

ATTACHMENT 4 – INTEMANN

Important studies excluded or dismissed in NHMRC's 2006 and 2017 fluoridation reviews

Background

NHMRC has self-evidently set itself up to limit its sources of information about fluoride consumption and fluoridation by how it defines acceptable studies. Specifically:

- Only accepting studies published in English – thereby excluding studies originating in non-English speaking countries where fluoride science is often more advanced;
- Considering human epidemiological studies only, not animal, in vitro, in silico, or even basic chemistry or biochemical knowledge based on clinical studies;
- Recommending fluoridation unreservedly, thereby encouraging expansion of fluoridation nation-wide and progressively cutting off its access to unfluoridated populations as comparators;
- Considering fluoride exposure only from fluoride in drinking water – thereby ignoring the toxicological importance of total fluoride from all sources, such as toothpaste, foods, beverages etc, and
- Considering only water with fluoride concentration no greater than 1.5 mg/L (on the grounds that higher concentrations are inapplicable to Australian conditions of 1mgF/L in water). That has made it reasonable to deny the need for toxicological assessment – the principle of which is that the 'dose' makes the 'poison' (not the concentration in water) – and hence deny the need to consider that (i) some Australians drink many volumes more water than others, and (ii) some Australians are more susceptible and sensitive to fluoride's effects.

By limiting itself to fluoride concentrations not significantly greater than used in fluoridation in Australia, NHMRC can deem it justifiable to: not measuring fluoride intake; not establish a benchmark dose; not study adverse health effects (because of assuming 1 mgF/L is safe for all), and not apply a safety factor to account for different susceptibilities in the population.

NHMRC's recommendations of safety reflect what NHMRC assumes must be safe in terms of fluoridation in isolation from the real world, where fluoride actually comes in many forms (e.g. air pollution, medication, etc.) and not just through water, and where wide-spread water fluoridation has now meant fluoride is present in basically all food processing and processed foods.

NHMRC's assumption of safety couched in such narrow terms has I believe led to the assumption or pretence that no actual safety investigations are needed.

Studies excluded or ignored

Following are some examples of relevant and potentially very useful studies and information that NHMRC has excluded or ignored.

Skeletal fluorosis

In 1991, the US Department of Health and Human Services estimated that adults living in communities water fluoridated at 1mgF/L routinely ingest between 1.6 and 6.6 mg of fluoride per day. That rate of ingestion is similar to what applies for Australians drinking fluoridated water. But importantly, it overlaps the dose that modern research indicates can cause arthritic symptoms and the early stages of skeletal fluorosis.

In its 1991 fluoridation review, NHMRC acknowledged the need for safety studies and made numerous recommendations, including concerning bone, such as:

- The incidence of bone cancer should be monitored in relation to fluoride exposure;
- There should be careful and systematic analysis of fluoride accumulation in bone, skeletal fluorosis, and any relationship with impaired renal function;
- There should be bone fluoride analysis on autopsy of individuals selected so as to assess fluoride accumulation over a lifetime, e.g. individuals with renal impairment or high volume water consumers.

The 1991 recommendations can be found in [Attachment 1](#), along with the recommendations from the 1999 NHMRC fluoridation review.

None of the 1991 recommended studies appear ever to have been undertaken.

In its 1999 fluoridation review, NHMRC reported:

“Since 1991 there have been 16 studies of water fluoridation and its effects on bone either BMD or fracture incidence. The pivotal cohort study of fluoridated water exposure and fractures or BMD demonstrated a trend for a decreased risk of hip fracture in France for water fluoride levels from 0.11ppm to 0.7ppm and an increase at 1ppm (Jacquim-Gadda, 1998.)”

NHMRC took no precaution from that 1999 warning, and continued to deem fluoridation unconditionally ‘safe’.

Osteosarcoma

There has been long-standing concern about the possibility that fluoride could be associated with osteosarcoma (bone cancer), based on biological plausibility. Namely, (i) Bone is the principal site of fluoride accumulation, particularly during the growth spurts of childhood; (ii) Fluoride is a mutagen when present at sufficient concentrations, and (iii) Fluoride stimulates the proliferation of bone-forming cells (osteoblasts), which may “increase the risk for some of the dividing cells to become malignant.” (NRC 2006, referenced below).

Several human epidemiological studies - Cohn 1992; Hoover 1991; Bucher 1991 – had found an association between fluoride in drinking water and the occurrence of osteosarcoma in young males.

Bassin 2001 unpublished, conducted and reported on an age-specific analysis of data from an existing study, and found that boys consuming fluoridated water at ages 6 to 8 years (the mid childhood growth spurt) had a statistically significant and “remarkably robust” risk of developing osteosarcoma during their teenage years. The analysis was later published (Bassin 2006), and its findings never refuted. Osteosarcoma is rare, but it appears from Bassin that its incidence is being exacerbated by widespread fluoridation.

By 2006, there were several published studies reporting the fluoride-osteosarcoma association:

- Bassin EB. (2001). *Association Between Fluoride in Drinking Water During Growth and Development and the Incidence of Osteosarcoma for Children and Adolescents*. Doctoral Thesis, Harvard School of Dental Medicine. [\[See study\]](#)
- Bassin EB, Wypij D, Davis RB, Mittleman MA. (2006). [Age-specific Fluoride Exposure in Drinking Water and Osteosarcoma \(United States\)](#). *Cancer Causes and Control* 17: 421-8.

- Bucher J.R., Heitmancik M.R., Toft J., Persing R.L. Eustis S.L. Haseman J.K. (1991). [Results and conclusions of the National Toxicology Program's rodent carcinogenicity studies with sodium fluoride](#). *International Journal of Cancer* 48(5):733-7.
- Cohn P.D. (1992). [A Brief Report On The Association Of Drinking Water Fluoridation And The Incidence of Osteosarcoma Among Young Males](#). New Jersey Department of Health and Environmental Health Services.
- Hoover R.N., Devesa S.S., Cantor K.P., Lubin J.H., Fraumeni J.F. (1991). [Time trends for bone and joint cancers and osteosarcomas in the Surveillance, Epidemiology and End Results \(SEER\) Program](#). *National Cancer Institute*. In: Appendix E and Appendix F of, Review of Fluoride: Benefits and Risks Report of the Ad Hoc Committee on Fluoride of the Committee to Coordinate Environmental Health and Related Programs US Public Health Service.
- McGuire S.M., Douglass C.W., Joshi A., Hunter D., DaSilva J. (1995). [Fluoride exposure and osteosarcoma](#). [Abstract] *Journal of Dental Research* 74:98.
- National Research Council (2006). Fluoride in Drinking Water: A scientific Review of EPA's Standards; National Research Council (NRC) 2006 of the National Academy of Sciences.
- National Toxicology Program [NTP] (1990). [Toxicology and Carcinogenesis Studies of Sodium Fluoride in F344/N Rats and B6C3f1 Mice](#). *Technical report Series No. 393. NIH Publ. No 91-2848*. National Institute of Environmental Health Sciences, Research Triangle Park, N.C.

Despite the emergent weight of evidence and the high quality of Bassin's analysis, NHMRC declined to recognise Bassin 2006 in its 2006 fluoridation review, and have never provided a justification for doing so. Bassin 2006 was again ignored in the NHMRC's 2017 fluoridation review by virtue of the start date that NHMRC adopted for study consideration in that review.

Is NHMRC intentionally ignoring evidence that questions the safety of fluoridation?

The evidence associating fluoride consumption with adverse effects on bone has continued to grow, as any efficient search will discover. Yet NHMRC continues to selectively ignore the evidence and declare fluoridation unconditionally safe.

NRC Review (2006)

In 2006, the US National Research Centre (NRC) published a comprehensive 3-year-long systematic review of fluoride science, conducted by a panel of 12 scientists and health professionals, concluding that fluoride exposure is associated with potential damage to teeth, bone, brain, endocrine system; thyroid, pineal, and more.¹

The NRC review importantly recommended the use of better methods to measure fluoride body burden by analysis of blood and urine, and not continue relying on purely epidemiological estimates based on fluoride concentration in water.

Despite representing an amazing resource of toxicologically important and useful research into fluoride's health effects, NHMRC excluded the entire NRC 2006 review from its 2007 fluoridation review on the grounds it was:

- "Not a scientific study" ([Attachment 3](#), NHMRC to PMHC 29 April 2016, 1st paragraph page 2) – which is terminological nonsense, and

¹ National Research Council. 2006. *Fluoride in Drinking Water: A Scientific Review of EPA's Standards*. Washington, DC: The National Academies Press
<https://www.nap.edu/catalog/11571/fluoride-in-drinking-water-a-scientific-review-of-epas-standards>

- Considered concentrations of fluoride outside NHMRC’s self-imposed upper limit of 1.5 mgF/L – which is toxicological nonsense.

On the latter point, had NHMRC actually desired to assess the toxicology of fluoride consumption, the NRC 2006 report would have provided an incredibly useful resource base of data for dose-response analysis at basically no cost.

Xiang et al

Of particular note among the studies that NHMRC excluded is Xiang et al, 2003,² which compared the IQ of two villages:

- Low fluoride village – average fluoride in well water = 0.36 mgF/L (range 0.18 – 0.76 mgF/L)
- High fluoride village – average fluoride in well water = 2.5 mgF/L (range 0.57 – 4.5 mgF/L)

This study was not available in English at the time of the NHMRC 2007 review, but it is obviously highly relevant to Australian rates of fluoridation at 1 mgF/L and should have been considered in the 2016 NHMRC review. However, it included fluoridation at concentrations above NHMRC’s own self-imposed cut-of limit of 1.5 mgF/L, and was excluded from consideration in the 2016 fluoridation review for the questionable reason of being a “wrong intervention” (NHMRC 2016, p. 423).

Xiang 2003 was certainly strong enough scientifically: having a clearly comparative low and high fluoride group; with strong controls for confounding factors (including lead, arsenic and iodine intake), and producing statistically significant results.

It found a loss of 5 – 10 IQ points across the range of ages in the high fluoride village compared to the low fluoride village, finding a clear dose-response.

However, perhaps inconveniently, it showed adverse effects in the range 0.75 and 1.5 mgF/L – which includes the 1 mgF/L concentration at which Australia fluoridates - indicating likely harm under Australian conditions and no margin of safety.

NHMRC’s 2017 fluoridation review

In 2014 NHMRC selected 1 October 2006 as the earliest publication date for studies to be included in its 2017 fluoridation review, which automatically excluded the important Bassin 2006 study and NRC 2006 review from being submitted for re-consideration. In consequence, NHMRC has never evaluated the evidence they offered, and from an observer’s perspective that seems intentional in regards to the 2017 NHMRC review, by virtue of NHMRC’s own chosen start-date for publications to be considered.

Many other studies which could have reliably informed NHMRC on fluoride’s health effects were excluded in their 2017 reviews by virtue of NHMRC’s narrow definition of acceptable studies.

Notable exclusions in the 2017 review:

² Xiang et al, 2003. “Effects of fluoride in drinking water on children’s intelligence”. *Fluoride*, vol 36, no. 2, pp. 84 – 94. (The journal ‘Fluoride’ is often dismissed by fluoridation proponents as biased and one-eyed because it offers studies critical of fluoridation safety. It has however also provided what could have been seen as a valuable resource by publishing English translations of fluoride-related studies from non-English-speaking country publications).

- Failed even to mention the highly significant Harvard meta-analysis (Choi, 2012), which analysed 27 fluoride toxicity studies and accounted well for confounding variables, reporting that 26 of the 27 studies showed a notable dose-response across a potential 7-point drop in IQ;
- Failed even to mention a significant study by Malin and Till (2015) associating fluoridation with ADHD, despite that study fulfilling all relevant criteria for inclusion and having been brought specifically to NHMRC's attention in 2016;³ and
- Referenced only 15 of the at-least 50 fluoride IQ studies that were then both available and highly relevant to fluoride neurotoxicity, all showing neurodevelopmental damage from fluoride in utero.⁴

While ignoring those higher-quality studies just mentioned, astoundingly NHMRC relied instead on the New Zealand Broadbent 2014 study, which has itself been roundly criticised for failing to account for confounding factors including lead, iron, arsenic; fluoride supplements, and maternal IQ.

Citing Broadbent as its sole reference in support, the 2017 NHMRC review concluded there is “no association between water fluoridation at current Australian levels and the cognitive function of children or adults”.

That conclusion would have been indefensible had NHMRC actually considered the highly relevant studies and reviews named above, that NHMRC seems to have intentionally excluded.

Conclusion - if you don't look you won't find

NHMRC is only able to continue in its defence of the safety of fluoridation by limiting the evidence it considers, specifically by:

- ignoring its own earlier recommendations for systematic precautionary safety studies to be conducted, and
- defining relevant studies very narrowly in terms of: English language; date of publication; only a narrow range of fluoride concentrations, and no consideration of actual daily fluoride intake from any source .

That situation has alarming consequences for highly-fluoridated Australia, basically ensuring incomplete advice based on arbitrarily narrow consideration of available fluoridation evidence.

I will defend my statements on this matter in court if required.

³ Malin AJ, Till C. Exposure to fluoridated water and attention deficit hyperactivity disorder prevalence among children and adolescents in the United States: an ecological association. *Environ Health*, 2015, 14: 17.

⁴ Of note, as at August 2021 there are now 70 fluoride IQ studies showing neurodevelopmental damage from fluoride in utero. The 70th study, US NIH funded and released late August 2021, is Cantoral et al. “Dietary fluoride intake during pregnancy and neurodevelopment in toddlers: A prospective study in the progress cohort”, *NeuroToxicology*, Volume 87, December 2021, Pages 86-93, 2021.

<https://www.sciencedirect.com/science/article/pii/S0161813X21001005?via%3Dihub>

The Cantoral study reports that fluoride from foods and beverages consumed during pregnancy is associated with lower cognitive neurodevelopment in boy babies, even when fluoride is ingested at recommended levels. Specifically, a 0.5 mg increase in total dietary fluoride intake during the third trimester and across pregnancy was associated respectively with a 3.10-points and 3.46-point lower cognitive score in boys.