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Children's Dental Health Survey 2013

Country specific report: England

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This report may be of interest to members of the public, health policy officials, Consultants in Dental Public Health and other members of the dental profession, epidemiologists and other academics interested in children's health.

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Executive Summary

This country specific report focuses on children in England who participated in the 2013 Children's Dental Health (CDH) Survey. The report encompasses:

- Clinical oral health, including tooth and gum condition
- Perceptions and experiences of dental health, including self-rated dental and general health
- Oral health related behaviours, including tooth brushing, diet, alcohol and tobacco consumption, and
- Patterns of dental service usage, including access and satisfaction with NHS dental treatment services

The dental examination covered different aspects of tooth and gum (periodontal) condition. A composite measure shows that around half (52%) of 5 year olds could be said to have good oral health, declining to less than a third (31%) of 15 year olds.

Obvious decay experience in primary teeth was present in 31% of 5 year olds. In permanent teeth, obvious dental decay experience was found in 32% of 12 year olds and 44% of 15 year olds, a decline from 41% and 55% in 2003.

In relation to periodontal health, 49% of 15 year olds had visible plaque deposits and 40% had gingivitis (bleeding). Evidence of trauma to permanent incisors was found in 12% of 12 year olds, with tooth surface loss into dentine or pulp on lingual surfaces of incisors found in 4% of 15 year olds. Almost three in ten (29%) 12 year olds had enamel defects.

The survey questionnaires provided information on perceptions and behaviours relevant to the oral health of children. The majority of children held positive views of their dental health. Two thirds of 12 year olds (66%) and three quarters of 15 year olds (75%) reported that their dental health was good or very good. Girls were more likely than boys to report good or very good dental health.

Despite many children reporting positive overall views of their dental health, dental problems were common. Overall, 45% of 12 year olds and 28% of 15 years olds reported that they were not happy with the appearance of their teeth and would like to have them straightened. Children eligible for free school meals were more likely than children who were not eligible for free school meals to say this. In addition, children from more economically deprived families were more likely to receive such treatment later in their adolescence, if at all, than other children of the same age. Toothache, reported by 19% of 12 year olds and 15% of 15 year olds, was more common among girls than boys, and more common among children from relatively deprived families than among other children.

Oral conditions can have an impact on children's quality of life in different ways, not just functionally, but also psychologically and socially. Overall, 58% of children aged 12 and 45% of those aged 15 reported that their daily life had been affected by problems with their teeth and mouth in the last three months. This was most commonly experienced as embarrassment when smiling, laughing or showing teeth, followed by difficulty eating and difficulty cleaning teeth. Children who were eligible for free school meals were more likely than other children to report problems in their daily life caused by their oral health.

The survey also provides a range of information on behaviours relevant to oral health, such as frequency of tooth brushing, diet, smoking and alcohol consumption. The proportion of children brushing their teeth twice a day, a good marker of oral hygiene, has remained relatively stable since 2003, with around four in five of all age groups completing this twice daily, as reported by parents. A minority of older children (16% of 12 year olds and 14% of 15 year olds) reported drinking sugary drinks four or more times a day, but children from more deprived families were more likely to report this at both ages than other children the same age. A third or more of the older children reported drinking water four or more times a day. Smoking amongst 12 year olds was not very common; however, 11% of 15 year olds reported being a current smoker. Similarly, amongst 12 year olds approximately a third (30%) of children reported ever drinking alcohol, increasing to almost three quarters (72%) in 15 year olds.

The information generated on patients' utilisation and experience of dental care services has implications for the oral health of children and the resources required by the NHS to treat and prevent oral health problems. In England, there has been little change in children's reported dental attendance patterns since 2003. More than 80% of 12 and 15 year olds reported attending the dentist for a check-up, but this also means that around one fifth of these age groups do not attend.

In relation to access to NHS dental services, more than eight out of ten parents reported they had never experienced difficulty finding an NHS dentist for their children, and there was no change in the proportion of parents reporting that they had experienced a difficulty since 2003. The survey found that 18% of parents whose children were eligible for free school meals reported difficulty finding an NHS dentist compared to 11% of parents whose children were not eligible.

In terms of overall satisfaction with dental services, just over nine in ten parents were satisfied. Self-report findings showed that 14% of 12 year olds and 10% of 15 year olds were classified as having extreme dental anxiety, and both 12 and 15 year old girls were more likely to report dental anxiety than boys. Children that were extremely anxious about going to the dentist were also less likely to report attending the dentist for a check-up.

1 Introduction and methodology

1.1 Introduction

The 2013 Children's Dental Health (CDH) survey, commissioned by the Health and Social Care Information Centre (www.hscic.gov.uk), is the fifth in a series of national children's dental health surveys that have been carried out every ten years since 1973.

The 2013 survey provides information on the dental health of children in England, Wales and Northern Ireland. The survey measures changes in oral health since the last survey in 2003, and provides information on children's experiences, behaviours and attitudes relevant to their oral health.

Detailed analysis across all three nations is covered in Reports 1-5. This report presents dental health experiences for children living in England. The report covers clinical indicators of oral health, as measured in the survey dental examination, and reported perceptions of oral health, behaviours and dental service usage patterns captured from parental and pupil questionnaires (the latter for 12 and 15 year olds).

Where sample size allows, the data collected in this latest survey will be compared to data from previous CDH surveys to show children's dental heath experiences within England over time. A major theme arising from the reports is the level of inequality in oral health of children and results are presented comparing children from relatively deprived families, indicated by their eligibility for free school meals in 2013, to other children of the same age. In addition, some comparisons are made by sex.

1.2 Dental terminology

This report makes reference to a number of technical terms associated with teeth and gums. For non-expert readers, a glossary can also be found in Annex A of the technical report. Further information is also available in sections 2.1.3 and 2.1.4 in Report 2. The following sections summarise that information.

1.3 Dental caries

Dental caries (also known as tooth decay) and decay experience of children's teeth is one of the major focuses of the clinical oral health sections. Decay experience is typically assessed in surveys by the dmft (in primary teeth) and DMFT (in permanent teeth) index. The index contains three components related to whether teeth have untreated caries (including where teeth already have fillings) (dt/DT), have already had fillings for caries (ft/FT), or have been removed because of caries (mt/MT).

In primary teeth, an assessment of teeth missing due to decay is complicated by the natural exfoliation of the teeth, making it difficult to determine whether a tooth was lost due to dental decay or whether it exfoliated naturally. Therefore, as in previous surveys, dental examiners were not asked to assess the reason for the absence of primary teeth.

The report presents estimates for the *prevalence*, or extent, of decay amongst children in the population represented by the proportion of children affected by decay at the time of the survey. Results on the mean number of teeth affected by decay at the time of the

survey[1] are also presented. Results for the primary and permanent dentition are provided at both the 'obvious' and 'clinical' dental decay thresholds of severity.

Obvious decay represents established disease which has spread through the outer tooth enamel to significantly involve the inner dentine layer beneath. The survey reports on both "obvious decay experience *excluding* visual dentine caries" where only decay at the frank cavity level is included and "obvious decay experience" where in addition to frank cavities, decay that can be visualised through the enamel is included. Obvious decay relates to untreated decay, whereas obvious decay *experience* relates to both teeth with untreated decay and teeth that had been previously filled or extracted because of decay.

Clinical decay experience incorporates obvious decay experience, as defined above, but also includes initial stage lesions that are judged to be confined to the tooth enamel. Enamel decay does not usually require a filling, but may indicate the need for interventions to prevent decay progressing into dentine. This is a new development for the 2013 survey and is closer to the criteria now used by clinicians examining and providing care for children. Both visual enamel changes, seen as characteristic white or brown changes in the optical properties of the tooth surface, and cavitation in the tooth enamel are recorded. In the report, "clinical decay experience" includes "obvious decay experience" as well as visual and cavitated enamel lesions whereas "clinical decay experience *excluding* visual enamel caries" only includes "obvious decay experience" and "enamel caries with cavitation".

1.4 Non-carious conditions

Tooth Surface Loss (TSL) is pathological non-carious loss of tooth tissues resulting from chemical action not involving bacteria (erosion), wear due to tooth-to-tooth contact (attrition) or physical wear not caused by tooth-to-tooth contact, for example tooth brushing (abrasion). As in 2003, buccal and lingual surfaces of primary and permanent upper incisors and occlusal surfaces of first permanent molars are reported. Evaluation of the data collected during the training weeks and calibration, showed that dental examiners had low levels of agreement in the case of enamel TSL but TSL into dentine and dental pulp are easier to identify. This variation should be taken into account when the results of this report are considered.

Developmental defects of enamel occur as the result of alterations to the structure of enamel during its formation. The aetiology, or cause, of these changes is variable as are the changes in appearance of the tooth. Where the opacities are considered unsightly, treatment may be required to improve the appearance of teeth. As in 2003, developmental defects in enamel were only reported on the upper incisors, canines and first premolars of 12 year olds.

Traumatic damage to permanent incisors and treatment undertaken to repair the damage was recorded. All permanent incisor teeth in all age groups were examined.

Indicators of oral health include the condition of children's gingivae (gums) as well as their teeth. The oral examination included four measures of *periodontal health*. Three of these, relating to the visual examination of the gingivae, recorded the presence of gum inflammation, plaque and calculus for each of the six segments of the mouth, for all age groups. The fourth measure of periodontal health was used for 15 year olds only, and required the use of a periodontal probe to detect changes in periodontal health around six

[1] Using the dmft/DMFT index

index teeth using the modified Basic Periodontal Index (BPE)[2]. The presence of gingival bleeding was recorded.

1.5 Perceptions of oral health, behaviours and dental service usage

One of the strengths of the CDH Survey is the range of behavioural and attitudinal information collected about the children taking part in the dental examinations.

A major innovation of the 2013 survey was the introduction of the pupil questionnaire for 12 and 15 year olds, to complement the questionnaire sent out to parents and carers for all age groups.

The pupil questionnaire collected a range of information on perceptions and behaviours relevant to oral health and health more generally. Information on subjective outcomes from experience of oral health and dental care was also collected; including assessments of overall dental health, recent problems with oral health and the impact of oral health on the quality of life of the child.

The parent questionnaire collected, for all age groups, information on dental hygiene, parental perceptions of the child's oral health, the impact of the child's oral health on the family and more detailed information on the dental care experienced by children, including satisfaction with and access to services.

1.6 Survey methodology

A representative sample of children aged 5, 8, 12 and 15 years attending state and independent schools, including academies and free schools in England but excluding special schools, were selected to take part in this survey. A parallel survey of children educated in special needs schools has been conducted as part of the NHS epidemiology programme in England and the results are expected to be published in 2015[3].

A total of 13,628 children were sampled in participating schools across England, Wales and Northern Ireland; 9,866 dental examinations were completed. Dental examination participation rates varied across the age cohorts as follows:

- 5 year olds 70%
- 8 year olds 65%
- 12 year olds 83%
- 15 year olds 74%

The requirement for positive written parental consent for the dental examination with 5 and 8 year olds is likely to have reduced participation from those cohorts. Older children (12 and 15 year olds) that were examined were asked to complete a questionnaire at the same appointment as their examination; 99.6% of them completed it.

Parents and carers, (referred to hereafter as parents), of children who were examined were invited to complete a questionnaire; the overall response rate was 43%. Response

[2] See 'Guidelines for periodontal screening and management of children and adolescents under 18 years of age.' Clerehugh V, Kindelan S. British Society of Periodontology and The British Society of Paediatric Dentistry, 2012

[3] The results are expected to be published on the NHS Dental Epidemiology for England website at http://www.nwph.info/dentalhealth/

was higher amongst the parents of 5 and 8 year olds, all of whom had already provided written consent for the dental examination.

Levels of missing data within productive cases were generally low. Item non-response on the dental examination was typically below 1% of eligible cases, with the highest non-response recorded in relation to trauma to permanent teeth (up to 2.1% of cases). For straightforward question formats, item non-response in the pupil and parent questionnaires was generally below 2%. Questions using a yes/no grid format for items on a list had the highest item non-response from both children and parents. As the majority of this non-response represented failure to tick the 'no' codes relevant to the individual, it was assumed that this was the case in the production of the derived variables associated with these questions.

Further information on the survey design and implementation can be found in the quality statement and technical report published alongside this report[4].

1.7 Consent methodology and trends

For the 2013 survey, the survey consent methodology was changed from negative (opt-out) parental consent for the dental examination to:

- For 5 and 8 year old examinations: positive (opt-in) parental consent was collected (with the children being allowed to opt-out on the examining day)
- For 12 and 15 year old examinations: positive (opt-in) consent was collected from the older children on the examining day (with parents being allowed to opt-out their children in advance)

When comparing the 2013 results with the previous surveys, these substantial changes must be taken into account, as they can lead to systematic changes (bias) in the data collected. For example, parents of younger children with tooth decay could have been less likely to opt their children into the survey. It is impossible to adjust for this non-response bias.

Further evidence relating to the likely impact of such changes is discussed in Report 1. Based on this evidence, trends in oral health in the primary dentition for 5 and 8 year olds are not presented. Although the change in methodology could also have impacted on the data for 12 and 15 year olds, this is regarded as less likely and so trends for permanent teeth in 12 and 15 year olds are presented.

1.8 Note on text and tables

Differences cited in the text are statistically significant ($p<0.05$) unless otherwise stated. This means that there is approximately a 1 in 20 risk that the difference does not exist in reality in the population when sampling error is taken into account.

A dash in a table indicates a zero value, while an asterisk indicates a proportion of less than 0.5% or a mean of less than 0.05.

The statistics in the tables are produced using weights that adjust for selection probabilities, non-response bias and population totals. The unweighted bases shown in each table indicate the number of valid responses on which the estimates are based.

[4] http://www.hscic.gov.uk/pubs/ChildDentalHealth

Weighted bases are presented for some estimates alongside standard errors and confidence intervals in Annex A of chapters 1 to 4 of the Child Dental Health (CDH) publication. The weighted and unweighted bases may vary slightly across tables due to item non-response.

Figures presented in parentheses [ ] indicate a low base number of respondents and results are indicative only.

2 Clinical Oral Health

This section summarises headline findings for England from the 2013 CDH Survey reports 2, 3 and 4. These findings relate to the Dental Examination component of the survey and cover good oral health, dental decay, periodontal (gum) status, tooth surface loss, enamel defects and accidental damage to teeth.

2.1 Good oral health

This section focuses on children who were deemed to have good oral health. This group was identified by constructing an indicator of good overall oral health, combining the absence of obvious decay experience, no tooth surface loss into dentine, and the absence of calculus, a periodontal risk factor that would imply the need for treatment.

Table E.1 shows 39% of children could be said to have good overall oral health by these indicators. Children aged 5 years were more likely to have good overall oral health than older children, but there was little difference between other age groups.

Table E.1 Percentage of children with good overall oral health, by age

England, 2013					Percentages
All children	5 years	8 years	12 years	15 years	Total
No obvious decay experience	69	51	63	56	60
No calculus	91	71	60	53	69
No tooth surface loss into dentine	84	97	97	93	92
Good overall oral health	**52**	**34**	**37**	**31**	**39**
Unweighted bases	*1,526*	*1,369*	*1,434*	*1,313*	*5,642*

2.1.1 Periodontal good health

Absence of gum disease is an important element in identifying children with healthy mouths. The gum disease related measures that were used in determining good oral health were the presence or absence of risk factors for gum disease, plaque and calculus, and whether the gingivae, the soft gum tissue, appeared healthy or not. The assessment was made for each sextant[5] in the child's mouth.

In England, plaque in no more than one sextant of the mouth was recorded in over half (56%) of children overall (Table E.2). The oldest and youngest children were less likely to have plaque in two or more sextants than those aged 8 or 12. This may reflect changes in tooth brushing habits with age; the youngest children are more likely to have their tooth brushing supervised by adults, whereas older children may be responsible for cleaning their own teeth, with potentially increasing degrees of skill or commitment with age. The five year olds were also more likely to have no gum inflammation (78%) compared to 12 year olds (39%), with an improvement in 15 year olds (47%). Overall, 36% of children had good periodontal health.

Table E.2 Percentage of children with no periodontal conditions, by age

England, 2013					Percentages
All children	5 years	8 years	12 years	15 years	Total
Plaque in no more than one sextant	67	45	47	62	56
No gum inflammation	78	54	39	47	55
No calculus	91	71	60	53	69
Good periodontal health (all of thes	**56**	**29**	**25**	**32**	**36**
Unweighted bases	*1,518*	*1,366*	*1,432*	*1,308*	*5,624*

[5] Both the upper arch and lower arch of the mouth can be split into three sextants – so in the case of the upper arch of the mouth, this would be the upper right, upper central and upper left sextants.

2.1.2 Absence of decay in primary teeth

Table E.3 shows the prevalence of no obvious (visible and cavitated dentine) decay experience in primary teeth. In 2013, nearly seven in ten children aged 5 and more than half of children aged 8 had no indication of obvious decay experience in the form of untreated decay or fillings in primary teeth. The proportion with no obvious decay experience was higher among children aged 5 compared with those aged 8; 69% and 55% respectively.

Table E.3 Percentage of children with no obvious decay experience in primary teeth, by age

England, 2013			Percentages
Children aged 5, 8	5 years	8 years	Total
No obvious decay experience	69	55	62
Unweighted bases	*1,526*	*1,369*	*2,895*

2.1.3 Absence of decay in permanent teeth

As decayed primary teeth are replaced by healthy permanent teeth, the overall condition of children's mouths improves, at least initially. Table E.4 shows that 87% of 8 year olds had no obvious decay experience in any permanent teeth, but with increasing age the irreversible impact of decay became apparent in more children, declining to 68% of 12 year olds and 56% of 15 year olds.

Table E.4 Percentage of children with no obvious decay experience in permanent teeth, by age

England, 2013				Percentages
Children aged 8, 12, 15	8 years	12 years	15 years	Total
No obvious decay experience	87	68	56	71
Unweighted bases	*1,369*	*1,434*	*1,313*	*4,116*

2.1.4 2003 and 2013 compared

Although for methodological reasons, it is inappropriate to compare 2003 and 2013 data on primary caries, there is confidence in the comparability of data for 12 year old and 15 year olds for obvious decay experience.

There has been some improvement in the prevalence of good oral health over the past ten years. The proportion of 12 and 15 year olds with no obvious decay experience in permanent teeth has increased since 2003 (Table E.5). For the first time in the series, a majority of 15 year olds had no obvious decay experience.

Table E.5 Percentage of children with no obvious decay experience in permanent teeth, by age

England, 2003-2013				Percentages
Children aged 12, 15	12 years		15 years	
	2003	2013	2003	2013
No obvious decay experience	59	68	45	56
Unweighted bases	*1,356*	*1,434*	*1,116*	*1,313*

There has also been no change in the proportion of 12 and 15 year old children in England with good overall oral health between 2003 and 2013. Among older children, more than a third were evaluated to have good oral health using this multi-faceted indicator (Table E.6). The challenge is to target the factors that have been shown to have an impact on good overall oral health in order to increase the proportion of children with healthy mouths whilst maintaining the oral health of those children with good oral health.

Table E.6 Percentage of 12 and 15 year olds with good overall oral health, by age

England, 2003-2013			Percentages
Children aged 12, 15	12 years	15 years	Total
2003	35	25	30
2013	37	31	34
Unweighted bases			
2003	*1,356*	*1,116*	*2,472*
2013	*1,432*	*1,311*	*2,743*

2.2 Prevalence of clinical decay experience

The criteria for assessing dental caries were developed further for the 2013 survey to allow estimates of clinical decay experience to also be produced. This evolution is in order to reflect changes in the presentation of decay and an increasing focus on the prevention and control of initial stage decay[6]. The survey therefore assessed decay in enamel only, both cavitated and visible. Typically, the approach to such lesions is increasingly not to fill or restore them but to adopt preventive strategies that minimise the risk of these developing into dentine decay lesions which typically are thought to require intervention.

Each table in this section reports both clinical decay (untreated) and clinical decay experience (untreated and treated teeth) both with and without visual enamel decay (but always including cavitated enamel caries). Although the treated teeth element includes filled teeth throughout, the treatment of missing teeth was different for primary and permanent teeth. For permanent teeth, loss of a tooth through decay could be determined. Among younger children, attribution of missing teeth to decay cannot be made and so missing teeth are excluded from clinical decay experience for primary teeth. This is explained further in Section 1.3 of the introduction to this report.

2.2.1 Clinical decay in primary teeth

Table E.7 shows the percentages of 5 and 8 year old children that had clinical decay experience in their primary teeth. The prevalence of clinical decay and clinical decay experience in primary teeth for 8 year olds was 54% and 58%. For 5 year olds, this was 47% and 49% respectively.

Table E.7 Percentage of children with clinical decay experience in primary teeth, by age

England, 2013		Percentages
Children aged 5, 8	5 years	8 years
	Visual enamel caries *included*	Visual enamel caries *included*
Clinical decay	47	54
Clinical decay experience	49	58
Unweighted bases	*1,526*	*1,369*

An alternative way of expressing the extent of clinical decay is to measure it in terms of the number of affected teeth. At ages 5 and 8, children in England had on average 1.6 teeth affected by clinical decay (Table E.8). Using the definition of clinical decay experience including visual enamel caries, the average number of teeth affected was 1.8 and 1.9 respectively for the two age groups.

[6] The international evolution and evidence for this approach has been collated by the ICDAS Foundation. See Pitts NB, Ismail AI, Martignon S, Ekstrand K, Douglas GVA, Longbottom C & ICCMS contributing authors. ICCMS™ Guide for Practitioners and Educators. 2014, ICDAS Foundation, http://www.kcl.ac.uk/dentistry/innovation/innovation-and-translation-centre/ICCMS-Document.pdf

Table E.8 Mean number of primary teeth with clinical decay experience, by age

England, 2013				Means
Children aged 5, 8	5 years		8 years	
	Visual enamel caries *included*	Visual enamel caries *excluded*	Visual enamel caries *included*	Visual enamel caries *excluded*
Clinical decay	1.6	0.9	1.6	1.1
Clinical decay experience	1.8	1.0	1.9	1.4
Unweighted bases	*1,526*	*1,526*	*1,369*	*1,369*

2.2.2 Clinical decay in permanent teeth

With respect to permanent teeth, over one in seven (15%) 8 year olds, around a third (34%) of 12 year olds and just under half (46%) of 15 year olds had clinical decay experience *excluding* visual enamel caries (Table E.9). The inclusion of visual enamel caries as decay increased the prevalence of clinical decay experience to 33%, 56% and 62% respectively.

Table E.9 Percentage of children with clinical decay experience in permanent teeth, by age

England, 2013						Percentages
Children aged 8, 12, 15	8 years		12 years		15 years	
	Visual enamel caries *included*	Visual enamel caries *excluded*	Visual enamel caries *included*	Visual enamel caries *excluded*	Visual enamel caries *included*	Visual enamel caries *excluded*
Clinical decay	30	11	48	20	51	24
Clinicial decay experience	33	15	56	34	62	46
Unweighted bases	*1,369*	*1,369*	*1,434*	*1,434*	*1,313*	*1,313*

Table E.10 presents the mean number of permanent teeth with clinical decay experience at each threshold of decay. At age 8, on average, 0.2 teeth had clinical decay *excluding* visual enamel caries rising to 0.6 teeth in 15 year olds. Clinical decay experience *excluding* visual enamel caries was higher with an average of 0.3, 0.8 and 1.4 teeth affected at ages 8, 12 and 15 respectively. These figures illustrate the irreversible and cumulative nature of dental decay with increasing age.

Table E.10 Mean number of permanent teeth with clinical decay experience, by age

England, 2013						Means
Children aged 8, 12, 15	8 years		12 years		15 years	
	Visual enamel caries *included*	Visual enamel caries *excluded*	Visual enamel caries *included*	Visual enamel caries *excluded*	Visual enamel caries *included*	Visual enamel caries *excluded*
Clinical decay	0.6	0.2	1.5	0.5	1.9	0.6
Clinical decay experience	0.7	0.3	1.9	0.8	2.8	1.4
Unweighted bases	*1,369*	*1,369*	*1,434*	*1,434*	*1,313*	*1,313*

2.3 Prevalence of obvious decay experience

Obvious decay and obvious decay experience are the traditional measures used in decay epidemiology and it is reported here to ensure compatibility. It also relates to treatment need in that, typically, obvious decay is thought to require active intervention, such as a filling. Obvious decay relates to decay into the dentine layer of a tooth and is reported here at two levels, with visual caries (i.e. before a tooth has cavitated) or without visual caries (i.e. once a tooth has cavitated).

As well as obvious (untreated) decay and obvious decay experience (untreated decay, filled teeth and missing teeth extracted due to decay), the individual components of filled teeth and teeth missing (extracted) due to decay are reported in this section. The coding of missing teeth was different for primary and permanent teeth, as explained in Section 2.2, and so missing teeth are excluded from clinical decay experience for primary teeth.

2.3.1 Obvious decay experience in primary teeth

In 2013, just under a third (31%) of 5 year olds and nearly half (45%) of 8 year olds were classified as having obvious decay experience *(including* visual dentine caries) in their primary teeth (Table E.11). In terms of the components of obvious decay experience, 28% of 5 year olds and 38% of 8 year olds had decay into dentine and 8% of five year olds and 19% of 8 year olds had fillings in otherwise sound primary teeth.

Table E.11 Percentage of children with obvious decay experience in primary teeth, by age

England, 2013				Percentages
Children aged 5, 8	5 years		8 years	
	Visual dentine caries *included*	Visual dentine caries *excluded*	Visual dentine caries *included*	Visual dentine caries *excluded*
Decay into dentine	28	21	38	31
Filled (otherwise sound)	8		19	
Obvious decay experience	31	25	45	40
Unweighted bases	*1,526*	*1,526*	*1,369*	*1,369*

Table E.12 shows that the mean number of primary teeth with decay into dentine was 0.8 in 5 year olds and 1.0 in 8 year olds. The mean number of filled (otherwise sound) primary teeth was 0.1 and 0.3 for the two age groups respectively.

Table E.12 Mean number of primary teeth with obvious decay experience, by age

England, 2013				Means
Children aged 5, 8	5 years		8 years	
	Visual dentine caries *included*	Visual dentine caries *excluded*	Visual dentine caries *included*	Visual dentine caries *excluded*
Decay into dentine	0.8	0.5	1.0	0.7
Filled (otherwise sound)	0.1		0.3	
Obvious decay experience	0.9	0.7	1.4	1.1
Unweighted bases	*1,526*	*1,526*	*1,369*	*1,369*

2.3.2 Obvious decay experience in permanent teeth

As the age of children increases, the percentage affected by obvious decay experience in permanent teeth, as well as the components of obvious decay experience, would be expected to increase.

At age 8, 13% had obvious decay experience in permanent teeth with 8% having untreated decay into dentine, 4% filled teeth and 2% teeth missing due to decay (Table E.13).

At the age of 12, around a third (32%) of children in England had obvious decay experience in their permanent teeth. Around a fifth (17%) had decay into dentine requiring treatment and a fifth (18%) had fillings.

At the age of 15, the prevalence of obvious decay experience in permanent teeth was 44%. A third (33%) of 15 year olds had teeth with fillings; this is a larger proportion than for 12 year olds.

However, some of the components of obvious decay experience did not differ between 12 and 15 year olds. The proportion of 15 year olds with decay into dentine and teeth missing due to decay was similar to 12 year olds (21% and 17% with decay into dentine; 6% and 3% with teeth missing due to decay respectively).

Table E.13 Percentage of children with obvious decay experience in permanent teeth, by age

England, 2013						Percentages
Children aged 8, 12, 15	8 years		12 years		15 years	
	Visual dentine caries *included*	Visual dentine caries *excluded*	Visual dentine caries *included*	Visual dentine caries *excluded*	Visual dentine caries *included*	Visual dentine caries *excluded*
Decay into dentine	8	5	17	9	21	11
Missing due to decay	2		3		6	
Filled (otherwise sound)	4		18		33	
Obvious decay experience	13	10	32	26	44	39
Unweighted bases	*1,369*	*1,369*	*1,434*	*1,434*	*1,313*	*1,313*

Initial stage enamel decay on permanent teeth considered "sound" at the obvious decay threshold was identified in around a quarter of 8 year olds in England (Table E.14). The proportion of 12 and 15 year olds was higher, with 42% and 46% respectively having this condition.

Table E.14 Percentage of children with any initial stage tooth decay in otherwise sound permanent teeth, by age

England, 2013			Percentages
Children aged 8, 12, 15	8 years	12 years	15 years
Initial stage decay on otherwise sound teeth	27	42	46
Unweighted bases	*1,369*	*1,434*	*1,313*

2.4 Severe or extensive dental decay

This section focused on children who had particularly severe or extensive oral health conditions, where the lifetime burdens to the individual or health care system are likely to be substantial.

A subgroup of children have been identified who are more likely to have significant problems related to dental caries in the short or long term, based on the distribution of several caries-related states that reflect untreated disease or likely treatment need. These include multiple teeth affected by caries, teeth which have been or are likely to be lost, and pain or sepsis related to dental caries.

For 5 year olds, four specific conditions have been identified:

- the presence of five or more teeth with experience of decay into dentine (dmft of 5+, also categorised as high dmft, an indicator of extensive decay)[7]
- the presence of three or more teeth with obvious dental decay lesions (untreated decay either in a tooth with no filling or a pre-existing filling, an indicator of extensive decay)
- the presence of any very severely decayed teeth that are deemed 'unrestorable' (severe decay)
- the presence of any evidence of sepsis as part of the PUFA examination[8] (severe decay)

For 15 year olds the same conditions apply, these refer to permanent teeth (indicated by 'DMFT' rather than 'dmft'). Also, an additional severe decay condition applies at 15 years, the loss of any permanent tooth due to decay. Among younger children, missing primary teeth were coded as unerupted permanent teeth, regardless of why they were missing, so this measure is not reported among 5 year olds.

[7] The total number of Decayed, Missing (due to decay) or Filled Teeth is widely used as an index of a child's decay experience. This is abbreviated to the acronyms "dmft" for primary teeth and "DMFT" for permanent teeth

[8] PUFA is an acronym for referring to four signs of sepsis: open Pulp, obvious Ulceration (related to sepsis), Fistula, and Abscess. The PUFA examination looked for signs of serious infection (sepsis) that usually occur where a tooth has been affected by very advanced decay or extensive treatment.

2.4.1 Severe or extensive decay in primary teeth

Table E.15 shows the prevalence of the various severe or extensive decay conditions for 5 year olds across England.

Overall, 13% of 5 year olds were affected by severe or extensive dental decay. The prevalence of each individual condition ranged from 4% ('Any PUFA signs') to 10% ('3+ teeth with decay into dentine') for 5 year olds.

Table E.15 Percentage of 5 year olds with severe or extensive dental decay

England, 2013	Percentages
Children aged 5	England
5+ teeth with obvious decay experience (high dmft)	6
3+ teeth with decay into dentine	10
Any unrestorable teeth	5
Any PUFA signs	4
Any of these	**13**
Unweighted bases	*1,526*

2.4.2 Severe or extensive decay in permanent teeth

Table E.16 shows the distribution of the various severe or extensive decay conditions defined in the introduction for 15 year olds across England.

Overall 14% of 15 year olds were affected by severe or extensive dental decay. The prevalence of each individual condition ranged from 2% ('Any unrestorable teeth' and 'Any PUFA signs') to 8% ('5+ teeth with obvious decay') for 15 year olds.

Table E.16 Percentage of 15 year olds with severe or extensive dental decay

England, 2013	Percentages
Children aged 15	England
5+ teeth with obvious decay experience (high dmft)	8
3+ teeth with decay into dentine	5
Any unrestorable teeth	2
Any PUFA signs	2
Loss of any permanent teeth due to decay	6
Any of these	**14**
Unweighted bases	*1,313*

2.4.3 The distribution of severe or extensive dental decay

The burden of decay is not evenly distributed. Whilst severe or extensive decay is clearly not restricted to the most deprived in society[9], the risks appear to be much higher where there is deprivation. The prevalence of any severe or extensive dental decay is 18% at age 5 and 20% at age 15 for quintile 1 (the highest deprived), but the proportion of children affected with severe or extensive decay in quintiles 4 and 5 (the lowest deprivation areas) is lower (Table E.17).

Table E.17 Percentage of 5 and 15 year olds with any severe or extensive dental decay, by 2010 English Index of Multiple Deprivation quintiles

England, 2013					Percentages
Children aged 5, 15	1 (highest deprivation)	2	3	4	5 (lowest deprivation)
5 year olds	18	18	11	8	4
15 year olds	20	12	9	10	8
Unweighted bases					
5 year olds	*591*	*293*	*236*	*184*	*173*
15 year olds	*531*	*244*	*157*	*172*	*156*

2.5 Periodontal conditions

Indicators of oral health include the condition of children's gums as well as their teeth. This section examines the periodontal health of children. The examination included five measures of periodontal health. Each of the six segments of the mouth were examined visually for the presence of gum (gingival) inflammation, plaque and calculus. Then, in 15 year olds only, periodontal pocketing and the presence of bleeding were assessed.

Trend analysis is presented in this section although users should be aware of the substantial variation in these data. Further details about the quality indicators can be found in Annex A of Report 2 of the CDH publication[10].

[9] https://www.gov.uk/government/collections/english-indices-of-deprivation
[10] http://www.hscic.gov.uk/pubs/ChildDentalHealth

2.5.1 Plaque

Table E.18 shows that the percentage of children with visible plaque was highest at age 8, with around seven out of 10 children having visible plaque. There was a reduction in this proportion between ages 8 and 15 to 64% at 12 years and 49% at 15 years.

Table E.18 Percentage of children with plaque, by age

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Presence of plaque	46	71	64	49
Unweighted bases	*1,526*	*1,365*	*1,432*	*1,311*

2.5.2 Calculus

The incidence of calculus among 5 year olds was relatively rare, with fewer than one in ten (9%) children in that age group having the condition (Table E.19). It was more commonly found in older children, with just under half (47%) of 15 year olds having calculus.

Table E.19 Percentage of children with calculus, by age

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Presence of calculus	9	29	40	47
Unweighted bases	*1,509*	*1,360*	*1,429*	*1,307*

2.5.3 Gingivitis

In 15 year olds, an assessment of gingival bleeding was made by applying a periodontal probe around six index teeth. Gingival bleeding is a marker of active periodontal disease (gingivitis).

Table E.20 shows that 40% of 15 year olds had gingivitis in 2013, in 2003, this was 45%.

Table E.20 Percentage of 15 year olds with gingivitis

England, 2003-2013		Percentages
Children aged 15	2003	2013
Presence of gingivitis	45	40
Unweighted bases	*1,116*	*1,313*

2.6 Other dental conditions

This section of the report covers non-carious conditions, starting with tooth surface loss, a pathological non-carious loss of tooth tissues. This section then moves on to report developmental defects in tooth enamel, also known as enamel opacities and finally looks at traumatic damage to teeth.

Although decay has traditionally been the focus of dental health services, the three conditions reported here all carry a significant burden both for affected individuals and for health services.

2.6.1 Tooth surface loss

Tooth surface loss (TSL) is a multifactorial condition, that is, it is caused by a number of factors including erosion, attrition and abrasion. In primary teeth, particularly incisors, increasing levels of TSL are expected before the teeth are exfoliated (shed). Significant TSL can however provide an indication of a problem which may continue to affect the permanent dentition and may give symptoms, or if the pulp of the tooth is exposed, cause sepsis (although this is rare). In children who have permanent teeth, TSL, particularly into dentine, is a concern because of potential sensitivity and appearance. It is unknown how much early TSL into enamel will translate into more serious wear. As with decay experience, TSL affects both primary and permanent teeth, and is similarly cumulative with age, being irreversible.

In primary teeth, the upper primary incisors were examined for TSL. Overall, 42% of 5 year olds had no TSL into enamel with 84% having no TSL into dentine. Children aged 8 were less likely to have any TSL, but this was largely because 8 year olds were much less likely to have primary incisors, which normally exfoliate (shed) between ages 6 and 7 years (Table E.21).

Table E.21 Percentage of children with no tooth surface loss in primary teeth, by age

England, 2013			Percentages
Children aged 5, 8	5 years	8 years	Total
No tooth surface loss into enamel or dentine	42	93	66
No tooth surface loss into dentine	84	98	91
Unweighted bases	*1,526*	*1,369*	*2,895*

Buccal and lingual surfaces were examined separately, and around a third (35%) of 5 year olds had evidence of TSL on one or more of the buccal surfaces of the primary upper incisors, although only 4% overall had buccal TSL involving dentine or pulp. TSL of the lingual surfaces was more common with 57% of 5 year olds being affected. TSL progressing to dentine or pulp was present on 15% of lingual surfaces (Table E.22).

Table E.22 Percentage of 5 year old children with tooth surface loss on the surfaces of the primary incisors

England, 2013		Percentages
Children aged 5	Any tooth suface loss	Tooth surface loss into dentine or pulp
Buccal surfaces	35	4
Lingual surfaces	57	15
Unweighted bases	*1526*	*1526*

In permanent teeth, as well as upper incisors, upper and lower first permanent molars were also examined on their occlusal surfaces and more than half of children recorded no TSL into enamel and most (96%) recorded no tooth surface loss into dentine (Table E.23).

Table E.23 Percentage of children with no tooth surface loss in permanent teeth, by age

39% of 12 year old children being affected (Table E.24).

England, 2013				Percentages
Children aged 8, 12, 15	8 years	12 years	15 years	Total
No tooth surface loss into enamel or dentine	76	47	41	55
No tooth surface loss into dentine	99	97	93	96
Unweighted bases	*1,369*	*1,434*	*1,313*	*4,116*

Just over a quarter (26%) of 12 year olds were reported to have tooth surface loss on the molars and the buccal surface of the incisors. As with primary incisors, tooth surface loss on permanent incisors was more common on lingual surfaces than buccal surfaces, with 39% of 12 year old children being affected (Table E.24).

Table E.24 Percentage of children aged 12 and 15 with any tooth surface loss on the surfaces of permanent incisors and first permanent molars

England, 2013	Percentages
Children aged 12, 15	
Incisors	
Buccal surfaces	
12 year olds	26
15 year olds	27
Lingual surfaces	
12 year olds	39
15 year olds	43
Molars	
12 year olds	26
15 year olds	32
Unweighted bases	
12 year olds	*1,434*
15 year olds	*1,313*

The proportion of tooth surface loss affecting dentine and pulp was low for both ages, with 4% of 15 year olds having tooth surface loss on lingual surfaces of the incisors and 3% having tooth surface loss in dentine or pulp on the occlusal surfaces of molars (Table E.25).

Compared to 2003 there have been no significant changes in TSL into dentine and pulp on permanent teeth in either 12 or 15 year old children.

Table E.25 Percentage of children aged 12 and 15 with tooth surface loss into dentine or pulp on the surfaces of permanent incisors and first permanent molars

England, 2003-2013	Percentages	
Children aged 12, 15	2003	2013
Incisors		
Buccal surfaces		
12 year olds	*	*
15 year olds	*	1
Lingual surfaces		
12 year olds	3	2
15 year olds	5	4
Molars		
12 year olds	2	1
15 year olds	4	3
Unweighted bases		
12 year olds		*1,434*
15 year olds		*1,313*

2.6.2 Prevalence of enamel defects

This section reports on developmental defects in tooth enamel, also known as enamel opacities. These defects[11] occur as the result of alterations to the structure of enamel during formation. In the dental examination, the upper 8 anterior teeth (incisors, canines and first premolar) were examined in 12 year olds only, for defects under natural lighting conditions.

Overall, just over one quarter (29%) of 12 year olds had one or more enamel defect in England in 2013 (Table E.26). The apparent reduction from 2003 was not statistically significant. As in 2003, the most common defects were demarcated or diffuse: 20% and 16% of 12 year olds respectively had these on one or more teeth in 2013. All other defects were rare, with only 2% presenting with hypoplasia, and 1% presenting with diffuse opacity and hypoplasia.

Table E.26 Percentage of 12 year olds with enamel opacities and other defects of tooth enamel

England, 2003-2013	Percentages	
Children aged 12	2003	2013
Demarcated opacity	18	20
Diffuse opacity	18	16
Demarcated and diffuse opacity	3	2
Hypoplasia	1	2
Demarcated opacity and hypoplasia	*	*
Diffuse opacity and hypoplasia	1	1
Demarcated and diffuse opacities and hypoplasia	*	*
Other defects	-	-
Any of the above defects	35	29
Unweighted bases	*1,356*	*1,434*

2.6.3 Traumatic damage

Traumatic damage to teeth can have a significant impact on a child both through the appearance of them and the associated symptoms. Treatment of traumatised teeth can also be extensive, carrying a burden for the individual and their carers as well as health services. In the dental examination, the 4 upper permanent incisors were examined for untreated or treated trauma. In 5 year olds, and some 8 year olds, permanent incisors had not erupted, and so data for these age groups are not reported.

The percentage of 12 and 15 year olds with any traumatic damage was 12% and 10% respectively in 2013 (Table E.27). These figures were comparable to 2003 levels with the exception of males aged 15 years where the figure was 17% in 2003 and 11% in 2013.

[11] Section 1.4 in the introduction contains more information on enamel defects.

In the total population, it can be reasonably expected that dental trauma in 15 year olds would be higher than in 12 year olds, because any child with traumatic damage at the age of 12 must also have it at age 15. The nature of a sample survey selecting different children at ages 12 and 15 at a single point in time allows for the possibility of there being a higher proportion of 12 year olds observed with dental trauma than 15 year olds. This may explain some of the unexpected reduction in trauma in 15 year old boys in Table E.27. It is also possible that 15 year olds had a low likelihood of experiencing trauma than 12 year olds, or that 15 year olds had received more treatment for traumatic damage. If the treatments were difficult to detect during the survey dental examination, this would make it appear that traumatic damage is less common in 15 year olds than 12 year olds.

Table E.27 Percentage of children with any traumatic damage to permanent incisors, by age and sex

England, 2003-2013				Percentages
Children aged 12, 15	12 years		15 years	
	2003	2013	2003	2013
Male	14	16	17	11
Female	7	8	10	8
Total	11	12	13	10
Unweighted bases				
Male	*693*	*689*	*554*	*623*
Female	*663*	*745*	*562*	*690*
Total	*1,356*	*1,434*	*1,116*	*1,313*

3 Perceptions and experience of dental health

Perceptions of dental health and the appearance of teeth amongst children are important considerations because these factors may be associated with health and wellbeing, with demand for treatment and with unmet dental treatment need. In addition, they highlight an aspect of dental health that is different but complimentary to that described by the clinical oral health indicators from the survey dental examination.

As part of the pupil questionnaire, 12 and 15 year olds were asked to rate how good their general and dental health was. They were also asked about their satisfaction with the appearance of their teeth and whether they thought they needed to have them straightened, i.e. perceived need for orthodontic treatment. Parents of all age groups were asked similar, although not identical, questions about their child's teeth.

3.1 Self-rated dental and general health

Table E.28 shows that, overall, both 12 and 15 year old children were more likely to rate their general health as very good or good compared to their dental health. This is not surprising, as most children are in good overall health but many have experienced issues with their dental health (for example one or more fillings or tooth extractions). Despite their overall positive perceptions, one third of 12 year olds and one quarter of 15 year olds reported that their oral health was fair, poor or very poor.

Table E.28 Percentage of children who rated their dental or general health as good or very good, by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Dental Health	66	75
General Health	85	89
Unweighted bases	*1,424*	*1,304*

Unweighted bases may vary by item due to non-response

Within both these age groups, girls were more likely than boys to report good or very good dental health (Table E.29).

Table E.29 Percentage of children that rated their dental health as good or very good, by sex

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Male	59	68
Female	72	82
Unweighted bases		
Male	*682*	*616*
Female	*741*	*687*

Unweighted bases may vary by item due to non-response

3.2 Satisfaction with the appearance of teeth in 12 and 15 year olds

In the pupil questionnaire for 12 and 15 year olds, children were asked how satisfied they were with the appearance of their teeth on a five point scale between 'very satisfied' and 'very dissatisfied'. The question did not provide examples of the concept of "appearance", so children may have prioritised aspects of appearance (e.g. the 'whiteness' of their tooth enamel, how straight they consider their teeth to be) differently when making the assessment. The two 'satisfied' answer categories and two 'dissatisfied' answer categories are grouped in the tables below.

Overall, half of 12 year olds and about three fifths of 15 year olds were satisfied, while much lower proportions (about one in six children in each age group) were dissatisfied with how their teeth looked (Table E.30).

Table E.30 The percentage of children satisfied or dissatisfied with the appearance of their teeth[1], by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Satisfied	50	61
Dissatisfied	17	15
Unweighted bases	*1,404*	*1,300*

[1] *Remaining responses were included in a 'neither satisfied nor dissatisfied' category that is not reported here.*

3.3 Perceived need for teeth to be straightened

Parents were asked whether their child was currently receiving orthodontic treatment and to rate their child's orthodontic treatment need in terms of whether they would like their child's teeth to be straightened.

As would be expected, these issues are not so relevant for the parents of the youngest children (Table E.31). At age 12, around a fifth of children were in treatment, and the parents of another quarter would prefer their child's teeth to be straightened. At age 15, both the percentage of children in treatment (16%) and the percentage of parents preferring their children's teeth to be straightened (14%) was lower, as a greater proportion have received orthodontic treatment by that age.

Table E.31 Parent reported need for child's teeth to be straightened, by age

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Prefer them straightened	6	27	26	14
In orthodontic treatment	*	3	20	16
Unweighted bases	*676*	*606*	*497*	*404*

In addition, the 12 and 15 year old children were asked whether they felt their teeth were 'all right' as they are, or whether they would prefer to have them straightened. Answer categories for already being in orthodontic treatment and being unable to make an assessment were also provided.

Table E.32 reports the proportions of children wanting their teeth straightened and those already in orthodontic treatment. Overall, 45% 12 year olds wanted their teeth straightened while another 10% were already receiving or had received orthodontic treatment. Among 15 year olds, a lower proportion preferred to have their teeth straightened. This is likely to be partly due to a higher proportion of 15 year olds having already completed orthodontic treatment.

There is a clear association with sex in 15 year olds, with higher percentages of girls reporting that they would prefer their teeth to be straightened than boys. Girls were also more likely to report receiving orthodontic treatment at age 12.

There is also a strong relationship between eligibility for free school meals (a widely used school level measure of deprivation) and the perceived need for teeth to be straightened. At both ages, those who were eligible for free school meals were considerably more likely to want their teeth straightened than those not eligible. There is also a difference at age 12 in terms of those already in orthodontic treatment, with a higher proportion of those not eligible for free school meals receiving orthodontic treatment compared to those that are eligible for free school meals. This may indicate that more perceived need for orthodontic treatment is met among 12 year olds from more affluent families compared to their counterparts from more deprived families.

Table E.32 Self-rated need for teeth to be straightened, by sex and eligibility for free school meals

England, 2013		Percentages	
Children aged 12, 15		12 years	15 years
All			
	Prefer teeth straightened	45	28
	Already in treatment	10	14
Male			
	Prefer teeth straightened	41	22
	Already in treatment	7	12
Female			
	Prefer teeth straightened	49	35
	Already in treatment	14	17
Eligible for free school meals			
	Prefer teeth straightened	60	36
	Already in treatment	4	12
Not eligible			
	Prefer teeth straightened	40	25
	Already in treatment	12	15
Unweighted bases			
England		*1,417*	*1,304*
Male		*682*	*617*
Female		*735*	*687*
Eligible for free school meals		*331*	*250*
Not eligible		*1,015*	*990*

3.4 Experience of problems with dental health

3.4.1 Parent reports for younger children

Parents were asked whether their child had experienced any dental health problems in the past 6 months. Overall, just over a third of 5 year olds and just over a half of 8 year olds were reported to have had a problem over this period (Table E.33).

According to the reports from parents of 5 year old children, toothache, other pain in the mouth, and bad breath were each experienced by approximately one in eight 5 year olds in the last 6 months, while other problems were less frequently experienced. The same three problems were more prevalent among 8 year old children, with around a fifth affected. Problems with the appearance of their teeth, a broken tooth or bleeding or swollen gums were each experienced by one in ten or more 8 year olds over the same time period.

Table E.33 Parent reported problems with their child's dental health in the last 6 months, by age

England, 2013	Percentages	
Children aged 5, 8	5 years	8 years
Any condition	37	56
Other pain in mouth	13	20
Toothache	14	18
Bad breath	12	18
Problems with appearance	5	16
Broken tooth	5	12
Bleeding or swollen gums	3	10
Other problems with teeth or mouth	3	2
Problems caused by dental treatment	-	1
Unweighted bases	*689*	*623*

Item bases may vary due to non-response

3.4.2 Self-reports from older children

For older children, details of their dental health problems were collected directly from the children themselves. The reference period for measuring whether or not a problem had been experienced was three months, which is different from the six month reference period used with parents. It is therefore not appropriate to compare the results from the two younger age cohorts with the older children

For both 12 and 15 year olds, around two thirds reported experiencing at least one problem with their dental health in the past 3 months (Table E.34).

The most commonly experienced condition at both ages was a sensitive tooth, with around a third of children having experienced this. Mouth ulcers and bad breath were each reported by around a fifth of children at both ages. Toothache was reported by 19% of 12 year olds and 15% of 15 year olds, the respective figure for bleeding or swollen gums were 16% and 17%.

Table E.34 Self-reported problems with dental health in the last 3 months, by age

England, 2013		Percentages
Children aged 12 , 15	12 years	15 years
Any condition	68	66
Sensitive tooth	32	34
Mouth ulcers	19	20
Bad breath	20	18
Toothache	19	15
Bleeding or swollen gums	16	17
Broken tooth	8	4
Unweighted bases	*1,412*	*1,295*

The base reported is for the 'any condition' item. Other item bases may vary due to non-response. Items are placed in descending order of prevalence for 12 year olds then in the same order for 15 year olds

The likelihood of children having experienced at least one condition over the last three months did not differ by sex or income deprivation status, but there were some significant variations in specific problems (Table E.35).

Girls were more likely to report toothache than boys at both ages, while 15 year old boys were more likely to report bad breath than girls of the same age. Toothache may be related to different patterns of dental caries between boys and girls, while the differences in bad breath are more linked to oral hygiene practices.

There were substantial differences by income deprivation status. Children that were eligible for free school meals were more likely to report toothache in the past 3 months compared to those that were not eligible for free school meals at both ages. Free school meal eligibility was also associated with higher prevalence of bleeding or swollen gums and broken teeth among 12 year olds, and a lower likelihood of reporting mouth ulcers.

Table E.35 Self-reported problems with dental health in the last 3 months, by sex and eligibility for free school meals

England, 2013				Percentages
Children aged 12, 15	Male	Female	Eligible for free school meals	Not eligible
12 year olds				
Any condition	66	70	68	68
Sensitive tooth	30	34	29	33
Mouth ulcers	21	17	12	21
Bad breath	22	17	16	21
Toothache	16	21	25	17
Bleeding or swollen gums	15	17	21	14
Broken tooth	7	10	12	7
15 year olds				
Any condition	64	68	73	65
Sensitive tooth	31	36	39	33
Mouth ulcers	18	22	15	21
Bad breath	22	15	23	18
Toothache	11	19	23	13
Bleeding or swollen gums	17	18	19	16
Broken tooth	4	4	7	4
Unweighted bases				
12 year olds	*682*	*740*	*338*	*1021*
15 year olds	*619*	*686*	*250*	*993*

The base reported is for the 'any condition' item. Other item bases may vary due to non-response. Items are placed in descending order of prevalence for 12 year olds then in the same order for 15 year olds

3.5 Impact of dental health on the child

Data on oral health related quality of life was collected through a global item (single question) and by using the Child Oral Impacts on Daily Performances (Child-OIDP) measure[12]. This was done for the first time in the 2013 survey. The single question on overall impact asked children how much the condition of their teeth and mouth affected their everyday life in the 3 months prior to the survey, with answer options of 'not at all', 'a little', 'somewhat', 'a fair amount' and 'a great deal'. The Child-OIDP measure focuses on eight key aspects of daily life and assesses the extent to which oral conditions may have negatively affected daily life over the same three month period. Answer options for each question were 'not at all', 'a little', 'a fair amount' and 'a lot'. Children who provided responses of 'a little', 'a fair amount' or 'a lot' were grouped to provide an estimate of the percentage of children suffering from each difficulty in the last 3 months.

Overall, around half (58% among 12 year olds and 45% among 15 year olds) of the older children said that they had at least one oral health related impact in the past 3 months (Table E.36). The most prevalent oral impact reported was avoiding smiling or laughing due to the condition of their teeth; this was reported by 36% of 12 year olds and 27% of 15 year olds. Other commonly reported impacts were difficulty eating (22% of 12 year olds and 19% of 15 year olds) and difficulty cleaning teeth (22% and 14%).

Table E.36 Percentage of children with difficulties in the last 3 months, by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Embarrassed smiling or laughing	36	27
Difficulty eating	22	19
Difficulty cleaning teeth	22	14
Felt different	14	10
Difficulty relaxing	10	9
Difficulty speaking	9	8
Difficulty enjoying being with people	9	8
Difficulty doing schoolwork	6	3
Any difficulty in last 3 months	58	45
Number of difficulties in last 3 months		
0	43	56
1	27	20
2+	30	25
Unweighted bases	*1383*	*1297*

The base reported is for the 'any condition' item. Other item bases may vary due to non-response.

[12] Gherunpong S, Tsakos G, Sheiham A. Developing and evaluating an oral health-related quality of life index for children; the CHILD-OIDP. Community Dental Health 2004; 21: 161-169.

In terms of differences by sex, 15 year old girls were affected in greater proportions than boys, 50% compared to 40%, and this difference was reflected in the children with the higher burden of oral impacts, defined as those that reported 2 or more impacts in the last 3 months (Table E.37).

The stronger associations, however, were found between income deprivation and oral impacts at age 15, where 53% of those eligible for free school meals and 43% of those not eligible reported at least one oral impact. The respective figures for 12 year olds were 63% and 56%, but this difference was not statistically significant.

Focusing on the children who reported experiencing multiple oral impacts, the differences relating to income deprivation were substantial; among 12 year olds, 40% of those eligible for free school meals but only 27% of those non-eligible reported two or more oral impacts in the past 3 months, while the respective figures among 15 year olds were 31% and 24%. These results highlight that oral health has a profound negative effect on quality of life especially among children whose families are relatively deprived, further demonstrating the importance that should be placed on addressing social inequalities in oral health.

Table E.37 Number of difficulties in the last 3 months, by sex and free school meal eligibility

England, 2013						Percentages
Children aged 12, 15	12 years			15 years		
	Any difficulty	One difficulty	2 or more difficulties	Any difficulty	One difficulty	2 or more difficulties
Male	57	28	28	40	20	20
Female	60	26	33	50	20	29
Eligible for free school meals	63	22	40	53	20	31
Not eligible	56	27	27	43	20	24
Unweighted bases						
Male	*680*			*617*		
Female	*732*			*686*		
Eligible for free school meals	*333*			*250*		
Not eligible	*1,008*			*989*		

3.6 Impact of dental health on the family

A series of questions, mostly extracted from the Family Impact Scale[13], asked parents to rate how that child's oral health had affected various aspects of family life in the last six months. The following five answer options were provided: 'never', 'once or twice', 'sometimes', 'often' or 'every day or almost every day'. Any answer other than 'never' was taken as demonstrating an impact.

Overall, 21% of parents of 5 year olds, 33% of parents of 8 year olds, 32% of parents of 12 year olds and 35% of parents of 15 year olds reported that the oral health problems of their child had a negative impact on family life over that period (Table E.38). The most commonly reported impact on family were about the parents taking time off work.

Table E.38 Impact of the child's oral health on the life of the family in the last 6 months, by age

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Any family impact	21	33	32	35
Time off work	8	12	19	23
Child needed more attention	11	16	13	15
Parent felt stressed or anxious	11	18	16	13
Parent felt guilty	7	14	11	11
Family activities interrupted	5	5	6	8
Parent's sleep disrupted	7	10	7	6
Financial difficulties	2	2	3	3
Unweighted bases	*676*	*614*	*497*	*405*

The base reported is for the 'any condition' item. Other item bases may vary due to non-response.

[13] Locker D, Jokovic A, Stephens M, Kenny D, Tompson B, Guyatt G.
Family impact of child oral and oro-facial conditions. Community Dent Oral Epidemiol. 2002;30 (6):438-48.

4 Dental health related behaviours

Another methodological innovation of the 2013 survey is the wealth of information collected on a range of oral health behaviours and attitudes, consisting of tooth brushing, diet, and, from the 12 and 15 year olds questionnaire, tobacco use and alcohol consumption. Of particular value are the 12 and 15 year olds' self-reports of their behaviours, complementing the parental accounts of dental hygiene regimes. Diet, tobacco and alcohol consumption are known risk factors for oral and general health.

4.1 Tooth brushing

Tooth brushing is a good marker of oral hygiene. Guidance has traditionally been that brushing teeth twice daily would suffice for a good level of oral hygiene which in turn would not act as a risk factor for oral diseases, particularly the ones related to the gums[14].

Parental reports of tooth brushing behaviour were generally similar to pupil self-reports for the 12 and 15 year olds. The added advantage of parental reports was that they provided information for 5 and 8 year olds. Overall, 82% of 5 year olds, 84% of 8 year olds, 79% of 12 year olds and 84% of 15 year olds brushed their teeth at least twice a day according to their parents.

There was little evidence of a significant increase in the percentage of children brushing their teeth twice or more a day in 2013 compared with 2003, except in 8 year olds (Table E.39).

Table E.39 Parental report of percentage of children brushing their teeth twice or more a day, by age

England, 2003-2013								Percentages
All children	5 years		8 years		12 years		15 years	
	2003	2013	2003	2013	2003	2013	2003	2013
Brush teeth twice or more a day	78	82	79	84	76	79	80	84
Unweighted bases	*553*	*672*	*543*	*603*	*454*	*502*	*357*	*399*

[14] Delivering Better Oral Health: An evidence-based toolkit for prevention' 3rd edition. (2014) Public Health England (PHE). URL: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/367563/DBOHv32014OCTMainDocument_3.pdf

Overall, 77% of 12 year olds and 81% of 15 year olds self-reported that they brushed their teeth twice daily or more often (Table E.40).

Table E.40 Percentage of children reporting brushing their teeth twice or more a day, by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Brushes twice or more a day	77	81
Unweighted bases	*1,406*	*1,295*

Girls were more likely to self-report brushing their teeth twice or more a day than boys at both ages (Table E.41). Among 12 year olds, 86% of girls and 69% of boys reported this, whilst among 15 year olds the respective figures were 89% and 73%.

Among 15 year olds, those children eligible for free school meals were less likely to report brushing their teeth twice or more a day (71%) than children who were not eligible (82%). The apparent difference in 12 year olds was not statistically significant.

Table E.41 Percentage of children reporting brushing their teeth twice or more a day, by sex and free school meal eligibility

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Male	69	73
Female	86	89
Eligible for free school meals	71	71
Not eligible	78	82
Unweighted bases		
Male	*676*	*611*
Female	*730*	*684*
Eligible for free school meals	*334*	*244*
Not eligible	*1,004*	*988*

4.1.1 Age started tooth brushing

An informative indicator of dental health behaviours is the age at which a child starts tooth brushing. Due to possible issues with the ability of a parent to accurately recall when this first occurred, this was only reported for 5 and 8 year old children.

Between 21% and 28% of younger children started having their teeth brushed when they were less than six months old and 50% to 52% between six months to a year (Table E.42).

This leaves between 20% and 29% of younger children where the start of tooth brushing was delayed until the child was over the age of one.

Table E.42 Age started tooth brushing, by age

England, 2013	Percentages	
Children aged 5, 8	5 years	8 years
Under 6 months	21	28
Between 6 months and 1 year of age	50	52
Over 1 year of age	29	20
Unweighted bases	*670*	*603*

The age at which children started tooth brushing did not vary by sex for either age group. The 5 year olds that were eligible for free school meals were less likely to be reported to have started tooth brushing at under six months than 5 years olds who were not eligible for free school meals (Table E.43).

Table E.43 Age started tooth brushing, by sex and free school meal eligibility

England, 2013		Percentages	
Children aged 5, 8		5 years	8 years
Male			
	Under 6 months	22	27
	Between 6 months and 1 year of age	47	52
	Over 1 year of age	31	21
Female			
	Under 6 months	21	28
	Between 6 months and 1 year of age	52	52
	Over 1 year of age	27	20
Eligible for free school meals			
	Under 6 months	12	26
	Between 6 months and 1 year of age	54	55
	Over 1 year of age	34	19
Not eligible			
	Under 6 months	23	28
	Between 6 months and 1 year of age	50	51
	Over 1 year of age	27	21
Unweighted bases			
Male		*333*	*293*
Female		*337*	*310*
Eligible for free school meals		*95*	*74*
Not eligible		*549*	*503*

4.2 Dental hygiene aids

The use of dental hygiene products can be a very useful marker of oral hygiene, particularly as the vast majority of children brush their teeth twice daily or more. Tooth brushing frequency may not be sufficient to differentiate between those that have optimal oral hygiene and those that need further improvement.

Parents were asked to indicate all oral hygiene aids that their children used, and Table E.44) shows the use of various dental hygiene aids in the last 12 months.

Mouthwash was the most common aide other than a manual or electric toothbrush and toothpaste, used by 22% of children aged 5 years, 57% of those aged 8, 59% of those aged 12 years and 67% of those aged 15 years. As expected, the use of mouthwash, dental floss and sugar free gum was generally higher for older children. Between 37% and 49% of children used electric tooth brushes.

Table E.44 Use of dental hygiene aids in the last 12 months, by age

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Toothbrush and toothpaste but no other products	64	28	19	14
Electric toothbrush	39	49	37	41
Mouthwash	22	57	59	67
Dental floss	3	10	16	20
Sugar-free or dental chewing gum	8	20	31	34
Unweighted bases	*689*	*623*	*510*	*407*

The base in this table is based on use of toothbrush and paste but no other product. Item bases may vary due to non-response
Categories will not sum to 100% as this was a multiple response question

4.3 Diet, alcohol and tobacco consumption

Frequent consumption of sugary drinks and foods is an important risk factor for dental caries as well as obesity[15]. As part of the pupil questionnaire, the 12 and 15 year olds were asked to report on their usual daily frequency of consumption for a small range of food and drink indicators, some of which tend to be relatively high in sugar content. They were also asked questions about whether they currently (or have ever) smoked or consumed alcohol. Although this data does not represent a comprehensive measurement of such behaviours, it can be used to create indicators of daily consumption of different types of drink (including sugary drinks and alcohol) as well as tobacco consumption.

[15] Moynihan PJ, Kelly SA. Effect on caries of restricting sugars intake: systematic review to inform WHO guidelines. J Dent Res. 2014 ;93(1):8-18.

Self-reports indicate that 16% of 12 year olds and 14% of 15 year olds drink sugary drinks 4 or more times a day (Table E.45). At least one third of 12 and 15 year olds reported drinking water four or more times a day.

Table E.45 Percentage of children consuming water, sugary drinks or fruit juice four or more times a day, by age

England, 2013						Percentages
Children aged 12, 15	12 years			15 years		
	Water	Sugary drinks	Fruit juice	Water	Sugary drinks	Fruit juice
Drinking four or more times a day	33	16	8	37	14	4
Unweighted bases	*1,387*	*1,405*	*1,392*	*1,290*	*1,294*	*1,288*

There were some differences in the consumption of these drinks by sex. In 12 year olds, boys were more likely to report consuming sugary drinks four or more times a day than girls, although this relationship was no longer significant at age 15 (Table E.46). Children eligible to receive free school meals were around twice as likely to report consuming sugary drinks four or more times a day than other children at both ages.

Table E.46 Percentage of children consuming water, sugary drinks or fruit juice four or more times a day, by sex and free school meal eligibility

England, 2013						Percentages
Children aged 12, 15	12 years			15 years		
	Water	Sugary drinks	Fruit juice	Water	Sugary drinks	Fruit juice
Male	34	19	8	35	15	3
Female	33	13	8	39	13	5
Eligible for free school meals	38	26	12	30	27	7
Not eligible	32	13	7	37	12	4
Unweighted bases						
Male	*662*	*672*	*662*	*607*	*610*	*606*
Female	*725*	*733*	*730*	*683*	*684*	*682*
Eligible for free school meals	*322*	*330*	*324*	*244*	*244*	*243*
Not eligible	*996*	*1,006*	*999*	*982*	*986*	*981*

Prevalence of smoking was very low amongst 12 year olds but 11% of 15 year olds reported being a current smoker and 29% reported ever having smoked (Table E.47).

Table E.47 Smoking status, by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Ever smoked cigarettes	7	29
Current smoker	2	11
Unweighted bases	*1,406*	*1,293*

Alcohol consumption is increasingly seen as a public health issue and related to oral health with erosion, accidental damage and oral cancer. Amongst 12 year olds just under a third (30%) of children reported ever drinking alcohol and almost three quarters (72%) of 15 year olds also reported this (Table E.48). In 15 year olds, 40% reported being a current alcohol drinker.

Table E.48 Alcohol consumption, by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Ever drunk alcohol	30	72
Current drinker	3	40
Unweighted bases	*1,405*	*1,296*

5 Patterns of dental service usage

Questions on utilisation and experience of dental care services have appeared in previous CDH Surveys. These are very important as they provide a good account of the pattern of dental services utilisation and also of how children and parents feel about using the services available. It is important context that most NHS treatment for children, including check-ups, is free of cost at the point of use; although the costs of getting to the dentist will vary. As such, information on service use has considerable implications both for the dental health of the children but also on the resources the NHS puts towards addressing and preventing oral health problems.

5.1 Pattern of dental attendance

Overall, 88% of 5 year olds and 94% of 8 year olds are reported by their parents to be visiting the dentist for a check-up (Table E.49).

There has been no significant change in dental attendance patterns since 2003.

Table E.49 Parent reported pattern of child dental attendance1, by age

England, 2003-2013				Percentages
All children	5 years		8 years	
	2003	2013	2003	2013
For a check-up[1]	89	88	94	94
Only when have trouble with teeth	4	6	3	5
Never been to the dentist	7	6	2	1
Unweighted bases	*547*	*678*	*547*	*616*

[1] *For the 2003 data, the question categories 'regular check-up' and 'occasional check-up' were combined for comparison to the 2013 category 'for a check-up'*

Older children self-reported their pattern of dental attendance. Over 80% of 12 and 15 year olds reported that they attended the dentist for a check-up (Table E.50). However, there are still 16% that are only attending when they have trouble, with 3% of 12 year olds and 2% of 15 year olds reporting that they have never visited the dentist.

Table E.50 Self-reported dental attendance pattern, by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
For a check-up	81	82
Only when have trouble	16	16
Never been	3	2
Unweighted bases	*1,410*	*1,297*

For each of the four age groups included in this survey, around 9 out of 10 children visited the dentist in the last 12 months, as reported by their parents (Table E.51). There was very little evidence of a change in the percentage of children annually attending the dentist between 2003 and 2013.

Table E.51 Percentage of children who visited the dentist in the last 12 months, by age

England, 2003-2013								Percentages
All children	5 years		8 years		12 years		15 years	
	2003	2013	2003	2013	2003	2013	2003	2013
Visited dentist in the last 12 months	86	87	93	92	92	90	88	90
Unweighted bases	*553*	*681*	*547*	*620*	*456*	*503*	*358*	*407*

5.2 Parent or guardian's dental attendance

Table E.52 compares the dental attendance pattern of the parent and the attendance of the child (as reported by the same parent). The data show that the dental attendance pattern of the parent and that of their child were strongly related when the pattern was favourable, but were quite different in cases where the parent was not attending for a check-up.

Almost all parents who reported that they attended a regular check-up themselves also reported that their child attended for a check-up. About a half of the 5 and 8 year olds whose parents only attend the dentist when they had trouble, attend for a check-up. Results for parents that attended less frequently are only indicative due to small sample sizes.

Table E.52 Dental attendance of responding parent by parent report of child dental attendance, by age

England, 2013					Percentages
All children		5 years	8 years	12 years	15 years
Adult attendance (responder)	Child attendance				
A regular check up	For a check-up	97	99	97	100
	Only when have trouble/never been	3	1	3	0
An occasional check up	For a check-up	82	84	[83]	[70]
	Only when have trouble/never been	18	16	[17]	[30]
Only when I have trouble / I don't go to the dentist	For a check-up	51	56	[60]	[54]
	Only when have trouble/never been	49	44	[40]	[46]
Unweighted bases					
A regular check up		*494*	*481*	*399*	*329*
An occasional check up		*85*	*73*	*43*	*29*
Only when I have trouble / I don't go to the dentist		*96*	*58*	*61*	*42*

5.3 Access to NHS dental treatment services

Similar to the 2003 results, more than 8 out of 10 parents in 2013 reported that they had never experienced any difficulty finding an NHS dentist for their children (Table E.53). There was no significant change in the proportion reported that that had ever experienced a difficulty between 2003 and 2013. Despite this finding, it is important to highlight that there were still considerable numbers of parents (around one in ten) that did report experiencing difficulty in finding an NHS dentist to examine and treat their children. The most common reason for parents having difficulty finding an NHS dentist for their children was reported to be local dentists not taking on NHS patients[16]. This issue affected almost 7 out of 10 parents who reported difficulty accessing an NHS dentist.

Table E.53 Ever had difficulty finding an NHS dentist

England, 2003-2013	Percentages	
All children	2003	2013
Yes	10	12
No	85	83
Never tried to find one	6	5
Unweighted bases	*1,847*	*2,213*

Parents of children who were eligible for free school meals were more likely to report experiencing difficulty finding an NHS dentist than those not eligible for free school meals in 2013 (Table E.54).

Table E.54 Ever had difficulty finding an NHS dentist, by free school meal eligibility status

England, 2013		Percentages
All children	Eligible for free school meals	Not eligible
Yes	18	11
No	78	84
Never tried to find one	4	4
Unweighted bases	*286*	*1,840*

5.4 Satisfaction with dental treatment services

Table E.55 presents the findings in relation to the satisfaction of users with different aspects of dental treatment services. Parents were asked to rate several facets of the last dental practice that they took their child to, on a scale from 'very good' to 'very poor'. A 'not applicable' was provided. Responses of 'very good' and 'good' were treated as 'satisfied', whilst 'poor' and 'very poor' were treated as 'dissatisfied'.

[16] Table 1.38 in Report 1

The results showed that around eight out of ten parents were satisfied with the last dental practice visit with their child for a routine appointment. Furthermore, over nine in ten said they were satisfied overall.

Table E.55 Percentage of parents satisfied with the last dental practice visited with their children, by age

England, 2013					Percentages
All children	5 years	8 years	12 years	15 years	Total
Wait for routine appointment	82	77	77	83	80
Wait for urgent appointment	76	76	80	80	78
Overall satisfaction	92	91	90	91	91
Unweighted bases	*627*	*603*	*500*	*399*	*2,129*

There was little variation in levels of overall satisfaction with last dental practice by the sex of the child or their relative deprivation status (Table E.56).

Table E.56 Percentage of parents overall satisfied with last dental practice visited with their children, by sex and eligibility for free school meals

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Male	90	92	93	93
Female	93	90	88	89
Eligible for free school meals	88	88	83	[87]
Not eligible	93	91	92	91
Unweighted bases				
Male	*309*	*295*	*257*	*193*
Female	*318*	*308*	*243*	*206*
Eligible for free school meals	*90*	*72*	*69*	*44*
Not eligible	*511*	*504*	*416*	*340*

5.5 Dental care received

In England, the lifetime experience of dental treatment in permanent teeth (fillings and extractions) was higher for successive ages in this sample. While there was an increase in the lifetime provision of fillings as well as extractions in permanent teeth by age, the age of 12 years seemed to be of particular importance; almost one in ten children had experienced extractions at that age . At age 15, 36% of children had received a filling in a permanent tooth and 21% had a permanent tooth extracted (Table E.57).

Table E.57 Dental care ever received, by age

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Permanent tooth filled	1	11	25	36
Permanent tooth extracted	1	2	9	21
Primary tooth filled	12	29	32	26
Primary tooth extracted	5	17	28	28
General anaesthetic before dental treatment	3	6	9	10
Sedation before dental treatment	1	6	13	24
A brace fitted or adjusted	*	*	14	36
Scale and polish	5	13	27	35
Preventative treatment to teeth	13	27	29	26
Advice on oral care	36	55	68	65
Unweighted bases	*642*	*613*	*506*	*405*

One in ten children at 15 years of age were reported to have experienced a general anaesthetic before dental treatment at some point in their life, whilst almost one in four children at 15 years of age were report to have received dental treatment under sedation.

Orthodontic treatment was only relevant to 12 and 15 year olds, with 14% and 36% having had a brace fitted or adjusted at these ages, respectively. The proportion of children who had received a scale and polish increased with age resulting in over one third of children at 15 years of age having experienced this dental procedure. Whilst 13% of 5 year old children were reported to have received preventative treatment to teeth, this figure rose to 29% in 12 year olds and 26% in 15 year old children. Advice on oral care broadly increased with age with just over one in three children at age 5 and almost two in three children at age 15 having received this aspect of dental care.

5.6 Dental anxiety and its relationship to treatment experience

Dental anxiety has not been assessed in any of the previous CDH Surveys beyond the inclusion of a single question (in the 2003 survey parent questionnaire) regarding emotions about attending the dentist.

The pupil questionnaire for 12 and 15 year olds included the Modified Dental Anxiety Scale (MDAS)[17], which is a modified version of Corah's Dental Anxiety Scale[18] and includes a question assessing fears associated with local anaesthesia as well as four other scenarios and asks the respondent to report the extent of their anxiety, ranging from not anxious to extremely anxious. These four scenarios include anticipated anxiety in relation to going to the dentist tomorrow, sitting in a dentist's waiting room, having a tooth drilled and having a scale and polish. A five point response format was used for each of the five items: 'not anxious' (1), 'slightly anxious' (2), 'fairly anxious' (3), 'very anxious' (4) and 'extremely anxious' (5). The MDAS score is calculated by summing the scores of the individual items (ranging between 5 and 25), with the lowest possible score (5) indicating no anxiety at all and scores of 19 and above indicating extreme dental anxiety, which may be indicative of dental phobia. For the purpose of analysis the data was grouped as follows: 5-9 indicating low or no anxiety, 10-18 showing moderate levels of anxiety and 19+ being extreme anxiety. These groups have been used in other national surveys.

In 2013, parents in England were asked to rate their child's anxiety about visiting the dentist in general terms (on a scale of 1-10 with a value of 1 being 'not at all anxious' and 10 being 'extremely anxious'). An option for 'my child never goes to the dentist' was provided. This scale was divided into groups as follows: A score of 1 indicating no anxiety; 2-4 low levels of anxiety and 5-10 moderate to extreme levels of anxiety.

Table E.58 shows the results for parental assessment of their child's dental anxiety. For around half of all children, parents reported no dental anxiety. Moderate to extreme dental anxiety was recorded for around a fifth of all children.

Table E.58 Parental report on child anxiety when visiting the dentist, by age

England, 2013				Percentages
All children	5 years	8 years	12 years	15 years
Not anxious	50	55	43	47
Low anxiety	26	27	27	30
Moderate to extreme anxiety	22	17	29	22
My child never goes to dentist	2	1	1	*
Unweighted bases	*628*	*602*	*497*	*402*

[17] Humphris, Morrison, and Lindsay (1995) The Modified Dental Anxiety Scale: validation and United Kingdom norms. *Community Dent Health* Sep 12 (3) 143-50

[18] Corah (1969) Development of a dental anxiety scale *J Dent Res* 48 (4) 596

Table E.59 shows the self-reported dental anxiety measure for the older children. Over one in ten (14% of 12 year olds and 10% of 15 year olds) were classified as having extreme dental anxiety.

Table E.59 Self-rated anxiety about visiting the dentist, by age

England, 2013	Percentages	
Children aged 12, 15	12 years	15 years
Low/no anxiety	23	36
Moderate anxiety	63	54
Extreme anxiety	14	10
Unweighted bases	*1,354*	*1,275*

Higher dental anxiety was more commonly reported by girls than boys in both age groups, which may indicate that girls are genuinely more anxious than boys or they are more willing to report it. There was no link between dental anxiety and relative deprivation.

Table E.60 Self-rated anxiety about visiting the dentist, by sex and free school meal eligibility

England, 2013		Percentages	
Children aged 12, 15		12 years	15 years
Male			
	Low/no anxiety	31	44
	Moderate anxiety	60	51
	Extreme anxiety	9	6
Female			
	Low/no anxiety	15	29
	Moderate anxiety	65	57
	Extreme anxiety	19	15
Eligible for free school meals			
	Low/no anxiety	26	37
	Moderate anxiety	63	52
	Extreme anxiety	11	12
Not eligible			
	Low/no anxiety	23	37
	Moderate anxiety	62	54
	Extreme anxiety	15	9
Unweighted bases			
Male		*653*	*607*
Female		*701*	*688*
Eligible for free school meals		*314*	*242*
Not eligible		*974*	*969*

Between two in ten and three in ten 12 and 15 year olds with extreme dental anxiety reported that they would only attend when they had trouble or that they had never been to the dentist.

Extremely anxious 15 year olds were less likely than other children of the same age to visit a dentist for check-ups. The apparent difference in 12 year olds is not statistically significant (Table E.61).

Table E.61 Dental attendance pattern for children with low and extreme self-rated dental anxiety, by age

England, 2013				Percentages
Children aged 12, 15	12 years		15 years	
	Low anxiety	Extreme anxiety	Low anxiety	Extreme anxiety
For a check-up	86	79	84	69
Only when I have trouble with my teeth/never been	14	21	16	31
Unweighted bases	*353*	*189*	*457*	*150*

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