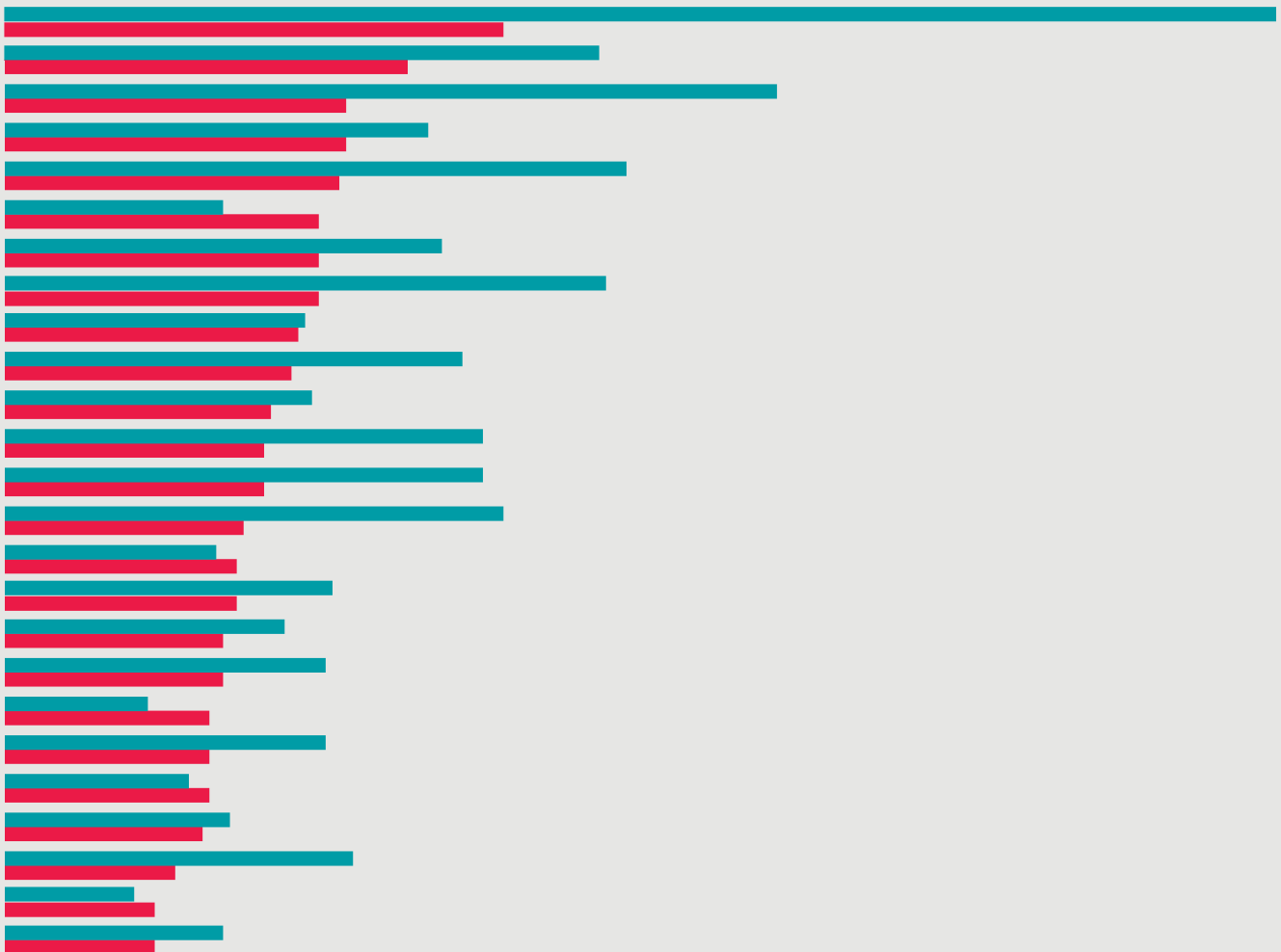


Root causes

Quality and inequality in dental health

Briefing



John Appleby, Robert Reed
and Leonora Merry

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About QualityWatch

QualityWatch is a major research programme providing independent scrutiny into how the quality of health and social care is changing. Developed in partnership by the Nuffield Trust and The Health Foundation, the programme provides in-depth analysis of key topics and tracks an extensive range of quality indicators. It aims to provide an independent picture of the quality of care, and is designed to help those working in health and social care to identify priority areas for improvement. The programme is primarily focused on the NHS and social care in England, but also draws on evidence from other UK and international health systems.

 The QualityWatch website www.qualitywatch.org.uk presents key indicators by area of quality and sector of care, together with analysis of the data. This free online resource also provides research reports, interactive charts and expert commentary.

About this report

QualityWatch briefings use publicly available data to provide a snapshot view of quality in specific areas of health and social care. This briefing uses a variety of routine data to provide evidence that NHS dental care has been improving steadily in recent times, but that regional and socioeconomic variations in quality remain that need to be addressed.

Acknowledgements

We thank colleagues at the British Dental Association for their helpful comments on an earlier draft. Within the Nuffield Trust we are grateful for the time and expertise provided by Dan Watson, Rowan Dennison and Josh Kraindler.

Key points

- Dental health has been steadily improving and outcomes are generally positive. The proportion of adults with no natural teeth has reached an all-time low, while the proportion of those with 21 teeth or more has been steadily rising. Likewise, the proportion of young children with tooth decay is on the decline and the dental health of older children is improving.
- The overall picture regarding access to dental care is also positive: although the percentage of parents who report experiencing difficulty finding a dentist for their child has increased marginally (from 9% in 2003 to 12% in 2013), most parents nevertheless now report that they do not have difficulty in finding a dentist.
- However, closer examination of these trends reveals concerning levels of variation between different parts of the country and socioeconomic groups. On the whole, dental health is better in the south and east of England, and poorer in the north of England: for example, children in Blackburn are four times more likely to have missing, decayed or filled teeth than children in South Gloucestershire.
- These regional variations are likely to be partly explained by a larger issue regarding levels of deprivation and the impact that this has on people's dental health. Despite recent improvements, more deprived groups have poorer dental health and are more likely to be hospitalised for dental health problems. At the last count for 2014/15, 83% of five-year-olds in the least deprived areas of the country had healthy teeth, compared with 70% in the most deprived areas – a gap of 13 percentage points.
- There is also evidence of a socioeconomic divide in terms of access: the percentage of parents that had difficulty merely finding an NHS dentist was substantially higher among those with children eligible for free school meals (18%) than those whose children were ineligible (11%).
- More needs to be done to ensure that the focus on prevention in dental health is joined up with wider efforts to prevent ill health: the Five Year Forward View foregrounded prevention, but dentistry is not a feature of the new models of care being trialled across the country. This seems to be a missed opportunity to tackle poor dental health while taking on other problems such as obesity and diabetes.
- One effective way of embedding prevention would be through the new dental contract, but the timescale for its rollout is unclear. Given the clear and present problems in poor dental health for certain groups, ensuring a speedy and effective rollout of a contract that genuinely focuses on prevention of poor dental health is vital.
- A more holistic approach to dental health, which both recognises its links to wider determinants of health and improves access for the most deprived, is needed. For example, more flexibility in how dental services are provided may be needed to alleviate the problems experienced by people at the lower end of the income scale when accessing dentists.

Introduction

The opening of the NHS's doors in 1948 suddenly exposed the concerning level of dental health need going unmet in the British population. In the first nine months of the NHS alone, dentists provided more than 33 million artificial teeth, 4.5 million extracts and 4.5 million fillings (Ross, 1952). The introduction of free NHS dental care has therefore perhaps contributed more to improving the nation's dental health, and access to dental care, than any other event since.

While it was initially free to patients, within three years the NHS had introduced charges to cover part of the cost of dental care. The next half-century saw major advances in dental practice and oral hygiene, as well as the contractual relationship with the NHS (see Box 1). A combination of better dental care, easier access to dentists, and improvements in the population's lifestyle and diet led to a vast improvement in dental health.

Today, there are over one million dental patient contacts each week, with around 24,000 dentists in England providing NHS treatment. Overall, the NHS in England spends around £2.1 billion per year on community-based dental services. Allowing for inflation, this level of spending is 15% lower than in 2010/11, and little different to the levels of 2006/7.

Patient charges – which go to the NHS as income and not to dentists – have increased substantially since they were introduced. The current three bands range in cost from £20.60 for examinations and X-rays, to £56.30 for fillings and root canals and £244.30 for crowns and dentures. As with prescription charges, various groups are exempt from charges. Overall, in 2015/16, patient charges raised around £744 million. They have accounted for an increasing proportion of the total spend on dentistry – from 19% in 2005/6 to 27% in 2015/16.

While dental disease has declined hugely overall, there remains a not-insignificant burden of dental problems and important variations in access across the country and between different population groups. The national 2013 Children's Dental Health Survey, for example, identified around one in seven children as having either severe or extensive tooth decay, or both (Health and Social Care Information Centre, 2015a). The 2009 Adult Dental Health Survey revealed that a fifth of those surveyed across England, Wales and Northern Ireland said that the treatment they chose to receive from the dentist had been influenced by cost. For those with very poor dental health, this figure reached 50% (Health and Social Care Information Centre, 2011).

So the story of NHS dental services may be one of relative success, but there remain problems, which are explored in this briefing. We draw on a variety of routine data to describe the evolution of the service and, in particular, to show how quality has changed over time. The data used include public and patient surveys, as well as regularly published data on dentists' activities and patient access. This mainly relates to England, but in some specific cases is applied to the UK as a whole or other UK countries (see Table 1 on page 7 for further details).

Box 1: Dentistry and the NHS

When the NHS opened its doors in 1948, the huge and previously unmet demand for dental care soon became apparent. Since then, dentistry has been an essential part of the health service, providing the UK population with care through practitioners working as independent contractors and operating from local surgeries.

Up until the 1990s, dentists choosing to contract with the NHS to provide treatment and care to NHS patients were reimbursed on a 'fee per item of service' model. Following concern that this payment method risked incentivising volumes of (potentially unnecessary) treatment, a new contract was introduced. This included payment based on the numbers of patients registered with dentists.

However, it has not been easy to strike the right balance between appropriate rewards for dentists and incentives to carry out NHS work as opposed to private work, ensuring appropriate treatment (including preventative interventions) and improving the quality of care. At the turn of the century, for example, 'Modernising NHS Dentistry' (Department of Health, 2000) argued that access, quality and the information dentists gave to patients regarding costs remained pressing issues. In many parts of the country, even finding a practice willing to take on new NHS patients had become a growing problem.

'NHS Dentistry: Options for Change' (Department of Health, 2002) provided further analysis of the problems faced by NHS dentistry. These included: continuing poor patient access to NHS dental care in parts of England; the dental contract with the NHS incentivising invasive work and disincentivising preventative work; and an array of confusing patient charges, with over 400 different payments for different treatments.

This led, in part, to a new contract being introduced in 2006, comprising three key changes. First, responsibility for planning and securing NHS dental services was devolved to the then local commissioning organisations, primary care trusts – since 2013 this responsibility has changed to NHS England and operates through local clinical commissioning groups (NHS England, 2016). Second, dentists were to be paid an annual sum for delivering an agreed number of treatments, weighted by complexity. And third, the number of patient charges was reduced from 400 to three.

Why is NHS dental care and quality important?

Oral health and wellbeing

Oral health has a great influence upon an individual's general health and wellbeing. The World Health Organization (WHO) emphasises the importance of good oral health, stating that 'the psychosocial impact of [oral] diseases often significantly diminishes quality of life' (WHO, 2017).

It is also important to remember that around 90% of dental problems are preventable with moderate consumption of sugar, sufficient exposure to fluoride, regular brushing, and routine visits to the dentist (Royal College of Surgeons of England, 2014). Yet, despite the fact that they are largely preventable, and notwithstanding significant improvements in the general population's oral health, many people still experience dental problems.

Measuring the quality of dental care is difficult as care quality is such a complex concept, and one that is somewhat underdeveloped in dentistry (Raleigh and Foot, 2010; Heath and others, 2009). However, there are many routine datasets which, when combined, can provide some insight into outcomes, behaviours, use and satisfaction.

Outcomes and inequalities

Despite significant improvements in many measures of dental health in recent decades, the presence of persistent inequalities is still a cause for concern (Acheson, 1998; Department of Health, 2005). For example, a recent addition to Public Health England's Public Health Outcomes Framework reveals stark variations in the proportion of children with tooth decay by geographical area. A Public Health England survey (2016) points to exposure of teeth to sugars through sugary snacks and drinks as a key cause for these variations (Scientific Advisory Committee on Nutrition, 2015). As well as being preventable and distressing, poor dental health among children is costly: £30 million was spent on hospital-based tooth extractions for children in 2012/13 (British Dental Association, 2015a).

The British Dental Association (2012) and WHO (2003) have also highlighted the importance of oral health for older people. WHO noted that 'the interrelationship between oral health and general health is particularly pronounced among older people. Poor oral health can increase the risks to general health and, with compromised chewing and eating abilities, affect nutritional intake.'

Maintaining good oral health can be difficult for elderly people. Moreover, the increasing numbers of older people with more teeth needing restoration has meant increasingly complex work for dentists. People living in residential care face additional challenges: oral health tends to be worse among elderly people residing in care homes. They also face particular difficulties accessing dental treatment and education regarding oral hygiene (Age UK, 2008).

Despite the positive impact of dental services and the general improvement in oral health in the population – driven in part by improvements in living standards, lifestyles and access to free or subsidised NHS dentistry – there remain questions about the quality of the dental service, particularly access to NHS dentists and the negative impact of patient charges on the use of dental services (Appleby, 2016).

Our approach

Data sources

To investigate these and other issues concerning the quality of NHS dental services, we draw on a wide range of published data relating to dental health outcomes, activity, education, and patient experience and satisfaction. This includes the decennial Adult Dental Health Survey (ADHS) and Children's Dental Health Survey (CDHS), the dental results from the GP Patient Survey, the oral health surveys by Public Health England, and NHS Digital's dental statistics. The data mainly relate to England, though some sources (for example the ADHS and the CDHS) include other territories of the UK depending on the survey date. It should also be noted that these two surveys also cover patients' experiences of private dentistry. Table 1 details these data sources. It should also be noted that some data – for example, people's reported ease of access to a dental appointment – will not necessarily relate solely to treatment that is eventually covered by the NHS. Indeed, some patients may have both publicly and privately paid treatments within the same course of treatment.

Table 1: Data sources for dental health outcomes, quality and activity

Name	Source/Type of data	Time period
Adult Dental Health Survey	NHS Digital: Oral health, preventative behaviour, activity, outcome, barriers to access	1968, 1978, 1988, 1998, 2009 (sample size in 2009 - 13,400)
Children's Dental Health Survey	NHS Digital: Oral health, attitudes and behaviours, impact of dental disease on quality of life	2013 (children at ages 5, 8, 12 and 15; sample size ~10,000)
British Social Attitudes Survey	National Centre for Social Research: Satisfaction with NHS dentistry	1983–2016
GP Patient Survey	NHS England: Access to dental appointments	2012–2016 (different method prior to 2012)
NHS dental statistics	NHS Digital: Dentists' activity, payments	2015/16 and 2016/17
NHS admitted patient care statistics and A&E hospital episode statistics	NHS Digital: A&E attendances, hospital admissions	2014/15 and 2015/16
Dental public health epidemiology programme	Public Health England: Surveys of oral health in children	2011–2013
NHS Outcomes Framework	NHS Digital: Oral health in children	2007 onwards
See references at end of report for further details		

Analysis

These datasets were used to provide an overview of current measures of dental health activity, patient attitudes, behaviours and health outcomes. Trends, snapshots and comparisons based on geography and population groups provide a picture of changes and variations across different dimensions of quality. In the next section we examine trends and variations in both oral health and dental activity – drawing on published data covering either the whole of the UK or England, or a combination of the four countries of the UK. We go on to look at education and risk factors in oral health, detail trends and variations in utilisation and access, then report on measures of public and patient satisfaction with dental services, before drawing out some conclusions based on these areas.

It should be noted that, owing to NHS organisational changes, geographical areas and regional names have changed over time to reflect new structures and managerial units. These are reflected in the way official statistics are reported. Where regional names are less intuitive, these are described in more detail.

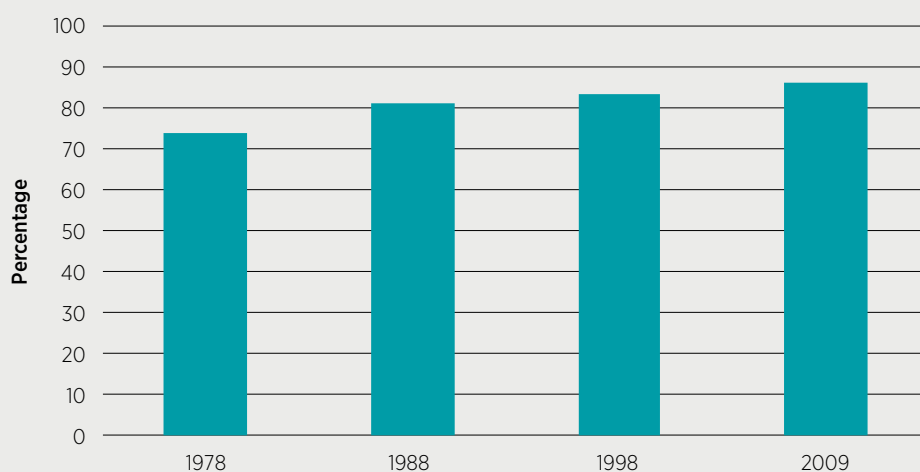
Findings

Dental health: trends and variations

Dental outcomes are improving over time, but inequalities persist

The ADHS and CDHS offer a range of measures that tell us about oral health and how it has changed over time. Key measures – such as proportion of adults and children with natural teeth, untreated teeth and overall oral health – have shown consistent improvement over time. Data from the ADHS show, for example, that the proportion of adults with 21 or more natural teeth has risen with each survey (see Figure 1). Similarly, the proportion of adults in England who had no natural teeth (edentate) has fallen by 22 percentage points, from 28% in 1978 to just 6% in 2009. And the proportion of adults in England, Wales and Northern Ireland with either good or very good oral health stood at 71% in 2009.

Figure 1: Percentage of adults with 21 or more teeth, England, 1978–2009



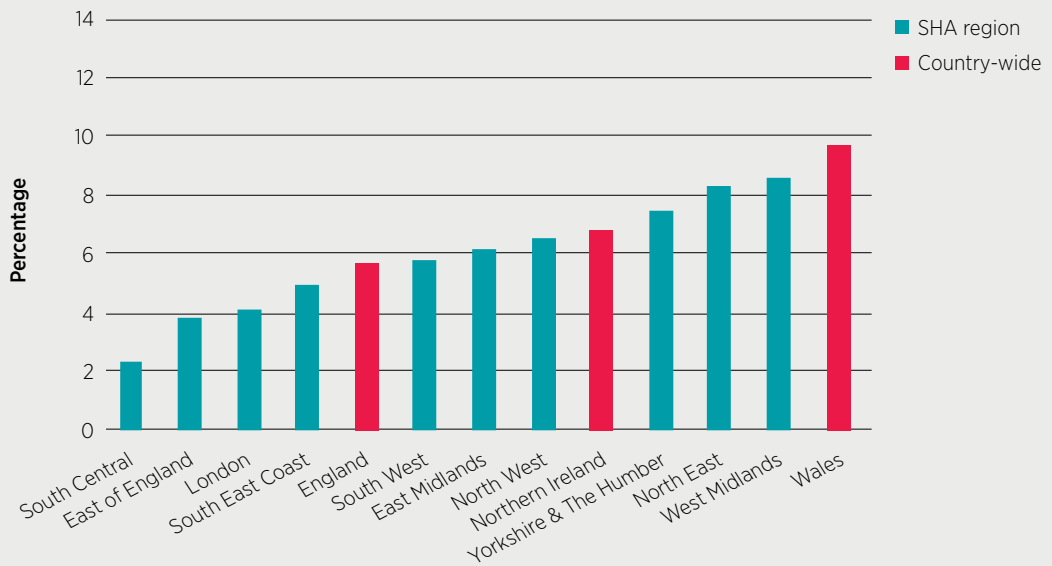
Source: ADHS 1978, 1988, 1998, 2009 (NHS Digital, no date).

Despite these improvements in oral health, there remain clear regional variations. For example, the proportion of people with no natural teeth was around 2% in South Central (the former English Strategic Health Authority (SHA) covering Hampshire and the Isle of Wight, Berkshire, Oxfordshire and Buckinghamshire), but 9% in the West Midlands SHA. Comparing across countries, in 2009 the proportion of people with no natural teeth was 6% in England, while in Wales it was 10% (see Figure 2).

Table 2 shows the extent of variation across regions of the UK in terms of general oral health, the proportion of people with carious teeth (tooth decay) and those experiencing any wear of their teeth. There is a noticeable pattern of better oral health in England compared with Northern Ireland and Wales. Within England, oral health is better in southern and eastern areas.

Variations also exist across occupational groups. For example, managerial professionals have the lowest levels of missing teeth (2%), while those in routine and manual occupations have the highest levels (10%). People working in managerial and professional occupations are also more likely to have excellent oral health than people in either intermediate or routine and manual occupations.

Figure 2: Regional variations in the percentage of people with no natural teeth, 2009



Source: ADHS 2009 (NHS Digital, no date). Chart shows actual percentages, whereas related text uses rounding.

Table 2: Regional variations in oral health, 2009

Region	Excellent oral health (%)	Region	Any carious teeth (%)	Region	Any wear (%)
East of England	20	South East Coast	21	South East Coast	66
South East Coast	17	East of England	23	East of England	70
London	11	London	28	North East	70
England	10	Northern Ireland	28	North West	73
North East	10	South Central	29	East Midlands	74
Yorkshire & The Humber	8	England	30	Yorkshire & The Humber	75
South Central	7	Yorkshire & The Humber	30	England	77
North West	7	North West	30	London	77
Wales	7	East Midlands	32	South West	82
Northern Ireland	7	North East	34	South Central	82
East Midlands	7	South West	36	Wales	87
South West	6	West Midlands	39	Northern Ireland	88
West Midlands	4	Wales	47	West Midlands	93

Source: ADHS 2009 (NHS Digital, no date)

Better outcomes

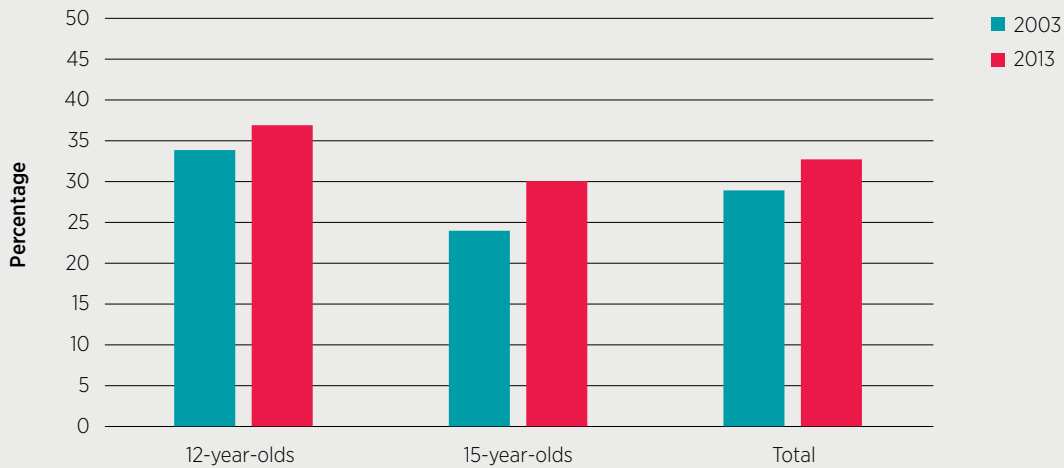


Worse outcomes

In recent years there has been a noticeable improvement in the overall oral health of children. For example, between 2008 and 2015, the proportion of five-year-olds with experience of tooth decay fell by a fifth (Public Health England, 2016). Public Health England noted that this improvement had followed several decades of stability following the marked improvements related to the introduction of fluoridated toothpaste in the 1970s (Anderson and others, 1982). They also noted that similar trends between 1980 and 2015 have been evident in Scotland and Wales.

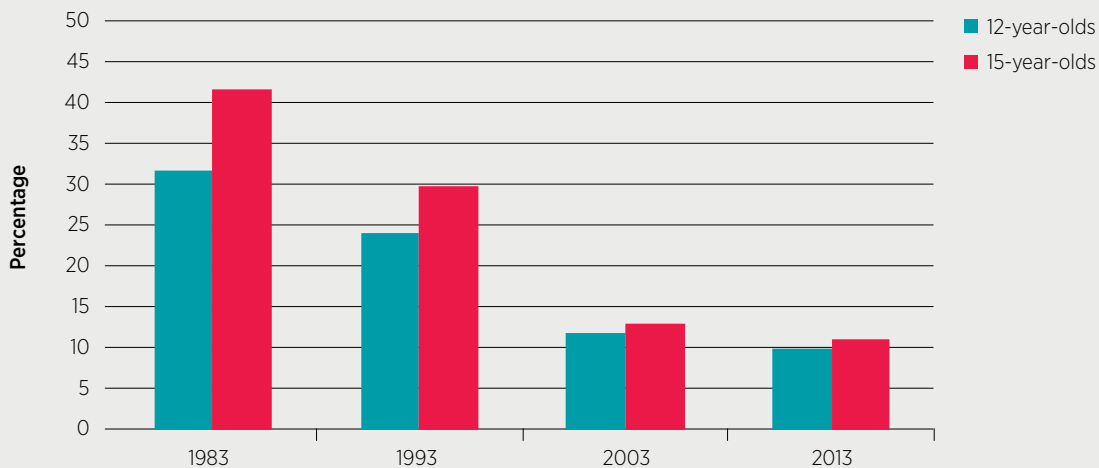
According to the latest CDHS, oral health among children improved in the decade between 2003 and 2013: for example, the proportion of 12- and 15-year-olds with good overall oral health rose by four percentage points, from 29% to 33% (Figure 3). In line with the outcomes shown in Figure 3, Figure 4 shows that the percentage of children with decay into dentine declined between 1983 and 2013.

Figure 3: Percentage of 12- and 15-year-old children with good overall oral health by age, 2003 and 2013



Source: CDHS 2003 and 2013 (Health and Social Care Information Centre, 2015a, b, c). NB: Five- and eight-year-olds are not asked this question in the CDHS.

Figure 4: Percentage of UK children with any decay in permanent teeth, 1983–2013

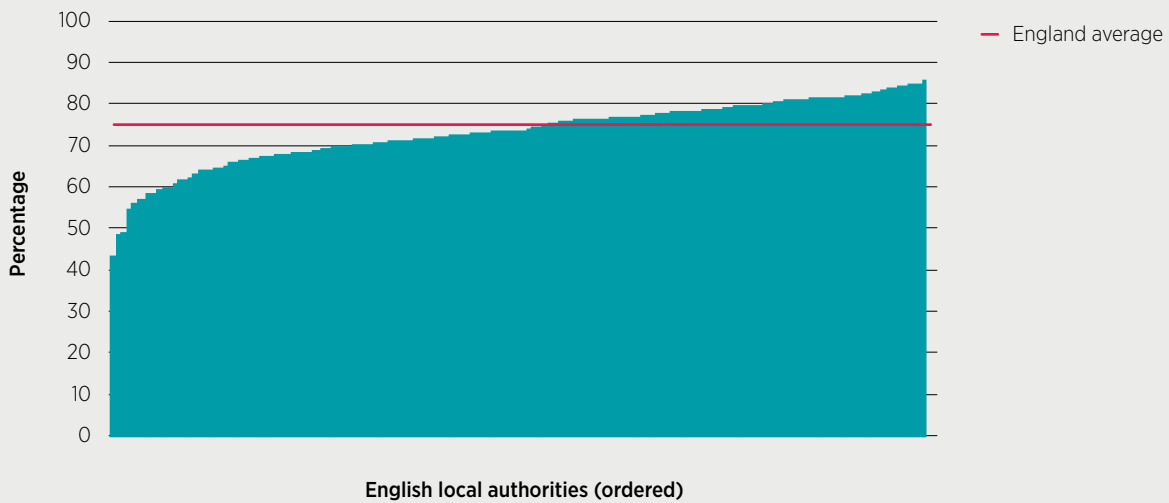


Source: CDHS 1983, 1993, 2003, 2013 (Health and Social Care Information Centre, 2015c)

Yet persistent variations remain. For example, the proportion of five-year-olds with missing, decayed or filled teeth ranges from 14% to around 57% across English local authorities (see Figure 5), and tooth extractions on children aged four and under have risen by a quarter over the last decade (Saddique, 2017).

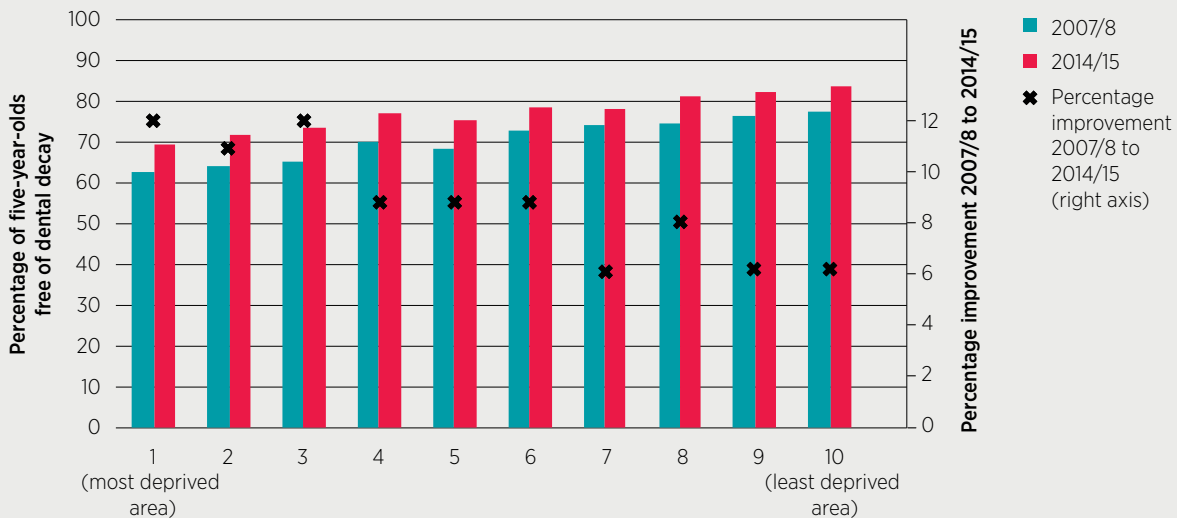
As Figure 6 shows, there are also variations between areas of England, with different levels of deprivation for the proportion of five-year-olds with no dental decay: in the least deprived areas, 83% had healthy teeth compared with 70% in the most deprived areas in 2014/15 – a gap of 13 percentage points. Encouragingly, this actually represents a reduction in variation since 2007/8, when the gap was 16 percentage points.

Figure 5: Variation in the percentage of five-year-olds free of dental decay, by English local authority (upper-tier local authorities), 2014/15



Source: Public Health England (2016)

Figure 6: Proportion of five-year-olds with no dental decay by areas of England classified by deprivation 2007/8 and 2014/15



Source: Public Health Outcomes Framework indicators. NB Organised using 2015 Index of Multiple Deprivation

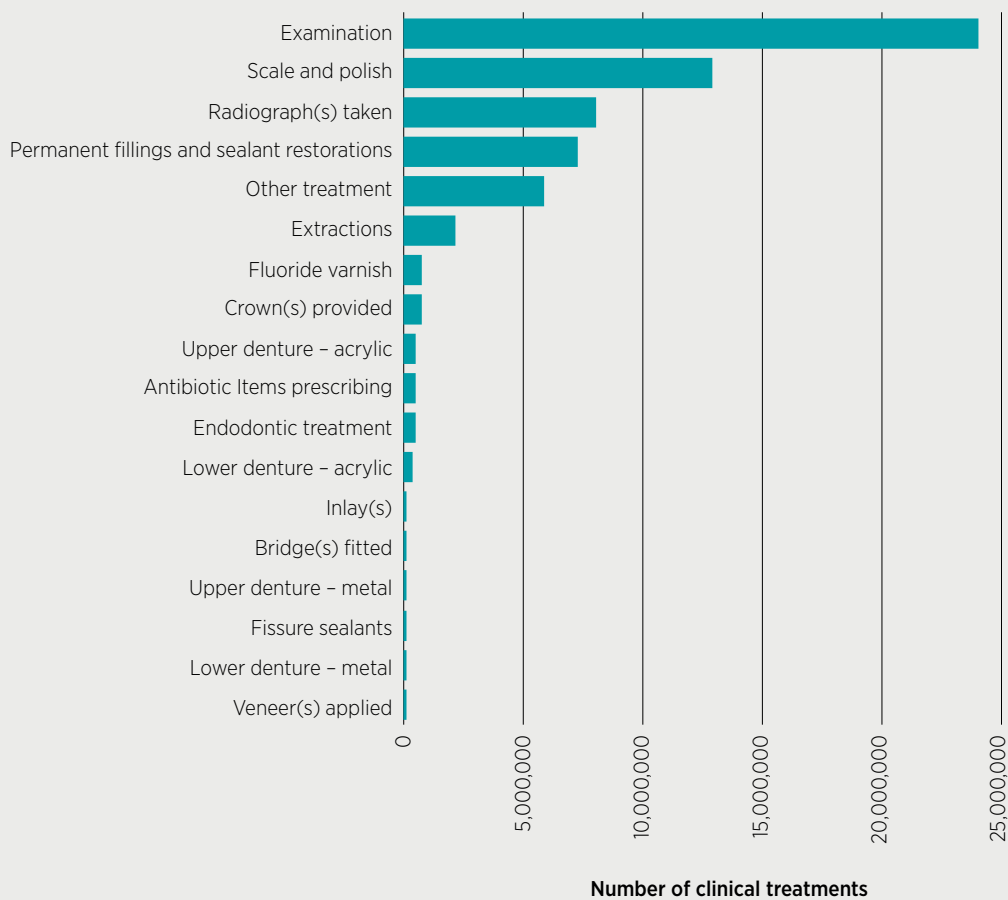
On another measure of deprivation – children eligible for free school meals, which is a proxy for low-income households – those eligible have worse overall dental health and reported poorer attendance for dental check-ups than ineligible children (Health and Social Care Information Centre, 2015c). For example, 29% of children eligible for free school meals have good overall oral health compared with 40% who are not eligible. Furthermore, children eligible for free school meals are more likely than ineligible children to have their everyday life negatively affected by their oral health.

Overall, for both adults and children, dental health has improved over time. But as we have noted, there remains clear evidence of geographic and socioeconomic variations in dental health.

Dental care activity: trends and variations

Over time, changes in the population’s dental health, alongside new dental technologies and approaches to dental health (as well as changes in the contract dentists hold with the NHS), have been reflected in the work and activities carried out by dentists – both in the community and in hospitals. Of around 65 million separate dental clinical treatments carried out in England in 2015/16, the majority involved examinations and cleaning (scale and polishing), while around 3% involved tooth extractions (see Figure 7).

Figure 7: Number and type of clinical treatments carried out in England, 2015/16



Source: NHS dental statistics for England, 2015/16 (NHS Digital, 2016)

Ready access to dental services has an important influence on a child’s dental health. Encouragingly, according to responses from parents in the 2013 CDHS, nine out of 10 children of all ages had visited a dentist in the past year, and over 80% of 12- and 15-year-olds reported attending the dentist for a check-up. Nevertheless, this still means that about one in five children did not attend a check-up at all in 2013. More recent data suggest that access problems for children may be even greater: recent statistics from NHS Digital show that 58.2% of the child population (around 6.8 million children) were seen by an NHS dentist in the 12 months up to 30 June 2017 (NHS Digital, 2017a). While these data do not include information on those that saw a private dentist, it suggests that a proportion of children are unlikely to have seen a dentist at all in the past year.

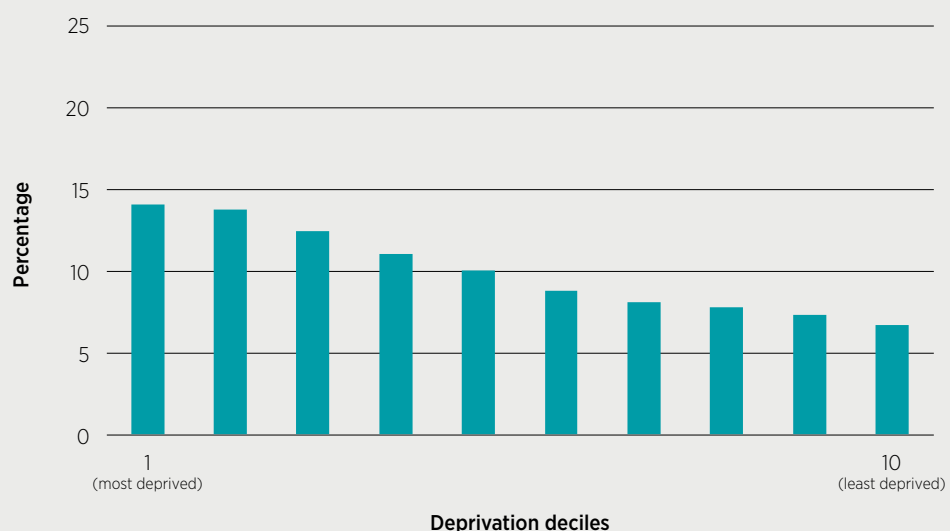
The CDHS also reveals noticeable variations in the proportion of children visiting dentists for check-ups in terms of their eligibility for free school meals: eligible five-year-olds are less likely (81%) to attend a dental check-up compared with children that are ineligible (91%).

While most dental activity is carried out in the community, hospitals also provide dental services, either for emergency or planned admissions for treatment. Numbers of attendances at an accident and emergency (A&E) department due to the need for dental treatment are relatively small. In 2014/15, this type of A&E attendance represented 0.08% of all attendances – around 14,000. There was also little change in the percentage of total A&E attendance for dental treatment over time, between 2010/11 and 2014/15.

The proportion of hospital admissions for dental treatment is also relatively small (around 1.5% of total admissions) – although this does represent around 235,000 patients (of all ages) – with around 47% of these having a primary diagnosis of dental caries (tooth decay) and around 90% of all operations involving tooth extraction.

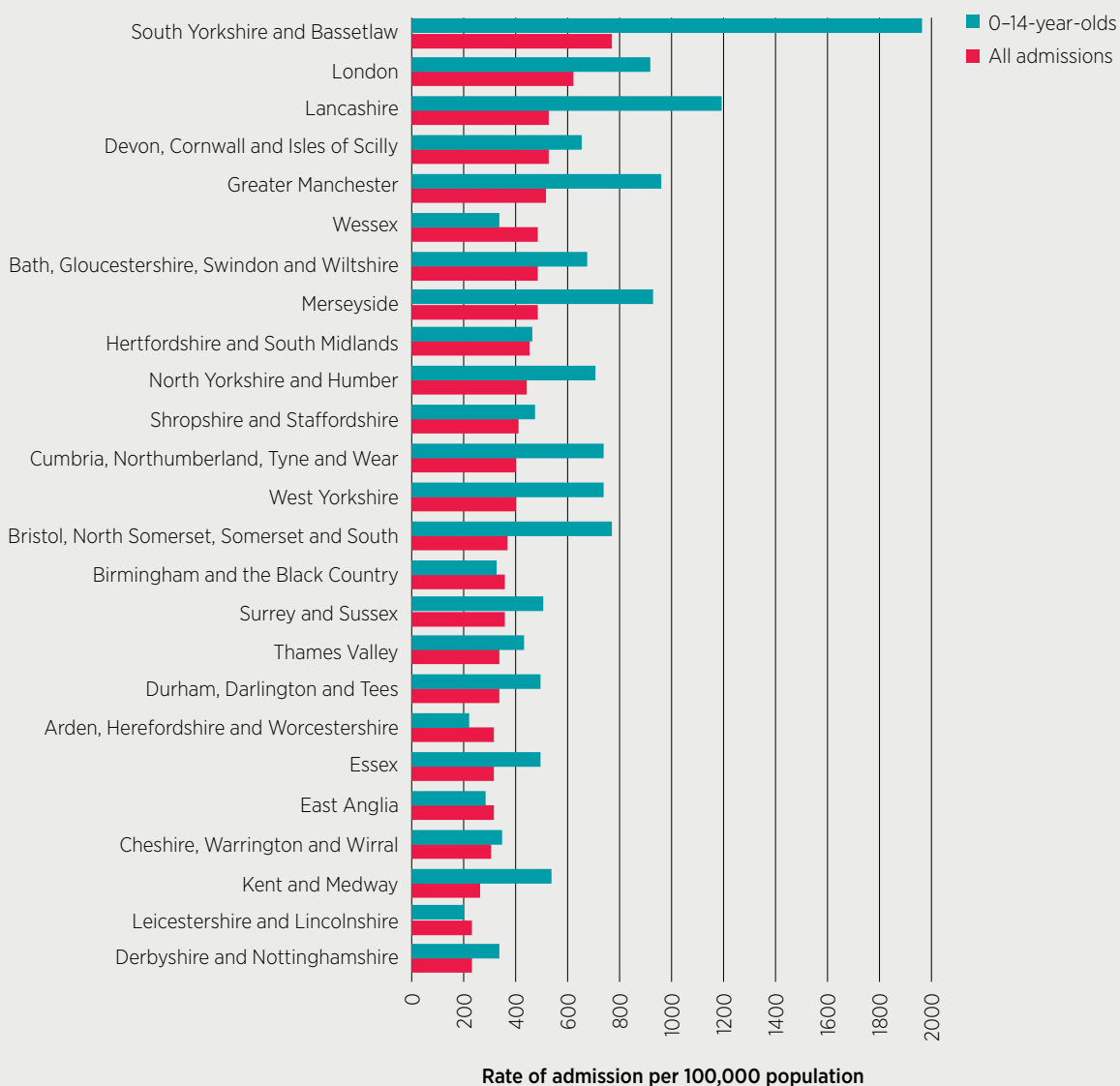
Hospital admissions also show wide disparities across deprivation groups. The most deprived areas of England have twice the proportion of dentistry admissions of the least deprived (see Figure 8).

Figure 8: Percentage of dentistry admissions within each deprivation decile (all ages), 2014/15



Source: A&E attendances, hospital admissions April 2014 to March 2015 (NHS Digital, no date, b)

Figure 9: Rates of admission to hospital with a primary diagnosis for dentistry: 2014/15



Source: A&E attendances, hospital admissions April 2014 to March 2015 (NHS Digital, no date, b)

Geographically, too, admissions with a primary diagnosis for dentistry show wide disparities, with South Yorkshire and Bassetlaw having more than three times the rate of admission as that of Derbyshire and Nottinghamshire (see Figure 9). For children aged up to 14, the variation is even larger – nearly ten-fold across England. Such differences are not only reflective of differences in need, but also of access and supply, as well as variations in healthcare-seeking behaviour across the population.

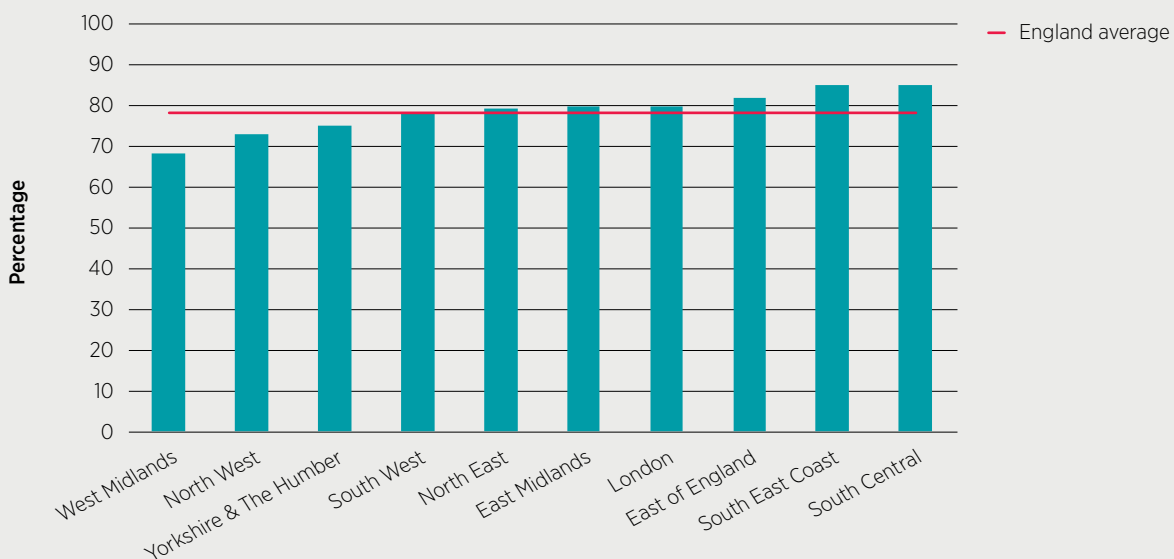
Wide regional and socioeconomic group disparities are also revealed by looking at the NHS Outcomes Framework indicator tracking rates of inpatient care for tooth extractions due to decay in children in England aged 10 and under. For example, while rates of admission across England for tooth extraction fell between 2014 and 2015, in Yorkshire, hospitalisation for tooth extraction was five times higher (845 per 100,000 population) than in the East of England (160 per 100,000) (NHS Digital, 2017b). A similar gap also exists between the most and least deprived areas of England.

It should be noted that people with dental problems do not always use dentists or hospitals: some also visit their GP for diagnosis, referral or treatment. It is estimated that around 600,000 people a year have consultations with GPs related to dental problems (British Dental Association, 2017). It has been suggested that this may be an indicator of people having difficulties accessing a dentist (Cope and others, 2016).

Raising awareness of risk factors/behaviours

Raising awareness of risky behaviours is an essential part of dental public health and improving outcomes. The proportion of people offered brushing advice appears to be higher in southern and eastern regions of the UK. Levels of advice in the former South Central SHA area are above the England average (85%), compared with below-average levels in the West Midlands (68%) (see Figure 10).

Figure 10: Proportion of patients surveyed who were offered advice on brushing by their dentist or practice staff, broken down by English Strategic Health Authority, 2009



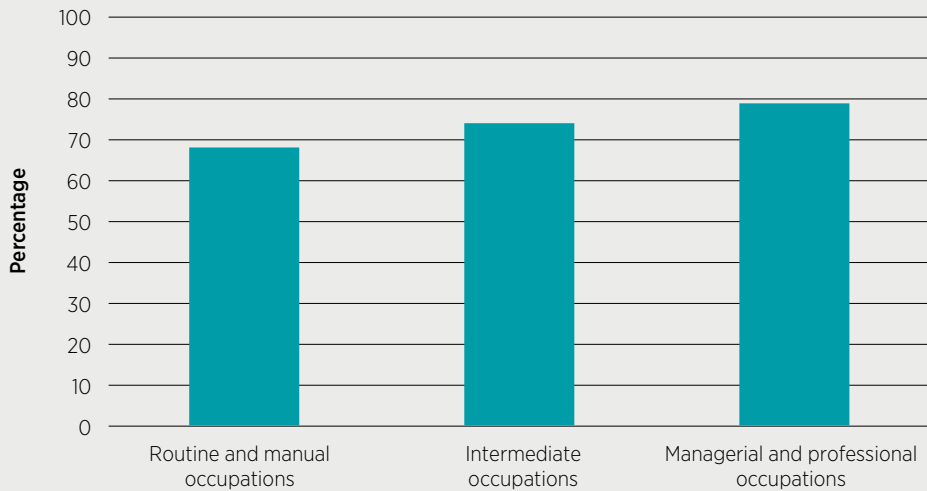
Source: ADHS 2009 (NHS Digital, no date)

Not brushing teeth at least twice a day is a key risk factor for poor oral health. The proportion of adults reporting brushing at least twice a day rose between 1988 and 2009, from 67% to 75%. As shown in Figure 11, adults in routine and manual occupations have the lowest levels of reported brushing twice a day or more (68%), compared with 79% of adults in managerial and professional occupations.

Over three-quarters of older children (77% of 12-year-olds and 81% of 15-year-olds) report brushing their teeth at least twice a day. Between 2003 and 2013 there was an increase in the proportion of children brushing twice a day or more.

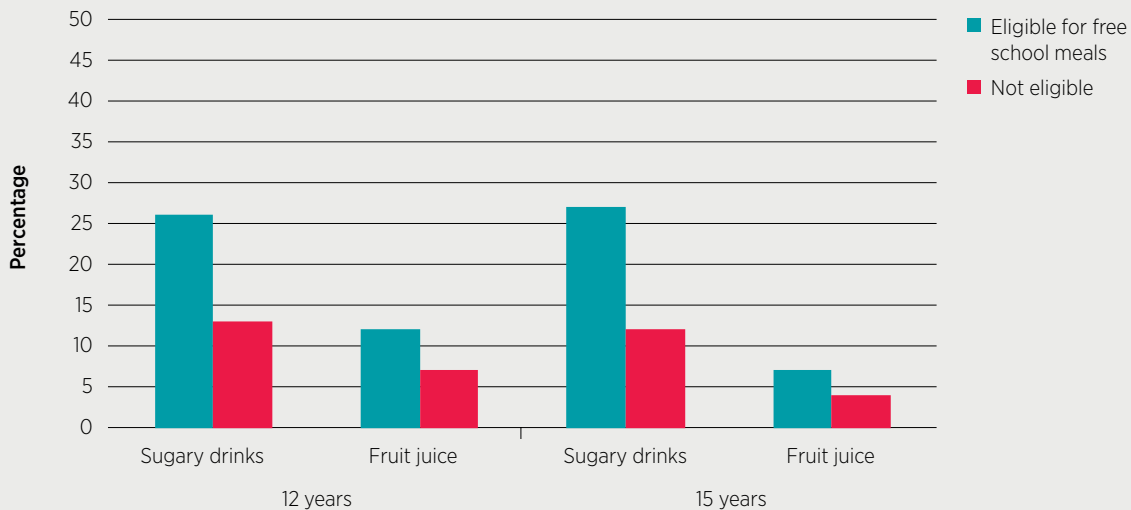
Another major risk factor for poor oral health is the consumption of sugary drinks and fruit juices. According to the ADHS, half of all adults have a high sugar intake. Since the ADHS was carried out, the Scientific Advisory Committee on Nutrition (2015) halved the previous recommendations on maximum daily sugar intake, suggesting these proportions might now be even higher. Indeed, Public Health England (2015) estimate that school-aged children consume around three times more sugar than the recommended maximum amount and adults consume around twice the recommended maximum amount.

Figure 11: Dentate adults reporting brushing teeth twice a day or more, by occupational characteristics, England, 2009



Source: ADHS 2009 (NHS Digital, no date)

Figure 12: Percentage of 12- and 15-year-old children consuming sugary drinks or fruit juice four or more times a day, by eligibility for free school meals in England, 2013



Source: CDHS 2013 (Health and Social Care Information Centre, 2015a, b, c)

Furthermore, high sugar consumption is associated with deprivation. Public Health England (2015) point to findings from the National Diet and Nutrition Survey that reveal higher sugar intakes in adults in the lowest income group compared with other income groups. Figure 12 highlights data from the CDHS showing that 12- and 15-year-olds that are eligible for free school meals drink more sugary drinks and fruit juices than children that are ineligible.

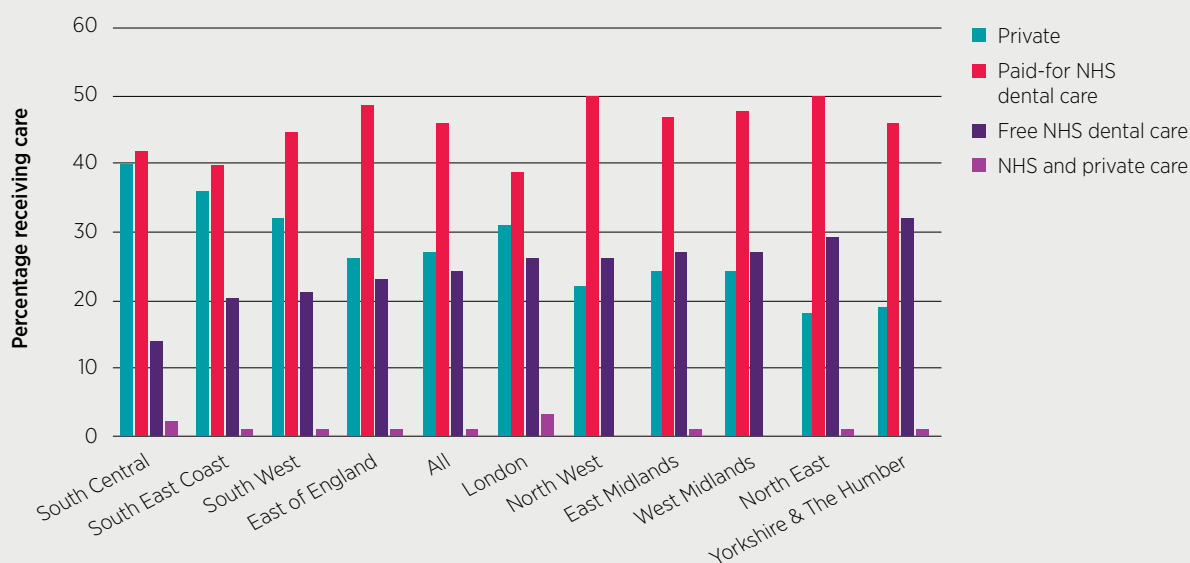
Unsurprisingly, data from the 2009 ADHS also highlight the negative impact smoking has upon oral health. Seven per cent of current smokers have excellent oral health, compared with 11% of those who have never smoked.

Access to dental services

According to the ADHS, in 2009, 92% of adults were able to successfully make an appointment at a dentist for treatment¹ and 74% of adults attended regular dental check-ups in the past three years.

Forty-five per cent of patients paid for their NHS dental care, 27% paid for private care, 25% received free NHS dental care and just 1% received a combination of both NHS and private dental care. In general, more free NHS care is provided in the north of England than the south. The largest proportion of patients receiving free NHS dental care are found in Yorkshire and The Humber (32%) and the North East (29%) (see Figure 13).

Figure 13: Type of dental care received during last completed course of treatment, percentage, by English Strategic Health Authority, 2009



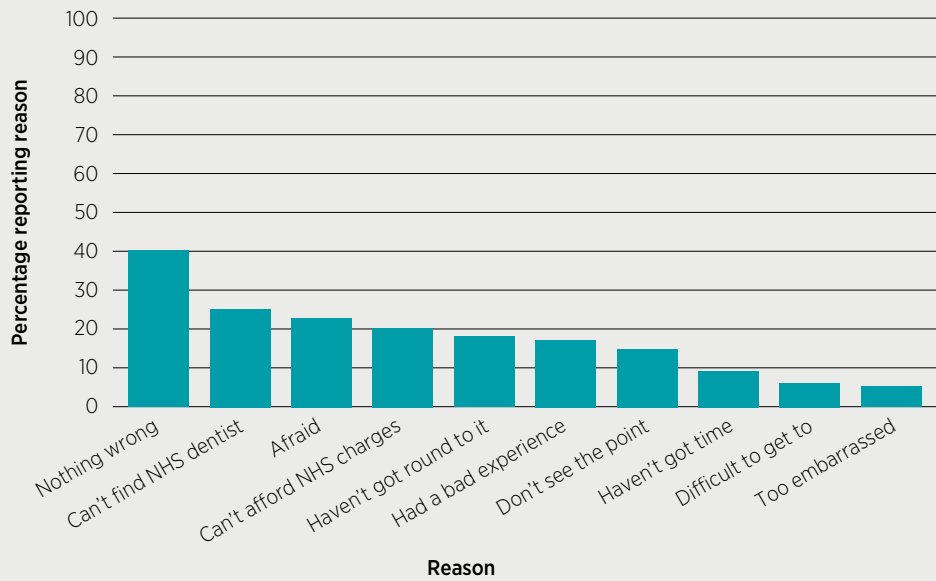
Source: ADHS 2009 (NHS Digital, no date)

As with many NHS services, the supply of dentists across the country is variable. For example, in 2014/15, Cheshire, Warrington and the Wirral had 60.8 dentists per 100,000 population – nearly 40% more than in Birmingham and the Black Country, which had 44.3 (Health and Social Care Information Centre, 2015d). However, given the nature of the mix between NHS and private work dentists can choose to do, plus variations in need, it is hard to draw firm conclusions about the impact of supply on patients' access to NHS dental care. Nevertheless, as noted below, having a local NHS dentist is an important factor in encouraging people to make an appointment, and around a quarter of people report not being able to find an NHS dentist as a reason for not attending a dentist in the last two years (see Figure 14).

Turning now to influences on a patient's decision to use NHS dental services, the most common reason for a patient choosing to receive NHS care was its affordability (63%), followed by service location (23%) and reputation of the dentist (10%) (see Figure 15).

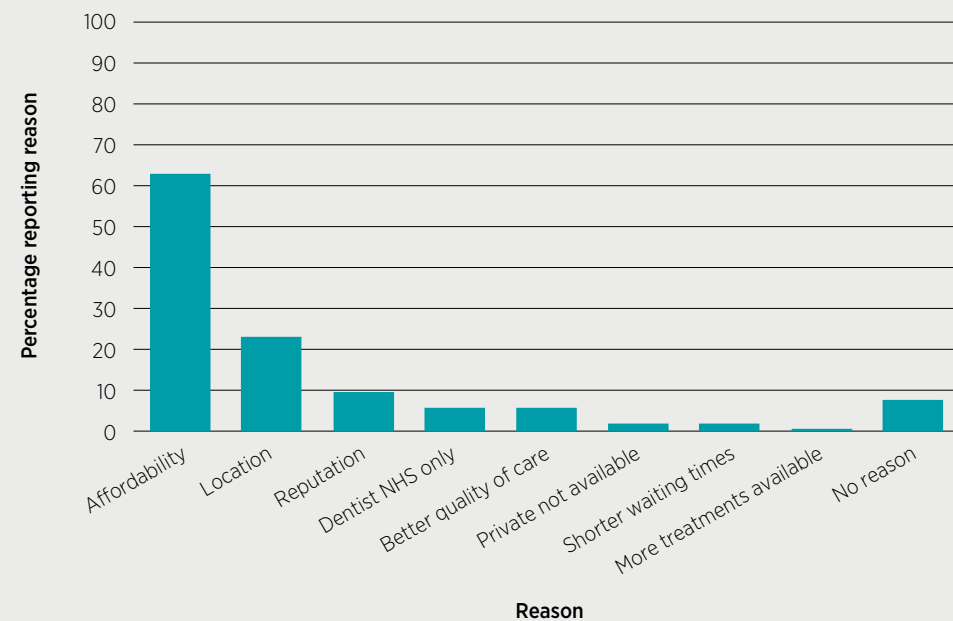
1. The actual treatment carried out might be wholly paid for by the NHS, or wholly private, or some combination, even within the same course of treatment, and with some exempted from NHS charges and others not.

Figure 14: Reported reason for not attending the dentist in the last two years, percentage, by reason, 2009



Source: ADHS 2009 (NHS Digital, no date)

Figure 15: Reported reasons for using NHS dental care, percentage, by reason, 2009



Source: ADHS 2009 (NHS Digital, no date)

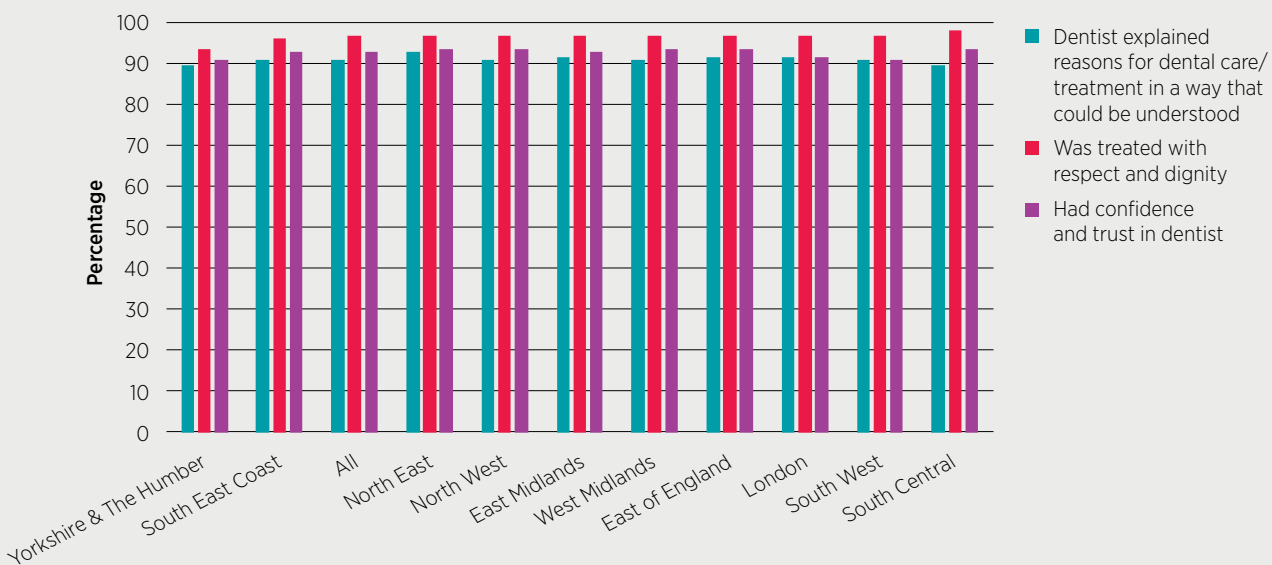
A patient's lack of perceived need for treatment was the main reason for not visiting a dentist (40%). Twenty-five per cent of respondents reported being unable to find an NHS dentist as their reason. Other reasons include being afraid (23%) and being unable to afford NHS charges (20%) (see Figure 14). For those with very poor dental health, cost was a barrier for half (Health and Social Care Information Centre, 2011). Other data tell us that having an NHS dentist in the local area is the most common factor encouraging people to make an appointment (37%), followed by the provision of better quality care (18%) (Health and Social Care Information Centre, 2015b).

Considering access for children in particular, 80% of parents across all child age groups reported that they did not experience difficulty finding an NHS dentist. While a large majority of parents reported that they had never experienced a difficulty, the percentage reporting ever having experienced difficulty has increased marginally, up from 9% in 2003 to 12% in 2013. The percentage of children that had difficulty finding an NHS dentist was higher among those with children eligible for free school meals (18%) than those whose children were ineligible (11%) (Health and Social Care Information Centre, 2015b).

Satisfaction with, and experience of, NHS dental care

Data from the 2009 ADHS found high levels of satisfaction with, and experience of, NHS dental care. In England, 97% of patients felt they were treated with respect and dignity, 93% had confidence and trust in their dentist, and 91% felt their treatment was explained in an understandable way. Patients from Yorkshire and The Humber had the lowest levels of satisfaction with their relationship with their dentist. The highest levels of satisfaction were found in the South Central region of England (see Figure 16).

Figure 16: Relationship with dentist at last visit by English Strategic Health Authority, 2009

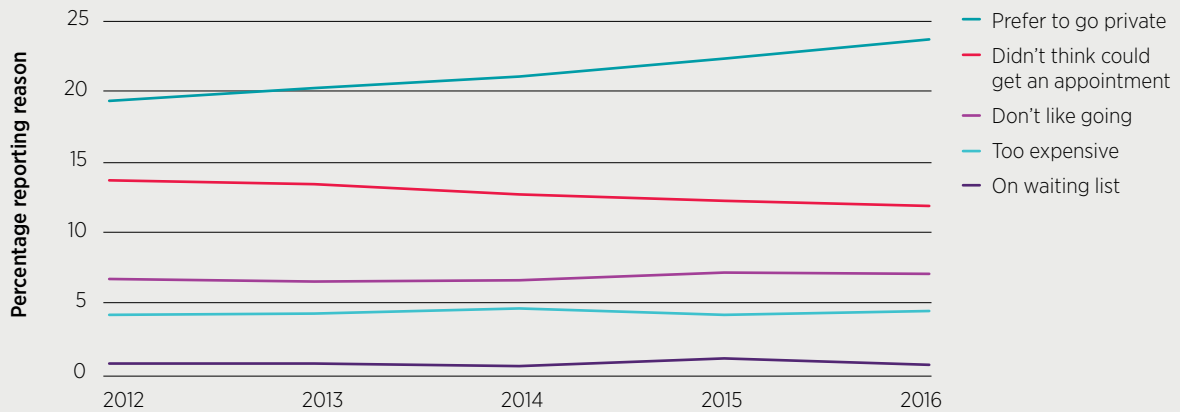


Source: ADHS 2009 (NHS Digital, no date)

There are similarly high levels of success in relation to being able to make an appointment. According to the dental results from the GP Patient Survey, in 2016, 93% of respondents said they had been successful in getting an appointment with an NHS dentist over the past two-year period. This varied little between 2012 and 2016. Satisfaction with the experience of attempting to get an NHS dental appointment has been rising since 2012. The proportion rating their experience as either ‘very good’ or ‘fairly good’ increased from 83% in 2012 to 85% in 2016.

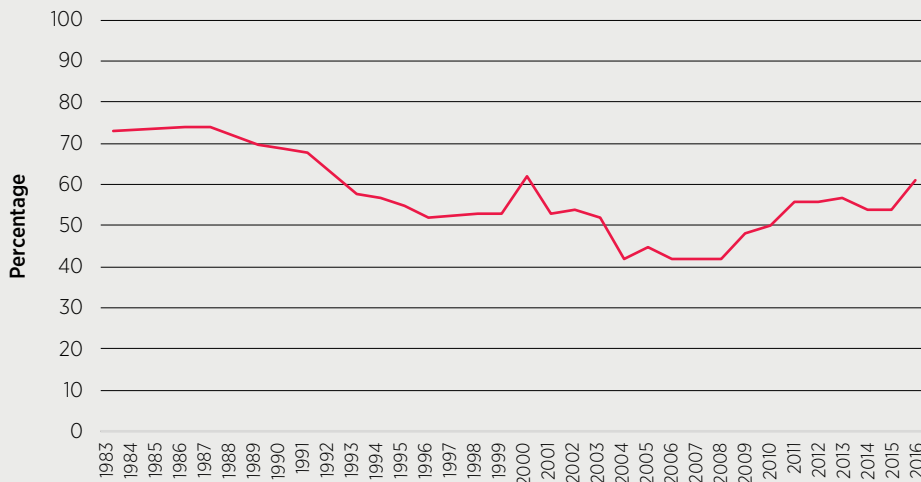
Since 2012, the proportion of respondents not booking an appointment as they preferred to go private has risen from 19% to 23%. Other reasons for not making an appointment generally remained stable between 2012 and 2016. Other notable reasons for not booking an appointment included the dentist being too expensive (4% in 2016) and a dislike of going (7%) (see Figure 17).

Figure 17: Why patients didn't made NHS dental appointments over the last two years, 2012-2016



Source: GP Patient Survey 2012-2016 (NHS Digital, no date)

Figure 18: Satisfaction with NHS dental services, 1983-2016



Source: Robertson (2016) analysis of BSA survey (National Centre for Social Research, no date)

Over 90% of parents of children of all ages reported that they were satisfied with the last dentist their child visited. However, the percentage of parents that had difficulty finding an NHS dentist for their child was substantially higher among those with children eligible for free school meals (18%) than those whose children were ineligible (11%) (Health and Social Care Information Centre, 2015b).

The National Centre for Social Research's British Social Attitudes (BSA) survey offers a useful long-term overview of how satisfaction with NHS dental care has changed. In the 2016 survey, compared with GPs and social care, NHS dentistry was the only service to increase its level of patient satisfaction by a statistically significant amount from 2015, rising from 54% to 61%. The highest levels of satisfaction with dentistry were seen in 1987 (74%). In broad terms, satisfaction with NHS dentistry was on a declining trend for the 25 years from 1983 to 2008, but since then it has risen, following a plateau between 2011 and 2015 (see Figure 18).

What this all means

Drawing on a variety of routine and publicly available data, this briefing has explored outcomes in dental health for adults and children over time. Given that nine out of 10 dental problems are preventable, according to the Royal College of Surgeons of England (2014), understanding where disparities exist is a first step towards developing policies and strategies to improve the overall dental health of the nation.

Below, we summarise four main themes that emerge from this briefing, before exploring what steps can be taken to tackle the issues identified.

Dental health across age groups and over time has been steadily improving and outcomes are generally positive

On almost every measure explored in this briefing, the story has been one of a steady improvement over time. The proportion of adults with no natural teeth has reached an all-time low, while the proportion of those with 21 teeth or more has been steadily rising. The proportion of young children with tooth decay has been falling, and older children have seen their dental health steadily improve. Meanwhile, satisfaction with dentistry remains high.

There are many plausible reasons for these gains. Improved education and awareness throughout society of the causes of dental decay, better diets, and improved access to dentists have clearly been major drivers. According to Public Health England (2016), there was an almost seven-fold increase in dentists' prescriptions for fluoride-based products between 2007 and 2014 – something that is likely to have had an impact on dental health outcomes. Despite these considerable improvements, the overall positive picture of the nation's dental health masks a number of concerning inequalities.

There are clear regional disparities in dental health affecting both adults and children

Much of the data we looked at included a regional breakdown, whether by former SHA area (as with the ADHS), by local authority area (Public Health England's oral health survey), or simply by region (NHS Outcomes Framework data). Across all of these datasets, a common picture emerged: dental health tends to be better in the southern and eastern regions of England, and poorer in the north of England. An exception to this is London, which, despite achieving higher than average outcomes in the ADHS, ranks below average in the other indicators.

The level of disparity in some areas was particularly striking: a child in Yorkshire and The Humber is five times more likely to be admitted to hospital for a tooth extraction than a child in the East of England, while a child in Blackburn with Darwen council is four times more likely to have missing, decayed or filled teeth than one in South Gloucestershire council.¹ While data from the ADHS are older, a similar picture emerges: someone in the North East is four times more likely to have no natural teeth than someone in the Home Counties.

1. Based on upper-tier local authorities – broadly reflecting county councils

Regional disparities in healthcare more generally are well documented: a recent Office for National Statistics (2017) data release examining lifestyles and wider characteristics linked to healthy life expectancy in England revealed a clear north-south divide over issues such as smoking rates, obesity and alcohol-related admissions. Likewise, a study published in August 2017 in the *Journal of Epidemiology and Community Health* found a widening gap in premature mortality between the north and the south of England (Buchan and others, 2017). The disparities in life expectancy and amenable mortality across the four countries of the UK have also been documented by the Nuffield Trust and The Health Foundation (2014) in previous work.

Like the wider disparities in healthcare, our analysis of dental health suggests that these regional variations cannot be looked at in isolation and are in fact part of a bigger story concerning levels of deprivation and the impact that this has on people's dental health.

More deprived groups have consistently poorer dental health and are more likely to be hospitalised for dental health problems

As well as a regional breakdown, the data we explored allowed us to look at how people in different socioeconomic groups compare in terms of the quality of their dental health and the outcomes they experience. The sources we explored offer various ways of doing this, including exploring the oral health of different occupational groups (using the ADHS), looking at indices of multiple deprivation (through Public Health England data) and investigating eligibility for free school meals as a proxy for low-income households (using NHS Digital data).

The findings are stark: despite improvements, there are still 13 percentage points between the proportion of children in the most deprived areas of the country with no dental decay and those in the least deprived areas. Similarly, less than a third of children eligible for free school meals had good overall oral health compared with two-fifths of those who were not eligible. Furthermore, children eligible for free school meals were less likely to attend a check-up. In adults, managerial professions had significantly lower levels of missing teeth than those in either intermediate or routine occupations.

Perhaps unsurprisingly, this disparity extends to hospital admissions for dental work. For adults, the most deprived are twice as likely to be admitted to hospital for dental work than the least deprived. For children, the rate of tooth extraction in the most deprived decile is almost five times that of the least deprived decile.

The link between levels of deprivation and poorer dental health is consistent with other literature. Research published in 2014 by Newcastle University, Newcastle upon Tyne NHS Foundation Trust, University College London and the National Centre for Social Research found that oral health was substantially worse, on all measures, among the poorest 20% of society than was the case for the richest (Steele and others, 2014), with the least-well-off 65-year-olds having eight fewer teeth than the richest – a quarter of a full set of teeth. Similarly, research in the *British Dental Journal* found that school-age children from the poorest backgrounds are up to three times more likely to be admitted to hospital for tooth extraction (Mortimore and others, 2017).

Overall, access to dentistry has improved, but socioeconomic disparities persist and the cost – either perceived or actual – is prohibitive for many

The data explored paint a positive picture overall regarding access to dental care. A large majority of adults were able to make appointments, and almost three-quarters of adults attend regular check-ups. While the percentage of parents reporting ever having experienced difficulty finding a dentist for their children has increased marginally – up from 9% in 2003 to 12% in 2013 – most people still reported that they did not have difficulty in finding a dentist.

However, as with dental health outcomes, we again see evidence of a socioeconomic divide. The percentage of parents that had difficulty just finding an NHS dentist was substantially higher among those with children eligible for free school meals (18%) than those whose children were ineligible (11%).

Furthermore, the data on how the cost of dental care has an impact upon access are concerning. Dental care is one of the few parts of the NHS that requires a patient contribution at the point of use, and the data explored in this briefing suggest that the cost – either perceived or actual – remains a barrier for many, despite the fact that around a quarter of people are eligible for free dental care: 20% of adults still reported that they had not attended the dentist in the past two years due to cost, and for those with very poor dental health the figure was 50%. Dental charges have risen in real terms over the seven years to 2017, at around 1% per year – with increases in the last two years likely to amount to over 6% in real terms, suggesting there may be wider funding issues at stake here.

Ensuring equity of access is one of the central goals of all primary dental care services. Although this report finds that levels of utilisation and access remain very high, pockets of reduced use and accessibility persist in parts of the country. This suggests that more work needs to be done to improve access for those in the most deprived groups and that the mixed charging structure of dental health is turning some people away from regularly seeing the dentist.

What should policymakers do?

Focus on the wider determinants of poor dental health

As this briefing and many other studies have shown, persistent poor dental health is associated with deprivation. While much progress has been made in improving dental health outcomes across the board, greater efforts to reduce inequalities in dental outcomes and risk behaviours must be made if we are to close this gap.

Dentists and their teams are perfectly placed to deliver prevention and promotion advice and interventions to patients, including advice on smoking cessation, healthy eating or responsible alcohol use.

Steele and others (2014) highlighted the need to establish a more integrated method of promoting dental health and reducing the inequalities in oral health. The authors argued that oral health, like other forms of health, is influenced by diet, hygiene, smoking, alcohol consumption and stress. And these common risk factors need to be tackled simultaneously.

Encouragingly, there is recognition among policymakers and practitioners alike that efforts to focus on the wider determinants of poor dental health are part of the solution. The 2007 Department of Health and British Association for the Study of Community Dentistry document *Delivering better oral health – an evidence-based toolkit for prevention* aimed at dental health professionals was a significant step forward; for example, it directly influenced toothpaste manufacturers to increase fluoride levels in children’s toothpaste. Its subsequent updates – most recently in March 2017 (Public Health England, 2017) – continue to provide practical, evidence-based advice to dentists on how to encourage healthier behaviours among patients, not just those deemed to be ‘at risk’.

However, more could be done to ensure that this focus on prevention in dental health is joined up with wider efforts across the health service to prevent ill health. While the importance of prevention is a core part of NHS England’s Five Year Forward View, dentistry is not mentioned within it and is, as Dr Paul Batchelor of the Faculty of General Dental Practice has put it, ‘conspicuous by its absence’ in the New Models of Care programme (Batchelor, 2016). What’s more, as dental care is commissioned directly by NHS England, it is not a feature of the Sustainability and Transformation Plans, many of which are predicated on significant savings from prevention. This seems to be a missed opportunity to tackle poor dental health, while taking on other problems such as obesity and diabetes.

Ensure that the opportunity presented by reform of the dental contract is used to genuinely focus on prevention

If dentists are to be better empowered to prevent poor health generally, including poor dental health, it is vital that the Government recognises the resources required for a preventative approach to be effective. One way to embed prevention is through the dental contract.

The Government is part way through reforming the outdated 2006 dental contract. The current contract focuses on incentivising activity and therefore limits access to dentistry as it effectively sets quotas on the number of patients that can be seen on the NHS by capping the number of dental procedures a dentist can perform each year. The contract is widely agreed to be unfit for purpose; for example, a 2008 Health Select Committee report (House of Commons Health Committee, 2008) condemned elements of the contract and the British Dental Association has said working to activity targets is like ‘being on a treadmill’. Given some of the trends we discuss in this briefing – such as improved oral health, reductions in decay and reductions in numbers of edentate people – it seems right to reform the contract to reflect these changes. Based on the recommendations of the Steele Report (2009), the Department of Health has been working to test elements of a proposed new contract.

Early pilots of a new contract in 2011 were widely welcomed (by the British Dental Association, among others) for providing a vehicle to embed prevention within the contract. However, there are now concerns that a later iteration of the contract, currently being piloted across the country, dilutes the preventative elements, returning instead to a system where payment for activity remains largely at its core. What’s more, the timescale for rollout is uncertain, with signs that implementation may slip to the start of the next decade. Given the clear and present problems in poor dental health for the groups we identify in this briefing, ensuring a speedy and effective rollout of a contract that genuinely focuses on prevention of poor dental health is vital.

Ensure access to dentists is improved for at-risk groups

Despite the fact that large numbers of people now report being able to see a dentist regularly, the persistent problems over access to dentists for some groups remain of concern. Moles and others (2001) pointed to findings from their research as well as other work to demonstrate the association between attendance at the dentist, oral health and demographic factors. They also emphasised the important influence that availability of services has upon levels of attendance – finding inequalities in the numbers of NHS dentists between different health authorities even after controlling for the total population size and demographics.

It has long been argued that the concept of access should encompass a wider range of factors that influence accessibility, such as proximity, affordability and accommodation (Penchansky and Thomas, 1981). Literature also suggests that greater consideration should be given to the oral health needs of vulnerable groups such as housebound older people, disabled people and the homeless (Watt and others, 2014). To tackle the apparent socioeconomic gradient in access to dentistry, more flexibility may be needed to accommodate people at the lower end of the income scale. An evidence summary by the British Dental Association (2015b) recently highlighted that the most effective approaches for increasing dental attendance in families from deprived areas were a mobile dental unit at school premises and a dental access centre.

Therefore, a more holistic approach to dental health, which both recognises its links to wider determinants of health *and* improves access for the most deprived, is needed.

Support research to better understand the impact of dental health interventions

The reasons for the improvements detailed in this briefing are likely to be down to a combination of factors, from improved education and awareness of dental health, to better diets and improved access to dentists.

The impact of increasing amounts of fluoride in toothpaste and in water is also likely to be a factor. Following recommendations in the Department of Health and British Association for the Study of Community Dentistry (2007) report, many manufacturers increased levels of fluoride in children's toothpaste. As Public Health England (2016) note, "it is possible that this increased use of higher concentration fluoride toothpaste has had the effect of controlling the development of decay and causing a real reduction in measured disease levels". However, to eradicate the inequalities we have described here, further analysis is needed to understand the impact of this and other measures on the health of children's teeth.

This briefing has assessed the quality of dental health in the UK over time using publicly available data. The overall picture is positive, with outcomes having improved across the board. However, the inequalities highlighted suggest that these improvements may stall without further policy focus on the dental health of those in the poorest areas or poorest sections of society. While these inequalities are well known and recognised within health policy, we hope this work will further encourage a focus on the wider determinants of poor dental health in order to improve dental health across all income groups and eradicate geographic variations.

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About the authors

John Appleby joined the Nuffield Trust as Director of Research and Chief Economist in September 2016, after 18 years at The King's Fund. He is a Visiting Professor at the City Health Economics Centre, City University London and Visiting Professor at the Institute of Global Health Innovation at Imperial College. John has previously worked in the NHS in Birmingham and London, and as senior lecturer at the universities of Birmingham and East Anglia. For five years he worked for the National Association of Health Authorities (now the NHS Confederation) as manager of the Association's Central Policy Unit. John has acted as an advisor to the UK Government and Parliament in various capacities, for example, carrying out a review for Ministers of the future funding needs of Northern Ireland's health service, and as a task force member for the Marmot Commission on health inequalities; a special adviser to the House of Commons Health Select Committee, member of the National Quality Board's Priorities sub-committee and as a member of the Department of Health's Stakeholder Reference Group on patient reported outcome measures.

Robert Reed joined the Nuffield Trust as a research analyst in November 2016. Prior to joining the Trust, Robert worked as an intelligence analyst for the joint public health team at the London Boroughs of Barnet and Harrow. He worked on adult obesity, mental ill health, the impact of the environment upon health, and strategic health needs assessments. Robert has now left the Nuffield Trust to pursue a PhD in epidemiology at the French National Institute for Health and Medical Research (INSERM) in Paris.

Leonora Merry joined the Nuffield Trust in January 2014. She leads on promoting and publicising the Trust's research work amongst the media, parliamentarians and the wider policy community. Leonora joined the Nuffield Trust from the Westminster think tank the Social Market Foundation (SMF), where she was Head of Media and External Affairs for three years. At the SMF Leonora worked to significantly raise the profile of the think tank's work in Westminster and amongst the media, contributing to the SMF being named UK Think Tank of the Year by Prospect Magazine in 2012 and leading to a threefold increase in media coverage. Prior to the SMF Leonora worked in communications and public affairs in the voluntary sector in Scotland. She has a first-class degree in Politics and History from the University of Edinburgh.

Nuffield Trust

The Nuffield Trust is an independent health charity. We aim to improve the quality of health care in the UK by providing evidence-based research and policy analysis and informing and generating debate.

The Health Foundation

The Health Foundation is an independent charity committed to bringing about better health and health care for people in the UK. Our aim is a healthier population, supported by high quality health care.

QualityWatch

QualityWatch, a Nuffield Trust and Health Foundation research programme, is providing independent scrutiny into how the quality of health and social care is changing over time.

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The Health Foundation

90 Long Acre
London WC2E 9RA

020 7257 8000
info@health.org.uk

www.health.org.uk

Nuffield Trust

59 New Cavendish Street
London W1G 7LP

020 7631 8450
info@nuffieldtrust.org.uk

www.nuffieldtrust.org.uk