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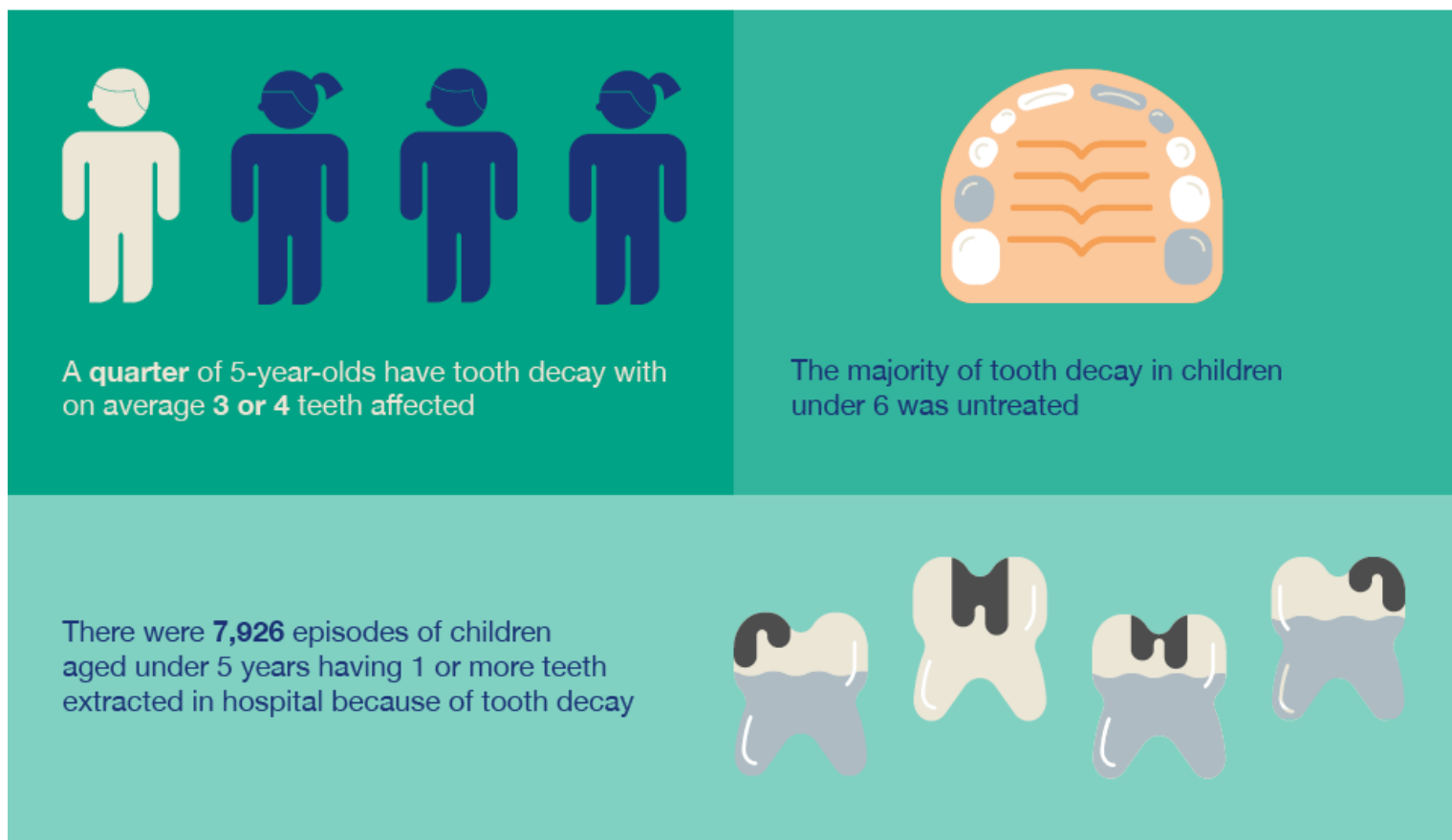
Public Health
England

Summary

This resource outlines how health professionals can help prevent tooth decay in children under 5 as part of ensuring every child has the best start in life.

Scale of the problem

Tooth decay is largely preventable yet it remains a serious problem. Findings from Public Health England's (PHE) [2015 national dental epidemiology survey of 5 year old children](#) showed that in 2015 in England, a quarter (25%) of 5 year olds had experienced tooth decay, having on average 3 or 4 teeth affected. The vast majority of tooth decay was untreated.



There was wide variation in the prevalence of tooth decay. The areas with poorer dental health tend to be in the north and in the more deprived local authority areas.

When comparing the regions, the estimates of tooth decay ranged from 33% in the north west to 20% in the south east.

The highest level of tooth decay was found in Blackburn and Darwen, where 56% of children aged 5 have tooth decay compared to the lowest level of just 4% in South Gloucester.

The most recent data for 5 year olds shows that 41% of variation can be explained by deprivation.

The [2013 oral health survey of 3 year olds](#) found that 12% had experienced dental decay. On average, these children had 3 teeth affected.

In the 2 years to March 2016, 38% of 0 to 4 year olds in England accessed a dentist. The rate varied across the country from 15% in the City of London to 58% in High Peak (Derbyshire).

Tooth extraction was the sixth most common procedure in hospital for children under 5 years of age, and it was the most common reason for hospital admission for children aged 5 to 9 years old.

Poor dental health impacts children and families

Poor dental health impacts not just on the individual's health but also their wellbeing and that of their

family. Children who have toothache or who need treatment may have pain, infections and difficulties with eating, sleeping and socialising.

A quarter of 5 year-olds have tooth decay when they start school. Children who have toothache or who need treatment may have to be absent from school and parents may also have to take time off work to take their children to a dentist or to hospital.

Oral health is therefore an important aspect of a child's overall health status and of their school readiness.

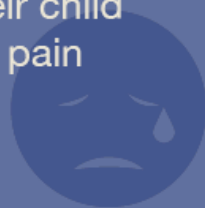
Research about extractions in children in North West hospitals found that **26%** had missed days from school because of dental pain and infection



An average of **3 days** of school were missed due to dental problems



67% of parents reported their child had been in pain



38% of children had sleepless nights because of the pain



Many days of work were potentially lost as **41%** of parents/ carers were employed

Many children would be missing additional school days while attending the hospital and recovery the following day, culminating in the majority of children missing at least 2 school days with some children being absent for up to 15 days.

These missed school days will not only affect the child, but the family as well. Many days of work were potentially lost, as 41% of parents or carers of these children were employed.

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.

Evidence shows that poor oral health may also be indicative of dental neglect and wider safeguarding

issues. Dental neglect is defined as ‘the persistent failure to meet a child’s basic oral health needs, likely to result in the serious impairment of a child’s oral or general health or development’.

Children who have high levels of disease in primary teeth have an increased risk of disease in their permanent teeth. If treated, these teeth will require long term maintenance throughout life.

Dental treatment under general anaesthesia presents a small but real risk of life-threatening complications for children and carries significant morbidity for children undergoing this procedure.

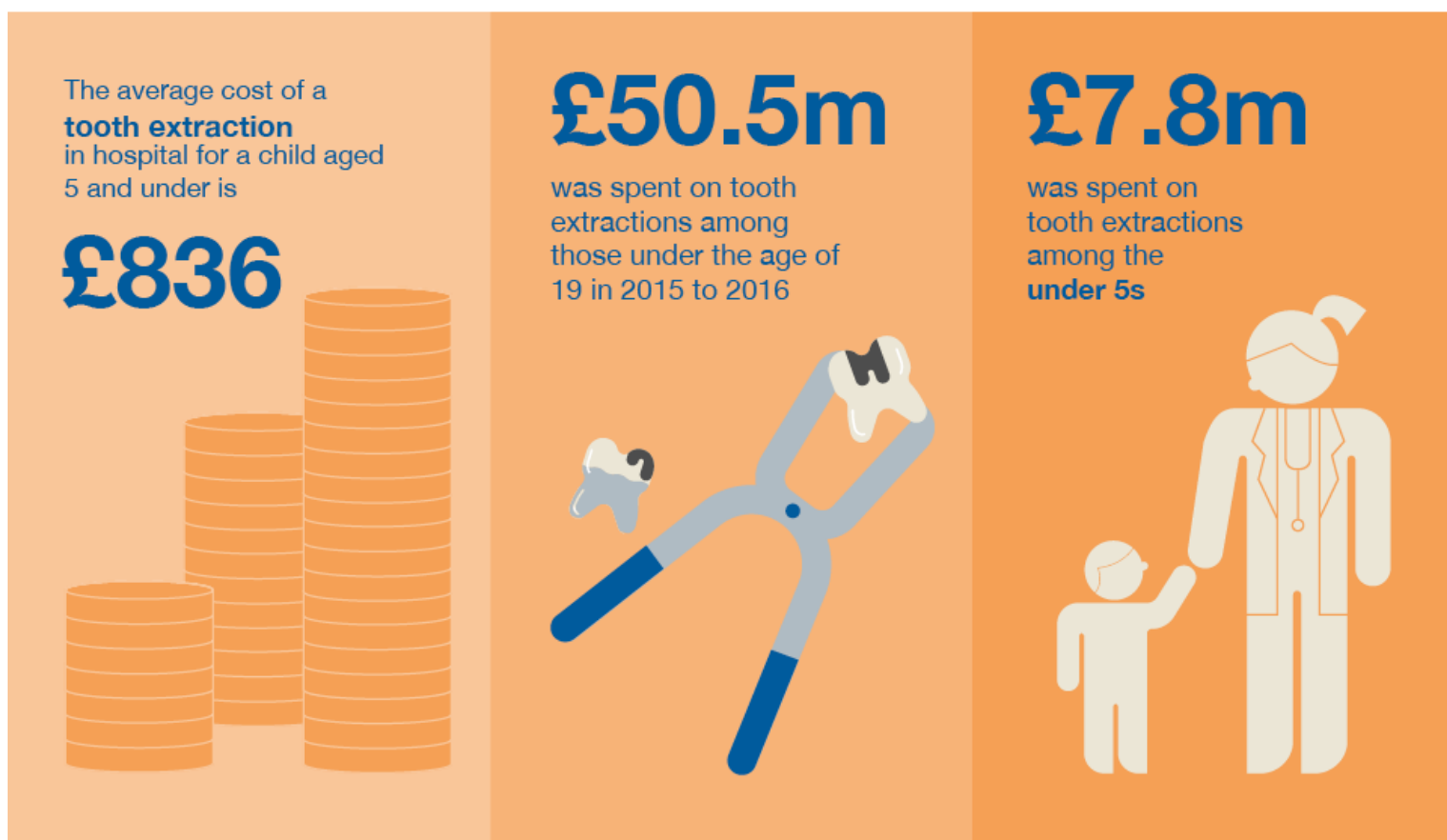
The [Global Burden of Disease study \(2010\)](#) found that most disability amongst 5 to 9 year olds in the UK was caused by poor oral health. An average of 2.24 hours of children’s healthy lives was lost for every child aged 5 to 9 years because of poor oral health. This exceeded the level of disability associated with vision loss (1.64 hours), hearing loss (1.77 hours) and type 2 diabetes (1.54 hours).

Why invest in oral health improvement

Despite being largely preventable, dental disease places significant costs on the NHS. In 2014, all age NHS dental treatment costs were £3.4 billion with an estimated additional £2.3 billion in the private sector.



Healthmatters The burden of tooth decay on the NHS



In the financial year 2015 to 2016, the cost of tooth extractions was approximately £50.5 million among children aged 0 to 19 years. This was for tooth extractions for any reason but the majority of extractions were for tooth decay. Among children under 5 years of age there were 9,306 admissions for tooth extractions (with 7,926 specifically identified as being due to tooth decay), at a cost of approximately £7.8

million.

There are a number of cost effective interventions to prevent tooth decay that can save money in the long term and reduce the number of children needing time off school because of tooth decay. Targeted community fluoride varnish programmes can, for example, result in an extra 3,049 school days gained per 5,000 children.

PHE estimates that the return on investment (ROI) for this intervention is £2.29 for every £1 spent after 5 years, increasing to £2.74 after 10 years.

PHE launched the [Children's Oral Health Improvement Programme Board](#) in 2016 with a wide range of partners and stakeholders with the aim to improve the oral health of all children and reduce the oral health gap for disadvantaged children.

The collective ambition of the board is that every child grows up free from tooth decay as part of the ambition for every child having the best start in life. Preventing tooth decay also fits in with the government's childhood obesity strategy, and work on health inequalities and social justice.

Risk factors for tooth decay

Tooth decay results from the destruction of the hard tissues of the tooth by acids produced in the mouth when bacteria in dental plaque metabolises dietary sugars. Repeated and prolonged acid attacks will eventually cause the tooth surface to weaken and a hole or cavity will form which may lead to pain and infection.

The risk of tooth decay increases as a child's diet starts to include foods and drinks other than breast milk or formula, depending on the free sugar content.

Every child who has teeth is at risk of tooth decay, but the risk increases for those living in the more deprived areas where the imbalance in income, education, employment and neighbourhood circumstances affect the life chances of children's development.

Children are more at risk of developing tooth decay if they are:

- eating a poor diet
- brushing their teeth less than twice per day with fluoride toothpaste
- from deprived backgrounds

How to prevent tooth decay

Improving child dental health requires a whole systems approach with action across the sector, from national and local policy, healthcare to families and the food and drink industry. Whilst local authorities have a lead statutory role in improving the oral health of their local population, everyone has a part to play.

Top 3 interventions for preventing tooth decay

1



Reduce the consumption of foods and drinks that contain sugars

2



Brush teeth twice daily with fluoride toothpaste (1350-1500ppm), last thing at night and at least on one other occasion. After brushing, spit don't rinse

3



Take your child to the dentist when the first tooth erupts, at about 6 months and then on a regular basis

Under 3s should use a smear of toothpaste



3 to 6 year olds should use a pea sized amount



Parents/carers should brush or supervise tooth brushing until their **child is at least 7**

Parental advice on good dental health

For babies:

Health professionals, such as midwives and health visitors, should support and encourage women to breastfeed. Creating the right environment to promote this is crucial. The [UNICEF Baby Friendly Initiative](#) provides a robust evidence based framework to develop a whole-systems approach to breastfeeding.

The UK government recommends exclusive breastfeeding for around the first 6 months of life. Complementary foods should be introduced into the infant's diet from around 6 months of age alongside continued breastfeeding (or infant formula if the mother chooses).

Not being breastfed is associated with an increased risk of infectious morbidity (for example, gastroenteritis, respiratory infections, middle ear infections) and current evidence suggests that breastfeeding up to 12 months of age is associated with a decreased risk of tooth decay.

PHE recommends that:

- breast milk is the only food or drink babies need for around the first 6 months of their life. First formula milk is the only suitable alternative to breast milk
- bottle-fed babies should be introduced to drinking from a free-flow cup from the age of 6 months and bottle feeding should be discouraged from 12 months old

- only breast or formula milk or cooled, boiled water should be given in bottles
- only milk or water should be drunk between meals and adding sugar to foods or drinks should be avoided

For all children:

Give healthier eating advice routinely to patients to promote good oral and general health. The main message is to reduce the amount of foods and drinks that contain 'free' sugars – a definition set by the Scientific Advisory Committee on Nutrition (SACN).

[SACN's definition](#) of 'free' sugars includes all sugars added to foods and drinks by the manufacturer, cook or consumer, as well as sugars naturally present in honey, all kinds of syrups and unsweetened fruit juices. It does not include sugars naturally present in milk and milk products and sugars contained within the cellular structure of foods (particularly fruit and vegetables).

[Healthy Start](#) vouchers can be used to help families on a low-income buy basic foods such as milk and fresh or frozen fruit.

PHE's [Delivering Better Oral Health: a toolkit for prevention](#) recommends that for all children:

- reduce the quantity and frequency of foods and drinks that contain sugar, only give sweet foods and dried fruit at mealtimes
- squashes sweetened with sugar, fizzy drinks, soft drinks and juice drinks have no place in a child's daily diet
- limit the amount of fruit juice and smoothies your child drinks to a maximum of 150 ml (1 portion) in total per day and drink it with meals to reduce the risk of tooth decay
- always ask for sugar-free medicines

Cut down on sugar consumption

SACN recommends that the average intake of 'free' sugars for all age groups from 2 years upwards should not exceed 5% of total dietary energy intake. However, children are consuming 2 to 3 times that amount and this is having a damaging effect on their health.

Sugars in foods and drinks are the major cause of tooth decay



**Reduce the amount of foods and drinks that contain “free” sugars
Swap sugary drinks for water or plain milk to prevent tooth decay**

Sugar reduction programme

A broad, structured and transparently monitored [sugar reduction programme](#) is being led by PHE to remove sugar from the products children eat most.

Evidence shows that slowly changing the balance of ingredients in everyday products, or making changes to product size, is a successful way of improving diets. This is because the changes are universal and do not rely on individual behaviour change.

All sectors of the food and drinks industry (retailers, manufacturers and the eating out of home sector) will be challenged to reduce overall sugar by 20% by 2020, across the 9 product categories that contribute most to children’s sugar intakes, including a 5% reduction in the first year (by August 2017).

This includes breakfast cereals, yoghurt and fromage frais, biscuits, cakes, confectionery (sweet and chocolate), morning goods (such as croissants, buns and muffins), puddings, ice-cream and sweet spreads and sauces.

Businesses can take action by:

- lowering the amount of sugar in products
- reducing portion size
- shifting consumer purchasing towards lower or no added sugar products

PHE will monitor progress by all sectors of industry towards achieving the 20% reduction by publishing updates every 6 months. This includes detailed reports on progress in March 2018 and March 2020.

Soft drinks industry levy

[Childhood obesity: a plan for action](#) also outlined plans for a soft drinks industry levy payable from April 2018 on those drinks containing added sugar with a total sugar content of 5g per 100ml or more.

A single 330ml can of a soft drink with added sugar (which can contain as much as 35g of sugar), may instantly take a child over their maximum recommended daily intake of sugar.

The aim of the levy is to encourage producers to reduce the amount of sugar in their products and to move consumers towards healthier alternatives. Businesses have been given 2 years from the initial announcement of the levy to implement change – some manufacturers are already taking steps to reduce levels in products.

Any drinks that remain out of scope of the levy will become part of PHE's sugar reduction programme.

Effective interventions for improving dental health

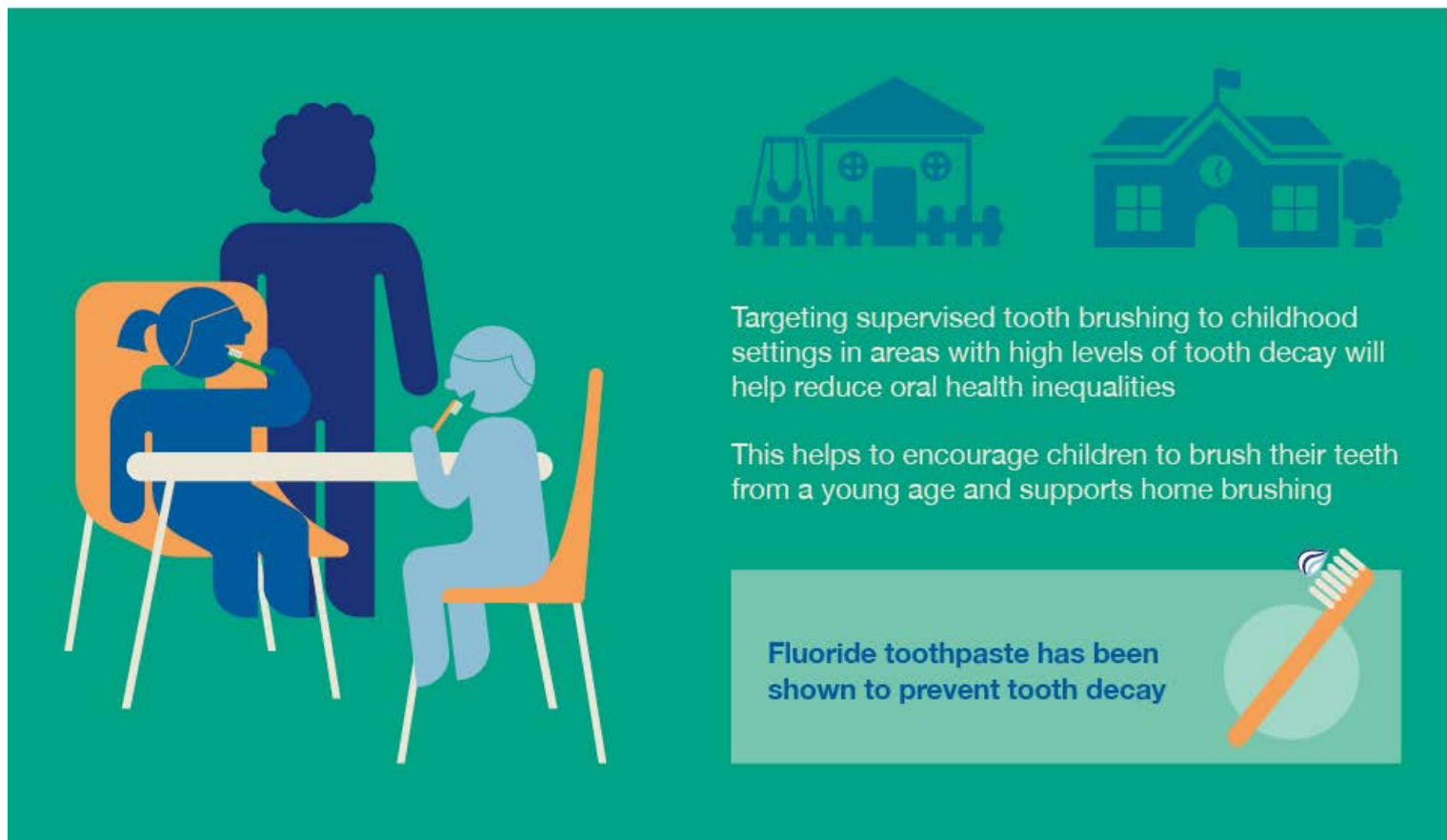
There have been a number of reviews on the clinical effectiveness and cost effectiveness of interventions for improving dental health including the [NICE guidance on oral health](#).

PHE commissioned a [review of the evidence of the cost-effectiveness of interventions to improve the oral health of children aged 0 to 5 years](#) and an ROI tool. They focused on the following programmes that are clinically effective and reduce the levels of tooth decay in 5 year olds.

Targeted supervised tooth brushing

Daily application of fluoride toothpaste to teeth reduces the incidence and severity of tooth decay in children. However, children in more deprived areas are less likely to brush their teeth at least twice daily.

Targeted childhood settings such as nursery and school settings can provide a suitable supportive environment for children to take part in a supervised tooth brushing programme, teaching them to brush their teeth from a young age and encouraging support for home brushing.



The evidence tells us that to maximise prevention of tooth decay, children aged 0 to 6 years should brush their teeth at least twice a day with family fluoride toothpaste (containing 1350 to 1500 parts per million (ppm) fluoride). Children under 3 years old should use a smear and 3 to 6 year olds a pea sized amount. They should spit not rinse after brushing and tooth brushing should be supervised by an adult.

At a population, school or early years' level, the evidence tells us that brushing each day at school over a 2 year period is effective in preventing tooth decay and can establish life long behaviour to promote oral health. It is also important that school based tooth brushing activity should promote and support tooth brushing in the home as well as the school or early years setting.

The [NICE guidance on oral health](#) and PHE recommend that targeted supervised tooth brushing schemes are considered for nurseries and primary schools in areas where children are at high risk of poor oral health. [A study of supervised tooth brushing in early years settings](#) reported that supervised tooth brushing schemes are 'easily deliverable'.

PHE estimates that after 5 years, the ROI for targeted supervised tooth brushing is £3.06 for every £1 spent. After 10 years, this increases to £3.66 for every £1 spent.

After 5 years, targeted supervised tooth brushing can result in an extra 2,666 school days gained per 5,000 children.

[PHE's supervised tooth brushing programme toolkit](#) supports commissioners and providers of such programmes in England, allowing them to gain assurance that they are commissioning and delivering high

quality programmes.

[Case study: Healthy Teeth, Happy Smiles! Leicester City Council](#)

Provision of toothbrushes and paste by post

Targeted and timely provision of free toothbrushes and toothpaste by postal delivery can encourage parents to adopt good oral health practices and start tooth brushing as soon as the first teeth erupt.

Postal delivery is likely to minimise uptake issues, making the impact on inequalities more favourable. Engaging with health visitors can help to ensure support for the programme and consistency of messages.

To increase effectiveness programmes should consider targeting to those with highest levels of disease and the use of 1350 to 1500 ppm fluoride toothpaste.

Other considerations when implementing a programme include deciding on the:

- length of programme
- frequency of postal drops
- age of commencement and provision of oral health advice information

PHE estimates that after 5 years, the ROI for every £1 spent is £1.03. After 10 years, this increases to £1.54.

After 5 years, the provision of toothbrushes by post can result in 1,025 school days gained per 5,000 children.

Targeted provision of toothbrushes and paste by post and by health visitors increases the cost effectiveness of the scheme. After 5 years, the ROI for every £1 spent is £4.89, increasing to £7.34 after 10 years. Combining postal provision of toothbrushes with support from health visitors can result in 2,566 days school days gained per 5,000 children after 5 years.

[Case study: Smile4Life in North West England](#)

Targeted community fluoride varnish programmes

A [rapid review of evidence on the cost-effectiveness of interventions to improve the oral health of children aged 0 to 5 years](#) found strong evidence of effectiveness of targeted community fluoride varnish programmes. The programmes involve the application of fluoride varnish to children's teeth, which is carried out by dental personnel outside dental practices.

They can have a positive impact on reducing health inequalities provided that they are targeted at high-risk populations.

Successful delivery depends on:

- engaging with parents and schools and early years' settings
- ensuring the inclusion of wider oral health improvement messages and supportive environments
- good links with dental practices to ensure that dental practices are informed if their patients have received fluoride varnish
- children having at least twice yearly applications

PHE estimates that after 5 years, the ROI for every £1 spent is £2.29, increasing to £2.74 after 10 years.

After 5 years, targeted community fluoride varnish programmes can result in an extra 3,049 school days gained per 5,000 children.

Water fluoridation programmes

Water fluoridation is the only oral health improvement intervention that does not require behaviour change by individuals.

All water contains small amounts of naturally occurring fluoride. Fluoride in water at the optimal concentration (1 ppm or 1 mg fluoride per litre of water) can help reduce the likelihood of tooth decay and minimise its severity.

Where the naturally occurring fluoride level is too low to provide these benefits, a water fluoridation scheme raises it to 1 ppm.

The first substantive community water fluoridation scheme in England was introduced in Birmingham in 1964. This was quickly followed in the same decade by schemes in a number of other local authorities, some urban, some rural.

Hull, which has one of the highest levels of tooth decay in the country, is the latest area to consider introducing water fluoridation.

Fluoridation schemes in England cover some 6 million people



5-year-olds in fluoridated areas are

28% less likely to have had tooth decay than those in non-fluoridated ones



In fluoridated areas there are

55% fewer hospital admissions of very young children for tooth extractions than in non-fluoridated areas

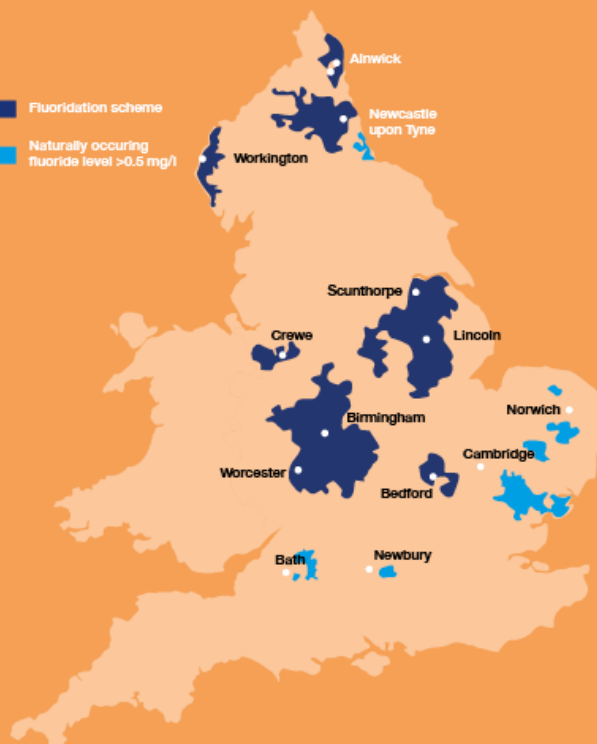


On average, fluoridation schemes in England cost less than 50 pence per person per year (operating costs)



Water fluoridation has operated effectively for 50 years in England and 70 years worldwide

Fluoridation scheme
Naturally occurring fluoride level >0.5 mg/l



Water fluoridation provides a universal programme. After 5 years, the ROI for every £1 spent is £12.71. After 10 years, this increases £21.98 for every £1 invested.

A total of 1,611 school days are gained per 10,000 children after 5 years.

The return of responsibility for water fluoridation to local authorities offers them the opportunity to take decisive action to improve oral health. An authority considering fluoridation will be met with claims that it does not work and that it causes harm. Both statements are untrue. [PHE's Water fluoridation: health monitoring report for England 2014](#) concluded that fluoridation is an effective community-wide public health intervention.

PHE's [Improving oral health: a community water fluoridation toolkit](#) for local authorities has more advice on how to introduce water fluoridation programmes.

Call to action

Achieving good dental health for all children needs the support and commitment of a wide range of partners. The most effective way to improve dental health is to embed it in all children's services at strategic and operational levels.

Commissioners

Dental commissioners

Dental commissioners are testing innovative commissioning to improve child oral health in 13 priority areas in England. Learning from this should inform wider commissioning.

Support commissioning of the Dental Check by One (DCby1) national initiative which aims to improve attendance of children under 2 years from the current level.

All children over 3 and all children at risk of tooth decay should have twice yearly applications of fluoride varnish. This is monitored in the dental assurance framework by NHS England, the current commissioner of NHS dental services, and dental practices should be supported to achieve year on year improvements in levels of provision.

Local authority commissioners

Local authority commissioners of children's services should seek to integrate oral health within 0 to 19 commissioning and the Healthy Child Programme.

Local authorities should also consider commissioning oral health improvement programmes, using the evidence of what works and with regard to the return of investment of the programmes.

Local authorities in areas with high levels of tooth decay may want to consider water fluoridation.

Healthcare practitioners

All healthcare practitioners should consider how they can influence behaviour to improve the oral health of children as part of making every contact count (MECC).

Dental teams

All members of the dental team should have access to training based on [Delivering Better Oral Health](#) and the new [Delivering Better Oral Health - quick guide to a healthy mouth in children factsheet](#).

All members of the dental team, including dental nurses, can offer oral health advice and those nurses that are appropriately trained and competent can apply fluoride varnish as well as providing oral health advice. To support healthier diets, dental teams can signpost parents to PHE's [Be food smart app](#) to identify hidden sugar and support reduced sugar consumption.

Dental teams should encourage dental attendance when the first tooth erupts at about 6 months of age, to give preventive messages.

Midwives

Midwives should have knowledge, developed as part of their training and through continuing professional development, of key oral health messages from the [Delivering Better Oral Health - quick guide to a healthy mouth in children factsheet](#) and [Improving oral health for children and young people for health visitors, school nurses and practice nurses infographic](#).

Advise all mothers to attend the dentist and that dental care is free whilst pregnant and until the child is 1 year old.

Encourage parents to take their baby to the dentist before the first tooth erupts, at about 6 months of age. The dental team can also offer advice on how to look after the baby's mouth from birth.

Health visitors

Health visitors have an important role in providing advice and support as part of the healthy child programme. This includes:

- universal interventions within the first year, providing oral health advice and support and signposting to dental services
- identifying families that need additional support, for example the siblings of children who have attended hospital for dental extractions due to tooth decay
- encouraging dental attendance when the first tooth erupts at about 6 months of age, to enable the dental teams to give preventive messages

Resources are available to support this including:

- Dental section in the red book (Personal Child Health Record)
- training on oral health in Healthy Child Programme Health Education England e-Learning for Health resource
- [Improving oral health for children and young people for health visitors, school nurses and practice nurses infographic](#) with 10 top tips for teeth
- [Delivering Better Oral Health - quick guide to a healthy mouth in children factsheet](#)
- Institute of Health Visiting (iHV) [Good Practice Points for Health Visitors Oral Health for Babies and Children](#) and iHV [Parent Tips: Looking after your children's teeth](#)

School Nurses

Have a role in advising on children's oral health, which can impact on school readiness.

General resources are available to support this including the resources mentioned above for health visitors.

Paediatricians, GPs, children's nurses and general practice nurses

Provide oral health messages for parents of 0 to 5s and advocate for child oral health.

Resources are available to support this, including:

- [Improving oral health for children and young people for health visitors, school nurses and practice nurses infographic](#) with 10 top tips for teeth
- [Delivering Better Oral Health - quick guide to a healthy mouth in children factsheet](#)
- signposting to local dental services
- encouraging dental attendance when the first tooth erupts at about 6 months of age, to enable the dental teams to give preventive messages

Pharmacists

Offer oral health advice for parents of young children based on the [Delivering Better Oral Health - quick guide to a healthy mouth in children factsheet](#) and signpost to dental services.

Healthy settings

Early years settings can provide essential support for oral health by:

- having healthy eating policies in place
- providing oral health training for managers and the workforce available through the e-Learning for Health and based on the [Delivering Better Oral Health - quick guide to a healthy mouth in children factsheet](#)
- providing daily supervised tooth brushing

Voluntary Sector

Can support oral health improvement through:

- providing parenting support programmes with oral health content to support the healthy child programme delivery
- providing continuing professional development in oral health for the early years workforce

Specialist societies

Ensure all children receive high quality care by:

- public engagement (including the production of patient information leaflets)
- developing or disseminating best evidence, guidelines and clinical protocols to the public and to healthcare professionals
- developing and leading oral health promoting initiatives
- advocating for child oral health

Royal Colleges

The royal colleges can support oral health through:

- providing pre and post-graduate education and professional development for dental and child health professionals including resources
- providing guidelines and policy statements to inform professionals and the public
- advocating for child oral health

Consultants in Dental Public Health

Public Health England centre-based consultants in dental public health have an important role supporting dental health improvement across the public health and the healthcare system.

They work closely with local authority public health teams, NHS England, local professional networks, Health Education England and other partners to support the delivery of dental health improvement across

the life course, giving every child the best start in life.

Resources

Download [infographics](#).

Read [Health matters blog](#).

Watch [Health matters videos](#).

Read [case study: Healthy Teeth, Happy Smiles! Leicester City Council](#).

Read [case study: Smile4Life in North West England](#).

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