



# ENVIRONMENTAL SCAN SNAPSHOTS

**Fluoridated Supplies at 24 October 2013**  
 Blue blobs and blue shaded areas indicate fluoridated supplies for 500 people or more.

Since this map was last updated, Hamilton has re-introduced their community water fluoridation programme

## Fluoridated New Zealand Community Drinking-Water Supplies



Reference: Accessed from [www.drinkingwater.org.nz](http://www.drinkingwater.org.nz), permission granted from ESR. Date: 25 September 2014.

We are currently working on the next National Fluoridation Information Service Environmental Scan, which will cover the period March 2013 to July 2014. This is a longer period than that covered by previous scans, and will be available at the end of the year.

In the meantime we would like to provide some snippets of what has been happening around the country in relation to community water fluoridation (CWF) in the last year.

### Hamilton

Reintroduced their CWF programme in July 2014. This followed a decision to stop CWF after a tribunal hearing on the issue held in May 2013. The decision to reintroduce CWF was based on the results of a referendum held with the local body elections in October 2013, which showed 67.7% of voters supported the reintroduction of CWF. Hamilton City Council was challenged with a judicial review by Safe Water Alternative NZ (SWANZ) over the decision to reintroduce

CWF. The review was to be heard on 9 September 2014; however SWANZ withdrew a week prior to the hearing.

### Hastings

CWF has continued in Hastings following a referendum with the local body elections in October 2013, showing 62.9% of the voters supported continued CWF. Hastings District Council is installing two fluoride free taps in the city for residents wanting to access non-fluoridated water.

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**Whakatane**

A referendum on the continuation of CWF was also held with the local body elections in Whakatane in October 2013. The referendum showed 60% of voters supported CWF to be continued in Whakatane and Ohope, as well as extending CWF to areas including Taneatua, Edgecumbe and Murupara. The Whakatane District Council is yet to decide whether their CWF programme will be extended.

**South Taranaki**

South Taranaki District Council was challenged with a judicial review by New Health NZ after the Council's decision to introduce CWF in December 2012. The judicial review hearing was held in November 2013, and the Judge's decision was released in March 2014. New Health NZ's challenge was rejected on all grounds. The decision has been appealed by New Health NZ, and will be heard on 25-26 November 2014. The area continues to be without CWF as a result of the on-going legal challenges.

**Rotorua**

A submission asking the Rotorua District Council to consider introducing CWF was made by a member of the Toi Te Ora Public Health Service during the 2014/15 annual planning process. Following this the Council voted 6-5 in July 2014 to hold a binding referendum on whether CWF should be introduced. However, a 'notice of motion' was signed by 6 councillors following the Council vote leading to a re-debate of the issue in late July. This resulted in the Council reversing their decision 7-6, so the referendum will not proceed. The cost of the referendum and risk of legal action were the main reasons given against holding a referendum. The Council currently has no further plans to reconsider the issue.

**Palmerston North**

A report on the issues surrounding CWF commissioned by the Palmerston North City Council was presented in November 2013. Following this the Council decided to hold off making any further decisions on the continuation of CWF until the result of the South Taranaki judicial review was known. It was also decided the issue would be discussed during the 2014/15 annual planning process. The Council received 56 submissions about CWF to their annual plan

and has resolved to install a fluoride-free tap at one of the city bores.

**Kapiti Coast**

Kapiti Coast District Council held a public hearing on 21 May 2014 about whether or not to continue CWF in Raumati, Paraparaumu and Waikanae. In total, 627 submissions were received – 266 for and 261 against continuing CWF. On 5 June 2014, the council voted 8 - 2 in favour of CWF being continued in the three areas.

**Ashburton**

A councillor brought up the issue of whether reintroducing CWF should be discussed during the Ashburton District Council annual planning process in March 2014, after having seen reports in media about the deterioration of Ashburton's dental health since CWF ceased in 2002. The matter was not discussed any further during the annual planning process, but may be brought back up during the Council long term planning process in 2015.

**Dunedin**

Discussion about increasing the level of fluoride back to 0.85ppm (as it was reduced to 0.75ppm from that level last year) was held during a Dunedin City Council meeting in May 2014. There was also discussion about introducing CWF in all regions of Dunedin with reticulated water supplies. A resolution was passed requesting a report from council staff before the 2015-16 long term planning process on the possibility of extending CWF coverage in the city and costs associated with that.

# Waimarama

## A NEW NFIS ADVISORY: DENTAL FLUOROSIS – IS IT MORE THAN AN AESTHETIC CONCERN?

This advisory is now available on the NFIS website. It was written in response to suggestions that dental fluorosis indicates toxic accumulation of fluoride within the body. NFIS has also noticed this topic is often discussed in the media. The advisory provides readers with clear information based on the evidence from scientific research.

The advisory begins with a review of the frequency and level of dental fluorosis occurring in New Zealand, whether it is increasing and what role community water fluoridation (CWF) plays in the development of dental fluorosis. It then considers what impact dental fluorosis, at the levels found in New Zealand, has on health and wellbeing, and whether dental fluorosis indicates a build up of fluoride in other body tissue such as bones.

The advisory concludes that there are no known health risks associated with CWF in New Zealand. CWF has been found to not lead to anything more than very mild or mild dental fluorosis for a small number of people. Read the full advisory [here](#).

# Articles of interest



Broadbent, J.M. et al. (2014). Community Water Fluoridation and Intelligence: Prospective Study in New Zealand. *American Journal of Public Health*. e-View Ahead of Print. doi: 10.2105/AJPH.2013.301857

This article investigated whether there is a relationship between exposure to community water fluoridation (CWF) prior to 5 years of age and lower IQ in childhood (7-13 years of age) and adulthood (38 years of age), using prospective data from the Dunedin Multidisciplinary Health and Development Study.

For more information about the study, see here <http://www.otago.ac.nz/news/news/otago070902.html>

Following the publication of this article, there have been several criticisms from anti-fluoride groups such as the Fluoride Action Network (FAN) (Fluoride Action Network, 2014a; Fluoride Action Network, 2014b). Below, you will find a selection of these criticisms, along with commentary from the authors.

Scientific aspects of the study questioned by the FAN	Commentary by the authors															
<p>"The study's small sample size of non-water-fluoridated subjects (99 compared to 891 water-fluoridated subjects), means it has low ability to detect an effect. Even worse, 139 subjects took fluoride tablets, but Broadbent does not say which. Since fluoride tablets are only recommended for children living in non-water-fluoridated areas, there may have been little difference in total fluoride intake between his comparison groups. Broadbent's failure to consider total fluoride exposure may thus explain why he found 'no effect'".</p>	<p>The number of study members who had never resided in a fluoridated area (n=99) was smaller than the number who had (n=891), but this does not indicate a low ability to detect an effect. In fact, 99 is a reasonable size for many types of study.</p> <p>The article was entitled "Community water fluoridation and intelligence", not "Estimated total fluoride intake and intelligence". We controlled for other sources of fluoride (toothpaste and use of fluoride tablets), but CWF is an area-based measure while fluoride tablets and toothpaste are individual measures, so, following a test for interaction (where no effect was found), these variables were analysed as covariates in the multivariate analysis. FAN stated "even worse, 139 subjects took fluoride tablets, but Broadbent does not say which". If we did not consider fluoride tablets intake in the statistical model, then this criticism would have validity. However, fluoride tablet intake was included in the model so the point is not relevant. We did conduct an analysis in which total fluoride intake was estimated, but we did not include that in the current study because it was focused on claims about community water fluoridation. No significant differences in IQ by estimated total fluoride intake prior to age 5 years were observed; those with high total fluoride intake had slightly higher IQs than those with low total fluoride intake.</p> <p>The measure of CWF and non-CWF exposure differentiated those who had lived in fluoridated areas at some point from those who had never done so. The families of some Study members had moved, even by age 5 years. A number of those who had lived in a fluoridated area prior to age 5 had also lived in a non-fluoridated area for part of that time. We found that the IQs of those who had lived part of their lives in a CWF area were not significantly different from those of people who had always lived in a CWF area. These data were pooled since the relevant question seemed to be whether those who had never lived in a CWF area prior to age 5 years had differing IQs to those who had. We were interested in comparing those who had never lived in a fluoridated area with those who had done so prior to age 5 years, due to the claimed "irreversible effects on IQ" from living in a CWF area.</p> <p>For the purposes of this study, the fluoride tablet comparison groups were (a) those who had taken fluoride tablets at any point prior to age 5 years and (b) those who had never taken fluoride tablets. Deeper data on use of fluoride tablets were available, including on their frequency of use. Accordingly, data on IQ by frequency of fluoride tablet use are presented in Figure 1. Those who took fluoride tablets daily had marginally higher IQs than those who took them at least twice a week, while those who took them only 'now and again' had marginally lower IQs.</p> <div data-bbox="622 1814 1516 2150"> <p><b>Figure 1. IQ by frequency of fluoride tablet use</b></p> <table border="1"> <caption>Data for Figure 1: Mean IQ score by frequency of fluoride tablet use</caption> <thead> <tr> <th>Frequency</th> <th>Childhood IQ (age 7-13 years)</th> <th>Adult IQ (age 38 yrs)</th> </tr> </thead> <tbody> <tr> <td>Daily (n=57)</td> <td>~102</td> <td>~103</td> </tr> <tr> <td>At least twice a week (n=18)</td> <td>~99</td> <td>~100</td> </tr> <tr> <td>Now and again (n=51)</td> <td>~98</td> <td>~96</td> </tr> <tr> <td>Unsure (n=13)</td> <td>~100</td> <td>~102</td> </tr> </tbody> </table> </div>	Frequency	Childhood IQ (age 7-13 years)	Adult IQ (age 38 yrs)	Daily (n=57)	~102	~103	At least twice a week (n=18)	~99	~100	Now and again (n=51)	~98	~96	Unsure (n=13)	~100	~102
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	<p>Among those who had always lived in unfluoridated areas and took fluoride tablets daily, the mean childhood IQ was 103.0 (sd 13.6, n=22). Among those who lived in unfluoridated areas and took fluoride tablets less than daily, the mean IQ was 99.9 (sd 11.1, n=31). Among those who lived in unfluoridated areas and did not take fluoride tablets, the mean IQ was 98.3 (sd 13.9, n=46). A similar pattern existed by adult IQ, as well as among those who had lived for part of their lives in fluoridated areas and had taken fluoride tablets at some point (with the highest mean IQs among those who took fluoride tablets daily).</p> <p>Fluoride is ubiquitous in the environment, so all participants had at least some exposure to fluoride (just like every human who has ever lived). In the Dunedin study, those who lived in the fluoridated areas certainly were getting exposed to more fluoride – for example, they were more likely to have diffuse opacities (which includes fluorosis) of the teeth (Suckling et al, 1985) and they had lower dental caries experience (Evans et al, 1980; Evans et al, 1982).</p> <p>As they grew older, more Study members moved to other parts of the world that may or may not be fluoridated – nearly half of them were living in nonfluoridated areas as adults. This was reported at the 2014 conference of the Association for Psychological Science in USA and we will be reporting further in a subsequent manuscript. Certainly, we found no evidence of lowered IQ or ‘mental numbing’ by lifetime exposure (but we did find smaller dental caries increments).</p>
<p>“... the study fails to allow for a whole range of confounding factors. The most important period for IQ damage is in the womb, yet the mothers’ fluoride intake and other factors like iodine deficiency were not controlled for. Similarly, there was poor information on total fluoride intake by these infants. Had the study actually been prospective as claimed, rather than retrospective, this essential information could have been available”.</p>	<p>The CWF data were recorded prospectively. Blood tests for iodine deficiency were not appropriate when the Study members were young. Iodine deficiency is not a major public health problem in New Zealand, thanks to the widespread fortification of salt with iodine in this country. The major issues that we felt required controlling for were SES, other sources of fluoride exposure (other than CWF), breastfeeding, and birthweight. We controlled for a similar set of confounders to those controlled by Meier et al (2012) in their study of cannabis exposure and IQ.</p>
<p>“Of the four factors Broadbent did adjust for, most were only crudely controlled. For example, SES was determined solely by the father’s occupation and classified into just 3 levels. Inadequate adjustment for SES could obscure a lowering of IQ caused by fluoride, because almost all of the non-water-fluoridated children came from one outlying town that had lower SES than the fluoridated areas”.</p>	<p>The measure of SES used in the Study was robust, originally described by Poulton et al (2002), and was based on the occupation of the caregiver who was the primary income earner (not necessarily the father). The SES of Study members from other non-fluoridated areas was not significantly different from that of those in the rest of Dunedin. We also used SES using a continuous measure and this did not affect the outcome of the analyses.</p>
<p>“The Dunedin research report begins with the conclusion it set out to ‘prove’ – that fluoridation is harmless”.</p>	<p>The claim that we began with the conclusion we set out to “prove” – that fluoridation is harmless is inaccurate. We began with a statement of our hypothesis, not a conclusion. We hypothesised that there would be no link, based on reasoning provided in the manuscript. This is the scientific method; any other approach would have not been scientific.</p>
<p>“In contrast, a Harvard University meta-analysis of studies was conducted by some of the world’s leading expert researchers into developmental neurotoxicology, who have no know bias on fluoridation policy. There were 27 studies reviewed. The total number now available is 43. The Dunedin authors wrongly dismiss this as a single study”</p>	<p>None of the authors of our study have conflicts of interest, as declared in the manuscript. Clearly, any meta-analysis is based on multiple studies, but a meta-analysis is still a single study. Meta-analysis is a statistical technique for combining the findings from a set of independent studies. The validity of the meta-analysis depends on the quality of the studies which are based. In fact, more than 27 studies were considered by Choi et al (2012), but some were excluded due to their poor quality or unacceptable bias. The authors of the meta-analysis stated that the studies that were included also had methodological flaws, rather serious in some cases. None of the 27 included studies investigated community water fluoridation programmes (Choi et al 2012). Although the authors of the meta-analysis are world leading experts in neurotoxicology, these studies were not done by them. There is a clear difference between conducting the studies and summarising the findings of the studies.</p>
<p>“Broadbent falsely criticizes 27 previous studies linking fluoride to children’s lower IQ - implying they didn’t adjust for any potentially confounding variables like lead, iodine, arsenic, nutrition, parent’s IQ, urban/rural and fluoride from other sources. In fact, several of the studies did control for these factors. A good example is Xiang’s work, which has controlled for lead, iodine, arsenic, urban/rural, fluoride from all sources, parent’s education, and socio-economic status (SES). Ironically, Broadbent failed to adjust for most of these factors in his own study despite having access to information on many of them”.</p>	<p>In terms of controlling for confounders, practically the only exception was the single article quoted by FAN. Note that we quoted the EU Scientific Committee on Health and Environmental Risks as stating that these studies had “no (or at best little) control for confounders”. The authors of the study in question stated: “The villages of Wamiaio and Xinhuai in Sihong County, Jiangsu Province, People’s Republic of China, are situated in isolated low-income areas with less economic development and a relative lack of communication with the outside world”. However, Xinhuai is part of a larger town and is close to a waterway, while the high fluoride/ low IQ town of Wamaiao appears to be isolated, by comparison. In one publication in the pseudojournal Fluoride, the low fluoride village was shown in a Google Earth image with the adjoining larger town cropped out (Xiang et al. 2012). A paper retracted from Environmental Health Perspectives in 2010 (Xiang et al 2010) reported no significant difference in IQ by serum fluoride concentration in the low fluoride town of Wamaiao. In fact, the gradient of a plot of IQ by serum fluoride was positive in the low fluoride town. This was obscured in the subsequent republication of those data in the Fluoride pseudojournal (Xiang et al 2011), since the data from the two villages were not reported separately.</p>

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In view of this, the authors of the study comment that criticisms such as these would, in scientific circles, be more appropriately directed as a (respectful) letter to the editor of the journal in which the article was published. Our experience has been that the opponents of fluoridation prefer to indulge in criticisms through the media, pseudojournals, and social media. They also engage in individual attacks in their criticisms of the work (see above, where FAN's criticisms are directed at 'Broadbent'). These would be considered libellous in a more litigious society.

### References

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## DIP YOUR TOES INTO A FLUORIDE REFERENDUM

By Johanna Wilson, previously Oral Health Promoter, Bay of Plenty District Health Board and now Adolescent Oral Health Coordinator, Hawkes Bay District Health Board.



I recently participated in the Whakatane Community Water Fluoridation Referendum, something I highly recommend to all Oral Health Promoters in New Zealand. This is a rewarding piece of work professionally and personally.

A good Community Water Fluoridation campaign brings together key stakeholders. Toi Te Ora Public Health Service led the Whakatane campaign, I was the Oral Health Promoter based in Whakatane and eager to participate. Other stakeholders included the Ministry of Health, Health Promotion Agency (HPA) and Te Ao Marama (NZ Maori Dental Association). From the beginning, these key stakeholders engaged and supported what we were trying to do – raise the profile of the benefits of retaining Community Water Fluoridation to Ohope and Whakatane, investigate extending it to outlining rural areas i.e. Taneatua, Edgecumbe, Murupara and to provide reliable and credible fluoride information for our communities.

We developed a robust communications plan to include full page advertisements, media articles, sound-bites with the local radio stations,

meetings with community organisations, fluoride information pamphlets and cool, water blue tee shirts for District Health Board (DHB) staff to wear. We used up to date scientific information on community water fluoridation from the National Fluoridation Information Service (NFIS). The HPA provided fluoride information, research and resources, as well as timely media coverage and statements of support from key people, which were extensively used in our campaign. We had a full page advert in a local newspaper with comments from Russell Wills, Sir Peter Gluckman and local key stakeholders (including a Medical Officer of Health, the Chairperson for the Primary Health Alliance, the DHB Pricipal Dental Officer and an Oral Health Promoter) that ran for several weeks towards the end of our campaign.

A positive result saw Whakatane District retain Community Water Fluoridation in the Ohope and Whakatane areas with a possibility of extending to other rural areas. We reviewed and reflected on this piece of work, as it will help us in the future. I think we did a fantastic job.



**NFIS**  
National Fluoridation  
Information Service

NFIS CONSORTIUM PARTNERS:



## WHAT'S NEW @ [nfis.org.nz](http://nfis.org.nz)

This quarter we have added the below documents to our website.

On the NFIS documents page you will find:

- NFIS Advisory titled Dental fluorosis – is it more than an aesthetic concern? This advisory looks at the relationship between CWF and the development of dental fluorosis and concludes that CWF does not lead to anything more than very mild or mild dental fluorosis for a small number of people.

On the CWF Activities page you will find:

- Evidence Based Organisations | A link to the Royal Society of New Zealand and Office of the Prime Minister's Chief Science Advisor's report titled 'Health effects of water fluoridation: a review of the scientific evidence.'
- Media | NFIS letters to the Editor

### COMING SOON!

Keep an eye out on the FAQ page – we have new ones coming soon.