric acid), lead and arsenic to drinking water;
- exposes populations to inadequately safeguarded harmful risks;
- over-exposes the unborn child, the infant, children and adults to concerning concentration of fluoride over an entire lifetime. The possibility of over-exposure should be assessed in the initial stages of a WF proposal in line with a **recommendation by the World Health Organisation**;
- **is not sustainable** because it does not seek behaviour change;
- reduces the imperative to tackle dental decay at an individual level once fluoride is in the drinking water.

**When asked the honest question: “do you want fluoride added to your drinking water”, the majority of people who know enough about the issue say “no”.**

## Appendix 1 Tooth decay in 5-year-olds, North East of England, 2015 and 2017

### Extract from the Oral Health Survey, England , 5-year-olds, 2017

Region	Lower Tier LA Code	Lower Tier LA Name	5-year-old population (mid 2016)	Examined	% of sample examined (* unavailable)	% d <sub>3</sub> mft = 0	% d <sub>3</sub> mft > 0
Country	E92000001	England	703,755	96,005	58.9	76.7	23.3
North East	E06000047	County Durham	6,087	2,763	52.3	74.2	25.8
	E06000005	Darlington	1,252	605	50.9	73.6	26.4
	E08000037	Gateshead	2,465	1,270	60.3	76.8	23.2
	E06000001	Hartlepool	1,207	615	60.0	79.5	20.5
	E06000002	Middlesbrough	2,035	754	60.2	67.9	32.1
	E08000021	Newcastle upon Tyne	3,555	1,341	50.2	80.7	19.3
	E08000022	North Tyneside	2,390	1,481	65.4	80.0	20.0
	E06000057	Northumberland	3,354	1,660	55.5	77.4	22.6
	E06000003	Redcar and Cleveland	1,691	688	61.5	75.1	24.9
	E08000023	South Tyneside	1,693	1,015	60.8	78.3	21.7
	E06000004	Stockton-on-Tees	2,617	1,129	64.6	79.4	20.6
E08000024	Sunderland	3,128	1,743	52.9	71.6	28.4	

### Extract from the Oral Health Survey, England , 5-year-olds, 2015

Lower Tier LA Code	Lower Tier LA Name	5-year-old population (mid 2014)	Examined	% of sample examined (* unavailable)	% d <sub>3</sub> mft = 0	% d <sub>3</sub> mft > 0
E06000047	County Durham	5,657	235	67.3	64.9	35.1
E06000005	Darlington	1,316	230	59.6	64.6	35.4
E08000037	Gateshead	2,450	175	61.3	76.2	23.8
E06000001	Hartlepool	1,157	233	51.8	84.6	15.4
E06000002	Middlesbrough	1,783	265	50.9	61.2	38.8
E08000021	Newcastle upon Tyne	3,325	203	44.4	77.5	22.5
E08000022	North Tyneside	2,373	236	68.0	81.7	18.3
E06000057	Northumberland	3,271	290	65.9	74.3	25.7
E06000003	Redcar and Cleveland	1,455	238	54.4	72.9	27.1
E08000023	South Tyneside	1,685	205	58.7	74.0	26.0
E06000004	Stockton-on-Tees	2,479	255	55.6	74.7	25.3
E08000024	Sunderland	3,043	231	67.6	59.9	40.1

Sources:

[https://webarchive.nationalarchives.gov.uk/20180801132949/http://www.nwph.net/dentalhealth/survey-results%20\(14\\_15\).aspx?id=1](https://webarchive.nationalarchives.gov.uk/20180801132949/http://www.nwph.net/dentalhealth/survey-results%20(14_15).aspx?id=1) (2015)

<https://www.gov.uk/government/statistics/oral-health-survey-of-5-year-old-children-2017> (2017)

## Appendix 2 The Paradoxical Admission by the British Fluoridation Society in 2015

www.bfsweb.org/facts/dental\_benefits/howfworks.htm



The screenshot shows the website's navigation bar with links: Home, About Us, The Facts, One in a Million, News, Search, Contact Us, Links. Below the navigation is a blue banner with the text 'The Facts' and an image of a glass of water with a fluoride tablet. The main content area is titled 'Dental Benefits Links' and includes a list of links on the left and text on the right. The text on the right discusses how fluoride works to control tooth decay, how teeth decay, and how fluoride protects teeth.

**The Facts**

- » [The dental benefits of water fluoridation](#)
- » [Safety of fluoridation - effects on general health](#)
- » [Ethics of water fluoridation](#)
- » [Dental fluorosis](#)
- » [The extent of water fluoridation in the UK and worldwide](#)
- » [Legal aspects of water fluoridation and local decision making](#)
- » [Support - including public opinion surveys](#)
- » [The cost and cost effectiveness and who pays?](#)
- » [Technical aspects of water fluoridation](#)
- » [Environmental aspects](#)

**Dental Benefits Links**

**HOW FLUORIDE WORKS TO CONTROL TOOTH DECAY**

**How do teeth decay?**

Tooth decay begins when the outer surface of the tooth is attacked by acid. The acid is produced by bacteria which live on the surfaces of the teeth as a layer called plaque. When foods or drinks containing sugars enter the mouth, the bacteria within the plaque rapidly convert the sugars into acid. The plaque can hold the acid in contact with the tooth surface for up to 2 hours before it is neutralised by saliva.

During the time that the plaque is acidic, some of the calcium and phosphate minerals, of which enamel is largely composed, are dissolved out of the enamel into the plaque. This process is called **demineralisation**. However, once the plaque acid has been neutralised the minerals can return to the enamel surface - a process called **remineralisation**. This whole process is often described as an "ionic see-saw" in which mineral ions constantly move back and forth between the tooth surface and the plaque.

The capacity for remineralisation is, however, limited, and if sugars enter the mouth too frequently a net loss of mineral from the enamel surface results in a cavity through which bacteria can penetrate and infect the inner structure of the tooth. This is tooth decay and, if left untreated, will gradually destroy the tooth causing pain and often the formation of an abscess.

**How does fluoride protect our teeth?**

The relationship between fluoride and tooth decay is complex and probably not yet fully understood. However, it is known that fluoride interferes with the process of tooth decay in at least four ways:

1. If children ingest sufficient fluoride during the period of enamel development (up to 7 years of age) the **fluoride alters the structure of the developing enamel making it more resistant to acid attack**. This was originally thought to be the most important mechanism of fluoride; however, with advances in knowledge this is now understood to be the least important mechanism.
2. When teeth are subjected to alternating demineralisation and remineralisation as ..

Screen Capture, 11.17am, 3<sup>rd</sup> June 2015

(To read with greater ease, select "View" and "Zoom". Select 200%.)

