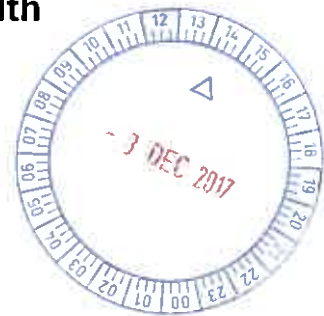




**The Hon Roger Cook MLA
Deputy Premier
Minister for Health; Mental Health**

Our Ref: 60-05398, 60-05485



Hon Matthew Swinbourn MLC
Chair
Standing Committee on Environment and Public Affairs
Parliament House
4 Harvest Terrace
WEST PERTH WA 6005

Dear Mr Swinbourn

Math,

Thank you for your letters of 2 and 8 November 2017 in relation to petitions 16, 23 and 33, that have been referred to your Committee.

I note that petitions 16 and 23 appear to be opposed to fluoridation of public water supplies in Kununurra and the Town of Port Hedland respectively, and that petition 33 is opposed to the fluoridation of public water supplies in Western Australia (WA) more generally and seeking the repeal of the *Fluoridation of Public Water Supplies Act 1966*.

I understand that, as part of your Committee's preliminary enquiries into the petitions, you are seeking my comments on the terms of the petitions, as well as my comments on associated submissions from the principal petitioners, Fluoride Free WA and Mr Michael Lusk.

I am pleased to provide the following comments, firstly with some general remarks about community water fluoridation in WA and the role of the statutory Fluoridation of Public Water Supplies Advisory Committee, then responding to the specific matters raised by the principal petitioners.

Merits of community water fluoridation

The McGowan Government supports fluoridation of community water supplies as an effective part of Western Australia's oral health strategy.

In summary, drinking water fluoridated at optimal levels results in important dental benefits for the Western Australian community and simply does not pose a health risk.

As background, fluoridation of community water supplies forms part of a suite of caries prevention measures that include healthy diet, good oral hygiene, appropriate use of fluoridated toothpaste and regular dental checks. It benefits all sectors of the community, regardless of age, individual motivation, socioeconomic status or the availability of dental care. Community water fluoridation especially benefits children.

Due to directives issued by successive Ministers for Health since 1967, some 92 percent of the Western Australian population receive the benefits of fluoridated drinking water, principally via the integrated water supply system, which supplies the Perth metropolitan area, as well as the Wheatbelt and southern regional communities and communities out to Kalgoorlie. Fluoridated drinking water is also provided to Geraldton, Albany and many other communities in regional WA, including Hedland, Karratha, Broome and Derby, as well as all other capital cities and most regional communities Australia-wide, with no detrimental effects.

The benefits and safety of fluoridation is supported by overwhelming scientific evidence and is supported both in the *WA State Oral Health Plan 2016-2020*¹ and the Commonwealth Government's National Oral Health Plan².

Further, a new National Health and Medical Research Council (NHMRC) study, also released recently, rules out safety concerns³, echoing the results of numerous other studies around the world that have, repeatedly, also found fluoridation of drinking water to be safe. A copy of the up-to-date Public Statement published by the NHMRC in November 2017 pursuant to this study is attached, and recommends:

"NHMRC strongly recommends community water fluoridation as a safe, effective and ethical way to help reduce tooth decay across the population. NHMRC supports Australian states and territories fluoridating their drinking water supplies within the range of 0.6 to 1.1 milligrams per litre (mg/L)."

I also cordially refer your Committee to the NHMRC publication *"Water Fluoridation and Human Health in Australia: Questions and Answers"*⁴, for more detailed answers on commonly asked questions in relation to community water fluoridation.

In relation to the science underpinning fluoridation, there is an impressive collective body of research supporting fluoridation of drinking water, gathered by many credible bodies worldwide. In summary, no epidemiological data or peer reviewed scientific paper published in a recognised scientific journal has drawn a link between adverse health effects and fluoridation of drinking water, nor does any reputable science or public health body oppose community water fluoridation, despite claims to the contrary circulated in anti-fluoridation literature, blog sites and social media.

¹ Details at: <http://ww2.health.wa.gov.au/Reports-and-publications/State-Oral-Health-Plan>

² Details at: <http://health.gov.au/dental>

³ Details at: www.nhmrc.gov.au/health-topics/health-effects-water-fluoridation

⁴ Ibid.

Fluoridation of community water supplies is in line with all sound principles of science and public health policy. Fluoridation of drinking water is supported by an extensive range of authoritative health research agencies and government bodies in Australia and worldwide, including:

- All Australian State Government health agencies.
- Council of Australian Governments Health Council via "*Healthy Mouths Healthy Lives - Australia's National Oral Health Plan 2015-2024*".
- National Health and Medical Research Council (Australia).
- Australian Dental Association.
- World Health Organisation.
- International Association for Dental Research.
- Centres for Disease Control and Prevention (USA).
- US Surgeon General.
- Harvard Medical School.
- Harvard School of Dental Medicine.
- Harvard School of Public Health.
- Australian Medical Association.
- Australian and New Zealand Society for Paediatric Dentistry.
- Australasian Academy of Paediatric Dentistry.
- Australian Academy of Science.
- Australian Centre for Human Health Risk Assessment.
- Australian Research Centre for Population Oral Health (ARCPOH).
- Public Health Association of Australia.
- Alzheimer's Australia.
- Kidney Health Australia.
- Royal Society of New Zealand and the Office of the Prime Minister's Chief Science Advisor.
- Ministry of Health New Zealand.
- US Environmental Protection Agency.
- US Department of Health and Human Services.
- Health Research Board, Ireland.
- National Cancer Institute (USA).

In all water supplies the fluoride levels remain well within the health-related guideline value of 1.5 milligrams per litre for fluoride that is set out in the "*Australian Drinking Water Guidelines*"⁵, published by the NHMRC. In WA, fluoridation of drinking water is based on optimal fluoride levels recommended by the NHMRC, with maximum fluoride levels, having considered relevant factors from all sources, not exceeding 1 milligram per litre established by law.

⁵ Details at: www.nhmrc.gov.au/guidelines/publications/eh52

I can reassure your Committee that drinking water fluoridated at optimal levels does not pose a health risk. Claims that cast doubt on the safety or cost-effectiveness of fluoridation of drinking water, of the type that appear to surface on a number of internet web sites or blogs and which appear to be the basis of the principal petitioners' submissions, have been comprehensively examined by the NHMRC in Australia, and other bodies such as the World Health Organisation, and have consistently been found to be baseless.

Water fluoridation is crucial in caries protection for those individuals who for reasons that may be social, economic or medical cannot brush their teeth regularly with fluoride toothpaste, a position that any vulnerable individual may encounter during their life time.

In summary, important dental benefits are obtained for a community from fluoridation of its water supplies, but only poorer oral health outcomes result from denying this public health measure on account of the opposing views of a small number of individuals.

Role of the Fluoridation of Public Water Supplies Advisory Committee

Detail about the role and function of the Fluoridation of Public Water Supplies Advisory Committee (the Fluoridation Committee) is provided in the attachment to this letter. In summary, the role of the Fluoridation Committee is to consider, advise and make written recommendations to the Minister for Health relating to fluoridation of drinking water supplies and the achievement of the objects and effectual administration of the *Fluoridation of Public Water Supplies Act 1966* (the Act).

The interest of all members of the Fluoridation Committee, including its current Chairman, the fifth Chairman in the Committee's history, is in achieving the objects and effectual administration of the Act, and in the good governance of the State within the scope provided by the Act. This is an interest shared by myself, the Premier and the State Government generally.

In response to claims about procedural irregularities about the process by which a decision to fluoridate water supplies is authorised, I can assure your Committee that this was done pursuant to lawful directives under the Act, signed by the then Minister for Health in January 2015 in relation to fluoridation for Kununurra, Hedland, Moora, Dongara, Port Denison and Newman, and similarly for Yanchep in March 2016.

Petitions 16, 23 and 33 and submissions from Principal Petitioners and Fluoride Free WA

The principal petitioner for petition 16, Mr Danny Carter of Kununurra, has been a prolific correspondent over a number of years, variously to my office, other Parliamentarians, the Department of Health (DOH), the Fluoridation Committee, and on social media, in airing his views, similar to those of Fluoride Free WA, in opposing community water fluoridation in WA generally and Kununurra specifically.

Contrary to Mr Carter's assertion, a considerable amount of detail has been provided in replies to his queries in recent years, including his queries about the consultation process for Kununurra. These are attached for your Committee's perusal.

Similarly, Fluoride Free WA, which appears to be registered as a political party in WA⁶, or its office bearers, have been prolific correspondents to Government agencies over the years, in very similar terms to their current submissions, despite the ongoing lack of credible evidence to support their assertions about water fluoridation.

The views expressed in the submission about claimed adverse health effects from water fluoridation, claims that fluoridated drinking water is 'medicine', and claims that fluoridation is not effective in relation to dental caries, appear to be rhetorical remarks drawn from dedicated anti-fluoridation literature circulating on the internet or on social media, or from the web sites or self-published literature by individuals or overseas organisations opposed to water fluoridation, that are cited therein. The conclusions are not backed by any credible peer-reviewed evidence.

In particular, the submission from the principal petitioner for petition 23 appears to consist entirely of uncited opinion, and the claim from the principal petitioner for petition 16 that community water fluoridation is somehow linked to or increases lead levels such as experienced at Perth Children's Hospital is irrefutably wrong.

The assertions in both submissions, while no doubt passionately held, are untrue, unverified, or not relevant to the context of community water fluoridation in Australia, yet appear to be written in such a way to invite a reader to conclude that community water fluoridation is harmful. In particular, calls for "an urgent royal commission into the NHMRC" appear to simply be based on the fact that the recent NHMRC review into water fluoridation reached a conclusion, based on credible evidence that individuals opposed to water fluoridation were not happy with.

The petitioners may be unaware that, via the "*Australian Drinking Water Guidelines*", NHMRC sets the policy basis for the quality and safety of drinking water in Australia generally for over 200 microbiological, radiological and chemical parameters, not just fluoride. This means that, in effect, requesting an "urgent royal commission" into the NHMRC also implies that the principal petitioners either view non-fluoridated drinking water supplies in Australia, such as at Kununurra, as already unsafe, as they are managed according to NHMRC advice or it means that, despite calls for "a royal commission", they readily trust NHMRC guidance on all aspects of drinking water quality except for fluoride, but for their own reason take a diametrically opposed view and, thus, choose not to accept NHMRC guidance about fluoridation specifically.

⁶ Details at: <https://elections.wa.gov.au/candidates-and-parties/registered-political-parties-wa>

The truth of the matter is that, considering the millions of Australians and people in similar countries of all ages who have safely consumed drinking water fluoridated to the appropriate level over many decades, no known adverse health effect is credibly attributable to drinking fluoridated water as supplied by water suppliers.

I respectfully draw your Committee's attention to the considerable documentation and resource provided by the NHMRC that demolishes the assertions in the submissions, both in relation to the credible science underpinning the health benefits of water fluoridation, as well as the ethical aspects.

It should be noted that this body of detailed information represents not merely my opinion or the opinion of the Fluoridation Committee, but represents in part the effective current consensus of the scientific community worldwide on the safety and efficacy of community water fluoridation.

On a specific matter, please also note that water fluoridation in WA is a public health measure that is carried out in accordance with law for the protection of public health. As such, it is consistent with the Report of the International Bioethics Committee of UNESCO on Consent ⁷.

The statements made by the principal petitioners in their submissions may fairly be regarded as their own opinion, or those of Fluoride Free WA, but no more than that.

Comment on matters related to community concern

Please note that, in relation to petition 23, water fluoridation was introduced in Hedland in 2016, with no adverse outcomes. In relation to the principal petitioner's remarks about the 2013 Hedland water fluoridation survey conducted for the DOH⁸, I can confirm that the survey was conducted in accordance with all applicable requirements about the conduct and validity of surveys. In summary, 52 percent of (445) respondents from the Hedland area agreed with the addition of fluoride to the public drinking water supply, with 17 percent not agreeing and 31 percent unsure. The survey report went into considerable detail as to how the 445 were selected and why this remained statistically significant. Therefore, it is difficult to reconcile the view that the survey was unrepresentative because it covered "a mere 445 people", when the principal petitioner's own petition only managed to garner 133 signatures.

In relation to the substantive comment underlying the petition 23, about the safety of fluoridation chemicals in drinking water supplies, I can advise your Committee that all chemicals added to drinking water in WA must meet the quality standards specified in the "*Australian Drinking Water Guidelines*" ⁹, as published by the NHMRC, as well as be approved by the DOH for addition to drinking water.

⁷ Details at: <http://unesdoc.unesco.org/images/0017/001781/178124e.pdf>

⁸ Details at: http://ww2.health.wa.gov.au/Articles/F_1/Fluoridation

⁹ Details at: www.nhmrc.gov.au/guidelines/publications/eh52

The DOH also ensures that drinking water suppliers follow strict protocols relating to testing, purity and source of products added to drinking water, to ensure that all drinking water supplied complies with the relevant requirements of the “*Australian Drinking Water Guidelines*”. More details are provided in the links below¹⁰.

In relation to community views more generally, it remains true that, in any community, some community members sincerely believe that public health initiatives, such as water fluoridation are harmful, or for reasons of their own become opposed to water fluoridation. While the individual passion and commitment of those who are opposed to water fluoridation is respected, the weight of peer reviewed, epidemiological and medical evidence continues to support the safety and efficacy of water fluoridation.

I am aware that there is a degree of opposition to the move in Kununurra, as per petition 16, and to a lesser degree in Hedland as per petition 23. However, while community consultation is important to inform public health decisions and to provide a social context to those decisions, the overriding driver for public health decisions always remains the protection of the health of the community as a whole.

It is not possible to design a community information strategy that will satisfy those opposed to fluoridation, or to ensure that every individual community member supports such initiatives. A balance must be struck between accommodating the views of individuals and protecting public health.

Nonetheless, the State Government has a responsibility to promote the best possible community health outcomes, and this includes extending the benefits of water fluoridation within WA. Ultimately, there is no credible evidence to invalidate the safety or efficacy of water fluoridation as a public health measure, and no sound public policy grounds or public health grounds for not introducing this key public health benefit, either for Kununurra or other similar communities in WA.

I am satisfied that extension of water fluoridation in WA, including to Kununurra, will provide significant improvements to the oral health outcomes in this community, life-long reduction in incidence of dental caries and reduction in future demand for dental surgical facilities. I encourage all parties to view water fluoridation as a significant positive step, for any community in WA, and a key step to providing the best possible health outcomes for any community, particularly for children.

Comment on submission by Mr Michael Lusk

In relation to claims linking community water fluoridation to therapeutic goods, or to medicine, and claimed inconsistencies of regulatory frameworks, both here and in the other submissions, please note that this tactic has been frequently used by those opposed to water fluoridation to attempt to discredit the basis of fluoridation in a number of jurisdictions worldwide, and it has always failed when tested in any jurisdictional legal forum.

¹⁰ Details at:

<http://www2.health.wa.gov.au/sitecore/content/Healthy-WA/Articles/F/Fluoride-facts-for-Western-Australia>

I respectfully draw your Committee's attention to the statement by the Therapeutic Goods Administration on its web site¹¹, entitled "*Fluoride in drinking water*", which states (in part):

"Water fluoridation is regulated by the States and Territories.

Fluoridated drinking water is not therapeutic goods within the definition of that term in the Therapeutic Goods Act 1989. The Therapeutic Goods Administration thus has no role in regulating fluoridated drinking water."

I also draw your Committee's attention to the answer to question 39 in the document "*Water Fluoridation and Human Health in Australia: Questions and Answers*", published by NHMRC, November 2017 and attached to this letter, which states:

39. Is Fluoridated Drinking Water Considered A Drug Or Medication?

No. In Australia, the Therapeutic Goods Administration (TGA) does not require fluoride compounds, such as those added to fluoride toothpaste and to community drinking water supplies, to be registered as medicines if they are used for the prevention of dental decay - nor are they scheduled as drugs or poisons when they are added to community drinking water supplies at optimal levels.

Fluoridated drinking water is thus not considered to be a therapeutic drug or medicine by the TGA in Australia, or by comparable therapeutic goods regulators in any other country where water is fluoridated. Fluoride is a natural component of most water supplies. The TGA is the Australian regulator responsible for making sure that therapeutic goods used to prevent or manage health conditions in Australia are safe and of good quality.

There is no valid argument presented in the submission that would support the claims made in the submission, or question the *Fluoridation of Public Water Supplies Act* 1966, any of its specific provisions, or any legitimate action made under this Act in relation to water fluoridation in WA.

The material about dental caries and fluoride on the second page of this submission is demolished by the weight of mainstream scientific and credible evidence worldwide that I have referred to in detail earlier in this letter, or it is not as relevant to the context of water fluoridation as the submitter appears to believe. In particular, the statement in the submission that "*It is proven beyond doubt that fluoride is both a nephrotoxin and a neurotoxin*", uncited and devoid of context, can be read, like the remainder of the submission, as an expression of his own opinion, but nothing more.

¹¹ Details at: www.tga.gov.au/behind-news/fluoride-drinking-water

Closing remarks

My role as Minister for Health is to ensure the proper function of public health policy in WA and, thus, the wellbeing of the Western Australian community. The signatories to the three petitions are of course entitled to their views, as are the Principal petitioners, and I respect and support their right to express their views to the Parliament, but that does not make those views a sound basis for public health policy.

I can confirm to your Committee that, in the clear absence of any public health evidence supporting the opinions expressed in the submissions, it is reasonable to regard those views as incompatible with the public interest and incompatible with the proper function of public health policy in WA. There are simply no sound public policy grounds or public health grounds for acceding to the request to cease water fluoridation in WA generally, or to fail to extend it to benefit Kununurra and Hedland, or to repeal the Act.

I trust that this information is of assistance to your deliberations. If your Committee would like more information on any particular aspects of this matter, public health experts of the DOH stand ready to assist, and can provide the necessary information.

Yours sincerely



HON ROGER COOK MLA
DEPUTY PREMIER
MINISTER FOR HEALTH; MENTAL HEALTH

Att:

- Role of the Fluoridation of Public Water Supplies Advisory Committee (attachment)
- Correspondence from the Minister for Health to the principal petitioner (petition 16), dated 23 May 2017.
- Correspondence from the Department of Health to the principal petitioner (petition 16), dated 23 May 2016.
- NHMRC Public Statement 2017 "*Water Fluoridation and Human Health in Australia*", November 2017.
- Water Fluoridation And Human Health In Australia: Questions And Answers, NHMRC, November 2017

5 DEC 2017

ATTACHMENT

Role of the Fluoridation of Public Water Supplies Advisory Committee

Drinking water supplies in Western Australia can only be fluoridated pursuant to the *Fluoridation of Public Water Supplies Act 1966* (the Act). Under the Act, the Minister for Health may only make such a direction based on the advice of the Fluoridation of Public Water Supplies Advisory Committee, which is established in accordance with the Act.

The Committee operates under the chairmanship of the Department of Health and, as with any statutory Committee established under an Act, ultimately is responsible to the Minister administering the relevant Act.

The Committee's function is to consider, advise and make written recommendations to the Minister for Health relating to:

- any proposal to add fluoride to any public water supply;
- any proposal for making, amending or revoking any regulation pursuant to the Act; and
- matters conducive to the achievement of the objects and effectual administration of the Act.

The Committee operates under the chairmanship of the Chief Health Officer of the WA Department of Health (or delegate) and has had five Chairs in its history. The Committee includes representatives from the Water Corporation and Chemistry Centre (WA), and nominees from the Australian Medical Association, the Australian Dental Association and the Western Australian Local Government Association, the latter three being appointed periodically by the Minister for Health.

The Committee is supported by a secretariat provided by the Environmental Health Directorate of the Department of Health, and an adviser from Dental Health Services, Department of Health. The Committee operates in accordance with applicable record keeping and privacy provisions for the Western Australian public sector as well as the governance requirements established under the Act. The Committee meets as necessary, with usually one to two meetings per year.

The Committee's deliberations are informed by sound research and statements by the NHMRC, the World Health Organisation, the Australian Research Centre for Population Oral Health, the Centers for Disease Control and Prevention (USA) and other bodies listed earlier in this letter, and reputable public health research journals, rather than from unverified material or blog opinion from the internet.

In summary, the role of the Committee is to consider, advise and make written recommendations to the Minister for Health relating to fluoridation of drinking water supplies and the achievement of the objects and effectual administration of this Act.



E-MAILED

**The Hon Roger Cook MLA
Deputy Premier
Minister for Health; Mental Health**

Our Ref: 60-00375, 60-00442

Mr Danny Carter
Organic Kreations
organickreations@hotmail.com

Dear Mr Carter *Danny,*

Thank you for your emails of 30 March and 3 April 2017 regarding fluoridation of the drinking water supply for Kununurra. I appreciate your interest in fluoridation.

As the Minister for Health, I would like to take this opportunity to set out some key background information for you about community water fluoridation, before turning to specific matters relating to Kununurra.

The Western Australian Government supports fluoridation of community water supplies as an effective part of Western Australia's (WA) oral health strategy. The benefits and safety of fluoridation is supported by overwhelming scientific evidence and is supported both in the *WA State Oral Health Plan 2016-2020*¹ and the Commonwealth Government's National Oral Health Plan.

Fluoridation of community water supplies is an effective way to deliver fluoride to all members of the community, regardless of age, individual motivation, socioeconomic status or the availability of dental care. Fluoridation forms part of a suite of caries prevention initiatives that also relate to healthy diet, good oral hygiene, appropriate use of fluoridated toothpaste and regular dental checks.

Fluoridation of drinking water is supported by an extensive range of authoritative health research agencies and government bodies in Australia and worldwide, including all State and Territory Government health agencies in Australia, the National Health and Medical Research Council (Australia) (NHMRC), the Australian Research Centre for Population Oral Health, the Australian Dental Association, the Australian Medical Association, the Centres for Disease Control and Prevention (United States of America), the World Health Organisation and numerous others.

¹ Details at: <http://ww2.health.wa.gov.au/Reports-and-publications/State-Oral-Health-Plan>

A new NHMRC study released recently rules out safety concerns², echoing the results of numerous other studies around the world that have repeatedly also found fluoridation of drinking water to be safe.

In relation to the science underpinning fluoridation, there is an impressive collective body of research supporting fluoridation of drinking water. I recommend the reviews referred to above, the studies cited therein and the websites of the research bodies listed above as reliable sources of information for you.

Claims that cast doubt on the safety or efficacy of fluoridation of drinking water have been comprehensively examined by the NHMRC in Australia, and other bodies worldwide, and have consistently been found to be without foundation.

In the case of Kununurra, fluoridation simply involves adjusting the fluoride level in the water supply from around 0.4 milligrams per litre, the long term historic level, to an optimal level of around 0.6 milligrams per litre. This aligns Kununurra with other regional communities in the Kimberley, such as Broome and Derby, as well as Halls Creek, whose ground water supply contains, and has for many decades, fluoride at around 0.6 milligrams per litre. This remains well within the health-related guideline value of 1.5 milligrams per litre set out in the *"Australian Drinking Water Guidelines"*.

In relation to your query about monitoring fluoride levels, the Department of Health (DOH) ensures that drinking water suppliers follow strict protocols relating to testing, purity and source of products added to drinking water. This process includes routine weekly monitoring of fluoride levels in all water supplies that are fluoridated, with weekly monitoring extending to Kununurra once fluoridation commences, and monitoring in accordance with the *"Australian Drinking Water Guidelines"* for all other non-fluoridated supplies.

In relation to many of the other specific matters raised in your email, I am advised that the DOH provided you with a detailed response in May 2016. Other information about water fluoridation will be provided by the DOH on its website, while any further queries can be cordially raised at the DOH's next community information session to be held in Kununurra, just prior to the introduction of fluoridation, in December 2017.

In relation to your views about feedback from the Kununurra community, I appreciate that you may have some concerns regarding water fluoridation and I acknowledge your opinion on this matter. However, the State Government has a responsibility to promote the best possible community health outcomes, and this includes extending the benefits of fluoridation within WA.

² Details at: www.nhmrc.gov.au/health-topics/health-effects-water-fluoridation

In relation to your query about dental health initiatives in Kununurra, Dental Health Services (DHS) provides free universal dental care to enrolled school children aged 5 – 16 years and subsidised dental care to eligible adults (Health Care and Pensioner Concession cardholders). In Kununurra, prevention and general dental care are also provided at the Ord Valley Aboriginal Health Service.

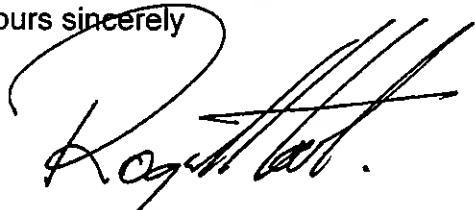
On request, DHS' Oral Health Promotions Unit assists schools, child care centres, child health nurses and similar groups with oral health promotion resources including dental hygiene information. In addition, DHS staff located in Kununurra are able to provide oral health promotion presentations to the children of local schools and can be contacted on (08) 9168 2055. The Oral Health Promotions Unit can be contacted on (08) 9313 0555 or at: ohp@dental.health.wa.gov.au.

I also appreciate your interest in combating tooth decay and improving public health, and invite you to submit any suggestions or ideas in this regard to the Office of the Chief Dental Officer, by email at: chiefdentaloffice@health.wa.gov.au.

In closing, I look forward to the extension of water fluoridation to the community of Kununurra, to provide significant improvements to the oral health outcomes in your community, life-long reduction in incidence of dental caries and reduction in future demand for dental surgical facilities. I encourage you to view community water fluoridation as a significant positive step for Kununurra and a key step to providing the best possible health outcomes for your community, particularly for children.

I trust that the information provided clarifies the situation and is of assistance.

Yours sincerely



HON ROGER COOK MLA
DEPUTY PREMIER
MINISTER FOR HEALTH; MENTAL HEALTH

23 MAY 2017

*Danny,
This letter covers off on your
concerns pretty well. I'm happy
with the work done to ensure public
health.
Cheers, Roger*



Government of Western Australia
Department of Health

Your Ref: 33-32908
Our Ref: 33-33002
Enquiries: Water Unit (08) 9388 4999

Mr Danny Carter
organickcreations@hotmail.com

Dear Mr Carter

FLUORIDATION FOR THE KUNUNURRA COMMUNITY WATER SUPPLY

Thank you for your email of 20 April 2016 to the Minister for Health (the Minister), following on from the Minister's previous reply to you regarding water fluoridation for Kununurra. Your email has been passed on to the Department of Health (DOH) for direct reply.

As the Minister indicated in his letter to you of 19 April 2016, fluoridation of community water supplies is an effective way to deliver fluoride to all members of the community, regardless of age, individual motivation, socioeconomic status or the availability of dental care. It forms part of a suite of caries prevention initiatives that also relate to healthy diet, good oral hygiene, appropriate use of fluoridated toothpaste and regular dental check-ups.

I can also reassure you that claims that cast doubt on the safety or efficacy of fluoridation of drinking water have been comprehensively examined, by the National Health and Medical Research Council (NHMRC) in Australia and other bodies worldwide, and have consistently been found to be without foundation.

Likewise, the safety of water fluoridation has been confirmed by the World Health Organization and bodies such as the Australian Centre for Human Health Risk Assessment affiliated with Monash University. Fluoridation of drinking water has been operating safely in Western Australia (WA) (and indeed for most of Australia's urban population) for over forty years and has had no adverse effect on the environment or human health.

Further information can be found in a review of the scientific research on water fluoridation published in 2007 by the NHMRC. This review is entitled "*A Systematic Review of the Efficacy and Safety of Fluoridation*" and is available for download from:

www.nhmrc.gov.au/publications/synopses/eh41syn.htm

This review stated that: "*Fluoridation of drinking water remains the most effective and socially equitable means of achieving community-wide exposure to the caries [decay]*"

Environmental Health Directorate
All correspondence PO Box 8172 Perth Business Centre Western Australia 6849
Grace Vaughan House 227 Stubbs Terrace Shenton Park WA 6008
Telephone (08) 9388 4999 Fax (08) 9388 4955
www.health.wa.gov.au
28 684 750 332

prevention effects of fluoride." I recommend this detailed review, published in 2007 and most relevant to Australia, as a reliable source of information for you.

Turning to the specific queries you have raised, in relation to your question about consultation for Kununurra, the DOH wrote to the Shire of Wyndham East Kimberley in September 2010, advising the Shire that the local Kununurra drinking water supply was not presently fluoridated, that local public consultation was being arranged and seeking the Council's views on this.

A media release was prepared, advertisements were placed in local newspapers, and DOH representatives held a public meeting in Kununurra in September 2010, to gauge the community's response to the proposal to fluoridate the local water supply and to emphasise the importance of seeking community views and opinions.

The community response was very positive. All community members who attended the public meeting in Kununurra supported water fluoridation (by signing the provided response register); none opposed it. The DOH also recorded that dental health professionals in Kununurra strongly supported the proposal. Opportunities were also provided for interested individuals to write to the DOH with their views after that date.

After the directive was made by the Minister to fluoridate the Kununurra water supply, media and public advice were circulated, in November 2015.

Follow-up public and media information on the introduction of water fluoridation for Kununurra is scheduled to be provided later in 2016. This is anticipated to be with the assistance of local medical and dental professionals.

In the meantime, general information about the benefits of fluoridation is provided at the DOH's HealthyWA website, at: www.healthywa.wa.gov.au

In relation to your question about 'dental issues' in Kununurra, the DOH relies mainly on statistics compiled by the Dental Health Services Branch of the DOH.

In relation to your question about the safety of chemicals added to drinking water, the NHMRC recommends three compounds for fluoridating drinking water in Australia: sodium fluoride, sodium silicofluoride and fluorosilicic acid.

In all cases the chemical in question is added to drinking water supplies in a carefully controlled manner at low levels and dissociates in water to form fluoride ions before the water leaves the treatment plant. Whilst drinking water delivered to consumers contains the fluoride ion, it does not contain undissociated fluorosilicic acid itself.

Please note also that all chemicals added to drinking water in WA must meet the quality standards specified in the "*Australian Drinking Water Guidelines*", as published by the NHMRC, as well as be approved by the DOH for addition to drinking water. The DOH also ensures that drinking water suppliers follow strict protocols relating to testing, purity and source of products added to drinking water, to ensure

that all drinking water supplied complies with the relevant requirements of the "*Australian Drinking Water Guidelines*".

I can also reassure you that the Water Corporation also applies its own Strategic Product Specifications and monitoring programs to ensure that any product added to drinking water meets applicable levels of purity.

In relation to your question about the cost of water fluoridation, information pertaining to costs of fluoridation is confidential commercial information between the Water Corporation and its contracted chemical suppliers. I am advised that, since fluoridation takes place in water treatment plants alongside a number of other more significant water treatment processes, such as chlorination, pH correction, filtration or desalination, the marginal cost attributed to matters such as water fluoridation is essentially a negligible part of the overall water treatment and production cost.

Fluoridation of drinking water is not 'mass medication', and has never been mass medication, in any country where fluoridation of community water supplies is practised. In Australia, the Therapeutic Goods Administration does not require fluoride compounds, such as those added to fluoride toothpaste and to community drinking water supplies, to be registered as medicines if they are used for the prevention of dental decay. Nor are they scheduled as drugs or poisons when they are added to community drinking water supplies at optimal levels.

In relation to your questions about fluoride for Kununurra specifically, I can advise that, when fluoridated, the fluoride level in Kununurra's drinking water supply will be in the range of approximately 0.5 to 0.7 milligrams per litre, with an optimum of 0.6 milligrams per litre. This is therefore adjusted to be slightly greater than the current level of around 0.4 milligrams per litre.

There is no plausible mechanism by which any person, adult or child could consume sufficient quantities of water with fluoride levels in this range on a daily basis to be harmful, no matter what other exposure levels may apply. Please note also that the concentration of fluoride in drinking water is noticeably less than that which occurs naturally in sea water, and will not adversely affect the palatability of the water.

It is a matter of individual preference if someone wishes to filter out various chemical species from their drinking water and there are numerous options for them to do so if they wish. However, this would be a private decision for individuals. As the Kununurra drinking water supply complies at all times with the stipulations of the "*Australian Drinking Water Guidelines*", both before and after the introduction of community water fluoridation, there is no reason for the water supplier or DOH to be involved in those decisions made by individuals after water fluoridation commences any more than before it commences.

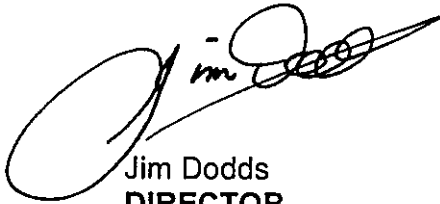
In closing, the WA Government and its health professionals have a responsibility to make decisions that balance the best possible community health outcomes with individual choices. Fluoridation of community water supplies plays a critical role in reducing dental decay and improving oral health. It has demonstrated a benefit to all

West Australians and to approximately 90 per cent of all Australians who enjoy the dental health benefits of this important public health initiative.

I look forward to the introduction of water fluoridation for Kununurra, so that your community can stand alongside Broome and Derby, communities which have enjoyed the benefits of fluoridated water for over forty years with no problems.

I trust that this information clarifies the situation and is of assistance.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Jim Dodds', with a large, stylized loop at the beginning.

Jim Dodds
DIRECTOR
ENVIRONMENTAL HEALTH DIRECTORATE

23 May 2016

NHMRC Public Statement 2017

Water Fluoridation and Human Health in Australia

NHMRC statement

NHMRC strongly recommends community water fluoridation as a safe, effective and ethical way to help reduce tooth decay across the population. NHMRC supports Australian states and territories fluoridating their drinking water supplies within the range of 0.6 to 1.1 milligrams per litre (mg/L^a).

This Public Statement is based on the findings presented in the NHMRC Information Paper: [Water fluoridation: dental and other human health outcomes](#), and its underpinning [Evidence Evaluation Report](#). Information is also available in the NHMRC Water fluoridation and human health in Australia: Questions and Answers.

Importance of community water fluoridation

Community water fluoridation is the process of adjusting the amount of fluoride in drinking water.

There is reliable evidence that community water fluoridation helps to prevent tooth decay.

The consequences of tooth decay are considerable: dental pain, concern about appearance, costs due to time off school and work, and costs of dental treatment.

There is no reliable evidence of an association between community water fluoridation at current Australian levels and any health problems.

In Australia, community water fluoridation programs are a safe, effective and ethical way of reducing tooth decay across the population. Fluoridated water is the primary source of fluoride exposure and helps reduce tooth decay for all, at all stages of life. This includes those who have less access to dental care and other measures that help protect the teeth from decay.

Fluoridation of drinking water particularly benefits children, and those on a lower income who tend to have higher rates of dental decay and less access to dental treatment and other forms of fluoride. Optimal dental health requires a combination of drinking fluoridated water, a healthy diet that minimises sugar intake, good oral hygiene, appropriate use of fluoridated toothpaste and regular dental check-ups.

Access to fluoridated drinking water in Australia

The majority of Australians, around 89 percent, have access to fluoridated drinking water^b. All Australian states and territories have fluoridated drinking water; however coverage in each jurisdiction varies (Figure 1).

To help protect teeth against tooth decay, only very small amounts of fluoride are needed in drinking water, taking into consideration fluoride in other sources such as foods, drinks and dental products. In some places in Australia there are already sufficient levels of fluoride naturally occurring in groundwater to help reduce tooth decay.

NHMRC supports Australian states and territories fluoridating their drinking water supplies within the range of 0.6 to 1.1 mg/L. This range is aimed at reducing tooth decay, while avoiding any occurrence of dental fluorosis of aesthetic concern.

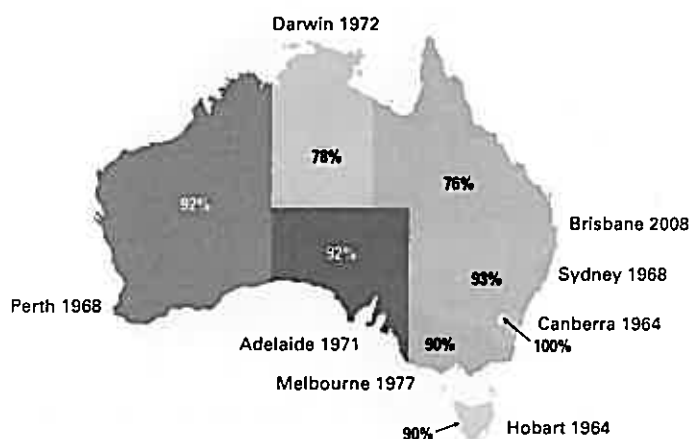
In each Australian state or territory, the government health authority determines the appropriate operational levels within the range of 0.6 to 1.1 mg/L.

For bottled drinking water, the Australia New Zealand Food Standards Code allows between 0.6 and 1.0 mg/L of naturally occurring and added fluoride, and any bottled water with fluoride added must be clearly labelled.¹ However, it is important to note that not many bottled waters contain fluoride, so those whose primary drinking water source comes from bottled water are at risk of receiving inadequate supplies of fluoride to prevent tooth decay.

^a mg/L are equivalent to parts per million (ppm)

^b Sourced from Dental Health Services Victoria (DHSV) 2017

Figure 1: Percentage of population with access to fluoridated water^c as at February 2017 and dates of introduction of community water fluoridation to Australian capital cities



The scientific evidence supporting water fluoridation

The existing body of evidence consistently shows that community water fluoridation reduces tooth decay.

This evidence comes from NHMRC's thorough review of the latest scientific research on the potential link between water fluoridation and human health relevant to Australia, and is detailed in the [Supporting documents](#). The key findings of this review are as follows.

Tooth decay

NHMRC found that water fluoridation reduces tooth decay by 26% to 44% in children and adolescents, and by 27% in adults. Recent Australian research states that access to fluoridated water from an early age is associated with less tooth decay in adults.

Dental fluorosis

Dental fluorosis can affect the appearance of teeth, most commonly appearing as white lines or areas on tooth surfaces. It is caused by a high intake of fluoride from one or more sources during the time when teeth are developing.

Almost all dental fluorosis in Australia, however, is very mild or mild, does not affect the function of the teeth and is not of aesthetic concern to those who have it. Mild to very mild dental fluorosis has been associated with a protective benefit against tooth decay in adult

teeth.² Moderate dental fluorosis is very uncommon and severe dental fluorosis is rare in Australia^d. The very small amount of moderate and severe dental fluorosis in Australian children aged 8-14 years is not statistically different between fluoridated and non-fluoridated areas, meaning there is no evidence that community water fluoridation at Australian levels gives rise to these forms of dental fluorosis.

In Australia dental fluorosis has declined, over a time when the extent of water fluoridation in Australia has expanded. The decline in dental fluorosis in Australia is linked to reduced exposure to fluoride from other sources such as toothpaste, due to the availability and promotion of low fluoride toothpastes for children and public health messages and guidelines about the appropriate use of these products (e.g. use only a small pea-sized amount; encourage children not to swallow toothpaste).^{3,4,5}

Health outcomes

There is reliable evidence that community water fluoridation at current Australian levels is not associated with cancer, Down syndrome, cognitive dysfunction, lowered intelligence or hip fracture.

There is no reliable evidence of an association between community water fluoridation at current Australian levels and other human health conditions such as chronic kidney disease, kidney stones, hardening of the arteries (atherosclerosis), high blood pressure, low birth weight, all-cause mortality, musculoskeletal pain, osteoporosis, skeletal fluorosis, thyroid problems or self-reported ailments such as gastric discomfort, headache, and insomnia.

NHMRC's role in community water fluoridation

NHMRC is Australia's leading expert body fostering the development of consistent individual and public health standards between the states and territories. It is responsible for providing the Australian community with health advice based on the best available scientific evidence. The main ethical justification for fluoridating water is that it provides an important dental health benefit - reducing tooth decay - across the population. Additional benefits of water fluoridation include reducing infection, pain, avoidable treatment and other consequences of tooth decay.

NHMRC has publicly supported community water fluoridation as a population health measure since 1952. NHMRC publishes the *Australian Drinking Water Guidelines* which provide an authoritative reference to

^c In some jurisdictions, the proportion of the population with access to fluoridated water is higher than the represented data. This is because some Australian drinking water supplies, particularly those relying on bore water, contain naturally occurring fluoride at a concentration of around 0.5 mg/L. It is recognised that this concentration offers some protection against tooth decay [WHO (2017): [Guidelines for Drinking Water Quality, Fourth Edition](#). Geneva: World Health Organization (WHO) p372].

^d Refer to the NHMRC *Information Paper - Water fluoridation: dental and other human health outcomes*, 2017 for rates of water fluoridation in Australia and the various grades (severity) of fluorosis.

the Australian community and the water supply industry on what defines safe, good quality drinking water, how it can be achieved and how it can be assured.

Community water fluoridation and infant formula in Australia

Infant formula products sold in Australia are safe to be fed to infants when made up with drinking water fluoridated at the levels used in Australia. All infant formula in Australia must comply with the composition and safety requirements of the *Australia New Zealand Food Standards Code*.⁶

NHMRC recommends exclusive breast feeding until around six months of age. However, this is not always possible and, for infants who are not breastfed or who are partially breastfed, NHMRC recommends that infant formula be used as an alternative until 12 months of age.

Use of fluoride tablets or supplements in Australia

Fluoride supplements in the form of drops or tablets should only be used on the advice of an oral health professional.⁵ They are no longer readily available in Australia.

Supporting documents

National Health and Medical Research Council (NHMRC). *Information Paper - Water Fluoridation: Dental and Other Human Health Outcomes*. Report prepared by the Clinical Trials Centre at University of Sydney. Canberra: NHMRC, 2017. <<https://www.nhmrc.gov.au/health-topics/health-effects-water-fluoridation>>

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Jack B, Ayson M, Lewis S, Irving A, Agresta B, Ko H, et al. *Health Effects of Water Fluoridation: Technical Report*. Report to the National Health and Medical Research Council (NHMRC). Canberra: NHMRC, 2016. <<https://www.nhmrc.gov.au/health-topics/health-effects-water-fluoridation>>

Other useful resources

Water Fluoridation and Human Health in Australia: Questions and Answers. Canberra: NHMRC, 2017. <<https://www.nhmrc.gov.au/health-topics/health-effects-water-fluoridation>>

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- 1 Food Standards Australia New Zealand. *Australia New Zealand Food Standards Code - Standard 2.6.2 - Non-alcoholic beverages and brewed soft drinks*. 2016 [updated 2016]; Available from: <https://www.legislation.gov.au/Details/F2016C00175>.
- 2 Do LG, Spencer AJ, Ha DH. Association between dental caries and fluorosis among South Australian children. *Caries Research*, 2009; 43:366-73.
- 3 Spencer AJ, Do LG. Changing risk factors for fluorosis among South Australian children. *Community Dentistry and Oral Epidemiology*, 2008; 36(3):210-8.
- 4 Do LG, Spencer AJ. Decline in the prevalence of dental fluorosis among South Australian Children. *Community Dentistry and Oral Epidemiology*. 2007; 35(4):282-91.
- 5 Australian Research Centre for Population Oral Health. The use of fluorides in Australia: guidelines. *Australian Dental Journal*. 2006; 51: 195-9. <<https://www.adelaide.edu.au/arcpoh/downloads/publications/journal/2006-spencer-aj.pdf>>
- 6 Food Standards Australia New Zealand (FSANZ). *Australia New Zealand Food Standards Code – Standard 2.9.1 – Infant formula products (revised March 2016)*. Canberra: FSANZ, 13 April 2017 <<http://www.foodstandards.gov.au/code/Pages/default.aspx>>



Australian Government
National Health and Medical Research Council

NH|MRC

Water Fluoridation and Human Health in Australia: Questions and Answers

WORKING TO BUILD A HEALTHY AUSTRALIA



Australian Government
Department of Health and Ageing

National Health and
Medical Research Council

WATER FLUORIDATION AND HUMAN HEALTH IN AUSTRALIA: QUESTIONS AND ANSWERS

NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL

These Questions and Answers have been developed by the National Health and Medical Research Council (NHMRC) in consultation with the jurisdictional health departments. They aim to provide helpful information to support the *NHMRC Public Statement 2017: Water fluoridation and human health in Australia*.

CONTENTS

About water fluoridation	1
1. Why drink fluoridated water?	1
2. What is fluoride?	1
3. What is water fluoridation?	1
4. Who benefits from community water fluoridation?	1
5. Where is community water fluoridation practised?	1
6. How many Australians have access to fluoridated drinking water supplies?	2
7. Is community water fluoridation a cost effective public health policy?	2
8. What role does community water fluoridation play in Australia's national oral health plan?	2
Fluoride and oral health	3
9. Why is oral health important?	3
10. What is tooth decay and why is it a problem?	3
11. How does fluoride in drinking water help to reduce tooth decay?	4
12. Should I still use fluoridated toothpaste if I am drinking fluoridated water?	4
13. What is dental fluorosis?	5
14. What is the pattern of dental fluorosis occurrence in Australia?	5
15. Should I take fluoride supplements?	5
The scientific evidence supporting water fluoridation	5
16. Who reviews scientific evidence relevant to Australia?	5
17. What conclusion did NHMRC reach in its latest review of the evidence?	6
18. How did NHMRC assure quality of its review of evidence?	6
19. What does the latest evidence say about whether some particular health effects of community concern are related to water fluoridation?	7
a. Cancer	7
b. Cognitive function and intelligence	7
c. Kidney health	7
d. Muscle and skeletal health	7
e. Thyroid health	7
20. Is community water fluoridation supported by health and scientific authorities around the world?	8
21. Has scientific evidence on community water fluoridation been reviewed elsewhere and what have the reviews concluded?	9
22. How will NHMRC keep up to date on any new evidence on water fluoridation and human health?	9

Fluoride and drinking water	9
23. Where does the fluoride that is added to drinking water come from?	9
24. What fluoride compounds are added to drinking water?	9
25. How are purity standards maintained for fluoride compounds added to drinking water?	10
26. How are fluoride compounds added to the water supply?	10
27. How much fluoride is recommended in drinking water?	11
28. Does fluoride affect the taste of water?	11
29. Do household filters remove fluoride from drinking water?	11
30. Is bottled water fluoridated?	11
Fluoride and diet	12
31. Is fluoride a nutrient?	12
32. Does fluoridated tap water cause allergies?	12
33. How much fluoride do we need?	12
34. What foods and drinks contain fluoride?	12
35. Can drinking fluoridated tap water result in the consumption of too much fluoride?	12
36. What is the advice provided for infant formula re-constituted with fluoridated water?	13
37. What advice is provided about drinking fluoridated water for pregnant or breast feeding mothers?	13
38. Does rainwater tank water contain fluoride?	13
39. Is fluoridated drinking water considered a drug or medication?	13
Fluoride and ethics	14
40. Is it ethical to fluoridate water?	14
41. Is individual consent required for water fluoridation?	14
42. Is community water fluoridation constitutional?	14
Fluoride regulations	15
43. How is community water fluoridation in Australia regulated?	15
Fluoride and the environment	16
44. How does fluoridated water affect the environment?	16
45. Can fluoridated water be used in organic farming?	16
46. Can fluoridated water be used in aquaponics?	16
Further reading	16
References	17

ABOUT WATER FLUORIDATION

1. WHY DRINK FLUORIDATED WATER?

There is consistent and reliable evidence that community water fluoridation helps to reduce tooth decay. The National Health and Medical Research Council (NHMRC) found that water fluoridation reduces tooth decay by 26 to 44% in children and adolescents, and by about 27% in adults (1). Recent Australian research suggests that access to fluoridated water from an early age is associated with less tooth decay in adults (1).

The consequences of tooth decay are costly due to time off school and work, and the costs of dental treatment. Tooth decay also leads to pain and can cause concerns about appearance. In Australia, community water fluoridation programs are considered a safe, ethical and effective way of reducing tooth decay across the population. Fluoridated water helps reduce tooth decay in all members of society, at all stages of life. This includes those who have less access to dental care and other measures that protect the teeth from decay.

2. WHAT IS FLUORIDE?

Fluoride (F-) is a chemical ion of the element fluorine (F) and is part of the earth's crust (2). It is a naturally occurring component of mineral salts found in rocks, soil, natural water sources, plants and animals. The amount of fluoride naturally occurring in water depends on the type of soil and rock through which the water drains. If rock formations are fluoride-rich, the amount of fluoride that can dissolve out of the rock as water passes over them is greater (2).

3. WHAT IS WATER FLUORIDATION?

Water fluoridation is the process of adjusting the amount of fluoride in drinking water to an optimal level to help reduce tooth decay. NHMRC supports Australian states and territories fluoridating their drinking water supplies within the range of 0.6 to 1.1 milligrams of fluoride per litre (mg/L) (3).

4. WHO BENEFITS FROM COMMUNITY WATER FLUORIDATION?

Community water fluoridation allows everybody to benefit from the protective effect of fluoride, without individuals having to make a conscious effort to change their behaviours (4). It benefits people of all ages throughout their life regardless of education, income or access to dental care (4, 5).

Tooth decay can develop at any age, so water fluoridation is an important way of reducing tooth decay in children and adults (6). Fluoridation of drinking water particularly benefits children, and those on a lower income who tend to have higher rates of tooth decay and less access to dental treatment and other forms of fluoride.

5. WHERE IS COMMUNITY WATER FLUORIDATION PRACTISED?

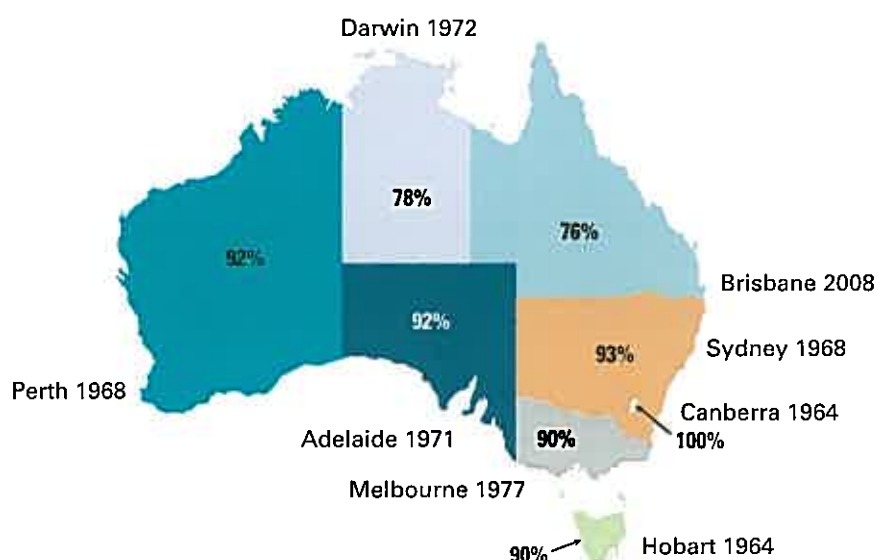
More than 400 million people around the world benefit from fluoridated drinking water – approximately 370 million accessing community water fluoridation schemes and about 50 million drinking naturally occurring optimal levels of fluoridated water (7). Countries with or planning to implement water fluoridation schemes include New Zealand, the United States, Canada, the United Kingdom, Ireland, Spain, Israel, Brazil, Chile, Argentina, Hong Kong, South Korea, Singapore and Malaysia (7). Many countries also use salt fluoridation schemes.

In Australia, the first community water fluoridation program began in 1953 in Beaconsfield, Tasmania (8) followed by Yass, New South Wales in 1956 (9). Most large Australian cities have fluoridated their water since the 1960s and 1970s.

6. HOW MANY AUSTRALIANS HAVE ACCESS TO FLUORIDATED DRINKING WATER SUPPLIES?

As of February 2017, 89 percent of Australians have access to fluoridated drinking water (10), which includes those areas with naturally occurring fluoride at a concentration of 0.5 mg/L and above (11). All Australian states and territories have fluoridated drinking water; however coverage in each jurisdiction varies (see Figure 1).^a

FIGURE 1: PERCENTAGE OF POPULATION WITH ACCESS TO FLUORIDATED WATER AS AT FEBRUARY 2017 AND DATES OF INTRODUCTION OF WATER FLUORIDATION TO AUSTRALIAN CAPITAL CITIES (BASED ON: *HEALTHY MOUTHS HEALTHY LIVES: AUSTRALIA'S NATIONAL ORAL HEALTH PLAN 2015 – 2024*, UPDATED WITH JURISDICTION STATISTICS)



7. IS COMMUNITY WATER FLUORIDATION A COST EFFECTIVE PUBLIC HEALTH POLICY?

Fluoridating water in Australia is a population-wide investment. In Australia, for every dollar that is spent on fluoridation, between \$7 and \$18 is saved due to avoided treatment costs (12-14).

Studies have reported that following the introduction of water fluoridation in Victoria, the community saved about \$1 billion over a 25 year period through avoided costs from dental treatment and days absent from work/school (15).

8. WHAT ROLE DOES COMMUNITY WATER FLUORIDATION PLAY IN AUSTRALIA'S NATIONAL ORAL HEALTH PLAN?

Australia has a national oral health plan that has been endorsed by all state and territory governments and the Australian Government. The purpose of *Healthy Mouths Healthy Lives: Australia's National Oral Health Plan 2015–2024* is to improve health and wellbeing across the Australian population by improving oral health status and reducing the burden of oral disease. The plan aims to help all Australians retain as many teeth as possible throughout their lives, have good oral health as part of good general health and have access to affordable and quality oral health services.

One of the plan's goals is to continue to extend water fluoridation of public water supplies. The plan reiterates the evidence that community water fluoridation is a safe, cost-effective and protective strategy that improves oral health by reducing tooth decay across the population.

^a Some Australian drinking water supplies contain naturally occurring fluoride at a concentration of 0.5 mg/L. It is recognised that some protection against tooth decay can be derived from concentrations of 0.5 mg/L and above [WHO (2017)] *Guidelines for Drinking Water Quality*, Fourth Edition. Geneva: World Health Organization (WHO) p372.

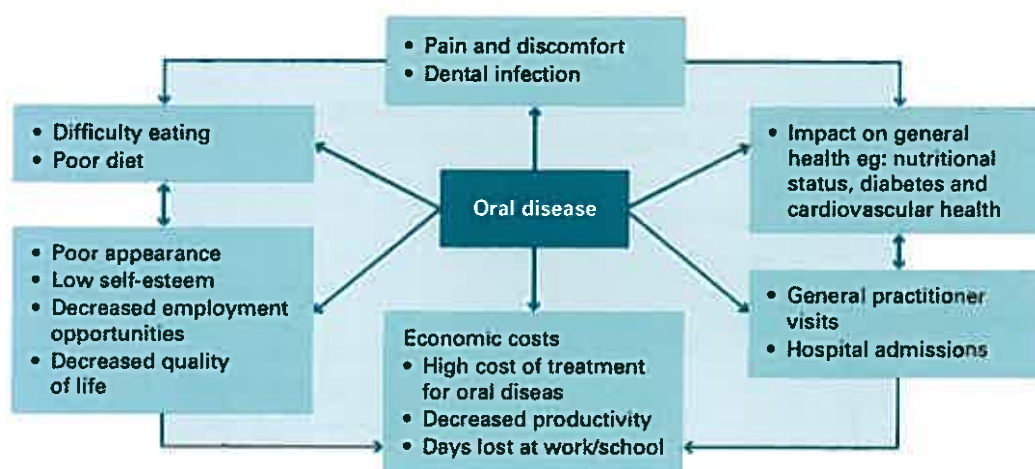
FLUORIDE AND ORAL HEALTH

9. WHY IS ORAL HEALTH IMPORTANT?

Oral health is important because it is fundamental to overall health, wellbeing and quality of life (11). A healthy mouth enables people to eat, speak and socialise without pain, discomfort or embarrassment (11).

Figure 2 shows the links between oral health and general health, as well as some of the social and economic implications of oral disease.

FIGURE 2: THE LINKS BETWEEN ORAL AND GENERAL HEALTH AND SOCIAL/ ECONOMIC COSTS OF ORAL DISEASE



Adapted from *Australia's National Oral Health Plan 2015–2024*

10. WHAT IS TOOTH DECAY AND WHY IS IT A PROBLEM?

Tooth decay is the breakdown of the outer layers of teeth. It is caused by bacterial acids that are produced when bacteria in the mouth break down sugar in foods and drinks (16). The acid removes calcium and phosphates from the tooth structure (called demineralisation), leading eventually to cavities or holes in the teeth, as well as potentially pain, infection and tooth loss (16).

The consequences of tooth decay are costly due to time off school and work, the costs of dental treatment, and pain and suffering (11, 17). Once a tooth is filled, it becomes structurally weaker and will almost certainly require further treatment in the future (18).

If left untreated, tooth decay can have serious, potentially life-threatening consequences (19).

Tooth decay is one of the most common chronic health problems in Australia, particularly in children and communities with insufficient fluoride in their drinking water. Tooth decay still occurs in populations with access to fluoridated water; however, rates of decay are much lower in communities with water fluoridation. There is a consistent association between sugar intake and tooth decay (20).

The most commonly used measure of tooth decay is called the decayed, missing or filled teeth index (DMFT/dmft index) (21). This is a measure of the number of teeth that are decayed, missing because of extraction or filled (21). Upper case lettering refers to permanent ('adult') teeth, while lower case lettering refers to primary ('baby') teeth (21). The DMFT index ranges from zero to 32, which is the maximum number of teeth in an adult; the dmft index ranges from zero to 20 (21).

II. HOW DOES FLUORIDE IN DRINKING WATER HELP TO REDUCE TOOTH DECAY?

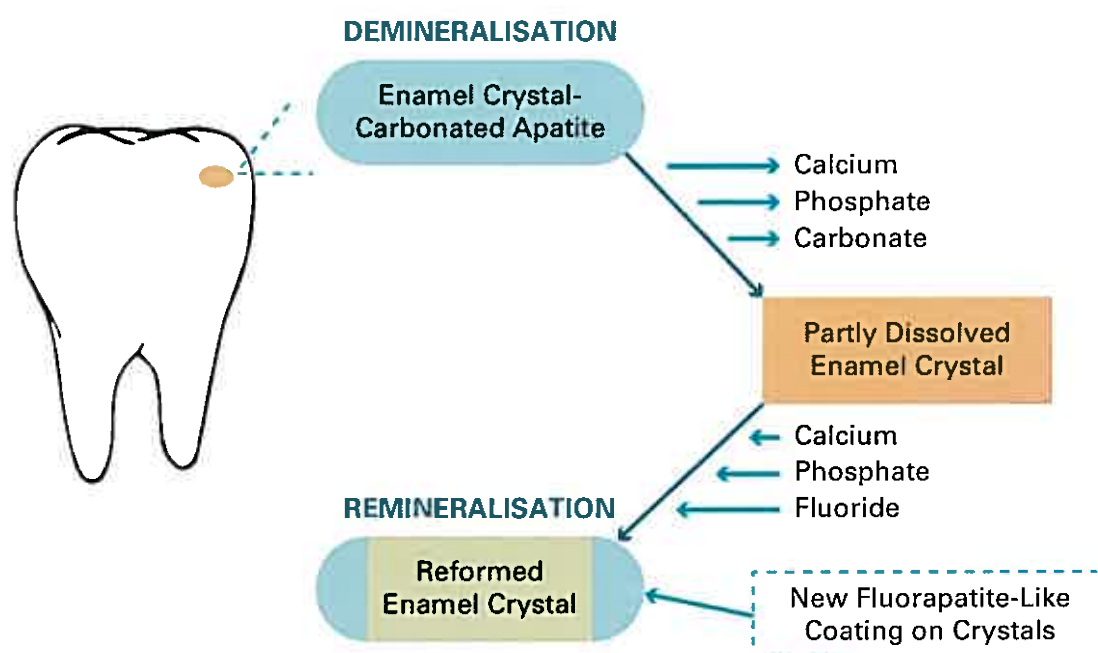
Fluoride in drinking water acts like a repair kit for teeth, working in a number of ways to strengthen teeth and make them more resistant to tooth decay for people of all ages (22).

There are two ways in which the fluoride in drinking water acts to reduce tooth decay:

- Reducing demineralisation (i.e. where the enamel begins to dissolve). This makes teeth more resistant to decay.
- Enhancing remineralisation (i.e. recovery of weakened enamel). This helps the repair of early tooth decay.

Fluoride also slows the activity of bacteria that cause decay and combines with enamel on the tooth surface to make it stronger and better able to resist decay (23, 2).

FIGURE 3: SCHEMATIC REPRESENTATION OF THE DEMINERALISATION AND REMINERALISATION PROCESSES WHICH LEAD TO REMINERALISED CRYSTALS WITH SURFACES RICH IN FLUORIDE AND OF LOW SOLUBILITY



Source: Adapted from Featherstone JDB (24). Reprinted with permission from Munksgaard International Publishers Ltd., Copenhagen, Denmark.

12. SHOULD I STILL USE FLUORIDATED TOOTHPASTE IF I AM DRINKING FLUORIDATED WATER?

Yes. Fluoridated drinking water and toothpaste with fluoride provide important and complementary benefits. Fluoridated water keeps low levels of fluoride in saliva and in dental plaque all day. The much higher concentration of fluoride in toothpaste offers additional benefit. Together, the two sources offer more protection than using either one alone.

For children aged between 18 months and under six years, it is recommended to use only a pea-sized amount of low-fluoride toothpaste and avoid fluoride mouth rinses.

13. WHAT IS DENTAL FLUOROSIS?

Dental fluorosis is caused by a high intake of fluoride from multiple sources during the time when teeth are developing inside the jawbone, usually from birth to six or eight years of age (2). It can appear as white lines or areas on the surface of both primary and permanent teeth and is identified after teeth erupt.

14. WHAT IS THE PATTERN OF DENTAL FLUOROSIS OCCURRENCE IN AUSTRALIA?

In Australia dental fluorosis has declined over the time period during which the extent of community water fluoridation has expanded (25-28). The decline in dental fluorosis is linked to reduced exposure to fluoride from other sources such as toothpaste, which is now available in low fluoride toothpastes for children. The use of low fluoride toothpaste is now actively promoted along with public health messages and guidelines about the appropriate use of these products (e.g. use only a small pea-sized amount; encourage children not to swallow toothpaste).

In Australia, where dental fluorosis has been identified, in most cases it is classified as very mild or mild. Mild to very mild dental fluorosis does not affect the function of the teeth, is not of aesthetic concern to those who have it and is associated with a protective benefit against tooth decay in adult teeth (1). Moderate dental fluorosis is very uncommon and severe dental fluorosis is rare in Australia. The very small amount of moderate and severe dental fluorosis in Australian children aged 8-14 years is not statistically different between fluoridated and non-fluoridated areas, meaning there is no evidence that community water fluoridation gives rise to these forms of dental fluorosis (1).

15. SHOULD I TAKE FLUORIDE SUPPLEMENTS?

Fluoride supplements in the form of drops or tablets should only be used on the advice of an oral health professional (4). They are no longer readily available in Australia.

THE SCIENTIFIC EVIDENCE SUPPORTING WATER FLUORIDATION

16. WHO REVIEWS SCIENTIFIC EVIDENCE RELEVANT TO AUSTRALIA?

NHMRC is Australia's leading expert body promoting the development and maintenance of public health and clinical standards. It is responsible for providing the Australian community with health advice based on the best available scientific evidence.

In 2014-2015, NHMRC conducted a comprehensive review of the latest scientific research on the health effects of water fluoridation relevant to Australia. This review identified and assessed new studies published between 2006 and 2015 to add to evidence identified in previous reviews [2000 McDonagh Review (29) and the 2007 NHMRC Review (21)].

Information about the recent review process is published in the 2016 Evidence Evaluation Report (6), Technical Report and Information Paper (1).

17. WHAT CONCLUSION DID NHMRC REACH IN ITS LATEST REVIEW OF THE EVIDENCE?

The conclusion reached by NHMRC is that the existing body of evidence consistently shows that water fluoridation safely reduces tooth decay. The findings from the latest review are summarised in the *Information Paper - Water fluoridation: dental and other human health outcomes, 2017*.

The NHMRC Public Statement 2017 (3) on water fluoridation and human health in Australia states:

NHMRC strongly recommends community water fluoridation as a safe, effective and ethical way to help reduce tooth decay across the population. NHMRC supports Australian states and territories fluoridating their drinking water supplies within the range of 0.6 to 1.1 milligrams per litre (mg/L).

There is reliable evidence that community water fluoridation as practised in Australia is not associated with cancer, Down syndrome, cognitive dysfunction, lowered intelligence or hip fracture (1).

There is no reliable evidence of an association between community water fluoridation as practised in Australia and other human health conditions such as chronic kidney disease, kidney stones, hardening of the arteries (atherosclerosis), high blood pressure, low birth weight, all-cause mortality, musculoskeletal pain, osteoporosis, skeletal fluorosis, thyroid problems or other self-reported ailments such as gastric discomfort, headache, and insomnia (1).

The term 'no reliable evidence' is used by NHMRC when there is a lack of confidence that the evidence reviewed is relevant to Australia or valid to accept any association between community water fluoridation and human health outcomes. Confidence in the body of evidence can be affected by several issues including the small numbers of studies, the study designs, the low quality of the studies and the lack of control for possible confounding factors. Confounding factors can include lack of consideration of fluoride from other sources, socioeconomic status and exposure to other chemicals such as iodine or lead.

18. HOW DID NHMRC ASSURE QUALITY OF ITS REVIEW OF EVIDENCE?

NHMRC takes care to ensure that its health advice, and the evidence it is based on, are of the highest possible quality. When reviewing evidence such as described in NHMRC's 2016 Evidence Evaluation Report (6), bias can occur when more attention is given to research studies supporting a particular view. Seeking or interpreting evidence in ways that support existing beliefs is referred to as confirmation bias (30). NHMRC addressed this type of bias by contracting the Clinical Trials Centre, University of Sydney, to identify and assess the available evidence. This was done using internationally recognised systematic review methods and having an independent group with expertise in the methodologies for evidence evaluation review the methods used by the Clinical Trials Centre.

Bias in research can also come from poorly designed studies, or from problems in the collection, analysis, reporting, publication or review of study data. This type of bias, referred to as research bias, can lead to invalid results (31). Where research bias was of concern in any of the included studies, it was noted in the NHMRC 2016 Evidence Evaluation Report (6) and the NHMRC Information Paper (1).

NHMRC sought feedback from experts on the research methods of the Evidence Evaluation and how the evidence was translated into the Information Paper. Feedback was also sought from independent external experts and the public.

19. WHAT DOES THE LATEST EVIDENCE SAY ABOUT WHETHER SOME PARTICULAR HEALTH EFFECTS OF COMMUNITY CONCERN ARE RELATED TO WATER FLUORIDATION?

NHMRC searched for evidence reporting any possible human health outcomes of water fluoridation. Those health effects which are of particular interest to the community are discussed in more detail below.

A. CANCER

There is no association between community water fluoridation and any form of cancer, including osteosarcoma and Ewing sarcoma (types of bone cancer) (1).

B. COGNITIVE FUNCTION AND INTELLIGENCE

There is no association between community water fluoridation as practised in Australia and cognitive function or intelligence of children and adults.

While some overseas studies suggested a possible link, these studies took place in countries where fluoride levels greatly exceed the levels seen in Australia and did not take into account factors such as parental education and the presence of arsenic in drinking water (1).

C. KIDNEY HEALTH

There is no reliable evidence of an association between community water fluoridation as practised in Australia and kidney stones or chronic kidney disease (1).

Kidney Health Australia state that there is no evidence that consumption of optimally fluoridated water causes chronic kidney disease or poses any risks for people with established chronic kidney disease.

D. MUSCLE AND SKELETAL HEALTH

There is no association between community water fluoridation as practised in Australia and hip fracture (1).

There is no reliable evidence of an association between community water fluoridation as practised in Australia and skeletal fluorosis, osteoporosis or musculoskeletal pain (1).

E. THYROID HEALTH

There is no reliable evidence of a link between community water fluoridation as practised in Australia and thyroid function, including goitre (enlargement of the thyroid gland) and hypothyroidism (underactive thyroid) (1).

Other possible health effects were considered by the NHMRC review and published in the Information Paper. Some of the findings are summarised in the answer to Question 17.

20. IS COMMUNITY WATER FLUORIDATION SUPPORTED BY HEALTH AND SCIENTIFIC AUTHORITIES AROUND THE WORLD?

Fluoridation of drinking water is supported by a range of national and international health research agencies and government bodies including:

- All Australian State Government health agencies
- Council of Australian Governments Health Council via "Healthy Mouths Healthy Lives - Australia's National Oral Health Plan 2015-2024" (refer to Q8).
- National Health and Medical Research Council (Australia)
- Australian Dental Association
- World Health Organization
- International Association for Dental Research
- Centres for Disease Control and Prevention (USA)
- US Surgeon General
- Harvard Medical School
- Harvard School of Dental Medicine
- Harvard School of Public Health
- Australian Medical Association
- Australian and New Zealand Society for Paediatric Dentistry
- Australasian Academy of Paediatric Dentistry
- Australian Academy of Science
- Australian Centre for Human Health Risk Assessment
- Australian Research Centre for Population Oral Health (ARCPHO)
- Public Health Association of Australia
- Alzheimer's Australia
- Kidney Health Australia
- Royal Society of New Zealand and the Office of the Prime Minister's Chief Science Advisor
- Ministry of Health New Zealand
- US Environmental Protection Agency
- US Department of Health and Human Services
- Health Research Board, Ireland
- National Cancer Institute (USA)

21. HAS SCIENTIFIC EVIDENCE ON COMMUNITY WATER FLUORIDATION BEEN REVIEWED ELSEWHERE AND WHAT HAVE THE REVIEWS CONCLUDED?

The science underpinning community water fluoridation and indeed the use of fluorides generally for preventing tooth decay is reviewed periodically worldwide. In all cases the conclusions support the ongoing continuation of community water fluoridation initiatives.

The 2015 New Zealand review found compelling evidence that fluoridation of water at the established and recommended levels produced broad benefits for the dental health of New Zealanders (32).

The 2015 United States Public Health Service review found that community water fluoridation remains an effective public health strategy for delivering fluoride to prevent tooth decay and is the most feasible and cost-effective strategy for reaching entire communities (33).

The 2015 Ireland review found that, in community water fluoridated areas, there is no strong evidence that community water fluoridation is definitively associated with negative health effects. However, the evidence base examining the association between health effects and community water fluoridation is limited (34).

22. HOW WILL NHMRC KEEP UP TO DATE ON ANY NEW EVIDENCE ON WATER FLUORIDATION AND HUMAN HEALTH?

The NHMRC is responsible for providing current and evidence-based advice on health. To do this, NHMRC monitors any new evidence, in particular any significant new body of evidence, including its quality and how applicable it is to Australian conditions. This is done in consultation with state and territory representatives working in the field of drinking water and human health, and any NHMRC expert committee that advises on the NHMRC *Australian Drinking Water Guidelines*. Additionally, the Council of NHMRC considers guidelines and advice 5 years after publication and recommends to the NHMRC Chief Executive Officer if there is a need to update the publication, based on any new body of evidence.

FLUORIDE AND DRINKING WATER

23. WHERE DOES THE FLUORIDE THAT IS ADDED TO DRINKING WATER COME FROM?

The fluoride compounds used to fluoridate water are derived from a mineral rock called fluorapatite ($\text{Ca}_5(\text{PO}_4)_3\text{F}$) (2). Commonly used as source material for the fertiliser industry, when phosphate is removed, an extra step in the refining process may be taken to collect fluoride gas (35, 36). This gas can be converted into a liquid or powder form for the specific purpose of adding to water supplies (36). Fluoride is a by-product, not a waste product, of this process (37).

24. WHAT FLUORIDE COMPOUNDS ARE ADDED TO DRINKING WATER?

There are three fluoride-releasing compounds recommended in the *Australian Drinking Water Guidelines* for use in fluoridating water. These recommended fluoridating compounds are sodium fluoride (NaF : a compound of fluorine and sodium); sodium fluorosilicate (Na_2SiF_6 : a compound of fluorine, sodium and silicon); and fluorosilicic acid (H_2SiF_6 : a compound of fluorine, hydrogen and silicon).

Table 1 summarises these compounds, their chemical formulae, alternative names and physical forms. The type of compound selected is based on the type and size of the water treatment plant.

TABLE 1: FLUORIDE COMPOUNDS USED IN COMMUNITY WATER FLUORIDATION PROGRAMS

COMPOUND NAME	CHEMICAL FORMULA	ALTERNATIVE NAMES	PHYSICAL FORM
Hydrofluorosilicic acid	H_2SiF_6	Hexafluorosilicic acid	Liquid
		Hydrofluosilicic acid	
		Fluorosilicic acid	
Sodium fluorosilicate	Na_2SiF_6	Sodium hexafluorosilicate	Powder
		Disodium hexafluorosilicate	
		Sodium silicofluoride	
Sodium fluoride	NaF		Powder

Adapted from Australian Drinking Water Guidelines, Chapter 8 (38)

25. HOW ARE PURITY STANDARDS MAINTAINED FOR FLUORIDE COMPOUNDS ADDED TO DRINKING WATER?

Procedures have been established to ensure that impurities present in chemicals added to drinking water supplies do not represent a risk to public health. The *Australian Drinking Water Guidelines* recommends exacting requirements regarding maximum levels of impurities for all chemicals added to drinking water supplies (38). All additives used to treat drinking water (including disinfectant, and other water treatment substances) contain low levels of impurities (28). It is also important to note that water itself naturally contains dissolved or suspended impurities – hence the reliance upon the *Australian Drinking Water Guidelines* (38, 39).

Water utilities ensure that any impurities in fluoride chemicals do not pose a risk to public health. The *Australian Drinking Water Guidelines* recommends that chemicals added to drinking water cannot add more than 10% of the maximum safe value when the chemical is added. Commercially available fluoridation chemicals consistently meet this requirement.

State and Territory regulations usually specify that all chemicals added to drinking water have to be accompanied by test certificates detailing the strength of the active ingredient and concentrations of impurities (38). No chemical is to be accepted or used without a batch analysis certificate showing that all quality requirements have been met (38).

26. HOW ARE FLUORIDE COMPOUNDS ADDED TO THE WATER SUPPLY?

State and territory water authorities add fluoride to community water supplies using strict controls that are typically set out in legislation or Codes of Practice. This includes controls on the quality and purity of chemicals used in accordance with the *Australian Drinking Water Guidelines* (38).

Fluoride is added to water at drinking water treatment plants, which have been designed to add carefully controlled amounts (40). Safety at the water treatment plant is maintained by a risk management, multi-barrier approach. Equipment is designed to shut down if fluoride exceeds predetermined levels at key points in the water treatment system. The fluoride level in the water is at least monitored daily and in most cases continuously (40). Samples of water are taken from sites in the distribution system to ensure adequate fluoride levels 'at the tap' (40).

In all cases the compounds containing fluoride that are added to water supplies at a treatment plant dissolve into their components well before the water leaves the treatment plant. This means that in a glass of drinking water, there is no difference between fluoride ions that are present naturally or fluoride ions from compounds added as part of a community water fluoridation scheme.

27. HOW MUCH FLUORIDE IS RECOMMENDED IN DRINKING WATER?

To help protect teeth against tooth decay, only a very small amount of fluoride is needed in drinking water. NHMRC supports adjusting fluoride in Australian drinking water supplies to between 0.6 and 1.1 mg/L to be the most effective way to reduce tooth decay (3). This range of 0.6 and 1.1 mg/L is aimed at reducing tooth decay, while avoiding any risk of dental fluorosis of aesthetic concern.

28. DOES FLUORIDE AFFECT THE TASTE OF WATER?

Fluoride has no taste or smell, so water fluoridation will not affect the taste or smell of drinking water.

29. DO HOUSEHOLD FILTERS REMOVE FLUORIDE FROM DRINKING WATER?

The optimum fluoride level in public drinking water supplies is a safe and effective way of helping to protect teeth against dental decay, and it is not necessary or desirable to remove the fluoride.

Distillers and filtering systems containing ion exchange resins, activated aluminium or reverse-osmosis membranes have been shown to be effective and will remove most of the fluoride from water.

More information about removing fluoride from water can be obtained from a professional water treatment company.

30. IS BOTTLED WATER FLUORIDATED?

In most cases, the answer is no, although some bottled water products contain naturally occurring fluoride from the source. Australian food regulations allow the addition of fluoride to bottled water within the permitted range of 0.6 – 1 mg/L. As with all packaged food in Australia bottled water must be clearly labelled and state the product contents.

FLUORIDE AND DIET

31. IS FLUORIDE A NUTRIENT?

Yes. In 2006 and updated in 2017, the National Health and Medical Research Council, the Australian Government Department of Health and the New Zealand Ministry of Health included fluoride as a 'nutrient' in its *Nutrient reference values for Australia and New Zealand including recommended dietary intakes* (41, 42). This document states:

Because of its role in the prevention of dental caries [decay], fluoride has been classified as essential to human health.

32. DOES FLUORIDATED TAP WATER CAUSE ALLERGIES?

There is no link between community water fluoridation as practised in Australia and allergic reactions or allergy like symptoms.

According to medical specialists from the Department of Allergy, Immunology and Respiratory Medicine at The Alfred Hospital in Melbourne, no clinical or scientific evidence exists to confirm fluoride at current Australian levels causes allergies or affects immunity (43). Specifically, they state:

... during the last 25 years, whether in Melbourne or in the UK, we have never seen a patient with any respiratory symptoms nor any allergy-like symptoms that could be attributed to fluoride 1ppm [1 mg/L] as in our fluoridated water (43).

33. HOW MUCH FLUORIDE DO WE NEED?

The *NHMRC Nutrient reference values for Australia and New Zealand: including recommended dietary intakes: Fluoride* (updated 2017) states that the Adequate Intake level of fluoride for the average adult male and female is 4.0 milligrams per day and 3.0 milligrams per day, respectively. The Adequate Intake in children varies by age (due to different body weights), ranging from 0.5 milligrams per day in 7 to 12 month olds, to 1.1 milligrams per day in children aged 4 to 8 years (42). This amount helps to minimise tooth decay in children, adolescents and adults, and can be obtained by drinking fluoridated water and consuming foods with fluoride in them.

34. WHAT FOODS AND DRINKS CONTAIN FLUORIDE?

Most foodstuffs contain traces of fluoride (2, 44). Higher amounts of fluoride can be found in dried tea leaves, for example, because of natural concentration by the tea plant (44). Other common sources of fluoride include cereal and grain based foods, almonds, apples, minced beef, chocolate and milk (45).

35. CAN DRINKING FLUORIDATED TAP WATER RESULT IN THE CONSUMPTION OF TOO MUCH FLUORIDE?

No. NHMRC found no evidence that community water fluoridation at current Australian levels causes human health problems. To help protect teeth against tooth decay, only very small amounts of fluoride are needed in water (46). NHMRC supports Australian states and territories fluoridating their drinking water supplies within the range of 0.6 to 1.1 mg/L.

The *NHMRC Nutrient Reference Values for Australia and New Zealand* identifies 10 milligrams per day as the upper level of fluoride intake for an average-sized adult (41). To meet or exceed this level of intake means drinking at least 10 litres per day of water with fluoride at current Australian levels. However, regardless of any fluoride content in the water, this is a dangerously high level of water intake and is not recommended (47) because of the risk of water overloading, even for people such as athletes, outdoor workers, military personnel and those living in hot and humid climates, who may approach this level of consumption occasionally.

People with specialised needs, such as renal dialysis patients, should follow the advice of their medical professionals based on their particular circumstances, which may include a wide variety of factors such as diet, body mass, history and other more significant ions in the water such as potassium, sodium or chloride. In no case would the level of fluoride in fluoridated water be the limiting factor in the amount of water that could be safely consumed.

36. WHAT IS THE ADVICE PROVIDED FOR INFANT FORMULA RE-CONSTITUTED WITH FLUORIDATED WATER?

Infant formula products sold in Australia are safe to feed to infants when made up with fluoridated drinking water.

NHMRC recommends exclusive breast feeding until around six months of age. However, this is not always possible and, for infants who are not breastfed or who are partially breastfed, NHMRC recommends that infant formula be used as an alternative until 12 months of age. All infant formula in Australia must comply with the composition and safety requirements of the *Australia New Zealand Food Standards Code (revised 1 March 2016)* (48).

37. WHAT ADVICE IS PROVIDED ABOUT DRINKING FLUORIDATED WATER FOR PREGNANT OR BREAST FEEDING MOTHERS?

It is safe for the unborn child and infant when pregnant and breast feeding mothers drink water fluoridated at Australian levels. Breast milk naturally contains about 5–10 µg (micrograms) of fluoride per litre of milk (2). The level of fluoride in breast milk remains steady when a nursing mother drinks fluoridated water (49).

38. DOES RAINWATER TANK WATER CONTAIN FLUORIDE?

Rainwater collected in domestic tanks will not contain fluoride. It is not recommended that tank water be fluoridated as it can be difficult to maintain the correct concentration. People relying on tank water for drinking and food preparation should seek advice concerning fluoride requirements from their local dental professional, school dental service, community dental service or from the Australian Dental Association.

People using rainwater for drinking and food preparation will gain some dental benefits when they consume food and beverage products processed in nearby fluoridated centres or work and study in fluoridated areas. Another source of fluoridated water for people who rely on rainwater tanks for drinking and food preparation is packaged (bottled) water with added fluoride (50).

39. IS FLUORIDATED DRINKING WATER CONSIDERED A DRUG OR MEDICATION?

No. In Australia, the Therapeutic Goods Administration (TGA) does not require fluoride compounds, such as those added to fluoride toothpaste and to community drinking water supplies, to be registered as medicines if they are used for the prevention of dental decay - nor are they scheduled as drugs or poisons when they are added to community drinking water supplies at optimal levels.

Fluoridated drinking water is thus not considered to be a therapeutic drug or medicine by the TGA in Australia, or by comparable therapeutic goods regulators in any other country where water is fluoridated. Fluoride is a natural component of most water supplies. The TGA is the Australian regulator responsible for making sure that therapeutic goods used to prevent or manage health conditions in Australia are safe and of good quality.

FLUORIDE AND ETHICS

40. IS IT ETHICAL TO FLUORIDATE WATER?

NHMRC considers that it is ethical to fluoridate water. The 2017 NHMRC Information Paper – Water fluoridation: dental and other human health outcomes states that water fluoridation is ethical because it provides an oral health benefit by reducing tooth decay in people of all ages and social groups (1).

Furthermore the Centre for Social Ethics and Policy, University of Manchester states:

In considering the ethics of fluoridation ... we should ask not are we entitled to impose fluoridation on unwilling people, but are the unwilling people entitled to impose the risks, damage and costs of failure to fluoridate on the community at large (51)

Community water fluoridation is also consistent with the Report of the International Bioethics Committee of UNESCO on Consent (2008) (52).

41. IS INDIVIDUAL CONSENT REQUIRED FOR WATER FLUORIDATION?

No. Governments and health professionals have a responsibility to make decisions that balance the best possible community health outcomes with individual choice. Decisions relating to community water fluoridation are made at state and/or local government level by representatives who are responsible directly or indirectly to the people. Many Government decisions impact on individual choice to some extent.

People are free to choose whether or not to drink fluoridated water supplied to them, as they please. Some effort and expense is required to avoid fluoridated water by the use of bottled water, the provision of rainwater tanks, or the installation of specifically designed filters. But in the absence of community water fluoridation, great effort and expense is required of those who wish to provide the protective benefits of fluoride for themselves and their children. A greater effort is required to 'opt in' to access fluoride if there is no community water fluoridation, than to 'opt out' of community water fluoridation. In Australia, the large majority of the public support water fluoridation (1). From a social equity perspective, water fluoridation protects a whole community including those who might be less likely to adopt preventive dental behaviours or who struggle to pay for dental care.

42. IS COMMUNITY WATER FLUORIDATION CONSTITUTIONAL?

Yes. The Australian Constitution allows state governments to pass legislation to protect and enhance public health (53).

Section 51(xxiiiA) of the Commonwealth Constitution is a provision giving the Commonwealth Parliament the power to make laws for, amongst other things, "the provision of dental services (but not so as to authorise any form of civil conscription)." The bracketed words prevent the Commonwealth from conscripting dentists and other oral health professionals to provide dental services in peace time.

The provision of fluoridated water to communities is not a dental service within the meaning of the above provision of the Constitution, nor are members of fluoridated communities "conscripted" to receive a dental service.

FLUORIDE REGULATIONS

43. HOW IS COMMUNITY WATER FLUORIDATION IN AUSTRALIA REGULATED?

In every Australian state or territory, community water fluoridation is regulated by an Act of Parliament or government policy.

Table 2 lists the current regulatory frameworks used in each Australian state and territory.

TABLE 2 STATE AND TERRITORY FLUORIDE LEGISLATION AND REGULATIONS

Australian Capital Territory	<p>Licensed condition issued under the <i>Public Health Act 1997</i> http://www.legislation.act.gov.au/a/1997-69/</p> <p>Clause 36 of the <i>Utilities (Technical Regulation) Act 2014</i> http://www.legislation.act.gov.au/a/2014-60/</p>
New South Wales	<p><i>Fluoridation of Public Water Supplies Act 1957</i></p> <p><i>Fluoridation of Public Water Supplies Regulation 2017</i></p> <p><i>NSW Code of Practice for Fluoridation of Public Water Supplies</i> http://www.health.nsw.gov.au/environment/water/Pages/fluoridation.aspx</p>
Northern Territory	<p>The Use of Fluorides in the Northern Territory – position statement 2010 http://www.health.nt.gov.au/Oral_Health/Water_Fluoridation/index.aspx</p>
Queensland	<p><i>Water Fluoridation Act 2008 (current as at 1 November 2013)</i> https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WatrFluorA08.pdf</p> <p><i>Water Fluoridation Regulation 2008 (current as at 21 December 2012)</i> https://www.legislation.qld.gov.au/LEGISLTN/CURRENT/W/WatrFluorR08.pdf</p> <p><i>Water Fluoridation Code of Practice (revised September 2013)</i> https://www.health.qld.gov.au/public-health/industry-environment/environment-land-water/water/fluoridation/default.asp</p>
South Australia	<p>Water fluoridation is implemented by SA Water as a matter of Government policy and maintained by Ministerial direction under the <i>Public Corporations Act</i>.</p>
Tasmania	<p><i>Fluoridation Act 1968</i> http://www.thelaw.tas.gov.au/tocview/contentw3p;doc_id=87++1968+AT@EN+20111005000000;rec=0</p> <p><i>Fluoridation (Interim) Regulations 2009</i> http://www.thelaw.tas.gov.au/tocview/index.w3p;cond=ALL;doc_id=%2B14%2B2009%2BAT%40EN%2B20160817150000;histon=;pdfauthverid=;prompt=;rec=;rtfauthverid=;term=fluoride;webauthverid=</p> <p><i>Tasmanian Code of Practice for the Fluoridation of Public Water Supplies (2017)</i> www.dhhs.tas.gov.au/publichealth/water/drinking/mains/fluoride</p>
Victoria	<p><i>Health (Fluoridation) Act 1973</i></p> <p><i>Code of practice for fluoridation of drinking water supplies 2009</i> https://www2.health.vic.gov.au/public-health/water/water-fluoridation/water-fluoridation-legislation</p>
Western Australia	<p><i>Fluoridation of Public Water Supplies Act 1966</i> https://www.slp.wa.gov.au/legislation/statutes.nsf/main_mrtitle_348_homepage.html</p>

FLUORIDE AND THE ENVIRONMENT

44. HOW DOES FLUORIDATED WATER AFFECT THE ENVIRONMENT?

In the marine environment, the naturally occurring background level of fluoride in sea water is around 1.4 mg/L, which is greater than the fluoride level in fluoridated drinking water supply systems in Australia.

The New Zealand Public Health Commission reported on the impact of fluoridated water on the environment in 1994. This study found that:

- “Given the distribution of fluoride in most ecosystems, it would seem very unlikely that any hazard to the environment exists at a water fluoridation level of 1ppm [1 mg/L]” (54).

There is insignificant risk to the environment from fluoridated drinking water being discharged directly to a waterway.

45. CAN FLUORIDATED WATER BE USED IN ORGANIC FARMING?

Yes. Water fluoridation does not impact on the ability of organic producers to obtain or retain organic certification for their produce (55). Under the Australian Certified Organic Standard, all drinking water is permitted as a conventional (non-certified) ingredient (56).

46. CAN FLUORIDATED WATER BE USED IN AQUAPONICS?

Yes. Fluoridated water can be used in aquaponics systems. All natural water systems contain some level of fluoride with some parts of Australia having naturally occurring fluoride at levels similar to the level used in community water fluoridation programs. As fluoride is found in all water supplies, plants, fish, animals and other organisms can metabolise fluoride. This metabolism ensures the fluoride level remains relatively constant, although some variation can be expected – as also occurs in natural water systems.

FURTHER READING

The National Child Oral Health Study undertaken between 2012 and 2014 was a cross-sectional study of the child population aged five to 14 years in Australia:

Do LG and Spencer AJ (eds), 2016. Oral health of Australian children: the National Child Oral Health Study 2012–14. Adelaide: University of Adelaide Press.

In 2008 the Australian Research Centre for Population Oral Health presented the results of a study that examined the effectiveness of water fluoridation on children's dental health across four Australian states: Queensland, Victoria, Tasmania and South Australia:

Armfield J, Spencer A, Roberts-Thomson K and Slade G, 2008. 'Lifetime exposure to water fluoridation and child caries experience.' Presented at the 86th General Session and Exhibition of the International Association for Dental Research. Toronto, Canada.

The Australian Institute of Health and Welfare report, *Australia's dental generations: the National Survey of Adult Oral Health*, describes the beneficial effects of water fluoridation in young children and adults up to 97 years of age.

Australian Institute of Health and Welfare, 2007. Australia's dental generations: the National Survey of Adult Oral Health 2004–06. Canberra: AIHW.

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