



# 1: Oral health and function – a report from the Adult Dental Health Survey 2009

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# Contents

Introduction	5
Key Findings	6
1.1 Total tooth retention	7
Introduction	7
1.1.1 Tooth loss	7
1.2 Number and condition of natural teeth	9
1.2.1 Number of natural teeth	9
1.2.2 Sound and untreated teeth	10
1.3 Periodontal health	13
Introduction	13
1.3.1 Levels of periodontal health	13
1.4 Oral health and function: future prospects	15
Introduction	15
1.4.1 Prevalence of excellent oral health	15
1.5 Trends	18
Introduction	18
1.5.1 Trends in total tooth loss	18
1.5.2 Trends in tooth retention	20
1.5.3 Trends in the retention of sound, untreated teeth	21
Conclusion	22
Notes and References	23
Tables	24

# Introduction

The mouth and teeth perform an essential set of functions, from the most basic, eating and speaking, to more subtle social functions related to appearance and non-verbal communication. This report describes the current oral health of the populations of England, Wales and Northern Ireland and considers in more detail how well the capacity for good oral health and function have been maintained. The report presents estimates of oral health by socio-demographic factors including age, sex, country, Strategic Health Authority (SHA) and the socio-economic classification of the household, as well as by behavioural factors such as reported dental attendance and time since last visit to the dentist. In addition, the report will also consider the prospects for the oral health and functionality of the different generations within the population.

A number of indicators of good oral health and function have been considered in this report including the presence of natural teeth, the number of healthy teeth and periodontal health. These have also been combined to produce a composite measure indicating the prospects for good oral health.

All of the Tables are to be found at the back of the report.

Full background and methodological details for the survey, including response and clinical examination conversion rates can be found in *Foundation report: Adult Dental Health Survey 2009*. A glossary of all clinical terms can also be found in this report.

## Key Findings

- In 2009, 94 per cent of the combined populations of England, Wales and Northern Ireland were dentate, that is had at least one natural tooth.
- The proportion of adults in England who were edentate (no natural teeth) has fallen by 22 percentage points from 28 per cent in 1978 to 6 per cent in 2009.
- The overall mean number of teeth amongst dentate adults was 25.7, with the majority of dentate adults (60 per cent) having between 27 and 32 teeth. Dentate adults had an average of 17.9 sound and untreated teeth but this varied hugely with age.
- Only 17 per cent of dentate adults had very healthy periodontal (gum) tissues and no periodontal disease<sup>1</sup>.
- Ten per cent of dentate adults had excellent oral health<sup>2</sup>.

# 1.1 Total tooth retention

## Introduction

One of the most basic measures of oral health is the extent to which any natural teeth are retained throughout an entire lifetime by the population. At the time of the first Adult Dental Health Survey (ADHS) in 1968, 37 per cent of the population of England and Wales combined had no teeth at all (they were edentate), and it was not at all uncommon for people to have lost all of their natural teeth at a relatively young age<sup>3</sup>. For example in 1968, 7 per cent of adults in England and Wales aged 25 to 34 and 22 per cent of adults aged 35 to 44 were edentate. These young edentate adults of 1968 are now part of an older generation whose overall levels of tooth retention are an important consideration when evaluating the oral health of the population in 2009.

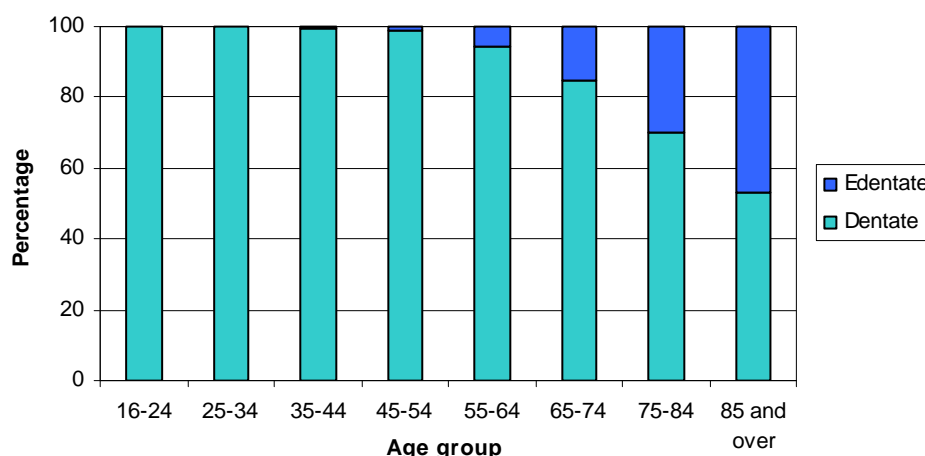
In the current ADHS, as in all previous surveys, any adult with at least one natural tooth was classified as dentate; this classification was based on information provided by individuals during the initial interview. Adults who were edentate were not seen by a dental examiner in the second part of the ADHS, the dental examination.

### 1.1.1 Tooth loss

In 2009, 94 per cent of the combined populations of England, Wales and Northern Ireland were dentate. Only a small minority of adults (6 per cent) had not maintained this basic threshold of oral health. Although the percentage of people who are edentate is small, it still accounts for approximately 2.7 million adults across England, Wales and Northern Ireland. Unsurprisingly, given the cumulative effects of dental disease and tooth loss, there was a strong relationship between increasing age and total tooth loss; less than 0.5 per cent of adults aged 25 to 34 years were edentate compared with 5 per cent of 55 to 64 year olds and 47 per cent of adults over 85. The proportion of adults with no teeth increased more or less exponentially with age group; however, for the first time in the survey series the majority of adults in each age group (even those over 85 years) were dentate. The fact that approximately half of the very old have retained some natural teeth has important implications in terms of the potential for good oral function, as well as service implications related to the continuing maintenance of natural teeth in these age groups.

Figure 1.1.1 and Table 1.1.1

Figure 1.1.1 Dentate and edentate adults by age



Across the combined population of adults aged under 65 in England, Wales and Northern Ireland (about 36.5 million people), just over half a million people are edentate. While this is a relatively small group, it is one which will continue to function in an edentate state for many years, and one which will present dental services with demands quite different from most of the rest of the population. Men were more likely than women to have some natural teeth, 95 per cent compared with 93 per cent, continuing a trend observed in previous surveys. The variation between men and women was greatest among the older age groups; 73 per cent of men aged 75 to 84 were dentate compared with only 67 per cent of women the same age. There were also differences between countries, with a smaller proportion of adults in Wales reporting that they had some natural teeth (90 per cent) compared with adults in England (94 per cent) and Northern Ireland (93 per cent). Among the English Strategic Health Authorities (SHAs), the highest proportion of adults with some natural teeth was South Central SHA (98 per cent), the lowest was the West Midlands SHA (91 per cent). Finally, socio-economic variations were also observed; 98 per cent of adults from managerial and professional occupation households were dentate compared to 90 per cent of adults from the lowest socio-economic occupational classification.

*Tables 1.1.1 and 1.1.2*

Some people have retained teeth, but in one jaw only. These adults are still considered to be dentate and are usually required to wear a complete denture in one arch to function, but they often show some of the functional problems (including speaking, eating, and smiling) related to wearing a complete denture. For both the patient and clinician this is an important and often challenging condition to manage. It may often represent an interim state as the teeth remaining in the other arch may be lost over time. Table 1.1.3 shows that amongst adults classified as dentate, the vast majority (97 per cent) had at least one natural tooth in both arches. Generally, where there are teeth in just one arch, it is the lower jaw in which teeth are retained (2 per cent overall); a very small proportion of adults (less than 0.5 per cent overall and no more than 2 per cent in any age group) retained teeth in their upper jaw only. The absence of teeth in one or the other arch but not both, is, as might be expected, strongly related to age, with the proportion of dentate adults with teeth in both arches falling dramatically above 75 years.

*Table 1.1.3*



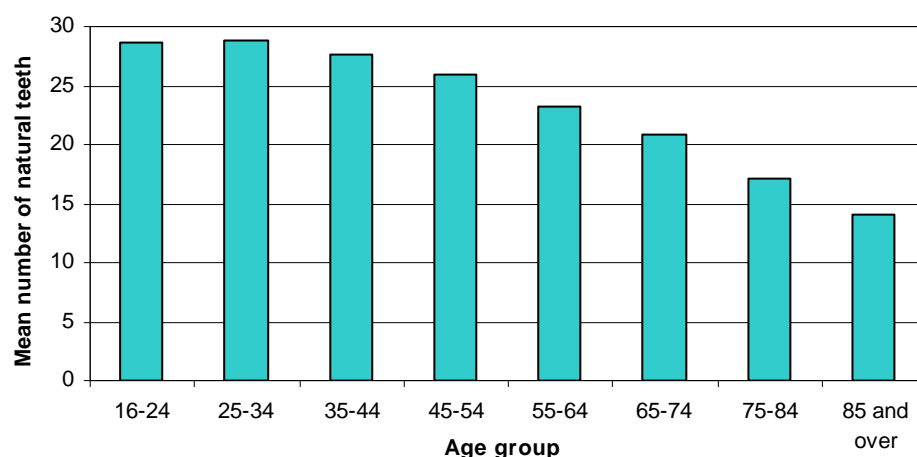
## 1.2 Number and condition of natural teeth

### 1.2.1 Number of natural teeth

Generally the more teeth retained, the better oral health and function is likely to be. In line with previous surveys the number of natural teeth is presented as a mean and in standard groupings. The overall mean number of teeth amongst dentate adults was 25.7, with the majority of dentate adults (60 per cent) having between 27 and 32 teeth. The number of teeth among dentate adults was strongly associated with age, reflecting the one-way nature of tooth loss and the accumulated effects of disease and treatment over the life course (see Figure 1.2.1). For example, dentate 16 to 24 year olds had 28.6 teeth on average compared with 23.2 teeth amongst dentate 55 to 64 year olds and 14.0 amongst dentate adults aged 85 and above.

*Figure 1.2.1 and Table 1.2.1*

**Figure 1.2.1 Mean number of natural teeth by age**



The difference in the average number of teeth between dentate men and women was small but significant, 25.8 compared with 25.5 respectively. However the difference in the proportions of dentate men and women who had 27 to 32 teeth was much more pronounced; 62 per cent of men had between 27 and 32 teeth compared with 57 per cent of women. The average number of teeth dentate adults had also varied by country (25.7 in England, 24.3 in Wales and 25.1 in Northern Ireland); SHA (highest in London with 27.0 teeth and lowest in the South West with 24.8); and the socio-economic classification of the household (dentate adults from managerial and professional occupation households had 26.6 teeth compared with dentate adults from routine and manual occupation households who had 24.7).

*Table 1.2.1*

The retention of 21 or more natural teeth is widely used to define the minimum number of teeth consistent with a functional dentition<sup>4</sup> for most people and it has been used in this way in previous ADH surveys. While this figure may be viewed as arbitrary, there is evidence to indicate that 21 or more natural teeth enable most dentate individuals to eat what they want in comfort without the need for a removable partial denture<sup>5 6</sup>. In 2009, 86 per cent of dentate adults had 21 or more natural teeth. This proportion fell significantly as age increased, again reflecting loss of teeth through life. For example, 100 per cent of dentate adults aged 16 to 24 had 21 or more natural teeth compared with 91 per cent of dentate 45-

54 year olds and 40 per cent of dentate adults aged 75 to 84. This decline should be seen in the context of the similar fall in the proportion of dentate adults with age. Among adults aged 85 and above only 53 per cent were dentate and of these adults 26 per cent had 21 or more natural teeth. These older dentate adults with enough natural teeth remaining to enable a functional dentition represent 14 per cent of all adults aged 85 and over.

*Table 1.2.2*

The proportion of dentate adults with 21 or more natural teeth was highest in England (86 per cent) followed by Northern Ireland (85 per cent) and was lowest in Wales (80 per cent). There was also significant variation between English SHAs with the highest rate in London (91 per cent) and the lowest in the North East and West Midlands SHAs (82 per cent in each). Finally, a clear socio-economic gradient was also evident; 92 per cent of dentate adults from managerial and professional occupation households had 21 or more natural teeth, compared with 79 per cent among dentate adults from routine and manual occupation households.

*Table 1.2.2*

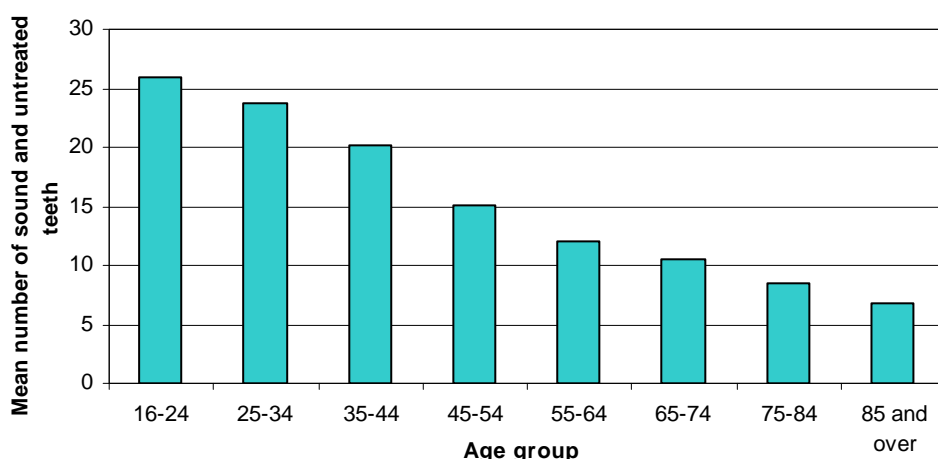
### 1.2.2 Sound and untreated teeth

Tooth decay, tooth wear and trauma to the teeth all cause irreversible damage, as does the dental treatment required to manage these conditions, which also carries a lifetime cost. The success of the population in retaining teeth in an undamaged state is a clear indicator of the potential for good oral health in the future. The term 'sound and untreated teeth' is defined as teeth with no visible decay or restoration of any kind, including those, such as veneers and crowns, which are not always placed to manage disease. Consequently, this represents not simply the absence of disease history, but also trends in professional tooth treatment. As such differences by age group will reflect changes in professional knowledge, technology and practice as well as disease prevalence.

In 2009, dentate adults had an average of 17.9 sound and untreated teeth. This varied from 25.9 amongst 16 to 24 year olds to fewer than 8.5 among those who were older than 75 years. Dentate adults under 45 years had more than 20 sound and untreated teeth on average, and given that retaining 21 or more natural teeth is an indicator of a minimum functional dentition, the lifetime prospects for most of these adults (who will benefit from modern disease prevention and management strategies) is very good. Dentate men had significantly more sound and untreated teeth than women, 18.2 compared with 17.5.

*Figure 1.2.2 and Table 1.2.3*

**Figure 1.2.2 Mean number of sound and untreated teeth by age**



There were also significant differences between countries (dentate adults in England had 18.0 sound and untreated teeth on average compared with 16.3 in Wales, and 15.8 in Northern Ireland) and between English SHAs (highest in London at 19.8 teeth and lowest in the South West at 16.0). Finally, the average number of sound and untreated teeth also varied by household socio-economic classification; dentate adults from managerial and professional occupation households had on average 18.3 sound and untreated teeth compared with 17.6 and 17.1 among dentate adults from routine and manual occupation and intermediate occupation households respectively. Note that when sound root surfaces were also included in the definition of sound and untreated teeth, the findings were very similar.

*Tables 1.2.3 and 1.2.4*

Complementing the indicator of 21 or more natural teeth, past surveys in this series have used the retention of 18 or more sound and untreated teeth as an additional marker of the health of the population's teeth. Table 1.2.5 shows that just over half of dentate adults (52 per cent) had 18 or more sound and untreated teeth. This varied with age, sex, country and SHA and the socio-economic classification of the household. Ninety-six per cent of dentate adults aged 16 to 24 and 68 per cent of those aged 35 to 44 had 18 or more sound and untreated teeth, compared with just over a third (35 per cent) of dentate adults aged 45 to 54 and only 5 per cent of dentate adults aged 75 to 84. The geographical variations were quite substantial; 53 per cent of dentate adults in England had 18 or more sound and untreated teeth, compared with 43 per cent of dentate adults in Wales and 39 per cent in Northern Ireland. Within England, dentate adults with the largest proportion of 18 or more sound and untreated teeth were in London SHA (65 per cent) and the lowest was in the South West SHA (43 per cent). Fifty-four per cent of dentate adults from managerial and professional occupation households had 18 or more sound and untreated teeth compared with 48 per cent of those from intermediate occupation households. As with the mean number of sound and untreated teeth, when root surfaces were included, the estimates of 18 or more sound and untreated teeth with roots were almost identical.

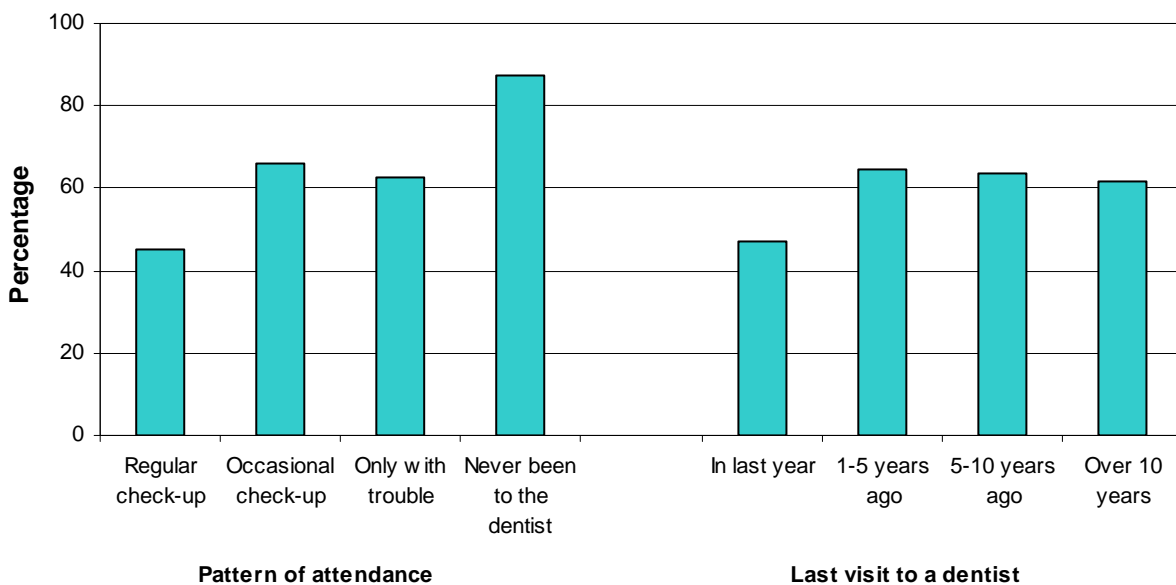
*Tables 1.2.5 and 1.2.6*

Table 1.2.7 presents the proportion of dentate adults with 18 or more sound and untreated teeth by reported dental attendance and time since last visit to the dentist. Those who reported attending a dentist for regular check-ups and those who had not seen a dentist in the previous 12 months were least likely to have 18 or more sound and untreated teeth (45 per cent and 47 per cent respectively). This partly reflects the age profiles associated with

different patterns of dental attendance (see *Service considerations: a report from the Adult Dental Health Survey 2009*) and may also reflect NHS guidelines, published in 2004, that individuals whose oral health and related behaviour are of a high standard do not need routine check-ups more frequently than every two years<sup>7</sup>. Less frequent attenders were more likely to have 18 or more sound and untreated teeth; 66 per cent of dentate adults who reported attending for an occasional check-up and 62 per cent of those who claimed to only go to the dentist when having trouble with their teeth. Similarly, 65 per cent or more of dentate adults who last visited a dentist one to five years ago, and 63 per cent of those who had been to a dentist more than five years ago had 18 or more sound and untreated teeth.

Figure 1.2.3 and Tables 1.2.7 and 1.2.8

**Figure 1.2.3 Percentage with 18 or more sound and untreated teeth by dental attendance**



## 1.3 Periodontal health

### Introduction

Good oral health is not dependent on teeth alone; rather it extends to the health of the tissues supporting the teeth, that is, the gums or the periodontium. The levels of good periodontal health in the population are presented here. (The prevalence and distribution of periodontal disease is considered in the report in this series *Oral Disease and Related Disorders: a report from the Adult Dental Health Survey 2009*).

For the periodontal examination in the ADHS, the mouth was assessed in six sectors (sextants). Examiners recorded bleeding, the presence of calculus and periodontal pocketing for each sextant. As in the previous section, the estimates presented in this section reflect percentages of the dentate population. This report uses two thresholds to indicate healthy periodontal tissues. Dentate individuals with very healthy periodontal tissues were represented by people with no bleeding, no calculus, no periodontal pocketing of 4mm or more, and in the case of adults aged 55 or above, no loss of periodontal attachment of 4mm or more anywhere in their mouth. A less stringent threshold includes adults who had calculus or bleeding but no pocketing in any sextants. This group represents those who may not have perfect periodontal health but who could still achieve very healthy periodontal tissues with excellent self-care and perhaps professional support. The groupings are not a precise indication of periodontal needs but should give an indication of the distribution of, and potential for, good periodontal health. For completeness, Tables 1.3.1 and 1.3.2 also show the proportions of dentate adults with some periodontal pocketing, indicating some degree of periodontal disease. The criteria used to enable the dental examiners to code healthy periodontal tissues are described in detail in Appendix 2 of the *ADHS 2009 Foundation Report*.

Observations of periodontal disease in non-clinical settings are potentially more problematic than the other measures included in the survey examination (see *Adult Dental Health Survey: oral health in the United Kingdom 1998, Chapter 3.3*). The periodontal assessment was not included in the calibration of examiners, because of the ethical implications of repeating an uncomfortable procedure on the same subjects. Consequently, it is likely that there was a greater degree of inter-examiner variability for the periodontal measures than for other parts of the dental examination. The impact of this on estimates is likely to be minor, except in comparisons between geographical areas.

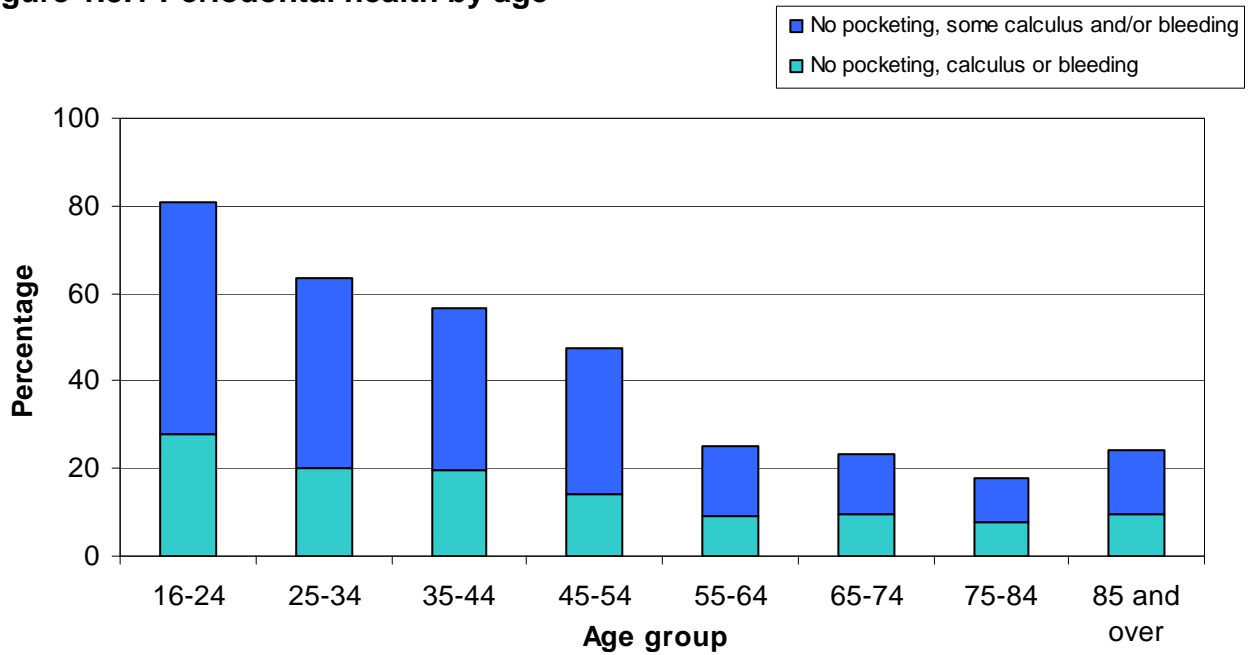
### 1.3.1 Levels of periodontal health

In 2009, only 17 per cent of dentate adults had no evidence of periodontal disease at the most stringent threshold. Good periodontal health was more common among adults under 45 years than in older age groups. For example 28 per cent of dentate adults aged 16 to 24 and 20 per cent of dentate adults aged 25 to 34 and 35 to 44, had very healthy periodontal tissues compared with 14 per cent of 45 to 54 year olds and 10 per cent or less of dentate adults aged above 55. Dentate women were more likely than men to have very healthy periodontal tissues, 19 per cent compared with 14 per cent. There were similar levels of periodontal health in England, Wales and Northern Ireland; however there were differences between some of the SHAs in England. In the East of England SHA 36 per cent of dentate adults had very healthy periodontal tissues, compared with 9 per cent of dentate adults in the West Midlands SHA. There were similar patterns when calculus and bleeding were disregarded. Note that differences between SHAs are likely to be influenced by inter-

examiner variability in the recording of periodontal disease. Examinations in each SHA were carried out by a small number of examiners. Small differences between examiners are likely to be exaggerated when considered at the SHA level. Note that this effect has minimal impact at the national level. A greater proportion of dentate adults from managerial and professional occupation households (21 per cent) had very healthy periodontal tissues compared with adults from intermediate occupation (16 per cent) and routine and manual occupation households (12 per cent).

Figure 1.3.1 and Table 1.3.1

Figure 1.3.1 Periodontal health by age



Periodontal health was also associated with dental attendance; dentate adults attending for regular or occasional check-ups had better periodontal health than those who only attended the dentist when they had some trouble with their teeth or those who never went.

Table 1.3.2

## 1.4 Oral health and function: future prospects

### Introduction

Single markers of oral health may be useful when considering how the health of a population might progress in the future according to different disease and treatment processes. However, to get a more accurate indication of the oral health of a population and its future prospects, it is possible to combine several clinical measures to identify those adults with the best current health. As a minimum these are dentate adults with enough teeth to function, a large majority of these teeth sound and untreated, and with no active decay or periodontal disease.

To identify the proportion of dentate adults who met these criteria, a composite measure was created. This measure of excellent oral health prospects comprised people who met all of the following criteria:

- 21 or more natural teeth;
- 18 or more sound and untreated teeth and roots;
- no decay detected at any site;
- no periodontal pocketing of 4mm or more and no loss of attachment of 4mm or more;
- no calculus or bleeding.

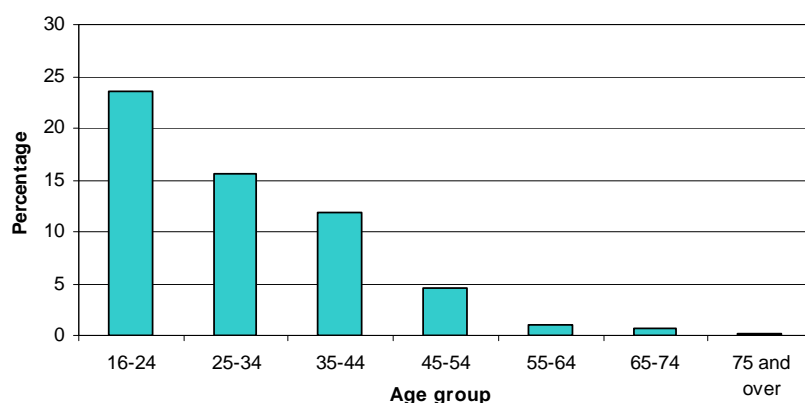
In view of the cumulative nature of the damaged caused by disease and treatment to teeth and their supporting structures, it is easier for younger adults to achieve this threshold, but being younger their teeth also have longer to survive.

### 1.4.1 Prevalence of excellent oral health

Table 1.4.1 presents the proportion of dentate adults with excellent oral health; one in ten adults (10 per cent) met the criteria. Not surprisingly the youngest adults (16 to 24 years) were most likely to have excellent oral health, with 23 per cent achieving this standard. Older adults were increasingly less likely to meet the threshold; only 12 per cent of adults 35 to 44 and 5 per cent of adults aged 45 to 54 fulfilled the criteria, and 1 per cent or less of adults above 55 could be described as having excellent oral health. Women were more likely than men to reach this threshold for oral health; 11 per cent of women achieved the threshold compared with 9 per cent of men.

*Figure 1.4.1 and Table 1.4.1*

**Figure 1.4.1 Excellent oral health (composite measure) by age**



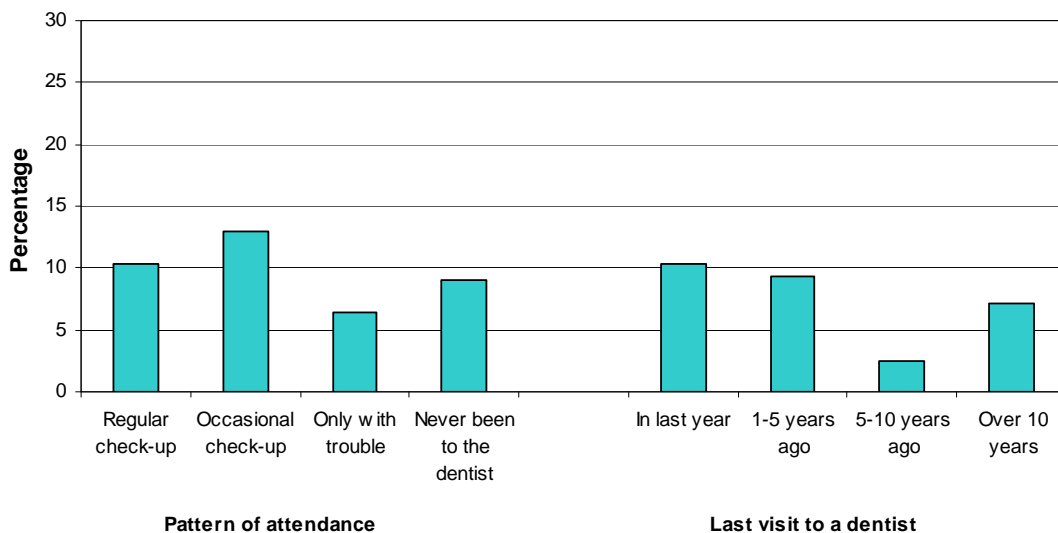
A similar proportion of dentate adults with levels of excellent oral health were found in England, Wales and Northern Ireland. There were however significant differences between SHAs in England. For example, 20 per cent of adults in the East of England had excellent oral health compared with 4 per cent of adults in the West Midlands. As before, these estimates should be interpreted with caution in view of the potential inter-examiner variability in how periodontal measures are recorded. Finally there was also variation by socio-economic classification of the household; 12 per cent of adults from managerial and professional occupation households had excellent oral health, compared with 7 per cent of adults from routine and manual occupation households.

Table 1.4.1

In addition to demographic and socio-economic factors, behavioural characteristics also influenced excellent oral health. The two measures of dental attendance illustrate the complexities of dental attendance and dental care. Dentate adults who attended the dentist only when they had trouble were least likely to have excellent oral health (6 per cent). Otherwise, adults who attended for an occasional check-up (13 per cent) were most likely to have excellent oral health, compared with those who attended the dentist for regular check-ups (10 per cent) or who said they never attended a dentist (9 per cent). To some extent this reflects the smaller proportion of dentate adults with sound and untreated teeth who were regular attenders, which in turn reflects age related attendance patterns, previous treatment need and professional interventions. Only 3 per cent of adults who had not visited a dentist for between five and ten years had excellent dental health, compared with 10 per cent who had seen a dentist in the last year and 9 per cent who had attended between one and five years ago.

Figure 1.4.2 and Table 1.4.2

Figure 1.4.2 Excellent oral health (composite measure) by dental attendance



Other indicators suggest that good patterns of oral health maintenance are reflected in better oral health. For example, a greater proportion of adults who brushed their teeth twice a day or more (11 per cent) had excellent oral health than adults who brushed once a day (7 per cent) or less often (1 per cent). Smoking was also linked to oral health; dentate adults who had never smoked were more likely to have excellent oral health than current or ex smokers



(11 per cent compared with 7 per cent and 9 per cent respectively). This does not necessarily imply cause and effect as smoking may be associated with a range of other behaviours which may also be related to oral health, but the relationship is noteworthy.

*Table 1.4.2*

The relationship between oral health and socio-demographic and behavioural factors was further explored using a multivariate logistic regression. This allows the complex relationships between the factors associated with excellent oral health to be accounted for. The model included sex, age, country, socio-economic classification of the household, two measures of dental attendance (pattern of attendance and when last attended), frequency of brushing, a measure of dental anxiety, and smoking status. Analysis was carried out using a forward stepwise method. The final models include only those variables that were significantly associated with the outcome of interest.

The model indicated that both personal and social characteristics (age and socio-economic classification of the household) and health-related behaviours were related to oral health. Even after controlling for other factors, increasing age was related to a sharp decline in the likelihood of excellent oral health. This is to be expected in view of the cumulative nature of damage from disease and tooth loss. Socio-economic classification of the household was also independently related to excellent oral health; dentate adults in professional and managerial occupation households were more likely to have excellent oral health. Once other factors were controlled for, the relationship between behaviour and excellent oral health is more apparent. Regular dental attendance, frequent tooth brushing and not smoking were all associated with excellent oral health.

*Table 1.4.3*

Of course dentate adults whose oral health is currently excellent are not guaranteed to have healthy mouths in the future; they may still go on to develop disease. However if they manage the risk factors traditionally associated with developing oral disease and decay (for example, diet, dental hygiene and smoking) then they should continue to have good prospects. A full discussion of the factors that prevent disease and minimize the risk of oral disease and tooth decay are described in more detail in the report from this series *Preventive behaviours and risks to oral health: a report from the Adult Dental Health Survey 2009*.

## 1.5 Trends

### Introduction

One of the advantages of having a series of surveys running for so long, using the same basic methods and measures, is that trends in oral health over time can be identified and projections can be made. This early insight into future demands is invaluable for planning services, and clinical and workforce priorities. The absence of Scotland from the 2009 ADHS means that it is not possible to describe and discuss oral health trend data for the whole of the UK. Rather than provide trend data for the three countries combined, which do not comprise a legislative entity, the trend data for England only will be discussed in this report. Trends for Wales and Northern Ireland will be less robust in view of the smaller sample sizes and are discussed separately in the country specific reports in the ADHS 2009 series.

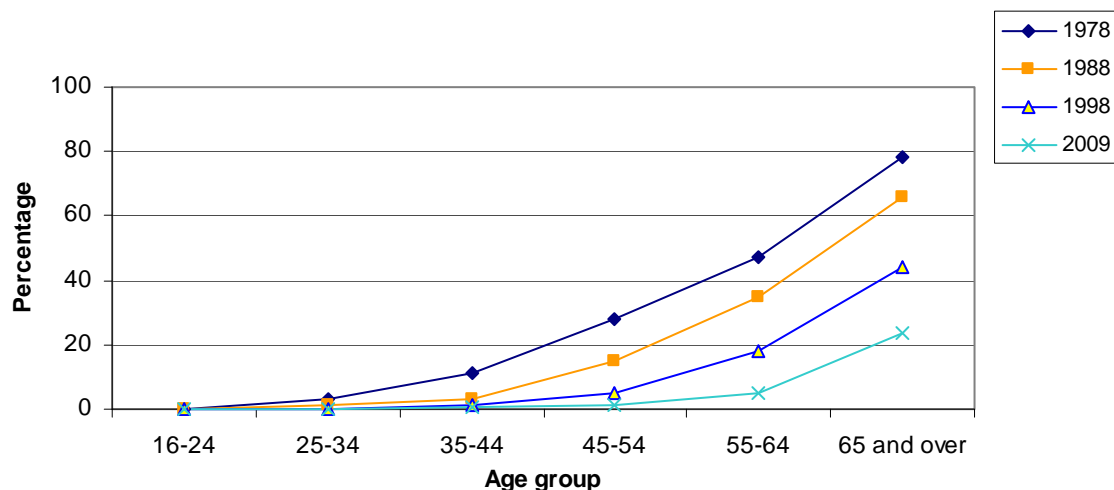
The sample size for England was much larger in the 2009 survey compared with previous Adult Dental Health Surveys; however the response rate to the current survey was lower. This reflects a wider tendency towards decreasing response rates in social surveys and means that there has been a greater dependence on weighting the 2009 data to control for response bias and variations between respondents, than in previous ADH surveys. Any resulting differences should be minimal but trends rely on very precise estimates so some caution should be exercised when interpreting these results. In some places a correction for age has been made in tables and text to correct for the interval between the 1998 survey and the current survey, which was eleven years, rather than ten years. Where this has been done, the actual ages of the respondents in each are one year more than indicated.

#### 1.5.1 Trends in total tooth loss

Table 1.5.1 shows the comparative estimates for the proportion of the adult population in England with total tooth loss for 1978, 1988, 1998 and 2009. The overall trend is clear: the proportion of adults with total tooth loss has fallen by 22 percentage points from 28 per cent in 1978 to 6 per cent in 2009. Age-related improvements can also be seen in Table 1.5.1 and Figure 1.5.1 which illustrates an age related curve which moves right (indicating a decline in the rate of total tooth loss) with each decade. It is clear from the age trends that being edentate is more about generation than about age and nowadays adults younger than 65 years rarely lose all their natural teeth. Those adults who were rendered edentate at a young age in the post-war years and who were represented in the early ADH surveys are now dying out and are being replaced by a dentate generation. This has been apparent and predicted since the publication of the 1988 ADHS but the process is now very well developed.

*Figure 1.5.1 and Table 1.5.1*

**Figure 1.5.1 Trends in percentage edentate by age, England: 1978-2009**



The decline in the rate of total tooth loss is also very clear among men and women; the proportion of men who are edentate has fallen from 24 per cent to 4 per cent between 1978 and 2009, while the decline among women has been even greater, falling 25 percentage points from 32 per cent in 1978 to 7 per cent in 2009.

*Table 1.5.1*

All of the surveys in the ADHS series have been cross-sectional and there has been no attempt to follow cohorts of individuals over time. However, when taken together the survey series does allow for changes within generations to be tracked. Table 1.5.2 demonstrates that up until 1988 the prevalence of total tooth loss in each 10 year age group typically increased. However since 1988, among adults aged above 65 years instead of the prevalence of total tooth loss increasing, it appears to have started falling. For example, in 1988 the prevalence of total tooth loss among adults aged 55 to 64 years was 35 per cent, in 1998 this had fallen to 34 per cent in this generation, and in 2009 it had fallen further to 31 per cent. Similarly this trend can also be observed in the generation who were 55 to 64 in 1998 and who were 65 to 74 in 2009; between these two surveys the rate of total tooth loss in this generation had fallen by 2 percentage points, from 18 per cent in 1998 to 16 per cent in 2009. On the face of it, this must be impossible as people who were edentate cannot become dentate. Even an increase in dental implants cannot account for this observation as people with no natural teeth were counted as edentate, even if they had implants. As already pointed out however, this is not a cohort study and as the same individuals were not examined there will be differences between the two samples. In addition this apparent anomaly could reflect slight differences in the way that the 1988, 1998 and 2009 surveys were weighted. However, even taking these important factors into account, no new incidence between 1988 and 2009 for the generation aged 55 to 64 years in 1988 would seem unlikely. With disease effects accumulating with age, and looking at trends in younger age groups in previous surveys, it would be reasonable to expect a decennial incidence of new cases of a few percentage points.

The relationships between total tooth loss and socio-demographic factors such as geography and socio-economic classification have already been outlined, and it is these relationships that might help explain why the rate of total tooth loss has declined rather than increased at certain points in time and within certain generations. Typically there is a strong relationship between socio-economic classification and those population groups who have the lowest life

expectancy and it is this more general relationship that might account for the apparent anomaly in the total tooth loss trend data. Given that edentate people are more likely to come from the same social groups as those with the lowest life expectancy, we might expect to see some selective mortality of the edentate population related to wider health issues, offsetting the increase in the edentate population we might otherwise expect. That is, the long term edentate may be dying off more quickly than new people are becoming edentate. The absence of natural teeth may be a good marker of poor oral and general health, and of early mortality.

*Table 1.5.2*

This finding makes it difficult to predict what will happen in the next few decades however it is likely that the trends observed over previous decades will continue. The edentate population will continue to be very concentrated in the oldest populations but the overall proportion of edentate people may reduce a little more quickly than had previously been expected.

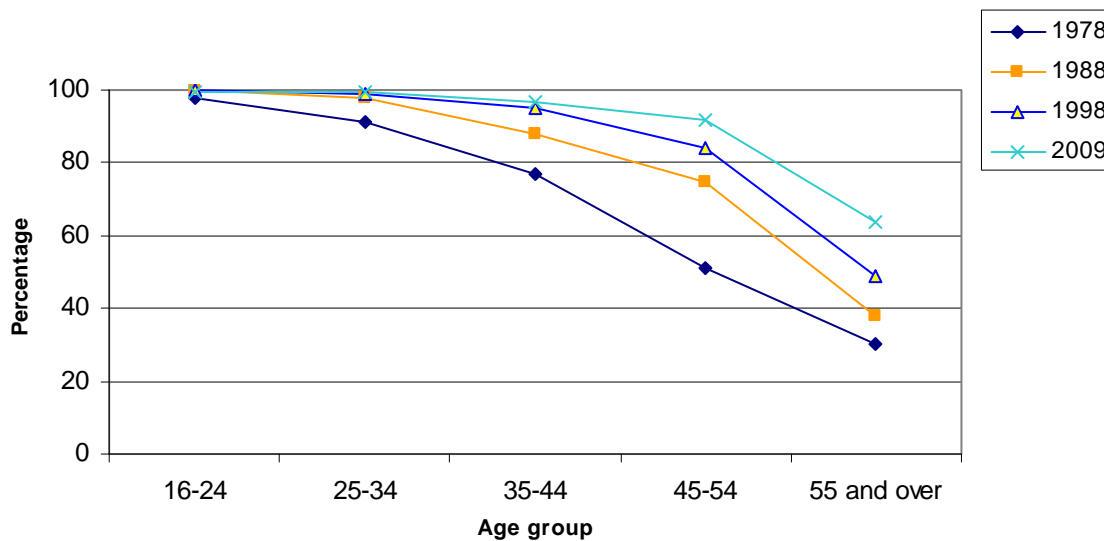
## 1.5.2 Trends in tooth retention

The percentage of dentate adults in England with 21 or more natural teeth has increased by 12 percentage points from 74 per cent in 1978 to 86 per cent in 2009. This improvement has been seen across all age groups; however it has been more pronounced among older age groups. Among dentate 16 to 24 year olds, having 21 or more natural teeth was already almost universal in 1978. In contrast, around half of dentate adults aged 45 to 54 in 1978 had 21 or more natural teeth, but over the last three decades this has increased by 41 percentage points, from 51 per cent in 1978 to 92 per cent in 2009. Over nine in ten of adults aged 45 to 54 now have 21 or more natural teeth and their prospects for retaining a functional dentition in the future look good, provided these teeth are well maintained.

Table 1.5.3 also shows the trends for the mean number of teeth for all dentate adults in England since 1978. Over the last 30 years or so the average number of teeth per person has increased by 2.4 teeth, from 23.3 in 1978 to 25.7 in 2009. This increase has been observed in all age groups, but most substantially among older age groups. In 1978 16 to 24 year olds had 27.4 teeth on average compared with 28.6 in 2009, whereas adults aged 45 to 54 in 1978 had 19.8 teeth on average compared with 26.1 in 2009. These averages are based on the dentate population which has increased as a proportion of all adults over the same period. In other words, there are now more people with any teeth than there were in 1978, and those who have teeth are likely to have more.

*Figure 1.5.2 and Table 1.5.3*

**Figure 1.5.2 Trends in percentage of adults with 21 or more natural teeth by age, England: 1978-2009**



### 1.5.3 Trends in the retention of sound, untreated teeth

As Table 1.5.4 shows, the percentage of dentate adults in England with 18 or more sound, untreated teeth has also increased steadily between 1978 and 2009. The threshold for recording dental caries changed in 1998<sup>8</sup> and the estimates for sound untreated teeth are not directly comparable over time. However the impact of this change was small when compared with the overall trend in the retention of sound, untreated teeth.

In 1978, 27 per cent of dentate adults had 18 or more sound and untreated teeth and by 2009 this had increased by 26 percentage points to 53 per cent. This improvement has been seen across all age groups. A steady increase in the mean number of sound and untreated teeth is also evident; in 1978 dentate adults in England had 13.2 sound and untreated teeth on average, rising to 18.0 in 2009. While there are inevitably slight variations relating to random error and minor survey effects, when the individual population age groups are followed through from survey to survey, the loss of sound teeth to other categories (missing, decayed or filled) was small.

Given that dentist activity continues, and yet the rate of sound and untreated teeth becoming unsound or treated is so small (and has been consistently so for a couple of decades), a great deal of dental activity must have been and still is focused on teeth that were already restored. The long term impacts of this are explored in the *Complexity and Maintenance* report in this series.

Table 1.5.4

## Conclusion

In 1968, with 37 per cent of the population of England and Wales<sup>3</sup> edentate the idea that more than half of people aged 85 or more would retain some natural teeth would have seemed unthinkable. Yet this was the case in 2009. The transformation in the population's oral health, first observed in the 1988 ADHS, has been extensive, and it is likely that a similar transformation has taken place across the United Kingdom.

Whilst the oldest age group demonstrates the emerging possibility for everyone of preserving natural teeth and dental function throughout life, an equally striking change in the quality of oral health and function can now be observed in the contrasting prospects of younger age groups. For those under 45, the likelihood of retaining not just some teeth, but a considerable number of healthy teeth, is now very high. In particular, the prospects for young adults aged 16-24 look better than they have ever been. For those aged over 45, the legacy of higher disease levels earlier in the life course and different patterns of dental care remain visible in the form of far fewer teeth and fewer sound teeth, but this generation still has a better outlook than their predecessors.

There are, however, still many people whose oral health and function does not meet the best possible standards. Good oral health cannot be taken for granted, even in the young, and the variations with social class and, to a lesser extent, geography are very apparent.

## Notes and References

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- <sup>1</sup> No bleeding, no calculus, no periodontal pocketing of 4mm or more, and in the case of adults aged 55 or above, no loss of periodontal attachment of 4mm or more anywhere in their mouth
- <sup>2</sup> 21 or more natural teeth, 18 or more sound and untreated teeth and roots; no decay detected at any site; no periodontal pocketing of 4mm or more and no loss of attachment of 4mm or more; and no calculus or bleeding
- <sup>3</sup> Gray PG, Todd JE, Slack GL and Bulman JS. (1970) *Adult dental health in England and Wales in 1968* HMSO London
- <sup>4</sup> The more teeth adults keep over their lifetime the better their oral health and function. Attributes such as eating comfortably and socialising without embarrassment can be related directly to the number and distribution of teeth, described as functional dentition. In the present survey, functional dentition was defined as achieving a threshold of 21 or more standing teeth.
- <sup>5</sup> Sheiham A, Steele JG, Marcenes W, Bates CJ, Prentice A, Lowe C, Finch S, Walls AWG. (2001) The relationship between dental status and haematological and biochemical measures of nutritional status among older people. A national survey of older people in Great Britain. *J Dent Res* 80(2): 408-413
- <sup>6</sup> Nowjack-Raymer RE, Sheiham A. (2007) Numbers of natural teeth, diet, and nutritional status in US adults. *J Dent Res*. Dec;86(12):1171-5.
- <sup>7</sup> NICE (2004) Dental recall – recall interval between routine dental examinations  
<http://guidance.nice.org.uk/CG19>
- <sup>8</sup> Visual caries was not recorded in the 1988 ADHS clinical criteria and so teeth that were coded as having visual caries in 1998 would have been coded as sound in 1988. As a result slightly higher levels of caries were recorded using the later criteria and fewer teeth coded as sound.

# Tables

## Presentation of data

- Figures are rounded to the nearest whole value. This could have an impact on row or column percentages which may add to 99 per cent or 101 per cent.
- Where “0 per cent” is shown in a table, this indicates that fewer than 0.5 per cent of people gave this answer. Instances where no answers for a particular response were given are indicated in the tables by '-’.
- A few respondents did not answer some questions. These ‘no answers’ have been excluded from the analysis. Tables that describe the same population have slightly varying bases.
- The individual figures for unweighted sample sizes are rounded to the nearest 10 cases and may not add up to the figures shown in the totals.
- Small bases are associated with relatively high sampling errors and this affects the reliability of estimates. In general, percentage distribution is shown if the base is 30 or more. Where estimates are considered unreliable due to relatively high sampling error, figures in the tables are presented with a turquoise shaded background.



**Table 1.1.1 Dental status by characteristics of all adults**

<i>All adults</i>		<i>England, Wales and Northern Ireland: 2009</i>			
<b>Characteristics of adults</b>		<b>Dentate</b>	<b>Edentate</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>
<b>All</b>	%	94	6	11,380	45,629
<b>Age</b>					
16-24	%	100	-	1,040	6,691
25-34	%	100	0	1,500	7,248
35-44	%	100	0	2,050	8,410
45-54	%	99	1	2,040	7,455
55-64	%	95	5	1,960	6,678
65-74	%	85	15	1,530	4,729
75-84	%	70	30	1,010	3,517
85 and over	%	53	47	240	902
<b>Sex</b>					
Men	%	95	5	5,090	22,146
Women	%	93	7	6,290	23,484
<b>Country</b>					
England	%	94	6	9,660	41,798
Wales	%	90	10	1,000	2,437
Northern Ireland	%	93	7	720	1,394
<b>English Strategic Health Authority</b>					
North East	%	92	8	990	2,110
North West	%	93	7	970	5,574
Yorkshire & The Humber	%	93	7	1,020	4,247
East Midlands	%	94	6	1,130	3,614
West Midlands	%	91	9	880	4,357
East of England	%	96	4	1,030	4,632
London	%	96	4	760	6,196
South East Coast	%	95	5	900	3,497
South Central	%	98	2	970	3,283
South West	%	94	6	1,010	4,288
<b>Socio-economic classification of household<sup>1</sup></b>					
Managerial and professional occupations	%	98	2	4,030	16,459
Intermediate occupations	%	95	5	2,010	7,923
Routine and manual occupations	%	90	10	3,830	15,302

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

**Table 1.1.2 Dental status by sex and age***All adults**England, Wales and Northern Ireland: 2009*

<b>Sex and age</b>		<b>Dentate</b>	<b>Edentate</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>
<b>Men</b>					
16-24	%	100	-	480	3,405
25-34	%	100	0	630	3,623
35-44	%	100	0	860	4,167
45-54	%	98	2	930	3,677
55-64	%	96	4	910	3,275
65-74	%	84	16	710	2,254
75-84	%	73	27	480	1,459
85 and over	%	72	28	90	285
<b>Women</b>					
16-24	%	100	-	560	3,286
25-34	%	100	0	870	3,624
35-44	%	99	1	1,200	4,242
45-54	%	99	1	1,110	3,778
55-64	%	93	7	1,050	3,402
65-74	%	85	15	820	2,475
75-84	%	67	33	530	2,058
85 and over	%	45	55	150	617
<b>All</b>					
16-24	%	100	-	1,040	6,691
25-34	%	100	0	1,500	7,248
35-44	%	100	0	2,050	8,410
45-54	%	99	1	2,040	7,455
55-64	%	95	5	1,960	6,678
65-74	%	85	15	1,530	4,729
75-84	%	70	30	1,010	3,517
85 and over	%	53	47	240	902
<b>Total</b>	<b>%</b>	<b>94</b>	<b>6</b>	<b>11,380</b>	<b>45,629</b>

**Table 1.1.3 Proportion of dentate adults with natural teeth in one or both arches by characteristics of dentate adults**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>				
<b>Characteristics of dentate adults</b>		<b>Teeth in:</b>			<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>
		<b>both arches</b>	<b>upper arch only</b>	<b>lower arch only</b>		
<b>All</b>	%	97	0	2	6,470	42,918
<b>Age</b>						
16-24	%	100	-	-	650	6,724
25-34	%	100	-	-	910	7,090
35-44	%	99	-	1	1,280	8,509
45-54	%	99	0	1	1,200	7,198
55-64	%	97	0	3	1,160	6,448
65-74	%	93	2	6	810	4,109
75-84	%	82	2	16	390	2,347
85 and over	%	71	-	29	80	494
<b>Sex</b>						
Men	%	97	0	2	2,960	21,069
Women	%	97	0	2	3,510	21,849
<b>Country</b>						
England	%	97	0	2	5,620	39,420
Wales	%	95	0	5	420	2,204
Northern Ireland	%	98	1	1	430	1,295
<b>English Strategic Health Authority</b>						
North East	%	97	0	3	570	1,924
North West	%	98	0	2	600	5,218
Yorkshire & The Humber	%	98	0	1	500	3,912
East Midlands	%	97	0	3	710	3,382
West Midlands	%	96	0	3	490	3,973
East of England	%	98	0	2	650	4,452
London	%	98	-	2	400	6,016
South East Coast	%	96	0	4	450	3,314
South Central	%	98	0	2	610	3,204
South West	%	97	1	2	660	4,026
<b>Socio-economic classification of household<sup>1</sup></b>						
Managerial and professional occupations	%	98	0	2	2,590	16,923
Intermediate occupations	%	97	0	3	1,180	7,797
Routine and manual occupations	%	96	0	3	2,020	13,612

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total. Shaded figures indicate the estimates are unreliable and any analysis using these figures may be invalid. Any use of these shaded figures must be accompanied by this disclaimer.

**Table 1.2.1 Number of natural teeth by characteristics of dentate adults**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>								
Characteristics of dentate adults		Number of natural teeth						Mean	Unweighted Base	Weighted Base (000s)
		1-8	9-14	15-20	21-26	27-31	32			
All	%	3	3	8	26	52	8	25.7	6,470	42,918
<b>Age</b>										
16-24	%	-	0	0	10	78	11	28.6	650	6,724
25-34	%	-	0	0	15	69	16	28.8	910	7,090
35-44	%	0	1	2	24	61	12	27.6	1,280	8,509
45-54	%	1	2	6	34	54	3	26.0	1,200	7,198
55-64	%	4	5	17	41	33	1	23.2	1,160	6,448
65-74	%	7	8	23	40	21	0	20.9	810	4,109
75-84	%	17	19	24	32	8	-	17.1	390	2,347
85 and over	%	30	25	20	22	4	-	14.0	80	494
<b>Sex</b>										
Men	%	3	4	8	23	53	10	25.8	2,960	21,069
Women	%	3	3	8	29	52	5	25.5	3,510	21,849
<b>Country</b>										
England	%	3	3	8	26	53	8	25.7	5,620	39,420
Wales	%	5	5	11	29	46	5	24.3	420	2,204
Northern Ireland	%	3	4	9	32	48	4	25.1	430	1,295
<b>English Strategic Health Authority</b>										
North East	%	3	5	10	29	47	6	25.0	570	1,924
North West	%	3	3	10	28	50	5	25.3	600	5,218
Yorkshire & The Humber	%	2	4	7	27	54	6	25.8	500	3,912
East Midlands	%	2	3	6	25	53	10	26.2	710	3,382
West Midlands	%	3	3	11	26	51	5	25.1	490	3,973
East of England	%	2	2	7	26	56	8	26.1	650	4,452
London	%	2	2	4	19	59	13	27.0	400	6,016
South East Coast	%	4	4	7	27	51	8	25.4	450	3,314
South Central	%	3	3	6	25	55	8	26.0	610	3,204
South West	%	3	5	9	33	45	5	24.8	660	4,026
<b>Socio-economic classification of household<sup>1</sup></b>										
Managerial and professional occupations	%	2	2	4	26	57	9	26.6	2,590	16,923
Intermediate occupations	%	3	3	9	30	48	7	25.3	1,180	7,797
Routine and manual occupations	%	4	5	12	26	48	6	24.7	2,020	13,612

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

Shaded figures indicate the estimates are unreliable and any analysis using these figures may be invalid. Any use of these shaded figures must be accompanied by this disclaimer.

**Table 1.2.2 Proportion of dentate adults with 21 or more natural teeth by characteristics of dentate adults**

*Dentate adults* *England, Wales and Northern Ireland: 2009*

<b>Characteristics of dentate adults</b>	<b>Percentage with 21 or more natural teeth</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>
<b>All</b>	86	6,470	42,918
<b>Age</b>			
16-24	100	650	6,724
25-34	99	910	7,090
35-44	97	1,280	8,509
45-54	91	1,200	7,198
55-64	75	1,160	6,448
65-74	61	810	4,109
75-84	40	390	2,347
85 and over	26	80	494
<b>Sex</b>			
Men	86	2,960	21,069
Women	86	3,510	21,849
<b>Country</b>			
England	86	5,620	39,420
Wales	80	420	2,204
Northern Ireland	85	430	1,295
<b>English Strategic Health Authority</b>			
North East	82	570	1,924
North West	84	600	5,218
Yorkshire & The Humber	88	500	3,912
East Midlands	89	710	3,382
West Midlands	82	490	3,973
East of England	89	650	4,452
London	91	400	6,016
South East Coast	85	450	3,314
South Central	88	610	3,204
South West	83	660	4,026
<b>Socio-economic classification of household<sup>1</sup></b>			
Managerial and professional occupations	92	2,590	16,923
Intermediate occupations	85	1,180	7,797
Routine and manual occupations	79	2,020	13,612

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

**Table 1.2.3 Number of sound and untreated teeth by characteristics of dentate adults**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>								
		<b>Number of sound and untreated teeth</b>								
<b>Characteristics of dentate adults</b>		<b>0</b>	<b>1-5</b>	<b>6-11</b>	<b>12-17</b>	<b>18-23</b>	<b>24 or more</b>	<b>Mean</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>
<b>All</b>	%	1	6	19	22	22	31	17.9	6,470	42,918
<b>Age</b>										
16-24	%	-	0	0	3	16	80	25.9	650	6,724
25-34	%	-	0	3	10	29	58	23.7	910	7,090
35-44	%	0	2	8	22	36	32	20.1	1,280	8,509
45-54	%	0	4	24	37	25	10	15.1	1,200	7,198
55-64	%	1	10	38	35	13	3	12.0	1,160	6,448
65-74	%	3	15	40	32	9	1	10.5	810	4,109
75-84	%	2	26	47	20	5	0	8.5	390	2,347
85 and over	%	7	41	31	20	1	-	6.8	80	494
<b>Sex</b>										
Men	%	1	6	18	21	21	33	18.2	2,960	21,069
Women	%	0	6	19	24	22	28	17.5	3,510	21,849
<b>Country</b>										
England	%	1	6	18	22	22	31	18.0	5,620	39,420
Wales	%	1	6	23	27	21	23	16.3	420	2,204
Northern Ireland	%	1	6	25	28	20	19	15.8	430	1,295
<b>English Strategic Health Authority</b>										
North East	%	1	6	17	23	26	28	17.8	570	1,924
North West	%	1	6	20	25	24	25	17.0	600	5,218
Yorkshire & The Humber	%	1	5	18	23	22	31	18.1	500	3,912
East Midlands	%	0	6	15	22	20	36	19.1	710	3,382
West Midlands	%	1	7	21	22	18	32	17.4	490	3,973
East of England	%	1	4	17	21	23	34	18.7	650	4,452
London	%	0	5	14	16	25	39	19.8	400	6,016
South East Coast	%	1	6	20	23	20	31	17.7	450	3,314
South Central	%	1	6	20	23	20	30	17.6	610	3,204
South West	%	2	8	23	25	19	24	16.0	660	4,026
<b>Socio-economic classification of household<sup>1</sup></b>										
Managerial and professional occupations	%	1	5	18	22	22	32	18.3	2,590	16,923
Intermediate occupations	%	1	6	20	26	22	26	17.1	1,180	7,797
Routine and manual occupations	%	1	7	20	21	21	30	17.6	2,020	13,612

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

Shaded figures indicate the estimates are unreliable and any analysis using these figures may be invalid. Any use of these shaded figures must be accompanied by this disclaimer.

**Table 1.2.4 Number of sound, untreated teeth and roots by characteristics of dentate adults**

Dentate adults

England, Wales and Northern Ireland: 2009

Characteristics of dentate adults		Number of sound, untreated teeth and roots						Mean	Unweighted Base	Weighted Base (000s)
		0	1-5	6-11	12-17	18-23	24 or more			
<b>All</b>	%	1	7	19	22	21	30	17.6	6,470	42,918
<b>Age</b>										
16-24	%	-	0	0	3	17	80	25.9	650	6,724
25-34	%	-	1	3	10	29	57	23.6	910	7,090
35-44	%	0	2	8	23	35	31	20.0	1,280	8,509
45-54	%	1	5	25	37	24	9	14.9	1,200	7,198
55-64	%	1	12	39	33	12	3	11.6	1,160	6,448
65-74	%	4	17	41	30	7	1	9.9	810	4,109
75-84	%	3	29	45	18	4	0	8.0	390	2,347
85 and over	%	8	45	27	19	1	-	6.3	80	494
<b>Sex</b>										
Men	%	1	7	18	20	21	33	17.9	2,960	21,069
Women	%	1	7	19	24	22	28	17.3	3,510	21,849
<b>Country</b>										
England	%	1	7	18	21	22	31	17.8	5,620	39,420
Wales	%	1	9	22	27	19	23	15.9	420	2,204
Northern Ireland	%	1	7	24	28	19	19	15.7	430	1,295
<b>English Strategic Health Authority</b>										
North East	%	1	6	18	22	25	27	17.6	570	1,924
North West	%	1	7	20	24	24	24	16.8	600	5,218
Yorkshire & The Humber	%	1	6	18	24	21	31	18.0	500	3,912
East Midlands	%	1	6	15	22	21	35	18.7	710	3,382
West Midlands	%	1	9	22	19	18	32	17.1	490	3,973
East of England	%	1	5	17	21	22	34	18.5	650	4,452
London	%	0	6	14	17	25	38	19.5	400	6,016
South East Coast	%	1	6	20	23	20	31	17.6	450	3,314
South Central	%	1	7	19	23	20	30	17.4	610	3,204
South West	%	2	9	24	23	18	24	15.7	660	4,026
<b>Socio-economic classification of household<sup>1</sup></b>										
Managerial and professional occupations	%	1	6	18	22	23	31	18.0	2,590	16,923
Intermediate occupations	%	1	7	20	25	22	25	16.8	1,180	7,797
Routine and manual occupations	%	1	8	20	21	21	30	17.3	2,020	13,612

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

Shaded figures indicate the estimates are unreliable and any analysis using these figures may be invalid. Any use of these shaded figures must be accompanied by this disclaimer.

**Table 1.2.5 Proportion of dentate adults with 18 or more sound and untreated teeth by characteristics of dentate adults**

<i>Dentate adults</i>	<i>England, Wales and Northern Ireland: 2009</i>		
<b>Characteristics of dentate adults</b>	<b>Percentage with 18 or more sound and untreated teeth</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>
<b>Total</b>	52	6,470	42,918
<b>Age</b>			
16-24	96	650	6,724
25-34	86	910	7,090
35-44	68	1,280	8,509
45-54	35	1,200	7,198
55-64	16	1,160	6,448
65-74	10	810	4,109
75-84	5	390	2,347
85 and over	1	80	494
<b>Sex</b>			
Men	54	2,960	21,069
Women	50	3,510	21,849
<b>Country</b>			
England	53	5,620	39,420
Wales	43	420	2,204
Northern Ireland	39	430	1,295
<b>English Strategic Health Authority</b>			
North East	53	570	1,924
North West	49	600	5,218
Yorkshire & The Humber	53	500	3,912
East Midlands	57	710	3,382
West Midlands	50	490	3,973
East of England	57	650	4,452
London	65	400	6,016
South East Coast	51	450	3,314
South Central	50	610	3,204
South West	43	660	4,026
<b>Socio-economic classification of household<sup>1</sup></b>			
Managerial and professional occupations	54	2,590	16,923
Intermediate occupations	48	1,180	7,797
Routine and manual occupations	51	2,020	13,612

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.



**Table 1.2.6 Proportion of dentate adults with 18 or more sound, untreated teeth and roots by characteristics of dentate adults**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>		
<b>Characteristics of dentate adults</b>	<b>Percentage with 18 or more sound, untreated teeth and roots</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>	
<b>All</b>	51	6,470	42,918	
<b>Age</b>				
16-24	96	650	6,724	
25-34	86	910	7,090	
35-44	67	1,280	8,509	
45-54	33	1,200	7,198	
55-64	15	1,160	6,448	
65-74	8	810	4,109	
75-84	5	390	2,347	
85 and over	1	80	494	
<b>Sex</b>				
Men	53	2,960	21,069	
Women	50	3,510	21,849	
<b>Country</b>				
England	52	5,620	39,420	
Wales	41	420	2,204	
Northern Ireland	39	430	1,295	
<b>English Strategic Health Authority</b>				
North East	52	570	1,924	
North West	48	600	5,218	
Yorkshire & The Humber	52	500	3,912	
East Midlands	56	710	3,382	
West Midlands	49	490	3,973	
East of England	56	650	4,452	
London	63	400	6,016	
South East Coast	50	450	3,314	
South Central	50	610	3,204	
South West	42	660	4,026	
<b>Socio-economic classification of household<sup>1</sup></b>				
Managerial and professional occupations	54	2,590	16,923	
Intermediate occupations	47	1,180	7,797	
Routine and manual occupations	50	2,020	13,612	

<sup>1</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

**Table 1.2.7 Proportion of dentate adults with 18 or more sound and untreated teeth by reported dental attendance**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>		
<b>Dental attendance</b>	<b>Percentage with 18 or more sound and untreated teeth</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>	
<b>All</b>	52	6,470	42,918	
<b>Dental attendance</b>				
Regular check up	45	4,380	26,817	
Occasional check up	66	550	4,278	
Only with trouble	62	1,450	11,063	
Never been to the dentist	88	80	710	
<b>Time since last dental visit <sup>1</sup></b>				
Less than 1 year	47	4,960	31,309	
Between 1 and 5 years	65	970	7,393	
Over 5 up to 10 years	63	260	2,068	
Over 10 years	62	200	1,425	

<sup>1</sup> Excludes people who had never been to dentist

**Table 1.2.8 Proportion of dentate adults with 18 or more sound and untreated teeth and roots by dental attendance**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>		
<b>Dental attendance</b>	<b>Percentage with 18 or more sound and untreated teeth and roots</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>	
<b>All</b>	51	6,470	42,918	
<b>Dental attendance</b>				
Regular check up	44	4,380	26,817	
Occasional check up	65	550	4,278	
Only with trouble	61	1,450	11,063	
Never been to the dentist	87	80	710	
<b>Time since last dental visit <sup>1</sup></b>				
Less than 1 year	47	4,960	31,309	
Between 1 and 5 years	63	970	7,393	
Over 5 up to 10 years	63	260	2,068	
Over 10 years	58	200	1,425	

<sup>1</sup> Excludes people who had never been to dentist

**Table 1.3.1 Proportion of dentate adults with periodontally healthy sextants by characteristics of dentate adults**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>				
<b>Characteristics of dentate adults</b>		<b>Periodontally healthy<sup>1</sup> and no calculus or bleeding</b>	<b>Periodontally healthy<sup>1</sup> with calculus and/or bleeding</b>	<b>Pocketing and LoA of 4mm or more</b>	<b>Unweighted Base</b>	<b>Weighted Base (000s)</b>
<b>All</b>	%	17	33	50	6,410	42,607
<b>Age</b>						
16-24	%	28	53	19	640	6,708
25-34	%	20	44	36	910	7,059
35-44	%	20	37	43	1,280	8,488
45-54	%	14	33	53	1,190	7,147
55-64	%	9	16	75	1,140	6,334
65-74	%	10	14	77	790	4,061
75-84	%	8	10	82	390	2,327
85 and over	%	10	15	76	80	483
<b>Sex</b>						
Men	%	14	33	53	2,940	20,934
Women	%	19	33	48	3,480	21,673
<b>Country</b>						
England	%	17	33	50	5,570	39,129
Wales	%	13	29	57	410	2,197
Northern Ireland	%	15	41	44	430	1,280
<b>English Strategic Health Authority</b>						
North East	%	18	34	48	560	1,905
North West	%	13	38	49	590	5,184
Yorkshire & The Humber	%	15	37	48	500	3,899
East Midlands	%	10	41	50	710	3,372
West Midlands	%	9	32	59	480	3,953
East of England	%	36	26	38	640	4,396
London	%	15	37	48	400	6,006
South East Coast	%	29	18	53	450	3,293
South Central	%	15	41	44	600	3,149
South West	%	11	24	65	660	3,971
<b>Socio-economic classification of household<sup>2</sup></b>						
Managerial and professional occupations	%	21	32	47	2,580	16,844
Intermediate occupations	%	16	32	52	1,170	7,740
Routine and manual occupations	%	12	34	54	2,000	13,465

<sup>1</sup> Periodontally healthy is defined as pocketing and loss of attachment (LoA) less than 4mm.

<sup>2</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

Shaded figures indicate the estimates are unreliable and any analysis using these figures may be invalid. Any use of these shaded figures must be accompanied by this disclaimer.

**Table 1.3.2 Proportion of dentate adults with periodontally healthy sextants by dental attendance**

<i>Dentate adults</i>		<i>England, Wales and Northern Ireland: 2009</i>				
		Periodontally healthy <sup>1</sup> and no calculus or bleeding	Periodontally healthy <sup>1</sup> with calculus and/or bleeding	Pocketing and LoA of 4mm or more	Unweighted Base	Weighted Base (000s)
<b>All</b>	%	17	33	50	6,410	42,607
<b>Dental attendance</b>						
Regular check-up	%	18	32	50	4,350	26,664
Occasional check-up	%	21	35	44	550	4,261
Only with trouble	%	12	35	53	1,430	10,930
Never been to the dentist	%	10	35	55	80	702
<b>Time since last dental visit <sup>2</sup></b>						
Less than 1 year	%	18	32	50	4,920	31,106
Between 1 and 5 years	%	15	36	49	960	7,334
Over 5 up to 10 years	%	9	38	53	260	2,055
Over 10 years	%	11	25	63	190	1,395

<sup>1</sup> Periodontally healthy is defined as pocketing and loss of attachment (LoA) less than 4mm.

<sup>2</sup> Excludes people who had never been to dentist

Shaded figures indicate the estimates are unreliable and any analysis using these figures may be invalid. Any use of these shaded figures must be accompanied by this disclaimer.

**Table 1.4.1 Proportion of adults with excellent oral health by characteristics of dentate adults**

*All dentate adults* *England, Wales, Northern Ireland: 2009*

Characteristics of dentate adults	Percentage with excellent oral health <sup>1</sup>	Unweighted base	Weighted base (000s)
<b>All</b>	10	6,470	42,918
<b>Age</b>			
16-24	23	650	6,724
25-34	16	910	7,090
35-44	12	1,280	8,509
45-54	5	1,200	7,198
55-64	1	1,160	6,448
65-74	1	810	4,109
75-84	0	390	2,347
85 and over	-	80	494
<b>Sex</b>			
Men	9	2,960	21,069
Women	11	3,510	21,849
<b>Country</b>			
England	10	5,620	39,420
Wales	7	420	2,204
Northern Ireland	7	430	1,295
<b>English Strategic Health Authority</b>			
North East	10	570	1,924
North West	7	600	5,218
Yorkshire & The Humber	8	500	3,912
East Midlands	7	710	3,382
West Midlands	4	490	3,973
East of England	20	650	4,452
London	11	400	6,016
South East Coast	17	450	3,314
South Central	7	610	3,204
South West	6	660	4,026
<b>Socio-economic classification of household<sup>2</sup></b>			
Managerial and professional occupations	12	2,590	16,923
Intermediate occupations	9	1,180	7,797
Routine and manual occupations	7	2,020	13,612

<sup>1</sup>21+ teeth, and 18+ sound and untreated teeth and roots, no active decay and periodontally healthy (pocketing or LoA less than 4mm) in all sextants, no calculus or bleeding.

<sup>2</sup> Excludes people in households where the household reference person was not interviewed. Respondents whose household reference person was a full-time student, in the Armed Forces, had an inadequately described occupation, had never worked or were long-term unemployed are not shown as separate categories but are included in the total.

**Table 1.4.2 Proportion of adults with excellent oral health by dental attendance and health behaviours**

<i>Dentate adults</i>		<i>England, Wales, Northern Ireland: 2009</i>		
<b>Dental attendance and health behaviours</b>	<b>Percentage with excellent oral health <sup>1</sup></b>	<b>Unweighted base</b>	<b>Weighted base (000s)</b>	
<b>All</b>	10	6,470	42,918	
<b>Dental attendance</b>				
Regular check-up	10	4,380	26,817	
Occasional check-up	13	550	4,278	
Only with trouble	6	1,450	11,063	
Never been to the dentist	9	80	710	
<b>Time since last dental visit <sup>2</sup></b>				
Less than 1 year	10	4,960	31,309	
Between 1 and 5 years	9	970	7,393	
Over 5 up to 10 years	3	260	2,068	
Over 10 years	7	200	1,425	
<b>MDAS score</b>				
0-9	9	3,290	21,233	
10-18	11	2,320	15,584	
19+	8	730	5,012	
<b>Frequency of teeth cleaning</b>				
Twice a day or more	11	4,820	31,782	
Once a day	7	1,450	9,704	
Never/less than once a day	1	180	1,321	
<b>Smoking behaviour</b>				
Current smoker	7	1,270	8,937	
Ex-smoker	9	2,240	14,186	
Never smoked	11	2,960	19,734	

<sup>1</sup>21+ teeth, and 18+ sound and untreated teeth and roots, no active decay and periodontally healthy (pocketing or LoA less than 4mm) in all sextants, no calculus or bleeding.

<sup>2</sup>Excludes people who had never been to dentist

**Table 1.4.3 Estimated odds ratios for excellent oral health**

<i>Dentate adults</i>		<i>England, Wales, Northern Ireland: 2009</i>			
Variable	N	Odds ratio	p-value <sup>1</sup>	Lower	Upper
<b>Age (p&lt;0.001)</b>					
16-24	650	1			
25-34	910	0.55	<0.001	0.41	0.73
35-44	1,280	0.32	<0.001	0.24	0.43
45-54	1,200	0.12	<0.001	0.09	0.18
55-64	1,160	0.02	<0.001	0.01	0.05
65+	1,280	0.01	<0.001	0.01	0.03
<b>Socio-economic classification (p=0.001)</b>					
Managerial and professional occupations	2,590	1			
Intermediate occupations	1,180	0.85	0.282	0.63	1.14
Routine and manual occupations	2,020	0.57	<0.001	0.42	0.76
Not given	670	0.66	0.042	0.45	0.98
<b>Pattern of dental attendance (p&lt;0.001)</b>					
Regular check-up	4,380	1			
Occasional check-up	550	0.71	0.051	0.50	1.00
Only with trouble	1,450	0.41	<0.001	0.27	0.60
Never	90	0.26	0.025	0.08	0.84
<b>Most recent dental attendance (p=0.011)</b>					
Less than 1 year	4,960	1			
Between 1 and 5 years	970	1.19	0.319	0.84	1.67
Over 5 up to 10 years	260	0.33	0.014	0.14	0.80
Over 10 years	200	1.70	0.144	0.83	3.46
Not given	80	1.67	0.464	0.42	6.68
<b>Frequency of teeth cleaning (p=0.007)</b>					
Twice a day or more	4,820	1			
Once a day	1,450	0.81	0.078	0.64	1.02
Never/less than once a day	200	0.07	0.008	0.01	0.50
<b>Smoking status (p=0.020)</b>					
Never smoked	2,960	1			
Ex-smoker	2,340	1.00	0.984	0.81	1.25
Current smoker	1,270	0.70	0.008	0.54	0.91

<sup>1</sup> P-value for each variable excludes missing values.

**Table 1.5.1 Proportion of edentate adults: England 1978-2009**

<i>All adults</i>		<i>England: 1978-2009</i>			
<b>Edentate</b>	<b>1978</b>	<b>1988</b>	<b>1998</b>	<b>2009</b>	
	<b>Percentage</b>				
<b>All</b>	28	20	12	6	
<b>Age</b>					
16-24	0	0	0	-	
25-34	3	1	0	0	
35-44	11	3	1	0	
45-54	28	15	5	1	
55-64	47	35	18	5	
65-74	} 78	} 66	34	15	
75 and over			56	33	
<b>Sex</b>					
Men	24	16	11	4	
Women	32	25	13	7	

**Table 1.5.2 The incidence of total tooth loss between surveys, based on prevalence data: 1968-2009**

<i>All adults</i>	<i>England &amp; Wales</i>			<i>England &amp; Wales: 1968, 1978; England: 1978-2009</i>						
	<b>Percentage edentate 1968</b>	<i>estimated incidence 1968-1978</i>	<b>Percentage edentate 1978</b>	<b>Percentage edentate 1978</b>	<i>estimated incidence 1978-1988</i>	<b>Percentage edentate 1988</b>	<i>estimated incidence 1988-1998</i>	<b>Percentage edentate 1998</b>	<i>estimated incidence 1998-2009</i>	<b>Percentage edentate 2009*</b>
16-24	1	2	0	0	1	0	0	0	0	-
25-34	7	5	3	3	0	1	0	0	0	0
35-44	22	7	12	11	4	3	2	1	0	0
45-54	41	7	29	28	7	15	3	5	1	1
55-64	64	10	48	47		35		18	[0]	6
65-75			74				[0]	34	[0]	16
75-84									[0]	31

\*age groups adjusted - see Section 1.5.1.



**Table 1.5.3 Number of natural teeth by age, England: 1978-2009**

	<i>Dentate adults</i>				<i>England: 1978-2009</i>			
	Percentage with 21 or more teeth				Mean number of teeth			
	1978	1988	1998	2009	1978	1988	1998	2009
<b>All</b>	74	81	83	86	23.3	24.4	24.9	25.7
<b>Age</b>								
16-24	98	100	100	100	27.4	27.8	27.9	28.6
25-34	91	98	99	100	26.0	27.4	28.2	28.8
35-44	77	88	95	97	23.2	25.5	26.9	27.7
45-54	51	75	84	92	19.8	22.7	24.3	26.1
55 and over	30	38	49	63	16.0	16.9	18.8	21.2

**Table 1.5.4 Number of sound untreated teeth by age, England: 1978-2009**

	<i>Dentate adults</i>						<i>England: 1978-2009</i>					
	Percentage with 18 or more sound untreated teeth						Mean number of sound untreated teeth					
	1978*	1988*	1998*	1998**	2009**	2009** #	1978*	1988*	1998*	1998**	2009**	2009** #
<b>All</b>	27	37	43	41	53	53	13.2	15.0	15.9	15.6	18.0	18.0
<b>Age</b>												
16-24	53	84	94	92	97	96	17.5	21.7	24.3	23.7	26.1	25.9
25-34	28	42	71	68	88	87	14.1	16.4	20.1	19.5	24.0	23.8
35-44	20	22	42	40	69	66	12.4	13.3	16.1	15.9	20.4	19.8
45-54	11	13	17	16	36	33	10.6	11.7	12.1	11.9	15.2	14.9
55-64	} 10	} 7	} 5	4	16	14	} 9.2	} 9.5	} 9.3	9.7	12.0	11.8
65 and over				5	8	8				8.6	9.6	9.5

\*1988 criteria  
 \*\*1998 criteria  
 # age-adjusted

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