



Children's Dental Health in the United Kingdom, 2003

Summary Report

Deborah Lader

Barbara Chadwick

Ivor Chestnutt

Rachael Harker

John Morris

Nigel Nuttall

Nigel Pitts

Jimmy Steele

Deborah White

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Office for National Statistics

1 Drummond Gate

London SW1V 2QQ

Tel: 020 7533 5091

Fax: 020 7533 9292

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Particular acknowledgement goes to Jan Gregory (1946-2004) for her considerable contribution to the series of adult and children's dental health surveys, as well as a wide range of other ONS surveys.

Notes on the tables and text

Proportionately larger samples were selected in Wales and Northern Ireland than in England to provide estimates for these three countries within the UK. The data needed to be reweighted in order to produce representative figures for the UK as a whole. Weighted bases are provided for UK estimates and unweighted sample sizes are provided for individual country comparisons.

There was no oversampling in Scotland relative to England as a separate analysis for Scotland was not required by the Scottish Executive.

Differences cited in the text are statistically significant ($p < 0.05$) unless otherwise stated.

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

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

Table of Contents

1 INTRODUCTION	6
COVERAGE OF THE SURVEY.....	6
OVERVIEW OF SURVEY DESIGN.....	6
RESPONSE TO THE EXAMINATIONS	7
RESPONSE TO THE QUESTIONNAIRE.....	8
WEIGHTING THE DATA.....	9
2 OBVIOUS DECAY EXPERIENCE.....	10
TRENDS IN THE CONDITION OF THE PRIMARY ('MILK') TEETH.....	10
THE CONDITION OF CHILDREN'S PRIMARY TEETH IN THE UNITED KINGDOM 2003.....	12
TRENDS IN THE CONDITION OF PERMANENT TEETH	14
THE CONDITION OF PERMANENT TEETH IN THE UNITED KINGDOM 2003	16
3 NON-CARIOUS DENTAL CONDITIONS.....	19
TOOTH SURFACE LOSS (TSL)	19
ENAMEL OPACITIES IN 12-YEAR-OLDS.....	20
SYMMETRY OF DIFFUSE DEFECTS	21
THE PREVALENCE OF ACCIDENTAL DAMAGE	22
4 PERIODONTAL CONDITION, HYGIENE BEHAVIOUR AND ATTITUDES TO ORAL HEALTH.....	24
THE VISUAL ASSESSMENT OF THE GUMS.....	24
GINGIVITIS AMONG 15-YEAR-OLDS.....	25
ORAL HEALTHCARE AT HOME	26
PARENTAL VIEWS ABOUT THE CAUSES AND PREVENTION OF DECAY	27
PERIODONTAL HEALTH AND DENTAL BEHAVIOUR	28
5 PATTERNS OF CARE AND SERVICE USE	30
VISITING THE DENTIST.....	30
CHILDREN'S DENTAL ATTENDANCE PATTERN.....	31
MOTHERS' AND CHILDREN'S DENTAL ATTENDANCE PATTERNS.....	32
DENTAL SERVICES USED.....	33
BARRIERS TO ACCESS	34
6 IMPACT OF ORAL HEALTH	36
IMPACT OF ORAL HEALTH AND DENTAL HEALTH BEHAVIOUR	38
IMPACT OF ORAL HEALTH AND DENTAL HEALTH	40
7 THE ORTHODONTIC CONDITION OF CHILDREN	42
INTRODUCTION.....	42
ORTHODONTIC CONDITION AMONG 12 AND 15-YEAR-OLDS.....	42
ORTHODONTIC CONDITION AT AGE TWELVE AND FIFTEEN YEARS BY COUNTRY.....	44
ORTHODONTIC TREATMENT NEED AMONG CHILDREN NOT WEARING AN APPLIANCE.....	45
TRENDS IN CURRENT AND PAST ORTHODONTIC TREATMENT.	47
TYPES OF ORTHODONTIC APPLIANCE	48

Summary report

8 SOCIAL FACTORS AND ORAL HEALTH IN CHILDREN	49
THE PREVALENCE OF TOOTH DECAY	49
THE SEVERITY OF TOOTH DECAY	51
TREATMENT FOR TOOTH DECAY	52
ORAL CLEANLINESS AND GUM HEALTH	53
NON-CARIOUS TOOTH SURFACE LOSS	55
ORTHODONTIC TREATMENT NEED	57

1 Introduction

The 2003 Children's Dental Health Survey, commissioned by the four United Kingdom Health Departments, is the fourth in a series of national children's dental health surveys that have been carried out every 10 years since 1973 in England and Wales and in the whole of the UK since 1983.

The survey provides information on the dental health of children in the United Kingdom, measures changes in oral health since the last survey in 1993 and provides information on children's experiences of dental care and treatment and their oral hygiene.

Coverage of the survey.

The surveyed population included children aged five, eight, twelve and fifteen years of age attending state and independent primary and secondary schools throughout the United Kingdom.

Although the previous Children's Dental Health Surveys examined children aged between five and fifteen years, the 1993 survey indicated there was little change in the exfoliation of primary dentition or eruption of permanent dentition over time (O'Brien, 1994, pp 15-16). Since little new information would be gained from collecting clinical data for all age cohorts, the 2003 survey concentrated on children aged five, eight, twelve and fifteen years. These age groups correspond to those associated with oral health targets for children set by the UK Departments of Health. The 2003 survey also, for the first time, included children at independent schools to provide estimates of all children rather than just those attending state schools.

Overview of survey design

The 2003 survey was based upon a representative sample of children aged five, eight, 12 and 15 years of age attending government maintained and independent schools in the UK. As in the three earlier surveys, dental examiners were recruited to carry out examinations on the sampled children in participating schools.

Schools were sampled by obtaining lists of maintained and independent schools from the relevant education departments. Sampled schools were asked to participate in the survey and those that agreed forwarded lists of children in the eligible age groups at their school to ONS. These lists were used to randomly select an appropriate number of children for each school. The sample was divided equally between children aged five, eight, 12 and 15 on 31 August 2003.

Children from schools with more than 30 per cent of children eligible for free school meals were defined as deprived and were oversampled relative to those with lower proportions of free school meal eligibility, so that they would make up approximately a third of the overall sample. The proportion of children eligible for free school meals is a school-level indicator that has been shown to be very highly correlated with the socio-economic status of the children and their parents.

Summary report

Children in Wales and Northern Ireland were also oversampled relative to England, to allow for the comparative analysis of the dental health of children in England, Wales and Northern Ireland. There was no oversampling in Scotland relative to England as separate analysis for Scotland was not required. The sample in England and Wales is also large enough to produce regional estimates in these countries. Regional estimates are not applicable to Northern Ireland, as the country is not divided into regions.

Dental examinations were carried out in schools between October and December 2003. Dental examiners carried out the examinations and a recorder noted the results. Recorders were the dental nurses who usually worked with the dental examiners. Dental examiners and recorders participated in a three-day training programme prior to the fieldwork to clarify understanding and application of the diagnostic criteria.

All examinations followed a set procedure and used the same criteria for all children within each age group, although the clinical parameters measured varied between age groups.

To supplement the examination data, background information on children's oral hygiene and dental care was requested by questionnaire from the parents of a random sub-sample of approximately half the examined children. The 2003 questionnaire was based upon the 1993 questionnaire so that results could be compared to previous rounds of the survey.

Response to the examinations

The survey relied on the cooperation of schools and the students within them. First, the consent of individual schools to involve their students was required. The school level response was 71 per cent for the United Kingdom (Table 1.1). This was lower than 1993 response when only 5 per cent of schools refused.

Table 1.1 Response from primary and secondary schools (United Kingdom, 2003)

	England	Wales	Scotland	Northern Ireland	United Kingdom
Secondary schools selected	130	35	11	26	202
Secondary schools agreeing	77	26	8	21	132
Primary schools selected	446	185	55	88	774
Primary schools agreeing	305	140	40	72	557
Total schools selected	382	220	66	114	976
Total schools agreeing	194	166	55	93	689
Response rate					
Secondary	59%	74%	73%	81%	65%
Primary	68%	76%	73%	82%	72%
All schools	66%	75%	73%	82%	71%

In total, 10,381 children were examined, 82 per cent of those sampled. Table 1.2 shows the number of children sampled and children's response to examinations.

Summary report

Table 1.2 Response from primary and secondary schoolchildren (United Kingdom, 2003)

	England	Wales	Scotland	Northern Ireland	United Kingdom
Number of children sampled:					
5 year olds	1843	676	225	521	3265
8 year olds	1731	651	220	528	3130
12 year olds	1712	655	256	506	3129
15 year olds	1723	660	258	533	3174
All children	7009	2642	959	2088	12698
Number of children examined:					
5 year olds	1620	582	196	456	2854
8 year olds	1547	573	198	472	2790
12 year olds	1356	559	218	462	2595
15 year olds	1116	482	164	380	2142
All children	5639	2196	776	1770	10381
Reasons for non-examination: all ages					
	%	%	%	%	%
Child absent all visits	6	8	8	7	7
Child refused	6	3	6	2	4
Parent refused	3	3	3	2	3
Child left school	2	2	3	*	2
Other	2	1	*	4	2
Successfully examined:					
	%	%	%	%	%
5 year olds	88	86	87	88	87
8 year olds	89	88	90	89	89
12 year olds	79	85	85	91	83
15 year olds	65	73	64	71	68
All children	80	83	81	85	82

Response to the questionnaire

Background data on children's oral hygiene and dental care were requested by questionnaire from the parents of a random sub-sample of 5480 examined children. In total, 3342 questionnaires were returned by the parents/carers of examined children, 61 per cent of those receiving a questionnaire.

Table 1.3 Response to postal questionnaire (United Kingdom, 2003)

	England	Wales	Scotland	Northern Ireland	United Kingdom
	%	%	%	%	%
Replied	65	62	68	45	61
Refused	34	36	30	55	37
Other non response (e.g. questionnaire returned by Royal Mail)	2	2	1	-	1
Base = 100 per cent (all parents who received a questionnaire)	2962	1158	414	946	5480

Percentages may not add to 100 due to rounding

Summary report

Weighting the data

While the sample selected within each country gave equal probability to each child of selection within that country, Wales and Northern Ireland were oversampled relative to England within the United Kingdom. Response within each age group also differed between the countries. In order that the sample estimates should be representative of the United Kingdom, the data were therefore weighted back to population proportions within age groups.

It was evident that there was some variation in response rates across countries, age groups and deprived/non-deprived groups, although real response rates were difficult to calculate due to the substitution of non-responding schools in the first wave and the differing size of sampled schools. For this reason a nonresponse weight equal to the reciprocal of the response rates was not used as this would have delayed analysis. As an alternative the sampled weighted by the probability weights was weighted up to known population totals. The population was that of August 2003 and since population totals for 2002 were used in the original sampling, this should also adjust for relative over and under-coverage in the weighting classes. The population weighting factors were multiplied by the sample weights to produce a final pupil-level weight, which adjusts for both differing probabilities of selection and nonresponse

Complete details of the survey methodology can be found in the Children's Dental Health in the United Kingdom 2003 Technical Report available at

<http://www.statistics.gov.uk/children/dentalhealth>

2 Obvious Decay Experience

A major part of the survey dental examination was an assessment of the obvious decay experience of children's teeth. Obvious decay experience is the sum of teeth which, at the time of the examination, had decay into dentine (including teeth that were filled in the past but which needed further treatment), filled teeth, or teeth that were missing due to decay. However, 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.

In the 2003 survey the criteria for assessing dental caries were changed from those used in the earlier surveys to reflect changes in the presentation of dentine decay. In order to compare the data on the condition of teeth in 2003 with those from 1983 and 1993, the 2003 data were re-classified according to the pre-2003 criteria. Where this report refers to trends in decay over time the conditions of children's teeth are assessed according to the pre-2003 criteria ($d_{3c}mft/D_{3c}MFT$, d_{3c}/D_{3c}). Results reporting the overall condition of children's teeth in 2003 use the revised 2003 criteria, which include visual dentine caries ($d_{3cv}mft/D_{3cv}MFT$, d_{3cv}/D_{3cv}). In all cases clinical caries in enamel was excluded. Full details of the 2003 and pre-2003 criteria can be found in the report covering Obvious Decay Experience available at

<http://www.statistics.gov.uk/children/dentalhealth>

Trends in the condition of the primary ('milk') teeth

In 2003, less than half of five-year-olds (43 per cent) had obvious decay experience ($d_{3c}mft$) in the primary teeth. Forty per cent of five-year-olds had at least one primary tooth with decay into dentine (d_{3c}) and 12 per cent had at least one filled primary tooth. Among eight-year-olds, 57 per cent had obvious decay experience ($d_{3c}mft$) in the primary teeth, half (50 per cent) had at least one primary tooth with decay into dentine (d_{3c}) and just over a quarter (26 per cent) had at least one filled primary tooth.

Table 2.1

Summary report

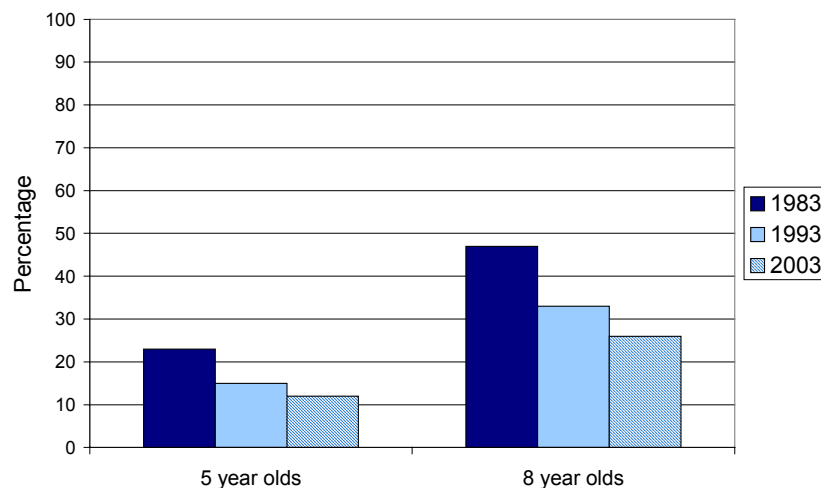
Table 2.1 Percentage of children with obvious decay experience ($d_{3c}mft$) by age (United Kingdom 1983, 1993, 2003)

Tooth condition	Age	
	5 year olds	8 year olds
	<i>Percentage of children:</i>	
Decay into dentine		
1983	41	49
1993	40	50
2003 ⁺	40	50
Filled (otherwise sound)		
1983	23	47
1993	15	33
2003 ⁺	12	26
Obvious decay experience		
1983	50	70
1993	45	61
2003 ⁺	43	57
Filled teeth as a percentage of obvious decay experience*		
1983	28	50
1993	17	35
2003 ⁺	15	28

⁺ Criteria used for 1993 survey ($d_{3c}mft$ does not include visual caries)

* Total number of filled teeth divided by total number of teeth with obvious decay experience

There were no statistically significant changes between the 1993 and 2003 surveys in the proportion of five and eight-year-olds with obvious decay experience ($d_{3c}mft$) or teeth with decay into dentine (d_{3c}) in the primary teeth. There were decreases in the proportion of children with filled primary teeth: the proportion of five-year-olds with filled primary teeth decreased from 23 per cent in 1983, to 15 per cent in 1993 and to 12 per cent in 2003 and among eight-year-olds decreased from 47 per cent in 1983, to 33 per cent in 1993 and to 26 per cent in 2003 (Figure 2.1). In both age groups filled primary teeth represented a smaller proportion of the total obvious decay experience than in previous surveys.

Figure 2.1 Percentage of children with filled primary teeth (United Kingdom 1983, 1993, 2003)

Summary report

Among both five and eight-year-olds there were no statistically significant changes between surveys in the average number of primary teeth with obvious decay experience ($d_{3c.mft}$) or decay into dentine (d_{3c}). There were decreases in the average number of filled primary teeth for both age groups. The average number of filled teeth in five-year-olds decreased from 0.5 teeth in 1983, to 0.3 teeth in 1993 and 0.2 teeth in 2003 and in eight-year-olds decreased from 1.2 teeth in 1983 to 0.7 teeth in 1993 and 0.5 teeth in 2003.

Table 2.2

Table 2.2 Mean number of primary teeth with obvious decay experience ($d_{3c.mft}$) by age (United Kingdom, 1983, 1993, 2003)

Tooth condition	Age	
	5 year olds	8 year olds
	<i>Mean number of teeth:</i>	
Decay into dentine		
1983	1.3	1.2
1993	1.4	1.3
2003 ⁺	1.4	1.3
Filled (otherwise sound)		
1983	0.5	1.2
1993	0.3	0.7
2003 ⁺	0.2	0.5
Obvious decay experience		
1983	1.8	2.3
1993	1.7	2.0
2003 ⁺	1.6	1.8

+ Criteria used for 1993 survey ($d_{3c.mft}$ does not include visual caries)

The condition of children's primary teeth in the United Kingdom 2003

In the primary dentition, use of the contemporary 2003 criteria for obvious decay experience ($d_{3cv.mft}$) and decay into dentine (d_{3cv}) had little impact on estimates of the proportion of children, or the mean number of teeth, affected by decay. For the United Kingdom, over 43 per cent of children showed signs of obvious decay experience ($d_{3cv.mft}$) by the age of five years, while over half (57 per cent) of eight-year-olds had obvious decay experience ($d_{3c.mft}$). There were differences in the proportion of children affected by decay in the primary teeth between countries of the United Kingdom. In both five and eight-year-olds, a lower proportion of children were affected by obvious decay experience ($d_{3cv.mft}$), decay into dentine (d_{3cv}) or fillings in the primary teeth in England than in Wales and Northern Ireland. For example, 41 per cent of five-year-olds in England had obvious decay experience ($d_{3cv.mft}$) in the primary teeth, compared with 52 per cent in Wales and 61 per cent in Northern Ireland, while 54 per cent of eight-year-olds in England had obvious decay experience ($d_{3c.mft}$) in the primary teeth, compared with 71 per cent in Wales and 76 per cent in Northern Ireland. A lower proportion of five-year-olds in Wales had obvious decay experience ($d_{3cv.mft}$) and decay into dentine (d_{3cv}) in the primary teeth than in Northern Ireland.

Table 2.3

Summary report

Table 2.3 Percentage of children with obvious decay experience ($d_{3cv}mft$) in primary teeth by country and age (United Kingdom, 2003)

	Country			
	England	Wales	Northern Ireland	United Kingdom
	<i>Percentage of children:</i>			
Decay into dentine				
5 year olds	38	48	57	40
8 year olds	48	64	70	51
Filled (otherwise sound)				
5 year olds	10	15	19	11
8 year olds	22	32	34	24
Obvious decay experience				
5 year olds	41	52	61	43
8 year olds	54	71	76	57
Unweighted sample size				
5 year olds	1620	582	456	2538 *
8 year olds	1547	573	462	2599 *

* Weighted bases presented for UK

A similar pattern was observed in the average number of primary teeth affected by decay in England, Wales and Northern Ireland. The average number of primary teeth with obvious decay experience ($d_{3cv}mft$), decay into dentine (d_{3cv}) or fillings was lower in England than in Wales and Northern Ireland among both five and eight-year-old children. For example, five-year-old children in England had an average of 1.5 primary teeth with obvious decay experience ($d_{3cv}mft$), compared with an average of 1.9 teeth in Wales and 2.5 teeth in Northern Ireland, while eight-year-old children in England had an average of 1.7 primary teeth with obvious decay experience ($d_{3cv}mft$), compared with an average of 2.5 teeth in Wales and 2.8 teeth in Northern Ireland. Five-year-olds in Wales had a lower average number of primary teeth with obvious decay experience ($d_{3cv}mft$) and decay into dentine (d_{3cv}) than five-year-olds in Northern Ireland.

Table 2.4

Table 2.4 Mean number of primary teeth with obvious decay experience ($d_{3cv}mft$) by country and age (United Kingdom, 2003)

	Country			
	England	Wales	Northern Ireland	United Kingdom
	<i>Mean number of teeth</i>			
Decay into dentine				
5 year olds	1.3	1.6	2.2	1.4
8 year olds	1.3	1.8	2.1	1.4
Filled (otherwise sound)				
5 year olds	0.2	0.3	0.3	0.2
8 year olds	0.4	0.6	0.7	0.4
Obvious decay experience				
5 year olds	1.5	1.9	2.5	1.6
8 year olds	1.7	2.5	2.8	1.8

Summary report

Trends in the condition of permanent teeth

Among eight-year-olds in 2003, 14 per cent had obvious decay experience ($D_{3c}MFT$) in the permanent dentition, 7 per cent had decay into dentine (D_{3c}) and filled teeth, while 1 per cent had at least one tooth missing due to decay. In 12-year-olds, 34 per cent had obvious decay experience ($D_{3c}MFT$) in the permanent dentition, 12 per cent had decay into dentine (D_{3c}), 26 per cent had at least one filled tooth and 3 per cent had at least one tooth missing due to decay. The figures for 15-year-olds were 49 per cent, 13 per cent, 42 per cent and 6 per cent respectively.

Table 2.5

Table 2.5 Percentage of children with obvious decay experience ($D_{3c}MFT$) in permanent teeth by age (United Kingdom, 1983, 1993, 2003)

Tooth condition	Age		
	8 year olds	12 year olds	15 year olds
<i>Percentage of children:</i>			
Decay into dentine			
1983	19	32	42
1993	12	24	30
2003*	7	12	13
Filled (otherwise sound)			
1983	25	69	85
1993	8	39	52
2003*	7	26	42
Missing due to decay			
1983	2	14	24
1993	1	7	7
2003	1	3	6
Obvious decay experience			
1983	38	81	93
1993	19	52	63
2003*	14	34	49
Filled teeth as a percentage of obvious decay experience *			
1983	58	70	74
1993	37	58	68
2003*	52	69	77

*Criteria used for 1993 survey ($D_{3c}MFT$ does not include visual caries)

* Total number of filled teeth divided by total number of teeth with obvious decay experience

The proportion of children with obvious decay experience ($D_{3c}MFT$) in the permanent teeth and the proportion with at least one permanent tooth with decay into dentine (D_{3c}) decreased in all age groups since the previous surveys. The decrease was particularly pronounced in the proportion of 15-year-olds with decay into dentine (D_{3c}) in the permanent teeth (42 per cent in 1983, 30 per cent in 1993 and 13 per cent in 2003). In all

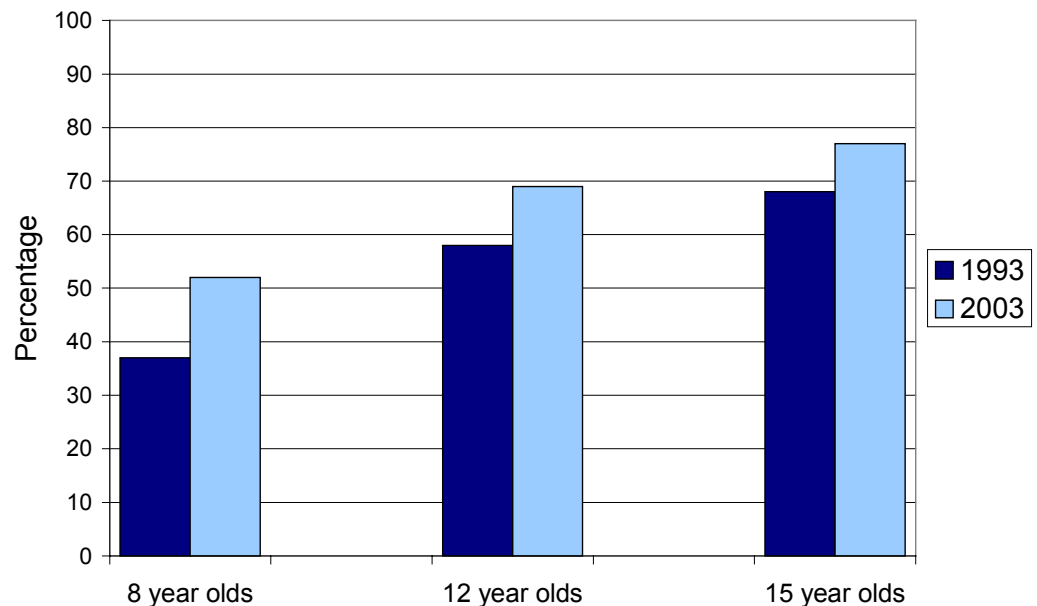
Summary report

age groups, the rate of change in obvious decay experience ($D_{3c}MFT$) was more pronounced between 1983 and 1993 than between 1993 and 2003.

The proportion of 12 and 15-year-olds with filled permanent teeth also decreased since the last survey. The proportion fell by 13 percentage points in 12-year-olds, from 39 per cent in 1993 to 26 per cent in 2003 and by 10 percentage points in 15-year-olds, from 52 per cent in 1993 to 42 per cent in 2003. Filled permanent teeth among eight, 12 and 15-year olds represented a higher proportion of the total obvious decay experience ($D_{3c}MFT$) than in 1993, (Figure 2.2). There was also a decrease in the proportion of 12-year-olds with permanent teeth missing due to decay, from 7 per cent in 1993 to 3 per cent in 2003.

Figure 2.2

Figure 2.2 Filled teeth as a percentage of obvious decay experience by age (United Kingdom 1983, 1993, 2003)



The average number of permanent teeth with obvious decay experience ($D_{3c}MFT$) and the average number of permanent teeth with decay into dentine (D_{3c}) decreased in all age groups since the previous surveys. Between the 1993 and 2003 survey the average number of permanent teeth with decay into dentine (D_{3c}) halved in eight-year-olds (to 0.1) and 12-year-olds (to 0.2) and more than halved in 15-year-olds (to 0.2). The average number of permanent teeth with obvious decay experience ($D_{3c}MFT$) fell from 0.4 teeth in 1993 to 0.2 teeth in 2003 in eight-year-olds, from 1.4 teeth in 1993 to 0.8 teeth in 2003 in 12-year-olds and from 2.5 to 1.6 teeth in 15-year-olds. Among 12 and 15-year-olds the average number of filled permanent teeth decreased since 1993: from 0.8 teeth in 1993 to 0.5 teeth in 2003 in 12-year-olds and from 1.7 teeth in 1993 to 1.2 teeth in 2003 in 15-year-olds.

Table 2.6

Summary report

Table 2.6 Mean number of permanent teeth with obvious decay ($D_{3c}MFT$) by age (United Kingdom, 1983, 1993, 2003)

Tooth condition	Age		
	8 year olds	12 year olds	15 year olds
	<i>Mean number of teeth</i>		
Decay into dentine			
1983	0.3	0.6	1.0
1993	0.2	0.4	0.7
2003 ⁺	0.1	0.2	0.2
Filled (otherwise sound)			
1983	0.5	2.1	4.4
1993	0.1	0.8	1.7
2003 ⁺	0.1	0.5	1.2
Missing due to decay			
1983	*	0.3	0.6
1993	*	0.1	0.1
2003	*	*	0.1
Obvious decay experience			
1983	0.8	3.1	5.9
1993	0.4	1.4	2.5
2003 ⁺	0.2	0.8	1.6

⁺ Criteria used for 1993 survey ($D_{3c}MFT$ does not include visual caries)

The condition of permanent teeth in the United Kingdom 2003

In the permanent dentition, use of the contemporary 2003 criteria for obvious decay experience ($D_{3cv}MFT$) and decay into dentine (D_{3cv}) increased the prevalence of decay detected among all age groups. When visual criteria were included in the assessment, the proportion of children with obvious decay experience increased from 14 per cent to 19 per cent for eight-year-olds, from 34 per cent to 43 per cent for 12-year-olds and from 49 per cent to 57 per cent for 15-year-olds. Proportions for decay into dentine increased from 7 per cent to 14 per cent in eight-year-olds, from 12 per cent to 29 per cent in 12-year-olds and from 13 per cent to 32 per cent in 15-year-olds. The proportion of filled teeth as a percentage of obvious decay experience fell when visual dentine caries were included: from 52 per cent to 30 per cent for 8 year olds, from 69 per cent to 46 per cent for 12 year olds and from 77 per cent to 57 per cent for 15 year olds.

There were differences in the proportion of children affected by decay in the permanent teeth between countries of the United Kingdom. In all age groups, a lower proportion of children were affected by obvious decay experience ($D_{3cv}MFT$), decay into dentine (D_{3cv}) or fillings in the permanent teeth in England than in Northern Ireland. For example, 55 per cent of 15-year-olds in England had obvious decay experience ($D_{3cv}MFT$) in the permanent teeth, compared with 78 per cent in Northern Ireland. The proportion of eight, 12 and 15-

Summary report

year-olds with obvious decay experience ($D_{3cv}MFT$) was lower in England than in Wales: 17 per cent for eight-year-olds in England compared with 26 per cent in Wales, 41 per cent for 12-year olds in England compared with 54 per cent in Wales, 55 per cent of 15-year-olds in England compared with 65 per cent in Wales. The only statistically significant differences in levels of obvious decay experience ($D_{3cv}MFT$) between Wales and Northern Ireland were among 12-year-olds: 54 per cent in Wales compared with 73 per cent in Northern Ireland. In all age groups, the proportion of children with filled permanent teeth was lower in England than in Wales or Northern Ireland, while the proportion with filled permanent teeth in Wales was lower than in Northern Ireland. A similar pattern was observed among 12 and 15-year-olds for the proportion with at least one permanent tooth missing due to decay.

Table 2.7

Table 2.7 Percentage of children with obvious decay experience ($D_{3cv}MFT$) in permanent teeth by country and age (United Kingdom , 2003)

	Country			
	England	Wales	Northern Ireland	United Kingdom
	<i>Percentage of children:</i>			
Decay into dentine				
8 year olds	13	18	25	14
12 year olds	28	35	44	29
15 year olds	31	35	46	32
Filled (otherwise sound)				
8 year olds	6	10	15	7
12 year olds	22	32	54	25
15 year olds	38	51	66	41
Missing due to decay				
8 year olds	1	1	1	1
12 year olds	2	4	14	3
15 year olds	5	9	17	6
Obvious decay experience				
8 year olds	17	26	34	19
12 year olds	41	54	73	43
15 year olds	55	65	78	57
Unweighted sample size				
8 year olds	1547	573	472	2599 **
12 year olds	1356	559	462	2689 **
15 year olds	1116	482	380	2556 **

* Weighted bases presented for UK

Differences between countries were also evident in the average number of teeth affected by decay. In all age groups, the average number of permanent teeth with obvious decay experience ($D_{3cv}MFT$) was lowest in England, followed by Wales and highest in Northern Ireland. For example, the average number of permanent teeth with obvious decay experience ($D_{3cv}MFT$) for 15-year-olds was 1.8 in England, compared with 2.5 in Wales and 4.4 in Northern Ireland. This pattern was also found among eight-year-olds for the average number of permanent teeth with decay into dentine (D_{3cv}), while in 12 and 15-year-olds the average number of permanent teeth with decay into dentine (D_{3cv}) was higher in Northern Ireland than in England. Among 12 and 15-year-olds, the average number of filled

Summary report

permanent teeth was lower in England than in Wales or Northern Ireland, while the average number of filled permanent teeth in Wales was lower than in Northern Ireland.

Table 2.8

Table 2.8 Mean number of permanent teeth with obvious decay experience ($D_{3cv}MFT$) by country and age (United Kingdom, 2003)

	Country			
	England	Wales	Northern Ireland	United Kingdom
	<i>Mean number of teeth</i>			
Decay into dentine				
8 year olds	0.2	0.3	0.5	0.2
12 year olds	0.5	0.7	1.1	0.5
15 year olds	0.8	0.8	1.2	0.8
Filled (otherwise sound)				
8 year olds	0.1	0.1	0.3	0.1
12 year olds	0.4	0.6	1.4	0.5
15 year olds	1.0	1.5	2.8	1.2
Missing due to decay				
8 year olds	*	*	*	*
12 year olds	*	0.1	0.3	*
15 year olds	0.1	0.2	0.4	0.1
Obvious decay experience				
8 year olds	0.3	0.5	0.8	0.3
12 year olds	1.0	1.4	2.7	1.1
15 year olds	1.8	2.5	4.4	2.0

3 Non-carious dental conditions

Tooth surface loss (TSL)

Tooth surface loss (TSL) is pathological non-carious loss of tooth tissues resulting from erosion, attrition or abrasion. The proportion of five-year-olds with evidence of TSL on one or more of the buccal surfaces of the primary upper incisors was 20 per cent, and 3 per cent had TSL involving dentine or pulp. TSL of the lingual surface was more common, affecting over half (53 per cent) of five-year olds. TSL progressing to dentine or pulp was present on 22 per cent of lingual incisal surfaces. These were similar to the 1993 findings.

Table 3.1

Table 3.1 Percentage of 5 year old children with tooth surface loss (TSL) on the surfaces of the primary incisors (United Kingdom, 1993, 2003)

	Any TSL	Into dentine or pulp
<i>Percentage of children:</i>		
<i>Buccal surfaces</i>		
1993	18	1
2003	20	3
<i>Lingual surfaces</i>		
1993	52	24
2003	53	22

TSL of the permanent incisors was both less common and less severe than that of primary incisors. At age 8, 4 per cent of incisors had some TSL on the buccal surfaces and by age 15 this had increased to 14 per cent. While there has been no increase in the eight-year-old group since 1993, there has been a slight increase in buccal TSL among both 12 and 15-year-olds.

Table 3.2

Table 3.2 Percentage of children aged 8, 12 and 15 with tooth surface loss on the surfaces of the permanent incisors and first permanent molars (United Kingdom, 1993, 2003)

	Age					
	8 year olds		12 year olds		15 year olds	
	1993	2003	1993	2003	1993	2003
<i>Percentage of children :</i>						
Incisors						
<i>Buccal surfaces</i>						
Any TSL	4	4	9	12	12	14
Into dentine or pulp	*	*	*	*	*	*
<i>Lingual surfaces</i>						
Any TSL	11	14	27	30	27	33
Into dentine or pulp	*	1	1	3	2	5
Molars						
Any TSL	n/a	10	n/a	19	n/a	22
Into dentine or pulp	n/a	*	n/a	2	n/a	4
<i>Weighted base</i>	<i>1694</i>	<i>2599</i>	<i>1502</i>	<i>2689</i>	<i>1129</i>	<i>2556</i>

Summary report

As in 1993, TSL was more common on the lingual surfaces of the incisors. The proportion of children with TSL of the lingual surfaces increased at each examined age group with 14 per cent of eight year old and 33 per cent of 15-year-olds affected. Among 15-year-olds there has been a six percentage point increase in the proportion of affected children since 1993. However, as in 1993 very little TSL was into dentine or pulp.

The proportion of first permanent molars with TSL on the occlusal surface rose at each age group with 10 per cent, 19 per cent and 22 per cent affected at age 8, 12 and 15 years respectively. There was little TSL into dentine with only 2 per cent of 12-year-olds and 4 per cent of 15-year-olds affected.

Enamel opacities in 12-year-olds

Overall, just over one third (34 per cent) of the examined teeth had one or more enamel opacity. As in 1993, the defects presenting most often were demarcated and diffuse opacities: 17 per cent and 16 per cent of 12-year-olds respectively had these on one or more teeth and 3 per cent had both demarcated and diffuse opacities on one or more tooth. Hypoplasia affected few 12-year-olds with two per cent having hypoplasia alone and one per cent hypoplasia in combination with diffuse opacities. Compared with the 1993 survey the proportion of 12-year-olds in the United Kingdom presenting with enamel defects has decreased slightly.

Table 3.3

Table 3.3 Percentage of 12 year olds with enamel opacities and other defects of the tooth enamel (United Kingdom, 1993, 2003, upper incisors and premolars)

	Country							
	England		Wales		Northern Ireland		United Kingdom	
	1993	2003	1993	2003	1993	2003	1993	2003
	<i>Percentage of children:</i>							
Demarcated opacity	19	18	15	20	20	24	20	17
Diffuse opacity	20	18	15	9	7	11	19	16
Demarcated and diffuse opacity	3	3	2	2	4	2	3	3
Hypoplasia	1	2	1	1	1	2	1	2
Demarcated opacity and hypoplasia	1	*	1	*	-	1	1	*
Diffuse opacity and hypoplasia	1	1	-	*	-	1	1	1
All three defects	-	*	-	*	-	-	-	*
Other defects	-	-	-	-	-	-	-	-
Any of the above defects	36	35	27	29	27	33	36	34

A higher proportion of 12-year-olds with enamel opacities was found in England (35 per cent) than in Wales (29 per cent). In Northern Ireland 33 per cent exhibited enamel opacities. Children in Northern Ireland were more likely to have demarcated opacities (24 per cent), compared with England (18 per cent). Diffuse opacities were more prevalent

Summary report

among English 12-year-olds (18 per cent) than they were in Wales (9 per cent) or Northern Ireland (11 per cent).

The vast majority (92 per cent) of demarcated defects covered less than one third of the tooth surface, with 6 per cent covering between one and two thirds of the surface and only 2 per cent extending beyond two thirds of the tooth surface. As in 1993, the diffuse opacities tended to be more extensive than demarcated opacities, but again the majority (59 per cent) were confined to less than one third of the tooth surface. Over a quarter (28 per cent) of diffuse opacities covered between one and two thirds of the tooth with 12 per cent affecting more than two thirds of the tooth surface. Over half (54 per cent) of opacities that were both demarcated and diffuse covered between one third and two thirds of the tooth surface, almost a third (32 per cent) of these defects covered less than one third of the tooth and 13 per cent occupied more than two thirds of the tooth surface.

Table 3.4

Table 3.4 Tooth surface area covered by different types of enamel opacities (United Kingdom, 1993, 2003, 12 year olds, upper incisors and pre-molars)

	Demarcated		Diffuse		Demarcated & Diffuse	
	1993	2003	1993	2003	1993	2003
	<i>Percentage of children:</i>					
Less than a third	93	92	64	59	56	32
A third, but less than two thirds	5	6	25	28	33	54
Two thirds or more	2	2	11	12	11	13
<i>Total number of teeth with defect (100 per cent)</i>	511	835	634	1369	62	99

Symmetry of diffuse defects

The symmetry of diffuse defects was measured for the first time in 2003. Among examined 12-year-olds with diffuse defects in the United Kingdom almost two thirds (65 per cent) are symmetrical. The proportion of symmetrical defects was highest in England, at 66 per cent, with Wales and Northern Ireland having lower levels of 48 per cent and 46 per cent respectively. However, it must be noted that very few of the symmetrical diffuse defects were severe, as assessed by reference to a standard impact photograph regarded as the level at which diffuse defects cause aesthetic concern. Only a minority of the teeth examined, which had symmetrical diffuse defects, had a defect more severe than the impact photograph.

Tables 3.5 and 3.6

Summary report

Table 3.5 Symmetry of diffuse enamel defects (United Kingdom, 2003, 12 year olds)

	England	Wales	Northern Ireland	United Kingdom
	%	%	%	%
Not symmetrical	34	52	53	35
Symmetrical	66	48	46	65
<i>Base (100 per cent of children with defect)</i>	272	54	60	409

Table 3.6 Severity of symmetrical enamel defects (United Kingdom 2003, 12 year olds)

	England	Wales	Northern Ireland	United Kingdom
		<i>Percentage:</i>		
Similar or less severe than photo	89	[98]	[93]	90
More severe than photo	11	[2]	[6]	10
<i>Base (100 per cent of children with defect)</i>	179	28	26	248

[] Caution low base number of respondents - results are indicative only.

The prevalence of accidental damage

The proportion of children sustaining accidental damage to their incisors increased with age from 5 per cent at age eight to 13 per cent by age 15. The proportion of children sustaining accidental damage to permanent incisors fell from 1993 among 12 and 15-year-olds. In 1993, 17 per cent of both 12 and 15-year-olds had some accidental damage compared to 11 per cent of 12 year olds and 13 per cent of 15 year olds in 2003. The decline was most pronounced among 12 year old boys, with the proportion having accidental damage falling from 25 per cent in 1993 to 14 per cent in 2003. Among 12 and 15 year olds, boys were more likely to damage their incisors than girls.

Table 3.7

Summary report

Table 3.7 Percentage of children with any accidental damage to the incisors by age, sex and country (United Kingdom 1983, 1993, 2003)

Age	England			Wales			Northern Ireland			United Kingdom		
	1983	1993	2003	1983	1993	2003	1983	1993	2003	1983	1993	2003
<i>Percentage of children:</i>												
Boys												
8 year olds	13	6	6	9	7	6	6	6	5	12	6	6
12 year olds	29	27	14	31	11	11	22	20	20	29	25	14
15 year olds	34	21	17	35	20	14	30	30	23	33	21	16
Girls												
8 year olds	7	5	4	6	5	1	5	4	5	7	5	4
12 year olds	16	9	7	12	6	7	13	7	10	16	9	8
15 year olds	19	12	10	27	11	12	19	25	11	19	12	10
All children												
8 year olds	10	6	5	8	6	3	5	5	5	10	6	5
12 year olds	23	18	11	22	8	9	18	13	16	23	17	11
15 year olds	26	16	13	30	16	13	24	27	17	26	17	13

The trends within countries are, in general, very similar to the United Kingdom pattern with the incidence of dental trauma declining over time for most age groups. The exception is amongst 12-year-old girls where there is a slight increase since the 1993 survey from 7 per cent to 10 per cent in Northern Ireland.

4 Periodontal condition, hygiene behaviour and attitudes to oral health

The visual assessment of the gums

Each of the six segments of the mouth were examined for the presence or absence of gum inflammation, plaque and calculus.

Table 4.1 shows that in 2003 only a third (32 per cent) of five-year-olds had some gum inflammation, but by the age of eight, this had almost doubled to 63 per cent. Among 12-year-olds a similar proportion (65 per cent) were affected. However, this had reduced to 52 per cent of 15-year-olds. The proportion of children in three of the four age groups with some gum inflammation had risen since the previous survey in 1993. The exception was for 15-year-olds, where levels had remained the same. This continued the trend demonstrated between 1983 and 1993, albeit with smaller rises. Plaque showed a similar pattern to that for gum inflammation: higher proportions of children aged eight (76 per cent) and 12 (73 per cent) had plaque than their counterparts aged five (50 per cent) and 15 (63 per cent). The prevalence of plaque increased by about five percentage points in all age groups since 1993. Only a small proportion (6 per cent) of five-year-olds had calculus compared with 23 per cent of eight-year-olds, 30 per cent of 12-year-olds and 39 per cent of 15-year-olds. Levels of calculus rose in all age groups except five-year-olds compared with previous surveys.

Table 4.1

Table 4.1 Percentage of children with unhealthy gums, plaque and calculus by age (United Kingdom, 1983, 1993, 2003)

Age	Gum inflammation			Plaque			Calculus		
	1983	1993	2003	1983	1993	2003	1983	1993	2003
	<i>Percentage of children:</i>								
5 year olds	19	26	32	29	45	50	3	5	6
8 year olds	46	58	63	55	70	76	13	16	23
12 year olds	49	60	65	48	68	73	21	20	30
15 year olds	48	52	52	47	57	63	33	32	39

Generally, children in Wales were less likely than those in England and Northern Ireland to have plaque, gum inflammation or calculus although not all the differences were statistically significant.

Table 4.2

Summary report

Table 4.2 Percentage of children with unhealthy gums, plaque and calculus by age and country (United Kingdom, 2003)

	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>			
Gum inflammation				
England	32	65	53	67
Wales	25	52	61	56
Northern Ireland	36	63	68	65
Plaque				
England	50	78	74	63
Wales	44	71	72	63
Northern Ireland	56	75	77	77
Calculus				
England	6	25	32	41
Wales	2	14	24	32
Northern Ireland	4	19	27	35

Gingivitis among 15-year-olds

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. Table 4.3 shows that 43 per cent of 15-year-olds had gingivitis, similar to that found 1993 (45 per cent) and a decrease from 48 per cent in 1983. A larger proportion of 15-year-olds in England (45 per cent) had gingivitis than in Wales (37 per cent).

Table 4.3

Table 4.3 Percentage of 15-year-old children with gingivitis by country (United Kingdom, 1983, 1993, 2003)

	Country		
	1983	1993	2003
	<i>Percentage of children:</i>		
England	47	44	45
Wales	41	62	37
Northern Ireland	60	39	44
United Kingdom	48	45	43

The relationship between gingivitis and dental decay is shown in Table 4.4. The proportion of 15-year-olds with gingivitis who had some decay into dentine (40 per cent) was higher than for those children with healthy gums (26 per cent). A similar pattern existed with obvious decay experience; 63 per cent of children with gingivitis had some experience of dental decay compared with 53 per cent of those who had healthy gums.

Table 4.4

Summary report

Table 4.4 Percentage of 15-year-old children with decay into dentine and obvious decay experience by periodontal condition (United Kingdom, 2003)

	Condition	
	Gingivitis	Healthy Gums
	<i>Percentage of 15-year-olds:</i>	
Decay into dentine (D3 _{cv})	40	26
Obvious decay experience (D3 _{cv} MFT)	63	53
<i>Weighted base</i>	897	1245

Oral healthcare at home

Information from the questionnaire gives an indication of the way that children's teeth and oral health are maintained at home. As in previous surveys, questions were asked about tooth brushing and the use of fluoride supplements. In addition, the use of other oral health aids was investigated.

Overall, more than three quarters of children in all age groups in 2003 reported brushing their teeth at least twice a day. Girls in all age groups tended to brush more frequently than boys: for example, in five-year-olds, 78 per cent of girls brushed twice a day compared with 74 per cent of boys and among the 15-year-olds, 79 per cent of girls aged brushed twice a day compared with 70 per cent of boys.

Table 4.5

Table 4.5 Frequency of tooth brushing by age (United Kingdom, 2003)

Frequency of tooth brushing	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>			
Boys				
Three times or more daily	2	1	2	5
Twice daily	74	73	70	70
Once daily or less	24	26	28	24
<i>Weighted base</i>	460	444	430	329
Girls				
Three times or more daily	3	1	7	7
Twice daily	78	80	75	79
Once daily or less	19	18	19	14
<i>Weighted base</i>	500	485	372	309
All				
Three times or more daily	2	1	4	6
Twice daily	76	77	72	75
Once daily or less	21	22	24	19
<i>Weighted base</i>	960	929	802	638

Summary report

Table 4.6 shows that in all age groups there had been an increase since 1993 in the proportion of children brushing twice daily, bringing all age groups to a similar level. For example, in the 15-year-olds, three-quarters brushed twice daily in 2003, compared with 67 per cent in 1993 and 46 per cent in 1983. Seventy-six per cent of five-year-olds brushed twice daily in 2003, compared with 74 per cent in 1993 and 53 per cent in 1983.

Table 4.6 Comparison of brushing frequency by year of survey (United Kingdom, 1983, 1993, 2003)

Frequency of tooth brushing	Age			8 year olds			12 year olds			15 year olds		
	5 year olds			1983	1993	2003	1983	1993	2003	1983	1993	2003
	<i>Percentage of children:</i>											
Three or more times daily	4	4	2	4	5	1	4	7	4	12	13	6
Twice daily	53	74	76	52	70	77	51	65	72	46	67	75
Once a day or less	42	21	21	40	25	22	44	28	24	38	20	19
Never	1	-	-	3	-	-	1	-	-	3	-	-

Parental views about the causes and prevention of decay

Parents were asked, as in previous surveys, for their views on the causes and prevention of decay. As in the previous surveys, the majority of parents believed that either the consumption of sweet and sugary foods or poor oral hygiene were the major causes of tooth decay. Parents of five-year-olds were more likely to believe sugar was a cause of decay compared with parents of 15-year-olds (82 per cent and 73 per cent respectively).

Table 4.7

Table 4.7 What parents believe causes tooth decay (United Kingdom, 1993, 2003)

What causes decay?	5 year olds		8 year olds		12 year olds		15 year olds	
	1993	2003	1993	2003	1993	2003	1993	2003
	<i>Percentage of parents:</i>							
Sugar, sweet things	84	82	84	81	80	81	77	73
Poor oral hygiene	66	66	67	65	70	65	72	67
Scientific explanation*	n/a	6	n/a	8	n/a	6	n/a	8
Poor diet/nutrition	15	12	14	13	15	16	18	18
Not going to the dentist	3	2	3	2	4	4	6	6
Type of teeth	4	5	3	5	3	4	3	5
Lack of fluoride	1	1	1	1	1	1	-	*
Other specified answer	3	4	3	3	3	5	3	4

n/a Scientific explanation was not coded as a distinct category in 1993.

Parental views about how to prevent decay had changed little since 1993, except that visiting the dentist was regarded by parents of children from all age groups as less likely to be a factor. There had been a slight increase in the proportion of parents of 12- and 15-year-olds who believed that avoiding sweets and sugary food would prevent decay, bringing them more into line with parents of younger children. Fifty-five per cent of 12-

Summary report

year-olds' parents in 2003 thought that avoiding sweet things would prevent decay compared with 47 per cent in 1993.

*Table 4.8***Table 4.8** What parents believe prevents tooth decay (United Kingdom, 1993, 2003)

What prevents decay?	5 year olds		8 year olds		12 year olds		15 year olds	
	1993	2003	1993	2003	1993	2003	1993	2003
	<i>Percentage of parents:</i>							
Avoid sweets/food	59	58	56	56	47	55	42	45
Good oral hygiene	81	80	80	78	81	80	83	79
Sugarfree/dental gum	n/a	1	n/a	1	n/a	3	n/a	2
Good diet / nutrition	26	23	26	25	27	27	28	26
Visit dentist regularly	25	16	24	17	27	18	29	22
Preventative treatment	3	*	4	1	4	2	4	2
Fluoride toothpaste/supplements	5	2	3	2	4	2	5	2
Fluoride in water	1	2	2	1	2	1	1	1
Fluoride, unspecified	2	1	2	1	1	1	2	1
Dental Education	3	4	3	3	3	3	4	4
Other	*	1	1	3	2	3	1	3

n/a Sugarfree/dental gum was not coded as a distinct category in 1993.

Periodontal health and dental behaviour

The relationship between children's periodontal condition and their tooth brushing behaviour is shown in Table 4.10. Generally, more frequent brushing was associated with less plaque and gingivitis, except for eight-year-old children. For example, 66 per cent of 12-year-olds who brushed twice daily had gingivitis, compared with 72 per cent who brushed only once. Forty-six per cent of five-year-olds who brushed twice daily had plaque, compared with 57 per cent of those brushing only once a day.

Table 4.9

Summary report

Table 4.9 Relationship between reported frequency of teeth brushing and periodontal condition (United Kingdom, 2003)

Age	Periodontal condition	Frequency of brushing		
		Three times or more daily	Twice daily	Once daily or less
<i>Percentage of children:</i>				
5 year olds	Gingivitis	[23]	31	37
	Plaque	[35]	46	57
	Calculus	-	6	6
8 year olds	Gingivitis	[79]	34	30
	Plaque	[92]	77	85
	Calculus	[4]	24	32
12 year olds	Gingivitis	[45]	66	72
	Plaque	[60]	71	86
	Calculus	[21]	29	29
15 year olds	Gingivitis	[46]	52	55
	Plaque	[64]	63	78
	Calculus	[32]	39	50

[] Caution low base number of respondents: figures are indicative only.

Table 4.10 shows that among 15-year-olds, those who brush more frequently are less likely to have gingivitis. Thus over half (56 per cent) of those who brush only once a day have gingivitis compared with 40 per cent of those who brush more frequently. Fewer 15-year-olds (39 per cent) who visit the dentist regularly have gingivitis, compared with those who only go when they have trouble (46 per cent)

Table 4.10 Percentage of 15-year-old children with gingivitis by reported brushing frequency and dental attendance (United Kingdom, 2003)

	Frequency of brushing		
	3 times or more daily	Twice daily	Once daily or less
Gingivitis	40	39	56
<i>Weighted base</i>	<i>50</i>	<i>470</i>	<i>118</i>

	Dental attendance			
	Regular attendance	Occasional attendance	Only when trouble	Don't know
Gingivitis	39	44	46	49
<i>Weighted base</i>	<i>376</i>	<i>84</i>	<i>141</i>	<i>39</i>

5 Patterns of care and service use

Visiting the dentist

The majority of children were reported as having visited the dentist at least once. The proportion of children who had never visited the dentist reduces with age to only 1 per cent of 12 or 15-year-olds. The proportion of five-year-olds who had never visited the dentist was only 6 per cent in 2003, compared with 14 per cent in 1983. This represents a major change in parental attitudes to visiting the dentist, despite a fall in disease levels at this age. Table 5.1. also provides information on children who had never visited the dentist according to the social class of the household.¹ While the overall picture has improved, there were differences between the social classes among five-year-olds in 2003 and the differences between social classes appeared wider in 2003 compared with 1983 and 1993. In 1983 there was a difference of 8 percentage points and a factor of 1.8 between the highest and lowest social class in the proportion of children aged five years who had never visited the dentist, whereas by 2003 the difference was 11 percentage points and a factor of 6.5. In other age groups in 2003 there were no statistically significant differences between the social classes.

Table 5.1

Table 5.1 Percentage of children who had never visited the dentist by age and social class of household (United Kingdom, 1983, 1993, 2003)

Social class of household	Age											
	5 year olds			8 year olds			12 year olds			15 year olds		
	1983	1993	2003	1983	1993	2003	1983	1993	2003	1983	1993	2003
	<i>Percentage of children:</i>											
I,II,III non-manual	10	7	2	3	2	*	1	*	1	-	1	-
III manual	15	10	5	4	3	2	3	1	1	1	1	2
IV, V	18	15	13	9	6	1	2	2	3	1	1	2
All households	14	10	6	4	4	2	2	1	1	1	1	1

Table 5.2 shows that in 2003 the proportion of children who had never visited the dentist was similar across the individual countries of the United Kingdom. Among five-year-olds this finding was in marked contrast to the 1983 study where the proportion varied from 13 per cent in England to 29 per cent in Northern Ireland. All countries have seen improvement since 1993 in the proportion of five-year-olds who had never visited the dentist but the difference is only statistically significant for England; a reduction from 11 per cent in 1993 to 7 per cent in 2003. The proportion of five-year-olds in Northern Ireland who had never visited the dentist improved dramatically between 1983 (29 per cent) and 1993 (5 per cent), this improvement being maintained in 2003 (4 per cent).

Table 5.2

¹ .Previous surveys examined social class in relation to treatment provision. Therefore where trends over time are reported social class is used as an indicator of socio-economic status. In 2001 the National Statistics Socio-economic Classification (NS-SEC) replaced Social Class as the standard occupationally based classification used for all official statistics and surveys. NS-SEC is used in the current report for analysis of 2003 data alone

Summary report

Table 5.2 Percentage of children who had never visited the dentist by country (United Kingdom, 1983, 1993, 2003)

Country	Age											
	5 year olds			8 year olds			12 year olds			15 year olds		
	1983	1993	2003	1983	1993	2003	1983	1993	2003	1983	1993	2003
	<i>Percentage of children:</i>											
England	13	11	7	4	4	2	2	1	1	1	1	*
Wales	16	6	5	4	1	2	1	2	-	1	1	-
Northern Ireland	29	5	4	7	1	1	5	*	-	1	3	-
United Kingdom	14	10	6	4	4	2	2	1	1	1	1	1

Parents were asked at what age their child had first attended a dentist and the responses are shown in table 5.3. In 2003, the proportion of five-year-olds who were reported as having first visited the dentist before the age of two years (31 per cent) had doubled since 1993 (15 per cent) and quadrupled since 1983 (7 per cent), confirming the finding that parents are apparently taking their children to the dentist at a younger age than was previously the case. Over half of children were reported as having visited the dentist before the age of three years in 2003 compared with a quarter in 1983. This is a difficult question for parents of older children to answer and the responses for older children should be interpreted with caution.

Table 5.3

Table 5.3 Age of first visit to the dentist by age (United Kingdom, 1983, 1993, 2003)

First visit to dentist	Age											
	5 year olds			8 year olds			12 year olds			15 year olds		
	1983	1993	2003	1983	1993	2003	1983	1993	2003	1983	1993	2003
	<i>Percentage of children who had visited the dentist by this age:</i>											
Under two years	7	15	31	6	12	33	5	7	27	3	7	22
Under three years	26	42	54	24	35	53	18	29	48	14	25	40
Under four years	59	67	75	48	58	67	39	51	64	35	50	59
Under five years	78	82	87	66	72	80	57	67	73	53	64	71
Five years or older	6	6	7	27	22	18	37	27	26	40	27	28
Never visited the dentist	14	10	6	4	4	2	2	1	1	1	1	1
Cant' remember	1	2	*	3	3	1	4	5	1	6	8	2

Children's dental attendance pattern

Parents' were asked to provide information about their child's dental visits. Attendance patterns were derived from information given about the length of time since the last dental visit and the reason for the visit. Regular attenders were those who had visited the dentist in the six months prior to the survey and who had done so for a check up. Occasional attenders were categorised as those whose last visit was longer than six months ago, but was also for a check up. Those whose last visit was because they had trouble with their teeth, or in the case of children because the community or school dentist had advised it,

Summary report

were classified as attending only with trouble. Table 5.4 shows the proportion of children in each age group reported as attending the dentist regularly, occasionally or only when having trouble with their teeth. The majority of children in all age groups were regular attenders: though around a third of five-year-olds were symptomatic attenders, falling to around a quarter of older groups.

Table 5.4

Table 5.4 Children's reported dental attendance patterns by age (United Kingdom, 2003)

Age	Frequency of visit		
	Regular attender	Occasional attender	Only attends when trouble
<i>Percentage of children:</i>			
5 year olds	58	10	32
8 year olds	62	12	26
12 year olds	64	14	23
15 year olds	62	16	21

Mothers' and children's dental attendance patterns

Mothers' attendance patterns were derived in the same way as children's, using information given about the length of time since the last dental visit and the reason for the visit.

Table 5.5 shows the proportion of children reportedly first attending the dentist before the age of five years compared with their mother's reported attendance pattern. This shows, as in previous surveys, that the two are associated. For example nearly all (92 per cent) of children aged five years in 2003 whose mothers were regular attenders had visited the dentist before the age of five compared with around half (55 per cent) of those whose mothers only attended when having symptoms; a wider gap than was apparent in 1993 when the figures were 92 per cent and 62 per cent respectively. The proportion of children aged five in 2003 whose mothers were occasional attenders who were under five on their first dental visit has improved from 72 per cent in 1993 to 91 per cent in 2003.

Table 5.5

Table 5.5 Percentage of children who were aged below five at first dental visit by age and mother's dental attendance pattern (United Kingdom, 1993, 2003)

Mother's attendance pattern	Age							
	5 year olds		8 year olds		12 year olds		15 year olds	
	1993	2003	1993	2003	1993	2003	1993	2003
<i>Percentage of children under five at first dental visit:</i>								
Regular attender	92	92	83	85	77	81	75	78
Occasional attender	72	91	60	72	59	55	53	42
Only attends with trouble	62	55	51	56	46	52	42	56
All types of attender	82	87	72	80	67	73	64	71

Summary report

Table 5.6 shows the proportion of children who attended the dentist regularly according to mothers' attendance patterns. The overall proportion of children classified as regular attenders has remained stable in all four age groups since 1993. There remains a marked difference between those whose mother is a regular attender and those whose mother only attends with symptoms. Among five-year-olds in 2003, 69 per cent of children whose mother was a regular attender were themselves regular attenders compared with only 26 per cent of those whose mother was a symptomatic attender. The figures were similar for the other age groups. Among older children, there is an apparent pattern of a reduction in dental attendance over time among those whose mothers were not regular attenders. For instance, among 15-year-olds the proportion of children classed as regular attenders fell from 42 per cent of those with occasional attender mothers in 1993 to 23 per cent in 2003 and 43 per cent of those with symptomatic attender mothers in 1993 to 36 per cent in 2003.

Table 5.6

Table 5.6 Percentage of children who attended the dentist regularly by age and mother's dental attendance pattern (United Kingdom, 1993, 2003)

Mother's attendance pattern	Age							
	5 year olds		8 year olds		12 year olds		15 year olds	
	1993	2003	1993	2003	1993	2003	1993	2003
	<i>Percentage of children who were regular attenders:</i>							
Regular attender	73	69	76	71	74	73	77	71
Occasional attender	39	31	43	33	52	30	42	23
Only attends with trouble	32	26	34	36	40	34	43	36
All types of attender	59	58	60	63	66	63	64	63

Dental Services Used

The majority of children in 2003 reported having used the General Dental Services, either in isolation or in combination with Community Dental Services (Table 5.7). In the five and eight year age groups almost as many reported using both General and Community Dental Services as reported using only the General Dental Service.

Table 5.7

Table 5.7 Dental services used by age (United Kingdom, 2003)

Dental Service	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>			
General Dental Services only	40	47	51	52
Community Dental Services only	9	8	8	7
General and Community Dental Services	43	40	38	38
Treatment outside the NHS	1	2	1	1
No experience of service	6	2	1	1
<i>Weighted base</i>	1230	1282	1263	1171

Summary report

The reported use of dental services outside the NHS by children remains very low, as in previous surveys. All NHS dental care for children is free and another way of investigating use of private dental care is to ask whether any dental treatment had been paid for. In keeping with previous years the proportion of children whose parents reported paying for some dental care on their behalf at some point was very low, around 1 per cent of five-year-olds rising to 6 per cent of 15-year-olds.

Table 5.8

Table 5.8 Experience of paying for dental treatment by age

	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
Ever paid for treatment	<i>Percentage of children:</i>			
Yes	1	2	4	6
No	99	98	96	94
<i>Weighted base</i>	<i>1373</i>	<i>1424</i>	<i>1374</i>	<i>1309</i>

Barriers to access

Despite an apparent rise in attendance amongst children since previous surveys, around 10 per cent of children in all age groups were reported as having experienced difficulty in accessing NHS dental care at some point. Among those reporting experience of difficulty around a fifth to a quarter in all age groups reported current problems with access.

Tables 5.9 and 5.10

Table 5.9 Percentage of children reporting experiencing difficulties in finding an NHS dentist by age (United Kingdom, 2003)

	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>			
Experienced difficulty	9	8	13	8
No attempt to access dentist	5	5	5	6
Over two years ago	86	87	82	86

Table 5.10 Time period when difficulties were experienced in finding an NHS dentist by age (United Kingdom, 2003)

	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>			
Currently having problems	22	20	24	26
In last two years	57	42	39	48
Over two years ago	22	38	36	25
<i>Weighted base</i>	<i>113</i>	<i>109</i>	<i>176</i>	<i>97</i>

Summary report

Table 5.11 shows the reported reason behind the experienced difficulty. The reported reasons were centred around dentists' acceptance policies; 76 per cent of those currently having problems reported that this was because family dentists in the area were not taking on new NHS patients. For those reporting current problems 28 per cent reported that local family dentists would take on their child only if the parents became private patients.

Table 5.11

Table 5.11 Percentage of children reporting different reasons for experiencing difficulty finding a dentist willing to treat child on the NHS by when this was (United Kingdom, 2003)

Reasons for difficulty finding an NHS dentist	Reported period of difficulty		
	Current problem	In the last two years	Over two years ago
	<i>Percentage of children:</i>		
Family dentists not taking any more NHS patients	76	69	75
Only if parents go to them for private treatment	28	45	26
No School or Community Dental Service	9	7	3
Other reason	9	5	5
<i>Weighted base</i>	<i>114</i>	<i>224</i>	<i>153</i>

6 Impact of Oral Health

The 2003 Children's Dental Health asked parents to consider whether their children had experienced any problems in the previous 12 months as a result of the condition of their teeth and gums. The types of problems assessed included things like pain, problems chewing or talking, feeling self-conscious or embarrassed, becoming less cheerful or irritable.

The parents of most of the children in all age groups did not think their children had been affected by their oral condition in the preceding year. However, some form of impact was reported by the parents of 22 per cent of five-year-olds, 26 per cent of eight-year-olds, 34 per cent of 12-year-olds and 28 per cent of 15-year-olds. The majority of those whose parents or guardians thought they had been affected in some way by their oral condition were only affected by one problem; 13 per cent of five-year-olds 16 per cent of eight-year-olds, 22 per cent of 12-year-olds and 17 per cent of 15-year-olds. Multiple types of problem were reported for 9 per cent of five-year-olds 10 per cent of eight-year-olds, 12 per cent of 12-year-olds and 12 per cent of 15-year-olds.

Table 6.1

Table 6.1 Percentage of children with number of reported oral condition problems experienced at least *occasionally* in the preceding 12 months by age (United Kingdom, 2003)

Number of problems reported	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>			
None	78	74	66	72
One	13	16	22	17
Two	4	6	5	6
Three	3	2	4	3
Four	1	1	2	2
Five or more	1	1	1	1
<i>Weighted base</i>	1373	1424	1374	1309

Percentages may not add to 100 due to rounding

The pattern of experience of problems arising from oral condition was similar in England, Northern Ireland and Wales. In England and in Wales children with the most reported problems were 12-year-olds, with eight-year-olds most affected in Northern Ireland.

Table 6.2

Summary report

Table 6.2 Mean number and percentage of children with reported oral condition problems experienced at least occasionally in the preceding 12 months by age and country (United Kingdom, 2003)

	Mean number of problems	Percentage with at least one problem	Unweighted sample size*
England			
5 year olds	0.4	22	553
8 year olds	0.4	26	547
12 year olds	0.6	35	456
15 year olds	0.5	30	358
Wales			
5 year olds	0.3	22	218
8 year olds	0.4	30	193
12 year olds	0.8	38	165
15 year olds	0.6	31	140
Northern Ireland			
5 year olds	0.3	16	112
8 year olds	0.6	25	128
12 year olds	0.5	24	101
15 year olds	0.3	21	88
United Kingdom			
5 year olds	0.4	22	1373
8 year olds	0.4	26	1424
12 year olds	0.6	34	1375
15 year olds	0.5	28	1309

* weighted bases shown for United Kingdom

The type of problems experienced are shown in Table 6.3. Among all age groups, pain was the most frequently reported problem. Among the younger age groups, this was followed by effect on oral function and affect on self-confidence, whereas among the older groups affect on self-confidence was reported more frequently than effect on oral function. Similar proportions were reported to have had an orally-related activity affected; 4 per cent of five-year-olds and eight-year-olds, 6 per cent of 12-year-olds and 7 per cent of 15-year-olds were reported to have experienced some problem with an orally-related activity as a result of their oral condition. In some, the condition of their mouths was thought to have led to their emotional outlook on life being affected (for example, being less cheerful or more irritable); 4 per cent of five-year-olds, 6 per cent of eight and 12-year-olds and 4 per cent of 15-year-olds were reported to have experienced some form of emotional impact as a result of their oral condition. The more far-reaching consequences of oral condition were rarely encountered, but a few children in every age group (under 2 per cent of their group) were reported to have had their social functioning, their general health or their life in general affected by some aspect(s) of their oral condition.

Table 6.3

Summary report

Table 6.3 Percentage of children reported as having oral condition problems occasionally or more often in the preceding 12 months by age (United Kingdom, 2003)

Type of problem	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>			
Pain				
Toothache or sore mouth	16	20	26	20
Impact on oral function				
Problems chewing, talking	6	5	5	7
Impact on self-confidence				
Embarrassed, self-conscious or worried	4	7	10	9
Impact on orally-related activity				
Stopped playing musical instrument	4	4	6	7
Impact on emotions				
Becoming less cheerful or more irritable	4	6	6	4
Impact on social functioning				
Stopping playing or speaking to friends	1	1	2	1
Impact on General Health				
General health effected	2	2	2	*
Impact on Life Overall				
Life as a whole made worse	2	2	2	1
<i>Weighted base</i>	<i>1370</i>	<i>1417</i>	<i>1371</i>	<i>1302</i>

Impact of Oral Health and Dental Health Behaviour

The extent to which a person is affected by their oral health may affect the ways in which they adopt preventive health behaviour. As it is often the parent who instigates a dental visit, their perception of the way in which their child is affected by their oral condition may be a critical factor in initiating a dental visit. Among those aged eight years or over who did not attend a dentist, over a third were reported to have experienced a dental problem, during the year. Among eight-year-olds alone, more of those who did not attend a dentist during the year were also reported to have experienced a problem (38 per cent) over the same time in comparison to those who did attend a dentist (25 per cent).

Table 6.4

Summary report

Table 6.4 Mean number and percentage of children with reported oral condition problems experienced at least occasionally in the preceding 12 months by age and whether they visited the dentist in the last 12 months (United Kingdom, 2003)

	Mean number of problems	Percentage with at least one problem	Weighted base
5 year olds			
Dental visit	0.4	23	1201
No dental visit	0.3	17	172
8 year olds			
Dental visit	0.4	25	1328
No dental visit	0.6	38	96
12 year olds			
Dental visit	0.6	34	1266
No dental visit	0.6	35	108
15 year olds			
Dental visit	0.5	27	1158
No dental visit	0.7	38	151

Table 6.5 shows a clear relationship between the habit of visiting a dentist and the reported experience of oral problems; among eight, 12 and 15-year-olds regular attenders were less likely to be reported as having had a problem in the preceding year than those who attended only when having trouble with their teeth. Among five-year-olds occasional attenders, but not regular attenders, were less likely to have experienced a problem over the preceding year compared with those attending only with trouble.

Table 6.5

Summary report

Table 6.5 Mean number and percentage of children with reported oral condition problems experienced at least occasionally in the preceding 12 months by age and child's dental attendance pattern (United Kingdom, 2003)

	Mean number of problems	Percentage with at least one problem	Weighted base
5 year olds			
Regular attendance	0.3	20	749
Occasional attendance	0.4	17	129
Only if trouble with teeth	0.5	28	408
8 year olds			
Regular attendance	0.3	20	853
Occasional attendance	0.4	30	159
Only if trouble with teeth	0.8	38	353
12 year olds			
Regular attendance	0.5	31	831
Occasional attendance	0.5	27	185
Only if trouble with teeth	1.0	47	294
15 year olds			
Regular attendance	0.4	25	771
Occasional attendance	0.4	23	198
Only if trouble with teeth	0.7	39	263

Impact of Oral Health and Dental Health

Tables 6.6 and 6.7 compare the experience of obvious decay experience in teeth as determined by the survey dental examination with the parental report of some form of oral problem. Among both five and eight-year-olds a higher proportion of children with obvious decay experience ($d_{3cv}mft$) in their primary dentition were reported to have had an oral problem and had experienced a greater number of problems than children of the same age with no obvious decay experience.

Table 6.6 Mean number and percentage of children with reported oral condition problems experienced at least occasionally in the preceding 12 months by age and obvious decay experience ($d_{3cv}mft$) in primary teeth (United Kingdom, 2003)

	Mean number of problems	Percentage with at least one problem	Weighted base
5 year olds			
Obvious decay experience	0.6	32	575
No obvious decay	0.2	14	798
8 year olds			
Obvious decay experience	0.5	31	822
No obvious decay	0.3	19	602

Summary report

Likewise, in permanent teeth a higher proportion of eight and 12-year-olds with obvious decay ($D_{3cv}MFT$) had experienced problems due to their oral condition than those without obvious decay. There were no statistically significant differences among 15-year-olds.

Table 6.7

Table 6.7 Mean number and percentage of children with reported oral condition problems experienced at least occasionally in the preceding 12 months by age and obvious decay experience ($D_{3cv}MFT$) in permanent teeth

	Mean number of problems	Percentage with at least one problem	<i>Weighted base</i>
8 year olds			
No obvious decay	0.7	35	271
Obvious decay experience	0.4	24	1153
12 year olds			
No obvious decay	0.7	38	565
Obvious decay experience	0.5	30	810
15 year olds			
No obvious decay	0.5	30	766
Obvious decay experience	0.5	26	543

7 The orthodontic condition of children

Introduction

The survey collected information relating to the orthodontic condition of 12 and 15-year-olds. The clinical examination recorded current and past orthodontic treatment, as well as the type of appliance worn by children undergoing treatment. For those children not already wearing an appliance, orthodontic treatment need was determined using the Simplified Index of Orthodontic Treatment Need which consists of two separate components, the aesthetic component and the dental health component.

The aesthetic component determines the level of need for orthodontic treatment on aesthetic grounds. The overall dental attractiveness of the anterior teeth are assessed using a ten point scale. This compares the anterior teeth with ten standard photographs. Grades eight to ten are regarded as a definite need for treatment.

The dental health component determines the need for orthodontic treatment on dental health grounds. The dental health component of the Index assesses five occlusal traits following the "MOCDO" convention; Missing teeth, Overjet, Crossbite, Displacement of contact points and Overbite.

Orthodontic condition among 12 and 15-year-olds.

The overall orthodontic condition of 12 and 15-year-olds is summarised in Table 7.1 and Figure 7.1. At the time of the survey, 8 per cent of 12-year-olds and 14 per cent of 15-year-olds were wearing an orthodontic appliance. A higher percentage of girls than boys were wearing an appliance in both age groups.

In total, 35 per cent of 12-year-olds and 21 per cent of 15-year-olds were assessed as having need for orthodontic treatment on both aesthetic and dental health grounds or on either aesthetic or dental health grounds alone. Among 12-year-olds the need for treatment was broadly similar for both boys and girls, however a larger proportion of 15-year-old boys (24 per cent) were judged in need of treatment than 15-year-old girls (19 per cent).

Among 12-year-olds, 57 per cent of all children participating in the survey were not wearing an orthodontic appliance and were not judged in need of orthodontic treatment. A higher proportion was observed among 15-year-olds (65 per cent).

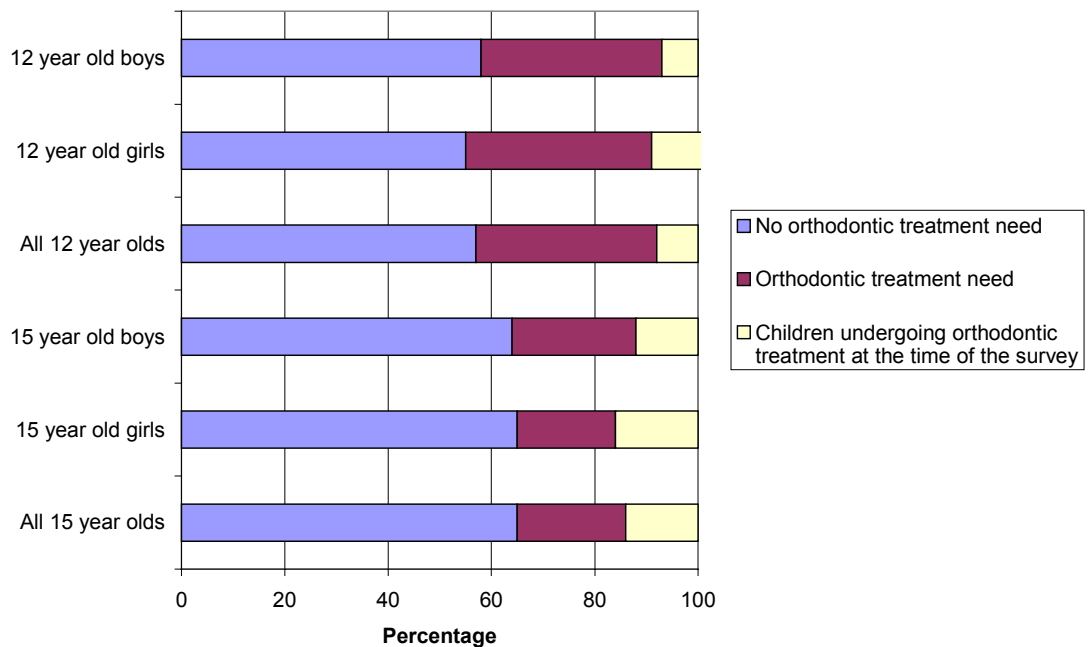
Table 7.1, Figure 7.1

Summary report

Table 7.1 Orthodontic condition among 12 and 15-year-olds by sex (United Kingdom, 2003)

Orthodontic condition	12 year olds			15 year olds		
	Boys	Girls	All	Boys	Girls	All
	<i>Percentage of children:</i>					
Children undergoing orthodontic treatment at the time of the survey	7	10	8	12	16	14
Children not undergoing orthodontic treatment at the time of the survey						
In need of orthodontic treatment on Dental Health grounds alone	26	26	26	18	15	16
In need of orthodontic treatment on aesthetic grounds alone	*	1	*	1	*	*
In need of orthodontic treatment on grounds of both dental health and aesthetics	9	9	9	5	4	5
No orthodontic treatment need	58	55	57	64	65	65
<i>Weighted base</i>	<i>1399</i>	<i>1291</i>	<i>2690</i>	<i>1257</i>	<i>1298</i>	<i>2555</i>

Figure 7.1 Orthodontic condition by age and sex (United Kingdom 2003)



Summary report

Orthodontic condition at age twelve and fifteen years by country.

The overall orthodontic condition of 12 and 15-year-olds in England, Wales, Northern Ireland and the United Kingdom is presented in Table 7.2 and Figure 7.2. The percentage of all children judged in need of orthodontic treatment at age 12 years was 35 per cent, 34 per cent and 38 per cent in England, Wales and Northern Ireland, respectively. In the 15 year olds, the corresponding figures were, 19 per cent, 25 per cent and 27 per cent, in England Wales and Northern Ireland.

Among both 12 and 15-year-olds a lower proportion of children were wearing an orthodontic appliance in Northern Ireland than in Wales. Six per cent of 12-year-olds and 9 per cent of 15-year-olds in Northern Ireland were wearing an appliance at the time of the survey compared with 11 per cent of 12-year-olds and 15 per cent of 15-year-olds in Wales. Differences between children in England and other countries were not statistically significant.

Table 7.2, Figure 7.2

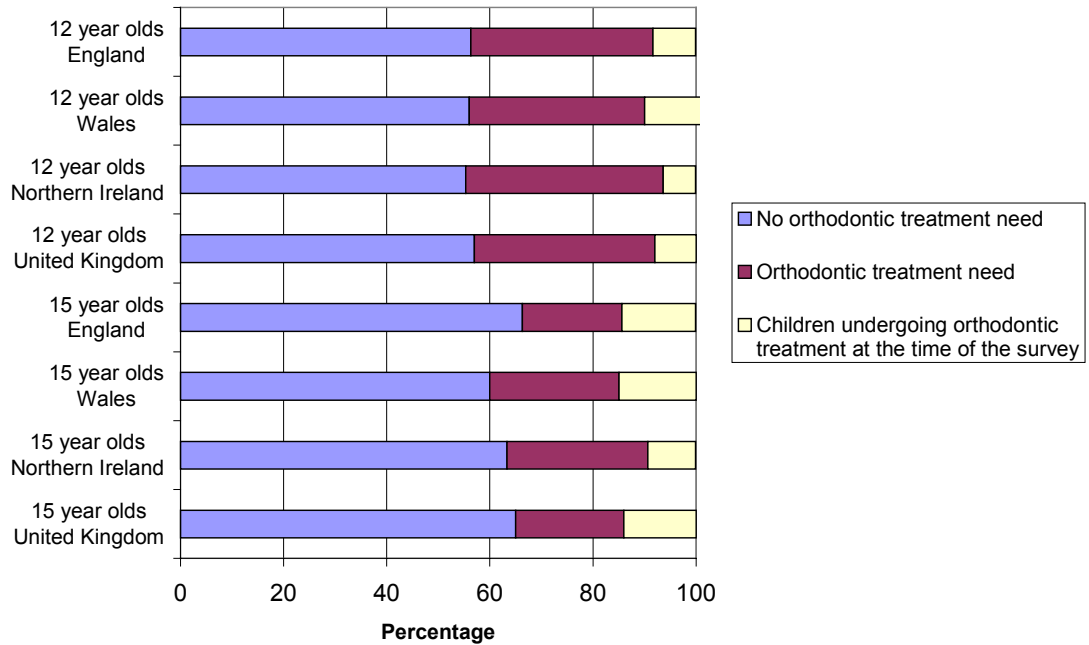
Table 7.2 Orthodontic condition among 12 and 15-year-olds by country (United Kingdom, 2003)

Orthodontic condition	England		Wales		Northern Ireland		United Kingdom ⁸	
	12 year olds	15 year olds	12 year olds	15 year olds	12 year olds	15 year olds	12 year olds	15 year olds
	<i>Percentage of children:</i>							
Children undergoing orthodontic treatment at the time of the survey	8	14	11	15	6	9	8	14
Children not undergoing orthodontic treatment at the time of the survey								
In need of orthodontic treatment on Dental Health grounds alone	26	15	26	18	28	20	26	16
In need of orthodontic treatment on aesthetic grounds alone	*	*	-	1	*	*	*	*
In need of orthodontic treatment on grounds of both dental health and aesthetics	9	4	8	6	10	7	9	5
No orthodontic treatment need	56	66	56	60	55	63	57	65
<i>Unweighted sample size</i>	<i>1356</i>	<i>1116</i>	<i>559</i>	<i>482</i>	<i>462</i>	<i>380</i>	<i>2690</i>	<i>2555</i>

* Weighted bases shown for United Kingdom

Summary report

Figure 7.2 Orthodontic condition by age and country (United Kingdom 2003)



Orthodontic treatment need among children not wearing an appliance

Table 7.3 shows the proportion of children, not already wearing an orthodontic appliance, who were judged in need of orthodontic treatment on the basis of the dental health component of the simplified index of orthodontic treatment need. The proportion recorded as having a malocclusion who were judged in need of treatment was higher among 12-year-olds (38 per cent) than 15-year-olds (24 per cent).

Table 7.3

Table 7.3 Percentage of 12 and 15-year-olds not undergoing orthodontic treatment at the time of the survey, with orthodontic treatment need on dental health grounds (United Kingdom, 2003)

Orthodontic condition	Age	
	12 year olds	15 year olds
	<i>Percentage of children:</i>	
Malocclusion absent	62	76
Malocclusion present	38	24
<i>Weighted base</i>	2468	2199

Summary report

The proportion of 12-year-olds not wearing an appliance who had orthodontic treatment need according to the dental health component of the simplified IOTN was similar in England, Wales and Northern Ireland. Among 15-year-olds a lower proportion of English children (23 per cent) not already wearing an appliance were deemed in need of treatment compared with children in Northern Ireland (30 per cent). Differences between England and Wales among 15-year-olds were not statistically significant.

Table 7.4

Table 7.4 Percentage of 12 and 15-year-olds not undergoing orthodontic treatment at the time of the survey, with orthodontic treatment need on dental health grounds by country (United Kingdom, 2003)

Orthodontic condition	England		Wales		Northern Ireland		United Kingdom ⁸	
	12 year olds	15 year olds	12 year olds	15 year olds	12 year olds	15 year olds	12 year olds	15 year olds
<i>Percentage of children:</i>								
Malocclusion absent	62	77	62	72	60	70	62	76
Malocclusion present	38	23	38	28	40	30	38	24
<i>Unweighted sample size</i>	<i>1249</i>	<i>965</i>	<i>499</i>	<i>424</i>	<i>435</i>	<i>338</i>	<i>2648</i>	<i>2199</i>

* Weighted bases shown for United Kingdom

The examining dentists were asked, by making reference to ten photographs, to score aesthetics on a ten point scale. A score of one represented the most attractive teeth and 10 the least attractive. Table 7.5 shows the proportion of children judged in each category. Need for treatment was indicated by a score of eight or above. A higher proportion of 12-year-olds (10 per cent), not already wearing an appliance, were scored in need of treatment on the basis of aesthetics than were 15-year-olds (6 per cent).

Table 7.5

Summary report

Table 7.5 Visual assessment of attractiveness of teeth among 12 and 15-year-olds not undergoing orthodontic treatment at the time of the survey (United Kingdom, 2003)

Assessment of attractiveness	Age	
	12 year olds	15 year olds
	<i>Percentage of children:</i>	
1 Most attractive	13	24
2	21	25
3	19	19
4	16	12
5	10	6
6	6	5
7	5	3
8	7	4
9	3	1
10 Least attractive	*	1
Greater than or equal to Grade 8	10	6
<i>Weighted base</i>	<i>2468</i>	<i>2199</i>

Trends in current and past orthodontic treatment.

In addition to recording whether 12 and 15-year-olds were undergoing treatment at the time of the survey, data were also collected on the type of appliance worn, the subjects past experience of orthodontic appliance wear and whether they had in the past undergone tooth extraction for orthodontic purposes. This information was also recorded in the Child Dental Health Surveys of 1983 and 1993.

Table 7.6 shows the proportions of 12 and 15-year-olds who had: worn an appliance in the past; undergone dental extractions for orthodontic purposes in the past; and who were under treatment at the time of the dental examination, in the 1983, 1993 and 2003 surveys². The proportion of 12 year-olds under treatment at the time of the survey changed little between the surveys. However, the proportion of 15-year-olds undergoing treatment at the time of the survey increased from 5 per cent in 1983, to 11 per cent in 1993, to 14 per cent in the 2003 survey. In both age groups the proportion of children reporting past appliance wear or having extractions for orthodontic purposes changed little between 1983, 1993 and 2003.

Table 7.6

² In analysing data on current and past orthodontic treatment over time a processing error was found in the 1993 data. The estimates recorded here for 1993 have been re-calculated and will differ from those published in the 1993 report.

Summary report

Table 7.6 Current and past orthodontic treatment among 12 and 15-year-olds (United Kingdom, 1983, 1993, 2003)

Age	Treatment received								
	Appliance in the past			Extractions in the past			Under treatment at time of survey		
	1983	1993	2003	1983	1993	2003	1983	1993	2003
	<i>Percentage of children:</i>								
12 year olds	5	6	5	8	11	7	9	9	8
15 year olds	17	19	18	24	26	22	5	11	14

Types of orthodontic appliance

The types of orthodontic appliance worn by children wearing an appliance at the time of the survey examination are presented in Table 7.7. For both age groups examined in 2003, the majority of appliances were of the fixed variety, 72 per cent among 12-year-olds and 83 per cent among 15-year-olds. There was an increase in the proportion of children undergoing therapy using fixed appliances and a corresponding decrease in the percentage wearing removable appliances compared with 1993.

Table 7.7

Table 7.7 Types of orthodontic appliance worn by children wearing an orthodontic appliance at the survey examination (United Kingdom, 1993, 2003)

Type of appliance	Age			
	12 year olds		15 year olds	
	1993	2003	1993	2003
	<i>Percentage of children:</i>			
Fixed	49	72	68	83
Removable	50	28	37	18
Other	2	3	2	4
<i>Base (100 per cent of children wearing an appliance)</i>	<i>109</i>	<i>191</i>	<i>87</i>	<i>250</i>
Don't know what type of appliance(n)		2		9
Children undergoing treatment but not wearing their appliance at the survey examination (n)		10		23

Percentages may not add to 100 as some children were wearing more than one appliance

8 Social factors and oral health in children

The prevalence of tooth decay

Table 8.1 shows the prevalence of obvious decay experience ($d_{3cv}mft$) for primary teeth in five and eight-year-olds in the United Kingdom, analysed by the deprivation category of the school. The proportion of children with decay into dentine and with obvious decay experience showed marked differences according to whether the school was deprived or not. Fifty six per cent of five-year-olds and 64 per cent of eight-year-olds from deprived schools had decay into dentine, compared with 37 per cent of five-year-olds and 48 per cent of eight-year-olds in non-deprived schools. Among five-year-olds, children from deprived schools were one and a half times more likely to have obvious decay experience than children from non-deprived schools (60 per cent compared with 40 per cent affected).

Table 8.1

Table 8.1 Percentage of children with obvious decay experience ($d_{3cv}mft$) in primary teeth by age and school level deprivation (United Kingdom, 2003)

	5 year olds		8 year olds	
	Deprived school	Non-deprived school	Deprived school	Non-deprived school
All children:				
Percentage with decay into dentine	56	37	64	48
Percentage with obvious decay experience	60	40	70	55
Mean number of primary teeth with obvious decay experience	2.4	1.4	2.2	1.7
Mean number of filled teeth	0.2	0.2	0.4	0.4
Children with decay experience:				
Mean number of primary teeth with obvious decay experience	4.2	3.8	3.3	3.3
Mean number of filled teeth	0.3	0.4	0.5	0.6
Filled teeth as a percentage of obvious decay experience	7	11	15	19

In permanent teeth a higher proportion of 15-year-olds from deprived schools (42 per cent) had decay into dentine compared with 15-year-olds in non-deprived schools (30 per cent). (The difference for decay into dentine among 12-year-olds was not statistically significant). In both age groups the proportion of children with obvious decay experience was higher in deprived schools than non-deprived. The difference was most pronounced among 15-year-olds: 72 per cent in deprived schools had obvious decay experience compared to 55 per cent in non-deprived schools.

Table 8.2

Summary report

Table 8.2 Percentage of children with obvious decay experience ($D_{3cv}MFT$) in permanent teeth by age and school level deprivation (United Kingdom, 2003)

	12 year olds		15 year olds	
	Deprived school	Non-deprived school	Deprived school	Non-deprived school
All children:				
Percentage with decay into dentine	34	28	42	30
Percentage with obvious decay experience	55	42	72	55
Percentage with extracted permanent tooth	6	3	11	5
Mean number of permanent teeth with obvious decay experience	1.6	1.0	2.8	1.9
Children with decay experience:				
Mean number of permanent teeth with obvious decay experience	2.9	2.4	3.9	3.5
Mean number of filled teeth	1.3	1.1	2.2	2.0
Filled teeth as a percentage of obvious decay experience	47	46	57	57

There was also a relationship between socio-economic status (NS-SEC) and decay experience in primary teeth. Among both five and eight-year-olds, the probability of having decay into dentine or obvious decay experience of the primary teeth was about 50 per cent higher in the lowest social group than in the highest. For instance, among five year-olds from managerial and professional backgrounds 31 per cent had decay into dentine and 34 per cent had obvious decay experience compared with 47 per cent and 53 per cent respectively for children from routine and manual backgrounds. These results are broadly similar to those found when using the school deprivation variable for analysis.

Table 8.3

Table 8.3 Percentage of five and eight-year-old children with obvious decay experience ($d_{3cv}mft$) in primary teeth by socio-economic status (NS-SEC) of household (United Kingdom, 2003)

	5 year olds		8 year olds			
	Managerial & Professional	Intermediate	Routine & Manual	Managerial & Professional	Intermediate	Routine & Manual
All children:						
Percentage with decay into dentine	31	34	47	42	51	60
Percentage with obvious decay experience	34	36	53	47	58	71
Mean number of primary teeth with obvious decay experience	1.2	1.0	1.8	1.5	1.9	2.0
Mean number of filled teeth	0.2	0.2	0.3	0.5	0.7	0.5
Children with decay experience:						
Mean number of primary teeth with obvious decay experience	3.7	2.9	3.7	3.4	3.5	3.0
Mean number of filled teeth	0.5	0.4	0.4	0.9	1.0	0.5
Filled teeth as a percentage of obvious decay experience	14	14	11	25	28	15

Summary report

In permanent teeth, although it appeared that 12-year-olds with the greatest probability of having decay into dentine (D_{3cv}) or of having obvious decay experience ($D_{3cv}MFT$) were those in the intermediate socio-economic group, the majority of the differences were not statistically significant. Among 15-year-olds, children from managerial and professional backgrounds had lower prevalence of decay into dentine (23 per cent) and obvious decay experience (47 per cent) compared to children from intermediate (37 per cent and 66 per cent respectively) and routine and manual (33 per cent and 65 per cent) backgrounds.

Table 8.4

Table 8.4 Percentage of 12 and 15-year-old children with obvious decay experience ($D_{3cv}MFT$) in permanent teeth by socio-economic status (NS-SEC) of household (United Kingdom, 2003)

	12 year olds		15 year olds			
	Managerial & Professional	Intermediate	Routine & Manual	Managerial & Professional	Intermediate	Routine & Manual
All children:						
Percentage with decay into dentine	22	29	27	23	37	33
Percentage with obvious decay experience	40	42	39	47	66	65
Percentage with extracted permanent tooth	2	3	3	2	3	7
Mean number of primary teeth with obvious decay experience	0.8	1.1	1.1	1.4	1.9	2.5
Children with decay experience:						
Mean number of primary teeth with obvious decay experience	2.0	2.7	2.9	3.0	2.8	3.8
Mean number of filled teeth	1.0	1.3	1.5	2.0	1.7	2.5
Filled teeth as a percentage of obvious decay experience	51	49	53	65	59	65

The severity of tooth decay

The prevalence of tooth decay is only an indication of the proportion of children affected, not how severely they are affected. It may be the case that social factors are important in determining whether or not a child has decay or decay experience, but not how many teeth are affected. Alternatively there may be a social risk operating at both levels.

Table 8.1 shows that among both five and eight-year-olds the average number of primary teeth with obvious decay experience was higher among children from deprived schools. However, as the prevalence is different for the two groups, the differences in mean scores may simply be a reflection of that difference in prevalence. For this reason the mean scores were recalculated only for the children in each group who had some history of decay. This provides an indication of whether the severity of the disease in those affected is associated with deprivation. Tables 8.1 and 8.3 indicate that in primary teeth the severity of obvious decay experience (as indicated by the mean number of affected teeth among those with obvious decay experience) is not strongly associated with school deprivation level or individual family socio-economic status among either five or eight-year-olds.

Summary report

In permanent teeth the average number of affected teeth among children with decay experience was higher for 12 year olds from deprived schools (2.9) compared with non-deprived schools (2.4). There were no further statistically significant differences. (Table 8.2)

The severity of decay among children with obvious decay experience in the permanent teeth showed a relationship with socio-economic status. Among both 12 and 15-year-olds with decay experience the average number of teeth with obvious decay experience was lower among children from managerial and professional backgrounds (2.0 teeth for 12-year-olds and 3.0 teeth for 15-year-olds) compared with those from routine and manual backgrounds (2.9 teeth for 12-year-olds and 3.8 teeth for 15-year-olds). (Table 8.4)

Treatment for tooth decay

Where decay occurs it can remain untreated, it can be treated by restoration (usually in the form of fillings) or the affected tooth can be extracted. To have teeth filled requires both access to a dentist and the propensity of the child to go, or for a parent to take them for treatment in the surgery. Extraction requires the same, but will usually occur where the disease is less easily treated either because of the extent of the disease in the tooth, or the level of co-operation of the child. Consequently the sort of treatment provided may be subject to social and socio-economic influences related to propensity to seek care, access to care and probably also economic considerations. Treatment choices can have long term impacts; the loss of a permanent tooth is an impairment which may have an impact throughout life. By looking at the constituent parts of the dmft or DMFT it is possible to see the sorts of treatment choices that have been made and how these vary with deprivation.

Table 8. 1 shows the filled(f) component of the dmft and the proportion of the dmft accounted for by this amongst children with obvious decay experience. This indicates that the filled component is not a statistically significantly different part of the total dmft in children from deprived schools (7 per cent of the dmft) compared with non-deprived schools (11 per cent of dmft) in five year olds, with a similar pattern for eight- year-olds (15 per cent and 19 per cent).

There were no differences between deprived and non-deprived schools or between socio-economic groups in the proportion of children with filled permanent teeth as a component of overall obvious decay experience. Table 8.2 also shows that the proportion of children that have experienced tooth loss for decay are generally very low compared to previous surveys, but there was a difference between deprived and non-deprived schools and between socio-economic groups among 15-year-olds . (Tables 8.1 and 8.3)

The proportion of the $d_{3cv}mft$ that was represented by filled primary teeth did appear to show some variation with individual measures of socio-economic status, although the difference is, in clinical terms, rather small as most of the score is made up of untreated decay or missing teeth. (Table 8.3)

Summary report

Oral cleanliness and gum health

Plaque is a key factor in the development of both dental decay and gum disease. It may be that some of the discrepancies observed between deprived and non-deprived school groups in decay could be explained by differences in oral hygiene. Furthermore, oral hygiene may be an indicator of the likely scale of future treatment need and is a fundamental consideration in the prevention of dental disease and the promotion of oral health, so differences according to social factors would be of concern.

Table 8.5 shows there were no statistically significant differences between the two categories of school in terms of the proportions affected by plaque, and neither was plaque any more extensive (involving more sextants) when the two school categories were compared.

Table 8.5

Table 8.5 Plaque, gingivitis and calculus by age and school deprivation status (United Kingdom, 2003)

Tooth condition	Age							
	5 year olds		8 year olds		12 year olds		15 year olds	
	Deprived school	Non-deprived school	Deprived school	Non-deprived school	Deprived school	Non-deprived school	Deprived school	Non-deprived school
Percentage of children with obvious plaque	51	50	70	78	76	73	59	64
Mean sextants with plaque	1.71	1.52	2.82	2.66	3.03	2.56	2.37	2.2
Percentage of children with gum inflammation	28	33	54	65	54	67	52	52
Mean sextants with gingivitis	0.8	0.86	1.58	1.86	1.93	2.1	1.55	1.5
Percentage of children with obvious calculus	5	6	17	25	33	30	36	40
Mean sextants with calculus	0.06	0.07	0.23	0.28	0.42	0.35	0.44	0.5
Percentage of children with gingivitis (index teeth)	n/a	n/a	n/a	n/a	n/a	n/a	43	43

N/a data on gingivitis was only collected for 15-year-olds

Estimates based on individual family measures of socio-economic status show a similar pattern. Although children from managerial or professional families consistently had the lowest levels of plaque, the differences in prevalence were not statistically significant. The same pattern was evident for the number of sextants affected, particularly once differences in prevalence are taken into account.

Table 8.6

Summary report

Table 8.6 Plaque, gum inflammation and calculus by age and socio-economic status (NS-SEC) of household (United Kingdom, 2003)

Tooth condition and NS-SEC	Age			
	5 year olds	8 year olds	12 year olds	15 year olds
Percentage of children with obvious plaque				
Professional & managerial	43	78	72	64
Intermediate	52	79	76	68
Routine & manual	49	78	74	66
Mean sextants with plaque				
Professional & managerial	1.3	2.5	2.3	2.0
Intermediate	1.6	3.0	2.7	2.7
Routine & manual	1.7	3.0	2.6	2.2
Percentage of children with gum inflammation				
Professional & managerial	30	68	62	50
Intermediate	26	62	75	63
Routine & manual	36	72	68	54
Mean sextants with gum inflammation				
Professional & managerial	0.8	2.0	1.8	1.3
Intermediate	0.8	1.6	2.0	2.2
Routine & manual	0.9	2.2	2.3	1.8
Percentage of children with obvious calculus				
Professional & managerial	5	26	30	39
Intermediate	2	28	28	41
Routine & manual	9	25	30	40
Mean sextants with calculus				
Professional & managerial	0.1	0.3	0.4	0.5
Intermediate	*	0.3	0.3	0.5
Routine & manual	0.1	0.3	0.4	0.5
Percentage of children with gingivitis (index teeth)				
Professional & managerial	n/a	n/a	n/a	34
Intermediate	n/a	n/a	n/a	42
Routine & manual	n/a	n/a	n/a	49

N/a data on gingivitis was only collected for 15-year-olds

Inflammation of the gums (gingivitis), usually occurs in response to plaque on the teeth. Calculus is a hard calcified deposit that forms on teeth from plaque over a period of time and can be removed by scaling. Among 12-year-olds, a lower proportion of children in deprived schools (54 per cent) had gum inflammation compared with children in non-deprived schools (67 per cent). There were no further statistically significant differences. For 15-year-olds the gums were examined more thoroughly, being gently probed to assess the presence of gingivitis; inflamed gums tend to bleed easily and healthy ones do not. There was no difference between deprived and non-deprived schools in the proportion of 15-year-olds with gingivitis (43 per cent in both). There were no consistent patterns to suggest the presence of calculus is linked to school deprivation status. (Table 8.5)

Summary report

There was no clear relationship between individual socio-economic groups and the proportion of children with gum inflammation or calculus in any age group, or the proportion of 15 year olds with gingivitis. (Table 8.6)

Non-carious Tooth Surface Loss

The impact of school deprivation level on the primary incisors of five year olds was significant for lingual surfaces, with 29 per cent of children from deprived schools showing wear into dentine or pulp compared with only 21 per cent of those from non-deprived schools. There was a similar difference when less severe wear was examined. For buccal surfaces, advanced TSL was much less prevalent and no significant differences were noted. When individual measures of social position were used, very similar trends were evident, with children from managerial and professional families having a lower prevalence of wear than the other groups, although the differences were generally not statistically significant. Again, it was only for lingual wear that any sort of pattern was evident.

Tables 8.7 and 8.8

Table 8.7 Percentage of five year old children with tooth surface loss (TSL) on the surfaces of the primary incisors by school deprivation status (United Kingdom, 2003)

	Any TSL	TSL into dentine or pulp
<i>Percentage of children:</i>		
Buccal surfaces		
Attending a 'deprived' school	22	5
Attending a 'non-deprived' school	19	2
Lingual surfaces		
Attending a 'deprived' school	58	29
Attending a 'non-deprived' school	52	21

Table 8.8 Percentage of five-year-olds with tooth surface loss (TSL) on the surfaces of the primary incisors by socio-economic status (NS-SEC) of (United Kingdom, 2003)

	Any TSL	TSL into dentine or pulp
<i>Percentage of children:</i>		
Buccal surfaces		
Managerial & professional	16	2
Intermediate	18	3
Routine & manual	16	1
Lingual surfaces		
Managerial & professional	42	15
Intermediate	55	22
Routine & manual	58	25

Summary report

By the age of eight years the permanent incisors have generally erupted, as have the permanent first molars and these teeth were scored during the examinations of older children. Permanent teeth tend to wear much less rapidly than primary teeth and the overall prevalence of severe wear was low, with no more than 5 per cent of children affected in any of the three older groups. Differences associated with the school level of deprivation were small, partly reflecting the low prevalence, and were non-significant. At a less severe level of wear there was a suggestion of a higher prevalence of lingual wear in 8, 12 and 15 year olds, for example 40 per cent of 12 year olds from deprived schools shows lingual TSL compared with 28 per cent from non-deprived schools, and a similar 12 percentage point difference was evident for the 15 year olds, although again these differences were not statistically significant. No pattern was evident for molar or buccal wear.

Table 8.9

Table 8.9 Percentage of eight, 12 and 15-year-olds with tooth surface loss (TSL) on permanent incisors and first permanent molars by age and school deprivation status (United Kingdom, 2003)

Tooth condition	8 year olds		12 year olds		15 year olds	
	Deprived school	Non-deprived school	Deprived school	Non-deprived school	Deprived school	Non-deprived school
	<i>Percentage of children:</i>					
Buccal surfaces of incisors						
Any TSL	5	4	13	12	14	14
TSL into dentine or pulp	1	*	*	*	*	*
Lingual surfaces of incisors						
Any TSL	19	13	40	28	44	32
TSL into dentine or pulp	2	*	4	2	2	5
Molars						
Any TSL	6	10	23	18	22	22
TSL into dentine or pulp	*	*	1	2	2	4

Individual measures of social position showed no consistent pattern and the majority of differences were not significant. Lingual wear into dentine or pulp was slightly less prevalent amongst children from managerial and professional families and non-manual backgrounds than the rest at age 15.

Table 8.10

Summary report

Table 8.10 Tooth surface loss by age and socio-economic status (NS-SEC) of household (United Kingdom, 2003)

Tooth condition and NS-SEC	Age		
	8 year olds	12 year olds	15 year olds
<i>Percentage of children:</i>			
Buccal surfaces of incisors:			
Any TSL			
Professional & managerial	4	9	12
Intermediate	5	13	16
Routine & manual	5	16	14
<i>TSL into dentine or pulp</i>			
Professional & managerial	*	*	*
Intermediate	*	*	*
Routine & manual	*	*	*
Lingual surfaces of incisors:			
Any TSL			
Professional & managerial	12	21	30
Intermediate	14	27	33
Routine & manual	12	37	35
<i>TSL into dentine or pulp</i>			
Professional & managerial	*	*	2
Intermediate	1	3	9
Routine & manual	1	2	9
Molars:			
Any TSL			
Professional & managerial	9	14	26
Intermediate	7	18	22
Routine & manual	10	27	15
<i>TSL into dentine or pulp</i>			
Professional & managerial	*	1	4
Intermediate	*	3	4
Routine & manual	1	1	6

Orthodontic treatment need

Table 8.11 shows the orthodontic treatment needs among 12 and 15-year-olds. Among 12-year-olds there is effectively no difference between children from deprived and non-deprived schools in terms of the unmet need (34-35 per cent of children), while similar proportions of children were receiving orthodontic treatment at this stage. Among 15-year-olds there was a difference between deprived and non-deprived groups for unmet need: 21 per cent in the non-deprived compared with 25 per cent of the deprived group. Conversely, those from the non-deprived group were more likely to be undergoing orthodontic treatment at age 15 with 15 per cent wearing an appliance compared with 10 per cent from the deprived schools.

Table 8.11

Summary report

Table 8.11 Orthodontic condition among 12 and 15-year-olds by school deprivation status (United Kingdom, 2003)

	12 year olds		15 year olds	
	Deprived school	Non-Deprived school	Deprived school	Non-Deprived school
	<i>Percentage of children:</i>			
Unmet treatment need	34	35	25	21
Undergoing treatment	8	8	10	15
No treatment need	59	56	67	66

Table 8.12 shows the same data broken down by socio-economic status. The base numbers are much smaller as this is based on a sub sample, so the margins for error of the percentages given are much wider. Nevertheless, exactly the same sort of pattern is evident, with similar levels of treatment and unmet need at age 12 but a difference opening up by age 15. At age 15 half as many children from professional and managerial families had unmet orthodontic need as those from routine and manual families and a similar trend was evident for household social class.

Table 8.12

Table 8.12 Orthodontic condition among 12 and 15-year-olds by socio-economic status (NS-SEC) of household (United Kingdom, 2003)

	12 year olds			15 year olds		
	Managerial & professional	Intermediate	Routine & manual	Managerial & professional	Intermediate	Routine & manual
	<i>Percentage of children:</i>					
Unmet treatment need	38	34	30	13	17	26
Undergoing treatment	8	7	13	18	17	10
No treatment need	54	59	56	68	66	64