



The Royal Australasian College of Physicians New Zealand (RACP) and the Paediatric Society of New Zealand (PSNZ) support water fluoridation as a highly effective, safe, cost-saving and equitable measure to prevent dental caries and improve oral health across all sectors of society.

What is fluoride?

- Fluoride is a naturally occurring element. In New Zealand, fluoride is already naturally present in all water supplies, but at a level that is not high enough provide oral health benefits. The fluoride levels are therefore adjusted to between 0.7-1.0 ppm – a level that safely provides protection from tooth decay¹.
- *Fluoride protects teeth by lowering the pH at which enamel starts to demineralise – as its impact is most effective when it is used in a low concentration and frequently², water is a suitable and safe mechanism for fluoride application.*

Why the RACP and PSNZ support water fluoridation

Fluoridation is effective

- Fluoridation of community water supplies is the single most effective public health measure to prevent dental decay³.
- Community water fluoridation programmes have directly reduced the rate of dental caries in New Zealand and throughout the world, including Australia, Canada, the USA, Chile, Columbia, Britain and Ireland⁴.
- Community water fluoridation has been identified as the single most effective public health measure to prevent tooth decay and improve oral health⁵ and by the Centers for Disease Control and Prevention as one of the ten great public health achievements of the 20th Century⁶.
- In New Zealand it is estimated that fluoridation of the water supply prevents between 58,000 and 267,000 decayed, missing or filled teeth (DMFT) annually.⁷
- The efficacy of water fluoridation continues to be quantified by strong research, for example, a systematic review⁸ of public water fluoridation concluded fluoridation of drinking water supplies reduces caries prevalence, both as measured by the proportion of children who are caries free and by the mean number of decayed, missing or filled baby teeth (DMFT).

¹ New Zealand Dental Association (2012) *Statement on Water Fluoridation*. Available from: <http://www.healthysmiles.org.nz/assets/NZDAFluoridationStatement2012-finalrevision.pdf>

² Ibid

³ American Dental Association (2005) *Fluoridation Facts*. Available from http://www.ada.org/sections/newsAndEvents/pdfs/fluoridation_facts.pdf

⁴ Esfaniari, S, Jamla, N, & Feine, J. Community-specific, preventive oral health policies: preventive measures on dental caries. *Journal of Investigative and Clinical Dentistry*, 2010; 1:2-7

⁵ Ministry of Health (2010) *Our Oral Health: Key findings of the 2009 New Zealand Oral Health Survey*. Wellington: Ministry of Health.

⁶ Centers for Disease Control and Prevention (1999) *Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries*. Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4841a1.htm>

⁷ Public Health Advisory Committee (2004) *Improving Child Oral Health and Reducing Child Oral Health Inequalities*. Report to the Minister of Health. Wellington: PHAC.

⁸ McDonagh, M. S., et al. (2000): "Systematic review of water fluoridation." *British Medical Journal* **321**: 855-859.

- Professor Sir Peter Gluckman, the Prime Minister's Chief Science Advisor, released a statement⁹ on June 12, 2013 that included the following assertion:
"The science of fluoride in water is effectively settled - there is no doubt that the presence of low amounts of fluoride in water (0.7-1.0 mg/L) reduces the incidence of dental caries"

Fluoridation is safe

- The safety of water fluoridation has been intensively researched for over 60 years¹⁰, and continues to be subject to review in New Zealand (through the National Fluoride Information Service¹¹) and overseas.
- Reviews of research from throughout the developed world have consistently found benefits to dental health and no adverse health effects from water fluoridation at optimal levels (0.7mg/L – 1.0mg/L)¹².
- Numerous research studies and systematic reviews have evaluated the safety of water fluoridation and no credible evidence supports an association between safe fluoridation and any adverse physical or psychological conditions¹³.
- The New Zealand Dental Association states that extensive reviews of international research have
"...consistently found benefits to dental health and no evidence of adverse health effects from water fluoridation at optimal levels (0.7-1.0mg/L)."
- Professor Sir Peter Gluckman,(in his aforementioned statement) conclusively asserts:
"It is absolutely clear that as doses used in New Zealand to adjust the natural level to a level consistent with beneficial health effects (0.7-1.mg/L), there is no health risk from fluoride in the water."

Fluoridation contributes to equitable outcomes

- Fluoridation benefits people of all ages with natural teeth.
- Water fluoridation contributes to equitable health outcomes¹⁴ as the benefit is greater for people in lower socio-economic groups and children.
- A study of Auckland children revealed a strong protective dose-response relationship between caries experience and fluoridation status, with children who lived continuously in fluoridated areas being 58% less likely to have dental caries as children who lived continuously in non-fluoridated areas (P < 0.001)¹⁵.
- Community water fluoridation benefits all people regardless of their circumstance - and provides the greatest benefits to children and those more at risk of tooth decay. A Ministry of Health 2012 report revealed that, overall, children and adults living in fluoridated areas had significantly lower lifetime experience of dental decay than those in non-fluoridated areas¹⁶.
- This is reinforced by previous New Zealand studies identifying consistent inequalities in oral health status between children in fluoridated and non-fluoridated areas of New Zealand^{17 18}.

⁹ The Office of the Prime Minister's Science Advisory Committee (2013) *Blog: What is in the water? Sir Peter Gluckman's comments on the Science of Water Fluoridation*, June 12 2013. Available from: <http://www.pmcsa.org.nz/blog/what-is-in-the-water/>

¹⁰ American Dental Association (2005) Fluoridation Facts. Available from: http://www.ada.org/sections/newsAndEvents/pdfs/fluoridation_facts.pdf

¹¹ The National Fluoride Information Service is a consortium of scientists funded by the Ministry of Health (MoH) established to monitor and critically review the ongoing research throughout the world to establish the effectiveness and safety of water fluoridation.

¹² American Dental Association (2005) Fluoridation Facts. Available from: http://www.ada.org/sections/newsAndEvents/pdfs/fluoridation_facts.pdf

¹³ Centers for Disease Control and Prevention (1999) Achievements in Public Health, 1900-1999: Fluoridation of Drinking Water to Prevent Dental Caries. Available from: <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4841a1.htm>

¹⁴ Treasure, E, et al. The York Review – A systematic review of public water fluoridation: A commentary. *British Dental Journal* 2002; 192:495-497

¹⁵ Kanagaratnam, S, Schluter, P, Durward, C, Mahood, R & Mackay, T. Enamel defects and dental caries in 9-year-old children living in fluoridated and nonfluoridated areas of Auckland, New Zealand. *Community Dentistry and Oral Epidemiology* 2009; 37(3):250-259.

¹⁶ Ministry of Health (2012). *Annual Report for the year Ended 30 June 2012 including the Director-General of Health's Annual Report on the State of Public Health*. Wellington: Ministry of Health.

¹⁷ Lee M and Dennison PJ (2004). "Water fluoridation and dental caries in 5 and 12 year old children from Canterbury and Wellington." *New Zealand Dental Journal* 100(1):10-5.

¹⁸ Kanagaratnam, S, Schluter, P, Durward, C, Mahood, R & Mackay, T. Enamel defects and dental caries in 9-year-old children living in fluoridated and nonfluoridated areas of Auckland, New Zealand. *Community Dentistry and Oral Epidemiology* 2009; 37(3):250-259

- Acknowledging, the significant socio economic and ethnic disparities in oral health status of New Zealand children and young people¹⁹ and water fluoridation's widespread efficacy and availability, water fluoridation is a significant contributor to equitable oral health outcomes in New Zealand

Fluoridation is cost effective

- Water fluoridation has been described as the most cost-effective preventive method in medicine²⁰²¹²². This assertion is quantified by numerous studies, including a 2001 economic evaluation of community water fluoridation²³ concluding that due to the reduction in dental treatment, fluoridation is not only cost effective but also cost saving for communities of various sizes. Additionally, New Zealand research has estimated that treating decay has been estimated to be around 30 times more expensive than preventing it with water fluoridation²⁴.

Additionally, *The RACP Oral Health in Children and Young People Position Statement*²⁵ includes the following recommendation regarding fluoridation:

"The RACP recommends:

Supporting cost-effective public health measures that have a proven impact on child oral health, such as:

- *Public water fluoridation for all communities with populations greater than 1000 people;*
- *Focusing on public water fluoridation for rural and remote communities, particularly in the Northern Territory and in Indigenous communities in Australia and New Zealand;*
- *Minimising the use of bottled water for children in communities with adequate water fluoridation;*
- *Supporting the establishment of oral health surveillance systems to provide an ongoing evidence base."*

The case against fluoride in New Zealand

The RACP and PSNZ acknowledge that although the scientific community considers the evidence is strongly in favour of water fluoridation as a safe, effective, cost-saving and equitable public health measure, there are vocal lobby groups who oppose it.

The following table presents the common anti-fluoride positions and evidence-based rebuttals on these positions.

Anti-fluoride position	Rebuttal
1. The benefits are unquantified	The evidence on the benefits of water fluoridation is indisputable. Several examples of robust research supporting water fluoridation are mentioned

¹⁹ Ministry of Health (2010) Our Oral Health: Key findings of the 2009 New Zealand Oral Health Survey. Wellington: Ministry of Health

²⁰ Parnell, C, Whelton, H, O'Mullane, D. Water fluoridation. *European Archives of Paediatric Dentistry* 2009; 10(3):141-148.

²¹ Griffin, SO, Jones, K & Tomar, SL. An Economic Evaluation of Community Water Fluoridation. *Journal of Public Health Dentistry* 2001; 61(2):78-86.

²² Ibid

²³ Griffin SO, Jones K, Tomar SL. *J Publ Health Dent* 2001;61(2):78-86. An Economic Evaluation of Community Water Fluoridation: An analysis of the most current data available on the effectiveness and costs of water fluoridation.

²⁴ ESR (1999) The Cost-Effectiveness of Fluoridating Water Supplies in New Zealand: A report for the Ministry of Health. Wellington: Institute of Environmental Science and Research Limited.

(Conservative estimates are that it costs \$4.20 to prevent each case of tooth decay through water fluoridation but it costs \$117 to treat each case of decay.)

²⁵ The Royal Australasian College of Physicians Paediatric and Child Health Policy Committee (2012) Oral Health in Children and Young People Position Statement. Available from: <http://www.racp.edu.au/page/paed-policy>

	<p>above. Whilst the calibre and extent of local, national and international health organisations²⁶ that actively support water fluoridation reinforces its importance. Water fluoridation is wide spread throughout the world, with 377, 655,000 people in 25 countries receiving artificially adjusted fluoridated water and a further 39.5 million people with access to naturally fluoridated water at the optimal level (as of November 2012)²⁷</p>
<p>2. It poses health risks and is a danger to the consumer</p> <ul style="list-style-type: none"> a. Research quality b. Toxicity c. Fluorosis 	<p>Scientific evidence over the last 60 years has consistently found water fluoridation at the recommended levels of 0.7-1.0mg/L to be safe and pose no adverse effects to the public.</p> <ul style="list-style-type: none"> a.) Studies addressing the adverse effects of water fluoridation often have flawed methodology, and lack internal and external validity; and may be confounded by the study environment, for example, conducted in communities with unique characteristics (i.e. extremely high exposure to natural fluoride). Subsequently, these studies must be cautiously interpreted and their extrapolation to the New Zealand context is often restricted and inappropriate. These concerns have been affirmed by New Zealand academics on recent research by Choi et al suggesting a link between Fluoride and Child's IQ²⁸. This stance is reinforced by the Ministry of Health²⁹: <ul style="list-style-type: none"> “Many of the articles that raise fears about water fluoridation relate to overseas countries such as India and China, where fluoride is well in excess of the recommended levels of 0.7 mg/L to 1.0 mg/L and are often poorly conducted, lack substance, or repeat previous statements already shown to be without scientific validity.” b.) Toxicity <ul style="list-style-type: none"> “...one would have to succumb to water intoxication before any toxic effect of fluoride was discernible”³⁰. Fluoride does not accumulate in the body, the level of fluoride in your blood reflects the level in the water you drink and the food you consume³¹. c.) Fluorosis <ul style="list-style-type: none"> The College acknowledges the risk of dental fluorosis from excessive fluoride concentrations – however maintains (alongside the latest impartial evidence base) that due to the dose-dependency of dental fluorosis, water fluoridation within safe levels (0.7-1.0ppm) poses a negligible risk of fluorosis to the consumer³². Additionally, known cases of fluorosis in New Zealand are usually graded as moderate or less - a level

²⁶ For example, The New Zealand Dental Association, World Health Organisation, World Dental Federation, New Zealand Ministry of Health, NZ Maori Dental Association (Te Ao Marama), NZ Cancer Society, Plunket, The NZ Public Health Association, The American Dental Association, The Children's Commissioner, The Dental Council of New Zealand.

²⁷ British Fluoridation Society (2012) *One in a Million: the facts about water fluoridation – The extent of water fluoridation*. Available from: <http://www.bfsweb.org/oneinmillion/09%20One%20in%20a%20Million%20-%20The%20Extent%20of%20Fluoridation.pdf>

²⁸ Borman B and Fyfe C (2013) Fluoride and Children's IQ. *NZMJ*. 126; 1375: 111-112. Available from: <http://journal.nzma.org.nz/journal/126-1375/5664/content.pdf>

²⁹ Ministry of Health (2011). *Water fluoridation: fluoride and health*. Available from: <http://www.health.govt.nz/our-work/preventative-health-wellness/fluoridation/fluoride-and-health>

³⁰ The Office of the Prime Minister's Science Advisory Committee (2013) *Blog: What is in the water? Sir Peter Gluckman's comments on the Science of Water Fluoridation*, June 12 2013. Available from: <http://www.pmcsa.org.nz/blog/what-is-in-the-water/>

³¹ Ministry of Health (2010) *Water Fluoridation Flip Book*. Available from: <http://www.health.govt.nz/our-work/preventative-health-wellness/fluoridation/fluoridation-resources/fluoride-flipbook>

³² National Fluoridation Information Service (2011). *Review of Scientific Reviews Relating to Water Fluoridation Published between January 2000 and July 2010*. Wellington: National Fluoridation Information Service Advisory.

	<p>which purely affects the cosmetic appearance of the teeth and is not of clinical concern^{33 34 35}.</p> <p>The 2009 New Zealand Oral Health Survey³⁶ reported no significant differences in the levels of dental fluorosis of people living in fluoridated and non-fluoridated areas.</p> <p>The RACP and PSNZ reaffirm the following New Zealand Dental Association position:</p> <p><i>"... when considering the slight white flecking that can occur in association with water fluoridation, it is also necessary to consider the much more significant effects of pain and poor appearance cause by dental decay³⁷."</i></p>
<p>3. Ethical perspectives, for example: <i>Fluoridation is a form of mass medication and it removes personal choice</i></p>	<p>The RACP and the PSNZ acknowledge that ethical issues are inextricably part of any public health decision.</p> <p>Public health actions, for example, cycle helmets, seatbelts, chlorination of water, air standards - all involve a degree of limitation to personal freedom on the basis of the greater good – and are quantified by their relative benefit to society.</p> <p>There are several examples of essential elements added to food or water for public health benefit, such as iodine to salt, chlorine to water, vitamins to margarine, and fortification of flour.</p> <p>The ethical issues concerning fluoridation have recently been examined by the Nuffield Council on Bioethics who:</p> <ul style="list-style-type: none"> • rejected the prohibition of water fluoridation based on the argument of mass medication and restricting personal rights³⁸, and • affirmed that water fluoridation should be accepted based on <i>the quantified risks and benefits, the potential alternatives, and, where there are harms, the role of consent.</i>³⁹ <p>They also used a 'stewardship mode'⁴⁰ to analyse the acceptable degree of state intervention to improve population health, concluding that water fluoridation can be justified based on its contribution to the goals of stewardship: the reduction of health inequalities, the reduction of ill health, and the concern for children, who represent a vulnerable group⁴¹.</p>

³³ Mackay and Thomson (2005). Enamel defects and dental caries among Southland children. *New Zealand Dental Journal*. 101(2):35-43.

³⁴ Schluter et al (2008) Prevalence of enamel defects and dental caries among 9 year old Auckland children. *New Zealand Dental Journal*. 104(4):145-152.

³⁵ Ministry of Health (2010) Our Oral Health: Key findings of the 2009 New Zealand Oral Health Survey. Wellington: Ministry of Health

³⁶ Ibid

³⁷ New Zealand Dental Association (2012) New Zealand Dental Association Inc. *Statement on Water Fluoridation*. Available from: <http://www.healthysmiles.org.nz/assets/NZDAFluoridationStatement2012-finalrevision.pdf>

³⁸ Nuffield Council on Bioethics. *Public health: ethical issues*. London: Nuffield Council on Bioethics, 2007. [Chapter 7: Case Study – Fluoridation of water]

³⁹ Nuffield Council on Bioethics. *Public health: ethical issues*. London: Nuffield Council on Bioethics, 2007. [Chapter 7: Case Study – Fluoridation of water] p.139

⁴⁰ The concept of 'stewardship' is intended to convey that liberal states have a duty to look after important needs of people individually and collectively. It emphasises the obligation of states to provide conditions that allow people to be healthy and, in particular, to take measures to reduce health inequalities. The stewardship-guided state recognises that a primary asset of a nation is its health: higher levels of health are associated with greater overall well-being and productivity.

⁴¹ Nuffield Council on Bioethics. *Public health: ethical issues*. London: Nuffield Council on Bioethics, 2007. [Chapter 7: Case Study – Fluoridation of water]

	<p>In regards to civil rights and autonomy, in 1980, the Human Rights Commission⁴² affirmed that: <i>“Fluoridation of water supplies by public authorities does not constitute a denial of human rights.”</i></p> <p>If people choose, they are able to remove fluoride from their drinking water through reverse osmosis filters and steam distillers. From an ethical perspective risk can be justified if the benefits significantly outweigh the risks. <i>“Given the evidence for fluoridation it could be argued that, in fact, there is an ethical imperative to take action”⁴³.</i></p> <p><i>New Zealand’s obligation to child health</i> Article 24 of the United Nations Convention on the Rights of the Child (UNCROC), which New Zealand is a party to states that: <i>Every child has the right to the best possible health.</i> This concept is affirmed by the British Fluoridation Society who state: <i>“Whilst anti-fluoridation campaigners may emphasise their preference for freedom from fluoride in water, there is a powerful counter argument that emphasises the need for freedom from tooth decay...whilst this affects all sections of society, it has a particular impact on children, a group of the population least well placed to campaign for their rights.”⁴⁴</i> And reinforced by Lord Avebury, a prominent British Human Rights campaigner <i>“...what is at stake is not the erosion of liberty but...the erosion of millions of teeth and the resultant suffering and misery of thousands of children which fluoridation would go far to prevent.”⁴⁵</i></p>
<p>4. Fluoride is a poison/toxin</p>	<p>Fluoride is a naturally occurring element and naturally present in the air, soil, water, seawater, plants and many foods. Fluoride is not a drug or toxin.</p>

Further information and evidence on water fluoridation’s safety and efficacy is available from:

- The National Fluoride Information Service
<http://www.rph.org.nz/content/14350004-1cf6-45ad-a32d-d35311bfe2fc.html>
The National Fluoride Information Service is a consortium of scientists who monitor and critically review the ongoing research on throughout the world to assess the effectiveness and safety of water fluoridation.
- The Ministry of Health
<http://www.health.govt.nz/our-work/preventative-health-wellness/fluoridation>
- Fluoride Facts New Zealand
<http://www.fluoridefacts.govt.nz>

⁴² Agenda item no. 9, Proceedings from the Human Rights Commission, 13 August 1980.

⁴³ John Harris – Bioethics Professor at the University of Manchester. *Quoted in One in a Million: The facts about fluoridation, the ethics of water fluoridation p.8.* British Fluoridation Society (012)
<http://www.bfsweb.org/onemillion/12%20One%20in%20a%20Million%20-%20The%20Ethics%20of%20Water%20Fluoridation.pdf>

⁴⁴ British Fluoridation Society (2012) *One in a Million: the facts about water fluoridation - The ethics of water fluoridation p. 15.* Available from: <http://www.bfsweb.org/onemillion/12%20One%20in%20a%20Million%20-%20The%20Ethics%20of%20Water%20Fluoridation.pdf>

⁴⁵ Lord Avebury (1984). Fluoridation and individual Freedom. *British Dental Journal.* 277

About the Paediatric Society of New Zealand (PSNZ)

The PSNZ has a membership in excess of 500 professionals with a focus on children's health and wellbeing. The organisation is multi-disciplinary and has a 14 member Council representing the full range of professional disciplines and geographic areas. Additionally the organisation has 24 Special Interest Groups with a focus on a wide range of child related issues including child development, parent information, epidemiology, fetus and the newborn, oncology, respiratory and many other topics. www.paediatrics.org.nz

About the Royal Australasian College of Physicians (RACP)

The RACP trains, educates and advocates on behalf of more than 14,300 physicians – often referred to as medical specialists – and 6,500 trainees, across Australia and New Zealand. The College represents more than 32 medical specialties including general medicine, paediatrics and child health, cardiology, respiratory medicine, neurology, oncology and public health medicine, occupational and environmental medicine, palliative medicine, sexual health medicine, rehabilitation medicine, geriatric medicine and addiction medicine. Beyond the drive for medical excellence, the RACP is committed to developing health and social policies which bring vital improvements to the wellbeing of patients. www.racp.edu.au