Adult self-reported attendance for dental check-ups over a 16-year period in the UK

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ABSTRACT

Objective: To report attendance patterns for dental check-ups in UK adults over the period 1991 to 2008, and associated factors.

Methods: Participants were adults aged 16 years and over from the nationally representative British Household Panel Survey, who were interviewed annually. Prevalence of dental attendance was assessed by UK country for each survey year. Associations between dental attendance (NHS and non-NHS) and socio-demographic factors were analysed for the years 1991 and 2008, using logistic regression.

Results: Sample sizes ranged from 8,827 in 1995 to 18,065 in 2001. The proportion of adults who reported seeking a dental check-up increased considerably between 1991 and 2008, mainly driven by an increase in the utilisation of non-NHS dental services. The largest increase was found in the age group 65 years and over. Attendance for check-ups increased from 54.6% to 67.9% in England, from 47.9% to 65.8% in Wales and from 47.3% to 67.3% in Scotland. There were clear social gradients in dental attendance by income and education, however inequalities decreased slightly between 1991 and 2008.

Conclusion: This study shows increases in reported attendance for dental check-ups from 1991-2008. Non-NHS dental check-ups rose in all 4 UK countries. NHS dental check-ups rose in Scotland, Wales and Northern Ireland but not England. The SES inequalities gradient in attendance for dental check-ups persisted throughout the study period although a reduction was seen. These findings have major implications for policy makers in the planning of services.

INTRODUCTION

Access to dental care is an important determinant of oral health and oral health inequalities.[1, 2] In high-income countries, including the UK, the epidemiology of oral diseases has undergone major changes within a generation, and has seen younger age cohorts with lower clinical disease levels and the more senior cohorts retaining teeth, often in poor condition.[3] When combined with the additional changes in the age profile of the population, namely an increase in the older cohorts and a decline in the proportion of younger people, along with changes in social values and consumer demand, these developments are likely to influence the population's needs and in turn have an impact on the demand for dental treatment.[4] For planning purposes, it is important to establish how dental attendance and associated factors change over time, and the implications of this for oral health, resources and workforce.

This study aimed to explore reported dental check-up patterns in the UK over a period of 18 years, to inform oral health policy development. Not least, the data may shed some light on the effects of previous policy decisions by exploring the relationships between dental attendance, demographic and socio-economic factors. In addition, given the evolving mixed 'economy' of dental care in the UK, data that cover attendance of both NHS and non-NHS funded arrangements are important given the overall objective of reducing oral health inequalities.

The British Household Panel Survey (BHPS) is an annual survey designed to improve the understanding of social and economic change at the individual and household level in the UK.[5] It is the only longitudinal dataset that reports dental check-up attendance irrespective of the arrangements through which adults seek care. As such the BHPS is a valuable source to inform planners of changes in the use of both NHS and non-NHS oral health care by the population.[6]

AIMS

This study aimed to report the prevalence of dental attendance in the UK over the period 1991-2008, and to identify potential associated factors. The objectives of this study were as follows:

I. To describe the prevalence of attendance for a dental check-up under both NHS and non-NHS arrangements between 1991 and 2008 in the UK, and to identify variations over time.
II. To assess the extent to which dental attendance was associated with demographic (age, sex, country) and socio-economic (income, education) factors over the study period.

METHODS

Data

The BHPS is a longitudinal study that was conducted annually from 1991 to 2008 by the Institute of Social and Economic Research.[5] The survey comprises a nationally representative sample of around 5,500 households and over 10,000 individuals aged 16 years and over who were interviewed each year. At wave nine (1999) two additional samples were recruited from Scotland and Wales. In the year 2001 the survey was extended to Northern Ireland.[7] The present study uses data from all 18 waves of the survey.

Dental attendance

The BHPS contains two dental attendance measures:

a) A binary variable indicating whether the respondent had a dental check-up during the past 12 months ('yes' or 'no');

b) If the answer to the first question was 'yes,' whether the dental check-up was obtained on the NHS, private, or both. Therefore, this variable had 4 categories: 'not applicable'; 'NHS'; 'private'; or 'both'.

Socio-demographic factors

The following socio-demographic factors were considered in the analyses: UK country; age group (used as a categorical variable as the relationship between age and dental attendance is non-linear); sex (male vs. female); household income (quintiles); education (no formal qualification; below degree level, including CSE, O level and A level; degree or higher degree).

Statistical analysis

All analyses were cross-sectional, with each wave of data analysed separately. First, we examined attendance patterns for each survey year by UK country, broken down into NHS and non-NHS attendance. Sample sizes ranged from 8,827 in 1995 to 18,065 in 2001 (Table 1). We then used logistic regression to assess associations between dental attendance (NHS and non-NHS) and socio-demographic factors for the years 1991 and 2008. Regression analyses were based on complete cases. Model 1 adjusted for UK country, age group and sex; Model 2 additionally adjusted for household income and education. All analyses were carried out using the statistical software package STATA IC (version 14).[8] The level of statistical significance was set at 0.05 for all tests. All estimates were weighted using the appropriate survey weight for each wave, to account for the sampling design.

RESULTS

The sample sizes for each wave and UK country from 1991 to 2008 are shown in Table 1. Sample sizes increased from 1991 to 2008, due to the Welsh and Scottish extensions in 1999 and the inclusion of Northern Ireland in 2001.

The results are presented in six sections. First, an overview of overall changes seen by country is reported. Subsequently, changes by key variables are reported and finally, the regression analyses covered.

Dental attendance patterns in the UK between 1991 and 2008

Trends in attendance patterns over time are shown in Figures 1 to 4. From 1991 to 2008 there was an increase in the overall percentage of the sample reporting that they had a dental check-up in the past 12 months in England, Wales, and Scotland.

Between 1991 and 2008, the overall prevalence of dental attendance for a check-up had increased from 54.6% to 67.9% in England, from 47.9% to 65.8% in Wales, and from 47.3% to 67.3% in Scotland (Table 2). For Northern Ireland, there was a slight increase from 63.1% in 2001 to 65.7% in 2008. For all four UK countries, increases in dental attendance were mainly due to increases in check-ups through non-NHS dental services.

In England, the prevalence of NHS check-ups was highest (48.2%) in the year 2002 and lowest (43.2%) in the year 2006, the year a new NHS dental contract was introduced. The prevalence of check-ups under NHS arrangements was 46.4% in 2005, 43.2% in 2006, and 43.7% in 2007. Between 2005 and 2006, the non-NHS sector saw a small increase in dental attendance, suggesting a marginal shift between sectors but the longer-term implications of transfer between sectors requires further research.

Variation in dental attendance by socio-demographic characteristics

Table 2 shows the prevalence of reported dental attendance by UK country, age, sex, income quintile, and education for the years 1991 and 2008. Over this period, there were some notable changes in attendance patterns. Figure 5 illustrates changes by age. While attendance increased for all age groups over the study period, the increase was most pronounced among the older age groups: for those aged 66 years or older, there was an increase from 29% to 54% in overall attendance, with marked increases for both NHS and non-NHS check-ups. Women reported higher attendance levels than men in both survey years, and the rate of change was similar for both sexes.

There were clear social gradients in dental attendance by income and education, in both 1991 and 2008 (Figure 6). In 1991, 34.8% of those with the lowest income (poorest quintile) reported attendance in the past 12 months, while among the most affluent it was 66.7%. Although by 2008 prevalence had increased overall, major inequities remained. However, the gradient was less steep in

2008, due to a greater increase in attendance among those belonging to the poorest quintile compared to those in the richest.

There were also stark differences in dental attendance by level of education (Figure 7). In 1991, 39% of those with no formal education reported attendance for a check-up, compared to 73% among those with a university degree. Again, the social gradient by education appeared to be less steep in 2008 than in 1991. When analysed by sector, NHS attendance increased among those with lower educational attainment level, but declined among those with a university degree. The latter reported the highest increase in the use of non-NHS dental services.

Results from logistic regression

The associations between dental attendance and socio-demographic factors for the years 1991 and 2008 were further examined using multiple logistic regression (Tables 3 and 4).

In 1991, adults living in Wales and Scotland were less likely to attend for a dental check-up than those living in England, after adjusting for age and sex (Model 1 in Table 3). The relationship with age appeared to be curvilinear. Compared to those aged 25 and younger, those in the 36-45 age group were 18% more likely to have had a dental check-up (95% CI 1.03-1.36). However, those in the older age groups were less likely to attend for a check-up when compared to the youngest age group. For example, those aged 66 and older were 75% less likely to have had a dental check-up than those aged 25 and younger (OR=0.25, 95% CI 0.21-0.29). Women were about 40% more likely to attend for a dental check-up than men (OR=1.39; 95% CI 1.27-1.51).

When income and education were added (Model 2 in Table 3), strong associations were observed between dental attendance and both household income and education. Compared to the least affluent, those in the most affluent income quintile were 86% more likely to attend for a dental check-up, after adjusting for education, sex, age, and country (OR=1.86; 95% CI 1.60-2.18). Those with degree level education were almost three times more likely to attend for a dental check-up than those with no formal education (OR=2.97; 95% CI 2.44-3.62).

In 2008, there were no differences in overall dental attendance between England, Scotland, Wales and Northern Ireland (Model 1 in Table 4). Again, those in the middle age groups were more likely and those in the oldest age group were less likely to have attended a check-up compared to those

aged 25 and younger. As before, women were more likely to attend for a dental check-up than men (OR=1.37; 95% CI 1.26-1.49).

As for the 1991 data, Model 2 revealed clear social gradients by income and education (Table 4). Those from the richest income quintile were 72% more likely to attend for a dental check-up than those in the poorest quintile after adjusting for education, sex, age, and country (OR=1.72, 95% CI 1.48-2.01). Those with a university degree were 2.5 times more likely to attend for a dental check-up than those with the lowest level of education (OR=2.47; 95% CI 2.11-2.88).

DISCUSSION

During the study period considerable growth in attendance for a dental check-up occurred in the UK. Furthermore, it is important to remember that over the study period, the size of the UK adult population increased by nearly 4 million.[9] This would suggest that the actual numbers seen per annum within the overall care system increased by over 2.5 million adults per annum over the study period.

While the NHS system reported small increases, by far the largest growth element was that of the non-NHS sector. Overall the non-NHS sector reported an increase from 6.7% in 1991 to 21.6% in 2008. This timeframe was a period of substantial economic growth in which UK Gross Domestic Product (GDP) increased by 1.42% per annum, which by 2010 gave a level of GDP per capita 17% higher than in 1997.[10] One of the most important implications of a growth in GDP is the impact on jobs and salaries that in turn leads to more consumer spending. The finding of the substantial growth in non-NHS dental care could in part be explained by this. If this is the case, a further factor to consider when planning services are changes in the economic circumstances and their impact on dental service usage overall.

This study used the BHPS sample to study changes in attendance for a dental check-up which occurred alongside changes in dental policy. Since the inception of an NHS dental service in 1948 there have been three major developments:

a) The introduction of patient charges in 1951.
b) A revised dental contract between the Department of Health and dentists in 1990.
c) A new GDS contract between dentists and the then Primary Care Trusts in 2006 in England.

We observed a slight decline in attendance for dental check-ups between 1991 and 1992. In 1990 system changes including a capitation element and relaxing of the upper prior approval limit were introduced, the impact of which contributed to NHS dental incomes exceeding the approved pay targets recommended by the Doctors and Dentists Review body.[11] In 1992, there was a reduction in fees; as a result, dentists scaled back their NHS work and expanded non-NHS treatment, for example only registering children for NHS services with adults paying privately for their own treatment. This could be a possible explanation for the changes observed from 1991 to 1992. The decline in dental check-ups between 1994 and 1996 may be due to a change in the registration period from 24 to 15 months, which was introduced in 1996, and reclassification of those exempt from paying dental charges. A further slight decline was observed between 2005 and 2006. In 2006, a new dental contract with patient charges in three bands was introduced that rewarded dentists based on UDAs (Units of Dental Activity). These changes were followed by an increase in the percentage of the BHPS sample attending for dental check-ups under non-NHS arrangements.

The largest increase in dental check-ups between 1991 and 2008 was found in the age group 65 years and over. This may be indicative of more older people retaining their teeth for longer, and having an increased demand for dental care.[12]

We found marked social gradients in dental attendance, both by income and by education. However, comparing the years 1991 and 2008, our findings suggest that absolute inequalities have somewhat decreased over the study period. Furthermore, given oral health inequalities, it does seem a rather strange paradox that the NHS wishes to see improved access to dental care but at the same time heightens the major barrier to it by increasing patient charges.[13]

CONCLUSION

The data suggest that there has been a substantial increase in the study population's annual attendance for a dental check-up between 1991 and 2008, mainly due to an increase in the utilisation of non-NHS dental services. Although inequalities in routine dental check-ups appear to have decreased to some extent over time, the issue remains a problem. If the goal of modern dental care arrangements lies with an emphasis on prevention rather than intervention, the implications of trying

to address inequalities in disease levels must recognise the economic barriers within primary dental care that co-payments make, irrespective of the funding system.

Ethical approval

The BHPS adheres to the Ethical Guidelines of the Social Research Association (SRA) and the Institute of Social and Economic Research's Ethical Procedures (ISER) that comprise the ISER code of conduct. As the present study is a secondary analysis of existing BHPS data, further ethical approval was not required.

Conflicts of interest

The authors declare no conflicts of interest.

'In Brief'

Reports the proportion of adults seeking a dental check-up increased considerably between 1991 and 2008, mainly driven by an increase in the utilisation of non-NHS dental services.

Highlights that NHS attendance increased among those with a lower educational attainment level, a finding not seen in the other educational level groups.

The largest proportional increase in dental check-ups between 1991 and 2008 was found in the age group 65 years and over; this may be indicative of increased numbers of older people retaining their teeth for longer, translating into increased demand for dental care.

Table 1: Sample sizes for each BHPS wave, by UK country

Year	Overall N	England	Wales	Scotland	Northern Ireland	Missing
1991	9,842	8,394	521	927	–	–
1992	9,455	8,010	487	880	–	78
1993	9,023	7,725	455	843	–	–
1994	9,057	7,745	484	828	–	–
1995	8,827	7,560	468	790	–	9
1996	9,137	7,874	468	794	–	1
1997	10,826	9,050	553	981	–	242
1998	10,548	8,864	559	906	–	219
1999	15,177	8,681	2,992	3,308	–	196
2000	15,603	8,921	3,001	3,491	–	190
2001	18,065	8,507	2,852	3,273	3,257	176
2002	15,708	7,290	2,642	2,910	2,849	17
2003	15,346	7,202	2,576	2,789	2,739	40
2004	14,777	7,066	2,511	2,624	2,513	63
2005	14,635	7,018	2,490	2,547	2,548	32
2006	14,414	6,984	2,495	2,482	2,431	22
2007	13,925	6,812	2,395	2,375	2,275	68
2008	13,454	6,601	2,349	2,271	2,150	83

Table 2: Prevalence of dental attendance for check-up (%), by covariates, in 1991 and 2008 (weighted, complete case analyses)

	1991 (N = 9,824)					2008 (N = 13,182)				
	n	Check-up (%)	NHS (%)	Non-NHS (%)	Both (%)	n	Check-up (%)	NHS (%)	Non-NHS (%)	Both (%)
Country										
England	8,381	54.6	45.1	6.7	2.7	6,514	67.9	45.6	21.4	0.8
Wales	520	47.9	39.9	4.7	3.4	2,309	65.8	47.8	17.7	0.2
Scotland	923	47.3	40.8	3.6	3.0	2,244	67.3	49.6	16.0	1.6
NI	–	–	–	–	–	2,115	65.7	48.0	14.9	2.8
Age										
16-25	1,676	61.1	53.7	5.3	2.1	2,094	65.3	53.0	11.6	0.8
26-35	2,042	62.9	52.2	6.6	4.1	1,972	65.0	45.1	18.4	1.5
36-45	1,827	64.9	53.6	7.9	3.4	2,504	75.8	52.7	22.2	0.8
46-55	1,438	55.2	45.1	7.2	2.9	2,142	74.9	49.3	23.8	1.8
56-65	1,172	49.3	39.7	7.1	2.6	1,929	70.7	46.5	22.5	1.7
≥ 66	1,669	28.7	22.5	4.6	1.5	2,541	53.5	37.8	14.6	1.0
Sex										
Male	4,560	50.8	41.3	6.5	3.0	5,940	63.6	43.1	19.3	1.1
Female	5,264	56.3	47.4	6.3	2.6	7,242	70.0	50.4	18.3	1.3
Income										
Poorest	1,965	34.8	30.2	3.4	1.1	2,660	54.8	42.0	12.0	0.9
2nd quintile	1,965	48.6	41.1	5.5	2.0	2,619	63.9	48.8	14.4	0.8
3rd quintile	1,959	57.8	48.6	6.6	2.6	2,626	69.9	49.8	18.7	1.5
4th quintile	1,972	61.0	50.1	7.5	3.4	2,642	72.2	49.5	21.0	1.8
Richest	1,963	66.7	52.9	8.9	4.8	2,635	75.6	45.7	28.5	1.3
Education										
No qualification	4,247	39.0	32.3	4.7	1.9	3,496	53.0	40.8	11.0	1.2
Some	4,862	64.5	53.8	7.4	3.3	7,679	71.4	50.2	19.9	1.3
Degree level	715	72.6	58.4	9.6	4.6	2,007	76.9	46.6	29.2	1.0

Table 3: Logistic regression models predicting odds of having had a dental check-up in 1991 (N=9,824)

	OR (95% CI)	
	Model 1	Model 2
Country		
England (ref)	1	1
Wales	0.77 (0.64, 0.92)**	0.79 (0.66, 0.96)*
Scotland	0.74 (0.64, 0.85)***	0.72 (0.62, 0.83)***
Age		
16-25 (ref)	1	1
26-35	1.08 (0.94, 1.25)	1.15 (0.99, 1.33)
36-45	1.18 (1.03, 1.36)*	1.41 (1.21, 1.64)***
46-55	0.79 (0.68, 0.92)**	1.08 (0.91, 1.28)
56-65	0.62 (0.53, 0.73)***	1.07 (0.91, 1.28)
≥ 66	0.25 (0.21, 0.29)***	0.52 (0.44, 0.62)***
Sex		
Male (ref)	1	1
Female	1.39 (1.27, 1.51)***	1.54 (1.41, 1.68)***
Income		
Poorest (ref)		1
2nd quintile		1.34 (1.16, 1.55)***
3rd quintile		1.57 (1.35, 1.82)***
4th quintile		1.56 (1.34, 1.82)***
Richest		1.86 (1.60, 2.18)***
Education		
No qualification (ref)		1
Some		2.20 (1.98, 2.44)***
Degree level		2.97 (2.44, 3.62)***

*** p <0.001 ** p <0.01 * p <0.05

Table 4: Logistic regression models predicting odds of having had a dental check-up in 2008 (N=13,182)

	OR (95% CI)	
	Model 1	Model 2
Country		
England (ref)	1	1
Wales	0.93 (0.82, 1.04)	0.97 (0.86, 1.10)
Scotland	0.97 (0.86, 1.09)	0.98 (0.87, 1.10)
Northern Ireland	0.89 (0.80, 1.00)	0.99 (0.88, 1.12)
Age		
16-25 (ref)	1	1
26-35	0.98 (0.83, 1.16)	0.93 (0.78, 1.10)
36-45	1.65 (1.42, 1.90)***	1.62 (1.40, 1.89)***
46-55	1.57 (1.35, 1.82)***	1.71 (1.46, 2.00)***
56-65	1.26 (1.09, 1.46)**	1.72 (1.46, 2.02)***
≥ 66	0.60 (0.52, 0.68)***	1.06 (0.91, 1.24)
Sex		
Male (ref)	1	1
Female	1.37 (1.26, 1.49)***	1.47 (1.35, 1.61)
Income		
Poorest (ref)		1
2nd quintile		1.29 (1.14, 1.47)***
3rd quintile		1.51 (1.31, 1.74)***
4th quintile		1.58 (1.37, 1.83)***
Richest		1.72 (1.48, 2.01)***
Education		
No qualification (ref)		1
Some		2.00 (1.80, 2.23)***
Degree level		2.47 (2.11, 2.88)***

*** p <0.001 ** p <0.01 * p <0.05

Figure 1: Changes in dental attendance reported in England, broken down by NHS and non-NHS arrangements

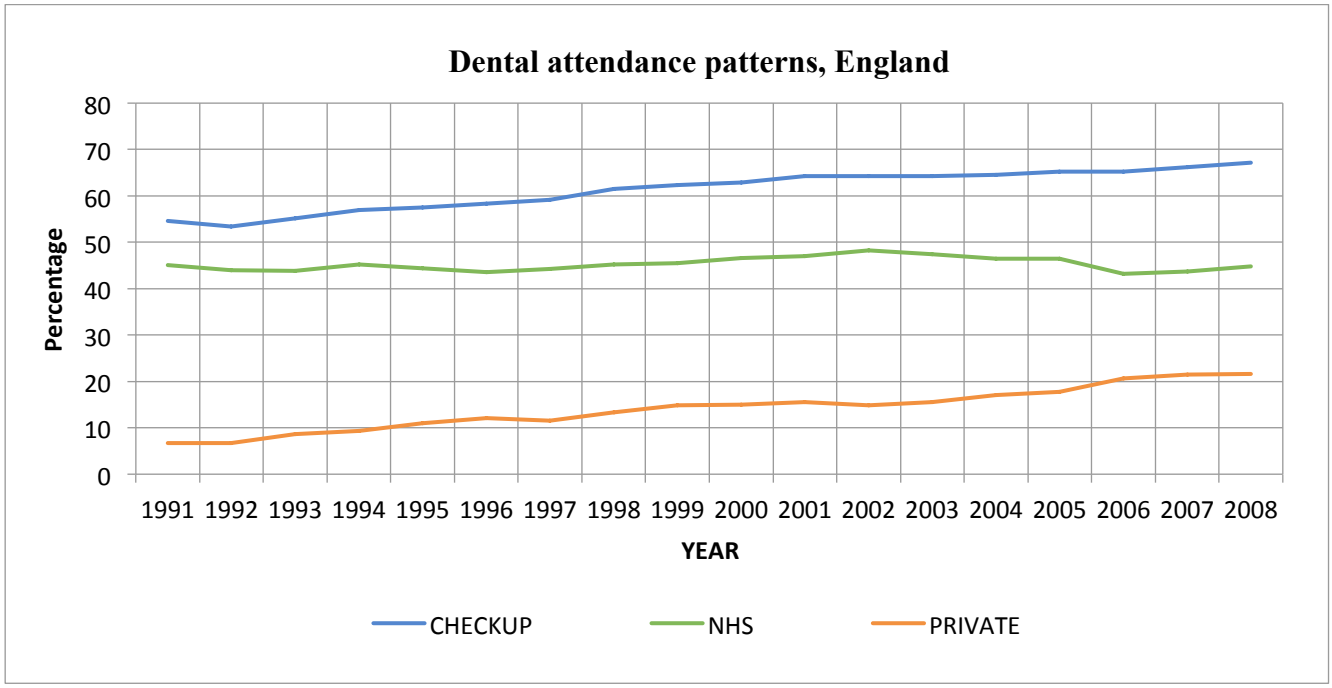


Figure 2: Changes in dental attendance reported in Wales broken down by NHS and non-NHS arrangements

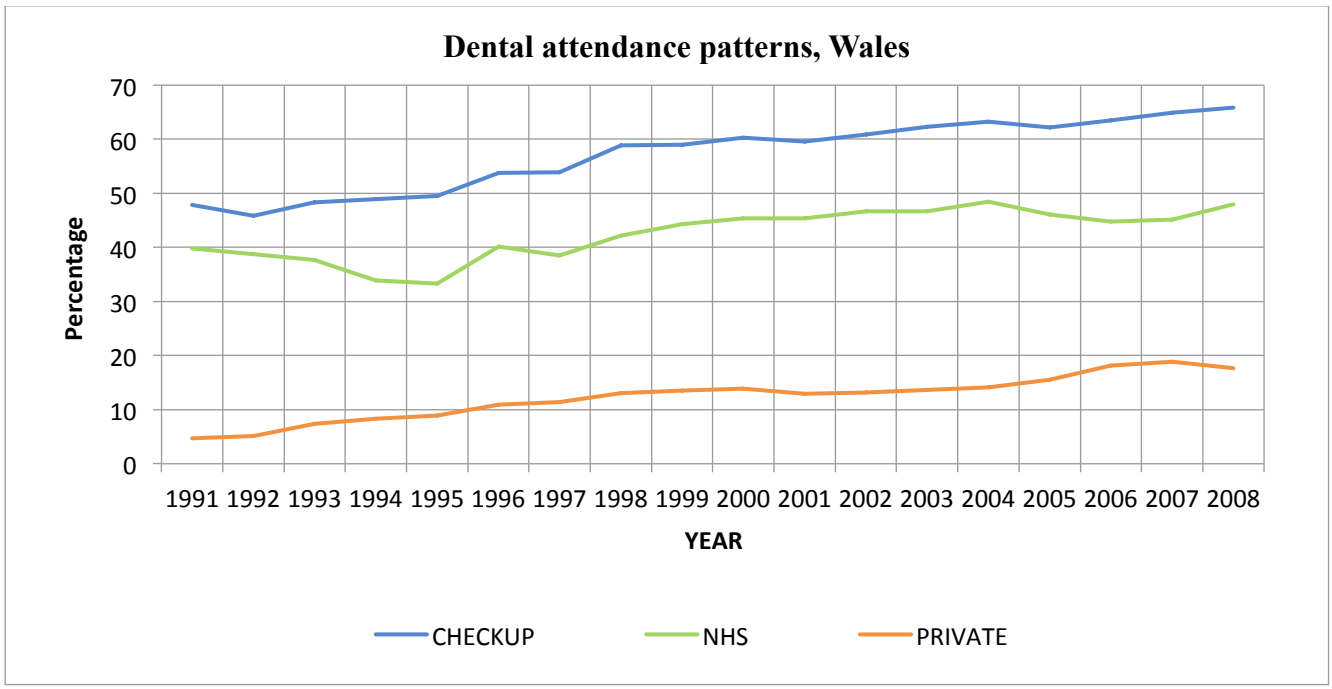


Figure 3: Changes in dental attendance reported in Scotland broken down by NHS and non-NHS arrangements

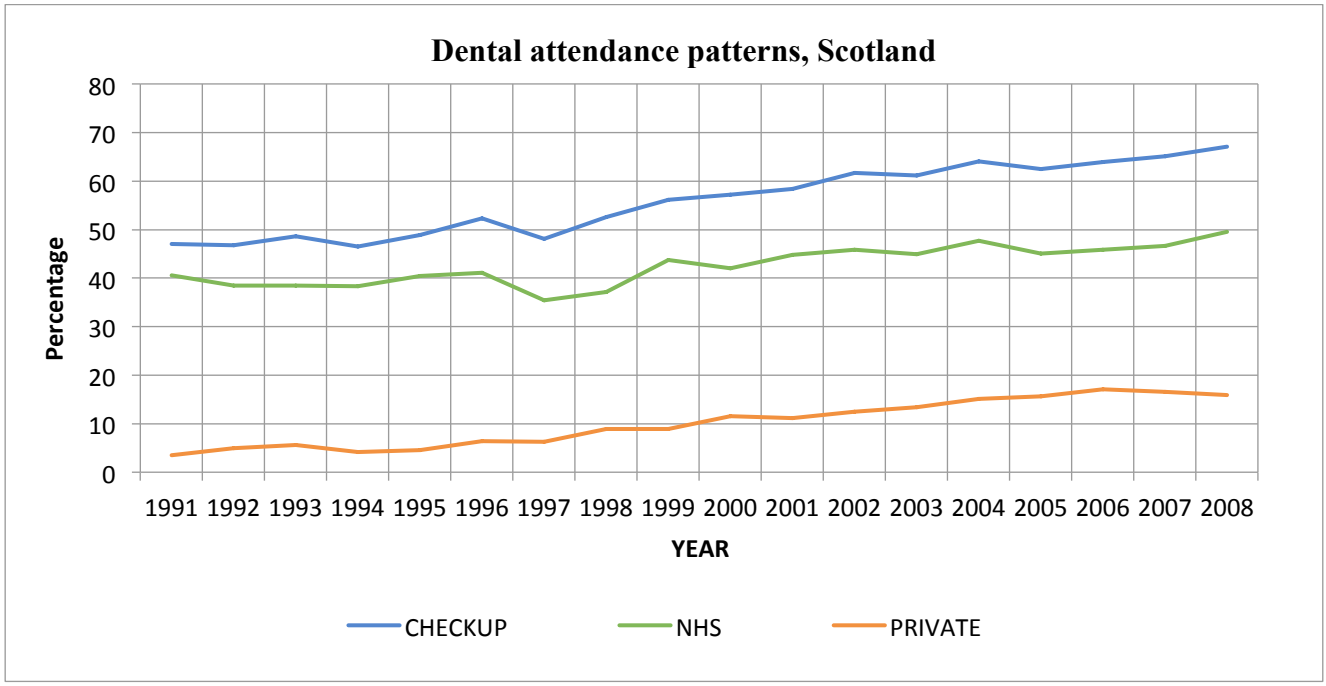


Figure 4: Changes in dental attendance reported in Northern Ireland broken down by NHS and non-NHS arrangements

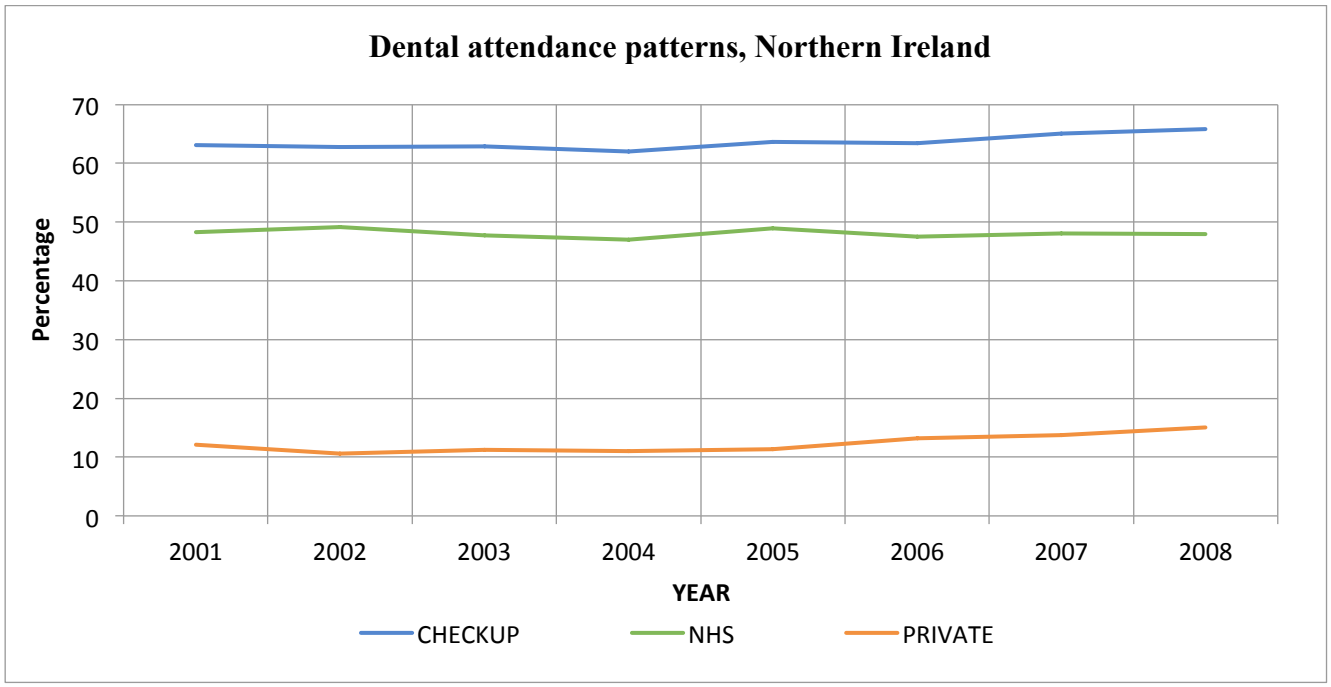


Figure 5: Reported dental check-ups by age group, 1991 and 2008

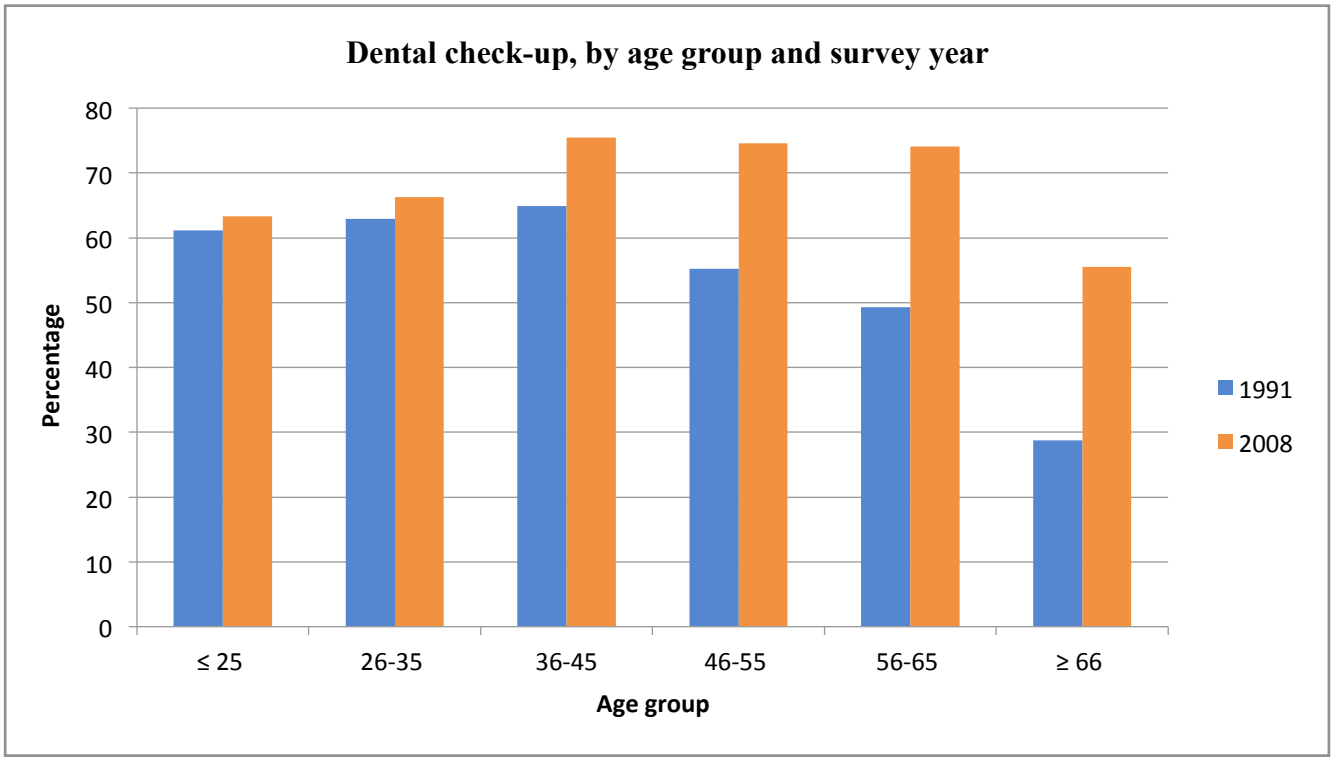


Figure 6: Reported dental check-ups by household income, 1991 and 2008

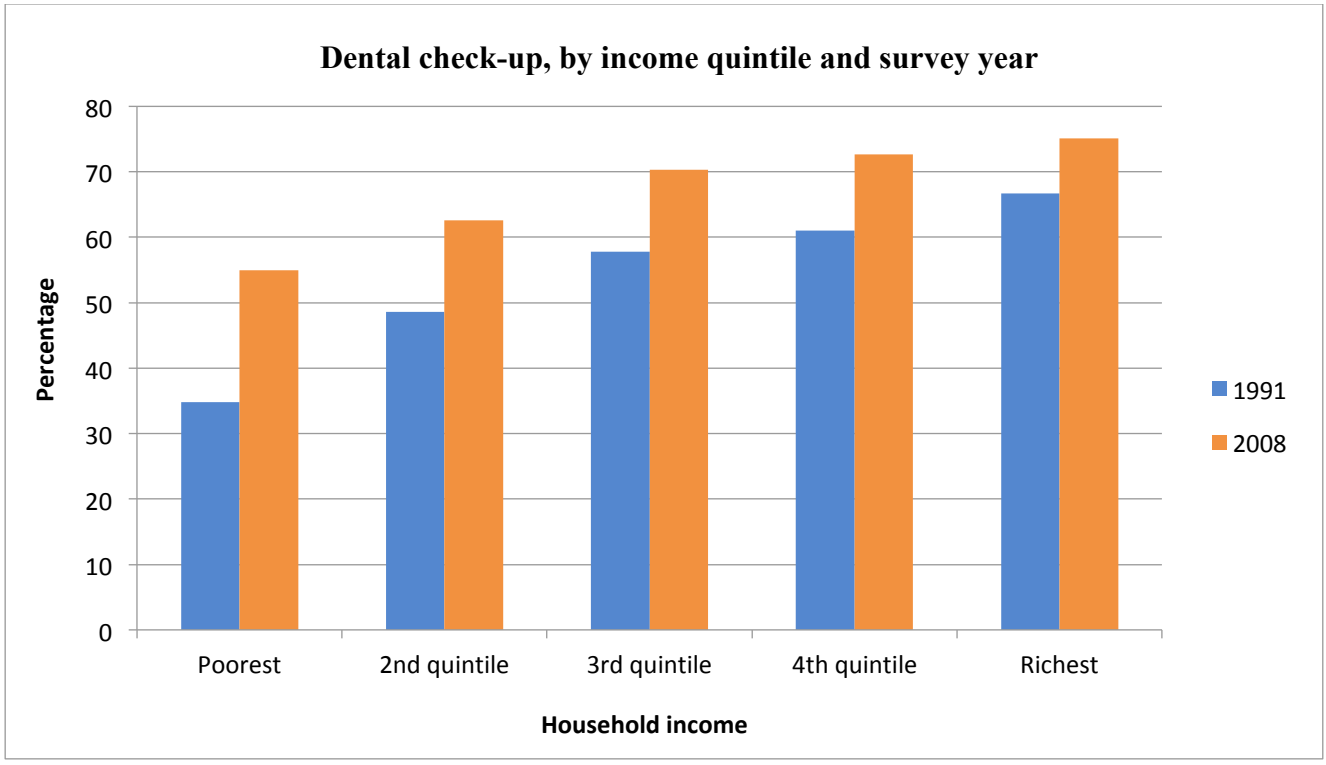
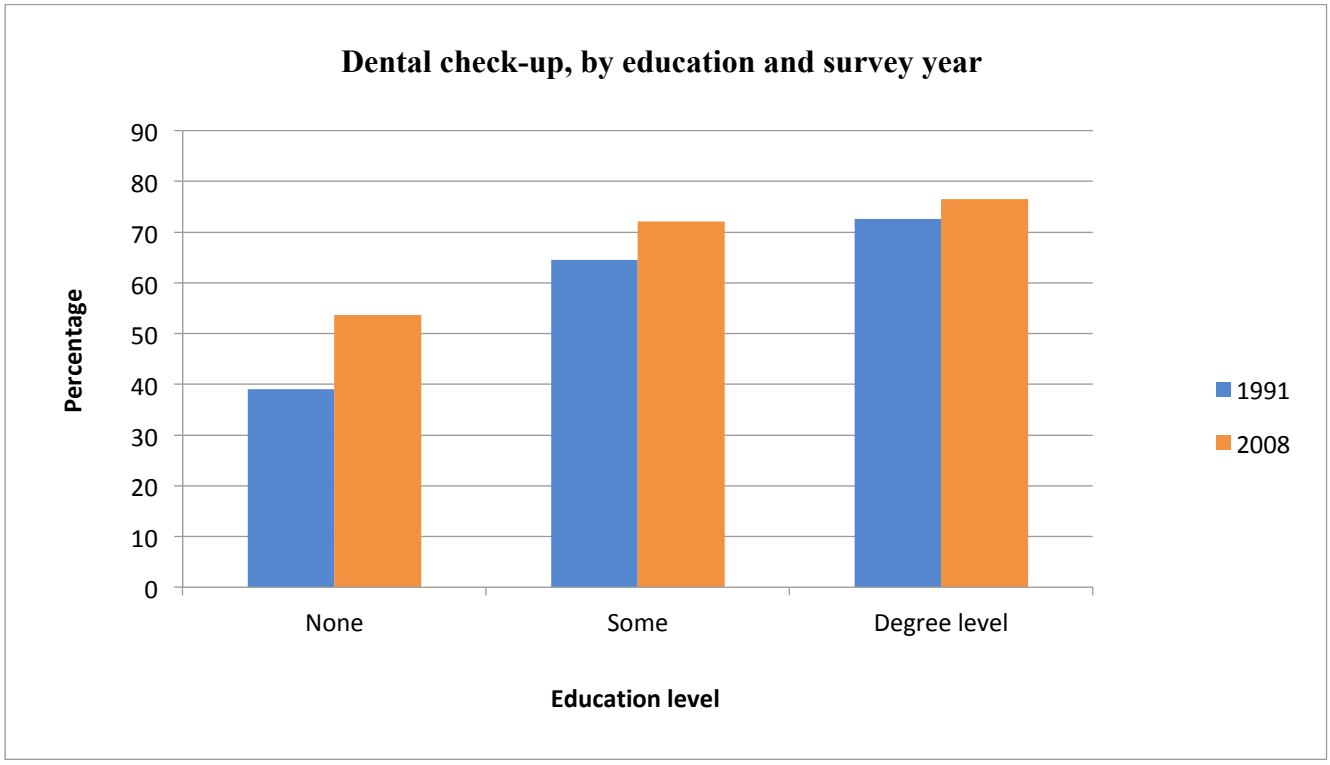


Figure 7: Reported dental check-ups by education, 1991 and 2008



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