

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.

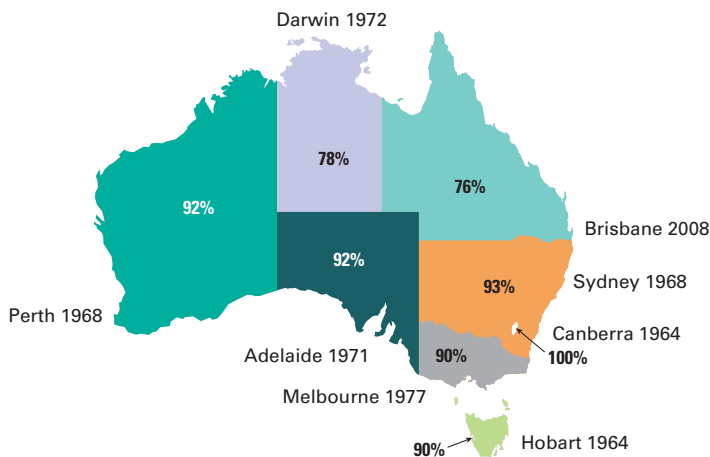
In each Australian state or territory, the government health authority determines the appropriate operational levels within the range of 0.6 to 1.1 mg/L.

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>>

Jack B, Ayson M, Lewis S, Irving A, Agresta B, Ko H, et al. *Health Effects of Water Fluoridation: Evidence Evaluation 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>>

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>>

National Health and Medical Research Council (NHMRC), National Resource Management Ministerial Council (NRMMC). *Australian Drinking Water Guidelines Paper 6 National Water Quality Management Strategy*. Canberra: NHMRC and NRMMC, 2011. <<https://www.nhmrc.gov.au/guidelines-publications/eh52>>

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Do LG, Spencer AJ, eds. *Oral Health of Australian Children: The National Child Oral Health Study 2012–14*. Adelaide: University of Adelaide Press, 2016. <<https://www.adelaide.edu.au/press/titles/ncohs/ncohs-ebook.pdf>>

Royal Society of New Zealand, *Health effects of water fluoridation: A review of the scientific evidence. A report on behalf of the Royal Society of New Zealand and the Office of the Prime Minister's Chief Science Advisor*, August 2014, available from: www.royalsociety.org.nz

David A. Cornwell, Nancy E. McTigue, and Savannah Hayes, *State of the Science: Community Water Fluoridation, Web Report #4641*, Water Research foundation (USA), 2015, available from: www.WaterRF.org

Marie Sutton, Rachel Kiersey, Louise Farragher, Jean Long, *Health Effects Of Water Fluoridation An evidence review 2015*, Health Research Board, Ireland, 2015, available from: <https://ace-notebook.com/Health-effects-of-water-fluoridation-free-related-pdf.html>

Some useful references

- 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>>