

When politicians and bureaucrats decide the science

Posted on [September 15, 2013](#) | [7 Comments](#) | [Edit](#)

The current separation of responsibility for water treatment (local body councils) and community health policy (District Health Boards) is a problem when considering fluoridation. This was illustrated by the Hamilton City Council's suspension of fluoridation of the city's water supply. In the end the City Council neglected its real responsibility (to find out and reflect the views of its citizens) and instead took over the health Board's responsibility for public health policy.

The council set itself up as a "tribunal" to make judgements on the science – a task they were clearly not equipped for.

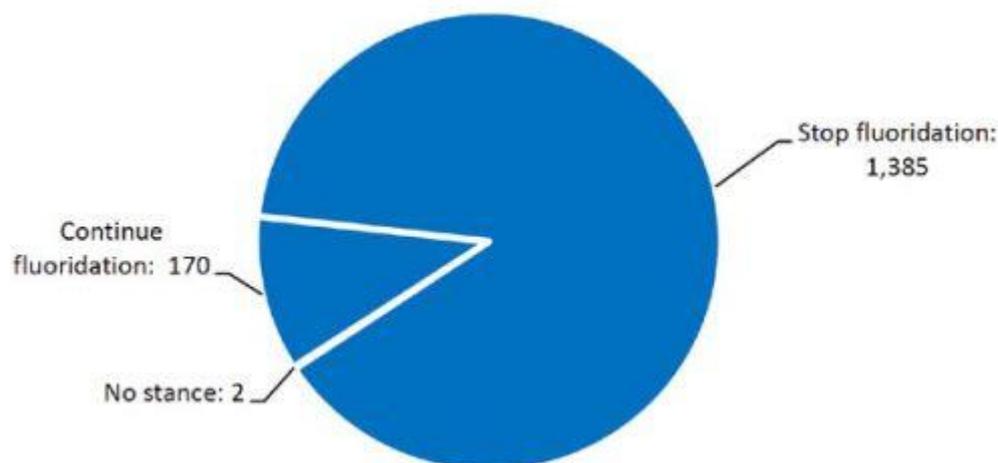
The "tribunal" process

Tegan McIntyre, the Hamilton City Council's Strategy and Research Unit manager, recently revealed a little of the process used by the council in its judgment of the science around fluoridation. She released *"a list of the key research papers referenced during the submission and tribunal process."* She also described the *"in-house evaluation"* of that research. This evaluation appeared to find the research acceptable if it was *"validated (peer reviewed) and/or published in an acknowledged peer-reviewed journals."*

You can download Tegan's list -[Scientific research supporting the stopping of fluoridation](#). The research seems to have been chosen using some sort of popularity index – she says *"Please note, this list does not cover all the reports referred as this was extensive but focuses on the ones most frequently cited."*

So, the unrepresentative nature of submissions is a bit of a problem to start with – the [summary of submissions](#) says –

"Of the 1,557 submissions received 1,385 (89%) seek Council to stop the practise of adding fluoride to the Hamilton water supply. 170 (10.9%) seek Council to continue the practise of adding fluoride and 2 (0.1%) submitters did not indicate a stance."



This in a city which showed 70% support for fluoridation at its 2006 referendum!

The validity of scientific research determined by this sort of popularity contest. Or by the way the councillors and council bureaucrats kept referring to “*experts on both sides*” as if it was simply a matter of weighing the submissions without any proper evaluation of the validity of claims made by the “experts.”

This approach is not acceptable for scientists who are used to critical consideration and in depth analysis of published research.

However, maybe it’s a natural way for bureaucrats without the scientific background necessary to make sense of a large number of submissions. I am sure the anti-fluoridation activist organisations realise this and I can understand why they use the approach of swamping such hearings with unrepresentative numbers of submissions, basically repeating the same message.

I will comment below on the documents in the list and the validity of the Council’s assessments.

1: Public Health Investigation of Epidemiological data on Disease and Mortality in Ireland related to Water Fluoridation and Fluoride Exposure by Declan Waugh.

Declan Waugh is a darling of the anti-fluoridation movement. He also made presentations (written and by Skype from Ireland) to the “tribunal” so I am not surprised to find it top of the list. Apparently the Council evaluated the document highly because it was a “*literature review collated by environmental scientist/consultant.*”

I haven’t had time to critically consider this specific document but in the scientific world Declan Waugh’s work is not so highly regarded. The [Irish Expert Body on Fluorides and Health](#) evaluated Waugh’s previous report – which he considers his “[main Report](#)” - ([Human Toxicity, Environment Impact and Legal Implications of Water Fluoridation](#)) and found it was “*not reliable.*” That while the “*report is expertly produced and is impressive in size and appearance. However, in spite of its presentation, its content is decidedly unscientific*” (see [Appraisal of Waugh report – May 2012](#)). Among specific points it made are these (see [Executive Summary of Appraisal of Waugh report – May 2012](#)):

- “*The allegations of ill health effects are based on a misreading of laboratory experiments and human health studies, and also on an unfounded personal theory of the author’s.*”

- *There is an absence of reporting of the bulk of the scientific literature which points to the lack of harmful effects from fluoridation.*
- *The views of authoritative bodies such as the World Health Organisation, the European Commission and others are significantly misrepresented.*
- *There is a misunderstanding of the evidence of benefits to oral health and with regards to enamel fluorosis.*
- *The view that there is a build up of fluoride in the environment is unfounded and not supported by the evidence.”*

Anyone willing to spend a little time can make their own evaluation of Declan Waugh’s scientific integrity simply by checking his approach to citations.

Two examples:

On page 74 of his “main report” we find the claim:

“Fluoride is known to be an inhibitor of enzymatic activity and research has identified fluoride as an inhibitor of homocysteine hydrolase.³⁶³“

The cited paper is:

Mehdi S, Jarvi ET, Koehl JR, McCarthy JR, Bey P. The mechanism of inhibition of S-adenosyl-L-homocysteine hydrolase by fluorine-containing adenosine analogs. J Enzyme Inhib. 1990;4(1):1-13.

Waugh is citing work about “fluoride-containing adenosine analogs” to make the claim about the fluoride anion. Extremely sloppy!

On Page 75 he claims:

“Current research has also identified the link between fluoride and atherosclerosis.³⁷⁰“

The cited paper is:

Li Y, Berenji G R, Shaba W F, Tafti B, Yevdayev E, Dadparvar S. Association of vascular fluoride uptake with vascular calcification and coronary artery disease. Nucl Med Commun. 2012 Jan;33(1):14-20.

Those familiar with the claims made by anti-fluoridation propagandists will recognise this paper.



It concluded “[18F]fluoride PET/CT might be useful in the evaluation of the atherosclerotic process in major arteries, including coronary arteries. “ Fluoride does not cause atherosclerosis but because fluoride is associated with calcium containing products of atherosclerosis – fluoride is only along for the ride - the authors proposed the technique for detecting atherosclerosis.

Waugh uses citations like a drunk uses a lamp post – for support rather than illumination. And this causes him to use the citations dishonestly – as evidence for claims that they actually don’t support. Try checking out a few citations yourself.

2: Ethics of Artificial Water Fluoridation in Australia by Niyi Awofeso

This appears to be an academic discussion of the ethical issues involved and comes out in opposition to fluoridation. Effectively it balances health equity against individual autonomy – a values/political judgement. The Council evaluated the document highly because it was “*Published in a peer-reviewed international journal.*”

I could not get the full text of this document so can’t really comment on it – except to conclude from the abstract that no scientific issues seem to be discussed.

3: Developmental Fluoride Neurotoxicity: A Systematic Review and Meta-Analysis by Anna L. Choi, Guifan Sun, Ying Zhang, and Philippe Grandjean

If you are familiar with the fluoridation debate you will recognise this paper – it is one of the most quoted by anti-fluoridation commenters on the internet. The Council evaluated the document highly because it was “*Published in a peer-reviewed research and news journal published with support from the National Institute of Environmental Health Sciences.*”

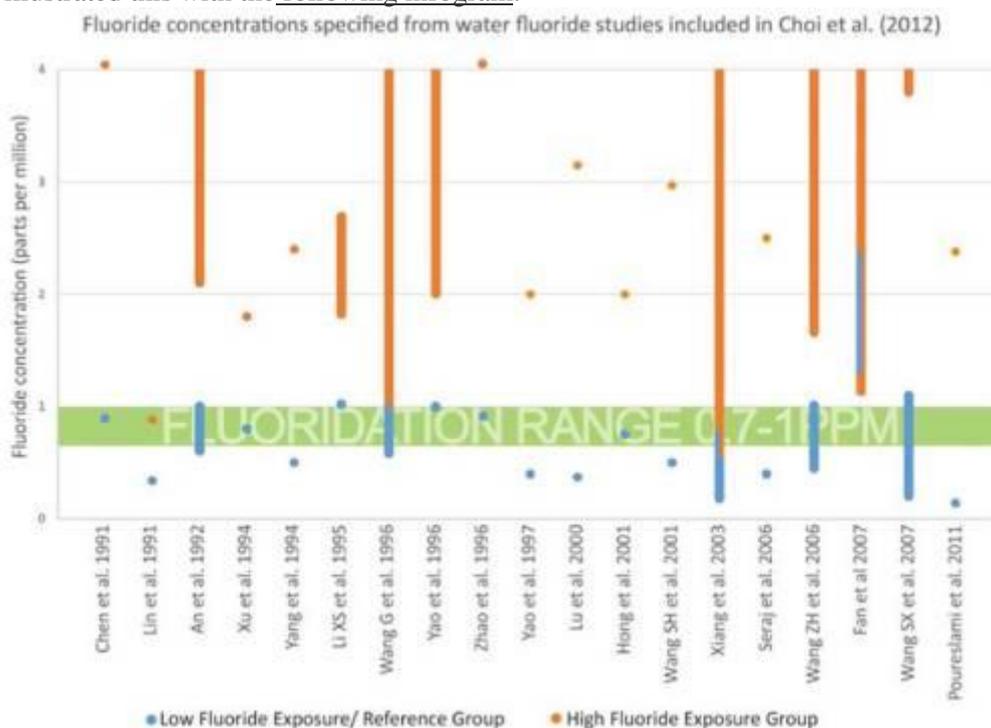
The study often seems to be quoted alongside outrageous claims like the Nazis used fluoride in the concentration camps to placate inmates. Or the US government adds fluoride to water to keep the population from revolting (see *Fluoridation and conspiracy theories*).

Because of the study’s misuse to attack fluoridation the authors warned in a [press release](#):

“These results do not allow us to make any judgment regarding possible levels of risk at levels of exposure typical for water fluoridation in the U.S. On the other hand, neither can it be concluded that

no risk is present. We therefore recommend further research to clarify what role fluoride exposure levels may play in possible adverse effects on brain development, so that future risk assessments can properly take into regard this possible hazard.”

One problem is that the effects on IQ were seen at high fluoride intakes (studies were of Chinese localities with a range of fluoride in drinking water from both natural and industrial pollution sources). The “control” ‘low fluoride exposure’ groups in this study are often exposed to fluoride concentrations comparable to that achieved by community water fluoridation schemes. Andrew Sparrow illustrated this with the following infogram:



Another problem is that no causal link between fluoride and IQ levels was sought or found. The fact that some of the locations suffered from industrial and coal pollution means these IQ effects, if real as social factors were not eliminated, could have been caused by any number of pollutants.

This work should not have been considered relevant to the question of fluoridation of Hamilton’s water supply – despite its popularity with anti-fluoridation submitters.

4: Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water by SCHER

The Council evaluated the document highly because it was *“Published by one of the independent non-food Scientific Committees which provides the European Commission with scientific advice.*

This review is often cited by both sides. Reasons for anti-fluoridation citing could include the clear assertion that fluoride *“is not an essential element for human growth and development.”* But the review does make clear the fluoride is beneficial for oral health. Misunderstandings often revolve around precise usage of words like *“essential.”*

Another reason could be the vague comparison between *“topical fluoride application”* and *“systemic”* intake of fluoride. This could enable anti-fluoridationists to claim fluoridated water is ineffective. However, the report does refer to the effectiveness of maintaining *“a continuous level of fluoride in the oral cavity.”* Fluoridated water does do this.

Again this illustrates the need for careful and critical evaluation of the scientific literature and the need to avoid simple claims which may incorrectly cite that literature. I just don't think politicians and bureaucrats can be relied on for that.

5: Estimated Dietary Fluoride Intake For New Zealanders by Peter Cressey, Dr Sally Gaw and Dr John Love

The Council evaluated the document highly because it *“was prepared as part of a Ministry of Health contract for scientific services.”*

It is a straightforward desktop study of the *“dietary fluoride intakes for a range of age and gender sub-populations based on New Zealand data.”* There are no surprises in the data, although the interest for anti-fluoridationists was probably their findings for formula-fed infants:

“The estimates for a fully formula-fed infant exceeded the UL [upper level of intake] approximately one-third of the time for formula prepared with water at 0.7 mg fluoride/L and greater than 90% of the time for formula prepared with water at 1.0 mg fluoride/L. However, it should be noted that the current fluoride exposure estimates for formula-fed infants are based on scenarios consistent with regulatory guidelines, rather than on actual water fluoride concentrations and observed infant feeding practices.”

They conclude *“the very young appear to be the group at greatest risk of exceeding the UL.”* However:

“the rarity of moderate dental fluorosis in the Australia or New Zealand populations indicates that current exceedances do not constitute a safety concern, and indicates that the UL may need to be reviewed.”

Anti-fluoridationist have made some mileage out of this, taking advantage of parent's understandable concerns about their children. They (and the Hamilton City Council in their initial advice to ratepayers) advised parent not to use fluoridated water to make up formulae when infants are fully formula-fed.

While the current expert advice is a little confusing it does take account of the need for review of current UL's and considers use of fluoridated water safe for fully formula-fed infants. However, they also advise that if parents are concerned they should use non-fluoridated water for part of the feeding – a peace of mind matter.

Again, I question if the “tribunal” really understood the complexity of the situation for fully formula-fed children. Even though health experts had explained the situation during the hearings they appear to have simply accepted the anti-fluoridationist's interpretation of this research.

Maybe it was the loudest, or more frequently presented, message which prevailed?

6: Fluoride in Drinking Water: A Scientific Review of EPA's Standards by National Research Council Of The National Academies Committee on Fluoride in Drinking Water.

The Council evaluated the document highly because the national research council is a “*government funded research entity.*”

This report usually get cited by both supporters and opponents of fluoridation – however, it actually does not have direct relevance to fluoridation of water supplies at the concentrations used in New Zealand (0.7 – 1.0 ppm) or in the US (0.7 to 1.2 ppm). “*The charge to the committee did not include an examination of the benefits and risks that might occur at these lower concentrations of fluoride in drinking water.*”

The NRC's task was to evaluate the scientific evidence to determine if the Environmental Protection Agency's maximum recommended levels of 4 ppm F should be lowered. They concluded it should be lowered to below 2 ppm to avoid any severe fluorosis. Anti-fluoride activists very often cite this report because of its thorough discussion of the negative effects of fluoride observed at high concentrations. They rarely admit that these effects are not reported for the concentration range used in public water fluoridation. This sort of scare-mongering often comes up in political debate but I

would expect a critical evaluation of the report would have recognised that it is not relevant to the Hamilton situation.

But then again, why should we expect politicians and bureaucrats to be capable of such critical consideration.

7: Water Fluoridation: a Review of Recent Research and Actions by Joel M. Kauffman

The Council evaluated the document highly because although the “*journal is not listed as an academic journal but as a professional association journal. [It]Has a double-blind peer-review process.*”

This was published in the Journal of American Physicians and Surgeons which really has no scientific standing. Issuepedia says “*the journal does not appear to be considered respectable by the scientific establishment*” because:

- It is not listed in the major literature databases (MEDLINE/PubMed nor the Web of Science).
- The World Health Organization found that a 2003 article on vaccination published in the journal had “a number of limitations which undermine the conclusions drawn by the authors.”
- Quackwatch lists it as an untrustworthy, non-recommended periodical.

Investigative journalist Brian Deer described the journal as the:

“house magazine of a right-wing American fringe group, the Arizona-based Association of American Physicians and Surgeons, which campaigns against US vaccination policies. The association is also vocal in opposing moves to combat fraud by private doctors, and medical professional efforts to reduce deaths from domestic firearms. In 2005, Time Magazine reported that the association had only 4,000 members. Although cited by Private Eye in stories attacking MMR, the association’s journal – recently renamed from the Medical Sentinel, presumably for the purpose of attempting to give its ideologically slanted material the aura of science – is barely credible as an independent forum for such material. No objective medical scientist with important information of any standard would submit it to such a publication, unless they couldn’t get it published anywhere else.”

So much for the Hamilton City Council high evaluation. But the paper itself is not at all convincing. It’s claims are poorly supported. It relies heavily on citation of sources from anti-fluoridation activists. Much of the citation is to just one book Fluoride: Drinking Ourselves to Death by Barry Groves – a staple anti-fluoridationist manual. Kauffman’s ideological motivation are obvious.

8: Prevention and reversal of dental caries: Role of low level fluoride by J. D. Featherstone.

The Council evaluated the document highly because it was in a “*ranking academic journal.*”

This paper is often cited by anti-fluoridationists as support for their claim that the “topical mechanism” of protection of existing teeth means that fluoridated water is ineffective. Yet the paper clearly includes “*fluoride in drinking water*” (as well as in “*fluoride-containing products*”) as operating via the topical mechanisms. Featherstone has also stressed drinking water in recent descriptions of the “topical mechanism” (*Topical Effects of Fluoride in the Reversal and Prevention of Dental Decay*). I can only conclude that some people have the wrong impression through superficial reading and their conclusions have been adopted by others without any checking. The Fluoridation Action network NZ (FANNZ) website even claims, incorrectly, that a topical effect of fluoridated water on teeth “*is contradicted by Featherstone.*”

Again, and again, I find this website very misleading in their use of citations.

The Hamilton City Council repeated this incorrect interpretation of topical mechanisms in their information leaflet for citizens (see *Topical confusion persists*) - a serious mistake which has been strongly criticised by health professionals. Did Council bureaucrats simply take the anti-fluoridationist use of this citation at their word – without any checking?

9: Why I changed my mind about water fluoridation by J. Colquhoun.

The Council evaluated the document highly because it was in a “*Peer-reviewed academic journal published by Johns Hopkins. Author: former dental officer in New Zealand during the 1970s and early 1980s*”

This is really a memoir, and not a high quality review. I found that it generally gave a lot of emphasis to longitudinal studies which show improvement in oral health over time for both fluoridated and unfluoridated areas. This may have surprised researchers at the time but is well recognised today and, by itself, is not evidence against the effectiveness of fluoridation. He also seems to be very selective, some would say cherry-picking, in referring to studies where comparison have been made between fluoridated and unfluoridated areas. They all appear to show either no effect, or that oral health was better in the non-fluoridated areas! (Anti-fluoridations regularly do such cherry-picking today).

Colquhoun presented the “topical” mechanism as an argument that fluoridated water is ineffective – a surprising interpretation for someone familiar with the literature. However, I guess his commitment to the anti-fluoridationist cause when he wrote this memoir might explain the faulty interpretation.

10: The mystery of declining tooth decay by Mark Diesendorf

The Council evaluated the document highly because it was published in “*Nature [which] is a prominent interdisciplinary scientific journal. Ranked the world’s most cited.*”

Although Diesendorf is an environmental scientist he is also an anti-fluoridation activist. In this paper he relies heavily on longitudinal studies, where oral health was found to improve in both fluoridated and unfluoridated areas over time. This is a well accepted observation, explained by improvements in diet and care of teeth, as well as availability of fluoridated toothpaste. I believe some of this improvement is also due to changes in dental practice involving less fillings.

Such research does not invalidate the also well recorded difference in oral health between fluoridated and unfluoridated areas observed in many good studies. However, the longitude observations still get trotted out as evidence against fluoridation by the anti-fluoridation activists.

Despite the high standing of Nature, this paper does come across as somewhat one-sided, maybe partly because of its age (1986).

Conclusions

The mistaken approach of the Hamilton City Council in its “tribunal” judgement of the science behind fluoridation illustrates the problems of the current situation where councils effectively make decisions about fluoridation because they manage water supplies. This can force them into a role for which they have neither the skills nor the training – making scientific and health judgements. Anti-fluoridation activists have taken advantage of this anomaly with a certain amount of success.

The Medical Association has called the debate on fluoridation to be raised to a national level. “*Medical Association chairman Dr Mark Peterson says it’s not ideal for it to be discussed at a regional level and not nationwide.*” This could be a way of avoiding the problems illustrated by the actions of some councils – including the Hamilton City Council.

The way scientific research was evaluated by the Hamilton City Council and its bureaucrats shows what can happen when such evaluations are not done critically by people with expertise in research and some understanding of the issues involved. Discussion and decision of the fluoridation issues at the national level could help ensure such evaluations are done by bodies better equipped for the job.

See also:

Similar articles on [fluoridation](#)

[Making sense of fluoride](#) Facebook page

[New Zealanders for fluoridation](#) Facebook page