

Adult Dental Health Survey

Oral Health in the United Kingdom 1998

A survey commissioned by the United Kingdom Health Departments carried out by the Social Survey Division of the Office for National Statistics in collaboration with the Dental Schools of Birmingham, Dundee, Newcastle and Wales, and the Central Survey Unit of the Northern Ireland Statistics and Research Agency

Introduction

This summary presents results from the 1998 Adult Dental Health Survey¹ which is the fourth in a series of national surveys carried out every ten years; in England and Wales in 1968 and across the United Kingdom (UK) since 1978¹. The purpose of the 1998 survey was to provide information on the condition of adults' teeth and oral health in the UK and its four constituent countries² and also to measure changes in oral health since 1988. The survey was based on a random sample of adults aged 16 years and over living in private households in the UK. The sample size was large enough to also produce results on a regional basis for England. All selected adults were asked to take part in an interview covering socio-demographic details and dental attitudes, experience and behaviour. For adults with some natural teeth, this was followed at a later date by a home dental examination was carried out by a dentist specially trained for the survey. In total, 6204 interviews and 3817 dental examinations were carried out³.

The oral health of a population can be measured using a variety of indicators. This summary presents information on the following clinical measures and dental attitudes, experience and behaviour:

- the proportion of adults who had lost all their natural teeth (who were edentate)
- the number of teeth present among adults with some natural teeth (referred to as dentate adults)
- the condition of teeth in terms of disease and treatment experience
- the condition of the supporting structures
- patterns of past and present dental attendance
- dental hygiene behaviour
- opinions and attitudes about visiting the dentist, dental treatment and having dentures.

Loss of all natural teeth

In 1998, 87% of adults in the UK had some natural teeth, while 13% had lost all their natural teeth. The proportion of adults who have lost all their natural teeth had decreased since 1978, when the first UK Adult Dental Health Survey¹ was carried out, from 30% in 1978 to 21% in 1988 to 13% in 1998.

Adults with no natural teeth were concentrated in the older age groups and in 1998 it was rare for adults to have lost all of their teeth before the age of 45. Among adults in all age groups under 45 years 1% or less had lost all their natural teeth compared with 58% of adults aged 75 and over.

Figure 1

All four countries of the UK showed marked improvements in the retention of natural teeth over the previous two decades, although there are still differences in the proportion of edentate adults within each country in 1998; 12% of adults in England and Northern Ireland, 17% in Wales and 18% in Scotland had lost all their natural teeth.

Table 1

In 1998 total tooth loss also varied by gender and social class although both men and women and adults from different social classes all showed improvements in the retention of natural teeth since 1978.

The number of teeth among dentate adults

The survey dental examination assessed the presence and condition of natural teeth; the condition of the root surfaces; whether there were spaces between the teeth, if these were filled by dentures or bridges and where teeth in the upper

and lower jaws contacted; the type and condition of any dentures; and the condition of the gums.

In each of the constituent countries of the UK, dentate adults in 1998 had about three quarters of the 32 teeth that are potentially present in adults. This proportion varied with age as one might expect but even among those aged 65 years and over an average of just over half of the potential 32 teeth were present (17.3 teeth).

Among dentate adults, the presence of 21 or more teeth was used as one indicator of a functional dentition (to be able to eat, speak and socialise without active disease, discomfort or embarrassment⁴). In 1998, 83% of dentate adults had 21 or more teeth. This proportion varied with age; almost everyone up to the age of 34 years had 21 or more teeth compared with less than half of the dentate population aged 55 years and over. The social and demographic variation in the retention of 21 or more natural teeth was greatest in the oldest age groups. For example, among those aged 65 years and over, almost half (47%) from non-manual backgrounds had 21 or more natural teeth compared with a third (33%) of those from skilled manual households and a quarter (25%) of those from unskilled manual households.

Since 1978, the proportion of dentate adults with 21 or more teeth has increased from 73% to 80% in 1988 and to 83% in 1998. There was a corresponding increase in the average number of teeth over the same period, from 23.0 in 1978 to 24.2 in 1988 and to 24.8 in 1998. The older age groups showed larger increases in the average number of teeth; those aged 55 years and over had an average of 1.8 more teeth in 1998 than in 1988. The comparable increase for those aged 16 to 24 years was 0.3 teeth.

Figure 2, Table 2

Figure 1 Total tooth loss by age, 1978-98

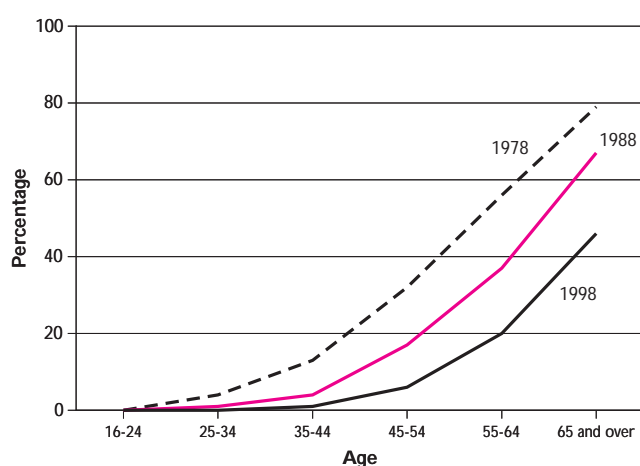
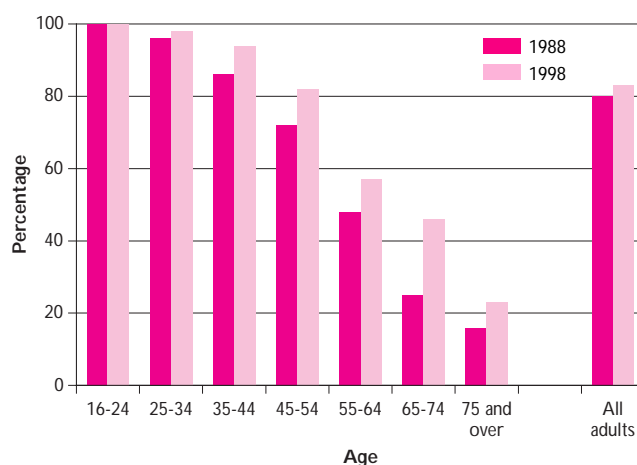


Figure 2 Dentate adults with 21 or more teeth by age, 1988-98



All adults	United Kingdom		
	1978	1988	1998
	<i>percentage edentate</i>		
All	30	21	13
Age			
16 to 24	0	0	0
25 to 34	4	1	0
35 to 44	13	4	1
45 to 54	32	17	6
55 to 64	56	37	20
65 and over	79	67	46
Gender			
Men	25	16	10
Women	33	25	15
Country			
England	28	20	12
Wales	37	22	17
Scotland	39	26	18
Northern Ireland [†]	..	18	12
Social class of head of household			
I,II,IIINM	22	14	8
IIIM	29	24	15
IV,V	38	32	22

[†] Separate data for Northern Ireland in 1978 are not available.
For bases see Appendix G in 1998 report.

If teeth are lost they can be replaced by dentures or bridges. In 1998, 16% of dentate adults had dentures in combination with natural teeth and 4% wore a bridge to replace some missing teeth. Those aged between 55 and 74 years were most likely to have dentures in combination with natural teeth and those aged 55 to 64 years were also most likely to wear a bridge. There were also differences in the proportion of dentate adults who had dentures with respect to geographical area, social class of head of household and usual reason for dental attendance, many of which reflected the variation in the number of teeth among these groups.

The condition of teeth

One of the more significant changes in the assessment of oral health in this survey has been the introduction of a measure intended to improve the sensitivity of recording dental caries (tooth decay). In the 1998 survey the criteria for measuring decay were changed from those used in the previous surveys in this series¹⁻⁵. For the first time teeth with visual caries were included in the assessment of decay whereas in the previous surveys a tooth was recorded as decayed only if cavitated caries were present. An assessment was also made of the extent of the decay. This means that in 1998, teeth with visual caries were classified as decayed whereas in the 1988 survey

Dentate adults	United Kingdom			
	Mean number of teeth that were:			
	Present	Sound and untreated	Decayed or unsound	Filled (otherwise sound)
All	24.8	15.3	1.5	7.0
Age				
16 to 24	27.9	23.4	1.6	2.6
25 to 34	28.1	19.1	1.8	6.6
35 to 44	26.7	15.4	1.4	8.8
45 to 54	24.0	11.7	1.4	9.3
55 to 65	19.9	9.6	1.3	7.4
65 and over	17.3	8.5	1.2	6.3
Gender				
Men	25.0	15.7	1.7	6.6
Women	24.6	14.9	1.3	7.3
Country				
England	24.9	15.6	1.5	6.9
Wales	24.2	15.1	1.2	6.9
Scotland	23.8	13.6	1.8	7.4
Northern Ireland	24.5	13.9	1.5	8.2
Social class of head of household				
I,II,IIINM	25.4	15.4	1.2	7.6
IIIM	24.2	14.8	1.7	6.9
IV,V	23.6	15.3	1.9	5.7
Usual reason for dental attendance				
Regular check-up	24.9	14.6	1.1	8.0
Occasional check-up	26.3	17.5	1.4	6.4
Only with trouble	24.0	16.0	2.3	5.1

[†] Condition of teeth are based on 1998 criteria (see notes and references)
For bases see Appendix G in 1998 report.

and earlier, such teeth were recorded as sound and untreated. Filled teeth with recurrent caries were assessed as decayed in the 1998 classification whereas they were defined as restored (otherwise sound) teeth according to the pre-1998 criteria. The 1998 results can be compared with previous surveys by excluding teeth with visual caries only from the measure of decay in 1998⁵. Comparisons in the condition of teeth among dentate adults in 1998 and previous surveys are presented on page 6 of this summary.

Sound and untreated teeth

In 1998 dentate adults had an average of 15.3 sound and untreated teeth⁶. The number of sound and untreated teeth varied with age. The average number of teeth varied from 23.4 among those aged 16 to 24 years to 9.1 among those aged 55 years and over and the proportion of dentate adults with 18 or more sound and untreated teeth varied from 89% of 16 to 24 year olds to 37% of those aged 35 to 44 years and to 5% of those aged 55 years and over.

The proportion of dentate adults with 18 or more sound and untreated teeth varied from 41% in England to 29% in Scotland; Wales and Northern Ireland were intermediate in the range, with 37% and 32% having 18 or more sound and untreated teeth respectively.

Figure 3, Table 2

Decayed or unsound teeth

Decayed or unsound teeth included teeth with visual or cavitated caries (including unrestorable teeth) or those with an unsound restoration⁶. Dentate adults had an average of 1.5 decayed or unsound teeth and over half (55%) had at least one such tooth. The numbers of decayed and unsound teeth varied little with age. Dentate adults in Wales were less likely to have at least one decayed or unsound tooth than people in the other countries; 48% compared with 56% (England), 58% (Scotland) and 60% (Northern Ireland). Those who reported going to the dentist only with trouble had, on average, twice as many decayed or unsound teeth as those who reported attending for regular check-ups; 2.3 compared with 1.1 teeth.

Dentate adults from non-manual backgrounds were less likely to have any decayed or unsound teeth (50%) than those from skilled and unskilled manual backgrounds (57% and 62% respectively). These differences were found among those aged under 45 years but above this age there was little significant difference with respect to social class.

Figure 4, Table 2

Teeth which had unrestorable decay were more likely to be found among dentate men than women (11% compared with 5%) and those from skilled or unskilled manual backgrounds (10% and 13% compared with 5% of those from non-manual

backgrounds). As many as 19% of those who attended the dentist only with trouble had unrestorable teeth compared with 3% and 4% respectively of those who reported attending for regular or occasional check-ups. There was little difference in the proportions of dentate adults with unrestorable teeth with respect to country or English region.

Fissure sealants

Fissure sealants are used as preventive treatment and are applied to the pits and fissures of teeth; the most vulnerable sites for the onset of caries. Fissure sealants were introduced on a widespread basis in the 1970s and the 1998 Adult Dental Health Survey was the first of the decennial surveys to include an assessment of the presence of sealants. Five per cent of dentate adults had teeth which had been fissure sealed; the majority of these sealants were found in the youngest age group (those aged 16 to 24 years).

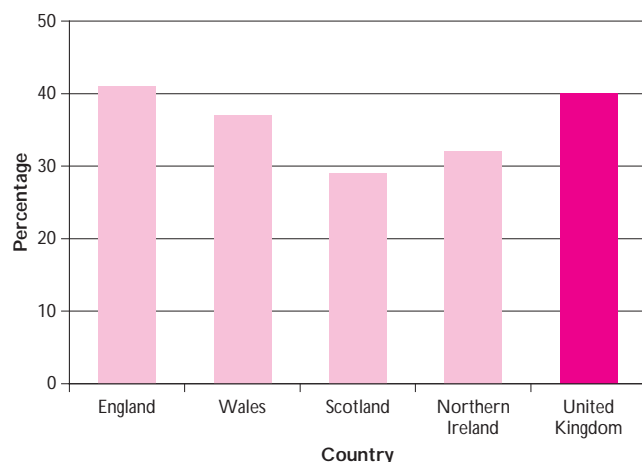
Toothwear

Another new aspect of the survey dental examination in 1998 was an assessment of the wear (loss of tooth substance due to a non-bacterial cause) of the anterior teeth. Two-thirds (66%) of dentate adults had some wear in their anterior teeth that involved at least some dentine, with 11% having wear that was moderate (i.e. extensive involvement of dentine) and 1% with severe wear.

Restorative treatment

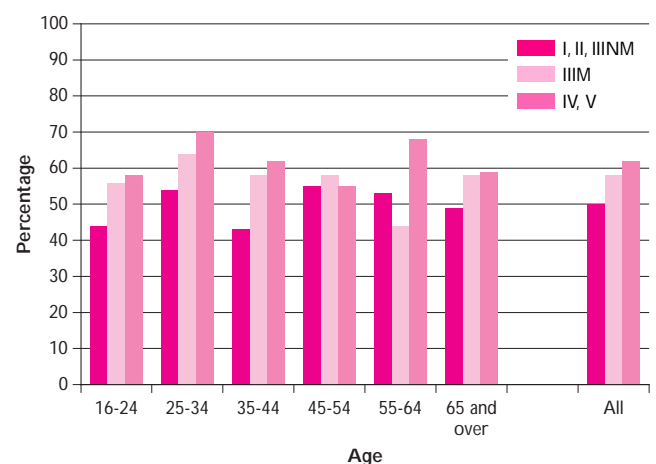
Dentate adults in the UK had an average of 7.0 filled (otherwise sound) teeth⁶ – teeth with an undamaged filling and no active caries anywhere on the tooth. Nearly a third (31%) of dentate adults aged 16 to 24 years had no filled (otherwise

Figure 3 Proportion of dentate adults with 18 or more sound and untreated teeth by country



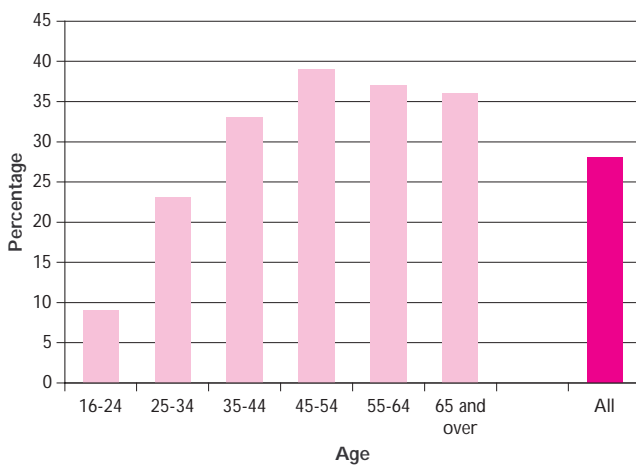
Based on 1998 criteria.

Figure 4 Proportion of dentate adults with some decayed or unsound teeth by age and social class



Based on 1998 criteria.

Figure 5 Mean proportion of teeth which were filled (otherwise sound) by age



Based on 1998 criteria.

sound) teeth, in contrast to the equivalent proportions for those aged 25 to 54 years which ranged between 3% and 9%. One third of dentate adults had at least one tooth with an artificial crown.

Table 2

The average proportion of teeth present in the mouth which were filled (otherwise sound) was 9% for the youngest age group. It increased to a maximum of 39% by the age of 45 to 54 years, and then remained at around this level among older dentate adults, despite the sharp reduction in the number of teeth.

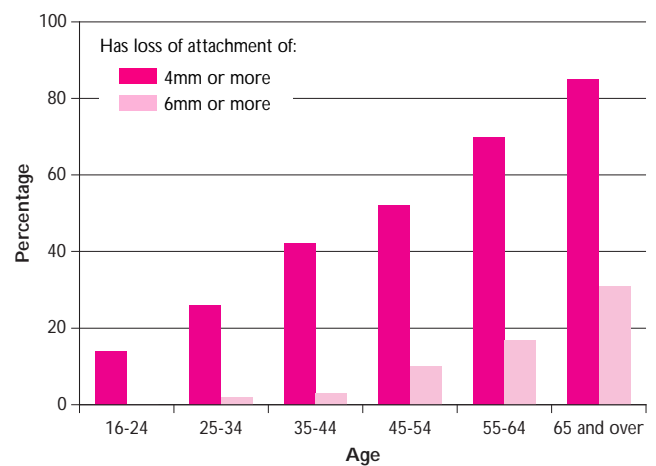
Figure 5

Dental decay is considered to be the most common reason for restoring teeth. Most decay occurs on the crown of the tooth, but as people get older and retain their natural teeth (as is increasingly the case), their gums may recede to expose the tooth root surfaces, which are then also prone to decay and may need restorative treatment. About half of all teeth in dentate adults aged 45 years and over were restored in some way – the teeth had either coronal fillings, had been artificially crowned or had root surface fillings.

The condition of root surfaces

Overall, two thirds of dentate adults (66%) had at least one tooth with a root surface that was either exposed, worn, filled or decayed, with an average of 6.4 teeth involved. Nearly a quarter (24%) had 12 or more teeth in this condition. The presence of root surface fillings was strongly related to age;

Figure 6 Proportion of dentate adults with loss of attachment of 4mm or more by age



no root surface fillings were found among those aged 16 to 24 years, but 43% of people aged 65 years and over had teeth with such fillings.

The condition of supporting structures

As part of the survey dental examination the condition of the gums were assessed in order to measure the prevalence of periodontal disease. The presence of visible plaque and calculus was also recorded, which are indicators of oral cleanliness and which are related with the progression of periodontal disease.

Nearly three-quarters (72%) of dentate adults had some visible plaque on their teeth. An average of 8.3 teeth had some visible plaque representing a third of all teeth. Seventy-three per cent of dentate adults had some calculus and on average 23% of teeth had some calculus deposits.

The reported frequency of teeth cleaning was associated with the prevalence of visible plaque: 69% of dentate adults who cleaned their teeth at least twice a day had visible plaque compared with 79% of those who cleaned their teeth once a day and 87% of those who cleaned their teeth less than once a day (including never). On average, visible plaque was found on over half the teeth of dentate adults who reported cleaning their teeth less than once a day compared with less than a third of teeth of those who reported cleaning their teeth at least twice a day or more.

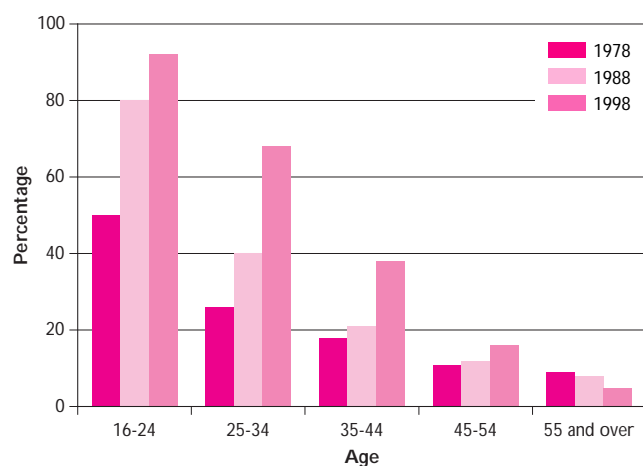
Fifty-four per cent of dentate adults had some periodontal pocketing⁶ of 4mm or more and 5% had deep pocketing (of 6mm or more); 43% had some loss of attachment⁶ of 4mm or more and 8% had loss of attachment of 6mm or more. The prevalence of pocketing and loss of attachment increased with age. For example, the proportion of dentate adults with some loss of attachment increased from 14% among those aged 16 to 24 years to 85% of those aged 65 and over.

Figure 6

Social and behavioural characteristics and oral health

As already described, oral health varied according to socio-demographic characteristics, such as age, gender, geographical region and social class of head of household and according to adults' dental behaviour. Some of these socio-demographic characteristics and dental behaviours are inter-related. Further analysis⁷ showed that age was the most significant variable in explaining the variation in the majority of clinical measures of oral health. However, the effect of age on whether or not respondents had any decayed or unsound teeth or any unrestorable teeth was not as large as for other measures of oral health. The social class of head of household or educational attainment or both were also found to be independently related to all the measures of oral health used. Geographical region, gender, marital status and economic status were found to have an effect in relation to some of the measures investigated. In general, the effects of all these socio-demographic factors were fairly small compared with the effects of age.

Figure 7 Proportion of dentate adults with 18 or more sound and untreated teeth by age, 1978-98



Based on pre-1998 criteria.

Aspects of dental behaviour were also found to have an independent effect for the majority of clinical measures of the oral health. The usual reason for dental attendance was the factor most strongly associated with dentate adults having unrestorable teeth. The reported frequency of tooth cleaning and whether the respondent had fissure sealants placed on their teeth were independently associated with the number of sound and untreated teeth among younger dentate adults aged 16 to 34 years.

Trends in the condition of natural teeth among dentate adults

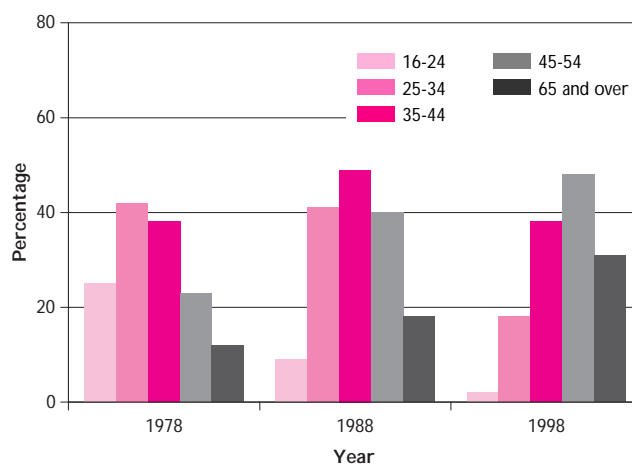
As previously mentioned, although the criteria for measuring decay in the 1998 Adult Dental Health Survey were changed, the 1998 data can be compared with previous surveys by excluding teeth with visual caries only from the measure of decay in 1998⁵. With this adjustment, the trends are as follows.

- An increase in the average number of sound and untreated teeth from 13.0 in 1978 to 14.8 in 1988 and to 15.7 in 1998.

This increase had mainly occurred among the younger age groups (those aged 16 to 44 years) and these groups also showed a corresponding increase in the proportion with 18 or more sound and untreated teeth. In comparison, among dentate adults aged 55 years and over there had been little change in either the average number of sound and untreated teeth or the proportion of the population with 18 or more such teeth over this period.

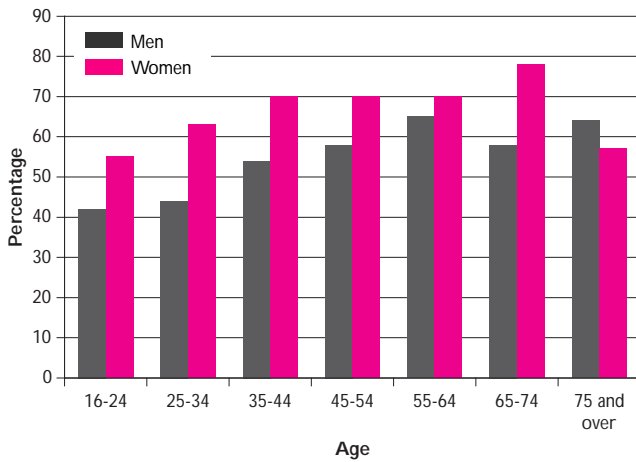
Figure 7

Figure 8 Proportion of dentate adults with 12 or more restored (otherwise sound) teeth by age, 1978-98



Based on pre-1998 criteria.

Figure 9 Proportion of dentate adults who reported attending for a regular check-up by age and gender



- No significant change in the average number of decayed or unsound teeth⁶ between 1988 and 1998 although the average did decrease between 1978 and 1988, from 1.9 to 1.1.

These results were repeated across all age groups, and by gender, social class and usual reason for dental attendance.

- Between 1988 and 1978 there was little overall change in the average number of restored (otherwise sound)⁶ teeth – teeth with either a filling or artificial crown with no cavitated decay or damage to the restoration – although there were changes in the pattern of restorative treatment in the different age groups.

In 1998, dentate adults had, on average, 8.1 restored (otherwise sound) teeth which was the same as that found in 1978 and similar to the level in 1988 (8.4). Among the youngest age group there was a sharp increase in the proportion with no restored (otherwise sound) teeth from 9% in 1978 to 13% in 1988 and to 30% in 1998. For those aged 55 years and over, the proportion with no restored (otherwise sound) teeth has decreased from 26% in 1978 to 10% in 1998.

In 1978 those aged 25 to 34 years were the most likely to have 12 or more restored (otherwise sound) teeth. This cohort of adults has continued to have the highest proportion with 12 or more restored (otherwise sound) teeth in subsequent surveys (those aged 35 to 44 in 1988 and aged 45 to 54 in 1998). It appears that in 1998 the older age groups were keeping more of their teeth than previous decades but were more likely to have had them restored. The younger adults not only had more teeth but also had more which were

Table 3 Attending the dentist for a regular check-up by age and gender, 1978-98

Dentate adults	United Kingdom			
	1978	1988	1998	
	<i>percentage who attend for a regular check-up</i>			
All		43	50	59
Age				
16-24		44	45	48
25-34		47	48	53
35-44		47	59	62
45-54		40	54	64
55 and over		32	45	66
Gender				
Men		36	42	52
Women		50	58	66

For bases see Appendix G in 1998 report.

unaffected by disease and which, therefore, had not required restorative treatment. All but the two oldest age groups (those aged 45 to 54 years and 55 years and over) showed lower proportions with 12 or more restored (otherwise sound) teeth in 1998 compared with 1988.

Figure 8

Dental attitudes, experiences and reported behaviour

Usual reason for dental attendance

Since the first survey of Adult Dental Health in 1968, respondents have been asked “In general do you go to a dentist for a regular check-up, an occasional check-up or only when you’re having trouble with your teeth?” The question is concerned with establishing the usual motive for attendance (for a check-up or with trouble) rather than the frequency of attendance and has been shown to relate closely to oral health status.

Twice as many dentate adults reported attending for regular dental check-ups (59%) as reported attending only when they had trouble with their teeth (30%). The proportion of dentate adults who reported going to the dentist for regular check-ups had increased from 43% in 1978 to 50% in 1988 and to 59% in 1998.

Table 3

In 1998, women were much more likely than men to report seeking regular dental check-ups (66% of women compared with 52% of men). Younger men were one of the groups least likely to seek regular check-ups; only 42% of men aged

16 to 24 years and 44% of men aged 25 to 34 years did so. There were also differences with respect to social class of head of household with those from a non-manual background more likely to report attending for regular check-ups than those from unskilled manual backgrounds; 65% and 49% respectively.

Figure 9

Over half of dentate adults (53%) said they went to a dentist at about the same frequency as five years previously, 20% claimed to go more often and 27% said they went less often than before.

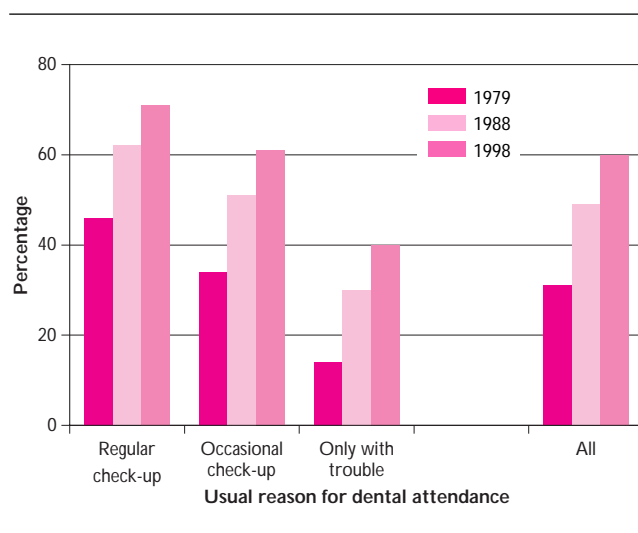
The most recent dental visit

During the interview adults were also asked about their most recent dental visit. Seventy-one per cent of dentate adults had visited a dentist within the year prior to the survey, 19% had visited the dentist between one and five years ago and 10% had last visited the dentist over five years ago.

Dentate adults were also asked about the course of treatment they had received at their most recent visit to the dentist; 60% of dentate adults had no teeth filled or extracted during the most recent course of treatment. A third of those who only attend when they have some trouble with their teeth (33%) had some extractions during their last course of treatment compared with 5% of those who sought regular dental check-ups. The proportion of dentate adults who had no teeth filled or extracted at their most recent visit almost doubled between 1978 and 1998, from 31% to 60%.

Figure 10

Figure 10 Dentate adults who had no extractions or fillings at most recent visit to the dentist by usual reason for dental attendance, 1978-98



Over three-quarters (77%) of dentate adults reported that their last course of the treatment was provided under the NHS while 18% said they had private dental care and 2% had a mix of NHS and private care. Since 1988 the proportion of dentate adults who reported having private dental care increased from 6% to 18% in 1998.

Opinions about visiting the dentist

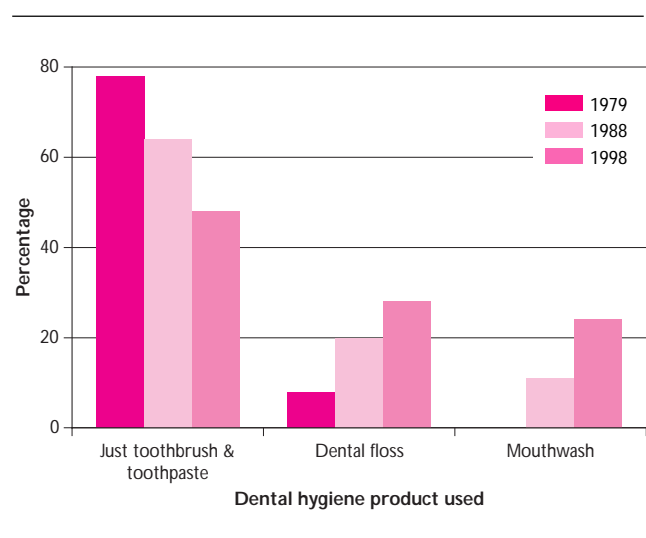
Respondents were shown a series of statements related to different aspects of going to the dentist and asked whether their feelings were reflected by these statements. The organisational aspects of going to the dentist seemed to be of most importance to people such as *I'd like to know more about what the dentist is going to do and why*. Statements relating to cost (such as *I'd like to be given an estimate without commitment*) were the next most important. This was followed by feelings of anxiety about going to the dentist.

Dental hygiene behaviour

Overall, 74% of dentate adults reported cleaning their teeth at least twice a day, 22% once a day, 4% less than once a day and less than 1% reported never to clean their teeth. The proportion of dentate adults who reported cleaning their teeth twice a day or more had increased from 64% in 1978 to 67% in 1988 and to 74% in 1998.

Respondents who cleaned their teeth were asked whether they used anything other than toothpaste and brush for dental hygiene purpose. In 1998, over half (52%) of dentate

Figure 11 Use of dental hygiene products, 1978-98



adults used such products compared with under a quarter (22%) in 1978. In 1998, dental floss and mouthwash were the two most frequently mentioned products respondents used (28% and 24% respectively). These results do not provide direct information about how effectively people clean their teeth, but gives some indication of their motivation towards dental hygiene.

Figure 11

The impact of dental disease

The dental examination gave a clinical indication of the dental problems among the people of the UK. People's perceptions of how they were affected as a whole by dental disease and oral conditions were investigated using a set of questions known as the Oral Health Impact Profile⁶. Just over half (51%) of dentate adults reported having experienced one or more oral problems that had an impact on some aspect of their life occasionally or more often during the year preceding the survey. The most frequently reported problem was oral pain; 40% of dentate adults said they had experienced pain occasionally or more often in the previous 12 months and 3% had experienced oral pain very often during this period.

Treatment preferences

In all of the adult dental health surveys, dentate adults have been asked to indicate their treatment preferences given particular situations. One question included in every survey was *If you went to the dentist with an aching back tooth, would you prefer the dentist to take it out or fill it?* There has been a marked increase in the proportion of respondents saying they would prefer a back tooth to be filled rather than extracted, from 65% in 1978 to 79% in 1998.

Attitudes, expectations and experiences in relation to dentures

Overall 41% of edentate adults had some problem with their dentures. The most frequently reported problem was difficulties with eating or drinking (26%). There were no significant differences in the reporting of problems with dentures among edentate adults with respect to age, gender, social class of head of household or past attendance behaviour.

Among dentate adults who had natural teeth only, 81% expected to retain some of these for their lifetime; 61% thought that the need for complete replacement of their teeth by dentures would be very upsetting and 27% found the idea of partial replacement by dentures very upsetting.

Oral health in England, Wales, Scotland and Northern Ireland

This summary has highlighted some of the oral health differences between the four countries of the UK. Below are listed some of the main findings related to the oral health of adults in each of these four countries.

England

- England is the largest country in the UK, both in terms of geography and population, and as such the oral health and dental behaviour in England was generally similar to that in the UK as a whole.
 - The number and condition of teeth of dentate adults in England has changed over the past two decades, although many of the changes between 1978 and 1998 were not significant. For example, the average number of teeth increased from 23.3 in 1978 to 24.4 in 1988, but did not change significantly between 1988 and 1998.
 - In 1998 there were regional variations both in the proportion of adults who had lost all their natural teeth and in the condition of teeth among dentate adults. For example, almost two-thirds (65%) of dentate adults in the North had at least one decayed or unsound tooth compared with just over half of those living in the Midlands (52%) and the South (51%).
 - In 1998 dentate adults living in the South were most likely to report having been a private patient; 24% compared with 18% in the Midlands and 9% in the North.
 - Dentate adults from the most deprived areas⁸ had the lowest average number of restored otherwise sound teeth (6.5) whereas those from the least deprived areas had the highest (8.6).
 - In 1994 the Department of Health set out a number of targets relating to the oral health of adults to be met by 1998. Data from the 1998 Adult Dental Health survey indicates that these targets have been met.
 - The proportion of dentate adults who went to the dentist for a regular check-up has increased from 44% in 1978 to 50% in 1988 and to 60% in 1998.
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Wales

- Between 1978 and 1998 the proportion of dentate adults with 21 or more teeth increased from 71% to 81%. The average number of teeth increased from 22.9 in 1978 to 24.2 in 1998.
 - Since 1978 there has been a marked increase in the proportion of dentate adults with 18 or more sound and untreated teeth with the biggest improvements occurring in the two youngest age groups.
 - The average number of decayed or unsound teeth found in dentate adults decreased from 1.7 in 1978 to 0.7 in 1998, although there was no significant change between 1988 and 1998.
 - There has been significant improvement in the proportion of adults with no natural teeth within each social class since 1978, but the gap between the different social classes has remained. In non-manual households the proportion of edentate adults decreased from 29% in 1978 to 10% in 1998, and in unskilled manual households from 40% to 24% during this time.
 - In 1998, 59% of dentate adults reported attending the dentist for a regular check-up compared with 39% in 1978. Over the same period there was a marked decline in the proportion who reported visiting the dentist only when having trouble with their teeth.
 - There were marked improvements in reported dental hygiene behaviour between 1988 and 1998. For example, 74% of dentate adults reported cleaning their teeth at least twice a day, compared with 64% in 1988.
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Scotland

- As in previous surveys of dental health in Scotland a larger proportion of women than men had lost all their teeth; 21% compared with 14%. These proportions were higher than those for the UK as a whole (15% and 10% respectively).
- Progress is being made towards the oral health target that by 2010, 95% of 45 to 54 year olds will be dentate.
- The average number of teeth among dentate adults has increased from 21.6 in 1978 to 23.8 in 1998. The average number of sound and untreated teeth increased from 11.3 in 1978 to 13.0 in 1988 and to 14.1 in 1998. There had been no change in the average number of decayed teeth between 1988 and 1998 but there was a decline since 1978 (from 2.1 to 0.9).
- The proportion of dentate adults in Scotland with 12 or more restored (otherwise sound) teeth remained at a similar level from 1978 to 1998 at 32% and 34% respectively. The variation with age was similar to that seen overall in the UK with a decrease in the experience of restorative treatment among the youngest dentate adults and an increase among older adults.
- Dentate adults were more likely to report attending the dentist for regular check-ups in 1998 than in 1988 (55% compared with 50%).

Northern Ireland

- In 1998 the proportion of adults with no natural teeth was 12%, close to the target of 10% by 2008 set by the Department of Health and Social Services.
- A decrease since 1979 in the proportion of adults with no natural teeth was evident in every age group, among both men and women and in every social class. Change has occurred more rapidly among younger adults, men and people from non-manual or unskilled manual backgrounds.
- By 1998, both the proportion of dentate adults with 18 or more sound and untreated teeth (34%) and the mean number of sound and untreated teeth (14.3) were very near the targets set for 2008 (35% and 15 teeth respectively).
- Based on the pre-1998 criteria, the average number of decayed and unsound teeth decreased from 1.5 in 1988 to 0.8 in 1998. Northern Ireland was the only country in the UK to show a significant decrease between 1988 and 1998.
- Dentate adults were more likely to report attending the dentist for regular check-ups in 1998 than in 1988 (51% compared with 42%). Between 1988 and 1998 there was a significant increase in the proportion of dentate adults who said that they had visited the dentist within the previous two years; 71% in 1988 compared with 81% in 1998.

Notes and references

1. The references for the surveys of adult dental health in this series are as follows:

Gray PG, Todd JE, Slack GL and Bulman JS. *Adult dental health in England and Wales in 1968* HMSO London 1970

Todd JE and Walker AM. *Adult dental health Volume 1 England and Wales 1968-78* HMSO London, 1980

Todd JE, Walker AM and Dodd P. *Adult dental health Volume 2 United Kingdom 1978* HMSO London, 1982

Todd JE and Lader D. *Adult dental health 1988 United Kingdom* HMSO London, 1991

Kelly M et al. *Adult Dental Health Survey: Oral Health in the United Kingdom 1998*, TSO, London, 2000.

Two separate surveys have been carried out during this period, one for Northern Ireland and one for Scotland:

Todd JE and Whitworth A. *Adult dental health in Scotland 1972* HMSO London, 1974

Rhodes JR and Haire TH. *Adult dental health survey Northern Ireland 1979* HMSO Belfast, 1981
2. Proportionately larger samples were selected in Wales, Scotland and Northern Ireland than in England in order to provide estimates for the four countries within the UK. The data needed to be reweighted in order to produce representative figures for the UK as a whole. The data were also reweighted to reduce the risk of non-response bias at the interview and dental examination stages of the survey.

3. In total, 6204 interviews were carried out from a sample of 3,666 responding households; at least one person was interviewed in 74% of all the households that were visited. If the respondent completed an interview and had some natural teeth they were eligible for a home dental examination; 3817 dental examinations were carried out representing a response rate of 72% for this stage of the survey.
4. *An Oral Health Strategy for England*, Department of Health, 1994
5. Neither set of criteria included lesions confined to the enamel of the tooth. The overall effect of including visual caries in the 1998 criteria was to:
 - decrease the estimate of the average number of sound and untreated teeth; 15.3 compared with 15.7 using the pre-1998 criteria
 - increase the estimate of the average number of decayed or unsound teeth from 1.0 to 1.5
 - decrease the estimate of the average number of restored (otherwise sound) teeth from 8.1 to 7.9.
6. Glossary of terms used:

Sound and untreated teeth

1998 criteria

Teeth with no evidence of visual or cavitated caries, nor any restorative treatment. It includes teeth with sealants which were sound or fractured but with no evidence of caries.

1988 criteria

Teeth with no evidence of cavitated caries, nor any restorative treatment. It includes teeth with visual caries. It includes teeth with sealants which were sound, fractured or with visual caries.

Decayed and unsound teeth

1998 criteria

Teeth with visual caries, cavitated caries and teeth that were so broken down, possibly with pulpal involvement, that they were unrestorable. It includes teeth that had restorations with recurrent caries and restorations which were lost, broken or damaged.

1988 criteria

Teeth with cavitated caries and teeth that were so broken down, possibly with pulpal involvement, that they were unrestorable. It includes teeth that had restorations with recurrent cavitated caries and restorations which were lost, broken or damaged.

Filled (otherwise sound) teeth

1998 criteria only

Teeth in which a filling has been placed but which are now sound with no active decay and no damage to the filling. Does not include artificially crowned teeth.

Restored (otherwise sound) teeth

1988 criteria (only)

Teeth which include a restoration (either filling or artificial crown) but are now sound with no cavitated decay and no damage to the restoration.

Periodontal attachment

The fibrous connection between the tooth root and the supporting bone and gum. Where gum (periodontal) disease has occurred some of this attachment between the tooth and supporting bone is lost. *This loss of attachment* begins around the neck of the tooth where the tooth projects into the mouth. Loss of attachment below the level of the gum margin results in a *periodontal pocket*. The loss of attachment which has taken place and the depth of the periodontal pocket can be gauged by using a graduated blunt probe held against the root of the tooth and gently placed under the gum as far as the base of the pocket.

7. Age standardisation, logistic regression and multiple regression were used to investigate the relationships between adults' socio-demographic characteristics, their dental behaviour and the clinical measures of oral health. For further details see Appendix F, Kelly et al, *op. cit.*
8. The Jarman underprivileged area score was used to classify respondents according to the relative living standards of the area they lived in. For further details see Jarman B, Identification of underprivileged areas, *British Medical Journal*, vol. 286, pp. 1705-1709 and Appendix F, Kelly et al, *op. cit.*
9. Slade G (ed). *Measuring oral health and quality of life* Chapel Hill: University of North Carolina, Dental Ecology 1997.

Further information

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The full report *Adult Dental Health Survey: Oral Health in the United Kingdom 1998* (Kelly et al.), is available from The Stationery Office (price £59).

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