

The Benefits of Water Fluoridation to Oral Health

Fluoride in water can reduce the likelihood of experiencing dental decay and minimise its severity. Systematic reviews of the scientific evidence confirm that it is an effective, safe public health measure suitable for consideration in localities where levels of dental decay are of concern. There is also evidence that water fluoridation is associated with improved outcomes such as fewer children admitted to hospital for tooth extraction.

Public Health England considers there to be 'strong evidence' for the benefits of water fluoridation and recommends its consideration in their Commissioning Guidance document and their Toolkit for Local Authorities:

[Commissioning better oral health for children and young people](#)

(PHE 2014)

[Improving oral health: a community water fluoridation toolkit for local authorities](#)

(PHE 2016)

What is good evidence?

There is an extremely wide range of evidence published both on the internet and in the scientific literature regarding fluoridation, some of which is supportive and some of which isn't. Recommendations on water fluoridation are based on an assessment of the strength of the evidence both for and against fluoridation.

In order to assess whether a public health intervention is effective, it is useful to look at a range of research using different methods and to assess the quality and quantity of that evidence. The following diagram illustrates what is normally regarded in the scientific community as the ladder of evidence in terms of quality.



(PHE 2016)

More weight is given to systematic reviews of studies and peer-reviewed research. Equally, care must be taken to assess evidence for its relevance to the specific scenario of fluoridating water to a level of 1 mg/l (or 1 ppm) rather than for example, the harms related to

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naturally occurring levels of fluoride found at considerably higher levels in areas of Asia, Africa and China.

Below is a list of systematic and other reviews of water fluoridation since 2000:

[A Systematic Review of Public Water Fluoridation](#)

(known as the York Review) NHS Centre for Reviews and Dissemination, University of York. (2000). McDonagh M, et al.

[Recommendations on Selected Interventions to Prevent Dental Caries, Oral and Pharyngeal Cancers, and Sports-Related Craniofacial Injuries.](#)

US Community Preventive Services Task Force (2002). Am J Prev Med 2001;23:16-20

[A Systematic Review of the Efficacy and Safety of Fluoridation](#)

National Health and Medical Research Council (Australian Government) (2007)

[Effectiveness of Fluoride in Preventing Caries in Adults.](#)

Griffin S O et. al. (adults) J Dent Res. 86:410-5. (2007)

[Critical review of any new evidence on the hazard profile, health effects, and human exposure to fluoride and the fluoridating agents of drinking water.](#)

(European) Scientific Committee on Health and Environmental Risks - SCHER (2011)

[Preventing Dental Caries: Community Water Fluoridation.](#)

US Community Preventive Services Task Force (2013)

[Health effects of water fluoridation: A review of the scientific evidence](#)

The Royal Society of New Zealand (2014)

[Water Fluoridation: Health monitoring report for England 2014.](#)

Public Health England (2014)

[Water fluoridation for the prevention of dental caries.](#)

Cochrane Oral Health Group (2015). Iheozor-Ejiogor Z, et al. Cochrane Library 2015

[Health Effects of Water fluoridation: An evidence review.](#)

Health Research Board (Ireland) (2015) Sutton M, Kiersey R, Farragher L, Long, J.

From an examination of the significant amount of good quality evidence over the last 10 to 20 years, such as that listed above, on the effectiveness and safety of water fluoridation in improving oral health, the anticipated benefits of fluoridation include:

- **Children having fewer teeth that are decayed, missing or filled**
 - 2.25 fewer decayed, missing and filled teeth among 5-15 year olds across a range of countries (York Review, 2000)

 - 35% fewer decayed, missing and filled baby teeth and 26% fewer decayed, missing and filled permanent teeth (Cochrane Oral Health Group, 2015)

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- 15% increase in children with no decay in their baby teeth and a 14% increase in children with no decay in their permanent teeth (Cochrane Oral Health Group, 2015)
- On average, five-year olds in fluoridated areas are 15% less likely to have had tooth decay than those in non-fluoridated areas. When deprivation and ethnicity (important factors for dental health) are taken into account, five-year olds in fluoridated areas are 28% less likely to have had tooth decay than those in non-fluoridated areas. (PHE, 2014)
- On average, 12-year olds in fluoridated areas are 11% less likely to have had tooth decay than those in non-fluoridated areas. When deprivation and ethnicity are into account, 12-year olds in fluoridated areas are 21% less likely to have had tooth decay than those in non-fluoridated areas. (PHE, 2014)
- **Reduced tooth decay in adults**
 - between 27% and 35% lower among those who have lived all their lives in fluoridated areas (Griffin et al, 2007)
- **Reduction in hospital admissions and extractions under general anaesthetic for children**
 - in fluoridated areas there were 45% fewer hospital admissions of children aged one to four for dental caries (mostly for extraction of decayed teeth under a general anaesthetic) than in non-fluoridated areas (when deprivation was accounted for, this figure rose to 55%) (PHE, 2014)
- **Reduction in days lost from school for children**
- **Reduction in days lost from work for adults**
- **Reduction in avoidable treatment costs from dental treatment** (see separate linked file on Costs and Cost Effectiveness for more detail)

The European Platform for Better Oral Health, a forum of organisations committed to preventing tooth decay and other oral diseases, cites water fluoridation as an example of good practice in its 2012 report 'The State of Oral Health in Europe' and concludes:

"The best available evidence suggests that the fluoridation of drinking water reduces the prevalence of caries, both in terms of the proportion of children who are caries-free and by the mean change in decayed, missing and filled teeth".

It also argues that water fluoridation is one of the few public health interventions that directly reduce disparities in dental decay between high and low socio-economic status groups.

[The State of Oral Health in Europe](#)

The US Centers for Disease Control lists water fluoridation among the ten greatest public health achievements of the 20th Century.

Although the focus for fluoridation benefits is on those with the poorest oral health (children), one advantage of water fluoridation is its beneficial effect on the whole population, as the oral health of adults and older people is also a concern locally.

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