

New Zealand Fluoridation Information Service

Truth – Objectivity - Integrity

Original 30 March 2011.

Updated 1 June 2011 following receipt of official information from NFIS regarding the Bassin and Sandhu studies.

Dear Councillor

You will have received recently a communication from Mr Peter Gush, on behalf of a new political lobby group funded by the Ministry of Health to promote water fluoridation on its behalf. That group is calling itself the National Fluoridation Information Service (NFIS).

This is not an independent information service to decision makers or the public. Its role is not to provide you with “robust and independent scientific and technical information, advice and critical commentary around water fluoridation.” Its role, as stated by the Ministry of Health in advertising for its National Co-ordinator (now Emmeline Haynes), is to (politically) lobby for water fluoridation on behalf of the Ministry. It has been allocated \$1.25 million over three years to politically promote water fluoridation.

The NZ MOH claims that “The NZ Fluoridation Information Service has been formed by independent scientists, doctors, and dentists, with connections to the international scientific community researching fluoride’s effects, to provide balanced and accurate information on which councillors can make robust decisions about water fluoridation.”

However, you should note that the Ministry of Health has acknowledged under the Official Information Act that a case **against fluoridation** can be made on the same standard of evidence as the case **for fluoridation**. The one-sided (mis)information provided in the document you have received is therefore inappropriate for a public servant to disseminate.

To ensure you have factual information available for your decision-making, we have annotated the original document with brief facts. You will appreciate that any comprehensive coverage would be substantial – for example the US National Research Council review (NRC, 2006) alone comprised some 500 pages.

Regarding the document you have received, we note that at no point does the NFIS cite any scientific or other references for its statements. We have referenced our comments, as required by scientific standards.

If you require further information, you can call us on 0800 FLUORIDE (0800 358674)

The NFIS has provided you with web sites of those in favour of fluoridation. Information on the case against fluoridation can be found on the web sites listed below. There are many others, but these will likely be the most useful to you. We provide these sites so that you can get both sides of the issue. NZFIS does not endorse sites either for or against fluoridation. Our role is to provide objective facts as we have determined them:

www.slweb.org

www.fluoridealert.org

www.fannz.org.nz

Please note that your Medical Officer of Health, like the DHB, is contracted to the Ministry of Health to **promote fluoridation**. Neither is allowed, under their Contract for Services, to give you accurate, balanced, unbiased information on fluoridation, even if they have it. Their Contract for Services requires them to promote fluoridation policy regardless of any contrary facts.

Yours sincerely

Mark Atkin BSc. LLB(Hons)

Legal Advisor, NZFIS

Original text as supplied by Mr Gush, with our comment in column 3.

Original NFIS text	Original NFIS text	Our comment
<ul style="list-style-type: none"> Water fluoridation does not prevent tooth decay. The assertion is based mostly on reworking data from studies that demonstrate the benefit of water fluoridation and then discrediting the studies or using routinely collected figures that at times show little difference if the group numbers are very small or competing effects have not been controlled properly. 	<ul style="list-style-type: none"> There is good evidence that water fluoridation reduces tooth decay. International evidence has found that water fluoridation increases the number of children without tooth decay by about 15%. A number of recent international reviews continue to show benefit although they have also pointed out that some of the studies could have used stronger scientific designs. NZ evidence has found that water fluoridation reduces the frequency and severity of tooth decay by over 30%. Greatest benefit is shown for Māori, Pacific, and socio-economically deprived children. 	<p>The quality of studies purporting to show benefits from fluoridation is poor, or at best moderate (York Review 2000).¹ None of these studies allows for the strong evidence that fluoridation causes a 1 year average delay in permanent teeth erupting through the gums, giving a false impression of benefit when comparing children of the same age. This delay was found by Feltman and Kosel (1961)² and by Komarek (2005).³ Komarek showed there was no benefit once the delay was allowed for. Armfield and Spencer, Australia (2004)⁴ showed no benefit after age 12, by which time the eruption delay becomes less significant.</p> <p>The “approximately 15%” is a reference to, and misrepresentation of, the York Review 2000. The review was a systematic review of over 3000 fluoridation population studies. It rejected over 90% as scientifically unreliable on methodological grounds. Of the remaining studies on fluoridation’s effect on tooth decay:</p> <ul style="list-style-type: none"> 1 study found a 5% increase in decay resulting from fluoridation 10 found no difference in decay rates from fluoridation 19 found apparent benefits ranging from marginal through to 64%. <p>The Review said that although the simple (unweighted) numeric average from these studies was 14.6% more caries-free</p>

		<p>children in fluoridated communities, it could not be quoted as a demonstrated benefit:</p> <p>“The quality ... is in general only low to moderate, and should be interpreted with caution, especially considering the significant heterogeneity between studies.”⁵ It is this that the NFIS quotes as a demonstrated benefit.</p> <p>The “number of recent reviews” do not constitute original research, which is the only basis of evidence for or against fluoridation. The reviews referred to were conducted by politically pro-fluoridation organisations, whereas York had a balanced panel of those for, those against, and those neutral to fluoridation.</p> <p>The 30% NZ figure does not result from research, but from the raw school dental data, unadjusted for socio-economic (SE) status, published on the Ministry of Health web site. A crude adjustment for SE status, by splitting Wellington/Hutt Valley and Auckland from the rest of NZ, and comparing the dental decay rates within each group separately, shows no statistically significant difference in decay rates (DMFT or % caries-free children). This shows the difference is caused by the SE status, which is on average higher in fluoridated communities (i.e. predominantly large cities), NOT from fluoridation. The 30% difference is actually ½ a DMFT, in practice ½ a filling.</p> <p>A 2008 Auckland study⁶ found no difference in the number or severity of dental caries as between fluoridated and unfluoridated</p>
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		<p>children. In the Northland study unfluoridated communities had a greater reduction in tooth decay over the 2 year period than the fluoridated areas. Armfield and Spencer found that socioeconomic status was the key determinant of dental health, and fluoridation made no difference to this group.</p> <p>Of the 4 studies cited by the MoH in its Oral Health Survey report in 2010, two found no benefit, one found no benefit by the usual measures (DMFT and % caries-free) but claimed a saving 1/2 a tooth surface affected - DMFS (out of 128 tooth surfaces) using an unspecified multivariate analysis, and the Wellington-Canterbury study was so fundamentally flawed that its claimed saving of 1 DMFS cannot be relied on. Had Dunedin or Hamilton been used instead of Wellington, there would have been more decay in the fluoridated cities, as shown by 2009 MoH published dental statistics. None of these studies controlled for delayed eruption in the teeth.</p>
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<ul style="list-style-type: none"> • Fluoride is a chronic poison-dental fluorosis is proof of this. • Dental fluorosis is the tooth mottling that can occur if too much fluoride is consumed by children when teeth are forming. The presence of any form of dental fluorosis is evidence of poisoning by fluoride. 	<ul style="list-style-type: none"> • Dental fluorosis is a spectrum. In very mild or mild fluorosis, there are white marks on teeth which are minimal, harmless, and sometimes even desirable. In severe fluorosis, teeth can be pitted or stained. • Despite over 50 years of water fluoridation in New Zealand, moderate and severe dental fluorosis is very uncommon and the New Zealand studies show no difference in the levels between children in fluoridated and non-fluoridated areas. • Rates of mild fluorosis have not changed over the last 25 years. Significant risk of dental fluorosis is unlikely with our drinking water fluoride levels in New Zealand. 	<p>Fluoridation opponents do not cite dental fluorosis as the proof that fluoride is a chronic poison, since dental fluorosis is caused by over-exposure to fluoride in the first few years of life only (although fluorosis may be connected to fluoride accumulation, even in this short timeframe). The fact that up to 50% of the fluoride swallowed each day accumulates in the body, primarily the bones, is well documented in the scientific literature. It is beyond question (NRC, 2006).</p> <p>There are two theories on how dental fluorosis occurs. The dominant theory is that fluoride accumulates in the jaw bone and poisons the (ameloblast) cells that make the tooth enamel. The alternate theory is that it inhibits the thyroid which in turn alters enzyme levels, causing fluorosis. Either way, the mere fact of ANY fluorosis is proof that fluoride has poisoned either the ameloblast cells or the thyroid gland. The extent of the fluorosis then becomes a moot point.</p>
<ul style="list-style-type: none"> • Infant formula made with fluoridated water may be harmful to babies. • Modelling shows that some infants who are solely bottle-fed may exceed existing upper limits for daily fluoride intake. Bottle-fed infants are at risk of developing dental fluorosis. 	<ul style="list-style-type: none"> • This is only a theoretical risk. The upper limit for daily intake is very conservative. If there is a problem there would be an epidemic of the more severe forms of dental fluorosis. We do not see this in New Zealand or in other countries with water fluoridation. 	<p>This is the same as saying that smoking cigarettes only creates a theoretical risk of getting lung cancer, so we should keep smoking.</p> <p>NZ research by Cressey⁷ showed that at 1ppm bottle-fed infants have a 90% likelihood of exceeding the limit. At 0.7ppm it is still 30%.</p> <p>Wong (2006)⁸ showed that even at 0.5ppm (in Hong Kong) increases in dental fluorosis</p>

- This concern has been investigated by the Ministry of Health and the Food Safety Authority of Australia and New Zealand (FSANZ). Both have confirmed that there is no safety concern in making up infant formula with fluoridated water.

are measurable. The severity of the fluorosis is a moot point, as discussed in the section above.

The “safe upper limit” has no scientific basis, as no safety studies on infants have ever been conducted. The limit is based on body weight and the upper limit for adults (which is also too high, based on modern studies. It is definitely NOT conservative). However, infants are biologically different from adults, so the extrapolation is scientifically invalid.

The only scientific review of fluoride and infants by NZFSA was published in 1999⁹ (NZFSA was then called ANZFA). It concluded that fluoridated water, either on its own or added to infant formula, constituted a risk to infants. NFIS is referring to, and misapplying, NZFSA’s 2006 approval of fluoridated bottled water. NZFSA stated at the outset that it was considering the application on the basis of “equivalence” – that fluoridated bottled water was equivalent to fluoridated tap water – therefore **it was not conducting a scientific enquiry into adverse health effects of fluoridate water**. Nevertheless, fluoridation promoters continue to falsely quote FSANZ’ report as scientific authority that there is no risk to bottle-fed infants.

<ul style="list-style-type: none"> • Water fluoridation can affect brain function and can reduce IQ. • Some studies from rural China where water supplies have extremely high levels of naturally occurring fluoride, suggest that residents living in these areas have lower IQ. 	<ul style="list-style-type: none"> • This possible association is not at all conclusive. • The studies are not relevant to New Zealand. The drinking water in the areas studied had fluoride levels many times greater than the maximum permitted level in New Zealand. 	<p>This is an admission that there may be an adverse effect. Is damaging the brains of children a reasonable risk to take to save ½ a filling?</p> <p>In 2010, the prestigious journal <i>Environmental Health Perspectives</i> (published by the National Institute of Environmental Health Sciences, which is part of the US Department of Human Health Services) accepted the Xiang study for publication (this was one of the 24 studies that have associated a lowering of IQ in children with moderate exposure to fluoride). This means that Xiang's methodology had been accepted as sound after peer review by one of the leading environmental health journals in the US. Xiang's research¹⁰ indicated impaired IQ at 1.9 ppm. A margin of safety of 10 is normally used when extrapolating from the dose causing harm in a small study group in order to protect a whole population. If we assume that NZ children drink about the same amount of water as the Chinese children in this study then to protect the mental development of ALL children in New Zealand the maximum allowable level of fluoride would be 0.19 ppm. 1.9 ppm is not "many times greater" than 0.85 ppm – common in NZ.</p>
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- Water fluoridation can cause bone cancer.
- Patients with osteosarcoma (a form of bone cancer) have higher levels of fluoride in their blood. Males who are exposed to fluoride in drinking water as children have a higher risk of osteosarcoma.

- There are major methodological flaws in the two main studies. The effect of water fluoridation on osteosarcoma cannot be reliably predicted but the majority of studies do not show a positive relationship. This particular cancer is also difficult to study: it is so rare that among boys aged 10-19 years in a 4000-person community, there would be one case every 400-900 years.

First, since NFIS admits it is uncertain, therefore possible, that fluoridation causes bone cancer, and Councils have a statutory duty to protect the public from health threats, the precautionary approach requires councils to cease fluoridation immediately until it can be proven that fluoridation does not cause osteosarcoma.

Methodology

We are not aware of any study demonstrating flaws in any of the three (not two) studies showing this link. We asked NFIS what they were referencing, under the Official Information Act. Their response is analysed below.

Bassin's study¹¹ was conducted as PhD research. Her methodology was approved by her PhD supervisor, and Harvard University's doctoral board. Her thesis was later published in the journal *Cancer Causes and Control* in May 2006 (Bassin et al., 2006). We are aware that her thesis supervisor, in a letter to the same issue of this journal, (Douglass and Joshipura, 2006) claims that his larger work did not find the same relationship as Bassin, but a) it is not certain that he used the same methodology as Bassin and b) despite the fact that this "refutation" study was promised for the Summer of 2006 it still has not been published (as of March 2011). We are aware of no *bona fide* criticism of her methodology, published in any internationally recognized peer-reviewed journal – the standard required by the Ministry of Health. Those who politically promote fluoridation inappropriately quote

		<p>this letter to the editor – essentially a broken promise - as scientific proof that Bassin was wrong.</p> <p>NFIS' response to our information request</p> <p>NFIS confirmed it referred to Bassin and Sandhu.</p> <p>Regarding Bassin, three sources were quoted, none of which is valid:</p> <ol style="list-style-type: none">1. The Health Impact Assessment (HIA), prepared by three Hawke's Bay Medical Officers of Health in 2009. In criticising Bassin, the HIA relies entirely on Douglass and Joshipura, discussed above.2. The NHMRC Review 2007, which in fact gave Bassin's study a quality rating of "fair to good". It made some criticisms of methodology, as one would expect from a systematic review, but not to the extent claimed by the NFIS, and not all criticisms were valid. (For example it criticised the fact that the fluoridated individuals drank less bottled water. But if they drank (unfluoridated) bottled water, they would not have been in the "fluoridated" group, as Bassin estimated individual fluoride intake!).3. The opinion of "Professor" Cox, director of NZ's cancer epidemiology group at Otago University medical faculty (which promotes fluoridation). In fact Mr Cox is an Associate Professor only; not a full professor. However, the NFIS has no correspondence from Mr Cox – it seems to be relying on the Hawke's Bay HIA document, which refers to a private
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		<p>communication from Mr Cox to an unspecified recipient. We asked Mr Cox for his analysis supporting the claim in his communication. He has never conducted an analysis of Bassin's study, hence his opinion has no validity.</p> <p>Another study examining osteosarcoma rates in New Jersey (New Jersey Department of Health [Cohn] 1992)¹² also found a 5 – 7 fold increased risk of osteosarcoma in young males living in fluoridated areas of three counties compared to non-fluoridated areas. Other epidemiological studies have not found this association but Bassin's study is the only one that pursued the possibility of the actual timing of fluoride exposure and this risk. The 6th, 7th and 8th years in which she found an increased risk corresponds to the mid-childhood growth spurt in which there is rapid bone turnover a situation which makes a tissue more vulnerable to genetic damage. Consequently other studies do not in any way refute Bassin's study. It would be like looking in trees and concluding there are no earthworms in NZ – if you look in the wrong place you will never find what you are looking for.</p> <p>Number of NZ cases Health officials quote approximately 3.5 deaths from osteosarcoma of adolescent males per year in NZ. Around 55- 60% of NZers drink fluoridated water, and those in unfluoridated communities get it in soft drinks, processed food, etc. If Bassin and Cohn are right, at least 2 of those deaths</p>
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		<p>are caused by fluoridation. Is it acceptable to kill 2 young men each year because fluoridation might reduce tooth decay? Even when the main, and perhaps only, way fluoride strengthens enamel is by use of fluoride toothpaste or professional fluoride dental applications?</p> <p>Blood fluoride study The study on blood-fluoride levels was by Sandhu (2009).¹³ It was peer reviewed by experts before being published in an internationally recognised journal.</p> <p>NFIS' response to our information request Regarding Sandhu, no published analysis or critique had been sighted, or was available to support the claim. The NFIS relied on the alleged "expertise" of the three Hawke's Bay Medical Officers of Health who authored the HIA report. No evidence of such alleged expertise was provided. No scientific critique is included or referred to by them in the HIA report – they just express a view consistent with their contractual obligations to the Ministry of Health to support fluoridation policy.</p>
<ul style="list-style-type: none"> • Water fluoridation causes a range of negative health effects on bones/joints and hormonal systems. 	<ul style="list-style-type: none"> • There is no evidence anywhere in the world that water fluoridation causes these illnesses. • Any associations are tenuous even for areas in the world with very high levels of naturally occurring fluoride in drinking water. 	<p>The following examples of research show accumulation of fluoride in bone at levels at or BELOW that used in fluoridation. The levels are at the low end of the range causing Stage I skeletal fluorosis.</p> <p>Zipkin L, et al. (1958). Fluoride deposition in human bones after prolonged ingestion of fluoride in drinking water. US Public</p>

		<p>Health Rep. 73:732-740. (Water fluoride content: 1ppm)</p> <p>Jackson D, Weidman SM. (1958). Fluorine in human bone related to age and the water supply of different regions. J. Path. Bact. 76: 451-459. Study 1: water fluoride content: <0.5 ppm; study 2: 0.8 - 1.2 ppm</p> <p>The World Health Organisation has acknowledged that some of what is diagnosed as “arthritis” in (fluoridated) Western society may in fact be early skeletal fluorosis. However, no fluoridated country, including NZ, has made any attempt to investigate the possibility that long term exposure to fluoridated water may increase the risk of some forms of arthritis.</p> <p>Hormonal change Jennifer Luke demonstrated in 2001¹⁴ that fluoride accumulates in the calcified deposits in the human pineal gland, to a level of up to 21,000 ppm (average 9000 ppm). Her animal study (1997)¹⁵ showed reduced melatonin hormone production and earlier onset of puberty. No research has ever been conducted to either reproduce or refute these findings in any fluoridated country, including NZ.</p> <p>There are numerous studies showing fluoride reduces thyroid function, and production of thyroid hormone, which are discussed at some length in the National Research Council report.¹⁶</p>
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		<p>Other adverse health effects There are many other adverse health effects of fluoridation demonstrated by a large number of studies published in internationally recognised peer-reviewed journals. These can be found on the web sites listed above, and in the US National Research Council's review of fluoride levels in drinking water (2006). These are also reviewed in a book by Connett, Beck and Micklem, that was published in October 2010, "The Case Against Fluoride."</p>
<ul style="list-style-type: none"> • Water fluoridation is mass medication and violates our freedom to choose. 	<ul style="list-style-type: none"> • It is generally accepted by the legal bodies that have tested this in New Zealand and internationally that fluoride added to drinking water is not a medicine or drug. • It is a prevention strategy for populations. It is like iodine added to salt to help prevent goitre, or vitamins and minerals added to many foods for health benefits. 	<p>The US Food and Drug Administration classifies fluoride as a drug (but has no jurisdiction over its addition to the water supply).</p> <p>The NZ Medicines Act 1981 (sections 3(1)(a) and 4(a)) defines a medicine as follows: <i>medicine</i> means any substance ... sold, or supplied wholly or principally - for administering to one or more human beings for a therapeutic purpose;</p> <p>Therapeutic purpose means - Treating or preventing disease</p> <p>The Ministry states that dental caries is a disease. Fluoridation is the supply of a substance (fluoride) to persons (entire communities) for the prevention of disease (dental caries). It is therefore medicine under the Medicines Act.</p> <p>The Privy Council in the Lewis case</p>

		<p>(1964)¹⁷ held that: “The fluoridation plant is for the purpose of the supply of what might be termed ‘medicated pure water’ (confirming the NZ High Court statement by McGregor J), and then: “Their Lordships think it an unnecessarily restrictive construction to hold (as did McGregor J.) that, because the supply of water was already pure there is no power to add to it constituents merely to provide medicated pure water, i.e. water to which an addition is made solely for the health of the consumers.”</p> <p>Fluoride is not the same as iodine or vitamins. These are essential dietary elements, with a minimum required daily intake (RDI), below which clinical disease symptoms appear (e.g. goitre in the case of iodine). Fluoride is not a nutrient or essential mineral. There is no RDI for fluoride. No disease symptoms appear if fluoride is completely eliminated from the diet.</p> <p>One can choose to buy iodised or non-iodised salt. Can we choose to have unfluoridated water supplied to our homes, or at a restaurant when dining out in a fluoridated town?</p>
<ul style="list-style-type: none"> Water fluoridation is toxic and fluoride is a waste product of the fertiliser industry. Fluoride may be released from industry processes. 	<ul style="list-style-type: none"> The fluoride used for water fluoridation in New Zealand is either manufactured locally or sourced from overseas. It must meet very strict quality and purity standards. 	<p>It is irrelevant who manufactures the fluoride. Silicofluorides are not manufactured specifically for fluoridation. Hydrofluorosilicic Acid (HFA) is produced as a toxic waste in the wet scrubbing system located before the effluent stacks of the</p>

superphosphate industry, to prevent the very toxic gases (hydrogen fluoride and silicon tetrafluoride) escaping into the air, which is illegal. The liquor is allowed to settle so that any suspended solids fall to the bottom, and the clear liquid is sold as such for use in fluoridation. It is not made to “exacting standards of purity”. There are three relevant standards:

- Pharmaceutical grade, used in fluoride tablets (fluoridating agents do not meet this standard)
- Food grade (there is no food grade specification, as it is illegal to add fluoride to food)
- Water treatment grade, specified in NZ by the Water and Wastes Assn. – a non-governmental body.

Water treatment grade is not a Governmental or scientific standard. This allows significant levels of toxic heavy metals to be present.¹⁸

Contaminant	mg/kg
Antimony	148
Arsenic	495
Cadmium	148
Lead	495
Mercury	99
Nickel	990
Selenium	495

To say fluoride chemicals are made to an exacting purity standard is simply spin-doctoring.

The only manufacturing process relates to Sodium Silicofluoride, where the still-

		<p>contaminated HFA is mixed with caustic soda to produce the solid salt, used in dry-feeder type fluoridation plants.</p> <p>The silicofluoride waste cannot be dumped directly in waterways, sea, or on land. The public water supply is a perfect way for fertiliser companies to dispose of their toxic waste – and be paid for doing so.</p>
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¹ McDonagh et al, National Health Service Centre for Reviews and Dissemination *Fluoridation of Drinking Water: a Systematic Review of its Efficacy and Safety* (York University, September 2000) 47-53. (York Review)

² Feltman R. Kosel G, 1961, J. Dental Medicine, vol 16.

³ Arnošt Komárek, Emmanuel Lesaffre, “A Bayesian analysis of multivariate doubly-interval-censored dental data” *Biostatistics* (2005) 6 (1): 145-155.

⁴ Armfield and Spencer *Community Dentistry And Oral Epidemiology* Volume 32 Issue 4 Page 283 - August 2004

⁵ York Review, *ibid*, pp xii, 67, 69.

⁶ Schuller PJ, Kanagaratnam S, Durward CS, Mahood R “Prevalence of enamel defects and dental caries among 9-year-old Auckland children” *NZ Dental Journal* December 2008 (p145-152).

⁷ Peter Cressey, BSc(Hons), Food Safety Programme, Institute of Environmental Science and Research “Dietary fluoride intake for fully formula-fed infants in New Zealand: impact of formula and water fluoride” *Journal of Public Health Dentistry 2010. ISSN 0022-4006*

⁸ Wong, McGrath, Lo, King “Association between Developmental Defects of Enamel and Different Concentrations of fluoride in the Public Water Supply” *Caries Research*, 2006:40, pp481 – 486.

⁹ Australia New Zealand Food Authority (NZFA) P93 – Infant Formula, May 1999 (finalised in 2002).

¹⁰ Xiang, Liang, Chen, Chen, Zhou, Wu, Zhou “Serum Fluoride Level and Children’s Intelligence Quotient in Two Villages in China” *Environmental Health Perspectives* doi: 10.1289/ehp.1003171 (available at <http://dx.doi.org/>) Online 17 December 2010 – withdrawn as it used previously published data, but validity not in question.

¹¹ Bassin EB, Wypij D, Davis RB, Mittleman MA. “Age-specific fluoride exposure in drinking water and osteosarcoma (United States)” *Cancer Causes Control*. 2006 May;17(4):421-8.

¹² Cohn PD, A Brief Report Onfs The Association Of Drinking Water Fluoridation And The Incidence of Osteosarcoma Among Young Males, NJ Depart. of Health, Environ. Health Service, 1992, 1- 17

¹³ Sandhu R, Lal H, Kundu ZS, Kharb S, “Serum Fluoride and Sialic Acid Levels in Osteosarcoma,” *Biological Trace Element Research* Apr 24, 2009 [Epub ahead of print]

¹⁴ Luke J (2001). Fluoride deposition in the aged human pineal gland. *Caries Res.* 35:125-128.

¹⁵ Luke J (1997). The effect of fluoride on the physiology of the pineal gland. Ph.D. Thesis. University of Surrey, Guildford, UK.

¹⁶ National Research Council. (2006). *Fluoride in Drinking Water: A Scientific Review of EPA's Standards*. National Academies Press, Washington D.C. pp 223, 197

¹⁷ *Attorney-General ex parte Lewis & anr v Lower Hutt City Corporation*, [1965] NZLR 116,.

¹⁸ NZ Water and Wastes Association Inc. *Standards for fluoridation of public drinking water* (1997).