Public Health England

Protecting and improving the nation's health

National Dental Epidemiology Programme for England: oral health survey of five-year-old children 2017

A report on the inequalities found in prevalence and severity of dental decay

Revised 17/05/2018

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Published 15 May 2018
PHE publications
gateway number: 2018081

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Executive summary

Dental decay among young children remains an important public health issue as it leads to pain and distress, sleepless nights for children and parents, and time off school and work. Decay levels among five-year-olds can give early indication of the success, or otherwise, of interventions aimed at improving the oral and general health of very young children including those designed to improve parenting, children's weight or overall health or diet. Such interventions may need many years to pass before the impact can be measured. It is therefore important to know what the levels of decay are in the population and the Public Health England (PHE) National Dental Epidemiology Programme (NDEP) is designed to find this out in a standardised way.

The summarised results in this report are from the fourth PHE NDEP oral health survey of five-year-old children, 2017.[i] Estimates at national, regional, PHE centre and upper and lower-tier local authority level are given for decay prevalence and severity. This data is the source for the dental indicator (proportion of children aged five who are free from obvious tooth decay) included in the Public Health Outcomes Framework[1] and NHS Outcomes Framework.[2]

Overall, 76.7% of five-year-old children in England whose parents gave consent for participation in this survey had no experience of obvious dental decay. This is the fourth consecutive survey which has shown improvement in the proportion of children who are free of obvious decay. Among the 23.3% of children with some experience of obvious decay (prevalence), the average number of teeth that were decayed, missing or filled was 3.4 (at age five, children normally have 20 primary teeth). The average number of decayed, missing or filled teeth ($d_3$mft) in the whole sample (including the 76.7% who were decay free) was 0.8. This results in nearly 17,000 children in this birth cohort already having experienced extraction of one or more teeth.

The results reveal wide variation at regional and local authority level for both prevalence and severity of dental decay. There is almost a twenty-fold difference in severity between the lower-tier local authorities, with the lowest level of decay (0.1 $d_3$mft in Waverley) and the highest (2.3 $d_3$mft in Pendle). Children from deprived backgrounds have higher levels of decay than those least deprived, prevalence among most deprived children is 33.7% and for the least deprived is 13.6%. Children in particular ethnic groups had markedly higher levels of decay prevalence. Among children from Eastern Europe the prevalence was 49.4%, compared to 19.6% for Black/black British. Children in non-fluoridated areas have poorer oral health than those in fluoridated areas and those in the north had poorer health compared with those elsewhere in the country.[3, 4]

[i] These survey data were collected during the 2016-17 school year but are referred to here as 2017.

Analysis shows that while dental decay levels are reducing, and there are signs that inequalities are beginning to reduce, the inequalities gap remains unacceptably high.

Summary results can be found in Appendix 1 and Appendix 2 of this report. Full tables of results are available at www.nwph.net/dentalhealth/

The methods used in this survey were the same as those used in previous surveys during 2008,[ii] 2012[iii] and 2015,[iv] therefore it is possible to make comparisons between the results arising from them. These show a continued increase in the proportion of children with no obvious dental decay from 69.1% in 2008, 72.1% in 2012, 75.2% in 2015 to 76.7% in 2017, equating to a change of nearly eight percentage points and an improvement of 11.0% since 2008. The average number of decayed, missing or filled teeth has fallen from 1.1 in 2008, 0.9 in 2012, 0.84[v] in 2015 to 0.78[v] in 2017, a reduction in severity of 29.0% since 2008.

The requirement for positive consent for children to take part prevents comparison with the 1992 to 2006 series of surveys[vi]. During the 1992 to 2006 series there was little change in the prevalence or severity of decay, however, data from the 2008 to 2017 series show a reduction that is most likely due to manufacturers increasing concentrations of fluoride in children's toothpastes in response to evidence based recommendations in PHE's Delivering Better Oral Health and local authority commissioned evidence based community programmes recommended in Commissioning Better Oral Health.[5, 6, 7] Surveys in Wales and Scotland have shown comparable trends over a similar period.[8, 9]

The observation that inequalities persist confirms the need to continue taking action so that all children can reach the better levels of oral health that have been shown to be possible. Information about the groups at greatest risk that this survey provides should be used to target communities where extra effort is required.

Local authorities have had responsibility for improving health, including oral health, since April 2013, following the transfer of responsibilities from PCTs.[10, 11] This report provides benchmarking data that may be used in joint strategic needs assessments and oral health needs assessments to plan and commission oral health improvement interventions. Two national documents were published in June 2014 which aimed to support local authorities in these activities.[12, 13]

[ii] These survey data were collected during the 2007-08 school year but are referred to here as 2008.
[iii] These survey data were collected during the 2011-12 school year but are referred to here as 2012.
[iv] These survey data were collected during the 2014-15 school year but are referred to here as 2015.
[v] At one decimal place the figures for 2015 and 2017 are the same (0.8), so we have used two decimal places here to show the difference.
[vi] Department of Health guidance in 2007 required written parental consent be gained for children to be examined in the surveys. This replaced passive consent which had been used for the previous 20 years.

Introduction

As part of Public Health England's co-ordinated National Dental Epidemiology Programme (NDEP), standard examinations of a random sample of five-year-old children were undertaken in the academic year 2016 to 2017. This was the fourth national dental survey of this age group to take place under positive consent for participation.[iv]

Since 1985, standardised and coordinated surveys of child dental health have been conducted across the United Kingdom (UK). These have produced robust, comparable information for use at regional and local government level and for varying health geographies. The first national survey of five-year-olds took place in 1992. PHE now has responsibility for coordinating these surveys in England as part of an annual programme. The PHE dental public health epidemiology team facilitated the survey and worked with the British Association for the Study of Community Dentistry (BASCD) who ensured standardisation of examiners. Each local authority commissioned local dental providers to undertake the fieldwork according to a national protocol.[14]

NHS and local authority commissioners and other health planners use the information produced from the surveys when conducting oral health needs assessments at a local level. These form an important component of the commissioning cycle when planning and evaluating local services and health improvement interventions. The data is also required to provide the dental indicator (proportion of children aged five who are free from obvious tooth decay) for the Public Health Outcomes Framework,[1] and NHS Outcomes Framework[2] which is used to monitor health improvement and the reduction of health inequalities at national and local levels.

The survey reported here involved children from mainstream, state-funded schools. Information concerning the oral health of five- and twelve- year-old children attending special support schools was the focus of a previous PHE NDEP survey and was reported in September 2015.[15]

Section 1. Methods

The sampling frame for this survey was children attending mainstream schools who were aged five years at the time of the survey. It was undertaken during the 2016/17 school year. Data was collected by trained and calibrated clinicians who were generally employed by NHS trusts providing community dental services. Pine et al.[16] described the methods whereby examiners should be trained and calibrated and these standards

were applied, along with BASCD standards for sampling and clinical examination[17,18] as in previous surveys. A visual-only examination method was used and informed the standard severity index for teeth with experience of dental decay; missing teeth due to decay (mt), filled teeth due to decay (ft) and teeth with visually obvious decay into dentine, which was the threshold for recording the presence of decay and is indicated by the subscript '$_3$' (d_3t). This threshold is widely accepted in the literature as a standard but that it provides an underestimate of the true prevalence and severity of disease. The presence and absence of plaque and oral sepsis were also recorded.

The primary sampling unit was lower-tier local authority areas. Samples were drawn for each local authority in England using the same methods and similar sampling intensities used in previous surveys and according to the survey protocol.[14] In some local authority areas larger samples were drawn at the request of commissioners to facilitate analysis at smaller geographical levels.

Sampled schools were contacted to seek co-operation and age-eligible children were identified. In larger schools random samples of children were taken. Requests for consent for sampled children were sent to parents and followed by a second request where no response was made to the first.

Data was collected using a tailor made data collection format in Microsoft Access with a very small number of teams still using the Dental Survey Plus 2 computer program. Electronic files of the raw, anonymised data were uploaded to a secure folder on a shared network drive by regional dental epidemiology coordinators (DECs). The DPH intelligence team collated, checked and cleaned the data then linked it using home postcodes so that lower super output areas and Index of Multiple Deprivation 2015 (IMD 2015) scores could be assigned.[19]

Population weighting[vii] was used to calculate estimates of a range of measures of oral health for each local authority. Deprivation scores were then used to allow weighting of the sample data to more closely match the actual distribution of deprivation quintiles[viii] in the source population.

Error bars indicate 95% confidence limits on charts in this report and in the tables available from www.nwph.net/dentalhealth/

Data suppression was applied when there were insufficient children examined in a group to allow production of a reliable estimate.

[vii] The sampling methodology used for this survey was school based and therefore not truly representative of the population of five-year-old children by Index of Multiple Deprivation (IMD) quintile. Thus, the sample was treated as a stratified random sample, that is, children were selected randomly from each IMD quintile but the sampling probability varied between IMD quintiles. For this reason, IMD-weighted estimates were produced to provide more robust estimates of overall prevalence.

[viii] Deprivation quintiles divide populations into fifths according to distribution of IMD scores.

Section 2. Results

Headline results are presented here along with an indication of the range of measures and some high-level illustrations of the inequalities noted. Full tables and charts of results at national, government region, lower- and upper-tier local authorities and for PHE centres are available from www.nwph.net/dentalhealth/

Participation in the survey

In total, 134 out of 152 upper-tier local authorities took part in the survey covering 303 out of 326 lower-tier local authorities.

A small proportion of parents (6.0%) actively stated they did not want their children included in the survey, while 0.5% of children with consent declined to take part on the day. Absenteeism on the day of examination accounted for a loss of 3.3% of consented children. Simple non-response to the request was the most common reason for non-consent (32.0%), despite two requests and schools actively seeking returned forms.

From the drawn sample 58.9% of children were examined, this response varied from 52.5% in the North West to 66.4% in the South West. At lower-tier local authority level the response rate varied from 25.7% in Woking, Surrey to 93.1% in Ryedale, North Yorkshire.

Of the children with parental consent 96,005 clinical examinations were included in the final analysis, representing 96.2% of the main consented sample. This represented 13.6% of the population of this age cohort attending mainstream state schools.

The proportion of consented children who were examined varied at regional and lower-tier local authority level. Across the regions, this varied from 95.1% in London to 97.5% in the East Midlands. At lower-tier local authority level it varied from 90.5% in Waverley, Surrey to 100.0% in Hyndburn, Lancashire.

Prevalence of dental decay at age five

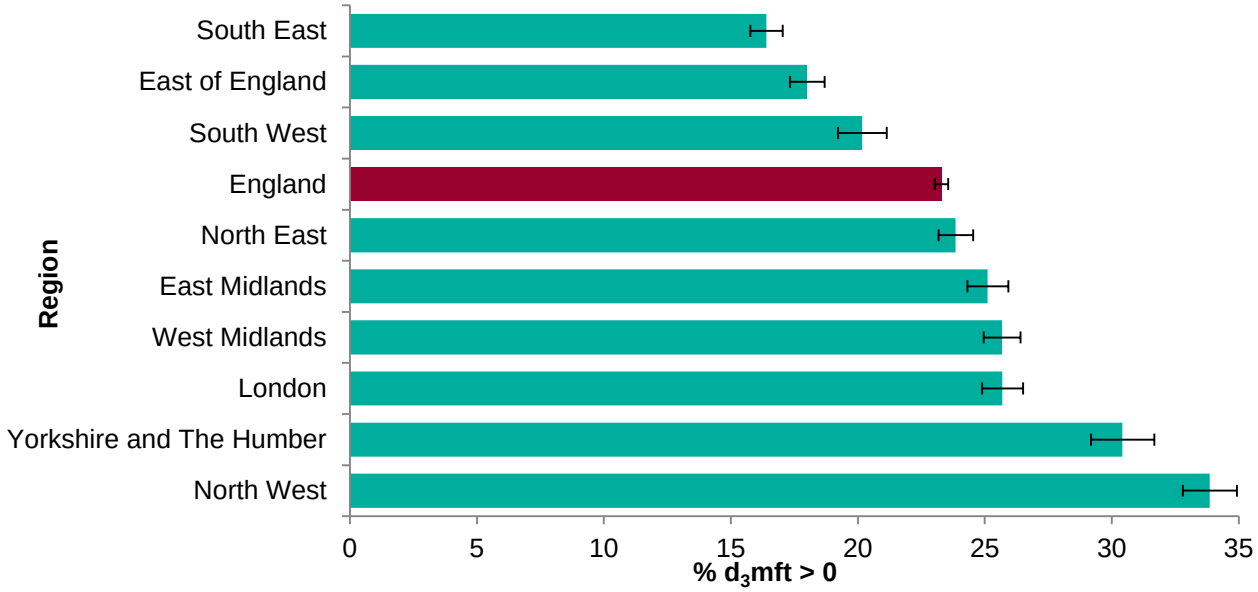
The PHOF indicator refers to the proportion of children who are free from obvious decay and this report also quotes the reverse of this, the proportion of children with experience of decay. The latter is more consistent with the measure for severity of decay; mean $d_3$mft (the number of decayed teeth and those missing or filled due to decay).

The proportion of five-year-old children in England who were free from visually obvious dental decay was 76.7%. The remaining 23.3% had experience of dental decay with

one or more teeth that were decayed to dentinal level, extracted or filled because of caries. This represents 164,000 children with the disease in one year cohort.

Comparison of prevalence of having the condition at regional level, the estimates of those with obvious decay experience ranged from 16.4% in the South East to 33.9% in the North West (Figure 1). Between the upper-tier local authorities there were wider variations, ranging from Cambridgeshire where 12.9% had obvious decay experience to Rochdale where 47.1% were affected.

Figure 1. Percentage of five-year-old children with obvious decay experience ($d_3$mft > 0) in England by region, 2017.

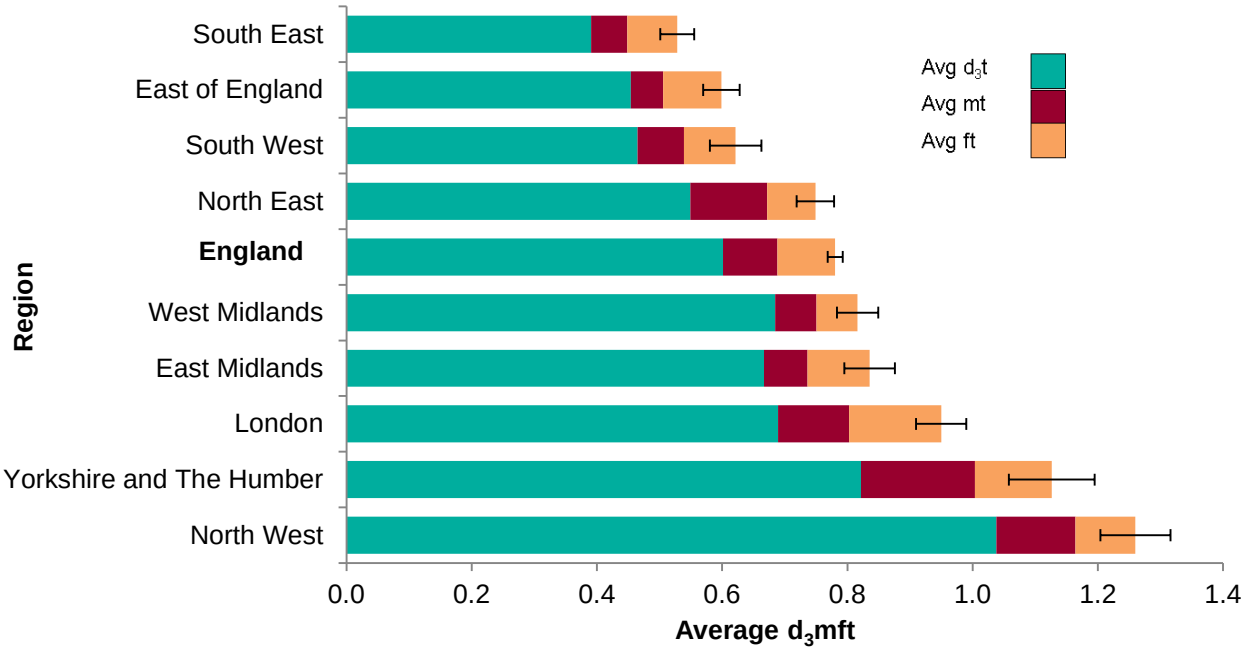


Error bars represent 95% confidence limits

Inequalities in severity of dental decay at age five

The average number of teeth affected by decay (decayed, missing or filled teeth – $d_3$mft) per child was 0.8. There was a large variation in the levels of decay between the regions, with the average $d_3$mft score ranging from 0.5 in the South East to 1.3 in the North West (Figure 2).

Figure 2. Average number of dentinally decayed, missing and filled teeth ($d_3$mft) among five-year-old children in England by region, 2017.



Error bars represent 95% confidence limits

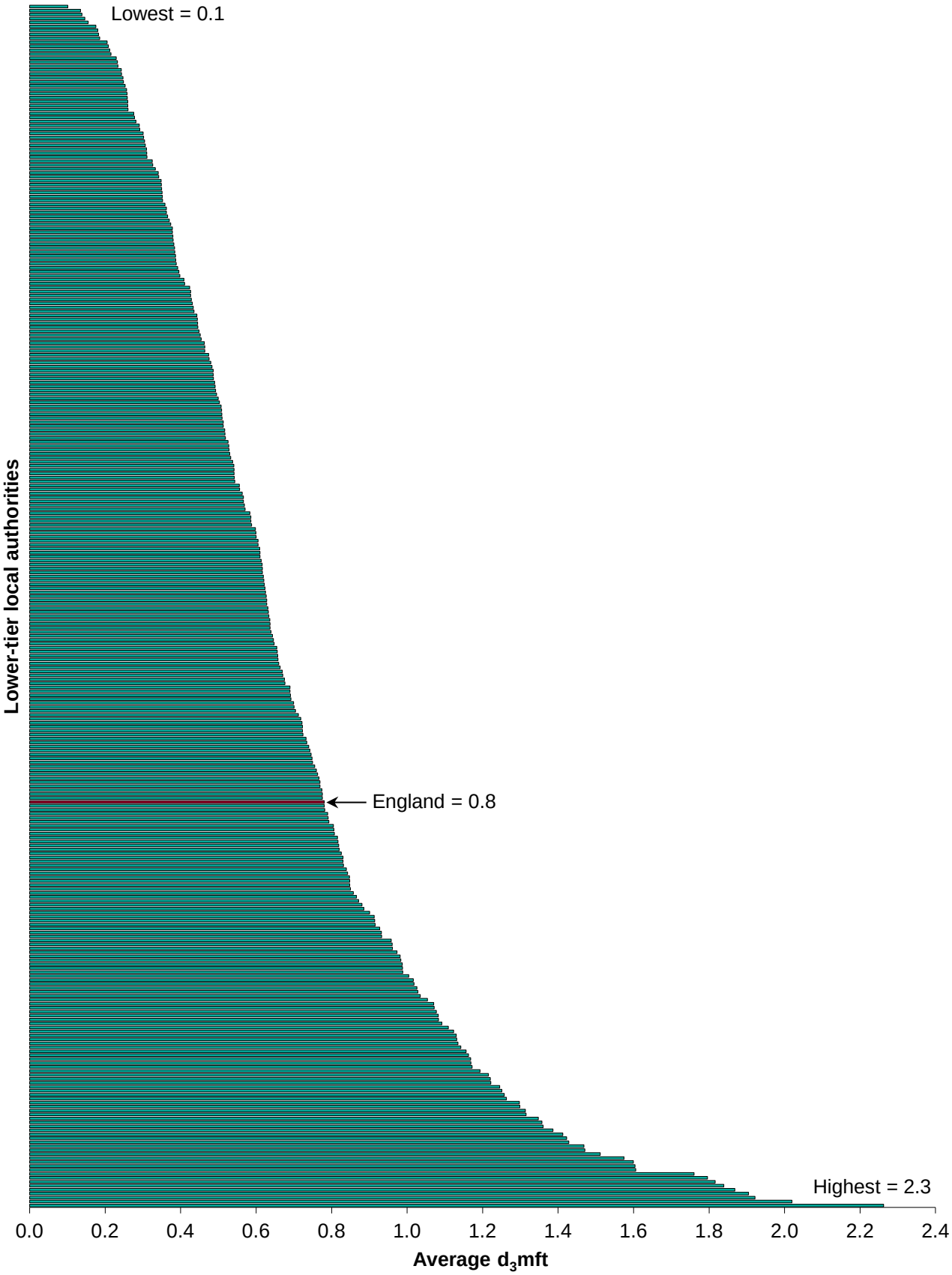
The major component of the $d_3$mft index in this age group is obvious, untreated dentinal decay (d_3t) (Figure 2). On average, five-year-old children in England had 0.6 teeth with untreated decay into dentine. At the regional level the average number of currently decayed teeth ranged from 0.4 in the South East to 1.0 in the North West with wide variation between upper-tier local authority areas, ranging from 0.2 in North Somerset and Brighton and Hove areas to 1.6 in Rochdale. For further details please refer to the care index section.

There was also wide variation in the average $d_3$mft scores across upper-tier local authority areas, ranging from 0.4 in thirteen[ix] local authorities to 1.9 in Harrow, Manchester and Rochdale.

There is wide variation evident at the lower-tier local authority area level (Figure 3), with a twenty-fold difference in severity between the areas with the lowest levels of decay (0.1 $d_3$mft in Waverley) and the highest (2.3 $d_3$mft in Pendle).

[ix] Rutland, Cambridgeshire, Essex, Hertfordshire, Bexley, Southwark, Brighton and Hove, East Sussex, Hampshire, Surrey, West Sussex, North Somerset, Staffordshire.

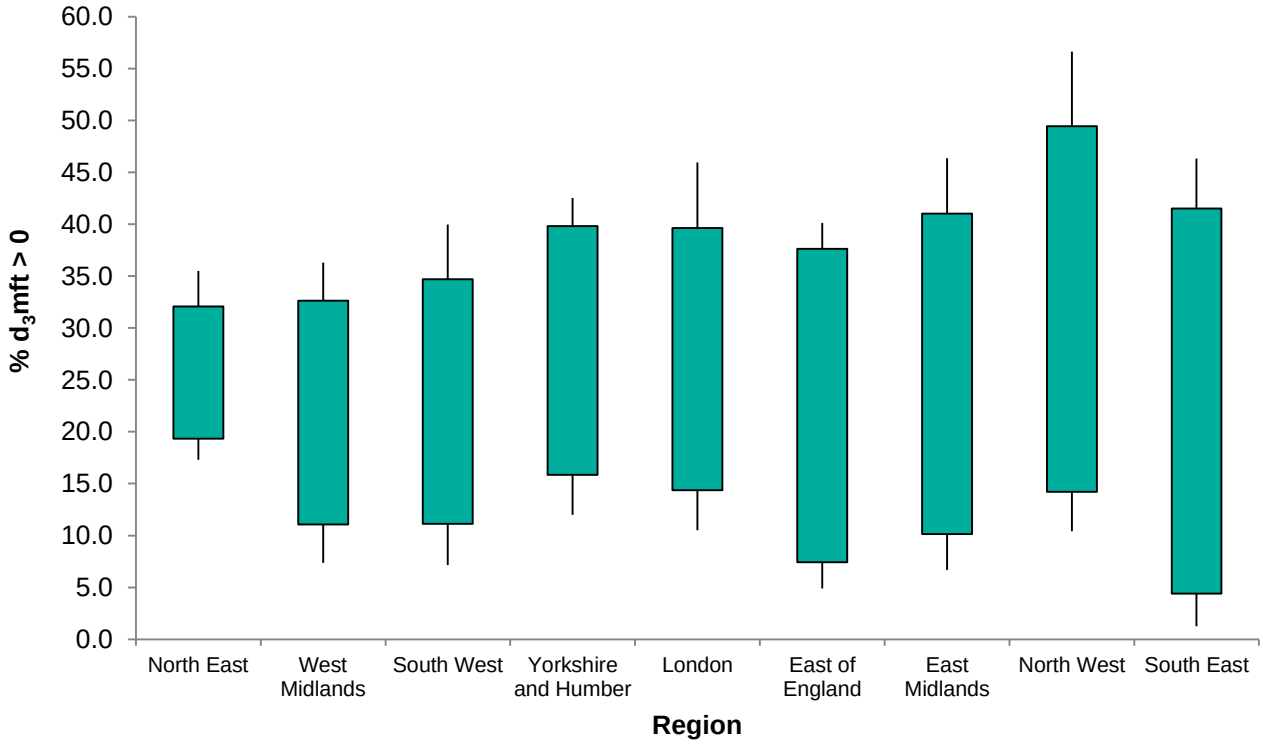
Figure 3. Variation in the average number of dentinally decayed, missing (due to decay) and filled teeth ($d_3$mft) among five-year-old children in England by lower-tier local authority areas, 2017.



Inequalities in prevalence of dental decay at age five

Within regions there are differing levels of variation in the proportion of children with decay experience within local authority areas (Figure 4). The widest level of variation is found in the South East region, where the best local authority area had less than five percent of children having caries experience ($d_3$mft>0) and the highest with over 40 per cent of children affected. In the North East the range was narrower, being 19 percent to 32 percent.

Figure 4. Variations in the prevalence of dental decay experience between best and worst lower-tier local authority areas among five-year-old children in England by region, 2017.



Vertical error bars represent 95% confidence limits

Figures 5 to 13 show the inequalities in prevalence of dental decay experience between local authority areas within each PHE region.

Figure 5. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in the East Midlands by lower-tier local authority areas, 2017.

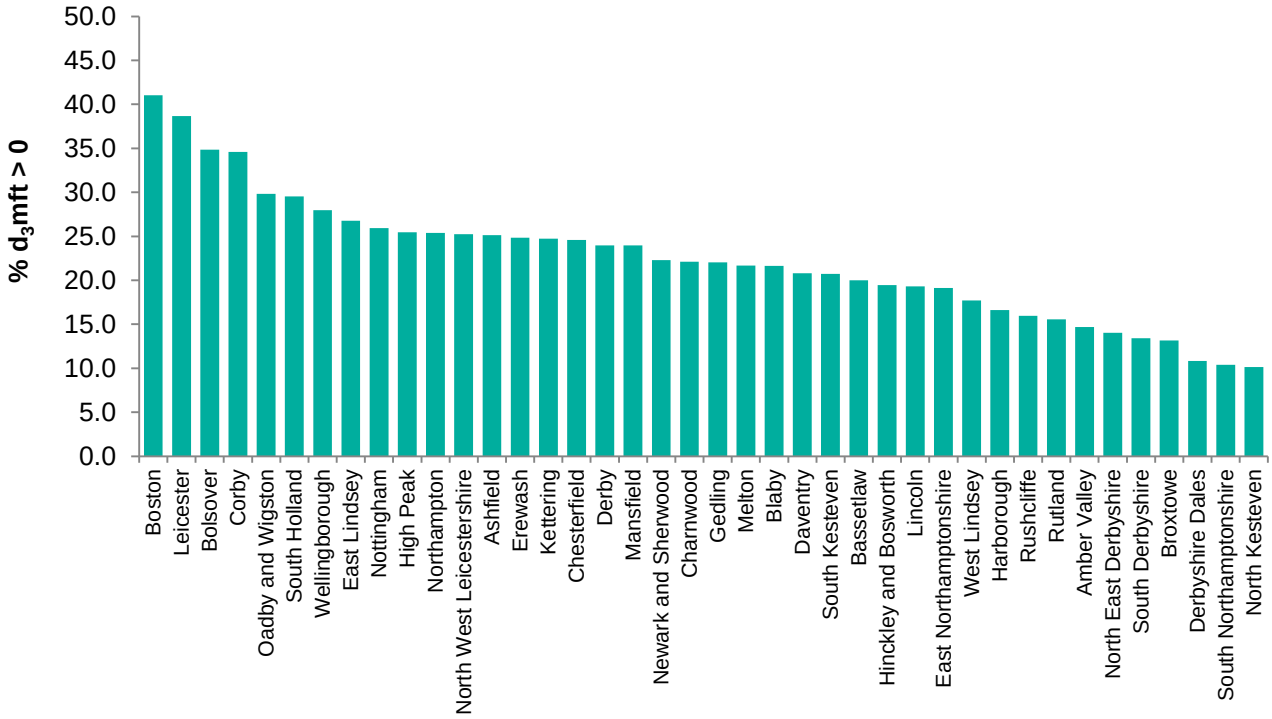


Figure 6. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in the East of England by lower-tier local authority areas, 2017.

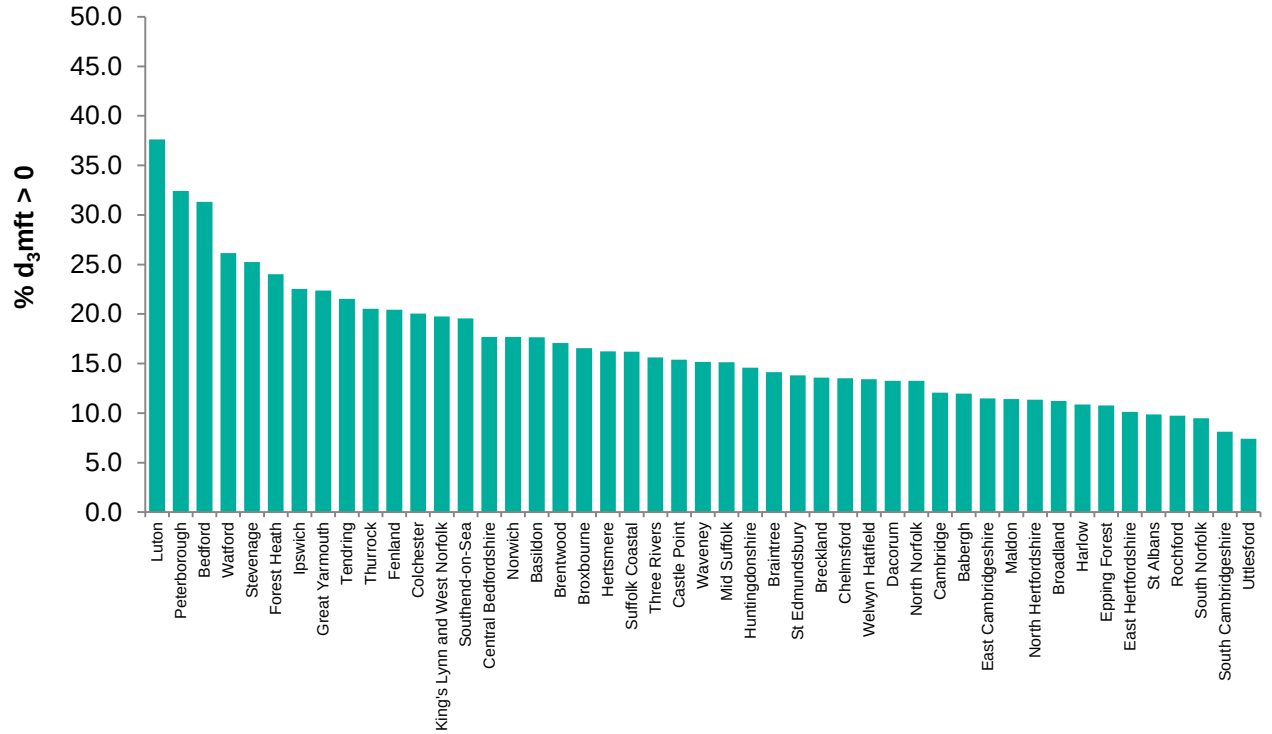


Figure 7. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in London lower-tier local authority areas, 2017.

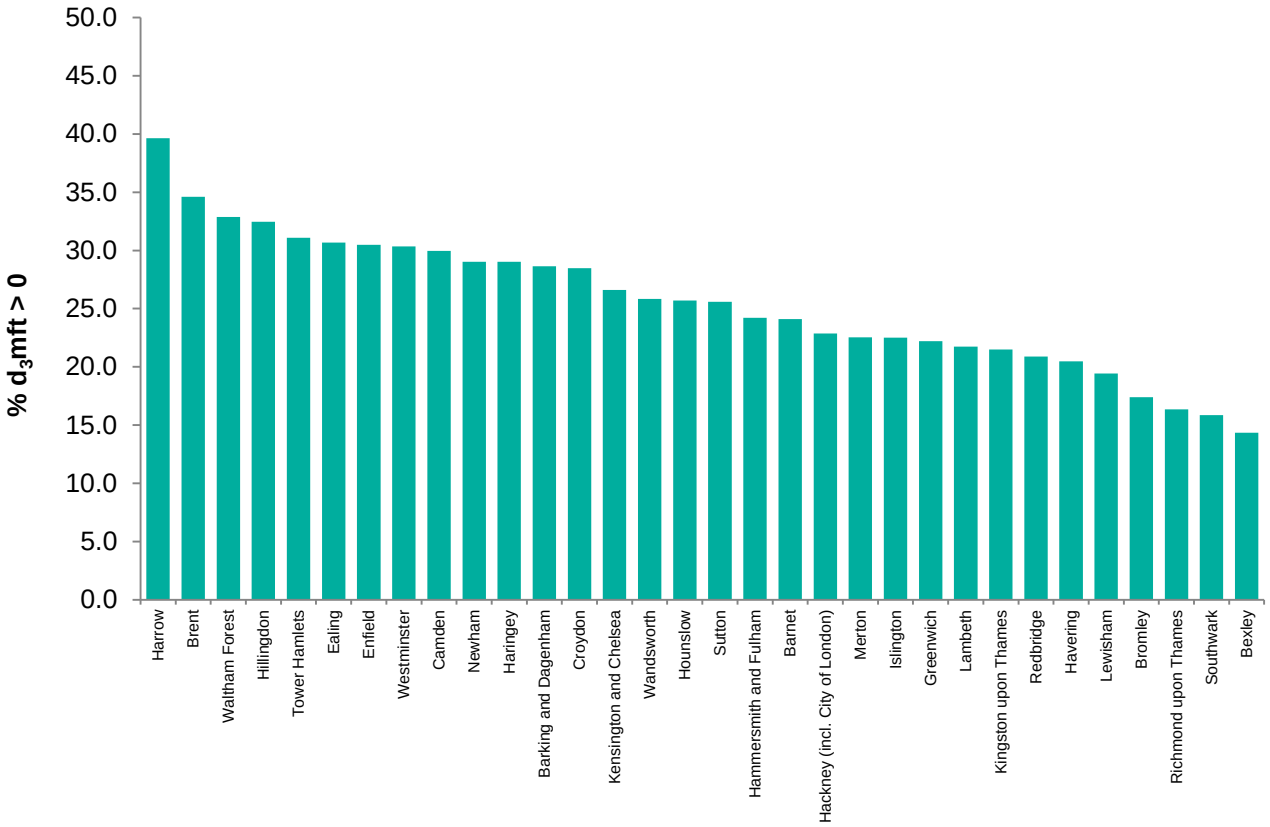


Figure 8. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in the North East by lower-tier local authority areas, 2017.

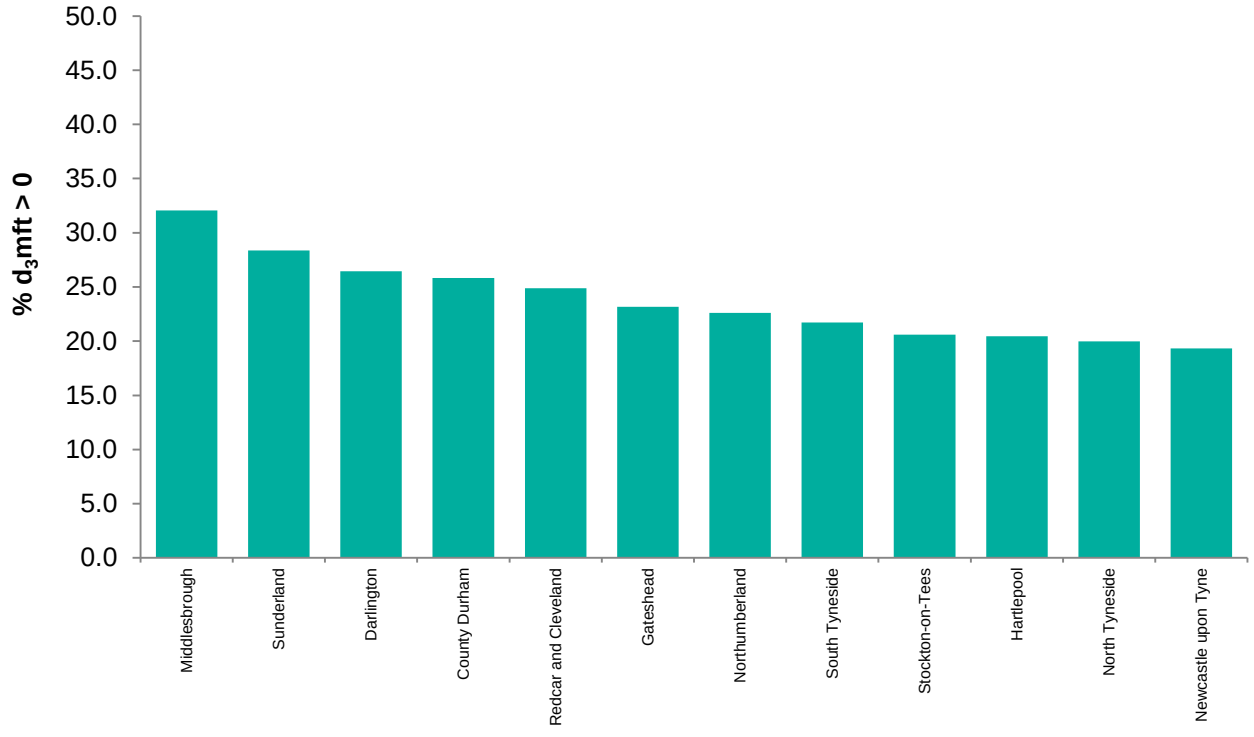


Figure 9. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in the North West by lower-tier local authority areas, 2017.

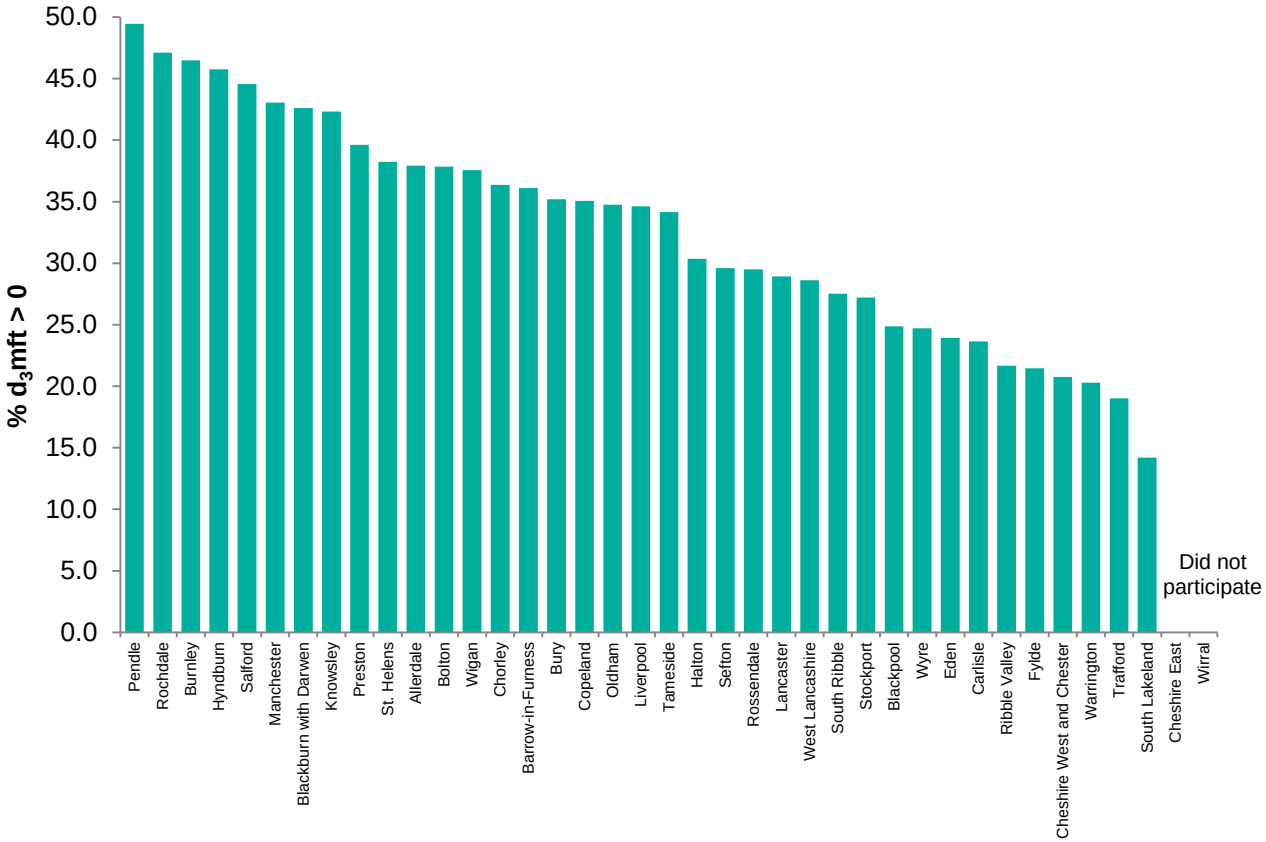


Figure 10. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in the South East by lower-tier local authority areas, 2017.

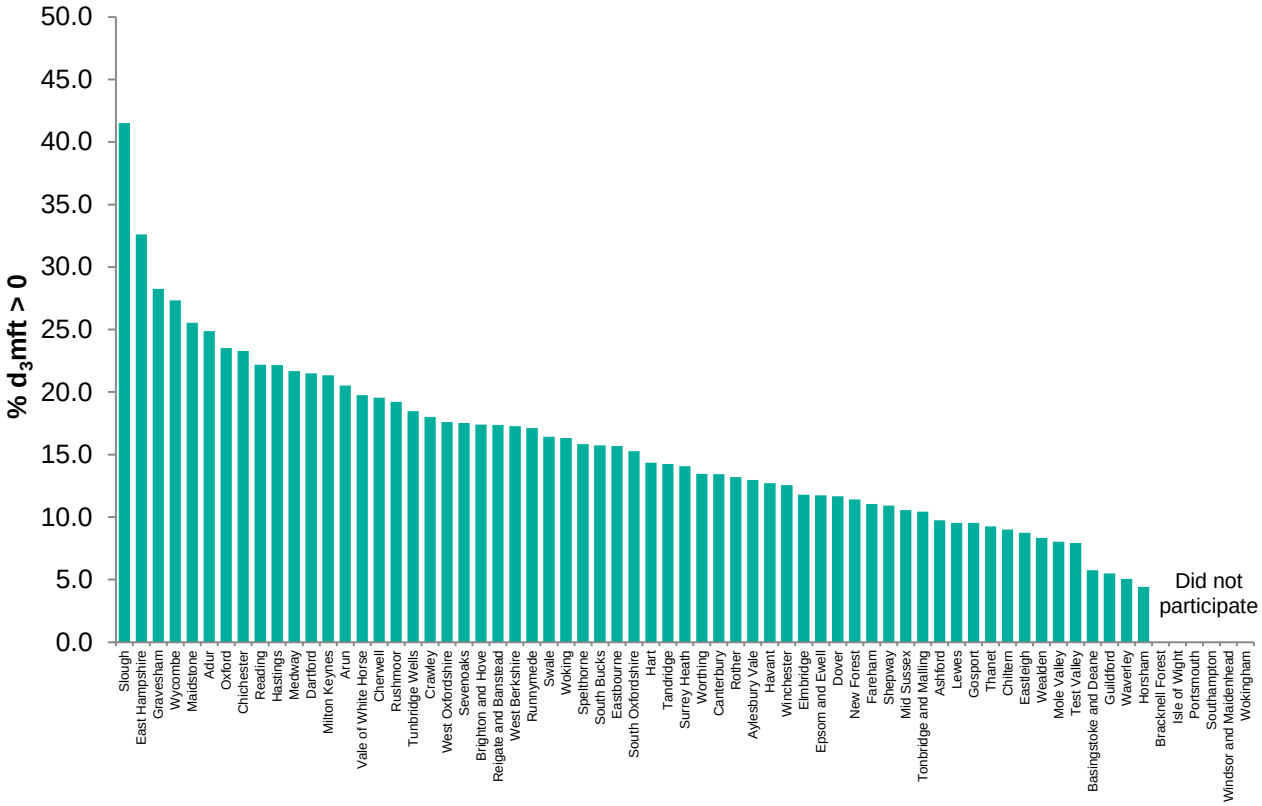


Figure 11. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in the South West by lower-tier local authority areas, 2017.

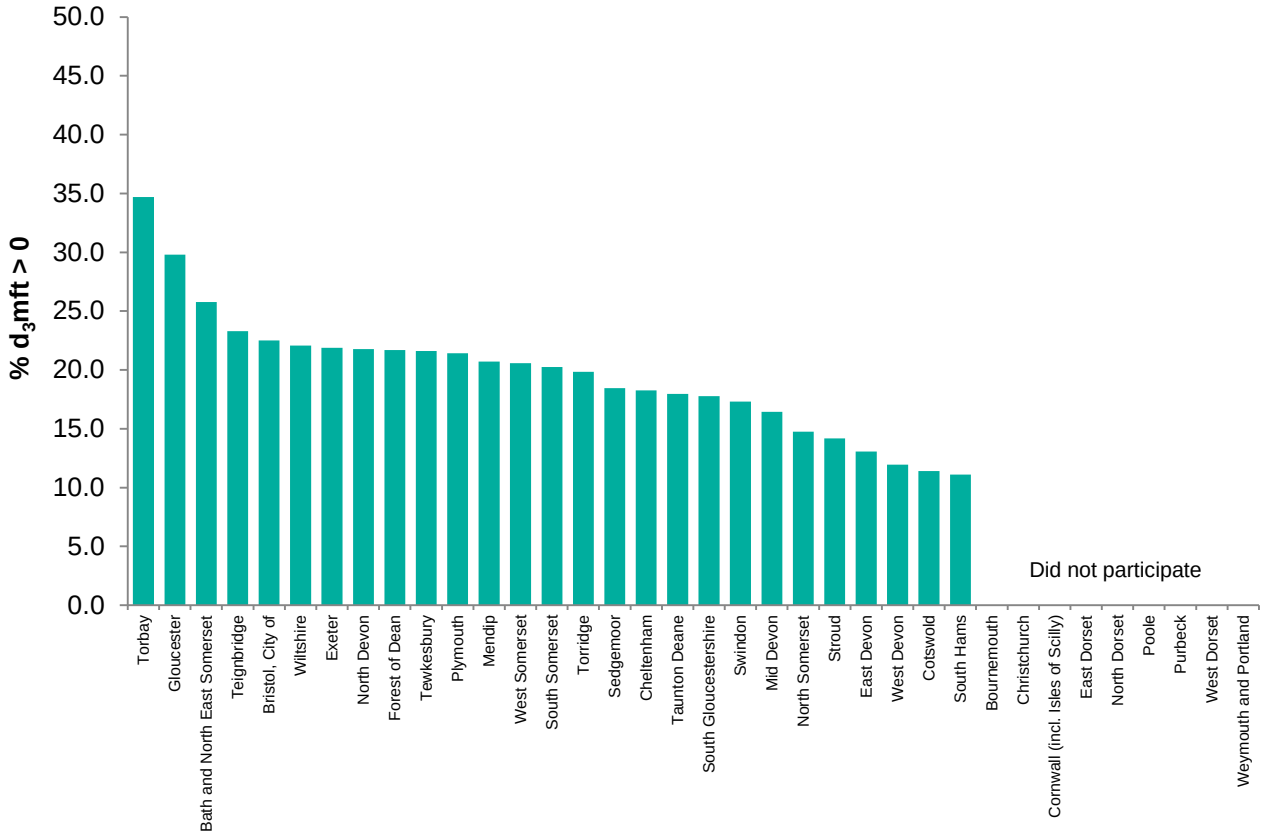


Figure 12. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in the West Midlands by lower-tier local authority areas, 2017.

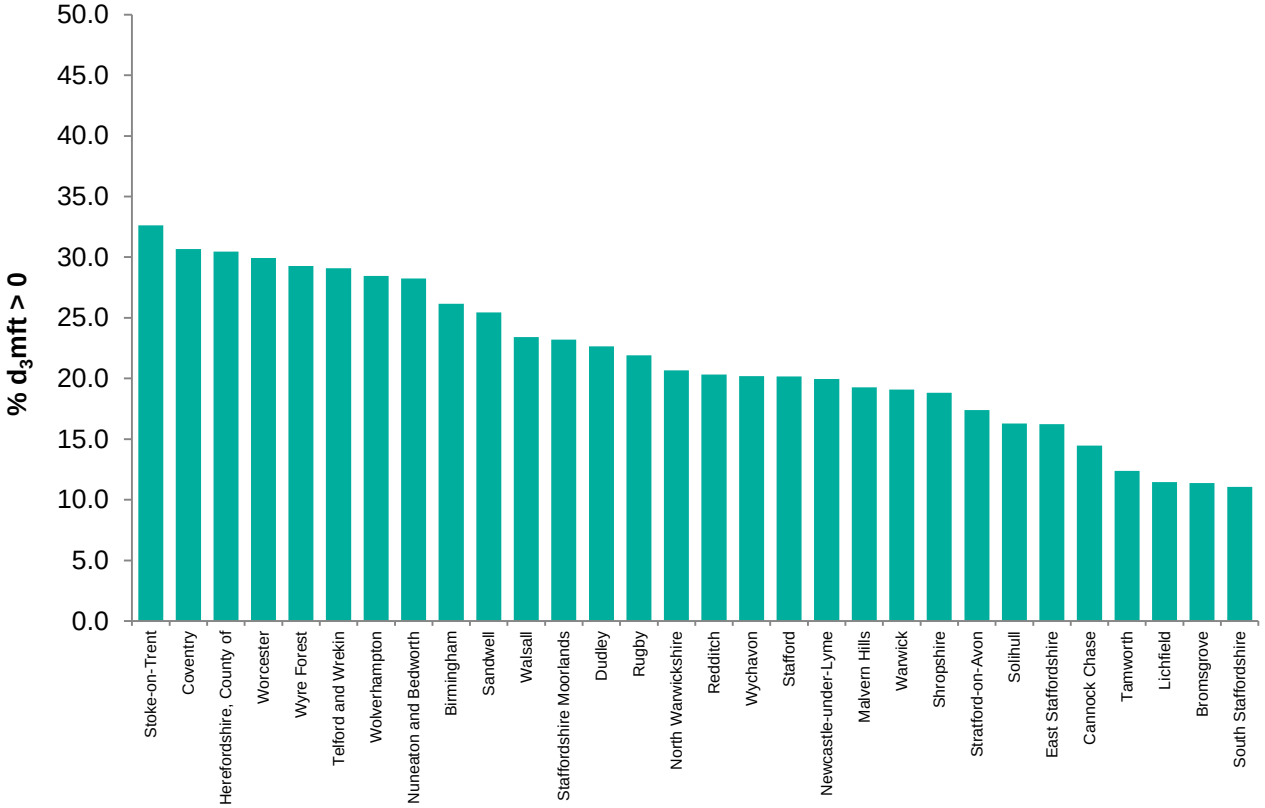
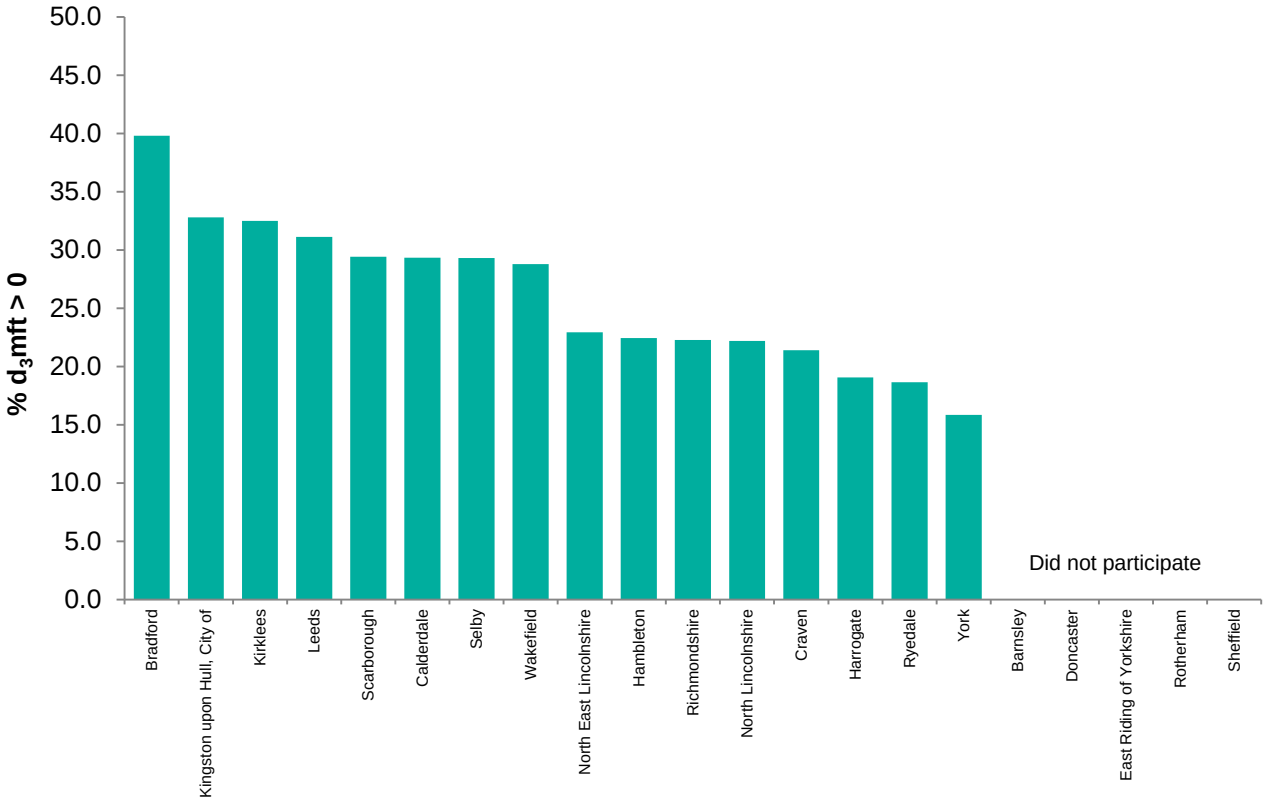


Figure 13. Variation in the percentage of five-year-old children with decay experience ($d_3$mft>0) in Yorkshire and The Humber by lower-tier local authority areas, 2017.

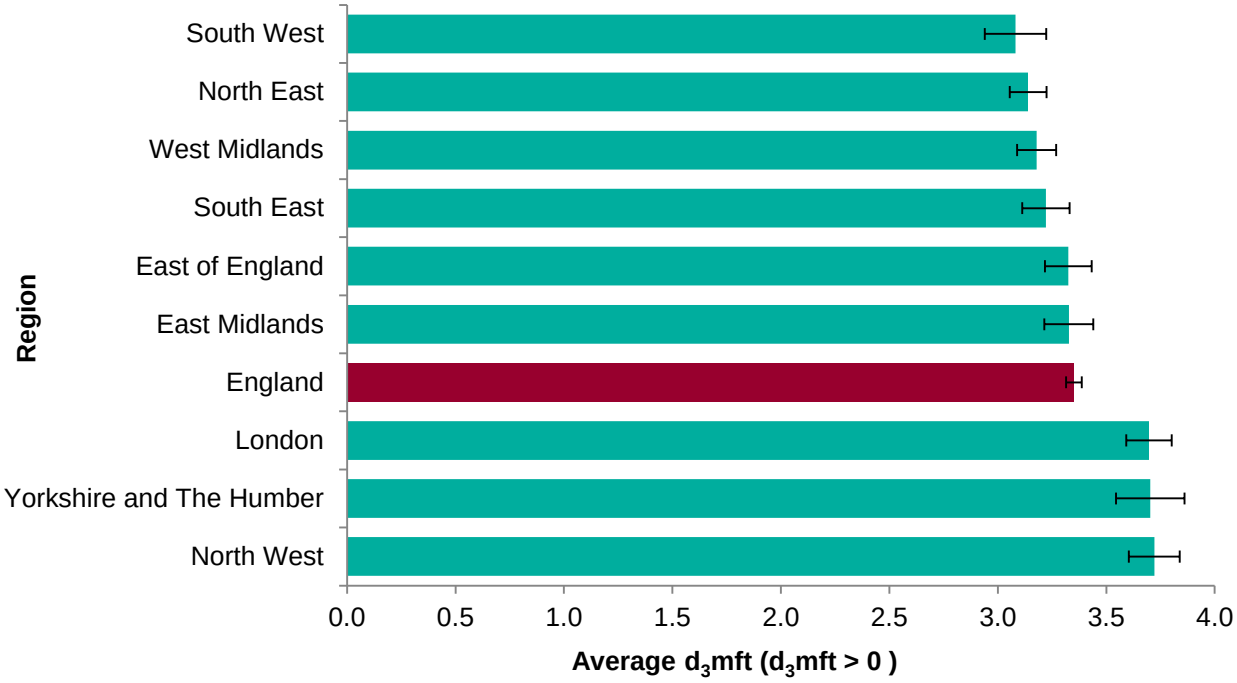


Severity levels among those with any decay

Looking at the severity of decay among only those children with decay experience, separately from children with no obvious decay, allows us to understand more about the extent of disease in these children. In 2017, 23.3% of the examined children had experienced decay. Among these children, the average number of decayed, missing (due to decay) or filled teeth was 3.4 (a child at this age normally has 20 primary teeth). Evidence shows that these are the children who are more likely to develop more carious lesions later in their childhood.[20]

Figure 14 shows the England average and variation across the regions. At upper-tier local authority level there is clear variation of this measure with affected children in Rutland and Wiltshire having only 2.3 teeth affected on average, while those in Harrow had 4.8.

Figure 14. Average number of dentinally decayed, missing (due to decay) and filled teeth ($d_3$mft) among five-year-old children with any decay experience ($d_3$mft>0). England by region, 2017.



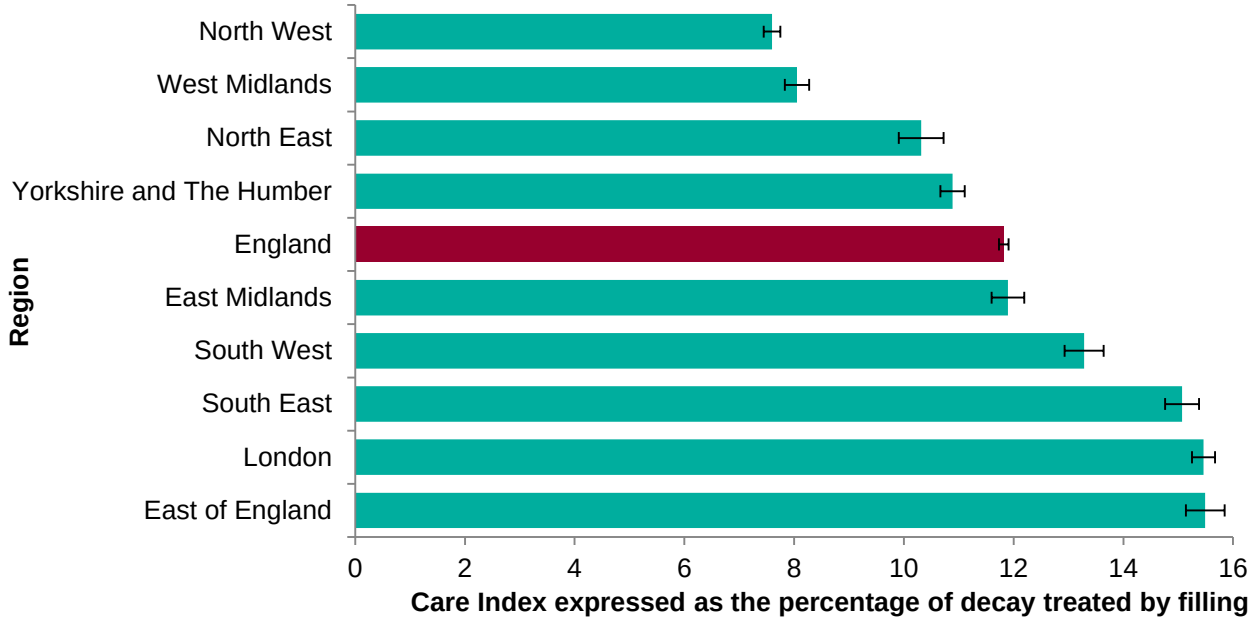
Error bars represent 95% confidence limits

The care index

The care index gives an indication of the restorative activity of dentists in each area. It is the percentage of teeth with decay experience that have been treated by filling (ft/$d_3$mft). Care should be taken in making assumptions about the extent or the quality of clinical care available when using this index. Other intelligence such as levels of deprivation, disease prevalence and the provision of dental services should be taken into account when trying to interpret the implications of high or low scores.

The proportion of decayed teeth that were filled was 11.8% across England as a whole. This varied between regions from 7.6% in the North West to 15.5% in London and the South East (Figure 15), and between upper-tier local authority areas from 2.7% in Blackpool to 31.7% in Islington. Within regions there was also considerable variation, for example, in London the index varied from 11.0% in Merton to 31.7% in Islington.

Figure 15. Care index among five-year-old children in England by region, 2017.

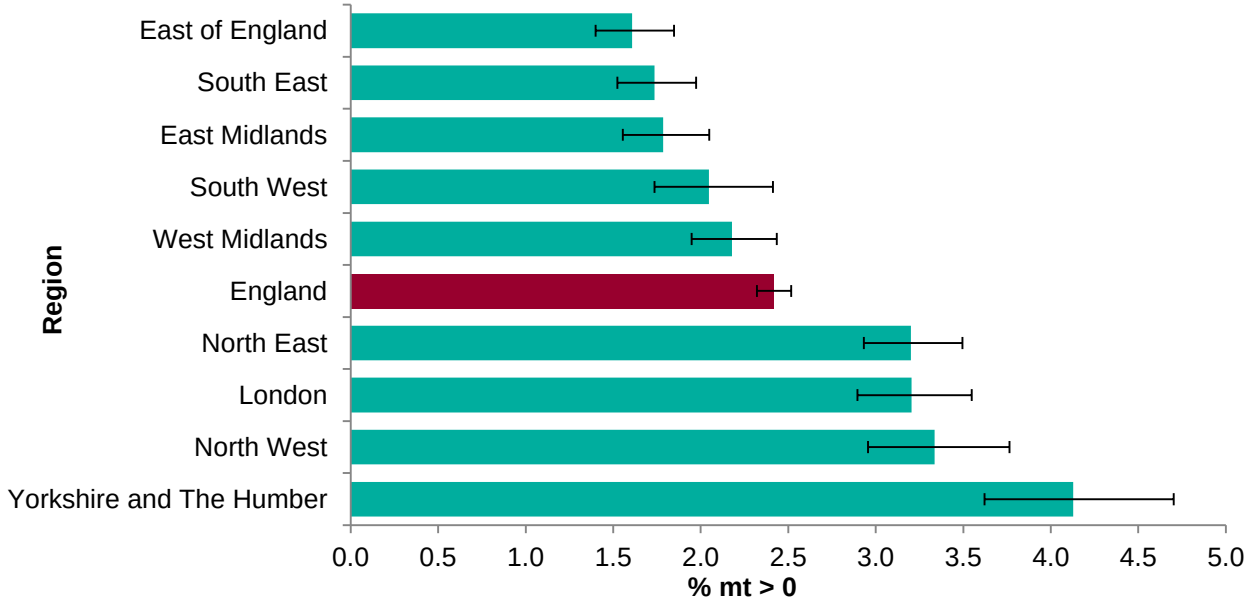


Error bars represent 95% confidence limits

Prevalence of children with extracted teeth (due to dental decay) at age five

Extraction of teeth in young children often involves admission to hospital and a general anaesthetic. This might have occurred at any age prior to the survey, from 12 months onwards.[21] The proportion of five-year-old children with experience of extraction (those with an mt score of one or more) across England was 2.4%. At regional level this ranged from 1.6% to 4.1% (Figure 16). For local authority areas this also varied from 0.0% in Shropshire in the West Midlands to 7.2% in Tower Hamlets in London.

Figure 16. Percentage of five-year-old children who have had one or more teeth extracted due to dental decay (mt > 0) in England by region, 2017.

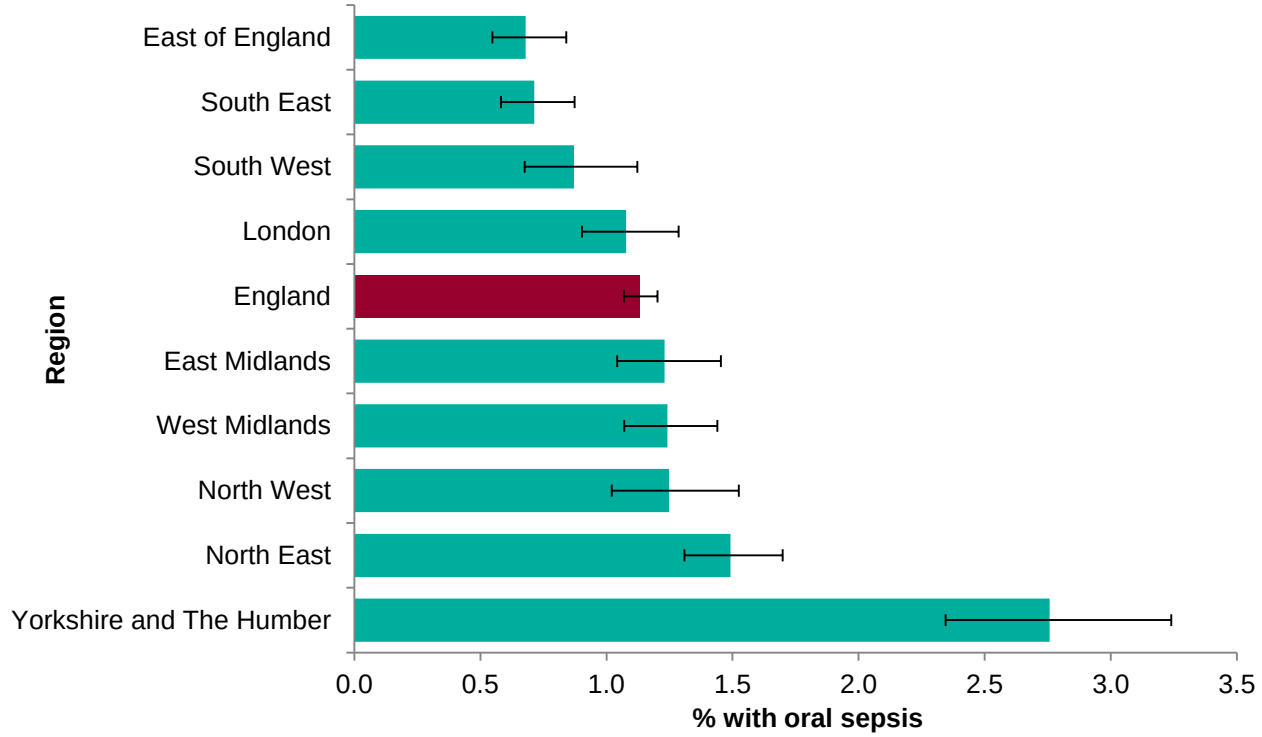


Error bars represent 95% confidence limits

Children with oral sepsis at the time of the examination

At the age of five-years, nearly all oral sepsis will be the result of the dental decay process rather than originating from gum problems. A small number of cases will be linked to traumatic injury of teeth, but no diagnosis of cause was recorded during this survey. Oral sepsis was simply defined in the protocol as the presence of a dental abscess or sinus recorded by visual examination of the soft tissues. Oral sepsis was recorded for 1.1% of volunteers. As expected, the level was generally higher in those areas where there were higher levels of decay. For example, the highest levels occurred in Yorkshire and The Humber (2.8%) and the lowest in the South East and East of England (0.7% Figure 17).

Figure 17. Percentage of five-year-old children with evidence of oral sepsis in England by region, 2017.

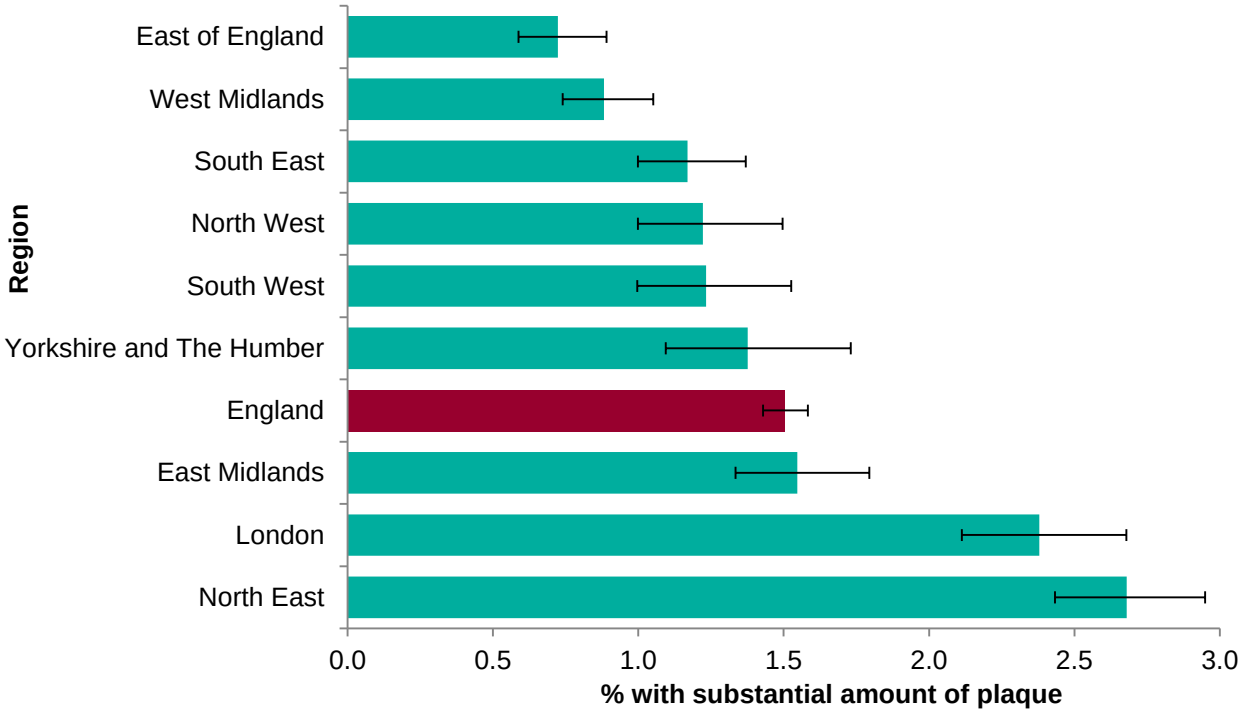


Error bars represent 95% confidence limits

Children with substantial amounts of plaque at the time of the examination

The presence of substantial amounts of plaque compared with ‘visible’ or no plaque provides a proxy measure of children who do not brush their teeth, or brush them rarely. Such children cannot benefit from the protective effects of fluoride in toothpaste on dental decay. A ‘Substantial amount of plaque’ was recorded for 1.5% of volunteers, ranging from 0.7% in the East of England to 2.7% in the North East (Figure 18).

Figure 18: Percentage of five-year-old children with substantial amounts of plaque in England by region, 2017.



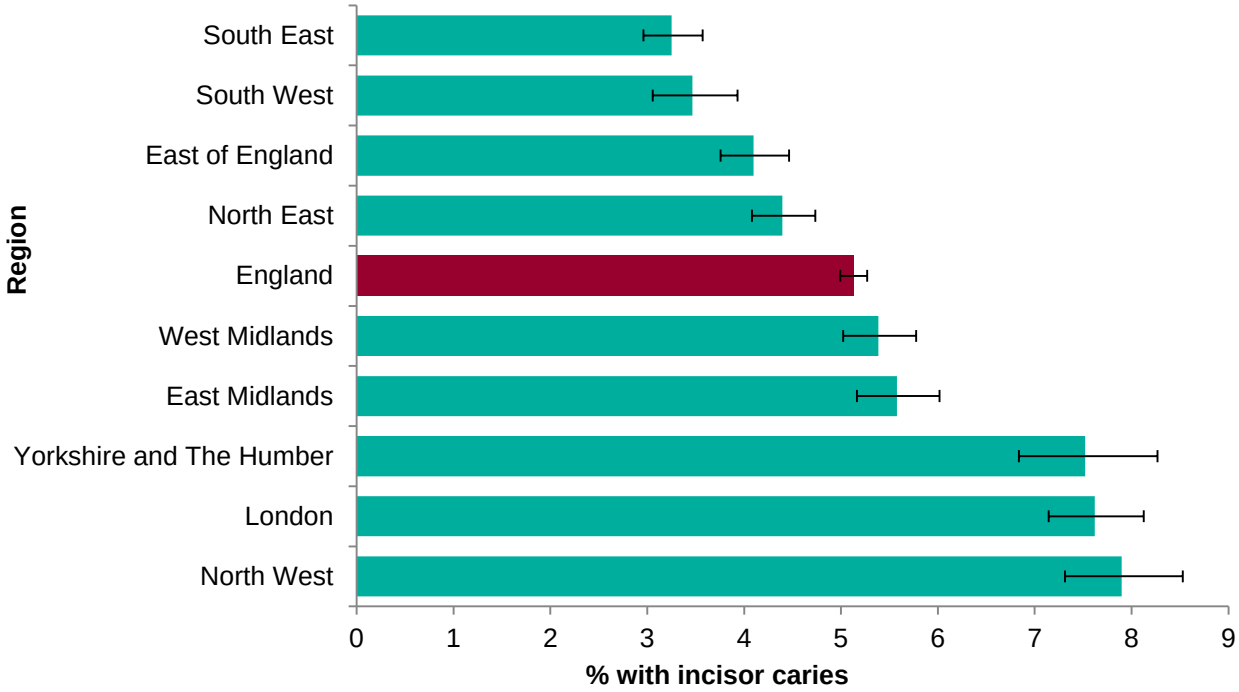
Error bars represent 95% confidence limits

Dental decay affecting incisors

It is useful to know what proportion of children had dental decay affecting one or more of their incisor (front) teeth. This type of decay is usually associated with long term bottle use with sugar-sweetened drinks, especially when these are given overnight or for long periods during the day.

Overall, the prevalence of incisor decay was 5.1% (Figure 19) and varied by region, ranging from 3.3% in the South East to 7.9% in the North West. Comparison at upper-tier local authority level shows far wider variation with a prevalence of 0.8% in North Somerset to 17.8% in Harrow. Within some local authorities there is likely to be marked geographic variation as this type of decay is closely linked with specific health behaviours which are influenced by local cultural norms. Children with incisor decay are likely to have more teeth affected than is the case for general decay, so tackling this problem may lead to relatively higher benefits.

Figure 19. Percentage of five-year-old children with caries affecting incisors in England by region, 2017.



Error bars represent 95% confidence limits

Comparisons by ethnic background

The compulsory collection of ethnicity data resulted in 97.7% of the volunteers being allocated an ethnicity code. The information source was school records which used parents' reporting of family ethnic group when their child started at school. The higher level ethnicity code set, used for school census returns, reflects categories used in the 2001 national population census, with additional sub-categories for Travellers of Irish heritage, pupils of Gypsy/Roma heritage and those from Sri Lanka and Eastern Europe.

Table 1 summarises four measures calculated for six specific ethnic codes and a group 'other' which drew together all those whose ethnic classification did not fit with the other six. Five-year-old children from Eastern European and from Chinese backgrounds had higher prevalence, severity and extent of dental decay than other ethnic groups.

The proportion of children with obvious decay was significantly higher in the Eastern European (49.4%) and Chinese (41.5%) ethnic groups than for other groups, which ranged from 19.6% to 40.9%. The mean $d_3$mft scores among the Eastern European (2.5) and Chinese (1.9) groups were more than three times higher than the white children (0.6). Among those with any obvious decay experience the number of teeth affected in the Eastern European and Chinese groups was 5.1 and 4.6 respectively, significantly higher than for other groups.

The proportion of children with dental decay affecting one or more incisor teeth was highest among Chinese (21.6%) and Eastern European (18.6%) ethnic groups. These proportions compare with 3.5% of the white children, 5.3% of black/black British and 13.6% of those from an Asian background.

Varying levels of caries are found within the Asian/Asian British group and these are shown in Table 2. Children from a Pakistani family are more likely to have general decay than other Asian/Asian British groups and their levels of incisor caries are also higher.

Figures 20 and 21 show prevalence and severity scores for each ethnic group.

Table 1. Inequalities in caries levels found in five-year-old children from different ethnic backgrounds, using several measures*

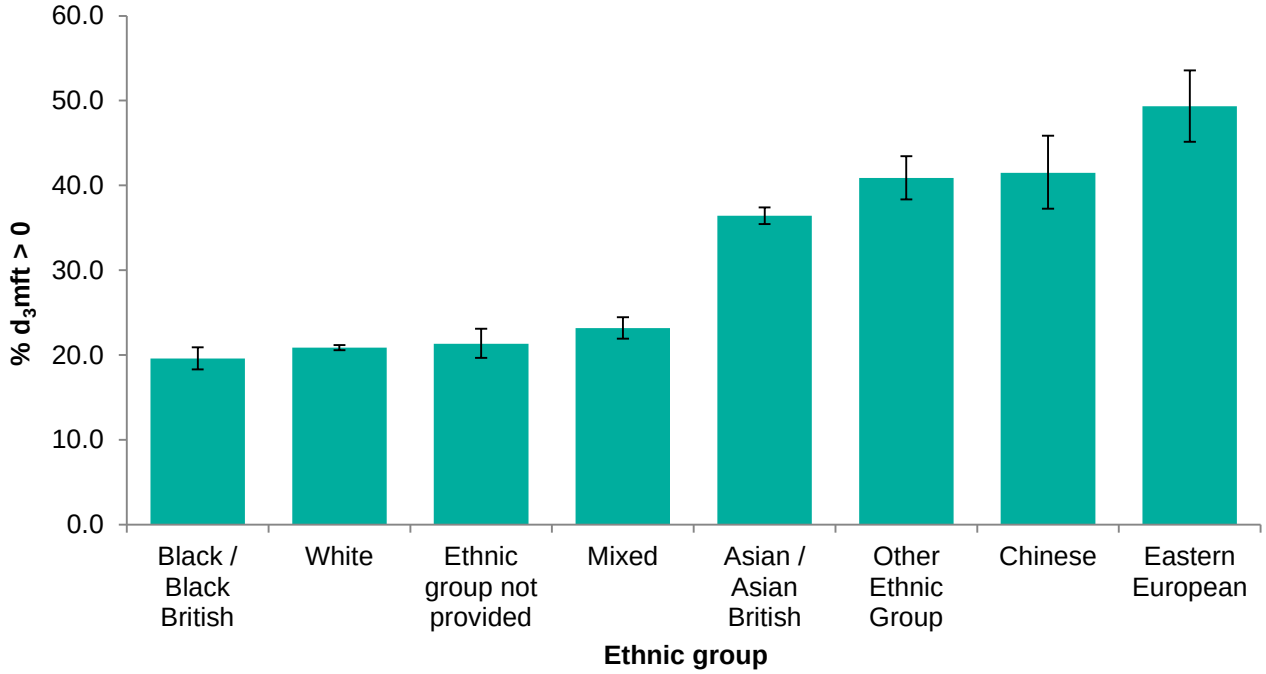
Ethnic group	Sample size (n)	Proportion of children with obvious caries experience	Mean $d_3$mft	Mean $d_3$mft of those with caries experience	Proportion with incisor decay of whole sample
White	74,142	20.9 (20.57-21.16)	0.6 (0.63-0.65)	3.1 (3.03-3.11)	3.5 (3.42-3.68)
Mixed	4,321	23.2 (21.93-24.45)	0.7 (0.67-0.78)	3.1 (2.96-3.28)	4.5 (3.93-5.17)
Asian/Asian British	9,264	36.4 (35.44-37.40)	1.5 (1.47-1.58)	4.2 (4.08-4.29)	13.6 (12.95-14.35)
Black/black British	3,628	19.6 (18.31-20.89)	0.7 (0.61-0.73)	3.4 (3.20-3.61)	5.3 (4.64-6.10)
Chinese - oriental	499	41.5 (37.24-45.85)	1.9 (1.64-2.20)	4.6 (4.17-5.09)	21.6 (18.25-25.47)
Eastern European	539	49.4 (45.15-53.56)	2.5 (2.22-2.79)	5.1 (4.70-5.47)	18.6 (15.50-22.05)
Other ethnic background	1,414	40.9 (38.34-43.46)	1.6 (1.49-1.77)	4.0 (3.75-4.23)	14.9 (13.09-16.80)
Not provided	2,198	21.3 (19.68-23.10)	0.8 (0.71-0.88)	3.7 (3.45-3.97)	5.5 (4.59-6.49)
Total	96,005	23.3 (23.03-23.56)	0.8 (0.77-0.79)	3.4 (3.31-3.39)	5.1 (4.99-5.27)

* 95% lower and upper confidence limits are shown in brackets

Table 2. Inequalities in caries levels found in five-year-old children from different Asian/Asian British sub-groups, using several measures*

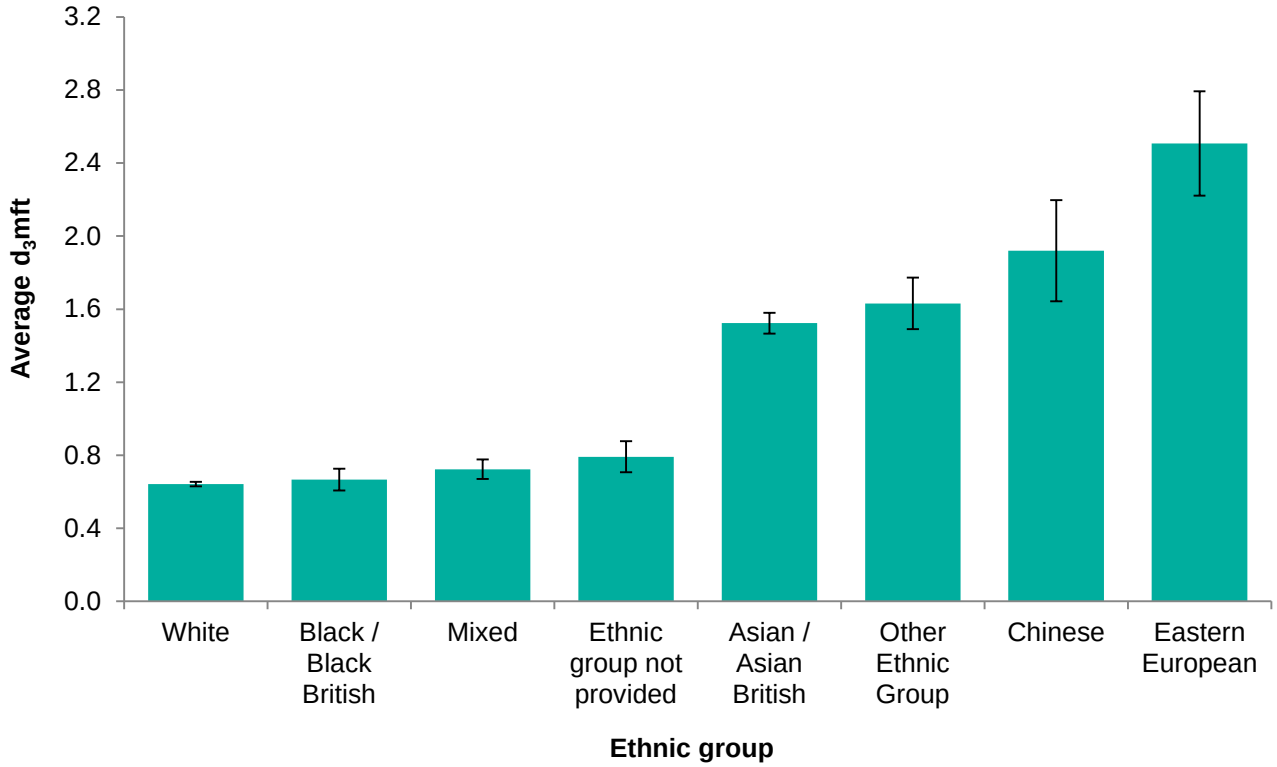
Ethnic group	Sample size (n)	Proportion of children with obvious caries experience	Mean $d_3$mft	Mean $d_3$mft of those with caries experience	Proportion with incisor decay of whole sample
Indian	3,207	28.7 (27.21-30.34)	1.1 (0.99–1.15)	3.7 (3.52-3.90)	10.6 (9.61-11.75)
Pakistani	2,884	45.2 (43.44-47.07)	2.0 (1.90-2.12)	4.4 (4.28-4.62)	16.4 (15.06-17.76)
Bangladeshi	1,509	34.6 (32.23-37.03)	1.4 (1.31-1.59)	4.2 (3.92-4.46)	12.9 (11.32-14.71)
Asian other	1,664	37.5 (35.21-39.85)	1.6 (1.48-1.76)	4.3 (4.06-4.57)	15.3 (13.67-17.14)
Total Asian/Asian British	9,264	36.4 (35.44-37.40)	1.5 (1.47-1.58)	4.2 (4.08-4.29)	13.6 (12.95-14.35)

Figure 20. Variations in the percentage of five-year-old children with obvious decay experience ($d_3$mft > 0) in England by ethnic group, 2017.



Error bars represent 95% confidence limits

Figure 21. Average number of dentinally decayed, missing (due to decay) and filled teeth ($d_3$mft) among five-year-old children in England by ethnic group, 2017.



Error bars represent 95% confidence limits

Comparisons with other surveys over time

The change from passive to explicit consent for dental surveys from 2007 onwards introduced a response bias which is unquantifiable and means that direct comparison cannot be made between surveys in 2008, 2012, 2015 and 2017 with those conducted before 2006.[22]

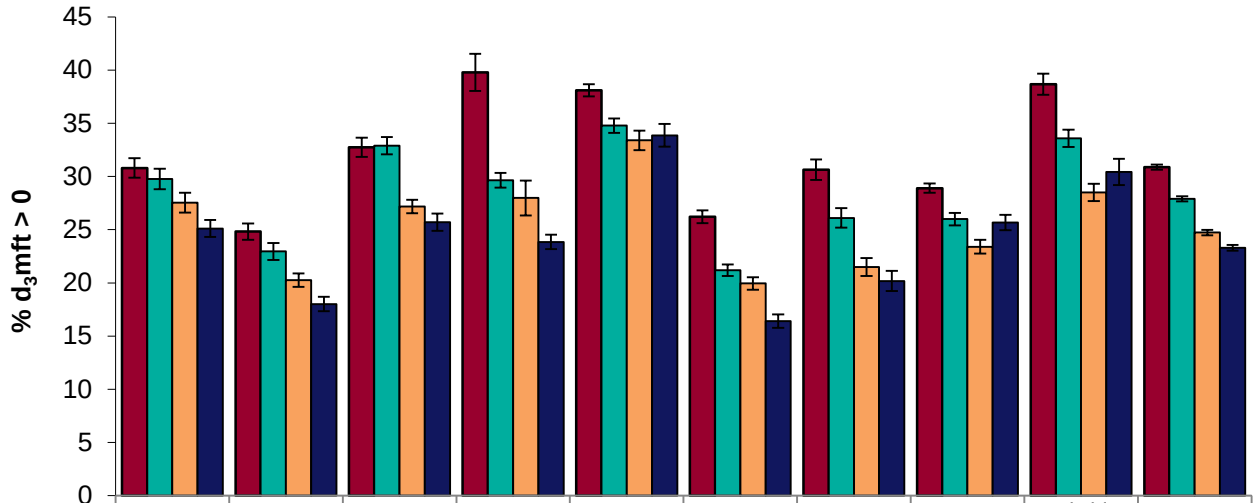
The same methods regarding consent and application of weighting were used in the 2008, 2012 and 2015 surveys and the one reported here. Direct comparison of the results of these surveys is therefore valid. Similar response rates were found in the first three surveys: 66.8% in 2008, 65.2% in 2012 and 66.5% in 2015. The response level in 2017 was 58.9%. It is likely that non-response bias applies in all four surveys and reference should be made to the response levels when making comparisons, particularly when the sample sizes are small and response levels are low.

Comparing whole population results across the four surveys from 2008 to 2017, using the standard PHE method of assessing trend, reveals a clear trend of significant improvement in prevalence of decay levels.[23, 24] The proportion of children in England with experience of obvious decay decreased from 30.9% in 2008 to 27.9% in 2012 to

24.7% in 2015 and to 23.3% in 2017 (Figure 22). This represents a decrease of nearly eight percentage points and a percentage change of 24.6% since 2008.

Using the same trend analysis method shows that there is an overall trend of improvement in all regions over the four surveys. Recent local variations from this trend require further investigation.

Figure 22. Percentage of five-year-old children with decay experience in England by region, 2008, 2012, 2015 and 2017.

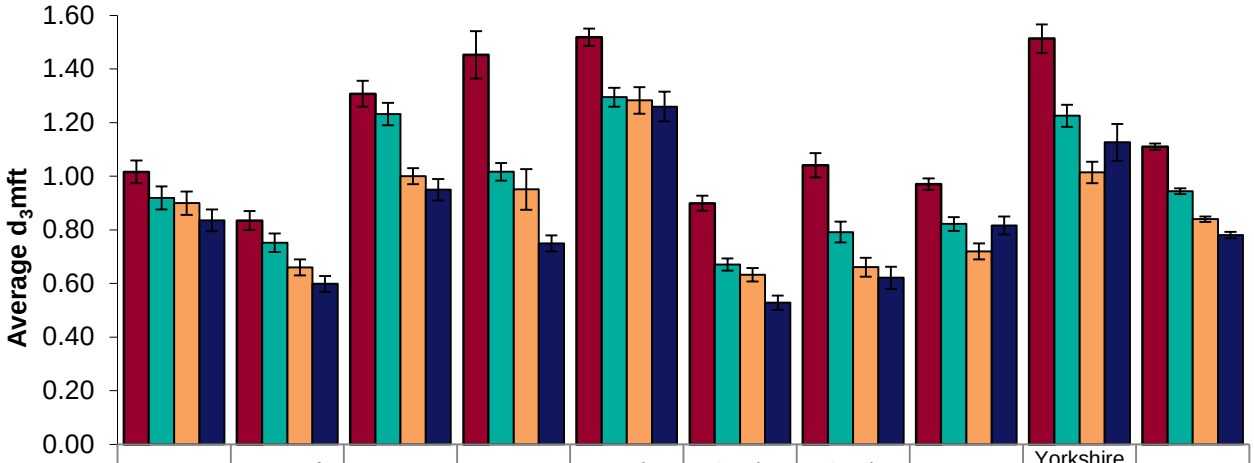


	East Midlands	East of England	London	North East	North West	South East	South West	West Midlands	Yorkshire and the Humber	**England**
2008	30.8	24.8	32.7	39.8	38.1	26.2	30.6	28.9	38.7	30.9
2012	29.8	23.0	32.9	29.7	34.8	21.2	26.1	26.0	33.6	27.9
2015	27.5	20.3	27.2	28.0	33.4	20.0	21.5	23.4	28.5	24.7
2017	25.1	18.0	25.7	23.9	33.9	16.4	20.2	25.7	30.4	23.3

Error bars represent 95% confidence limits

Severity has also decreased over this time with the mean $d_3$mft reducing from 1.1 in 2008, to 0.9 in 2012, to 0.8 (0.84) in 2015 and 0.8 (0.78) in 2017 (Figure 23). This represents a reduction of 0.3 $d_3$mft, a decline of 29.0% between 2008 and 2017.

Figure 23. Average number of dentinally decayed, missing (due to decay) and filled teeth ($d_3$mft) among five-year-old children in England by region, 2008, 2012, 2015 and 2017.

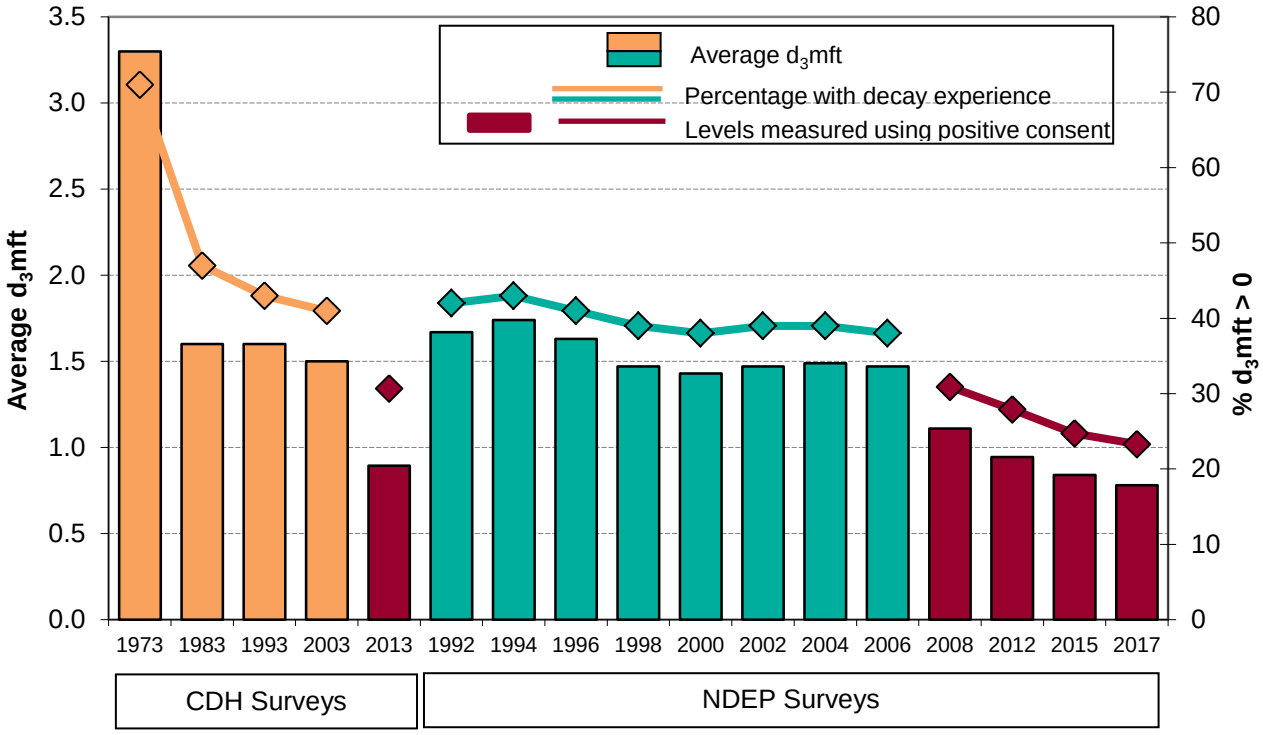


	East Midlands	East of England	London	North East	North West	South East	South West	West Midlands	Yorkshire and the Humber	**England**
2008	1.0	0.8	1.3	1.5	1.5	0.9	1.0	1.0	1.5	1.1
2012	0.9	0.8	1.2	1.0	1.3	0.7	0.8	0.8	1.2	0.9
2015	0.9	0.7	1.0	1.0	1.3	0.6	0.7	0.7	1.0	0.8
2017	0.8	0.6	0.9	0.7	1.3	0.5	0.6	0.8	1.1	0.8

Error bars represent 95% confidence limits

While comparison is limited across the full timeline of these surveys (for the reasons highlighted above), the general trends still give an indication of what has been happening over time. Figure 24 shows there was little change in either the prevalence or severity of dental decay in this age group between 1998 and 2006. Following the change to consent methods it is not possible to determine if any of the change between 2006 and 2008 was due to an actual change in disease levels. However, the surveys carried out using explicit positive consent show a significant reduction in prevalence and severity between 2008 and 2017, as described above. The chart shows the series of decennial child dental health surveys (CDH) which used a slightly different method but also introduced explicit consent for the 2013 survey. The same pattern of stability between 1980 and 2003 is seen, followed by a marked reduction in the 2013 survey.[22]

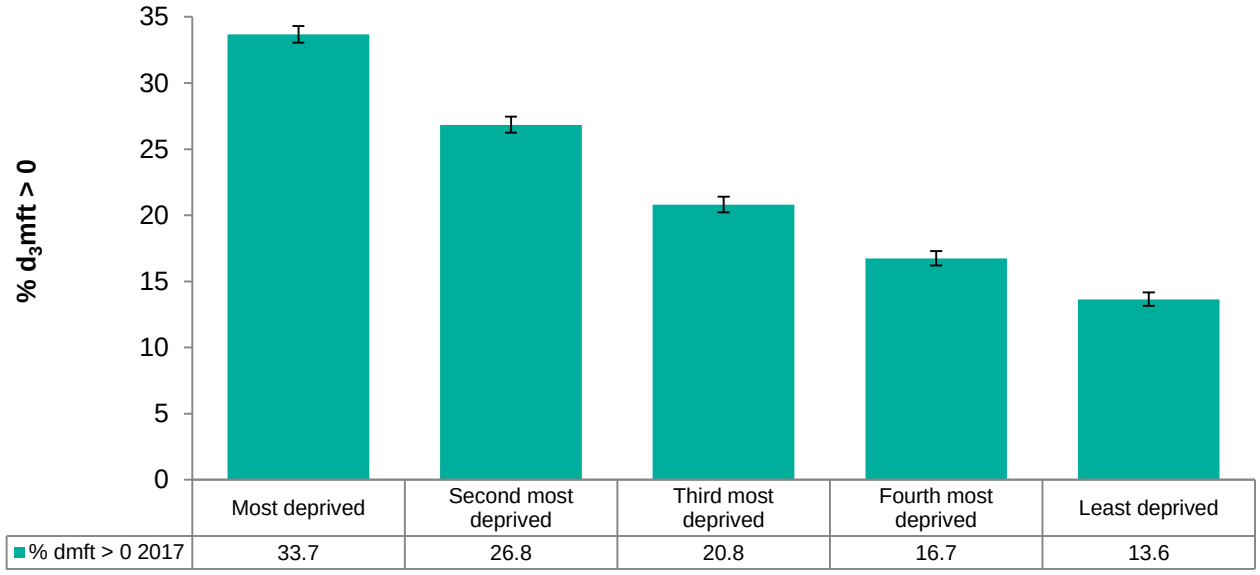
Figure 24. Results of dental surveys of five-year-olds in England from National Child Dental Health surveys and PHE Dental Public Health Epidemiology Programme surveys, 1973 to 2017.



Comparison of inequalities due to deprivation over time

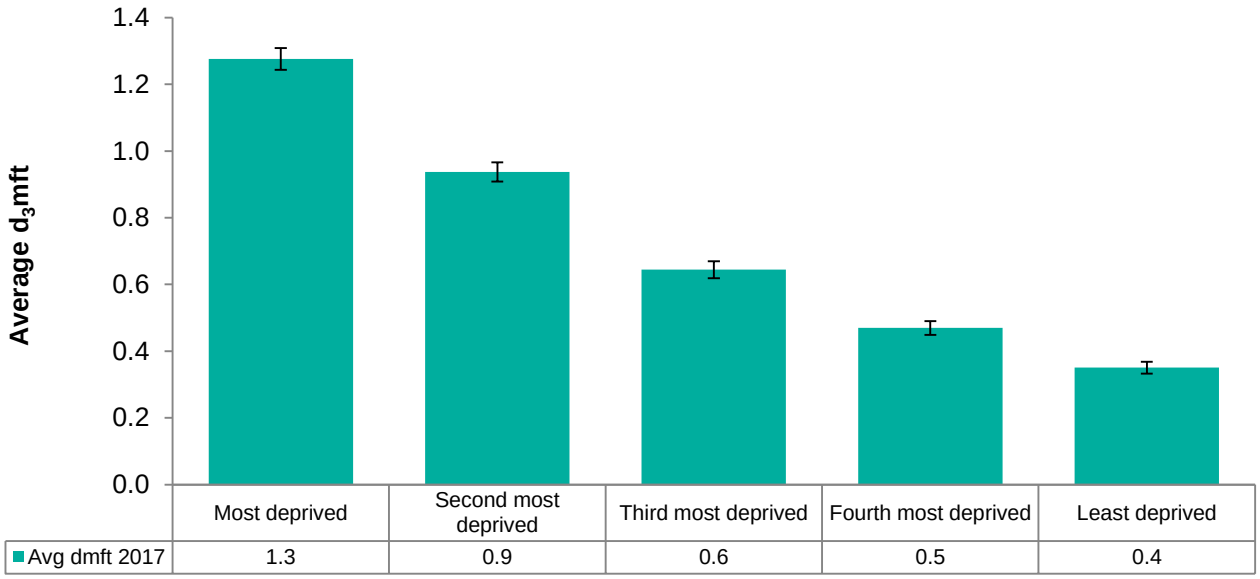
Over many years and in most dental epidemiological surveys in the UK, the relationship between deprivation and dental decay levels has been illustrated. Figures 25 and 26 show the caries prevalence and mean severity split across five deprivation groups (known as deprivation quintiles) in England.

Figure 25. Percentage of five-year-old children with decay experience in England by national Index of Multiple Deprivation (IMD 2015) quintiles, 2017.



Error bars represent 95% confidence limits

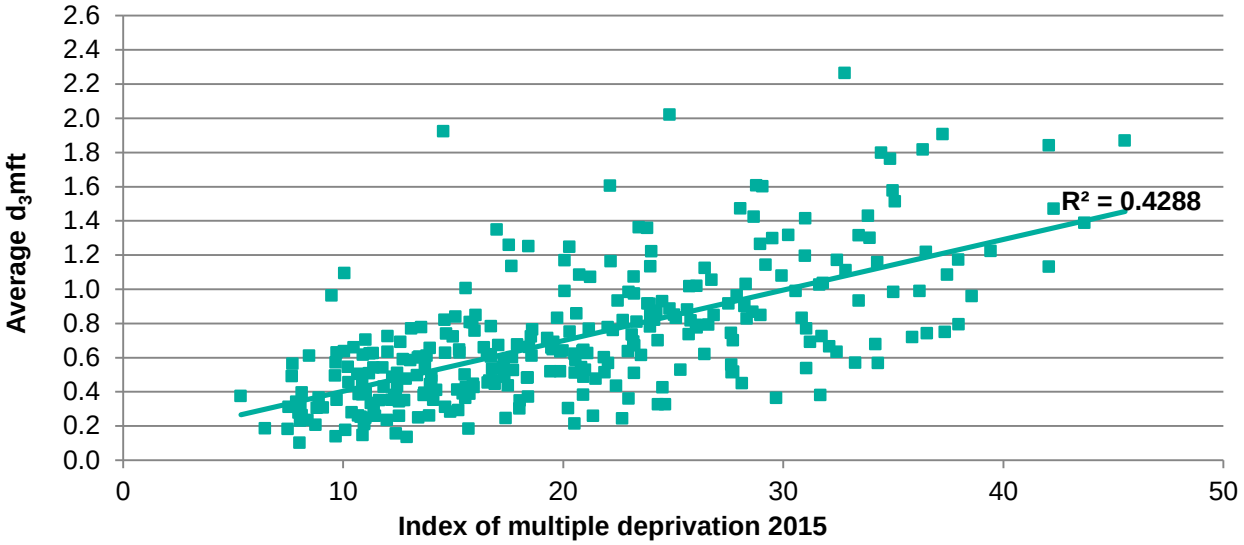
Figure 26. Average number of dentinally decayed, missing (due to decay) and filled teeth ($d_3$mft) among five-year-old children in England by national Index of Multiple Deprivation (IMD 2015) quintiles, 2017.



Error bars represent 95% confidence limits

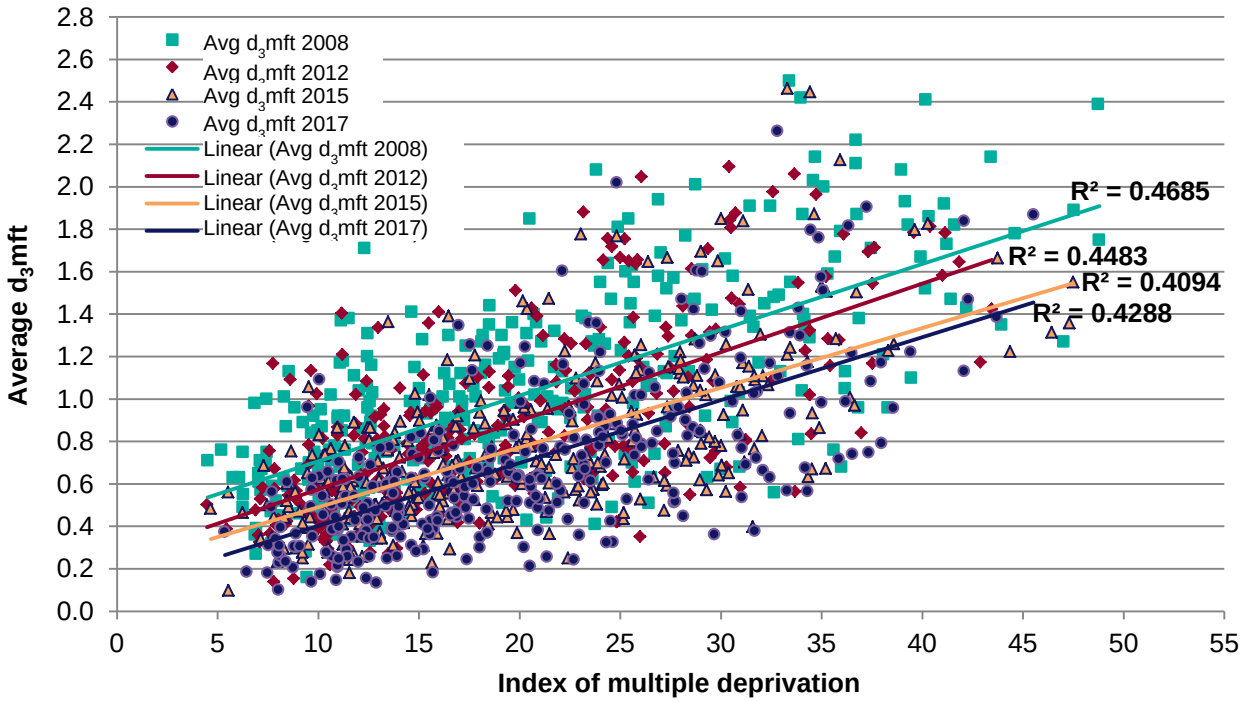
Decay levels are higher in local authority areas where mean deprivation scores are higher. Figure 27 shows the strength of the correlation between the estimates of mean decay severity ($d_3$mft) and mean Index of Multiple Deprivation (IMD 2015) scores for lower-tier local authority areas in England.

Figure 27. Correlation between number of dentinally decayed, missing (due to decay) and filled teeth ($d_3$mft) among five-year-old children and Index of Multiple Deprivation (IMD 2015) score. Lower-tier local authority areas in England, 2017.



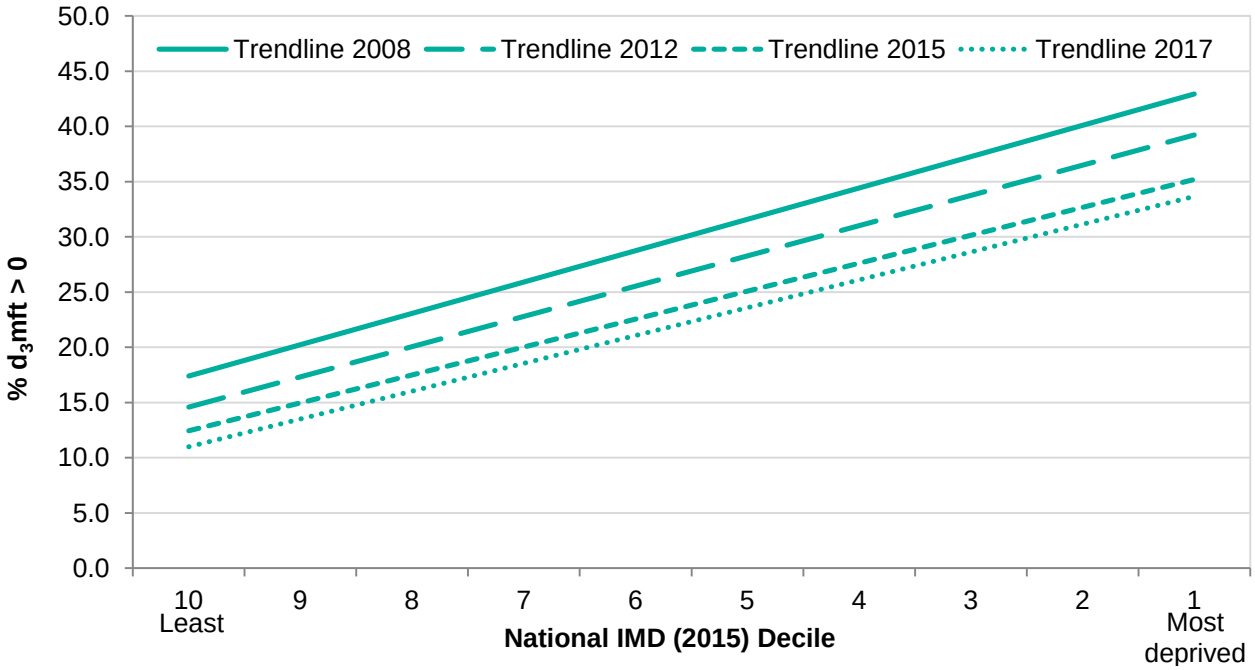
The same correlations have been carried out for the results from the 2008, 2012, 2015 and current survey and are shown in Figure 28. The slope of the lines for each survey and the correlation coefficients appear to remain similar over time, however further analysis of these trends is indicated using the Slope Index of Inequality (Figure 29).

Figure 28. Correlation between numbers of dentinally decayed, missing (due to decay) and filled teeth ($d_3$mft) among five-year-old children and Index of Multiple Deprivation score. Lower-tier local authority areas in England, 2008 (IMD 2007), 2012 (IMD 2010), 2015 and 2017 (IMD 2015).



The gradient in Figure 29 is known as the Slope Index of Inequality (SII). The steeper the gradient the greater the social distribution observed in the outcome indicator. Effectively the SII is like putting a line of best fit through the ten deprivation groups (known as deprivation deciles[x]), but it adjusts for the size of the samples. It would appear that the gap between the slopes is narrowing among the more deprived groups and this suggests that inequalities in caries levels between deprivation groups are reducing (measured using the SII).

Figure 29. Slope index of inequality



Section 3. Implications of results

Inequalities in health

Inequalities in the levels of dental decay experienced by five-year-old children living in different parts of the country and in different life circumstances persist. Frequent exposure of teeth to free sugars, most commonly through eating and drinking sugary snacks and drinks, is the cause of decay.[25] Free sugars are also contributory factors to other issues of public health concern in children, for example, childhood obesity and development of Type II diabetes later in life.

[x] Deprivation deciles divide populations into tenths according to distribution of IMD scores.

There is a clear correlation at lower-tier local authority level between the index of multiple deprivation and decay levels. A similar pattern is also seen in the National Child Measurement Programme (NCMP),[26] with the highest levels of unhealthy weight tending to be found in the most deprived areas. It is not surprising that both surveys show a common association as the factors that lead to dental decay and obesity are similar. Work is underway to link the results of this oral health survey with child level data drawn from the NCMP to establish the nature of the relationship between dental decay levels and childhood height and weight as previously this has not been clearly established.[27] It should also be noted that other factors such as ethnicity, exposure to water fluoridation and geographic location are also independently associated with decay levels in children, over and above that for deprivation.[4]

Changes in levels of dental decay over time

The use of standardised BASCD criteria and a prescribed training and calibration process ensures the ability to look at trend data over time. This is the fourth survey to be carried out since some methodological changes, including the requirement to seek explicit consent in 2007. It provides a fourth data point which confirms a clear trend for lower levels of decay in this age group and signs of a reduction in oral health inequalities.

This finding may be explained by several factors, most likely due to manufacturers increasing concentrations of fluoride in children's toothpastes in response to evidence based recommendations in PHE's Delivering Better Oral Health and local authority commissioned, evidence based community programmes recommended in Commissioning Better Oral Health.[5, 6, 7] The likely effect of these recommended programmes on oral health inequalities has also been highlighted.

Putting this information to use

Data from this survey will be used to produce the dental indicator (4.2 tooth decay in children aged five) in the Public Health Outcomes Framework (PHOF)[1] and NHS Outcomes Framework.[2] This reports the proportion of children who are free of obvious decay for local authority areas.

Summary results can be found in Appendix 1 and Appendix 2 of this report. Full tables of results at PHE, NHS England and local government region, and upper and lower tier local authority level, are available at www.nwph.net/dentalhealth/

For local authorities these data are used as important contributions to joint strategic needs assessments. This is because dental decay levels among five-year-olds can give early indication of the success, or otherwise, of interventions aimed at improving the

oral and general health of very young children including those designed to improve parenting, overall health or diet. Such interventions may need many years to pass before the impact can be measured.

Reliable data on dental decay levels can assist with planning and commissioning dental health improvement programmes, which are the responsibility of local authorities. These would be commissioned following strategic planning, taking into account the measured health needs of the population. Toolkits are available from PHE[12] and NICE[13] about commissioning oral health improvement programmes and there is good evidence that, in addition to place-based generic health improvement activities, which will address some of the common risk factors for dental decay, strategies to increase the exposure to fluoride are effective. In addition PHE have developed a return on investment (ROI) tool that can assist with decision-making about oral health improvement programmes and support the case to invest.[28]

Improving the oral health of children is a PHE priority and in 2016 PHE launched the Children's Oral Health Improvement Programme Board (COHIPB) to provide national systems leadership. The board has over 20 organisational partners who have the shared ambition that, every child grows up free of tooth decay as part of getting the best start in life. The COHIPB has developed a number of resources which support local authorities to deliver their oral health improvement functions for children.

Use of the data at a lower level than local authority boundaries can help to show where inequalities lie within a local authority and therefore where targeted interventions are required. The introduction of a measure showing children with incisor caries will indicate where interventions are required to tackle this specific problem which is related to long term use of a baby bottle and sugary drinks.

Consistent data are available to indicate which ethnic groups are at higher risk of decay, over and above the impact of deprivation.[4] The country level estimates for ethnic groups can be used locally to inform planners about tailoring interventions for specific groups in the population according to their cultural needs.

Local authorities may seek dental public health advice from consultants in dental public health, in PHE centres, with regard to commissioning additional surveys using this method. This would allow them to evaluate their interventions and to investigate specific population groups.

Cleaned and verified copies of the raw, anonymised data will be available to Dental Epidemiology Coordinators.[29] This will enable them and their colleagues working in PHE centres to make maximum use of their data if further analysis is required for local use.

Local authority personnel can apply to become a super-user and access the raw, anonymised data for specific purposes via this process:

1. Local authority requestor to send an email to DentalPHIntelligence@phe.gov.uk providing the following information:
    a. Name of individual to be allocated as 'super user'
    b. Local Authority
    c. Contact details
2. The nominated 'Super User' will be contacted by a member of the Dental Public Health Intelligence Team who will send a data sharing agreement to be sent over for signing.
3. Once the signed agreement has been received, the super user will be sent their (anonymised) data along with a set of analysis guidance notes.

Any other data requests that are for national data, or complex queries, should be emailed to DentalPHIntelligence@phe.gov.uk

Section 4. References

1. Public Health England. Public Health Outcomes Framework [Internet]. Last updated February 2018 [cited 2018 Mar 14]. Available from: https://fingertips.phe.org.uk/profile/public-health-outcomes-framework

2. Department of Health. NHS Outcomes Framework 2016. Available from: www.gov.uk/government/publications/nhs-outcomes-framework-2016-to-2017

3. Public Health England. Water fluoridation: health monitoring report for 2018. Available from: www.gov.uk/government/publications/water-fluoridation-health-monitoring-report-for-england-2018

4. Weston-Price S, Copley V, Smith H and Davies GM. A multi-variable analysis of four factors affecting caries levels among five-year-old children; deprivation, ethnicity, exposure to fluoridated water and geographic region. Accepted for publication by Community Dental Health.

5. GM Davies, J Neville, K Jones and S White. Why are caries levels reducing in five-year-olds in England? British Dental Journal (2017) **223**, 1-5.

6. Public Health England. Delivering better oral health: an evidence based toolkit for prevention [Internet]. Third edition, 2014 [cited 2016 Feb 9]. Available from: www.gov.uk/government/publications/delivering-better-oral-health-an-evidence-based-toolkit-for-prevention

7. Public Health England. Local authorities improving oral health: commissioning better oral health for children and young people. An evidence-informed toolkit for local authorities. Available from: www.gov.uk/government/publications/improving-oral-health-an-evidence-informed-toolkit-for-local-authorities

8. National Dental Inspection Programme (NDIP) 2014. Report of the 2014 Detailed National Dental Inspection Programme of Primary 1 children and the Basic Inspection of Primary 1 and Primary 7 children. Available from: http://ndip.scottishdental.org/wp-content/uploads/2014/10/2014-10-28-NDIP-Report.pdf

9. Picture of oral health 2016. Dental epidemiological survey of 5 year olds 2014/15. Welsh oral health information unit, Cardiff University. Available from: www.cardiff.ac.uk/__data/assets/pdf_file/0006/218589/Picture-of-Oral-Health-2016.pdf

10. The Stationery Office. Health & Social Care Act 2012 [Internet]. 2006 [cited 2016 Feb 9]. Available from: www.legislation.gov.uk/ukpga/2012/7/enacted

11. Secretary of State. Statutory Instrument No 3094. National Health Service, England Social Care Fund, England Public Health, England. The NHS Bodies and Local Authorities (Partnership Arrangements, Care Trusts, Public Health and Local Healthwatch) Regulations 2012 [Internet]. 2012 [cited 2016 Feb 9]. Available from: www.legislation.gov.uk/uksi/2012/3094/part/4/made

12. Public Health England. Local authorities improving oral health: commissioning better oral health for children and young people. An evidence-informed toolkit for local authorities [Internet]. 2014 [cited 2016 Feb 9]. Available from: www.gov.uk/government/publications/improving-oral-health-an-evidence-informed-toolkit-for-local-authorities

13. National Institute for Health and Care Excellence. Oral health: approaches for local authorities and their partners to improve the oral health of their communities [Internet]. NICE guidelines [PH55] 2014 [cited 2016 Feb 9]. Available from: www.nice.org.uk/guidance/ph55

14. Dental public health epidemiology programme. Oral health survey of five-year-old children 2016-17 National protocol Version 1 Public Health England 2016. Gateway ref: 2016226. Available from: www.nwph.net/dentalhealth/survey5(16_17).aspx

15. Public Health England. Oral health survey of five-year-old and 12-year-old children attending special support schools 2014. A report on the prevalence and severity of

dental decay [Internet]. Dental public health epidemiology programme 2015 [cited 2016 Feb 9]. Available from: www.nwph.net/dentalhealth/

16. Pine CM, Pitts NB, Nugent ZJ. British Association for the Study of Community Dentistry (BASCD) guidance on the statistical aspects of training and calibration of examiners for surveys of child dental health. A BASCD co-ordinated dental epidemiology programme quality standard. Community Dental Health. 1997a 14 (Supplement 1):18-29.

17. Pitts NB, Evans DJ, Pine CM. British Association for the Study of Community Dentistry (BASCD) diagnostic criteria for caries prevalence surveys – 1996/97. Community Dental Health. 1997 14 (Supplement 1): 6-9.

18. Pine CM, Pitts NB, Nugent ZJ. British Association for the Study of Community Dentistry (BASCD) guidance on sampling for surveys of child dental health. A BASCD coordinated dental epidemiology programme quality standard. Community Dental Health.1997b 14 (Supplement 1):10-17.

19. Office for National Statistics. Ward population estimates, mid – 2011(Census based) [Internet]. Statistical bulletin, 2013 [cited 2016 Feb 9]. Available from: www.ons.gov.uk/ons/dcp171778_311891.pdf

20. Hall-Scullin, E, Whitehead, H, Milsom, K, Tickle, M, Su, T-L & Walsh, T (2017): Longitudinal study of caries development from childhood to adolescence. Journal of Dental Research **96**, no. 7, 762-767.

21. PHE Hospital episodes for teeth extraction for children 0-19 years, 2011-12 to 2016-17 [Internet]. Last updated April 2018. Available from: www.nwph.net/dentalhealth/Extractions_270317.aspx

22. Davies G.M., Robinson R., Neville J. and Burnside G. (2014): Investigation of bias related to non-return of consent for a dental epidemiological survey of caries among five year olds. Community Dental Health **31**, 21-26.

23. Davies G.M., Jones C.M., Monaghan N., Morgan M.Z., Pine C.M., Pitts N.B., Neville J.S. and Rooney E. (2011): The caries experience of 5 year-old children in Scotland, Wales and England in 2007-2008 and the impact of consent arrangements. Reports of Co-ordinated surveys using BASCD criteria. Community Dental Health **28**, 5-11.

24. Public Health England. Oral health survey of five-year-old children 2012. A report on the prevalence and severity of dental decay [Internet]. National dental epidemiology programme, 2013 [cited 2016 Feb 9]. Available from: www.nwph.net/dentalhealth/

25. Carbohydrates and Health Scientific Advisory Committee on Nutrition 2015. The stationery office, London. Available from: www.gov.uk/government/publications/sacn-carbohydrates-and-health-report

26. National Child Measurement Programme: England, 2014/15 school year. 2015. Health and Social Care Information Centre. Available from: www.hscic.gov.uk/catalogue/PUB19109/nati-chil-meas-prog-eng-2014-2015-rep.pdf

27. Public Health England. The relationship between dental caries and obesity in children: an evidence summary 2015. Available from: www.gov.uk/government/uploads/system/uploads/attachment_data/file/466334/Caries_obesity_Evidence_SummaryOCT2015FINAL.pdf

28. Public Health England. Improving the oral health of children: cost effective commissioning. Available from: www.gov.uk/government/publications/improving-the-oral-health-of-children-cost-effective-commissioning

29. Contact details of local Dental Epidemiology Coordinators available from: www.nwph.net/dentalhealth/

Section 5. Summary tables

The complete sets of tables with detailed results are available from: www.nwph.net/dentalhealth/

Appendix 1. National Dental Epidemiology Programme for England, Oral health survey of five-year-old children 2017, upper-tier local authority (LA)

Public Health England

LA did not partake in survey

Based on fewer than 30 volunteers

Region	Upper-Tier LA Code	Upper-Tier LA Name	% of sample examined (* unavailable)	Weighted Measures					
				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (d_3mft > 0)	% with incisor caries
Country	**E92000001**	**England**	**58.9**	**0.8**	**0.6**	**76.7**	**23.3**	**3.4**	**5.1**
East Midlands	E06000015	Derby	47.8	0.9	0.7	76.0	24.0	3.8	5.9
	E10000007	Derbyshire	55.1	0.6	0.5	79.6	20.4	3.1	3.4
	E06000016	Leicester	69.9	1.6	1.2	61.3	38.7	4.1	12.1
	E10000018	Leicestershire	72.0	0.6	0.5	77.7	22.3	2.6	3.6
	E10000019	Lincolnshire	67.8	0.9	0.7	76.0	24.0	3.8	7.0
	E10000021	Northamptonshire	70.9	0.7	0.6	75.7	24.3	3.0	4.4
	E06000018	Nottingham	70.5	1.2	1.0	74.1	25.9	4.7	8.0
	E10000024	Nottinghamshire	57.1	0.6	0.4	79.9	20.1	2.8	3.2
	E06000017	Rutland	70.7	0.4	0.3	84.4	15.6	2.3	1.3
East of England	E06000055	Bedford	72.7	1.3	0.9	68.7	31.3	4.0	10.7
	E10000003	Cambridgeshire	60.9	0.4	0.3	87.1	12.9	2.8	3.0
	E06000056	Central Bedfordshire	79.3	0.5	0.3	82.3	17.7	2.6	3.7
	E10000012	Essex	52.0	0.4	0.3	85.5	14.5	2.7	1.9
	E10000015	Hertfordshire	56.4	0.4	0.3	84.6	15.4	2.6	3.7
	E06000032	Luton	52.3	1.6	1.1	62.4	37.6	4.3	12.7
	E10000020	Norfolk	60.2	0.7	0.5	84.6	15.4	4.2	3.5
	E06000031	Peterborough	54.0	1.1	0.9	67.6	32.4	3.3	8.4
	E06000033	Southend-on-Sea	55.4	0.5	0.4	80.4	19.6	2.7	2.7
	E10000029	Suffolk	54.6	0.5	0.4	83.0	17.0	3.1	3.4
	E06000034	Thurrock	57.7	0.6	0.5	79.5	20.5	2.9	3.7
London	E09000002	Barking and Dagenham	37.3	1.0	0.7	71.4	28.6	3.4	8.9
	E09000003	Barnet	50.2	0.8	0.5	75.9	24.1	3.2	5.5
	E09000004	Bexley	59.7	0.4	0.3	85.6	14.4	2.7	2.0
	E09000005	Brent	59.9	1.3	0.9	65.4	34.6	3.7	9.2
	E09000006	Bromley	62.0	0.5	0.4	82.6	17.4	2.7	4.6
	E09000007	Camden	58.6	1.0	0.7	70.0	30.0	3.4	9.9
	E09000008	Croydon	52.8	1.0	0.7	71.5	28.5	3.6	8.3
	E09000009	Ealing	*	1.0	0.6	69.3	30.7	3.4	6.5
	E09000010	Enfield	51.0	1.1	0.7	69.5	30.5	3.7	10.6
	E09000011	Greenwich	64.7	0.8	0.5	77.8	22.2	3.5	6.5
	E09000012	Hackney (including City of London)	37.0	0.7	0.6	77.1	22.9	3.2	7.1
	E09000013	Hammersmith and Fulham	41.4	0.8	0.7	75.8	24.2	3.4	6.2
	E09000014	Haringey	63.1	1.3	0.9	71.0	29.0	4.5	12.4
	E09000015	Harrow	63.8	1.9	1.5	60.4	39.6	4.8	17.8
	E09000016	Havering	51.7	0.5	0.4	79.5	20.5	2.5	2.2
	E09000017	Hillingdon	74.3	1.2	1.0	67.5	32.5	3.8	13.8
	E09000018	Hounslow	52.1	0.8	0.6	74.3	25.7	3.3	6.4
	E09000019	Islington	54.2	0.6	0.4	77.5	22.5	2.5	4.3
	E09000020	Kensington and Chelsea	41.9	0.8	0.5	73.4	26.6	3.1	10.0
	E09000021	Kingston upon Thames	64.7	0.6	0.4	78.5	21.5	2.9	6.0
	E09000022	Lambeth	63.0	0.6	0.4	78.3	21.7	2.9	4.5
	E09000023	Lewisham	69.3	0.5	0.3	80.6	19.4	2.8	3.8
	E09000024	Merton	58.5	0.8	0.6	77.5	22.5	3.8	5.2
	E09000025	Newham	65.8	1.3	1.0	71.0	29.0	4.5	8.8
	E09000026	Redbridge	47.5	0.7	0.6	79.1	20.9	3.5	5.9
	E09000027	Richmond upon Thames	69.9	0.5	0.4	83.6	16.4	3.0	3.5
	E09000028	Southwark	68.9	0.4	0.3	84.1	15.9	2.4	2.8
	E09000029	Sutton	60.6	0.6	0.4	74.4	25.6	2.5	5.6
	E09000030	Tower Hamlets	40.4	1.2	0.8	68.9	31.1	3.9	10.8
	E09000031	Waltham Forest	36.6	1.4	1.1	67.1	32.9	4.3	12.8
	E09000032	Wandsworth	53.0	1.0	0.7	74.2	25.8	3.8	8.4
	E09000033	Westminster	53.0	0.9	0.7	69.7	30.3	3.1	9.0

Appendix 1 continued. National Dental Epidemiology Programme for England, Oral health survey of five-year-old children 2017, upper-tier local authority (LA)

Public Health England

LA did not partake in survey

Based on fewer than 30 volunteers

Region	Upper-Tier LA Code	Upper-Tier LA Name	% of sample examined (* unavailable)	Weighted Measures					
				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
North East	E06000047	County Durham	52.3	0.8	0.6	74.2	25.8	3.1	4.9
	E06000005	Darlington	50.9	0.9	0.6	73.6	26.4	3.3	4.8
	E08000037	Gateshead	60.3	0.6	0.5	76.8	23.2	2.7	3.6
	E06000001	Hartlepool	60.0	0.6	0.5	79.5	20.5	2.8	3.5
	E06000002	Middlesbrough	60.2	1.2	0.9	67.9	32.1	3.6	8.5
	E08000021	Newcastle upon Tyne	50.2	0.7	0.5	80.7	19.3	3.6	4.1
	E08000022	North Tyneside	65.4	0.5	0.4	80.0	20.0	2.7	2.7
	E06000057	Northumberland	55.5	0.6	0.4	77.4	22.6	2.8	3.8
	E06000003	Redcar and Cleveland	61.5	0.9	0.6	75.1	24.9	3.6	4.2
	E08000023	South Tyneside	60.8	0.7	0.4	78.3	21.7	3.1	1.8
	E06000004	Stockton-on-Tees	64.6	0.6	0.4	79.4	20.6	3.1	4.0
	E08000024	Sunderland	52.9	1.0	0.7	71.6	28.4	3.5	6.6
North West	E06000008	Blackburn with Darwen	45.7	1.8	1.5	57.4	42.6	4.3	9.9
	E06000009	Blackpool	37.1	1.0	0.8	75.1	24.9	3.9	5.7
	E08000001	Bolton	58.8	1.6	1.3	62.2	37.8	4.2	9.9
	E08000002	Bury	43.1	1.0	0.8	64.8	35.2	2.8	5.7
	E06000049	Cheshire East							
	E06000050	Cheshire West and Chester	38.4	0.7	0.5	79.3	20.7	3.3	1.2
	E10000006	Cumbria	59.0	1.0	0.8	70.9	29.1	3.5	5.0
	E06000006	Halton	55.0	1.1	0.8	69.6	30.4	3.6	7.7
	E08000011	Knowsley	50.3	1.5	1.3	57.7	42.3	3.5	11.5
	E10000017	Lancashire	53.2	1.3	1.1	66.0	34.0	3.7	7.1
	E08000012	Liverpool	50.6	1.4	1.1	65.4	34.6	4.0	10.0
	E08000003	Manchester	62.4	1.9	1.5	57.0	43.0	4.3	13.8
	E08000004	Oldham	40.8	1.4	1.2	65.2	34.8	4.1	10.3
	E08000005	Rochdale	47.9	1.9	1.6	52.9	47.1	4.0	13.2
	E08000006	Salford	65.0	1.5	1.3	55.4	44.6	3.4	11.1
	E08000014	Sefton	68.0	0.9	0.7	70.4	29.6	3.0	4.9
	E08000013	St. Helens	57.1	1.4	1.2	61.8	38.2	3.7	11.6
	E08000007	Stockport	57.8	1.0	0.8	72.8	27.2	3.6	7.3
	E08000008	Tameside	53.8	1.2	1.0	65.9	34.1	3.4	10.5
	E08000009	Trafford	70.0	0.8	0.6	81.0	19.0	4.0	6.3
	E06000007	Warrington	31.1	0.8	0.7	79.7	20.3	3.8	5.7
	E08000010	Wigan	63.9	1.2	0.9	62.4	37.6	3.1	8.1
	E08000015	Wirral							
South East	E06000036	Bracknell Forest							
	E06000043	Brighton and Hove	89.5	0.4	0.2	82.6	17.4	2.6	2.7
	E10000002	Buckinghamshire	68.7	0.7	0.5	82.8	17.2	3.9	5.9
	E10000011	East Sussex	48.8	0.4	0.3	86.9	13.1	3.2	2.2
	E10000014	Hampshire	72.0	0.4	0.3	86.8	13.2	2.9	2.4
	E06000046	Isle of Wight							
	E10000016	Kent	62.8	0.6	0.4	83.7	16.3	3.5	2.9
	E06000035	Medway	56.1	0.7	0.5	78.3	21.7	3.2	4.1
	E06000042	Milton Keynes	72.4	0.7	0.6	78.7	21.3	3.4	5.9
	E10000025	Oxfordshire	72.6	0.6	0.5	80.2	19.8	3.2	3.4
	E06000044	Portsmouth							
	E06000038	Reading	65.4	0.8	0.7	77.8	22.2	3.5	4.2
	E06000039	Slough	64.8	1.6	1.3	58.5	41.5	3.9	15.6
	E06000045	Southampton							
	E10000030	Surrey	58.1	0.4	0.3	87.0	13.0	2.8	2.1
	E06000037	West Berkshire	66.6	0.5	0.3	82.7	17.3	2.6	2.7
	E10000032	West Sussex	*	0.4	0.3	84.9	15.1	2.9	2.3
	E06000040	Windsor and Maidenhead							
	E06000041	Wokingham							

Appendix 1 continued. National Dental Epidemiology Programme for England, Oral health survey of five-year-old children 2017, upper-tier local authority (LA)

Public Health England

LA did not partake in survey

Based on fewer than 30 volunteers

Region	Upper-Tier LA Code	Upper-Tier LA Name	% of sample examined (* unavailable)	Weighted Measures					
				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
South West	E06000022	Bath and North East Somerset	60.2	0.7	0.6	74.2	25.8	2.8	2.5
	E06000028	Bournemouth							
	E06000023	Bristol, City of	55.8	0.8	0.6	77.5	22.5	3.6	4.7
	E06000052	Cornwall (including Isles of Scilly)							
	E10000008	Devon	75.1	0.5	0.4	82.1	17.9	2.8	2.8
	E10000009	Dorset							
	E10000013	Gloucestershire	62.7	0.7	0.5	79.9	20.1	3.5	5.3
	E06000024	North Somerset	62.9	0.4	0.2	85.2	14.8	2.9	0.8
	E06000026	Plymouth	88.1	0.8	0.5	78.6	21.4	3.6	2.6
	E06000029	Poole							
	E10000027	Somerset	50.7	0.6	0.5	80.4	19.6	3.0	2.5
	E06000025	South Gloucestershire	66.6	0.6	0.4	82.2	17.8	3.5	2.4
	E06000030	Swindon	71.8	0.5	0.4	82.7	17.3	2.9	5.2
	E06000027	Torbay	75.5	1.2	0.9	65.3	34.7	3.4	6.7
	E06000054	Wiltshire	84.3	0.5	0.4	77.9	22.1	2.3	3.0
West Midlands	E08000025	Birmingham	44.9	0.8	0.7	73.9	26.1	3.0	5.3
	E08000026	Coventry	68.3	1.0	0.9	69.3	30.7	3.4	8.1
	E08000027	Dudley	55.3	0.6	0.4	77.4	22.6	2.5	3.2
	E06000019	Herefordshire, County of	82.9	1.1	0.9	69.5	30.5	3.6	6.8
	E08000028	Sandwell	57.7	0.7	0.5	74.6	25.4	2.9	4.8
	E06000051	Shropshire	55.4	0.6	0.6	81.2	18.8	3.3	5.7
	E08000029	Solihull	62.1	0.5	0.4	83.7	16.3	2.8	4.2
	E10000028	Staffordshire	54.2	0.4	0.4	83.7	16.3	2.5	2.2
	E06000021	Stoke-on-Trent	51.9	1.2	1.0	67.4	32.6	3.6	7.3
	E06000020	Telford and Wrekin	58.8	0.9	0.7	70.9	29.1	3.2	7.1
	E08000030	Walsall	57.8	0.8	0.6	76.6	23.4	3.3	4.9
	E10000031	Warwickshire	68.2	0.5	0.4	78.4	21.6	2.5	2.8
	E08000031	Wolverhampton	56.1	1.0	0.8	71.6	28.4	3.5	7.4
	E10000034	Worcestershire	56.1	0.6	0.5	78.2	21.8	2.9	3.3
Yorkshire and the Humber	E08000016	Barnsley							
	E08000032	Bradford	49.5	1.8	1.2	60.2	39.8	4.5	11.4
	E08000033	Calderdale	62.1	1.0	0.7	70.7	29.3	3.3	5.1
	E08000017	Doncaster							
	E06000011	East Riding of Yorkshire							
	E06000010	Kingston upon Hull, City of	60.6	1.1	0.9	67.2	32.8	3.4	8.0
	E08000034	Kirklees	64.8	1.1	0.8	67.5	32.5	3.3	9.3
	E08000035	Leeds	56.3	1.1	0.9	68.9	31.1	3.6	9.5
	E06000012	North East Lincolnshire	46.0	0.9	0.7	77.1	22.9	3.8	5.7
	E06000013	North Lincolnshire	65.2	0.6	0.4	77.8	22.2	2.9	3.6
	E10000023	North Yorkshire	70.0	0.6	0.5	78.2	21.8	2.8	3.3
	E08000018	Rotherham							
	E08000019	Sheffield							
	E08000036	Wakefield	56.2	0.9	0.7	71.2	28.8	3.2	5.2
	E06000014	York	69.8	0.6	0.5	84.1	15.9	3.7	3.6
Region	E12000004	East Midlands	65.8	0.8	0.7	74.9	25.1	3.3	5.6
	E12000006	East of England	55.8	0.6	0.5	82.0	18.0	3.3	4.1
	E12000007	London	55.3	0.9	0.7	74.3	25.7	3.7	7.6
	E12000001	North East	57.0	0.7	0.5	76.1	23.9	3.1	4.4
	E12000002	North West	52.5	1.3	1.0	66.1	33.9	3.7	7.9
	E12000008	South East	64.1	0.5	0.4	83.6	16.4	3.2	3.3
	E12000009	South West	66.4	0.6	0.5	79.8	20.2	3.1	3.5
	E12000005	West Midlands	58.1	0.8	0.7	74.3	25.7	3.2	5.4
	E12000003	Yorkshire and The Humber	59.5	1.1	0.8	69.6	30.4	3.7	7.5
Country	**E92000001**	**England**	**58.9**	**0.8**	**0.6**	**76.7**	**23.3**	**3.4**	**5.1**

Appendix 2. National Dental Epidemiology Programme for England, Oral health survey of five-year-old children 2017, lower-tier local authority (LA)

Public Health England

LA did not partake in survey
Based on fewer than 30 volunteers

Region	Lower-Tier LA Code	Lower-Tier LA Name	% of sample examined (* unavailable)	Weighted Measures					
				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
Country	**E92000001**	**England**	**58.9**	**0.8**	**0.6**	**76.7**	**23.3**	**3.4**	**5.1**
East Midlands	E07000032	Amber Valley	59.8	0.4	0.4	85.3	14.7	3.0	2.7
	E07000170	Ashfield	49.2	0.7	0.5	74.9	25.1	2.7	3.4
	E07000171	Bassetlaw	58.6	0.6	0.4	80.0	20.0	3.0	2.8
	E07000129	Blaby	70.2	0.6	0.5	78.4	21.6	2.6	3.3
	E07000033	Bolsover	60.9	1.0	0.7	65.1	34.9	2.9	3.9
	E07000136	Boston	69.4	2.0	1.7	59.0	41.0	4.9	17.3
	E07000172	Broxtowe	69.7	0.3	0.3	86.8	13.2	2.4	1.5
	E07000130	Charnwood	72.5	0.6	0.5	77.9	22.1	2.7	3.3
	E07000034	Chesterfield	34.4	0.9	0.7	75.4	24.6	3.7	7.3
	E07000150	Corby	71.3	1.1	0.9	65.4	34.6	3.0	4.3
	E07000151	Daventry	68.6	0.6	0.5	79.2	20.8	2.8	3.2
	E06000015	Derby	47.8	0.9	0.7	76.0	24.0	3.8	5.9
	E07000035	Derbyshire Dales	61.1	0.4	0.3	89.2	10.8	3.5	0.9
	E07000137	East Lindsey	60.0	0.8	0.7	73.2	26.8	3.2	4.7
	E07000152	East Northamptonshire	71.3	0.4	0.3	80.9	19.1	2.1	1.2
	E07000036	Erewash	54.8	0.7	0.7	75.2	24.8	3.0	2.2
	E07000173	Gedling	55.8	0.4	0.4	78.0	22.0	2.0	1.8
	E07000131	Harborough	72.0	0.4	0.3	83.4	16.6	2.4	2.2
	E07000037	High Peak	62.2	0.6	0.4	74.5	25.5	2.4	4.3
	E07000132	Hinckley and Bosworth	70.8	0.5	0.4	80.6	19.4	2.5	3.8
	E07000153	Kettering	71.6	0.8	0.6	75.3	24.7	3.4	5.2
	E06000016	Leicester	69.9	1.6	1.2	61.3	38.7	4.1	12.1
	E07000138	Lincoln	61.7	0.7	0.7	80.7	19.3	3.7	7.9
	E07000174	Mansfield	57.5	0.8	0.7	76.0	24.0	3.3	6.3
	E07000133	Melton	71.7	0.5	0.4	78.3	21.7	2.3	4.1
	E07000175	Newark and Sherwood	55.6	0.7	0.6	77.7	22.3	3.2	4.8
	E07000038	North East Derbyshire	50.8	0.6	0.5	86.0	14.0	4.4	3.9
	E07000139	North Kesteven	75.7	0.3	0.2	89.9	10.1	2.5	2.6
	E07000134	North West Leicestershire	73.2	0.7	0.6	74.8	25.2	2.9	4.8
	E07000154	Northampton	70.0	0.9	0.7	74.6	25.4	3.6	7.7
	E06000018	Nottingham	70.5	1.2	1.0	74.1	25.9	4.7	8.0
	E07000135	Oadby and Wigston	73.6	0.8	0.6	70.2	29.8	2.6	3.8
	E07000176	Rushcliffe	53.7	0.3	0.3	84.1	15.9	2.1	1.0
	E06000017	Rutland	70.7	0.4	0.3	84.4	15.6	2.3	1.3
	E07000039	South Derbyshire	58.3	0.4	0.2	86.6	13.4	2.6	0.8
	E07000140	South Holland	60.4	1.1	0.9	70.4	29.6	3.8	7.1
	E07000141	South Kesteven	74.6	0.8	0.6	79.3	20.7	3.7	4.6
	E07000155	South Northamptonshire	70.4	0.3	0.3	89.6	10.4	2.6	1.2
	E07000156	Wellingborough	72.6	0.7	0.6	72.0	28.0	2.7	5.5
	E07000142	West Lindsey	69.2	0.4	0.2	82.3	17.7	2.1	1.1
East of England	E07000200	Babergh	59.3	0.3	0.2	88.0	12.0	2.4	1.3
	E07000066	Basildon	48.1	0.5	0.4	82.3	17.7	2.9	1.3
	E06000055	Bedford	72.7	1.3	0.9	68.7	31.3	4.0	10.7
	E07000067	Braintree	50.2	0.4	0.2	85.9	14.1	2.6	0.3
	E07000143	Breckland	62.2	0.5	0.5	86.4	13.6	3.9	3.1
	E07000068	Brentwood	60.8	0.4	0.3	82.9	17.1	2.6	2.6
	E07000144	Broadland	60.3	0.4	0.3	88.8	11.2	3.4	1.7
	E07000095	Broxbourne	69.9	0.6	0.4	83.5	16.5	3.7	4.1
	E07000008	Cambridge	53.3	0.4	0.3	87.9	12.1	3.2	5.7
	E07000069	Castle Point	52.1	0.4	0.4	84.6	15.4	2.9	3.3
	E06000056	Central Bedfordshire	79.3	0.5	0.3	82.3	17.7	2.6	3.7
	E07000070	Chelmsford	53.2	0.5	0.4	86.5	13.5	3.7	2.3
	E07000071	Colchester	49.2	0.5	0.5	79.9	20.1	2.7	2.8
	E07000096	Dacorum	55.7	0.3	0.1	86.7	13.3	2.0	0.0
	E07000009	East Cambridgeshire	63.8	0.3	0.2	88.5	11.5	2.3	1.6
	E07000242	East Hertfordshire	60.6	0.3	0.3	89.9	10.1	3.1	2.3
	E07000072	Epping Forest	54.0	0.2	0.2	89.2	10.8	1.7	1.3
	E07000010	Fenland	58.5	0.7	0.5	79.6	20.4	3.4	4.9
	E07000201	Forest Heath	43.2	0.7	0.5	76.0	24.0	2.7	1.6
	E07000145	Great Yarmouth	50.4	1.1	1.0	77.6	22.4	5.0	8.0
	E07000073	Harlow	51.8	0.3	0.2	89.1	10.9	3.0	0.9
	E07000098	Hertsmere	60.7	0.4	0.4	83.8	16.2	2.5	4.2
	E07000011	Huntingdonshire	58.5	0.4	0.3	85.4	14.6	2.6	2.7

Appendix 2 continued. National Dental Epidemiology Programme for England, Oral health survey of five-year-old children 2017, lower-tier local authority (LA)

Public Health England

LA did not partake in survey
Based on fewer than 30 volunteers

Region	Lower-Tier LA Code	Lower-Tier LA Name	% of sample examined (* unavailable)	Weighted Measures					
				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
East of England	E07000202	Ipswich	51.1	0.8	0.7	77.5	22.5	3.6	7.2
	E07000146	King's Lynn and West Norfolk	65.7	0.8	0.7	80.3	19.7	4.2	3.2
	E06000032	Luton	52.3	1.6	1.1	62.4	37.6	4.3	12.7
	E07000074	Maldon	49.9	0.3	0.2	88.6	11.4	2.6	1.5
	E07000203	Mid Suffolk	59.9	0.5	0.3	84.9	15.1	3.1	4.1
	E07000099	North Hertfordshire	55.9	0.3	0.2	88.6	11.4	3.0	0.7
	E07000147	North Norfolk	61.1	0.5	0.4	86.8	13.2	3.6	2.0
	E07000148	Norwich	60.9	0.8	0.7	82.3	17.7	4.7	5.1
	E06000031	Peterborough	54.0	1.1	0.9	67.6	32.4	3.3	8.4
	E07000075	Rochford	51.2	0.2	0.2	90.3	9.7	2.2	0.0
	E07000012	South Cambridgeshire	70.9	0.2	0.2	91.9	8.1	2.8	1.4
	E07000149	South Norfolk	63.7	0.4	0.3	90.5	9.5	4.1	1.3
	E06000033	Southend-on-Sea	55.4	0.5	0.4	80.4	19.6	2.7	2.7
	E07000240	St Albans	53.8	0.2	0.1	90.1	9.9	1.8	0.0
	E07000204	St Edmundsbury	52.4	0.4	0.3	86.2	13.8	2.8	1.3
	E07000243	Stevenage	58.9	0.6	0.5	74.8	25.2	2.5	9.6
	E07000205	Suffolk Coastal	60.6	0.5	0.4	83.8	16.2	3.3	2.5
	E07000076	Tendring	46.2	0.7	0.6	78.5	21.5	3.1	4.3
	E07000102	Three Rivers	53.8	0.3	0.2	84.4	15.6	2.2	5.4
	E06000034	Thurrock	57.7	0.6	0.5	79.5	20.5	2.9	3.7
	E07000077	Uttlesford	57.8	0.1	0.1	92.6	7.4	1.9	1.1
	E07000103	Watford	47.6	0.8	0.5	73.8	26.2	3.0	10.6
	E07000206	Waveney	56.0	0.5	0.4	84.8	15.2	3.4	4.7
	E07000241	Welwyn Hatfield	50.3	0.3	0.2	86.6	13.4	2.6	0.0
London	E09000002	Barking and Dagenham	37.3	1.0	0.7	71.4	28.6	3.4	8.9
	E09000003	Barnet	50.2	0.8	0.5	75.9	24.1	3.2	5.5
	E09000004	Bexley	59.7	0.4	0.3	85.6	14.4	2.7	2.0
	E09000005	Brent	59.9	1.3	0.9	65.4	34.6	3.7	9.2
	E09000006	Bromley	62.0	0.5	0.4	82.6	17.4	2.7	4.6
	E09000007	Camden	58.6	1.0	0.7	70.0	30.0	3.4	9.9
	E09000008	Croydon	52.8	1.0	0.7	71.5	28.5	3.6	8.3
	E09000009	Ealing	*	1.0	0.6	69.3	30.7	3.4	6.5
	E09000010	Enfield	51.0	1.1	0.7	69.5	30.5	3.7	10.6
	E09000011	Greenwich	64.7	0.8	0.5	77.8	22.2	3.5	6.5
	E09000012	Hackney (including City of London)	37.0	0.7	0.6	77.1	22.9	3.2	7.1
	E09000013	Hammersmith and Fulham	41.4	0.8	0.7	75.8	24.2	3.4	6.2
	E09000014	Haringey	63.1	1.3	0.9	71.0	29.0	4.5	12.4
	E09000015	Harrow	63.8	1.9	1.5	60.4	39.6	4.8	17.8
	E09000016	Havering	51.7	0.5	0.4	79.5	20.5	2.5	2.2
	E09000017	Hillingdon	74.3	1.2	1.0	67.5	32.5	3.8	13.8
	E09000018	Hounslow	52.1	0.8	0.6	74.3	25.7	3.3	6.4
	E09000019	Islington	54.2	0.6	0.4	77.5	22.5	2.5	4.3
	E09000020	Kensington and Chelsea	41.9	0.8	0.5	73.4	26.6	3.1	10.0
	E09000021	Kingston upon Thames	64.7	0.6	0.4	78.5	21.5	2.9	6.0
	E09000022	Lambeth	63.0	0.6	0.4	78.3	21.7	2.9	4.5
	E09000023	Lewisham	69.3	0.5	0.3	80.6	19.4	2.8	3.8
	E09000024	Merton	58.5	0.8	0.6	77.5	22.5	3.8	5.2
	E09000025	Newham	65.8	1.3	1.0	71.0	29.0	4.5	8.8
	E09000026	Redbridge	47.5	0.7	0.6	79.1	20.9	3.5	5.9
	E09000027	Richmond upon Thames	69.9	0.5	0.4	83.6	16.4	3.0	3.5
	E09000028	Southwark	68.9	0.4	0.3	84.1	15.9	2.4	2.8
	E09000029	Sutton	60.6	0.6	0.4	74.4	25.6	2.5	5.6
	E09000030	Tower Hamlets	40.4	1.2	0.8	68.9	31.1	3.9	10.8
	E09000031	Waltham Forest	36.6	1.4	1.1	67.1	32.9	4.3	12.8
	E09000032	Wandsworth	53.0	1.0	0.7	74.2	25.8	3.8	8.4
	E09000033	Westminster	53.0	0.9	0.7	69.7	30.3	3.1	9.0
North East	E06000047	County Durham	52.3	0.8	0.6	74.2	25.8	3.1	4.9
	E06000005	Darlington	50.9	0.9	0.6	73.6	26.4	3.3	4.8
	E08000037	Gateshead	60.3	0.6	0.5	76.8	23.2	2.7	3.6
	E06000001	Hartlepool	60.0	0.6	0.5	79.5	20.5	2.8	3.5
	E06000002	Middlesbrough	60.2	1.2	0.9	67.9	32.1	3.6	8.5
	E08000021	Newcastle upon Tyne	50.2	0.7	0.5	80.7	19.3	3.6	4.1
	E08000022	North Tyneside	65.4	0.5	0.4	80.0	20.0	2.7	2.7

Appendix 2 continued. National Dental Epidemiology Programme for England, Oral health survey of five-year-old children 2017, lower-tier local authority (LA)

Public Health England

LA did not partake in survey
Based on fewer than 30 volunteers

Region	Lower-Tier LA Code	Lower-Tier LA Name	% of sample examined (* unavailable)	Weighted Measures: Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
North East	E06000057	Northumberland	55.5	0.6	0.4	77.4	22.6	2.8	3.8
	E06000003	Redcar and Cleveland	61.5	0.9	0.6	75.1	24.9	3.6	4.2
	E08000023	South Tyneside	60.8	0.7	0.4	78.3	21.7	3.1	1.8
	E06000004	Stockton-on-Tees	64.6	0.6	0.4	79.4	20.6	3.1	4.0
	E08000024	Sunderland	52.9	1.0	0.7	71.6	28.4	3.5	6.6
North West	E07000026	Allerdale	61.5	1.4	1.1	62.1	37.9	3.6	6.9
	E07000027	Barrow-in-Furness	84.3	1.3	1.1	63.9	36.1	3.6	5.4
	E06000008	Blackburn with Darwen	45.7	1.8	1.5	57.4	42.6	4.3	9.9
	E06000009	Blackpool	37.1	1.0	0.8	75.1	24.9	3.9	5.7
	E08000001	Bolton	58.8	1.6	1.3	62.2	37.8	4.2	9.9
	E07000117	Burnley	50.7	1.8	1.6	53.5	46.5	4.0	10.4
	E08000002	Bury	43.1	1.0	0.8	64.8	35.2	2.8	5.7
	E07000028	Carlisle	63.1	0.8	0.6	76.4	23.6	3.2	4.8
	E06000049	Cheshire East							
	E06000050	Cheshire West and Chester	38.4	0.7	0.5	79.3	20.7	3.3	1.2
	E07000118	Chorley	59.0	1.3	1.0	63.6	36.4	3.5	4.9
	E07000029	Copeland	63.1	1.3	1.1	64.9	35.1	3.6	7.2
	E07000030	Eden	21.1	1.0	0.3	76.1	23.9	4.2	2.7
	E07000119	Fylde	48.9	0.7	0.7	78.5	21.5	3.4	4.4
	E06000006	Halton	55.0	1.1	0.8	69.6	30.4	3.6	7.7
	E07000120	Hyndburn	51.8	1.8	1.5	54.2	45.8	3.8	10.9
	E08000011	Knowsley	50.3	1.5	1.3	57.7	42.3	3.5	11.5
	E07000121	Lancaster	54.1	1.2	0.9	71.1	28.9	4.2	8.9
	E08000012	Liverpool	50.6	1.4	1.1	65.4	34.6	4.0	10.0
	E08000003	Manchester	62.4	1.9	1.5	57.0	43.0	4.3	13.8
	E08000004	Oldham	40.8	1.4	1.2	65.2	34.8	4.1	10.3
	E07000122	Pendle	54.9	2.3	1.9	50.6	49.4	4.6	15.4
	E07000123	Preston	54.3	1.5	1.2	60.4	39.6	3.7	8.3
	E07000124	Ribble Valley	58.4	0.7	0.7	78.3	21.7	3.2	2.6
	E08000005	Rochdale	47.9	1.9	1.6	52.9	47.1	4.0	13.2
	E07000125	Rossendale	60.7	0.8	0.7	70.5	29.5	2.9	3.4
	E08000006	Salford	65.0	1.5	1.3	55.4	44.6	3.4	11.1
	E08000014	Sefton	68.0	0.9	0.7	70.4	29.6	3.0	4.9
	E07000031	South Lakeland	60.4	0.4	0.3	85.8	14.2	3.0	1.6
	E07000126	South Ribble	45.5	0.8	0.7	72.5	27.5	2.9	2.4
	E08000013	St. Helens	57.1	1.4	1.2	61.8	38.2	3.7	11.6
	E08000007	Stockport	57.8	1.0	0.8	72.8	27.2	3.6	7.3
	E08000008	Tameside	53.8	1.2	1.0	65.9	34.1	3.4	10.5
	E08000009	Trafford	70.0	0.8	0.6	81.0	19.0	4.0	6.3
	E06000007	Warrington	31.1	0.8	0.7	79.7	20.3	3.8	5.7
	E07000127	West Lancashire	43.8	1.1	1.0	71.4	28.6	3.7	7.0
	E08000010	Wigan	63.9	1.2	0.9	62.4	37.6	3.1	8.1
	E08000015	Wirral							
	E07000128	Wyre	56.9	0.9	0.7	75.3	24.7	3.8	3.3
South East	E07000223	Adur	90.4	0.4	0.2	75.1	24.9	1.4	1.0
	E07000224	Arun	*	0.6	0.4	79.5	20.5	3.0	3.8
	E07000105	Ashford	72.6	0.3	0.1	90.2	9.8	3.1	1.3
	E07000004	Aylesbury Vale	67.6	0.5	0.5	87.0	13.0	3.9	5.0
	E07000084	Basingstoke and Deane	72.3	0.1	0.1	94.3	5.7	2.3	0.4
	E06000036	Bracknell Forest							
	E06000043	Brighton and Hove	89.5	0.4	0.2	82.6	17.4	2.6	2.7
	E07000106	Canterbury	74.9	0.4	0.3	86.6	13.4	3.2	0.9
	E07000177	Cherwell	74.7	0.6	0.4	80.4	19.6	3.2	5.3
	E07000225	Chichester	*	1.3	1.3	76.7	23.3	5.8	5.8
	E07000005	Chiltern	70.3	0.2	0.1	91.0	9.0	2.1	0.6
	E07000226	Crawley	86.6	0.6	0.4	82.0	18.0	3.3	3.7
	E07000107	Dartford	63.7	0.6	0.4	78.5	21.5	3.0	4.6
	E07000108	Dover	61.1	0.4	0.3	88.3	11.7	3.7	0.0
	E07000085	East Hampshire	76.4	1.0	0.8	67.4	32.6	2.9	5.4
	E07000061	Eastbourne	43.9	0.5	0.3	84.3	15.7	3.3	2.8
	E07000086	Eastleigh	71.9	0.2	0.1	91.3	8.7	2.0	1.1
	E07000207	Elmbridge	70.4	0.3	0.3	88.2	11.8	2.6	3.5
	E07000208	Epsom and Ewell	73.6	0.3	0.3	88.3	11.7	2.6	4.2

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				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
South East	E07000087	Fareham	76.1	0.3	0.2	89.0	11.0	2.8	1.7
	E07000088	Gosport	67.2	0.2	0.1	90.5	9.5	2.5	0.0
	E07000109	Gravesham	57.2	1.1	0.9	71.7	28.3	4.0	7.8
	E07000209	Guildford	77.8	0.2	0.1	94.5	5.5	2.8	0.0
	E07000089	Hart	71.8	0.4	0.3	85.6	14.4	2.6	3.4
	E07000062	Hastings	44.4	0.7	0.5	77.8	22.2	3.2	3.9
	E07000090	Havant	70.5	0.3	0.2	87.3	12.7	2.6	0.7
	E07000227	Horsham	*	0.1	0.0	95.6	4.4	3.3	0.0
	E06000046	Isle of Wight							
	E07000063	Lewes	43.5	0.3	0.2	90.5	9.5	3.6	0.4
	E07000110	Maidstone	68.5	0.8	0.6	74.5	25.5	3.2	5.8
	E06000035	Medway	56.1	0.7	0.5	78.3	21.7	3.2	4.1
	E07000228	Mid Sussex	*	0.2	0.2	89.4	10.6	2.2	1.5
	E06000042	Milton Keynes	72.4	0.7	0.6	78.7	21.3	3.4	5.9
	E07000210	Mole Valley	54.4	0.2	0.2	92.0	8.0	2.6	0.7
	E07000091	New Forest	70.8	0.4	0.3	88.6	11.4	3.3	2.9
	E07000178	Oxford	70.3	0.9	0.6	76.5	23.5	3.6	5.0
	E06000044	Portsmouth							
	E06000038	Reading	65.4	0.8	0.7	77.8	22.2	3.5	4.2
	E07000211	Reigate and Banstead	50.0	0.4	0.3	82.6	17.4	2.3	1.8
	E07000064	Rother	54.6	0.5	0.4	86.8	13.2	3.7	3.4
	E07000212	Runnymede	74.7	0.6	0.5	82.9	17.1	3.7	3.1
	E07000092	Rushmoor	70.1	0.8	0.6	80.8	19.2	4.2	7.2
	E07000111	Sevenoaks	55.6	0.5	0.4	82.5	17.5	2.6	3.0
	E07000112	Shepway	54.9	0.5	0.4	89.1	10.9	4.4	0.6
	E06000039	Slough	64.8	1.6	1.3	58.5	41.5	3.9	15.6
	E07000006	South Bucks	68.6	0.6	0.6	84.3	15.7	4.0	5.2
	E07000179	South Oxfordshire	72.5	0.4	0.3	84.7	15.3	2.4	0.8
	E06000045	Southampton							
	E07000213	Spelthorne	49.7	0.6	0.3	84.2	15.8	3.5	4.2
	E07000214	Surrey Heath	56.4	0.5	0.3	85.9	14.1	3.5	0.0
	E07000113	Swale	74.3	0.8	0.5	83.6	16.4	5.2	1.1
	E07000215	Tandridge	56.0	0.3	0.1	85.8	14.2	2.0	0.8
	E07000093	Test Valley	72.5	0.3	0.1	92.1	7.9	3.2	1.3
	E07000114	Thanet	66.6	0.4	0.2	90.7	9.3	3.9	2.3
	E07000115	Tonbridge and Malling	55.4	0.3	0.2	89.6	10.4	2.5	1.4
	E07000116	Tunbridge Wells	52.7	0.5	0.4	81.5	18.5	2.9	3.5
	E07000180	Vale of White Horse	72.3	0.6	0.5	80.3	19.7	3.1	2.3
	E07000216	Waverley	53.1	0.1	0.1	94.9	5.1	2.0	0.0
	E07000065	Wealden	61.1	0.2	0.2	91.7	8.3	2.5	0.7
	E06000037	West Berkshire	66.6	0.5	0.3	82.7	17.3	2.6	2.7
	E07000181	West Oxfordshire	73.5	0.6	0.5	82.4	17.6	3.2	2.1
	E07000094	Winchester	73.1	0.3	0.2	87.4	12.6	2.1	2.4
	E06000040	Windsor and Maidenhead							
	E07000217	Woking	25.7	0.6	0.5	83.7	16.3	3.8	4.4
	E06000041	Wokingham							
	E07000229	Worthing	*	0.3	0.2	86.6	13.4	2.2	2.5
	E07000007	Wycombe	68.4	1.1	0.8	72.7	27.3	4.0	9.5
South West	E06000022	Bath and North East Somerset	60.2	0.7	0.6	74.2	25.8	2.8	2.5
	E06000028	Bournemouth							
	E06000023	Bristol, City of	55.8	0.8	0.6	77.5	22.5	3.6	4.7
	E07000078	Cheltenham	61.8	0.6	0.4	81.7	18.3	3.4	5.6
	E07000048	Christchurch							
	E06000052	Cornwall (including Isles of Scilly)							
	E07000079	Cotswold	67.0	0.3	0.2	88.6	11.4	2.5	2.4
	E07000040	East Devon	80.6	0.4	0.3	86.9	13.1	2.7	2.9
	E07000049	East Dorset							
	E07000041	Exeter	72.9	0.6	0.5	78.1	21.9	2.8	4.4
	E07000080	Forest of Dean	57.1	0.5	0.4	78.3	21.7	2.2	3.5
	E07000081	Gloucester	56.4	1.4	1.1	70.2	29.8	4.6	9.0
	E07000187	Mendip	51.0	0.5	0.4	79.3	20.7	2.5	3.5
	E07000042	Mid Devon	78.8	0.5	0.4	83.5	16.5	2.9	4.1
	E07000043	North Devon	76.6	0.6	0.4	78.2	21.8	2.6	3.5
	E07000050	North Dorset							

Appendix 2 continued. National Dental Epidemiology Programme for England, Oral health survey of five-year-old children 2017, lower-tier local authority (LA)

Public Health England

LA did not partake in survey
Based on fewer than 30 volunteers

Region	Lower-Tier LA Code	Lower-Tier LA Name	% of sample examined (* unavailable)	Weighted Measures					
				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
South West	E06000024	North Somerset	62.9	0.4	0.2	85.2	14.8	2.9	0.8
	E06000026	Plymouth	88.1	0.8	0.5	78.6	21.4	3.6	2.6
	E06000029	Poole							
	E07000051	Purbeck							
	E07000188	Sedgemoor	52.4	0.5	0.4	81.6	18.4	2.8	1.9
	E06000025	South Gloucestershire	66.6	0.6	0.4	82.2	17.8	3.5	2.4
	E07000044	South Hams	75.2	0.4	0.2	88.9	11.1	3.5	0.4
	E07000189	South Somerset	51.1	0.7	0.6	79.7	20.3	3.3	2.7
	E07000082	Stroud	65.8	0.4	0.3	85.8	14.2	2.7	3.3
	E06000030	Swindon	71.8	0.5	0.4	82.7	17.3	2.9	5.2
	E07000190	Taunton Deane	50.7	0.7	0.5	82.0	18.0	3.7	2.9
	E07000045	Teignbridge	66.3	0.7	0.5	76.7	23.3	2.8	2.5
	E07000083	Tewkesbury	67.3	0.7	0.5	78.4	21.6	3.0	4.2
	E06000027	Torbay	75.5	1.2	0.9	65.3	34.7	3.4	6.7
	E07000046	Torridge	74.7	0.6	0.5	80.2	19.8	3.1	1.7
	E07000047	West Devon	77.9	0.2	0.2	88.0	12.0	2.0	0.5
	E07000052	West Dorset							
	E07000191	West Somerset	45.8	0.4	0.3	79.4	20.6	2.1	0.9
	E07000053	Weymouth and Portland							
	E06000054	Wiltshire	84.3	0.5	0.4	77.9	22.1	2.3	3.0
West Midlands	E08000025	Birmingham	44.9	0.8	0.7	73.9	26.1	3.0	5.3
	E07000234	Bromsgrove	59.3	0.2	0.2	88.6	11.4	2.2	1.2
	E07000192	Cannock Chase	54.6	0.2	0.2	85.5	14.5	1.5	0.0
	E08000026	Coventry	68.3	1.0	0.9	69.3	30.7	3.4	8.1
	E08000027	Dudley	55.3	0.6	0.4	77.4	22.6	2.5	3.2
	E07000193	East Staffordshire	40.2	0.6	0.5	83.8	16.2	3.9	3.7
	E06000019	Herefordshire, County of	82.9	1.1	0.9	69.5	30.5	3.6	6.8
	E07000194	Lichfield	49.2	0.2	0.2	88.6	11.4	2.0	0.6
	E07000235	Malvern Hills	55.5	0.6	0.5	80.7	19.3	3.1	2.4
	E07000195	Newcastle-under-Lyme	67.2	0.7	0.6	80.1	19.9	3.5	4.5
	E07000218	North Warwickshire	68.6	0.6	0.5	79.3	20.7	2.8	2.7
	E07000219	Nuneaton and Bedworth	64.2	0.7	0.6	71.8	28.2	2.5	3.5
	E07000236	Redditch	57.9	0.5	0.4	79.7	20.3	2.5	3.7
	E07000220	Rugby	66.3	0.6	0.5	78.1	21.9	2.8	2.8
	E08000028	Sandwell	57.7	0.7	0.5	74.6	25.4	2.9	4.8
	E06000051	Shropshire	55.4	0.6	0.6	81.2	18.8	3.3	5.7
	E08000029	Solihull	62.1	0.5	0.4	83.7	16.3	2.8	4.2
	E07000196	South Staffordshire	60.0	0.2	0.2	88.9	11.1	2.2	1.9
	E07000197	Stafford	56.5	0.4	0.3	79.8	20.2	2.1	2.0
	E07000198	Staffordshire Moorlands	63.1	0.5	0.5	76.8	23.2	2.3	3.2
	E06000021	Stoke-on-Trent	51.9	1.2	1.0	67.4	32.6	3.6	7.3
	E07000221	Stratford-on-Avon	72.1	0.3	0.3	82.6	17.4	1.9	1.2
	E07000199	Tamworth	43.7	0.3	0.2	87.6	12.4	2.1	0.5
	E06000020	Telford and Wrekin	58.8	0.9	0.7	70.9	29.1	3.2	7.1
	E08000030	Walsall	57.8	0.8	0.6	76.6	23.4	3.3	4.9
	E07000222	Warwick	71.3	0.5	0.4	80.9	19.1	2.5	4.0
	E08000031	Wolverhampton	56.1	1.0	0.8	71.6	28.4	3.5	7.4
	E07000237	Worcester	56.0	1.2	1.0	70.1	29.9	3.9	7.1
	E07000238	Wychavon	58.7	0.4	0.4	79.8	20.2	2.2	1.9
	E07000239	Wyre Forest	47.8	0.8	0.7	70.7	29.3	2.8	3.4
Yorkshire and the Humber	E08000016	Barnsley							
	E08000032	Bradford	49.5	1.8	1.2	60.2	39.8	4.5	11.4
	E08000033	Calderdale	62.1	1.0	0.7	70.7	29.3	3.3	5.1
	E07000163	Craven	81.1	0.7	0.5	78.6	21.4	3.1	6.8
	E08000017	Doncaster							
	E06000011	East Riding of Yorkshire							
	E07000164	Hambleton	44.3	0.6	0.5	77.5	22.5	2.7	2.3
	E07000165	Harrogate	66.7	0.5	0.3	80.9	19.1	2.9	1.7
	E06000010	Kingston upon Hull, City of	60.6	1.1	0.9	67.2	32.8	3.4	8.0
	E08000034	Kirklees	64.8	1.1	0.8	67.5	32.5	3.3	9.3
	E08000035	Leeds	56.3	1.1	0.9	68.9	31.1	3.6	9.5
	E06000012	North East Lincolnshire	46.0	0.9	0.7	77.1	22.9	3.8	5.7
	E06000013	North Lincolnshire	65.2	0.6	0.4	77.8	22.2	2.9	3.6

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				Mean d_3mft	Mean d_3t	% d_3mft = 0	% d_3mft > 0	Mean d_3mft (% d_3mft > 0)	% with incisor caries
Yorkshire and the Humber	E07000166	Richmondshire	79.1	0.7	0.5	77.7	22.3	3.1	4.7
	E08000018	Rotherham							
	E07000167	Ryedale	93.1	0.5	0.4	81.4	18.6	2.7	2.1
	E07000168	Scarborough	82.7	0.7	0.6	70.6	29.4	2.5	4.8
	E07000169	Selby	58.1	0.8	0.6	70.7	29.3	2.9	3.2
	E08000019	Sheffield							
	E08000036	Wakefield	56.2	0.9	0.7	71.2	28.8	3.2	5.2
	E06000014	York	69.8	0.6	0.5	84.1	15.9	3.7	3.6
Region	E12000004	East Midlands	65.8	0.8	0.7	74.9	25.1	3.3	5.6
	E12000006	East of England	55.8	0.6	0.5	82.0	18.0	3.3	4.1
	E12000007	London	55.3	0.9	0.7	74.3	25.7	3.7	7.6
	E12000001	North East	57.0	0.7	0.5	76.1	23.9	3.1	4.4
	E12000002	North West	52.5	1.3	1.0	66.1	33.9	3.7	7.9
	E12000008	South East	64.1	0.5	0.4	83.6	16.4	3.2	3.3
	E12000009	South West	66.4	0.6	0.5	79.8	20.2	3.1	3.5
	E12000005	West Midlands	58.1	0.8	0.7	74.3	25.7	3.2	5.4
	E12000003	Yorkshire and The Humber	59.5	1.1	0.8	69.6	30.4	3.7	7.5
Country	**E92000001**	**England**	**58.9**	**0.8**	**0.6**	**76.7**	**23.3**	**3.4**	**5.1**