

Hide this message




Department
of Health &
Social Care


Independent report

Statement on water fluoridation from the UK Chief Medical Officers

Published 23 September 2021

Contents

- [Introduction – the impact of dental decay](#)
- [Role of fluoride in improving dental health](#)
- [Impact of water fluoridation in areas of deprivation](#)
- [Conclusion](#)
- [Further information](#)

 [Print this page](#)

Introduction – the impact of dental decay

Tooth decay is a significant, yet largely preventable, public health problem in the UK that causes substantial work for the NHS. It affects people at all stages of life and is the most common oral disease in children. There is a strong association with deprivation.

Tooth decay is prevalent among young children across the UK. In the school year of 2019, 23.4% of 5-year-olds in England^{[[footnote 1](#)]} and 26.5% of P1 children in Scotland^{[[footnote 2](#)]} had experienced tooth decay. Data collected in 2015 to 2016 showed 34.2% had experienced tooth decay among the same age group in Wales^{[[footnote 3](#)]}. The Children's Dental Health Survey 2013 reported 40% of 5-year-olds had experienced tooth decay in Northern Ireland^{[[footnote 4](#)]}.

There are a number of reasons why people can suffer tooth decay including a sugary diet, poor dental hygiene and, in much of the country, a lack of fluoride.

Tooth decay can significantly affect individuals' general health and wellbeing. They can suffer pain and have difficulties eating, sleeping and socialising^{[[footnote 5](#)]}. It is a progressive disease which, if left untreated, can cause severe pain and on rare occasions cause serious issues like sepsis.

It can have a detrimental effect on children's learning and development as pain and infections from decay can result in school absences. In 2019, 6% of children aged under 16 in England had time off nursery or school in the last 6 months because of problems with their teeth, mouth or gums^{[[footnote 6](#)]}.

Tooth decay also has a considerable impact upon NHS health services, despite it being largely preventable. In 2019 to 2020, 35,190 children aged 0 to 19 years in England were admitted to hospital for the extraction of decaying teeth. These procedures often require specialist anaesthetic and theatre resources. In the same year, the cost of hospital admissions for tooth extractions among those aged 0 to 19 years in England was estimated to be £54.6 million^{[[footnote 7](#)]}, the majority due to preventable tooth decay.

Role of fluoride in improving dental health

Fluoride is a naturally occurring mineral found in water and some foods. The amount of naturally occurring fluoride in water varies across the UK due to geological differences.

Water fluoridation schemes involve adding fluoride to community drinking water supplies in areas of low natural fluoride, increasing the level to that known to reduce tooth decay. This happens in approximately 25 countries internationally, covering an estimated 400 million people^{[[footnote 8](#)]}.

Evidence from observational and interventional studies shows that appropriate levels of fluoride can reduce the prevalence and severity of dental decay in both adults and children.

A report by Public Health England^{[[footnote 5](#)]} found that water fluoridation can substantially reduce hospital admissions for tooth extraction. If all 5-year-olds with drinking water with less than 0.2 mg/l fluoride instead received at least 0.7mg/l from a fluoridation scheme, then the number experiencing caries would be lower. The decline would be 17% in the least deprived areas, rising to 28% in the most deprived, and the number of hospital admissions for tooth extractions in children and young people is estimated to reduce by 45 to 68%.

Water fluoridation is not a substitute for good oral hygiene, regular dental check-ups and limiting sugar intake but it has an effect even when those are absent.

There are other effective methods for getting fluoride onto teeth. It is added to most toothpastes and can be applied as a fluoride varnish by a dental professional. In Scotland, Wales and Northern Ireland, daily supervised tooth brushing schemes take place in early years and primary school settings. Some local authorities in England have also commissioned supervised tooth brushing schemes in their areas. These approaches can all help to protect teeth against decay, however, water fluoridation schemes can be advantageous as they do not require population behaviour change. Water fluoridation can benefit both adults and children who are less likely to engage with other methods.

There are adverse associations between much higher levels of natural fluoride in drinking water and the prevalence of dental mottling, referred to as dental fluorosis. Dental mottling is a small risk from the levels used in public health but not a uniform one in all fluoridated areas and can still affect people in non-fluoridated areas. Severe fluorosis is only common in areas with very high natural fluoride levels, well above those used in public health interventions (and which require fluoride to be removed from drinking water).

There are some weaker studies which claim an association with hip fracture, Down's syndrome, kidney stones, bladder cancer or osteosarcoma (a cancer of the bone). However, there is conflicting evidence to support these claims and prevailing public health opinion is now that there is no significant association between water fluoridation and these conditions.

Water fluoridation is an area that often attracts exaggerated and un evidenced statements that can cause unnecessary concern.

The level of fluoride in drinking water must be closely monitored as too much fluoride can be harmful. The World Health Organization recommends a maximum level of 1.5 milligrams of fluoride per litre of water (mg/L)^{[[footnote 9](#)]}. In the UK, the level of fluoride in drinking water is monitored by the Drinking Water Inspectorate (England and Wales), The Drinking Water Quality Regulator for Scotland and Northern Ireland Water.

Impact of water fluoridation in areas of deprivation

Dental health surveys conducted across the UK show that there is an association between socio-economic deprivation and poor dental health. For example, the 2013 Child Dental Health Survey, which collected data from England, Wales and Northern Ireland, found that children from lower income families were more likely to have oral disease than other children of the same age^{[[footnote 10](#)]}.

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^{[[footnote 2](#)][[footnote 7](#)][[footnote 11](#)]}. It has its greatest positive effect in children who do not get fluoride through regular toothbrushing or dental interventions.

Conclusion

As with all things in medicine and public health there is a balance of risk and benefit. There is unquestionably an issue with tooth decay in the UK and an entrenched inequality which needs to be addressed. Fluoridation of water can reduce this common problem.

On balance, there is strong scientific evidence that water fluoridation is an effective public health intervention for reducing the prevalence of tooth decay and improving dental health equality across the UK. It should be seen as a complementary strategy, not a substitute for other effective methods of increasing fluoride use.

Dr Frank Atherton, Chief Medical Officer, Wales

Dr Michael McBride, Chief Medical Officer, Northern Ireland

Dr Gregor Smith, Chief Medical Officer, Scotland

Professor Chris Whitty, Chief Medical Officer, England

Further information

Cardiff University Welsh Oral Health Information Unit (2020) [Designed to Smile Monitoring Report](#)

NHS Digital (2009) [Adult Dental Health Survey 2009 – First Release](#)

NHS Digital (2015) [Children's Dental Health Survey: country specific report – Wales](#)

NHS Scotland Information Services Division (2019) [The Scottish Adult Oral Health Survey 2016-2018](#)

[Childsmile – NHS Scotland](#)

[Childsmile – NHS Scotland](#)

[Designed to Smile – NHS Wales](#)

[Happy Smiles Programme – Health and Social Care Board, Northern Ireland](#)

- Public Health England (2019) [Oral health survey of 5-year-old children 2019](#) ↵
- Public Health Scotland (2020) [Report of the 2020 Detailed Inspection Programme of Primary 1 Children and the Basic Inspection of Primary 1 and Primary 7 Children](#) ↵ ↵²
- Cardiff University (2017) [Dental caries in 5-year olds \(2015/2016\)](#) ↵
- NHS Digital (2015) [Children's Dental Health Survey: country specific report – Northern Ireland](#) ↵
- Public Health England (2018) [Water Fluoridation: Health monitoring report for England 2018](#) ↵ ↵²
- NHS Digital (2021) [Health Survey for England 2019 Dental Health](#) ↵
- Public Health England (2019) [Hospital tooth extractions of 0 to 19 year olds](#) ↵ ↵²
- Mullen (2005) 'History of water fluoridation', *British Dental Journal*, 199 (1-4) ↵
- World Health Organization (2017) [WHO Guidelines for drinking-water quality, fourth edition](#) ↵
- NHS Digital (2015) [Child Dental Health Survey 2013, England, Wales and Northern Ireland – Executive Summary](#) ↵
- Public Health England (2014) [Water Fluoridation: Health monitoring report for England 2014](#). ↵

Is this page useful?

Yes

No

[Report a problem with this page](#)

Coronavirus (COVID-19)

[Coronavirus \(COVID-19\): guidance and support](#)

Brexit

[Check what you need to do](#)

Services and information

[Benefits](#)

[Births, deaths, marriages and care](#)

[Business and self-employed](#)

[Childcare and parenting](#)

[Citizenship and living in the UK](#)

[Crime, justice and the law](#)

[Disabled people](#)

[Driving and transport](#)

[Education and learning](#)

[Employing people](#)

[Environment and countryside](#)

[Housing and local services](#)

[Money and tax](#)

[Passports, travel and living abroad](#)

[Visas and immigration](#)

[Working, jobs and pensions](#)

Departments and policy

[How government works](#)

[Departments](#)

[Worldwide](#)

[Services](#)

[Guidance and regulation](#)

[News and communications](#)

[Research and statistics](#)

[Policy papers and consultations](#)

[Transparency and freedom of information releases](#)