

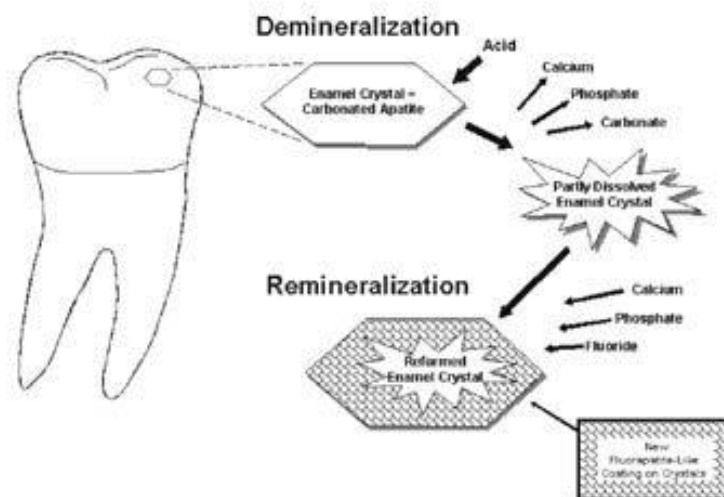
## 12 reasons why community water fluoridation is safe and effective

**1: Fluoride works by a surface reaction with existing teeth but research shows that it has a beneficial systemic effect with developing teeth.**

The document asserts that “*Fluoride promoters now claim that if there is any benefit from fluoride it is from contact with the surface of the tooth*” and cite as their authority a High Court judge (incidentally, from a ruling that went against anti-fluoride campaigners). A High Court Judge is hardly an authority on scientific matters

Yes, the surface or “topical” action at the tooth surface is understood to be the **predominant** mechanism for existing teeth. The US Center for Disease Control illustrates this in its figure from the document *Recommendations for Using Fluoride to Prevent and Control Dental Caries in the United States*.

**FIGURE 1. The demineralization and remineralization processes lead to remineralized enamel crystals with surfaces rich in fluoride and lower in solubility**



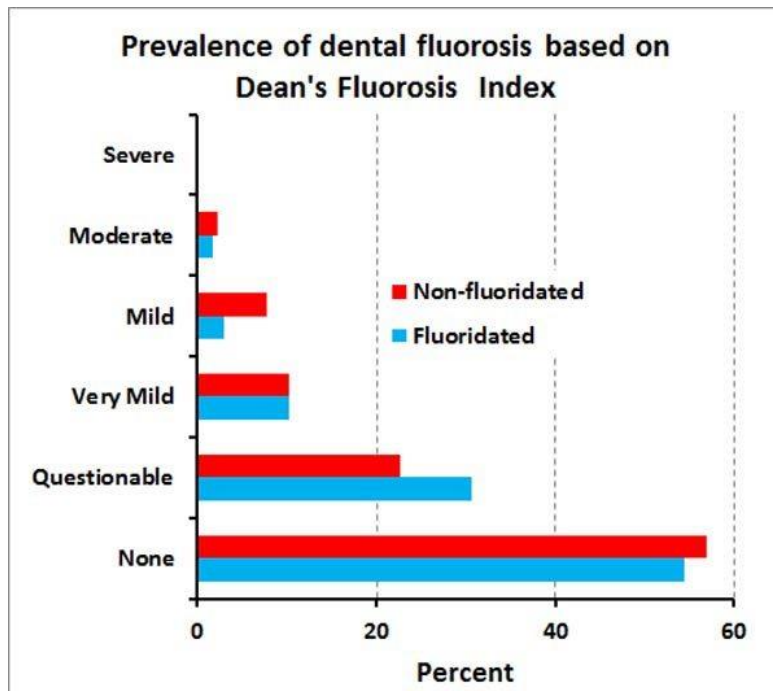
But, I pointed out in my article *Cherry-picking and misinformation in Stan Litras's anti-fluoride article*, research also suggests fluoride is incorporated into the developing teeth of children and this helps provide protection.

Newbrun (2004), for example, stressed in a review of the systemic role of fluoride and fluoridation on oral health:

*“The role of systemic fluoride in caries prevention is neither “minimal” nor “of borderline significance.” On the contrary, it is a major factor in preventing pit and fissure caries, the most common site of tooth decay. Maximal caries-preventive effects of water fluoridation are achieved by exposure to optimal fluoride levels both pre- and posteruptively.”*

Cho et al (2014) presented data showing that children exposed to CWF during teeth development retained an advantage over those never exposed to it. Systemic fluoride may not play a role with existing teeth but it does during tooth development – even if it is difficult to determine the relative contributions of systemic fluoride and “topical” or surface fluoride to lasting oral health.

## 2: Too much fluoride causes dental fluorosis but this is not relevant to CWF.



Some children from both fluoridated and non-fluoridated areas do exhibit dental fluorosis. This is thought to be due to excessive consumption of fluoridated toothpaste and one important factor used in determining the optimum concentration of fluoride used in CWF is to prevent the development of dental fluorosis.

Anti-fluoride propagandists usually cite horrific figures for dental fluorosis because they incorporate all forms of dental fluorosis, from the mildest to the most severe, into their figures. For example, they will cite [Ministry of Health Oral Health Survey data](#) to claim that New Zealanders have a prevalence of 45% dental fluorosis caused by

fluoridation. In fact, the dental fluorosis of concern (the severe and moderate forms) is very rare and the [NZ Oral Health survey](#) (from which this data is taken) showed no difference between fluoridated and unfluoridated areas.

## 3: Fluoride is not a neurotoxin (or neurotoxicant) at concentrations used in CWF.

Sure, animals studies show effects at high concentrations and there are studies of possible negative cognitive effects from areas of endemic fluorosis where drinking water concentrations of fluoride are relatively high. However, studies from areas where CWF is used ([Broadbent et al, 2014](#)) or natural levels of fluoride in drinking water are similar (see [More nails in the coffin of the anti-fluoridation myths around IQ and hypothyroidism](#)) do not show any negative effect on cognitive ability. In fact, the research suggests that fluoride may actually improve cognitive ability and improve chances of employment and income in adults (see the last link).

The Lancet article cited by FFNZ did not classify fluoride as a “neurotoxin” and the only discussion of fluoride in that article related to the poor quality studies from areas of endemic fluorosis referred to above. Scientific journal publish research findings and reviews – they don’t pass regulations or get into classifications.

## 4: FFNZ’s reference to dose is simply an attempt to claim evidence from high concentrations studies is relevant to CWF. It isn’t.

All the research indicates that the optimum recommended concentrations used in CWF are high enough to help reduce tooth decay but low enough to have no negative health effects. Only very mild dental fluorosis, which is often judged positively by teenagers and parents, is a possible result of such low concentrations.

The US National Toxicology Review referred to will simply extend previous reviews of animal studies to include human studies. This research programme also plans to include some animal studies using low fluoride concentrations – precisely because most former studies have used high concentrations unrepresentative of CWF.

The fact that new research like this commonly occurs is a good thing as it helps guarantee that social health measures like CWF are safe and they provide confidence to the public that there is continuous monitoring that would pick up any formerly unseen problems.

### **5: Skeletal and dental fluorosis occurs in parts of the world with high drinking water fluoride concentration but this is not relevant to CWF**

The World Health Organisation recommends that drinking water fluoride concentrations should be in the range 0.5 – 1.5 mg/l. High enough to support dental health but low enough to prevent skeletal fluorosis or dental fluorosis of any concern.

Anti-fluoride campaigners commonly refer to the negative health effects in areas of endemic fluorosis (eg., China, India, and Senegal) where drinking water fluoride concentrations are much higher than used for CWF. But those facts are completely irrelevant to the situation in countries like New Zealand. And they are irrelevant to CWF which uses much lower drinking water concentrations.

### **6: There is no credible evidence to suggest that fluoride is an endocrine disruptor at concentrations used for CWF**

A number of animal and human studies have produced conflicting results for endocrine effects of fluoride. These studies suffer from the use of high or unspecified fluoride concentrations. Effects have sometimes been seen for human in areas of endemic fluorosis. Studies have often been confused because of confounding effects due to iodine deficiency (known to cause thyroid problems), calcium and water hardness.

This means that it is easy to cherry-pick individual studies to support claims of harm from fluoride but these are usually for areas of high fluoride concentration or the studies are flawed by the problem of confounding effects.

The authoritative 2014 New Zealand Fluoridation Review (Eason et al. *Health effects of water fluoridation: A review of the scientific evidence*) considered “*alleged effects of CWF on health outcomes . . . including effects on reproduction, endocrine function, cardiovascular and renal effects, and effects on the immune system.*” It concluded:

*“The most reliable and valid evidence to date for all of these effects indicates that fluoride in levels used for CWF does not pose appreciable risks of harm to human health.”*

### **7: Bottle-fed babies do not receive harmful amounts of fluoride.**

The FFNZ claim they do is a common anti-fluoride misrepresentation of the health recommendations concerning CWF and bottle-fed babies. These recommendations advise that use of fluoridated water to reconstitute baby formula is not harmful. They simply suggest that parents who are concerned should occasionally use non-fluoridated water for that reconstitution – a peace of mind thing.

For example, the American Dental Association advises:

*“Yes, it is safe to use fluoridated water to mix infant formula. If your baby is primarily fed infant formula, using fluoridated water might increase the chance for mild enamel fluorosis, but enamel fluorosis does not affect the health of your child or the health of your child’s teeth.”*

Where parents want to reduce the risk of dental fluorosis they:

*“can use powdered or liquid concentrate formula mixed with water that either is fluoride-free or has low concentrations of fluoride.”*

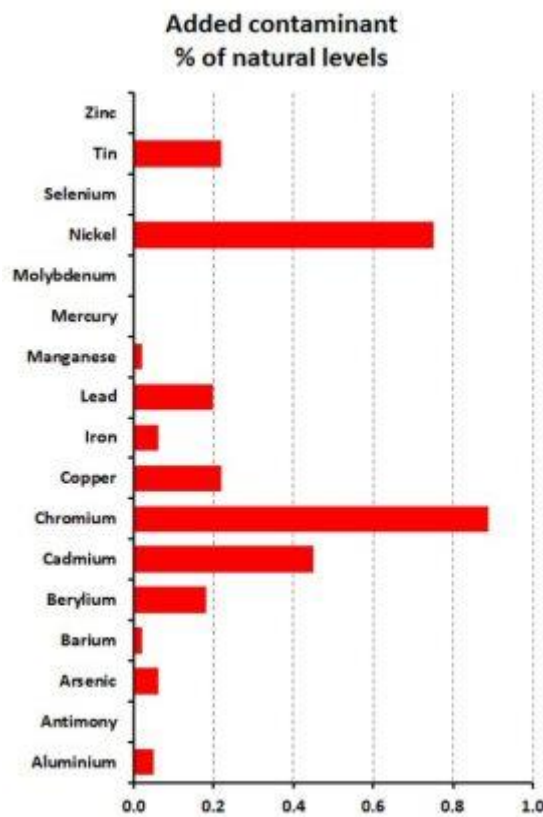
Arguments based on low concentrations in human breast milk simply rely on the naturalistic fallacy – the claim that something is good or right because it is natural (or bad or wrong because it is unnatural). There are common concerns about deficient levels of some beneficial elements in human breast milk and recommendations for using supplements. See, for example, *Iron and fluoride in human milk.*

## 8: Fluoridation chemicals are not contaminant-laden waste products.

For example, fluorosilicic acid, the most commonly used fluoridation chemical in New Zealand, is a by-product of the fertiliser industry. When used for water treatment it must pass rigorous restrictions on contaminant levels. Certificates of analysis are required.

With these regulations and checks for water treatment chemicals, the concentration of any contaminant introduced into tap water by their use is much lower than the concentration of those contaminants already naturally present in the source water used.

See *Chemophobic scaremongering: Much ado about absolutely nothing* for data based on a typical certificate of analysis for fluorosilicic acid and the natural concentrations of contaminants for the source water used by Hamilton City. The concentration of contaminants introduced into drinking water is well under 1% of the levels already naturally present in the water source (see graph).



## 9: Fluoridation is not a medicine and it does not violate human basic rights.

That was determined in High Court rulings – cases brought by anti-fluoride campaigners financed by the “natural”/alternative health industry. All appeals so far against those rulings have been rejected.

## 10: Community water fluoridation is not suitable or necessary for many countries

A claim that only 5% of the world uses community water fluoridation is not relevant. Consider that just over 10% of the world do not have access to safe clean water so their people have more pressing concerns than water fluoridation. Many countries like China, India, and parts of North Africa use drinking water with fluoride concentrations that are excessive – fluoride removal or searches for alternative sources are their priority.

Even many developed countries or regions do not have reticulation systems which enable cost-effective fluoridation. This may be the case in Christchurch where the use of a number of bores may mean fluoridation of much of the city is not cost-effective.

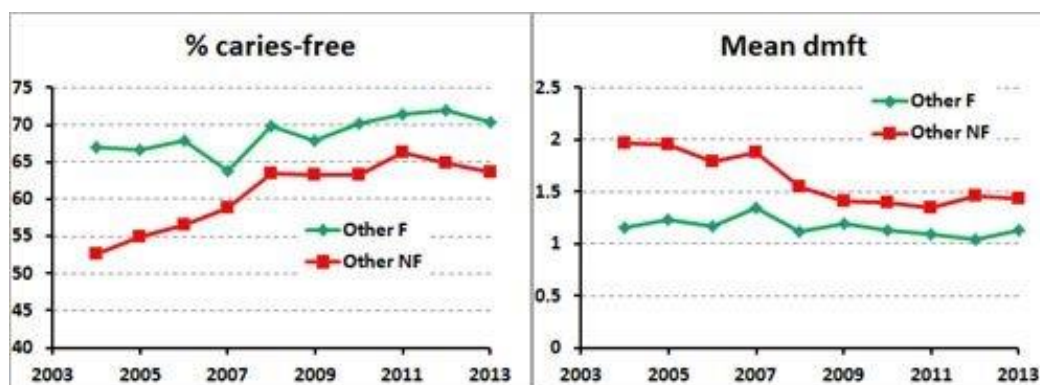
Many countries already have natural concentrations of fluoride in their drinking water that are near optimum – making any supplementation unnecessary.

A recent review (O’Mullane et al., 2016) summarised the numbers of people around the world with access to beneficial levels of fluoride in their drinking water:

*“General estimates for the number of people around the world whose water supplies contain naturally fluoridated water at the optimum level for oral health are around 50 million. This means that, when the numbers of people with artificially (369.2 million) and naturally fluoridated water supplies (50 million) at the optimum level are added together, the total is around 437.2 million.”*

### 11: The effectiveness of community water fluoridation in reducing tooth decay is well established.

This fact is very often misrepresented by anti-fluoride campaigners. For example, in the FFNZ document, a recent New Zealand study is cited to argue that “*there is no difference in decay rates between non-Māori children in fluoridated and non-fluoridated areas.*” In fact, the authors of that study warned that the data for “non-Māori” children were misleading because it included data for Pacific Island children who have generally poorer dental health than other ethnic groups and are concentrated in fluoridated regions, thus distorting the data for non-Maori. When the data for all ethnic groups are considered separately it clearly shows the beneficial effects of community water fluoridation. This figure shows the non-Māori data corrected by removing the data for Pacific Island children. It confirms that there is a difference in decay rates between fluoridated and non-fluoridated area.



Comparison of data for “other” (non-Māori/non-Pacific Island) children in fluoridated (F) and unfluoridated (UF) areas. 5-year-old New Zealand children. dmft = decayed, missing and filled teeth.

FFNZ claims about the Cochrane Review and data from the District Health Boards and Ministry of Health are also incorrect. While the Cochrane Review did specifically exclude most recent studies because of its selection criteria it still concluded:

*“Data suggest that the introduction of water fluoridation resulted in a 35% reduction in decayed, missing or filled baby teeth and a 26% reduction in decayed, missing or filled permanent teeth. It also increased the percentage of children with no decay by 15%. These results indicate that water fluoridation is effective at reducing levels of tooth decay in both children’s baby and permanent teeth.”*

### 12: Community water fluoridation is only one part of successful dental health policies

These included regular fluoride varnishes, regular dental examinations, registering children into dental programmes, education measures such as guided toothbrushing, presenting children with toothpaste and toothbrushes, the involvement of parents in dental health and plaque checking and in dental health programmes generally. Health professionals see all these elements, including water fluoridation, as complementary. There is absolutely no suggestion that community water fluoridation means no other social dental health programme is used. However, in areas where community water fluoridation is not available health professionals will often introduce extra measures, such as wider use of fluoride dental varnishes, to help protect child dental health.

FFNZ misleads when it claims other aspects of a dental health programme can simply be substituted for water fluoridation. All parts of these programmes are complementary, one cannot normally be substituted for another.