



British Society of  
**Paediatric Dentistry**  
Improving children's oral health

| Position  
Statement

# Water fluoridation

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## Summary

Water fluoridation is a public health measure that was first introduced 76 years ago and it is estimated that it benefits in excess of 400 million people worldwide in some 25 countries. It results in substantial reductions in dental decay and resulting sequelae such as abscesses, toothache, tooth extraction and need for general anaesthetic and hospital admission. Dental decay is of medical, social and economic significance. The widespread use of fluoride-containing toothpaste has reduced the burden of dental caries in the UK, but there remains considerable morbidity which is particularly severe in more deprived communities. These communities benefit substantially from water fluoridation. The beneficial effects of water fluoridation and fluoride in toothpaste are additive. The British Society of Paediatric Dentistry (BSPD) supports the fluoridation of public water supplies in communities where the burden of dental decay is severe enough to warrant this public health measure and fluoridation is technically feasible.

## Fluoride and the prevention of dental decay

For nearly a century it has been known that fluoride in drinking water prevents dental decay. In 1945, the fluoride concentration in the water supply of the US city of Grand Rapids, Michigan, was adjusted to the optimum concentration of 1 mg per litre of water. Subsequent surveys showed substantial improvements in dental health in children who had received fluoridated water.

Water fluoridation schemes were introduced in other communities in the United States and in other countries. The success of these public health programmes resulted in the development of other ways of using fluoride's ability to prevent dental decay, for example in toothpastes and mouth rinses. The effectiveness of these is very well established and has resulted in substantial improvements in oral health worldwide.

## International support for water fluoridation worldwide

The World Health Organization first published a technical report on water fluoridation in 1958. Since then, WHO has consistently found water fluoridation to be safe and effective and has urged countries to consider introducing this public health measure. The Sixtieth World Health Assembly in Geneva in 2007 considered oral health and recommended water fluoridation as an equitable, effective and safe public health measure. This statement was recognised when the World Health

Assembly considered oral health again in May 2021. The US Centers for Disease Control and Prevention have identified water fluoridation as one of ten great public health achievements in the twentieth century. The two leading international dental organisations – the World Dental Federation and the International Association for Dental Research – have consistently supported water fluoridation.

## UK support for water fluoridation

Leading professional organisations in the UK supporting water fluoridation include:

- Public Health England
- Faculty of Public Health of the Royal Colleges of Physicians of the UK
- Royal College of Paediatrics and Child Health
- British Medical Association
- British Dental Association
- British Association for the Study of Community Dentistry

Support has come from across the political spectrum, with facilitating legislation having been introduced over the past thirty-seven years by Conservative and Labour health ministers. Between around two thirds and three quarters of respondents in many national and regional opinion surveys conducted over that period thought fluoride should be added to water if it can reduce tooth decay.

On 23 September 2021, the Chief Medical Officers of England, Wales, Scotland, and

Northern Ireland, issued a Statement on water fluoridation. The report stated that 'Tooth decay is a significant, yet largely preventable, public health problem in the UK that causes substantial work for the NHS.' Evidence showed that appropriate levels of fluoride can reduce the prevalence and severity of dental decay, and substantially reduce hospital admissions for tooth extraction – in children and young people by 45 to 68%. 'There is evidence that water fluoridation can help narrow differences in dental health between more and less deprived communities with people living in fluoridated areas suffering less tooth decay compared to those living in non-fluoridated areas.' No adverse associations had been substantiated except an increase in dental mottling that 'is a small risk from levels [of fluoride in water] used in public health'. The report states 'Water fluoridation is an area that often attracts exaggerated and unevidenced statements that can cause unnecessary concern.'

## Water fluoridation and child dental health

The effectiveness of water fluoridation has been evaluated in many countries; most of these investigations have evaluated effectiveness in children. As an overview, water fluoridation cut decay experience by half (50% reduction) before the widespread use of fluoride-containing toothpastes, while more recently, since the widespread use of fluoride-containing toothpastes, reduction in dental decay due to water fluoridation has been 35% to 40%. The decay preventing effects of fluoride in water and fluoride in toothpastes are additive so that children living in communities receiving fluoridated water and who use a fluoride-containing toothpaste benefit from both.

To provide detail: prior to 1990, 113 publications in 23 countries identified 66 studies of primary teeth providing a modal reduction (the most common reduction) of 40-50% and 86 studies of permanent teeth providing a modal reduction of 50-60%. Since 1990, 59 publications in 10 countries have yielded 30 studies examining primary teeth providing a modal reduction of 30-60%

and the 53 studies providing modal reductions in permanent teeth of 40-50%. Authoritative reviews have been published in several countries. In the UK, a major review in 2000 concluded that, for children aged 5 to 15 years, the average reduction in decay was 2.2 teeth; this is equivalent to about a 40% reduction. In a follow-up review in 2015, the average reduction in caries in primary teeth was 35%. In the USA, a major review put the per cent reduction in decay due to water fluoridation at between 30 and 50%. Major reviews in Australia and New Zealand have confirmed the clinical effectiveness and cost effectiveness of water fluoridation.

There are other benefits to children from water fluoridation other than the reduction in the number of decayed teeth. Badly decayed teeth cause abscesses and toothache, and the occurrence of dental abscesses and toothache is reduced by water fluoridation. Extraction of decayed teeth is much less common in children living in fluoridated communities; likewise, the experience of general anaesthetics for tooth extraction is less. Extraction of decayed

teeth is the most common reason for admitting children to hospital in the UK and other countries. These hospital admissions are expensive – studies in England, Israel and Australia show that water fluoridation approximately halves the need for these admissions. Public Health England, in their 2018 report, said that hospital admissions for caries-related tooth extractions were 59% lower in areas with fluoridated water compared with areas with low levels of fluoride in drinking water.

The most deprived and vulnerable children in our society, unfortunately, have the most dental decay. An excellent attribute of water fluoridation is that it reaches all people in the community, requiring no personal effort or expense by parents and carers. Very many

surveys in this country and in other countries have shown that it is these children who benefit most from water fluoridation. In their 2018 report, Public Health England said that the probability of having dental decay was reduced by 52% in children living in the most deprived areas compared with a reduction of 23% for children living in the least deprived areas. That is why the World Health Organization calls water fluoridation an equitable public health measure. Economic analyses of the impact of water fluoridation show health benefits consistently outweighing costs: from US and Australian analyses, the most commonly quoted ratio is a 38-fold benefit and from New Zealand 9-fold.

## The need for water fluoridation in the UK

Mainly as a result of the widespread use of fluoride-containing toothpastes, the dental health of children in the UK has improved substantially over the past 40 years. However, much morbidity remains, and dental decay is one of the most prevalent and expensive diseases. The national survey by Public Health England of children's dental health in 2017 indicated that 23% of 5 year-olds had decayed primary teeth. For those with decay, an

average of 3.4 teeth were affected per child. There are substantial differences in experience between social groups and areas of the country. For example, while 16% of 5 year-olds in the South East region of England had decayed teeth, the percentages were 34% in North West England and 30% in Yorkshire and the Humber. In the 2008-9 survey of 12 year-olds, the number of decayed teeth showed

an eight-fold difference between the worst and best local authority in England.

Hospital admissions of children for dental extractions are far too high. In 2017-18, there were 45,077 children and adolescents admitted to hospital in England for extraction of decayed teeth. These numbers were highest in the five-nine year-old age group, which showed a 5 per cent increase between 2012–13 and 2017–18, from 24,894 to 26,111. The second highest admissions in 2017–18 were for tonsillitis,

with 12,143 cases, making dental decay by far the most common reason for children aged between five and nine to be admitted to hospital. This is costly for the NHS, with £54.6 million spent on hospital-based tooth extractions for children and adolescents in 2019–20.

While community programmes aimed at preventing dental caries may be targeted at communities with greatest need, water fluoridation is unique in its ability to reach all people at minimal cost.

## Position statement:

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