Dental health and use of fluoride

In this guide

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13. Tooth decay is a significant, yet largely preventable, public health problem in England. It can be almost entirely prevented by reducing the amount and frequency of the consumption of sugar in food and drink and by adequate exposure to fluoride, which can be applied directly to teeth via toothpaste, through professional application of fluoride varnish or by addition to the drinking water supply. It affects people at all stages of life and is the most common oral disease in children. Tooth decay is a progressive disease which, if left untreated, can cause pain and infection. In severe cases it can lead to hospitalisation.

14. Poor oral health can have a negative impact throughout life. Poor oral health impacts on children and families. It affects children's ability to eat, smile and socialise and causes pain and infection with days missed at school, and parents' work to attend a dental service to receive care. Children who have high levels of disease in primary teeth have an increased risk of disease in their

permanent teeth. Once treated, these teeth will require long term maintenance throughout life.

15. Amongst adults, it can result in time off work due to pain or treatment. Good oral health is essential for general health and wellbeing. For example, good oral health can support older people to stay independent for longer, or to recover from episodes of crisis or frailty.

16. Evidence shows that poor oral health in older people can lead to:

- Pain and discomfort, which can lead to mood and behaviour changes, particularly in people who cannot communicate their experience, have speech problems and reduced ability to smile and communicate freely.
- Problems chewing and swallowing which limit food choices and can lead to impaired nutritional status.
- Poor quality of life.
- Reduced self-confidence and increased social isolation.
- Impaired well-being and mood.
- Poor general health and premature mortality.

17. The Global Burden of Disease (GBD) study for 2010 found that most disability amongst children aged five to nine in the UK was caused by poor oral health. An average of 2.24 hours of children's healthy lives was lost for every child aged five to nine years because of poor oral health. This exceeded the level of disability associated with vision loss (1.64 hours), hearing loss (1.77 hours) and type 2 diabetes (1.54 hours) (GBD, 2013).

18. Oral health is seen as a marker of wider health and social care issues including poor nutrition and obesity. The relationship between obesity, deprivation and dental caries is unclear. Despite this, it is likely that interventions that reduce sugar intake have the potential to impact both conditions at the population level because deprivation and high intakes of free sugars are known risk factors for both dental caries and for obesity (Public Health England (PHE), 2017).

19. Like many common chronic lifestyle associated diseases, the prevalence of dental caries is linked to deprivation. This has been shown by results of oral health surveys.

Oral health in England

20. In England, as part of the annual National Dental Epidemiology Programme, DHSC co-ordinates dental surveys which assess local oral health needs of specific population cohorts.

Oral health survey of children in year six, 2023 (OHID, 2024)

21. The survey found that 16% of Year Six schoolchildren who participated in this survey had experienced tooth decay. Of these children each child had on average two affected teeth. Year six school children living in the most deprived areas of the country were more than twice as likely to have experience of tooth decay (23%) as those living in the least deprived areas (10%).

Oral health survey of five year old children 2024 (OHID, 2025a)

22. This survey found that more than a fifth (22.4%) of five year old children in England had experience of tooth decay, having on average 3.5 affected teeth (at the age of five years children normally have 20 primary teeth).

23. There are significant oral health inequalities in England. Children living in the most deprived areas of the country were more than twice as likely to have experienced tooth decay (32.2%) as those living in the least deprived areas (13.6%). There were also disparities in the percentage of those who had experienced tooth decay by ethnic group, which was significantly higher in the Other ethnic group (45.4%) and the Asian or Asian British ethnic group (37.7%). Inequalities in prevalence of experience of tooth decay in five year old schoolchildren significantly reduced from 2008 to 2015 but there has been little change in inequalities since then.

Oral health survey of three year old children 2020 (PHE, 2021)

24. This survey found that, 10.7% of children participating in the survey had experience of tooth decay despite having had their back teeth for just one or two years. Among the children with experience of tooth decay, each had on average three affected teeth (at age three, children normally have all 20 primary teeth).

25. Children living in the most deprived areas of the country were almost three times as likely to have experience of dental decay (16.6%) as those living in the least deprived areas (5.9%).

26. This is the second national survey undertaken for this age group in England. The first was completed in 2013 , The findings indicate that the oral health of three year olds has changed little since 2013 when 11.7% had experience of dental decay.

Hospital tooth extractions in 0 to 19 year olds 2025 (OHID, 2026)

27. In the financial year ending 2025 there were 56,143 episodes of tooth extractions in NHS hospitals in England for 0 to 19 year olds. Of these, 33,976 episodes (60.5%) of tooth extractions were for a primary diagnosis of tooth decay.

28. Tooth decay is still the most common reason for hospital admission in children aged between five and nine years. The decay related tooth extraction episode rate for children and young people living in the most deprived communities was just over 3 times that of those living in the most affluent communities. Dental treatment under general anaesthesia has a small but real risk of life-threatening complications for children and carries significant morbidity for children undergoing this procedure.

29. The costs to the NHS of hospital admissions for tooth extractions in children aged 0 to 19 years have been estimated and are based on the latest NHS national cost collection data. The costs were £87.7 million for all tooth extractions and £51.2 million for decay-related tooth extractions in the financial year ending 2025.

Adult dental health survey 2023 (OHID, 2025b)

30. Among dentate adults (those with at least 1 natural tooth), over two-fifths (41%) showed evidence of obvious decay.

31. The severity of tooth decay varied by household income with rates of severity lower in higher income households. A similar pattern was seen with area deprivation, with rates of severity lower for adults living in the least deprived areas.

Evidence for effectiveness of various fluoride vehicles

32. Toothbrushing with fluoride toothpaste is the most commonly used vehicle for prevention of tooth decay in the world and is thought to be the main reason for improvements in the number of people affected by tooth decay over the last forty years (Ten Cate, 2013). For best effects, toothbrushing with fluoride toothpaste needs to be undertaken twice daily, once at bedtime and on at least one other occasion (OHID, 2025c). In the most recent survey of national Adult Oral Health Survey (OHID, 2025d), 71% of adults with teeth reported brushing twice a day. Of those that brushed their teeth, 87% used a fluoride toothpaste. Six per cent of adults who cleaned their teeth reported using a high fluoride toothpaste that had been prescribed to them by a dentist.

33. Application of fluoride varnish is another option for increasing the availability of fluoride on teeth. Fluoride varnish has to be applied by a trained member of the dental team. A Cochrane review concluded that fluoride varnish had a substantial caries-inhibiting effect in both permanent and primary teeth (Marinho et al, 2013).

34. Fluoride mouth rinses are another way of increasing fluoride availability in the mouth. These are used for children aged eight years and above. Effectiveness evidence shows that regular use of fluoride mouthrinse under supervision results in a reduction in tooth decay in children's permanent teeth (Marinho et al, 2016).

35. Fluoride tablets and drops (supplements) can be prescribed for the prevention of dental caries in children. It is recognised that the use of fluoride tablets and drops requires ongoing compliance by families and can result in under and over-use. The evidence shows that the uses of fluoride supplements are associated with a reduction in caries increment when compared with no fluoride supplement in permanent teeth, but the effect on primary teeth is less clear as is whether there is benefit over and above use of topical fluorides (Tubert-Jeannin et al, 2011). In England, in our current guidance, we do not advise use of fluoride tablets and drops.

36. There are school milk schemes in England in which parents can opt for their child to have fluoridated milk. They are provided in areas which water is not fluoridated and where levels of caries are high. There is low quality evidence to suggest fluoridated milk may be beneficial in reducing tooth decay (Yeung et al,

2015). Additional high-quality research is needed before definitive conclusions about the benefits of milk fluoridation can be made.

37. Some countries use fluoridated salt. However, in England this method of oral health improvement has not be utilised as a community intervention. Although salt fluoridation has the potential to reach populations, the lack of availability or actual use of fluoridated salt may mean that the intervention does not obtain full coverage. In addition, fluoridated salt would be contradictory to public health messages that encourage the reduction of consumption of salt to decrease the risk of hypertension.

Rationale for water fluoridation intervention

38. Water fluoridation is a fluoride vehicle that does not require behaviour change/compliance by the individual.

39. All water contains small amounts of naturally occurring fluoride. At the optimal concentration (one part per million or 1mg fluoride per litre of water [1mg/L]) it can reduce the prevalence and severity of tooth decay. Where the naturally occurring fluoride level is too low to provide these benefits, a water fluoridation scheme raises fluoride to the optimal level.

40. Water fluoridation schemes have been used for over 75 years internationally. Schemes in England have been in place since the 1960s. At levels recommended in the UK, it is a safe and effective public health measure to reduce dental caries and inequalities in dental health.

41. Following public consultation in 2024, we will expand community water fluoridation in the north east of England so that it reaches 1.6 million more people by April 2030. We will assess further rollout in areas where oral health outcomes are worst.

42. The water fluoridation provisions of the Health and Care Act 2022 came into force on 1st November 2022 and transferred statutory powers from local authorities to the Secretary of State to introduce, vary and terminate community water fluoridation schemes as well as to pay water companies for reasonable operating costs. Water fluoridation continues to be a ministerial priority and contributes to the Health Mission priority of “a shift from sickness to prevention” reducing preventable illness and tackling persistent health inequalities. It will contribute to the government’s ambition to “raise the healthiest generation of children ever” reducing tooth decay, one of the most common diseases affecting

children and the leading cause of hospital admission for five to nine year olds.

43. The four UK Chief Medical Officers have made a statement on water fluoridation. This concludes that “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”.

44. Water fluoridation is a complementary strategy, not a substitute for other effective methods of increasing fluoride such as fluoride toothpaste. Good practices such as regular dental check-ups and limiting sugar are important, but water fluoridation does have a positive effect even when those practices are absent.

45. With the evidence on cost benefit and the statement on water fluoridation from the UK Chief Medical Officers, community water fluoridation should be seen as a complementary strategy, not a substitute for other effective methods of increasing access to fluoride. It provides an important population level intervention as part of the overall strategy to improve oral health that will bring benefits to the most disadvantaged communities.

46. There have been many individual studies of the effects of water fluoridation over decades, using a wide variety of research methods, across different countries and investigating a range of health outcomes. There have been multiple systematic reviews of water fluoridation schemes from around the world. The common finding of these reviews is that water fluoridation is a safe and effective public health intervention for reducing the prevalence of tooth decay. Other relevant references that may be of interest are:

- Australian National Health and Medical Research Council (NHMRC) 2017.
- Royal Society of New Zealand (RSNZ) 2021.
- (Ireland) Health Research Board (HRB) 2022.
- Community Water Fluoridation Exposure: A Review of Neurological and Cognitive Effects - A 2020 Update.

47. The Secretary of State continues to have a duty to monitor the effects of water fluoridation schemes on health and to publish reports at no greater than four yearly intervals.

48. The most recent Health Monitoring Report (2022), which considers dental and other health outcomes, found that:

Ffive year olds in areas with higher fluoride concentrations were less likely to experience dental caries, and less likely to experience severe dental caries, than in areas with low fluoride concentrations.

- Five year olds in areas with a fluoridation scheme in place were less likely to experience dental caries than in areas without a scheme.
- Children and young people in areas with higher fluoride concentrations were less likely to be admitted to hospital to have teeth removed (due to decay) than in areas with low fluoride concentrations.
- Children and young people in areas with a fluoridation scheme in place were less likely to be admitted to hospital to have teeth removed (due to decay) than in areas without a scheme.
- These effects were seen at all levels of deprivation, but children and young people in the most deprived areas benefitted the most.

49. These findings are consistent with the view that water fluoridation at levels within the UK regulatory limit (<1.5mg/l) is an effective, safe, and equitable public health intervention to reduce the prevalence, severity, and consequences of dental caries. It supports previous findings that these benefits are greatest in the most deprived areas, thereby contributing to reducing dental health inequalities. Although most studies focus on children, there are also substantial benefits for adults. Studies suggest adults living in fluoridated areas may retain more teeth when compared to adults living in non-fluoridated areas and suffer less decay (Griffin et al, 2007). The next Health Monitoring Report will be published in March 2026.