

A wide waterfall cascading over rocks into a pool, with a mossy rock in the foreground.

Water Fluoridation

NSW Ministry of Health

Healthy Mouths, Healthy Lives

- Poor dental health is associated with poor general health
- Health care costs rise when oral health is neglected
- The good news is that dental diseases are preventable

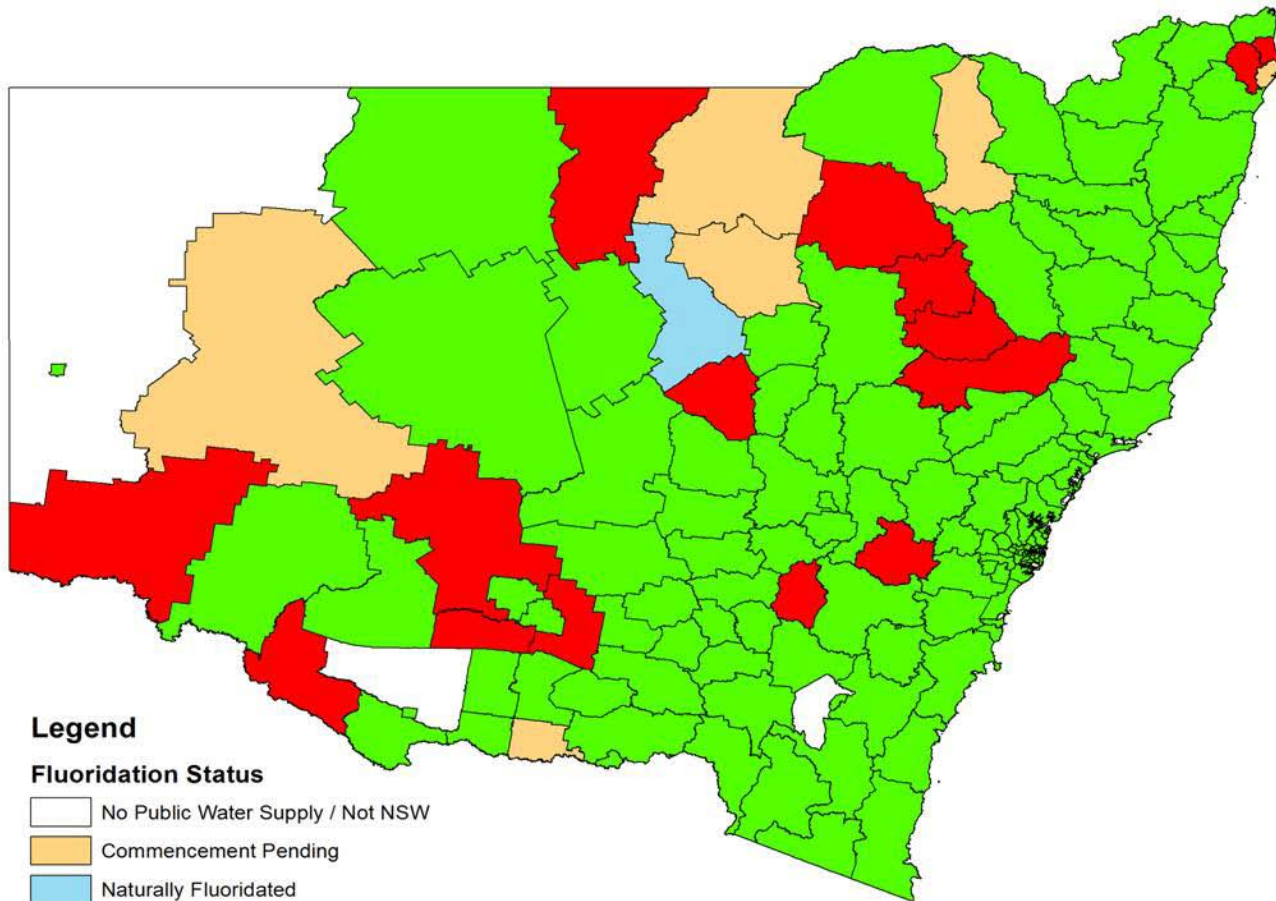
Fluoridation facts

- **Fluoride is a natural substance** found in water, soil and common foods.
- **Water fluoridation prevents dental decay in all ages.**
- **It is a safe, legal and ethical way of providing benefit to everyone, especially those who are disadvantaged.**
- **Despite fluoride in toothpaste, there is still substantially more tooth decay in unfluoridated areas compared to fluoridated areas of NSW.**

Coverage in NSW

Approximately 96% of the NSW population receives fluoridated water.

Sydney water has been fluoridated since 1968.



Legend

Fluoridation Status

- No Public Water Supply / Not NSW
- Commencement Pending
- Naturally Fluoridated
- Not Fluoridated
- Fluoridated

Fluoridation status of water utilities in NSW, August 2013



Health

Rates of tooth decay, unfluoridated vs fluoridated parts of NSW, 2007

Children aged 5-6 years

Despite the widespread availability of fluoridated toothpaste, differences remain in fluoridated vs unfluoridated parts of NSW

- Unfluoridated regions of NSW – 2.62 decayed missing or filled teeth
- Fluoridated parts of NSW – 1.4 decayed missing or filled teeth.

Source: NSW Child Dental Health Survey, 2007.



A three year-old who had all his teeth extracted under general anaesthetic due to rampant tooth decay

Fluoridation: Cost-effectiveness

Water fluoridation is highly cost-effective

For every \$1 spent on fluoridation, \$7 to \$18 is saved due to avoided treatment costs

Fluoridation: Balancing the ethical principles

Do Good ✓
Avoid Harm ✓
Be Fair ✓



Respect individual
choice) ?
Minimal burden on
others ?

Water fluoridation

Nature thought of it first!

What is fluoride?

- An element found naturally in water sources and soil.
- Fluoride is also present in some commonly consumed foods such as tea.

Definition

Water fluoridation is the process of adjusting the fluoride content of water to the recommended level for optimal dental health.

Water fluoridation - benefits

- benefits anyone with natural teeth
- regardless of age, socioeconomic level, educational achievement, or individual motivation
- complements other prevention strategies
 - tooth brushing
 - flossing
 - healthy diet



Fluoride - the ionic form in solution is natural



tasteless

everywhere

unavoidable

sea water: [F] = 0.8 - 1.4 ppm

unfertilised soils: [F] = 300+ ppm

“Low Fluoride” [F] = 0 - 0.3 ppm

“Water Fluoridation” [F] = 0.6 - 1.1 ppm

“High Fluoride” [F] = 1.5 - 25 ppm

Water fluoridation - benefits

- Safe** – no identified harmful side effects
- Effective** – delivers proven decay reduction
- Efficient** – better than other methods of fluoride delivery
- Cost-effective** – benefits far outweigh the cost
- Equitable** – in that it transcends socio-economic barriers that might prevent the use of other decay preventing products.

Is fluoride safe?

- Yes, water fluoridation is safe.
- The Australian Water Quality Guidelines recommend levels up to 1.5 mg/L, based on protecting against dental fluorosis
- The US EPA has set a maximum permissible level of 4mg/L based on protecting against skeletal fluorosis
- The safety of water fluoridation has been confirmed by the World Health Organization and the National Health and Medical Research Council

Does fluoride cause allergy / Can people be allergic to fluoride?

- Since fluoride is naturally present in so many common foods and water, it is questionable whether true allergy to fluoride exists.
- The weight of scientific evidence indicates that optimal levels of fluoride resulting from water fluoridation programs do not cause allergic reactions, allergy-like symptoms or intolerance.
- Fluoride is an inevitable component of all diets due to its presence in common foods. Individuals believing that allergy symptoms are related to fluoridated water are essentially claiming an effect from an incremental increase of fluoride, not its presence versus its absence.

Is fluoride safe for babies?

- Fluoridated water is safe for babies.
- Breastfeeding remains the preferred method of infant feeding and provides perfect nutrition to match an infant's needs.
- Although breast milk is the best feeding choice for babies, infant formula is readily available and nutritionally adequate. If infant formula is used, it is safe in Australia to reconstitute it using fluoridated water.

Does fluoride lower IQ?

- The studies claiming an effect of fluoride on IQ have major deficiencies that limit the conclusions that can be drawn
- These include:
 - the study designs (ecologic studies)
 - lack of controlling for major potential confounders
- There is no reason to believe the reported effects would be associated with fluoridated drinking water, as the control levels (the levels of fluoride consumed by the higher IQ populations) were the same as for fluoridated water supplies in Australia.

Can fluoride cause arthritis

- Optimal water fluoridation does not cause arthritis
- Water fluoridation is safe in terms of any effect on bone mineral density and is endorsed by Osteoporosis Australia and Arthritis Australia, which state:

There is no credible evidence, or even theory, to implicate water fluoridation in the cause of any type of arthritis.

Can fluoride cause bone fractures?

- The NHMRC in 2007 concluded that there is no clear association between fluoridation and hip fractures or other fractures.
- Skeletal fluorosis occurs in individuals with excessively high levels of fluoride exposure ($>4\text{mg/L}$), and is endemic in several parts of the world with water supplies with naturally occurring fluoride at levels that are much much higher than those in Australian fluoridated water supplies.
- The US EPA sets drinking water guidelines up to 4mg/L to protect against skeletal fluorosis
- Australian drinking water guidelines recommend a limit of 1.5mg/L to protect against dental fluorosis

Can fluoride affect people with kidney disease?

- Kidney Health Australia states that there is no evidence that consumption of optimally fluoridated drinking water poses any health risk for people with chronic kidney disease.
- Dialysis machines use reverse osmosis to remove fluoride and other electrically charged particles.

Ethics

- An ethical argument relies on the evidence of harms and benefits
- It is a question of **the best result collectively:**
 - We need to show that there is evidence of benefit for fluoridation over and above other measures to prevent or treat the same oral disease
 - This evidence is conclusive
- **Justice-based argument:**
 - Fluoridation is more equitable across the population
 - Disadvantaged people may not be able to access dental services to treat tooth decay or consistently take other preventive measures in order to compensate for a lack of fluoride in the water supply

Ethics

- **Infringement on liberty:**

- Without identifiable harms, fluoridation does not pose a substantial infringement on individual liberty

- **“Mass Medication” argument:**

- Fluoride is a naturally occurring element, not a medicine
- Fluoride occurs naturally in water sources in some parts of the world at concentrations comparable to those used in water fluoridation programs
- Therefore fluoride is not a mass medication

Ethics

- **Privilege:**

- The majority of the population are unlikely to speak out about their preference for fluoridation. Surveys of communities that are supplied by Rous Water in NSW show a majority in favour of fluoridation, with only a minority actively not in favour
- A vocal minority **should not be privileged** over the majority, some of whom stand to be disproportionately disadvantaged

Ethics

- **“Difficult to opt-out” argument**
 - Those objecting to fluoridation on this basis would need to show a risk of harm
 - There is no scientific evidence of harm to date
 - There is an opt-out option for the small minority with strong objections to fluoridated water: to use water tanks and bottled water

Thank You

