PSGR

Physicians & Scientists for Global Responsibility

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Submission

Inquiry into Supplementary Order Paper No. 38 on the Health (Fluoridation of Drinking Water) Amendment Bill

Submitted to the:

Committee Secretariat
Health Committee
Parliament Buildings
Wellington

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PSGR would welcome an opportunity to speak to this submission.

Physicians and Scientists for Global Responsibility Charitable Trust (PSGR) work to educate the public on issues of science, medicine, technology (SMT). PSGR work to encourage scientists and physicians to engage in debate on issues of SMT, particularly involving genetics and public and environmental health.

PREFACE

This Submission is in two parts:

<u>Part One</u> addresses evidence that many serious relevant considerations are not addressed in departmental policy formulation stages underpinning the Bill; and

<u>Part Two</u> highlights breaches of Parliament's LAC Guidelines as well as breaching fundamental public law principles and fiduciary obligations to both Parliament and therefore the New Zealand public.

Part Two reasons that this is not a proper basis for public confidence in giving statutory sole decision-making powers to the same department as foreshadowed in the SOP into which the Health Committee is inquiring.

Introduction

1. PSGR considers that the Supplementary Order Paper (SOP) amendment to confer power to the Director-General of Health to direct local drinking-water suppliers to add (or not to add) is *unreasonable* because it gives powers for one public servant in one department to require known bio-accumulative toxins to be put into public water supplies. To do so, when the claimed benefits of doing that are so minor as to be *de minimis*; seems to be absurd; especially when compared with the probabilities of harm to people and the environment are proportionately unacceptable.

2. Such action seems to assume that a medical treatment - the adding of sodium silicofluoride (SSF), or similar - will be of approximately equal benefit or risk to all citizens. However, to not take into account individual vulnerability is unacceptable and extremely hazardous. This appears to be absurd.

2.1. PSGR observes that the Office of the Prime Minister's Chief Science Advisor documentation refers to many studies that consider the data on claimed benefits to be inconclusive and that many newer studies on risks to health were excluded from that documentation.

2.2. From this, the Health Committee can infer that there is no consensus on whether fluoride is harmful, and in particular, whether fluoride presents a neurodevelopmental risk.

2.3. Conversely, no conclusion may be drawn on *absence of harm*.

2.4. Experts in oral health, clinical dentistry and toxicology appear to have applied a somewhat narrow view of toxicology around single substances. This appears to have tainted the current policy formulation approach; and that includes the associated peer review.

2.5. The issue of potential neurotoxicity of fluoride may have more relevance to endocrine pathways, yet no experts in endocrinology, including neurodevelopmental endocrinology, appeared to participate in either analysing the data or in the peer review process or in the policy formulation process.

2.6. While this submission predominantly concerns the human health risk, we note the potential for fluoridation of community water supplies to present a long-term environmental health risk. PSGR are unable to identify forecast modelling on the potential for firstly, the potential for fluoridation of drinking water to accelerate the bioaccumulation of fluoride in the environment[1], following release through liquid and solid waste streams. Secondly, PSGR have been unable to identify analysis exploring the efficacy of treatment in existing fluoridated regions. This is of concern as there is potential for fluoride bioaccumulation in fresh and groundwater beyond the capacity of the environment to degrade.[2]

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[1] Han et al 2021. Chemical Aspects of Human and Environmental Overload with Fluorine. Chem. Rev. 121:4678−4742

[2] Close & Humphries 2019. National Survey of Pesticides and Emerging Organic Contaminants (EOCs) in Groundwater 2018. CSC19016

3. What does that mean for the Health Committee?

3.1. The principal Act, the Health Act, directs decision-makers to act to protect public health.

3.2. With a lack of scientific consensus, with evidence of potential for harm, we recommend a precautionary approach is adopted, and that power to fluoridate remains a local, democratic project and is not transferred to the Director-General of Health.

3.3. Recommendations are noted on page 22.

PART ONE

BREACHES OF POLICY FORMULATION REQUIREMENTS

4. Health Committee members have a duty to consider issues of relevance.

4.1. An approach which exclusively relies on principles of clinical dentistry may be deficient because it appears to rely on a longstanding (legacy) approach that was never properly reviewed. The legacy approach of the Ministry of Health (MoH) to engage experts with expertise predominantly in oral health, toxicology and may be deficient.

4.2. An increasing body of scientific literature draws attention to the potential neurological (and in particular, neurodevelopmental) impact from exposures to fluoride.

4.3. Indeed, increasing scientific evidence regarding the adverse effects of fluoride appears to have underpinned a prominent court case in the United States. Importantly, '*the court is considering whether it can decide that risk, without solid proof that fluoride causes neurological effects.*'[3]

4.4. The judges' position appears to reflect key facets of the precautionary principle:

> *When human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm.*[4]

5. It appears that Parliament may have been misled.

5.1. All documents produced by the MoH appear to underpin its established policy of putting fluoride into public water supplies. Thus, the MoH approach to policy gives little if any consideration to (and therefore due weight) to problems of long-term serious morbidities.

5.2. The Ministry's approach to policy formulation[5] [6] excluded consideration of safer and more effective policy options with broader public health benefits. Potential costs to the environment from sustained emissions[7] were not discussed.

5.3. Further, MoH policy formulation chose only the risk of dental fluorosis as a control benchmark – effectively excluding from due consideration other relevant options

5.3.1. The Ministry's claimed potential for dental caries to be alleviated by fluoride in some groups, appears outweighed by the uncertainty concerning life-long health risks to both unborn babies through to 6-year-olds.

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[3] Bloomberg Law, June 18. 2020. New Health Data Puts EPA's Fluoride Toxicity Trial on Ice.
[4] UNESCO 2005, World Commission on the Ethics of Scientific Knowledge and Technology. Page 14.
[5] Coleman, J. (2016?) Decision-Making on the Fluoridation of Drinking-Water Supplies. https://www.health.govt.nz/system/files/documents/pages/cabinet-paper-decision-making-fluoridation-drinking-water-supplies.pdf
[6] Moore & Poynton 2015. Review of the benefits and costs of water fluoridation in New Zealand. Sapere Research Group. https://www.health.govt.nz/system/files/documents/publications/review-benefits-costs-water-fluoridation-new-zealand-apr16.pdf
[7] Han et al 2021. Chemical Aspects of Human and Environmental Overload with Fluorine. Chem. Rev. 121:4678−4742

5.3.2. Therefore, this legislation has potential to present an *elevated risk* of harm to the embryo (to 9 weeks), throughout the foetal stage and through childhood.

5.4. Significantly, the WHO has recognised these developmental *windows of vulnerability*[8]to the effect that:-

5.4.1. The timing and amount of dose of a substance (or lack thereof) can produce the conditions for long term harm. Many biological mechanisms, or co-factors overlap, such as oxidative stress and endocrine disruption which has the potential to alter biochemical, molecular, epigenetic and gene expression processes. [9]

5.5. Substantial gaps in Ministry policy formulation coverage of health risks of fluoride place Parliamentary decision-makers, including select committees, at 'sea without an anchor'.

5.5.1. The Office of the Prime Minister's Chief Science Advisor (PMSCA), and the Royal Society Te Apārangi draw extensively from Guth and colleagues. We observe that the lead author is strangely on the peer review panel; a clear conflict of interest. The Guth papers, are published in the Archives of Toxicology.

5.5.2. Toxicological perspectives approach remains at a distance from the potential for endocrine disrupting levels of chemicals to act synergistically and produce feedback loops at the delicate levels of hormone function. While this is convenient for deriving a claimed (safe) regulatory level, failure to consider and give due weight to systemic interdependencies, may increase risk for infants and children.

6. Evidence suggests fluoride has endocrine-disrupting potential.

6.1. An authoritative body of literature supports the potential for fluoride to interfere with hormonal pathways, particularly iodine,[10] therefore, claims that fluoride is not harmful appear increasingly unsound and misleading.

6.2. A 2020 study suggests that the presence of exposure to fluoride during the first and second trimester exposures may produce neurological and psychomotor delays.[11] Prenatal exposures may be the most detrimental. In addition:-[12]

6.2.1. Thyroid receptor functioning may play a critical role.

6.2.2. Thyroid hormone action is considered to be the target of more chemicals than any other endocrine system.[13]

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[8] Etzel 2020. The special vulnerability of children. International Journal of Hygiene and Environmental Health. 227:113516

[9] Wright 2018. Environment, susceptibility windows, development and child health. 29:2;211–217.

[10] Waugh, D.T., Fluoride Exposure Induces Inhibition of Sodium/Iodide Symporter (NIS) Contributing to Impaired Iodine Absorption and Iodine Deficiency: Molecular Mechanisms of Inhibition and Implications for Public Health, Int. Jnl. of Environmental Research and Public Health, 2019.

[11] Jiménez et al 2020 In utero exposure to fluoride and cognitive development delay in infants. NeuroToxicology. 59:65-70

[12] Xu et al 2020. Fluoride exposure and intelligence in school-age children: evidence from different windows of exposure susceptibility. BMC Public Health.20:1657

[13] For discussion see Professor Barbara Demeneix

6.2.3. Iodine plays a major role in thyroid hormone function. The risk of iodine deficiency is particularly problematic in prenatal periods.[14]

6.2.4. Gene expression is modulated through epigenetic mechanisms, which often happen at hormone level.[15]

6.2.5. Studies concerning the potential for fluoride to have neurotoxic potential, which do not appear on the PMSCA fluoride site, concluded:

6.2.5.1. 'Exposure to increasing levels of fluoride in tap water was associated with diminished non-verbal intellectual abilities; the effect was more pronounced among formula-fed children' [16]

6.2.5.2. 'Our study suggests low-moderate fluoride exposure is associated with alterations in childhood thyroid function that may modify the association between fluoride and intelligence. [17]

6.2.6. Other hormonal pathways are implicated. Fluoride has been shown to alter levels of luteinizing hormone, testosterone, with sex-based differences.[18]

6.3. Scientists consider that the predominant health burden from endocrine disruptors appears to relate to brain function, and exposures arising in vulnerable developmental periods, which impact IQ, behaviour and learning ability.[19]

6.4. Officials are required to comply with a number of fundamental principles when they provide policy advice to Parliament. The cost of endocrine disruption to brain development has not been considered.

7. Fluoride is not a nutrient.[20]

7.1. The risk to from conception to age 6 cannot be properly evaluated because it is extraordinarily difficult to assess when hormonally driven harm starts. There is no known safe level of exposure, based on 21st century scientific understanding of biological risk. In moments of uncertainty, limiting uncertain exposures may be the best policy.[21]

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[14] Demeneix 2019. Evidence for Prenatal Exposure to Thyroid Disruptors and Adverse Effects on Brain Development. Translational Thyroidology / ETJ Prize Lecture 2019Eur Thyroid J. 8:283–292

[15] Demeneix B., Toxic Cocktail. Oxford University Press, 2017. Page. 7.

[16] Till et al 2020. Fluoride exposure from infant formula and child IQ in a Canadian birth cohort. Environment International. 134:105315

[17] Wang et al 2020. Thyroid function, intelligence, and low-moderate fluoride exposure among Chinese school-age children. Environment International. 134:105229

[18] Hao et al 2009. Effect of Fluoride on Human Hypothalamus-Hypophysis-Tesis Axis Hormones. Journal of Environment and Health. 26:4;838-840

[19] Attina et al 2016. Exposure to endocrine-disrupting chemicals in the USA: a population-based disease burden and cost analysis. Lancet Diabetes Endocrinol 2016; 4: 996–1003. Lancet Diabetes and Endocrinology, 4(12), 996-1003.

[20] European Food Safety Authority (EFSA). Scientific Opinion on Dietary Reference Values for fluoride. EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). EFSA Journal 2013;11(8):3332.

[21] Bourguignon et al 2018. Rationale for Environmental Hygiene towards global protection of fetuses and young children from adverse lifestyle factors. Environmental Health 17:42

7.2. In pregnancy, circulating fluoride passes the placenta and reaches the foetus. The fluoride concentration in the placenta can be higher than in maternal blood. The variance in individuals reflects natural physiological variation, exposing a foetus to differential risk.[22]

7.3. Fluoride may be an unwitting strawman that leaves decision-makers, including the Health Committee vulnerable to underestimation of both exposures and fluoride as a 'catch-all' for oral health. For example:

7.3.1. Biologically, baby teeth contain less enamel. Studies emphasise fluoride strengthens the enamel of baby (deciduous) and permanent teeth. However, there are remarkable differences in the enamel substrate with baby teeth having a much thinner layer.[23]

7.3.2. The skeleton of a newborn contains only about 5-50 mg of fluoride[24]. Fluoride is bioaccumulative. This remains rarely addressed.

7.3.3. Fluoride increases risk of bone fractures, and bone tissue disorders, particularly when other nutritional deficiencies are present.[25]

7.3.4. Cressey notes that formula fed babies are particularly at risk from higher exposure.

7.3.5. In New Zealand, 5-year-olds express higher levels of fluoride in their urine than adults.[26] Urinary levels can be extrapolated to estimate intake values.[27]

7.3.6. In children, 55% of fluoride is retained in tissues.[28]

7.3.7. The EFSA advises that at 1mg per day 10% of the population is subject to dental fluorosis. Narrow interpretations of fluoride in people, should take into account fast-increasing environmental exposures to fluorine.

8. The Health Committee have authority to make broader recommendations:

8.1. Ministry policy has, for some three decades positioned tooth decay as being firstly, an oral care issue (a behavioural issue), and secondly, a fluoride deficiency issue. At some distance is 'healthy eating'.[29] Recent promotional literature maintains this narrative, and indeed, the PMCSA website asserts that there is 'insufficient levels of fluoride in New Zealand water'.

8.2. Because fluoride is not a nutrient this policy position is unsound and highly misleading and deceptive.

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[22] EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332

[23] Oliveira et al 2010. Microstructure and Mineral Composition of Dental Enamel of Permanent and Deciduous Teeth. Microscopy Research and Technique. 73:572–577

[24] European Food Safety Authority (EFSA). Scientific Opinion on Dietary Reference Values for fluoride. EFSA Panel on Dietetic Products, Nutrition, and Allergies (NDA). EFSA Journal 2013;11(8):3332. Page 12.

[25] Fordyce 2011. Fluorine – Human Health Risks. Nriagu J O (ed.) Encyclopedia of Environmental Health, Volume 2, pp. 776–785

[26] tMannetje et al 2018 Report on the Biological Monitoring of Selected Chemicals of Concern Results of the New Zealand biological monitoring programme, 2014-2016. Centre for Public Health Research. Technical Report 2017-1

[27] Villa et al 2010. Relationships between Fluoride Intake, Urinary Fluoride Excretion and Fluoride Retention in Children and Adults: An Analysis of Available Data. Caries Res 2010;44:60–68

[28] EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332

[29]Oral health https://www.healthed.govt.nz/search?topic%5B0%5D=14&type=resource&mode=picture-view

8.3. The current policy focus on biomedical oral care (teeth cleaning and fluoride) appears to have uncoupled dental disease from its social and obvious sugar-diet roots.

8.4. A reasonable person might conclude that current Ministry policy formulation on dental health is materially deficient and therefore a risk to public health. It evades consideration of interdependent and multimorbid disease conditions in populations most at risk from dental caries.[30] [31]

8.5. Dietary and regulatory policies designed to ameliorate harmful dietary exposures and increase capabilities to access healthier food may have a sounder evidence base for shaping regulatory policies for newborn and childhood dental health[32] [33] than fluoridation, and would, in addition to dental protection, confer other health benefits, including reducing the likelihood of multimorbidity in childhood.[34]

9. Why was Ministry policy formulation so inappropriate?

9.1. Early Ministry policy formulation, that gave rise to its legacy approach to fluoridating public water supplies, has not been joined by consideration of a wider array of options for addressing dental caries problems.

9.2. Policy formulation appears to have excluded due consideration of both ever-greater environmental exposures and other policy options which favour safe and effective oral health options. Such other options also seem to offer solutions to other significant public health problems, for example diabetes, obesity, mental health, metabolic syndromes and cancer.

9.3. It was arguably not appropriate for the PMCSA to seek a somewhat generalised report from the Royal Society Te Apārangi. The Royal Society demonstrated in its report that it had no grasp of required principles necessary for formulating the taking of regulatory powers in the public sector. The Royal Society does not operate under legislation that requires the society to comply with Parliamentary and public law principles to protect health.

9.4. We observe that only one of the 12 peer reviewers of the PMCSA / Royal Society Te Apārangi has expertise outside oral health and clinical dentistry. This has limited the scope and the potential to address fundamental drivers of dental health.

9.5. This expertise focus may have led decision-makers to ignore relevant confounders – variables that are risk factors for using fluoride as an intervention. Public health policy cannot be a political matter; rather it is a matter that involves the rigour of public interest science – especially with emphases on probabilities of harm to people.

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[30] Health and Independence Report 2017. Director-General of Health's Annual Report on the State of Public Health. Ministry of Health.
[31] Russell et al 2020. Multimorbidity in Early Childhood and Socioeconomic Disadvantage: Findings From a Large New Zealand Child Cohort. Academic Pediatrics 20:5;619-627.
[32] Policy Brief. Options to reduce Sugar Sweetened Beverage (SSB) consumption in New Zealand. Pacific Health Dialog. 20:1
[33] Robertson et al 2018. Supporting a sugar tax in New Zealand: Sugar sweetened beverage (‘fizzy drink’) consumption as a normal behaviour within the obesogenic environment. Peer J. 6: e5821.
[34] Russell et al 2020. Multimorbidity in Early Childhood and Socioeconomic Disadvantage.

9.6. Prominent public health advocates[35] [36] long concerned with oral health seem to have not played an adequate and weighty role in the Ministry's formulation of policy.

9.7. The Health Committee do not have access to a scientific institute that might undertake the basic science to research the hormonal human health effects from environmental chemicals. Despite the presence of four brain research institutes, the potential for environmental chemicals and heavy metals to damage brain health, which includes neurodevelopmental damage including IQ, behavioural and learning difficulties, remains unexplored.

9.8. Elsewhere research continues apace.[37] [38] [39]Such as, for example, research to document the potential for common chemicals in human amniotic fluid to disrupt brain development.[40]

9.9. Parliament seems to be left 'in the dark' as New Zealand lacks any policy on endocrine disruption, and the risk to the embryo, the foetus and child, from early hormone level exposures. (PSGR notes many medications are targeted at the hormone level, and therefore the potential for receptors and synthetic chemicals to interact is well known to the medical community).

9.10. This policy vacuum presents a public health risk.

10. A summary of serious policy formulation omissions.

10.1. The Office of the PMCSA's Website notes that New Zealand and Australian upper levels for children are higher than European values (See Appendix Figures 1 &2).

10.2. In 2017 a technical report was initiated to review nutrient reference values (NRVs) as adequate intake (AI) and upper level (UL) for infants and young children. [41]

10.3. That initiative appears to have been taken following evidence that dietary fluoride sources plus fluoridated water together, resulted in an exceedance of the already established acceptable upper level of intake for infants.

10.4. What appears strange, is that the adequate intake (AI) of 0.05mg/kg is based on epidemiological studies performed before the 1970s. These studies are constrained to the potential for caries.[42]

10.5. The Report noted that 'infants and children under the age of 8 years consuming fluoridated water were the group most likely to exceed the UL for fluoride of 0.1 mg/kg bw/day'.

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[35] Fizz. Sundborn G., Beaglehole R., Jackson R., Swindburn B. Thornley, S. Merriman T.

[36] New Zealand Beverage Guidance Panel. http://www.fizz.org.nz/pdf/research/17%20Policy%20Brief.pdf

[37] Kassotis et al 2020. Endocrine-disrupting chemicals: economic, regulatory, and policy implications. The Lancet, 8, 719-730

[38] Kahn et al 2020. Endocrine-disrupting chemicals: implications for human health. The Lancet 8:703-718

[39] Kumar et al 2020. Environmental Endocrine-Disrupting Chemical Exposure: Role in Non-Communicable Diseases. Front. Public Health. doi: 10.3389/fpubh.2020.553850

[40] Fini 2017. Human amniotic fluid contaminants alter thyroid hormone signalling and early brain development in Xenopus embryos. Scientific Reports 7:43786

[41] Australian and New Zealand Nutrient Reference Values for Fluoride. A report prepared for the Australian Government Department of Health and the New Zealand Ministry of Health. (2017)

[42] EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332. P.1

10.6. A new higher upper level (UL) of intake was derived from the 'critical end point for severe fluorosis.[43] (See Appendix Figure 3)

10.7. Neurotoxicity was dismissed as not being a relevant consideration. Also dismissed was harm to the thyroid, risk of ADHD, and risk to people's kidney's.[44]

10.8. Strangely, the 2017 Report cites an EFSA 2005 paper, despite the fact that EFSA had recently conducted a review (2013). [45]

10.9. The 2013 EFSA was extraordinarily detailed in discussing the dietary burden and risk to infants. The levels established were much lower than the NZ/Au levels. (See Appendix Figure 4)

10.10. The scientists involved in the reassessment were principally experts in oral health, toxicology and clinical dentistry.

11. Royal Society Te Apārangi are correct.

11.1. They state: 'While there is some evidence that high fluoride concentrations may have an adverse effect on developing brains, there is no convincing evidence of neurological effects at fluoride concentrations achieved by fluoridation of water supplies in Aotearoa New Zealand.'

11.2. This is because only one paper appears to have been produced.[46] Broadbent et al's paper demonstrated a predisposition which clearly favoured community water fluoridation. With this arguable bias, the paper cannot be taken as authoritative and suitable to inform policy.

11.3. It is not surprising that the current estimate of risk in Europe, would advise a lower daily fluoride intake than New Zealand, as there are more rigorous consultative procedures in place. However, this remains based on a balance of efficacy for caries protection, and recognition that 'it may not be possible to achieve effective fluoride-based caries prevention without some degree of dental fluorosis' and noting 'in severe cases the teeth are stained brown, show enamel defects, are pitted and fragile, and may be deformed or break'.[47]

12. The greater potential for risk – sustained chemical burdens from conception.

12.1. The modern embryo, foetus, and child are exposed to endocrine disruptors from conception[48], while pesticides and heavy metals in consumer foods contaminate diets, from conception.[49] [50]

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[43] Page 57.
[44] Pages 25-26, 31.
[45] EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332
[46] Broadbent et al., "Community Water Fluoridation and Intelligence: Prospective Study in New Zealand," American Journal of Public Health 105, no. 1 (2015).
[47] EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332. Page 11.
[48] Demeneix, B., & Slama, R. (2019). Endocrine Disruptors: from Scientific Evidence to Human Health Protection. requested by the European Parliament's Committee on Petitions. PE 608.866 - March 2019. Brussels: Policy Department for Citizens' Rights and Constitutional Affairs.
[49] U.S. House of Representatives, February 4, 20121. Baby Foods Are Tainted with Dangerous Levels of Arsenic, Lead, Cadmium, and Mercury. Subcommittee on Economic and Consumer Policy Committee on Oversight and Reform
[50] FSANZ 25th Australian Total Diet Study. Appendices.
https://www.foodstandards.gov.au/publications/Documents/25th%20Australian%20Total%20Diet%20Study%20appendices.pdf

12.2. A Chinese study demonstrated how mitochondrial DNA is altered when low levels of fluoride in 7-13 year olds and that gender could modify this response.[51] Mitochondrial DNA alterations are cofactors in many diseases, how fluoride might impact mitochondrial health, particularly at younger ages, remains unknown. Contrary to a Cabinet paper[52], gender may be a risk factor.

12.3. The current representation of fluoride ignores the potential for far greater risk during vulnerable prenatal and childhood windows, when rapid development results in the higher intake, absorption and bioaccumulation of both beneficial and harmful content.

12.4. Preschool and school age children are presenting with a greater range of neurological deficits including IQ loss, behavioural problems and learning difficulties.

12.5. This paper has focused on exposures to the under 6 age group, however, artificial fluoride exposures, including potential for bioaccumulation are risk factors for older groups.

13. Increased levels of developmental disabilities[53], ADHD and autism spectrum[54] in our young people.

13.1. Optimum neurological health is dependent on a safe, healthy environment. Optimum nutrition, and minimal exposures to toxic - including endocrine disrupting - substances, sets the framework in place to build resilience for the stresses of daily life.[55] [56] [57]

13.2. Multiple complex conditions – or multimorbidity - is an increasing problem in our children.[58] New Zealand has the highest rate of obesity in the OECD.[59] Associated conditions of obesity include diabetes, cancer, adverse mental health.

13.3. Children with ADHD are likely to present with associated comorbidities. [60] For example, the following can be considered as an example demonstrates the complexity that is required when deciding to medicate a population:

13.3.1. Kidney failure can present as a comorbidity of ADHD

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[51] Zhou et al 2019. Low-to-moderate fluoride exposure, relative mitochondrial DNA levels, and dental fluorosis in Chinese children. Environment International 127-70-77

[52] Coleman, J. (2016?) Decision-Making on the Fluoridation of Drinking-Water Supplies. https://www.health.govt.nz/system/files/documents/pages/cabinet-paper-decision-making-fluoridation-drinking-water-supplies.pdf

[53] Zablotsky et al 2019. Prevalence and Trends of Developmental Disabilities among Children in the United States: 2009–2017. Pediatrics. 2019;144(4):e20190811

[54] Antshel & Russo 2019. Autism Spectrum Disorders and ADHD: Overlapping Phenomenology, Diagnostic Issues, and Treatment Considerations. Curr Psychiatry Rep. 21:34

[55] Rucklidge & Kaplan 2021. The Better Brain. Vermilion.

[56] Trasande 2019. Sicker, Fatter, Poorer. Houghton Mifflin Harcourt.

[57] Demeneix B., Toxic Cocktail. Oxford University Press

[58] Russell, J., Grant, C., & Morton, S. (2019). Multimorbidity in Early Childhood and Socioeconomic Disadvantage: Findings From a Large New Zealand Child Cohort. Academic Pediatrics, 20(7), P619-627.

[59] OECD. (2019). The Heavy Burden of Obesity. The economics of prevention. OECD Health Policy Studies. OECD Publishing. doi:https://doi.org/10.1787/67450d67-en.

[60] Akmatov et al 2019. Psychiatric and Nonpsychiatric Comorbidities Among Children With ADHD: An Exploratory Analysis of Nationwide Claims Data in Germany." Journal of Attention Disorders.

13.3.1.1. Fluoride exposure may contribute to complex changes in kidney and liver parameters.[61] The study authors noted reverse causality could not be ruled out. This infers that less healthy adolescents with impaired kidney and liver may not be able to absorb and excrete fluoride appropriately.

13.3.2. Juvenile arthritis can present as a comorbidity of ADHD

13.3.2.1. Sodium fluoride may exacerbate rheumatoid arthritis.[62]

13.3.3. Exposure to higher levels of fluoride in tap water was associated with an increased risk of ADHD symptoms and diagnosis of ADHD among Canadian youth, particularly among adolescents.[63]

13.4. Unfortunately, the current MoH policy formulation ignores the potential for bio-acccumulative risk. Conventional toxicological approaches presume exposures are linear and rarely consider hormone-level interdependencies, and this is the approach the Chief Science Advisor, and the Royal Society Te Apārangi appear to have taken.

14. Beneficial nutrition for optimum bone (including dental) health.

14.1. The current local approach led by the MoH inevitably valorise one ingredient, a non-metal element, fluoride, that is neither a nutrient nor essential for tooth development. Other nutrients, calcium, phosphorus and vitamins A, D and C, are needed for healthy tooth development.[64]

14.2. The etiology of caries may be driven by firstly, exposures to sugar (in the form of fermentable carbohydrates which are common in ultra-processed food) and secondly, by nutritional inadequacy.

14.3. Of course, these drivers impact and drive multiple chronic diseases that are presenting in younger and younger populations. The child that has dental decay, is more likely to have obesity and other multimorbid conditions, including depression.

14.4. Increasing evidence suggests that the frequency and concentration of fermentable dietary carbohydrates[65] may be a dominant risk factor for both periodontal disease and dental caries.[66]

14.5. Minerals such as magnesium, calcium, and phosphorus found in the diet constitute the main structural components of the tooth. Nutritional inadequacy can promote absorption impairment, increase bleeding tendency, bone resorption, looseness, and premature tooth loss.[67] MoH literature does not emphasise these factors.

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[61] Malin et al 2019. Fluoride exposure and kidney and liver function among adolescents in the United States: NHANES, 2013–2016. 132:105012

[62] Duell & Chesnut 1991. Excacerbation of Rheumatoid Arthritis by Sodium Fluoride Treatment of Osteoporosis. Arch Intern Med. 151:783-784

[63] Riddell et al 2019. Association of water fluoride and urinary fluoride concentrations with attention deficit hyperactivity disorder in Canadian youth. Environment International. 133:105190

[64] EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332. pages 1 and 9.

[65] Science Daily 2009. Diets Bad For The Teeth Are Also Bad For The Body. https://www.sciencedaily.com/releases/2009/07/090709170807.htm

[66] Nyvad & Takahashi 2020. Integrated hypothesis of dental caries and periodontal diseases. Journal of Oral Microbiology. 12:1710953

[67] Uwitonze et al 2020. Oral manifestations of magnesium and vitamin D inadequacy. Journal of Steroid Biochemistry & Molecular Biology 200:105636

14.6. Vitamin D promotes tooth mineralization, and deficiencies can induce dentin and enamel defects during tooth development and may play a role in the production of dental caries. Poor vitamin D status is also associated with the presence of periodontal disease. [68] Of course, periodontal disease and dental caries are strongly associated, and both most likely to arise following the perturbation of local microbial communities.[69]

14.7. The benefit of vitamin D status and oral health remains outside New Zealand 2012[70], 2020[71] and 2016[72] policy discussion. Deficiencies below the European target of 50nmol/L (20ng/ml)[73] appear common in New Zealand.[74]

14.8. There is no oral health literature presented to the public detailing the interrelationship between magnesium, calcium and phosphorous and the key role these 3 minerals play in protecting bone health.[75]

14.9. Vitamin D, a fat-soluble vitamin with hormonal action, promotes the absorption of calcium, and promotes bone mineralization with many other nutrients and hormones.

14.10. PSGR note current approaches to health ignore the interrelated benefits of nutrients across the health sphere. For example, magnesium lowers risk of heart disease, stroke and diabetes. Vitamin D is immune protective and cancer protective. Many studies especially regarding children, demonstrate levels of serum vitamin D in the population as deficient.

14.11. Leafy greens are magnesium rich, but there is no government policy connecting consumption of leafy greens to dental health. Vitamin D cannot be adequately accessed through diet, but there is no government policy guiding supplementation of vitamin D for musculoskeletal health. Data suggests magnesium deficiency is common, however this remains unaddressed in New Zealand policy.[76]

14.12. Analyses point to the fact that (E.g.[77]) magnesium, phosphorus and phosphorous decrease absorption of fluoride. However, the converse also applies. As scavenger element, fluoride

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[68] Uwitonze et al 2018. Effects of vitamin D status on oral health. Journal of Steroid Biochemistry & Molecular Biology. 175:190-194

[69] Costalonga & Herzberg. The oral microbiome and the immunobiology of periodontal disease and caries. 162:200;22-38

[70]Ministry of Health 2012. Consensus Statement on Vitamin D and Sun Exposure in New Zealand

[71] Ministry of Health 2020. Companion Statement on Vitamin D and Sun Exposure in Pregnancy and Infancy in New Zealand. : A supplement to the Consensus Statement on Vitamin D and Sun Exposure in New Zealand. Updated 2020.

[72] BPAC Vitamin D and calcium supplementation in primary care: an update Best Practice Journal Issue 76. https://bpac.org.nz/BPJ/2016/July/docs/BPJ76-supplementation.pdf

[73] European Food Safety Authority. 2016 Dietary reference values for vitamin D: EFSA Panel on Dietetic Products, Nutrition and Allergies (NDA). EFSA Journal 2016;14(10):4547www p.17

[74] University of Otago. Otago reveals concerning prevalence of vitamin D deficiency in Southern New Zealand women. January 22nd , 2018. https://www.otago.ac.nz/news/news/otago673255.html

Wheeler et al 2018. A Longitudinal Study of 25-Hydroxy Vitamin D and Parathyroid Hormone Status throughout Pregnancy and Exclusive Lactation in New Zealand Mothers and Their Infants at 45 ◦ S. . Nutrients. 10, 86; doi:10.3390/nu10010086

Delshad et al 2019. Wintertime Vitamin D status and its related risk factors among children living in Auckland, New Zealand. NZMJ 132:1504

Cairncross et al 2017. Predictors of vitamin D status in New Zealand preschool children. Maternal & Child Nutrition (2017), 13, e12340

[75] Bergman et al 2009. What is Next for the Dietary Reference Intakes for Bone Metabolism Related Nutrients Beyond Calcium: Phosphorus, Magnesium, Vitamin D, and Fluoride? Critical Reviews in Food Science and Nutrition, 49:2;136-144,

[76] Foote 2020. PhD thesis. Magnesium Intakes and the Main Dietary Sources of New Zealand Adolescent Males. University of Otago.

[77] EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332. Page 12.

reduces access to many important nutrients required for physiological, including bone and dental health.

15. Do social, economic, and political determinants of health remain outside policy?

15.1. The apparent linear perspective of policy and of actions by decision-makers which indicate an apparent dismissal, or side-lining of constant and co-occurring variables may not appropriately reflect principles of public health.

15.2. Most New Zealanders are not broadly supportive of adding fluoride to community drinking water. Māori, Pasifika and Asian groups less likely to support drinking-water fluoridation.[78]

15.3. Sir Michael Marmot has noted that 'the default position is to consider inequalities in health care'.[79] Work continues to include and address the social and environmental determinants of health in government policy agendas.[80]

15.4. Children have a right to *health*, this is often narrowly interpreted as a right to health care.

15.5. Māori and Pasifika have much worse health outcomes than New Zealand Europeans.[81]

15.6. The capacity for low-income groups to access an adequate diet that does not promote sustained deficiency across all nutrient classes remain outside policy parameters.

15.7. These confounding and compounding issues have the potential to dually produce *positive* feedback loops, such as the role of vitamins in synergistically interacting to build bone health, or *adverse* feedback loops, such as the synergistic and bio-accumulative exposures to toxins that place the embryo, foetus and child at more risk of harm than earlier generations.

Please now refer to Part II on the following page that sets out breaches of policy formulation principles.

[78] Whyman et al 2016. Community Water Fluoridation: attitudes and opinions from the New Zealand Oral Health Survey. Australian and New Zealand Journal of Public Health. 40:2;186-192

[79] Marmot, M. (2018). Medical Care, Social Determinants of Health, and Health Equity. World Medical and Health Policy, 195-197.

[80] Baker, P., Friel, S., Kay, A., Baum, F., Strazdins, L., & Mackean, T. (2018). What Enables and Constrains the Inclusion of the Social Determinants of Health Inequities in Government Policy Agendas? A Narrative Review. Int J Health Policy Manag, 7(2), 101-111.

[81] Health and Independence Report 2017. The Director-General of Health's Annual Report on the State of Public Health. Ministry of Health.

PART TWO

UNLAWFUL FOUNDATIONS OF THE BILL INVALIDATE BOTH THE SUPPLEMENTARY ORDER PAPER AND THE BILL AS EARLIER PROPOSED

Introduction

16. Part One of this Submission set out a number of 'relevant considerations' and scientific matters that publicly-available evidence indicates were not either considered or given due weight by officials involved in the formulation of this Bill.

16.1. The exclusion of these matters from consideration indicates that required due process for the taking of regulatory powers was not observed in the formulation of the original Bill.

16.2. The Supplementary Order Paper (SOP) now before the House seeks, in effect, to give unfettered statutory decision-making powers to the Director-General of Health – who, it may be presumed, presided over a grossly-faulted process in the design of the original Bill.

16.3. Therefore, giving unfettered powers to the head of a department that apparently has no respect for the principles of public law; no respect for complying with Cabinet Guidelines; and yet now seeks unfettered decision-making powers to put known toxins in public water supplies through the provisions of this SOP could be reasonably be seen by the public as unconscionable.

16.4. This Part Two of this Submission to your Inquiry sets out the evidence of non-compliance with both required regulatory best practice guidelines; no respect for principles of public law; no respect for the responsibilities of Parliament to always act diligently in the public interest; and no due concern for probabilities of harm to the public.

16.5. An example of some of the main 'relevant considerations' not observed during the formulation of this Bill (upon which the SOP amendment relies) are illustrated in Part One of this Submission. This Part Two notes the absence of these 'relevant considerations' in the documentation that purports to justify this regulation.

17. Non-compliance with regulatory formulation requirements

17.1. The Cabinet Manual has endorsed and requires officials contemplating the taking of regulatory powers to comply with regulatory best practice guidelines that were originally developed by the OECD and largely adopted by New Zealand in a similar form. These are known as a Regulatory Impact Assessment (RIA) and Regulatory Impact Statement (RIS) documents. Control of the quality of these documents is currently supposed to be the responsibility of The Treasury.

17.2. There are also comprehensive Legislative Advisory Committee Guidelines (LAC Guidelines)[82] that provide detailed and disciplined approaches for formulating the taking of regulatory powers.

17.3. In addition, there are public law principles that are also supposed to apply to shaping all proposed regulatory provisions as well as applying to all regulatory administration and associated decision-making undertaken by public servants.[83]

17.4. Both Parliament and the New Zealand public rely upon strict adherence to these principles and tools to make sure that regulatory steps taken by Parliament are sensible; that they are in the public interest; and that they protect the public – the latter being a primary duty and role of government and Parliament in our Westminster-based New Zealand constitutional model.

17.5. The purpose of requiring compliance with these regulatory-quality steps is to give confidence to both Parliament and to the public that:

17.5.1. proposed legislation is sound;

17.5.2. it has been prepared with required rigour;[84]

17.5.3. it clearly defines the issues; and

17.5.4. it has considered other options (including non-legislative options) for achieving a policy objective.[85]

17.6. Compliance with these requirements help to formulate policy documents in a form as required by both Cabinet Guidelines and LAC guidelines. The documentation available[86] [87] do not demonstrate that these requirements have either been considered or mention the policy formulation steps leading to the production of this proposed Bill. We cannot access a Regulatory Impact Analysis as required by Cabinet.[88]

17.7. The RIA dated 2016, does not record that alternative options (E.g. Scotland's Child Smile program and/or dietary interventions). Nor did that RIA consider research data linking dental caries to dietary high sugar intake. the potential for alternate policy measures that address the risk factors for dental caries which are common to many other chonic diseases, including high sugar consumption.[89]

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[82] Legislation Advisory Committee Guidelines. Guidelines on Process and Content of Legislation 2001. For an explanation of why we quote 2001 Guidelines please see Section 19.

[83] Joseph, PA Constitutional & Administrative Law in New Zealand 3rd Ed., Thomson-Brookers 2007

[84] Particularly Legislative Advisory Committee Guidelines; Regulatory Impact Assessments and Statements; compliance with the principles of public law; and drawing upon relevant matters of science – especially weighted to give effect to the precautionary principle that is a cornerstone of responsible government exercised in the public interest.

[85] For example, consideration of adopting the 'Child Smile' that has had considerable success in Scotland; or taxing sugar in food and drinks for a dual-policy purpose of reducing dental carries and better avoiding acquired diabetes in the NZ population.

[86] Coleman, J. (2016?) Decision-Making on the Fluoridation of Drinking-Water Supplies. https://www.health.govt.nz/system/files/documents/pages/cabinet-paper-decision-making-fluoridation-drinking-water-supplies.pdf

[87] Moore & Poynton 2015. Review of the benefits and costs of water fluoridation in New Zealand. Sapere Research Group. https://www.health.govt.nz/system/files/documents/publications/review-benefits-costs-water-fluoridation-new-zealand-apr16.pdf

[88] June 2020 https://www.treasury.govt.nz/sites/default/files/2017-06/RIS-impact-analysis-requirements-at-a-glance-june2020.pdf

[89] March 21, 2016. Regulatory Impact Statement. https://www.treasury.govt.nz/sites/default/files/2016-06/ris-moh-tdfd-jun16.pdf

17.8. The only cost-benefit document publicly accessible is the 2015 Sapere report. This does not address other policy mechanisms to address the drivers of the risk factors and makes some curious claims regarding the benefits of fluoridation. The Sapere report does not look at other alternative policy options that might address the risk factors, such as diet.

17.9. Not only should these components have been considered, they should have also been accorded appropriate weight and be accompanied with the reasoning that supported those weights.

17.10. Publicly-available documentation about the formulation of the Bill indicates that there has been no due focus on compliance with required principles associated with taking the proposed regulatory powers: therefore both the Bill and the proposed Supplementary Order Paper (SOP) proposed amendment to it are arguably totally unfit for purpose because they are both likely to cause serious harm[90] to the majority of people in New Zealand. Arguably, the NZ machinery-of-government has no power from the people to do that.

18. Taking into account all 'relevant considerations'

18.1. Taking into account all 'relevant considerations' is a key component of developing sound and principled legislation.[91]

18.2. The Royal Society Te Apārangi was commissioned by the Prime Minister's Science Advisor to undertake a review of science matters that relate to the Ministry of Health's long-established practice of encouraging local authorities to put an industrial-waste-sourced fluoride (and its many associated toxic and bio-accumulative substances) into public water supplies.

18.3. MoH has claimed that its long-established policy to encourage that form of fluoride addition to public water supplies is based on a finding from a review of fluoride effects in the Hawkes Bay: a review that was arguably scientifically-flawed in its structure; its administration; and its conclusions[92] that claimed a very significant reduction in dental caries.

18.4. It is noteworthy that none of the scientific documentation produced by the Royal Society - nor its recent scientific updates by the Office of the Prime Minister - seem to have considered the relevant science set out in Part One of this Submission.

18.5. Yet Part One illustrates a reasonable probability of many harms to the public that this Bill (as now further amended) seeks statutory administrative powers to force upon the public of New Zealand.

19. Guidelines for legislation

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[90] Refer to Part one of this Submission

[91] Legislative Advisory Committee Guidelines, Foreword, Attorney-General, 2001

[92] Other studies have concluded that only topical applications of pharmaceutical grade fluoride (toothpaste or rubbing fluoride onto teeth) can strengthen enamel to have a very minor beneficial effect on resistance to dental caries – but at the risk of damaging essential and beneficial mouth flora. Systemically-consumed fluoride in water supplies has been repeatedly found to have no significant beneficial effects: but that systemic administration carries many public health hazards – just some of which are illustrated in Part One of this Submission.

19.1. PSGR have drawn from the 2001[93] Legislation Design and Advisory Committee Legislation Guidelines. While we are sure there are improvements in the 2018[94] edition, we find that the 2001 edition addresses some factors in more depth such as the granting of public power.

19.2. For example, discussion in the 2001 LAC concerning the exercise of power (Section 3): -

'The most significant powers are those that affect individuals. In general, the greater the potential for public powers to impact on individuals, the greater the protections there should be, in terms of the independence of the decision-maker, the procedure to be followed, the specificity of the criteria for the decision, the rights of the appeal and review available'.[95]

19.3. At page 24 of those same Guidelines:-

'The status quo is a dynamic concept. It is the situation that will arise if current policy is maintained. Maintaining current policy could lead to deterioration in the public interest, for example, escalating environmental damage in the event allowable maximum pollution discharge limits aren't reduced as the number of polluting factories increases. Equally, evaluation of the status quo should include consideration of the potential for a problem to "self-correct". The status quo should always be considered as an option, to ensure that alternatives are not chosen which would lead to worse outcomes than expected by maintaining the current policy settings. The status quo is frequently the option against which other options should be compared'.

19.4. Elsewhere in those Guidelines, at page 7 it states:-

'Errors in Bills can be corrected at the select committee stage. But to rely on select committees to correct ill-conceived or poorly-drafted legislation is not acceptable. The select committee process provides the public with an opportunity to comment on the legislative embodiment of the Government's policy and bring matters which may need further consideration to the attention of Parliament; it is not (supposed to be) *a quality inspection process designed to correct poor policy analysis or drafting'.* (Page 7)

20. Absence of effective controls on preparation of regulation

20.1. Arguably, the evidence advanced in the Submission indicates that the intent of the LAC Guidelines has been ignored by officials involved in both the formulation of this Bill and its further SOP amendment. That is contrary to required regulatory good practice that both Parliament for good government and which the New Zealand public relies upon for its public safety and protection.

20.2. Therefore, contrary to the expectations of the LAC Guidelines, this public Submission to a Select Committee of Inquiry has to take that place of the expectations in the LAC Guidelines "*...a quality inspection process designed to correct poor policy analysis or drafting."*

21. Poor policy analysis

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[93] Legislation Design and Advisory Committee Legislation Guidelines, 2018 Edition. Last Updated March 2018.
[94] Legislation Advisory Committee Guidelines. Guidelines on Process and Content of Legislation 2001 edition and amendments
[95] Ibid page 158.

21.1. The 2001 LAC Guidelines require thinking about and making a proper definition of the underlying problem. Arguably, that has not been done, because the major underlying issue lies with a high processed-sugar level in available processed food and drink products.

21.2. Poor people tend to consume a greater quantity of such products because they appear to be a cheaper option than non-processed safe and nutritious food products.

21.3. From a public health perspective it follows that high consumption of processed sugars in peoples' diets will lead to both dental caries *and* acquired diabetes – among other serious medical problems.

21.4. Therefore the MoH rigid and decades-long obsession with focussing solely on *one* morbidity (i.*e.* dental caries); *one* possible option (*i.e.* fluoridate public water supplies); and *one* faulted non-scientific study claimed to support fluoridation as effective is not a basis for complying with the requirements of the LAC Guidelines.

21.5. These LAC Guidelines specifically require a proper definition of the problem(s) that need to be addressed; there is no evidence in the RIA and RIS that such due definition and understanding of the natural cluster of the problems has been carried out. There is just the naive assumption that there are many cases of severe dental caries – and that requires regulatory powers to force that medical treatment into people through contamination of public water supplies with a cheap industrial-grade product that contains many additional bio-accumulative toxins.

21.6. The LAC Guidelines also require that all relevant options for addressing those problems should be researched and evaluated: the RIA and RIS prepared by officials do not show any such due consideration of options; therefore, those documents are evidence of a pre-determined approach that excludes compliance with LAC Guidelines.

21.7. There is a relevant quotation from those Guidelines:- "Early in the policy development process officials should carry out an informed consideration *(emphasis added)* of the options available to deal with an identified problem. The decision about how to intervene may be as important as the decision to intervene."[96]

21.8. For example supposing if cases of acute dental carries arise from children's ingestion of sugary drinks and food – the ingestion of which is known to predispose children to acute dental carries problems, as well as to predispose their bodies to later development of diabetes Type II. That *combination* is indeed a most serious public health issue.

21.9. The officials' clear pre-determination that acute dental caries occurs as a problem of inadequate fluorine in public drinking water (*i.e.* 'a top-up' is required) is arguably absurd, farcical and (and even laughable - were it not that such an assertion is serious threat to the health of New Zealanders).

21.10. The scientific fact is that systemic administration of fluoride through putting a mix of toxins from an industrial-waste product does not prevent dental caries. Rather, the evidence is that

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[96] Ibid

topical application of a pharmaceutical grade of fluoride applied directly to teeth (e.g. toothpaste) can harden teeth enamel and make a minor contribution to minimising dental carries.

22. Officials with a serious conflict of interest

22.1. Officials in the MoH have been 'committed to a particular approach'[97] (*i.e.* its internal policy *encouraging* fluoridation of public water supplies) for many decades. Through this Bill it is now seeking statutory powers to *require* that mass medication.

22.2. On the evidence it is clear that MoH is seeking those powers with a pre-determined mind; with a mind that is not prepared to consider other options (as required by LAC Guidelines); with a mind that is not prepared to take into account the hazards of its former policy; and without giving due consideration to a great deal of evidence and basic principles of chemistry that indicate a reasonable probability of causing harm to the public and the environment from adding bio-accumulative toxins - a fluoride and its many contaminants - to public water supplies.

22.3. The evidence clearly shows that the MoH has not complied with essential procedural requirements for seeking legislative powers.

22.4. That 'closed mind' approach is arguably unconscionable; it is a breach of trust to both Parliament and the people of NZ who are in various relationships of dependency on MoH complying with the tenets of responsible government and its approach to responsible regulation.

22.5. Ignoring those procedural requirements has the effect of setting aside fiduciary obligations [98] to arguably owed to both Parliament and the people of New Zealand.

22.6. Those public officials have clearly not (on the evidence) given *due consideration* to many *relevant matters* of safety nor has due consideration been given to alternative options for what may be properly defined as 'the dietary sugar problem'. Paul Finn – the leading authority on fiduciary obligations (at reference 9 below) may well class such deficiencies as 'unconscionable'.

22.7. For example, there is strangely no reference in MoH documentation available to the House and to the public about the success of Scotland's 'Child Smile' programme; there is no reference to the hazards of fluoride and its industrial waste contaminants that attach to MoH existing departmental policy - examples as set out in Part One of this Submission.

22.8. It seems from MoH documentation that dietary sugar is of no relevance as an issue for the occurrence of dental carries; the sole MoH claim is that the issue is that peoples' diet is short of fluoride (a toxin) and that needs to be 'topped-up'.

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[97] LAC Guidelines

[98] Fiduciary obligations occur in *circumstances* where there is a high level of *trust* in the skill and competencies of the decision-maker: the surgeon operating on an unconscious patient; or a growing baby in its mother's womb – being fed with toxins that the mother derives from her public water supplies. Ref: P.d Finn, *Fiduciary Obligations*, 1977 & P.D Finn, *Fiduciary Obligations: 40th Anniversary Republication with Additional Essays*, Sydney: Federation Press, 2016.

23. Breaches of public law principles

23.1. '*An authority acts unreasonably …. if it fails to address relevant considerations*'[99] . It is plain that actions in the preparation of this Bill were 'unreasonable'.

23.2. Under New Zealand's Westminster form of government there is a convention (therefore an 'obligation' that officials are bound by a '*positive morality of the community*' . The evidence surrounding the formation and thrust of this Bill is that it arguably *contravenes constitutional and political ethics*[100] .

23.3. A most particularly-relevant and important convention is that the conduct of government must *promote responsible government* : this Bill, drafted by officials, misleads the peoples' elected representatives in Parliament – thus arguably undermining people's trust in the machinery-of-government. That is arguably a most serious matter for Parliament.

23.4. The Office of the Prime Minister's Science Advisor clearly played a major role in MoH official's campaign to garner support for its established fluoridation of public water supplies. That Office further commissioned the New Zealand Royal Society to produce a report that appeared, superficially, to add weight to the MoH established policy to put fluoride and its industrial waste co-contaminants into public water supplies.

23.5. However, these 'scientists' clearly had no understanding of their public law obligations that arise when their work is clearly to be used as a basis for formulating public policy – and latterly for seeking statutory powers to force mass-medication upon the New Zealand people via their water supplies.

23.6. For example, the Office of the Prime Minister's Science Advisor has a website posting (updated as at 2 June 2021) that carries a summary of the essence of the Royal Society's report with some updates. But note that the content of that website does not even mention let alone evaluate the components of the risks to the public arising from placing fluorine (and its many highly-toxic and bio-accumulative co-contaminants) into public water supplies.

23.7. It will be plain to the New Zealand public that the Office of the Prime Minister's Science Advisor allowed itself to be used to decorate a long-established departmental policy cake; and that the same Office paid for assistance in that endeavour from the New Zealand Royal Society – that obediently produced a report that seemed, from its content, to accept narrow terms of reference (a focus on dental caries caused by a lack of fluoride in public water supplies) with no due consideration of the public interest and no consideration of the many serious harms posed to human health from adding fluoride to public water supplies. (Ref. Part One of this Submission.)

23.8. It is noteworthy that there was an off-shore (USA) peer review by a leading toxicologist of the Royal Society's report led by Professor Paul Connett: that peer review was scathing about the Royal Society report's approach and omissions of relevant matters. Part One of this

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[99] P.A Joseph Constitutional and Administrative Law in New Zealand

[100] E.A. Freeman in Growth of the English Constitution (3rd Ed.) and quoted by A.V. Dicey in Introduction to the Law of the Constitution (10th Ed.,)

Submission is a further illustration of the omissions of risk factors that should have been identified and given due weight by officials.

23.9. Scientific evaluations that are to be used for formulation of public policies or otherwise for shaping statutory powers require a special rigour and quality that focusses upon the *probability of harm to the public.*

23.10. Many academic scientists tend to be fundamentally regressive in their approach: for example, 'is there any evidence in the past literature about toxicity of fluoride used in public water supplies'.

23.11. But that academic and regressive approach to science assumes that substantial projects would have been paid for by governments seeking such evidence; such science is not 'commercially-funded' because there is little commercial money to be made from it. And many governments around the globe have stopped funding public good science projects that have a primary focus on policies required to be in the public interest.

23.12. So, the 'regressive' academic approach to such research is unlikely to find the evidence that they pretend to be seeking.

23.13. Thus, the proper scientific approach that might partially satisfy the 'public interest' test entails an evaluation of all of the relevant chemistry that is involved: plus the *probabilities* of harm to people and other animals and life-forms in the people's environment.

23.14. Such analyses are not found in the Royal Society's report commissioned by the Office of the Prime Minister's Science Advisor; nor is it found in the 2 June 2021 updates of that science paper published by that Office.

23.15. It seems very clear from the evidence in this matter, that persons associated with the Office of the Prime Minister's Science Advisor have little if any understanding of their obligations to furnish advice that is congruent with Parliamentary requirements; that is congruent with public law obligations; and advice that gives effect to *fiduciary obligations* owed by Parliament to the New Zealand public – obligations that arise in the circumstances of trust between government and the people that government is supposed to protect. (Circumstances of trust that include, for example, the child in the womb that is not able to defend itself in law from inept 'science' that results in chronic toxic assaults from inept government policies.)

23.16. Proper science advice to government also needs to observe explicitly compliance with the *principle of proportionality* : for example does adding to public water supplies toxic waste from the fertiliser industry for a claimed reduction of dental caries justify the bio-accumulative risks to the public and its environment? The current 'science' advice to government does not seem to comply with the demands of that principle of government.

23.17. That deficiency leads to difficulty addressing another requirement of reasonable government: that of providing science advice that explicitly includes coverage of *the precautionary principle.* This principle is already embodied in several aspects of New Zealand environmental law and even more widely in international public law.

24. Key features of the precautionary principle (PP) are that:

24.1. The PP reverses the burden of proof by making it incumbent on the proponent of a potentially harmful activity to prove first that the activity is harmless; and

24.2. The PP bans any potentially harmful activity if there is scientific uncertainty about material adverse effects.[101]

24.3. On the matter of fluoridation of public water supplies, it is plain from documentation produced by the MoH, the Royal Society of New Zealand and the Office of the Prime Minister's Science Advisor that there has been no due consideration of the precautionary principle.

24.4. Therefore the 'science' advice allegedly underpinning this Bill (and the long-standing policy of the MoH to fluoridate public water supplies) is arguably not fit for purpose; it is therefore further submitted that it would be unconscionable for the House of Representatives to allow passage of this Bill (in either of its two proposed forms) through its third reading.

25. Summary

25.1. The RIA and RIS evidence is clear that MoH officials have failed to comply with the LAC Guideline requirements: the issue has been narrowly-defined as a lack of fluoride in children's diets ('a top-up is necessary').

25.2. But fluoride is not a nutrient: it is a very dangerous element that is uniquely able to extract other essential elements out of a person's body – both young people and old people; it is a known very dangerous substance that is useful for killing life-forms through disruption of living processes.[102] It has powerful endocrine-disruption effects for example. [103]

25.3. On the evidence it is plain that the minds of MoH officials have been closed to the probability that peoples' shopping carts – prominently bulging with sugary drinks and many sugar-laden foods (even tinned baked beans have added sugar) are the cause of a broad-spectrum of serious maladies in both young and old – including serious dental caries; obesity; and diabetes Type II.

25.4. The LAC Guidelines require the MoH officials to have considered a proper definition of the problem. Arguably, that definition has to identify high levels of sugar consumption for all age-groups; it should have considered powerful 'information and education campaigns'; it should have considered recommending a tax on sugar in food products; it should have considered voluntary standards and codes of practice for food processors and suppliers.

26. Government, Parliament and the NZ public – seriously misled

26.1. The consequence of this evidence of serious omissions by officials and the failure of administrative controls on compliance with principles required when seeking legislative powers is that both the Government, Parliament and the people of New Zealand have been

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[101] Boutillon, The Precautionary Principle: Development of an International Standard (2002) 23 Mich J. Int'l L 429 at 433

[102] Han et al 2021. Chemical Aspects of Human and Environmental Overload with Fluorine. Chem. Rev. 121:4678−4742

[103] Waugh, D.T., Fluoride Exposure Induces Inhibition of Sodium/Iodide Symporter (NIS) Contributing to Impaired Iodine Absorption and Iodine Deficiency: Molecular Mechanisms of Inhibition and Implications for Public Health, Int. Jnl. of Environmental Research and Public Health, 2019.

seriously misled by MoH and other officials that should have been operating effectively various controls on required procedures.

27. Public loss-of-confidence in NZ machinery-of-government

27.1. The seriousness of this lack of control on advancement of Bills seeking statutory powers is that the reasoning people in New Zealand cannot any longer have confidence in the New Zealand machinery-of-government – because it obviously has no effective controls on its conduct and it is arguably not complying with principles of public law; nor is it complying with required and long-established guidelines and principles.

Recommendations

I. THAT the Health Committee of Inquiry into the proposed SOP alteration to the original Bill as passed though First and Second Readings note that this Submission raises evidence that the original Bill and its recommended SOP further amendment have serious failings in both relevant science and compliance with required procedures for formulating statutory powers [that clearly calls into question the competency of a department to administer its statutory powers that it will have obtained through a faulted policy formulation process.]

II. THAT the Health Committee should recommend to the House that the further progress of this Bill and its SOP should be halted until such time as the Health Committee has undertaken a more extensive inquiry into the factors raised in this Submission.

III. THAT the Health Committee, in actioning such an extensive inquiry – (2) above - should have recourse to engaging independent scientist evaluations of:

   a. the primary causes of dental caries and particularly the weight to be accorded to the role of dietary sugar;

   b. the degree to which dietary sugar and dietary under-nutrition is material to the causing of other significant morbidities; and further

   c. commission a report from an international specialist in fluoride toxicity in animals – to identify probabilities of any material harm (including endocrine-disruption and inter-generational harm) to people and their environment from the practice of adding industrial-sourced fluoride containing several known bio-accumulative toxins.

Note:- Items (a) and (b) should determine whether or not dietary sugar is a significantly greater contributor to dental caries than the NZ government officials' alleged dietary lack of fluorine.

Item (c) should inform Parliament as to the probability of material harm from ingestion of industrially-sourced fluoride being put into public water supplies.

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Appendix

Australian and New Zealand Nutrient Reference Values for Fluoride. A report prepared for the Australian Government Department of Health and the New Zealand Ministry of Health. (2017)

(PDF)

Figure 1 –Australia, New Zealand and the US have much higher upper limits than is recommended by EFSA (2013) yet the EFSA evaluation may present the most complex evaluation of risk to under 6-year-olds.

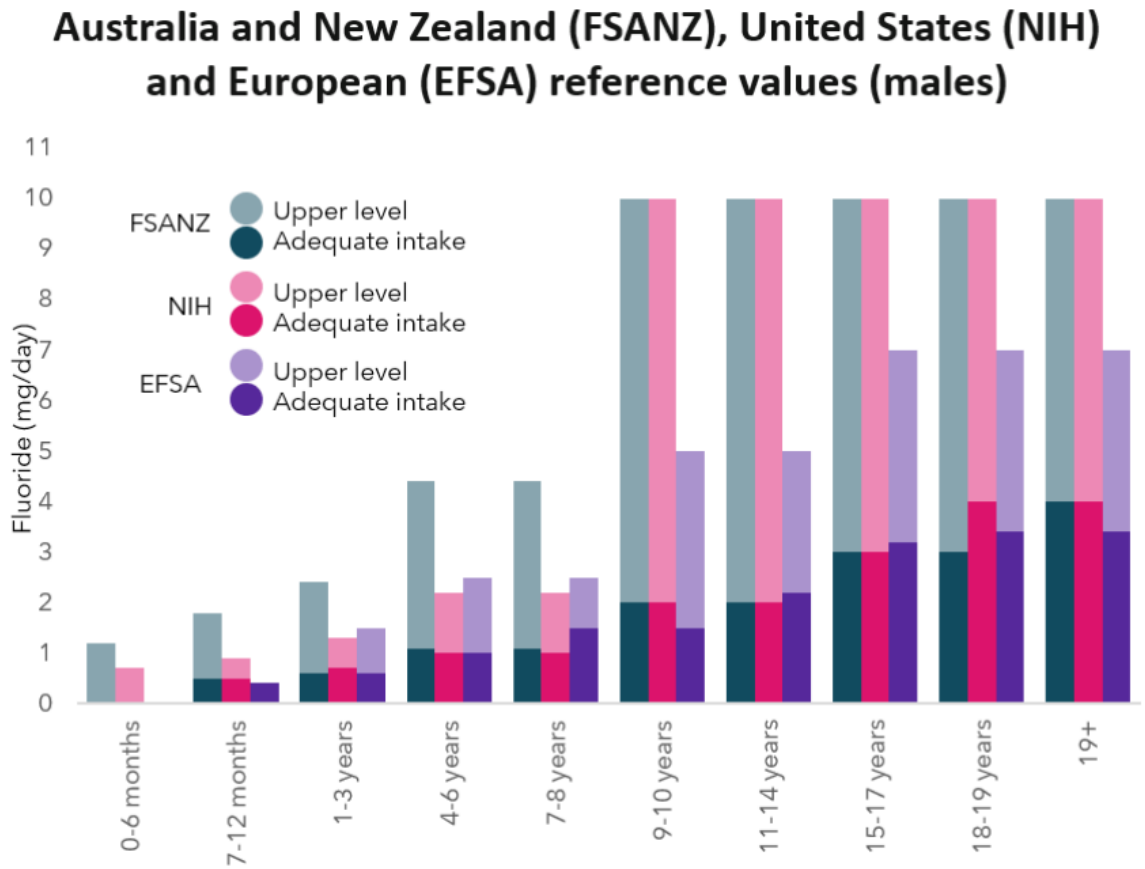
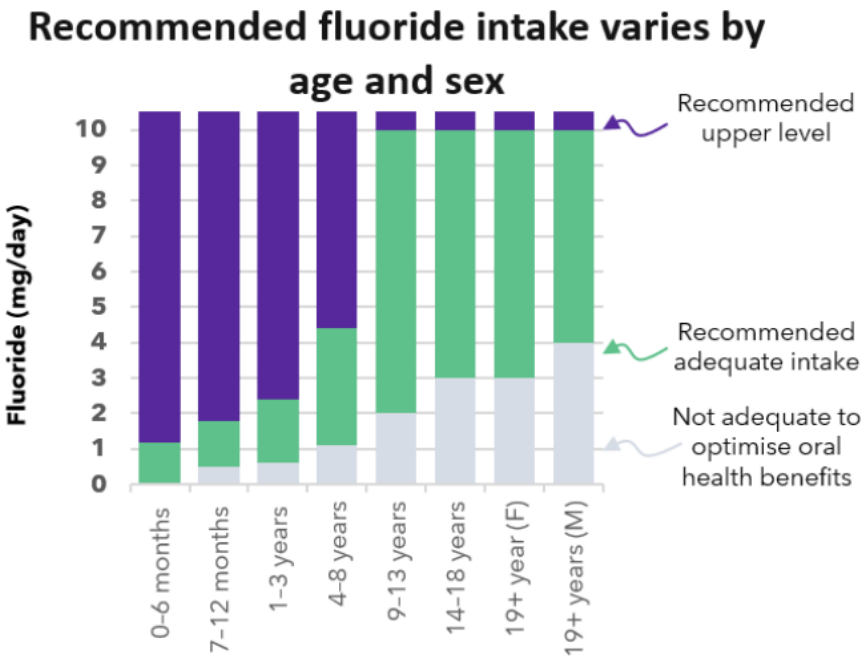


Figure 14: Reference values for males in Australia and New Zealand, the United States and Europe.

Figure 1 Fluoridation: an update on evidence. Office of the Prime Ministers Chief Scientific Advisor.

Figures 2 and 3 demonstrate there is no safe adequate intake advised for babies.



Age group	Adequate intake (mg/day)	Upper level of intake (mg/day)
Infants		
0-6 months	Not applicable (previously 0.01)	1.2 (previously 0.7)
7-12 months	0.5	1.8 (previously 0.9)
Children		
1-3 years	0.6 (previously 0.7)	2.4 (previously 1.3)
4-8 years	1.1 (previously 1.0)	4.4 (previously 2.2)
9-13 years	2	10
Adolescents		
14-18 years	3	10
Adult females		
19+ years, including pregnant or lactating women	3	10
Adult males		
19+ years	4	10

Figure 13: The recommended fluoride intake in Aotearoa New Zealand varies by age and sex. See Nutrient Reference Values set by the Australian

Figure 2 Fluoridation: an update on evidence. Office of the Prime Ministers Chief Scientific Advisor.

Recommendations for the UL for fluoride for children aged 0-8 years

	Age	Mean bodyweight	UL
Infants	**0–6 months**	**6 kg**	**1.2 mg/day**
Infants	**7–12 months**	**9 kg**	**1.8 mg/day**
Children	**1–3 years**	**12 kg**	**2.4 mg/day**
Children	**4–8 years**	**22 kg**	**4.4 mg/day**

The AI for fluoride for children up to 8 years old of 0.05 mg F/kg bw/day is equivalent to the following intakes expressed as mg F/day, using the same reference bodyweight data as for the UL.

Recommendations for the AI for fluoride for children aged 7 months - 8 years

	Age	Mean bodyweight	AI
Infants	**0–6 months**	**6 kg**	**Not applicable**
Infants	**7–12 months**	**9 kg**	**0.5 mg/day**
Children	**1–3 years**	**12 kg**	**0.6 mg/day**
Children	**4–8 years**	**22 kg**	**1.1 mg/day**

Figure 3 Australian and New Zealand Nutrient Reference Values for Fluoride. A report prepared for the Australian Government Department of Health and the New Zealand Ministry of Health. (2017) Page 4

Figure 4 Displays the EFSA (2013) conclusions that have been excluded from this consultation. Reviews would normally include the most recent evaluation.

CONCLUSIONS

The Panel concludes that the AI of fluoride from all sources for both children and adults can be set at 0.05 mg/kg body weight per day. Table 5 lists the AI for age groups of children and adults calculated with the relevant reference body weights and rounded, where necessary. For pregnant and lactating women the AI is based on the body weight before pregnancy and lactation, because there is no evidence that a fluoride intake above the AI for non-pregnant women has a beneficial effect on the dental health of the child, and because the low fluoride content of breast milk does not increase significantly with higher fluoride intakes.

Table 5: Summary of Adequate Intake for fluoride for infants, children and adults

Age	Reference weight (kg) Males	Adequate Intake from all sources (mg/day) Males	Reference weight (kg) Females	Adequate Intake from all sources (mg/day) Females
7-11 months	8.9 [(a)]	0.4	8.2 [(a)]	0.4
1-3 years	12.2 [(b)]	0.6	11.5 [(b)]	0.6
4-6 years	19.2 [(c)]	1.0	18.7 [(c)]	0.9
7-10 years	29.0 [(d)]	1.5	28.4 [(d)]	1.4
11-14 years	44.0 [(e)]	2.2	45.1 [(e)]	2.3
15-17 years	64.1 [(f)]	3.2	56.4 [(f)]	2.8
≥ 18 years	68.1 [(g)]	3.4	58.5 [(g)]	2.9

(a): Median body weight-for-age of male or female infants, respectively, aged 9 months (WHO Multicentre Growth Reference Study Group, 2006).
(b): Median body weight-for-age of boys and girls, respectively, aged 24 months (WHO Multicentre Growth Reference Study Group, 2006).
(c): Median body weight of boys and girls, respectively, aged 5 years (van Buuren et al., 2012).
(d): Median body weight of boys and girls, respectively, aged 8.5 years (van Buuren et al., 2012).
(e): Median body weight of boys and girls, respectively, aged 12.5 years (van Buuren et al., 2012).
(f): Median body weight of boys and girls, respectively, aged 16 years (van Buuren et al., 2012).
(g): Median body weight of 18 to 79-year-old men and women, respectively, based on measured body heights of 16 500 men and 19 969 women in 13 EU Member States and assuming a BMI of 22 kg/m^2 (see Appendix 11 in EFSA NDA Panel (2013)).

Figure 4 EFSA Scientific Opinion on Dietary Reference Values for fluoride. EFSA Journal 2013;11(8):3332. Page 28.