PRELIRE

Informing Policy with Evidence

NHS dental charges and the effect of increases on access: an exploration

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Contents

Key points

- Debates about user charges for various aspects of health care have recurred at regular intervals since the creation of the UK NHS, and indeed similar debates occur in health care systems around the world.
- Substantial and convincing international empirical evidence on the general effect of user charges (e.g. for prescribed medicines and primary care visits) has demonstrated repeatedly that they deter people from accessing health care, even when such care is of demonstrable patient benefit. Despite this, most countries rely on user charges to some extent to raise revenue.
- The NHS has never charged for GP visits or hospital care (with the exception of cost recovery after road traffic accidents, paid primarily by insurers). Since the 1950s, however, patient charges are in place for NHS dental care, prescribed medicines and opticians' services.
- Charges apply only to some NHS patients. All children, and adults on means-tested benefits, are entitled to free NHS dental treatment; some adults on low incomes are also able to apply for free dental care. Despite this, it is likely that NHS dental charges affect disproportionately those on low incomes, and those with poorer dental health.
- A systematic literature search and scoping review focused specifically on the effect of dental charges on access to dental care in the UK revealed very few empirical studies, with apparently no evidence beyond the 1990s.
- It is difficult to observe a clear relationship between NHS dental charges and access to treatment for a number of reasons.
    - First, dental health is generally improving, with notable cohort effects which complicate longitudinal analysis.
    - Second, the number and proportion of adults who are entitled to free NHS dental treatment change over time (both because of individuals' circumstances and changes in welfare systems such as the rollout of Universal Credit). Many data sources on dental care do not identify separately those who pay for care and those who are exempt from charges. Only activity by dentists (courses of treatment) separate free from charged episodes of care.
    - Third, the practice of NHS dentistry, dental technology and choices of treatment have changed notably over time.
    - Finally, the availability of NHS dentists is constrained and supplemented by substantial private sector provision. People 'priced out' of NHS dentistry may therefore be replaced by others who were previously attending private dentists, due to lack of availability of an NHS dentist. This makes data on courses of NHS treatment hard to interpret; we therefore explore first the overall number and percentage of adults attending an NHS dentist, which is our primary measure of access.

- The number of adults attending an NHS dentist has been relatively static over recent years, but the overall population has increased. The percentage of the adult population in England attending an NHS dentist over the preceding 24 months has decreased by three percentage points since 2014/15, to slightly fewer than 50% of adults.
- The overall number of NHS dental courses of treatment (COTs) have increased over time for both adults and children. Exploring this by payment category shows that COTs for paying adults have risen but for non–paying adults across all treatment bands they have decreased. This is likely to reflect improvements in financial circumstances and the associated decrease in eligibility for free care, or changes in eligibility rules.
- The mean number of dentists per 100,000 undertaking some NHS care has increased over time, but we cannot tell whether their time committed to NHS work has changed.
- In the GP dental survey, of those adults who did not try to get an NHS dental appointment, 4% reported that the expense of NHS dental care was their main reason for not trying to get an appointment in 2012, this had increased to 5% by 2020.
- In a statistical model analysing CCG-level data from 2012/13 to 2019/20, we explored the relationship between the percentage of adults attending an NHS dentist over the previous 24 months and a measure of the 'affordability' of NHS dental care (charges as a proportion of weekly gross disposable household income (GDHI)). Accounting for area level differences, availability of NHS dentists (per 100,000 population) and general trends, the model indicated that increased cost appears to reduce the proportion of adults who access dental care, but the results did not reach statistical significance.
- Similar relationships emerged using NHS courses of treatment (COTs) as a dependent variable. Higher levels of cost (as a proportion of GDHI) are associated with lower COTs, but again results did not reach statistical significance. Dentists per 100,000 and the percentage of COTs that were free of charge are both significant predictors of the number of COTs.
- Different charging regimes in the constituent countries of the UK permit some comparisons. England's charges have increased more than those in Wales. In Scotland, a dental examination is free of charge, but treatments are charged. In Scotland the percentage of adults attending an NHS dentist in the last two years has increased, in Wales this is relatively static over time, and in England, this decreased slightly. Wales and England had very similar rates of attendance between 2012 and 2015, but since 2015 are showing a slight but noticeable divergence in trends, with a slightly lower percentage of the population accessing NHS dentistry in England.
- Areas of higher deprivation have a higher percentage of adults attending an NHS dentist reflecting the fact that higher income individuals are more likely to attend a private dentist.
- Whilst the analysis in this report is constrained, particularly by data limitations, all of our findings suggest a likely relationship between increased NHS dental charges and reduced access to NHS dentistry; a relationship which is likely to affect poorer individuals and those with worse oral health disproportionately. This is consistent with underlying theory and a substantial evidence base on user charges in other areas of health care.

1 Background and purpose

In the early 1950s, following Treasury concerns that NHS services 'free at the point of use' were creating spiralling costs, the government introduced user charges for dentures, spectacles and (slightly later) prescription medicines. Over the lifetime of the NHS, heated debates about user charges for various aspects of health care have recurred at regular intervals in the UK[1,2] and around the world.[3] Empirical evidence from many countries on the effect of user charges has demonstrated repeatedly and convincingly that they deter people from accessing services.[4] Despite this, most countries use them to some extent.

User charges are implemented primarily to raise revenue. Dental charges are reported to raise slightly under 30 per cent of NHS expenditure on dental services,[5] but overall, patient charges make up only around 1 per cent of the total NHS budget.[6] Charges may also be viewed as deterring 'over-consumption' of services, but this seems highly unlikely to be relevant in the context of NHS dentistry.

There are no charges for NHS GP visits or hospital care (with the exception of cost recovery after road traffic accidents when a driver is responsible for causing injury; this is primarily paid by insurers). Dental charges, however (along with charges for prescriptions and opticians), remain. Exemptions (including for all children and adults on means-tested benefits) and the NHS low income scheme aim to mitigate the negative effects of user charges. Since devolution of responsibility for NHS services to the governments of Wales, Scotland and Northern Ireland, some differences in charging systems and levels have emerged.

Decisions on the level of NHS dental patient charges in England are made annually: over the last four years, as part of the 2015 spending review, they have been increased by 5% each year. There is a risk that such increases may be making dental care unaffordable for those who have to pay, particularly those just above the eligibility requirements for free dental care. This report is intended to inform decisions about the 2021/2022 increase in charges.

There is a substantial and convincing body of evidence about user charges for prescription medicines, and a smaller but still relevant literature about user charges and their effects on use of health care, including primary care and emergency department attendances. Lee et al (2015) reviewed experimental and quasi-experimental studies of efforts to control pharmaceutical expenditure. Within this broader review, 52 studies related to user charges for prescription medication: synthesis demonstrated that user charges reduce utilisation of pharmaceuticals, and reduce public expenditure by shifting costs to

patients. But they reduce the use of essential as well as less essential drugs, and without adequate exemptions they affect vulnerable groups disproportionately.[7]

Studies of user charges for health services in developed countries include the classic RAND health insurance experiment,[8] a randomised controlled trial and the largest and most rigorous study of user fees to date. This found that the more patients had to pay for care, the less they used it. This lowered costs but did not improve efficiency, as people received fewer services when they actually needed more. The authors estimated price elasticity of demand (-0.2), and while the study has been subject to criticism since, a more recent re-analysis[9] found the central contribution to be robust: patients do respond to out-of-pocket payment levels when seeking health care. An economic review of studies of co-payment[10] found that it reduces the use of prescription medicines, and consultations with GPs, ambulatory care and specialists, but has no significant effect on hospitalisations. The authors found very limited evidence of whether or not health outcomes were affected from reduced utilisation, but 'confirmed almost unambiguously that distributional consequences are a real matter of concern'.[10]

Good evidence on the effect of user charges on access to dental care is sparse, and a clear relationship is much harder to identify. The UK's mixed market for dentistry, along with excess demand for NHS dentists, particularly complicates analysis. Not only are there large numbers of private dentists providing an alternative to NHS services, but many dentists work across both public and private sectors. Problems in accessing NHS dental care continue to be reported,[11] so it is likely that some patients attending private sector dentists would prefer an NHS dentist. In this situation of excess demand for NHS dental care, people 'priced out' of NHS dentistry may be replaced by others who previously attended private dentists, so data on activity of NHS dentists (courses of treatment) are problematic. We therefore use the overall number and percentage of adults attending an NHS dentist as our primary measure of access.

Longitudinal analysis is also complicated by changes in the number of people who have access to free NHS dental care and by cohort effects in dental health. Data limitations, particularly in identifying patients who are charged and those who are exempt or claim a refund through the low income scheme, add to the analytical difficulties. All of this makes it challenging to observe a clear relationship between NHS dental charges and access to treatment. With this caveat, we address the following research questions.

- Are NHS dental charges deterring patients from accessing dental care?
- What impact have increasing charges (particularly the recent 5% annual uplifts) had on patients' ability to access dental care?
- Are certain communities and/or populations particularly affected by dental charges?

2 Literature review

To explore the evidence base on the relationship between dental charges and access to dental care, we conducted a rapid scoping review. We focused on economic analysis of dental charges in the UK, partly to assess existing research, and partly to inform our analytical approach.

Our search strategy, conducted by an information specialist (see Appendix A) used the following approach:

- We used search terms to identify papers about charges for dental services, combining terms about dentistry (e.g. dental, dentist, teeth) with terms about payment (e.g. charge, fees, prices)
- We linked these with search terms identifying demand for or utilisation of services (e.g. demand, access, utilisation, treatments)
- We restricted the resulting papers to those focused on the UK.

This search identified 410 papers, but reviewing titles, abstracts and reference lists revealed only two papers of direct relevance. [12,13] Both of these studies examine the relationship between NHS charges and uptake of treatments in Scotland, and both used retrospective longitudinal data. While the findings are out-of-date (one paper used a time series from 1962 to 1981 and the other from 1982-1998), the methods inform our analysis.

3 Data and methods

3.1 Associations between NHS dental charges and access to dental care: descriptive analysis and trends

To describe trends in access to dental care, we use annual and quarterly data on NHS dental statistics that are freely available via NHS Digital.[14] These data are available and comparable for adults from 2006 onwards. Data includes the number of patients attending, number and type of treatments, workforce statistics and other information relating to NHS dental care. The statistics are reported nationally with most also broken down by Clinical Commissioning Group (CCG).

Prior to April 2013, the data were recorded at the level of Primary Care Trust (PCT). In order to construct a comparable time series at CCG level we mapped PCTs to CCGs using the matrices published by the National Audit Office. [15] A number of CCGs have merged since 2013; we combined data from these CCGs to create a time series for 191 CCGs, as they existed on 1 April 2019.

As children are exempt from NHS dental charges, our analyses focuses on adults. Nevertheless, it is useful to include some data on children, partly as a comparator and partly to explore spillover effects (if adults stop attending, they may be less likely to take their children too).We exclude any data collected after February 2020 owing to the potential impact of COVID-19 on dental attendance and treatments.

We also explore the availability of NHS dentists by area (CCG) and examine inequalities in access to NHS dentists by area deprivation scores. Finally, we consider trends in patient experiences and measures of dental health.

3.1.1 Trends in attendances and dental activity

3.1.1.1 Attendances at NHS dentists

Attendance records of individual patients are recorded in the annual dental statistics report. They measure the number of patients attending in the previous two years. We examine the changes by CCG using descriptive statistics.

3.1.1.2 Courses of treatment

Courses of treatment (COTs) are collected for each treatment band. The number of COTs in the previous year are reported, these are broken down by whether or not the patient is eligible for free treatment. We examine changes over time using descriptive statistics.

3.1.2 Supply of NHS dentists

To explore the availability of NHS dentists in each area we used the number of dentists as recorded in the NHS Digital NHS dental statistics annual reports. We calculated the number of dentists per 100,000 using the population figures for each CCG.

3.1.3 Patient experiences - access to an NHS dentist

We explored the GP Patient survey dental statistics[16] to examine the ability to get an NHS appointment and reasons for not trying to get an appointment. These data are available from 2012, however the data were only available at CCG level from 2015 onwards and so the time series results are presented at the national level. The 2019/20 data was collected before any impact of COVID-19.

3.1.4 Patient outcomes - measures of dental health

We explored a number of data sources to measure dental health. NHS Digital dental statistics contain data on the number of adult COTs that contain each kind of treatment so we can examine the number of fillings and extractions and compare to the total number of examinations carried out. We can also examine the number of admitted hospital episode statistics (HES) recorded with a primary diagnosis of dental caries (K02).

Although we are primarily concerned with adult dental health behaviour, we also examine data from the National Dental Epidemiology Programme for England to explore any changes in dental health of 5-year olds.

These outcomes are presented at the national level.

3.2 Modelling the relationship between costs and access to dentistry

To explore whether costs of treatment affect access to an NHS dentist we analyse the relationships between a measure of 'affordability' and the percentage of adults attending and the relationship between affordability and courses of treatment (examining bands of treatments as subgroups). We use CCG level data, calculating affordability levels for each CCG and adjusting for the availability of NHS dentists in each area (see regression equations in Appendix B).

To approximate 'affordability' of NHS dental care, we use the cost of treatment as a percentage of weekly gross disposable household income (GDHI).[17] The GDHI for each upper tier local authority area (NUTS level 3) was mapped to a CCG using Office for National Statistics (ONS) lookup tables. In most cases this was a 1-1 mapping, but where a CCG spans more than one local authority, the GDHI from the area contributing the biggest proportion of the population was used.

Published regional GDHI values are adjusted for inflation, so we also adjusted the cost of dental treatment for inflation using the consumer price inflation time series published by the ONS. We calculated the cost of treatment as a percentage of weekly GDHI for each treatment band and each CCG. NHS charges apply across the country, but income levels vary, so this figure gives some insight into variations in affordability.

Attendance at an NHS dentist and treatments received is likely to be affected by the availability of dentists locally so we include a variable in the model to reflect supply or availability of NHS dentists: the number of NHS dentists per 100,000 population for each CCG. NHS Digital dental statistics annual reports record NHS dentists for each CCG. It is important to note that these data record the number of dentists who provide any NHS services, but not how much time is devoted to NHS care, or how many NHS services they provide. This is a limitation, both in terms of dual practice (NHS and private sector work) and part-time working.

To remove the effect of the 2006 contract (which caused a sharp decrease in attendances, recovered only gradually over time) we restrict our time series to 2012/13 to 2018/19.

3.2.1 Costs and percentage of adults attending

To investigate the relationship between costs and the percentage of adults attending we used a fixed effects regression model. The percentage of the population attending an NHS dentist over the previous two years in each CCG was calculated and used as the dependent variable. Population estimates (mid-year) were taken from the Office for National Statistics.

Independent variables in this model reflect affordability (dental treatment costs as a percentage of GDHI) and availability (number of dentists per 100,000 population). To take account of any changes over time we included dummy variables for year, comparing each year to 2018/19. We also included dummy variables for CCGs. We compared a model using CCGs as random effects to the fixed effect model; a Hausman test was significant indicating that a fixed effect model was preferable. The percentage attending data are not currently available separated by band so we test the cost of each band in separate models of the percentage attending.

3.2.2 Costs and courses of treatment

To investigate the relationship between costs and the number of courses of treatment (COTs) we used a similar fixed effects regression model. The total number of COTs for each year for each CCG was calculated, this was then converted to a rate per 100,000 population, again using mid-year population estimates published by ONS. The independent variables reflected affordability (charges as a percentage of weekly GDHI) and availability (number of dentists per 100,000 population). Again we included dummy

variables for year and CCGs. The data for COTs is broken down by patient type (paying/non-paying adults) so a variable for the percentage of treatments exempt from charges was also included in the model. The analyses were conducted separately by treatment band.

3.3 Comparing costs and attendances in England with other UK countries

Differences in the level and rate of change of NHS dental charges between UK countries enable comparisons, which we explore with descriptive statistics and trends. England and Wales have the same approach to dental charges, but with a different level of fee for each treatment band.[18] In Scotland, an initial dental examination is free of charge, but treatments are charged at 80% of the cost up to a maximum of £384.[19] We assume that a preliminary examination in Scotland is comparable with a band 1 check up in England and Wales, which is not strictly accurate.

3.4 Exploring inequalities in dental access and deprivation

To determine whether certain communities and/or populations are particularly affected by dental charges we explore inequalities by area-level deprivation. We use descriptive statistics to explore whether attendance changed between and within CCGs with different deprivation levels, using quintiles from the income domain (rank of average income) of the 2019 Indices of Deprivation (IMD) as published by the Ministry of Housing, Communities and Local Government.[20]

4 Findings

4.1 Associations between NHS dental charges and access to dental care: descriptive analysis and trends

4.1.1 Trends in attendances and dental activity

The national data show that the percentage of the adult population that attended a dentist started to decrease from 2014/15.

Table 4.1: Costs of NHS dental treatment (band 1) in England, adults attending and courses of treatment over time

Cost change date	Actual period Year	Band 1 Cost	Adults seen		Band 1 COTS	
			Number (000s)	% of adult population	Number (000s)	COTS per 100,000
1/4/2006	2006/07	£15.50	20,285	51.0	12,451	31,241
1/4/2007	2007/08	£15.90	19,435	48.5	12,580	31,271
1/4/2008	2008/09	£16.20	19,869	49.1	13,036	32,097
1/4/2009	2009/10	£16.50	20,668	50.7	13,376	32,651
1/4/2010	2010/11	£16.50	21,342	52.3	13,596	32,870
1/4/2011	2011/12	£17.00	21,755	52.1	13,691	32,779
1/4/2012	2012/13	£17.50	21,938	52.5	13,746	32,673
1/4/2013	2013/14	£18.00	22,024	52.0	14,164	33,439
1/4/2014	2014/15	£18.50	22,096	52.2	14,325	33,528
1/4/2015	2015/16	£18.80	22,163	51.8	14,504	33,645
1/4/2016	2016/17	£19.70	22,216	51.5	14,807	34,053
1/4/2017	2017/18	£20.60	22,145	50.9	14,583	33,331
1/4/2018	2018/19	£21.60	22,030	50.4	14,868	33,774
1/4/2019	2019/20	£22.70	21,840	49.6	14,515	32,792

4.1.1.1 Attendances at NHS dentists

Figure 4.1 shows quarterly national data, with number and percentage of adults reporting having attended an NHS dentist over the previous 24 months. The data presented finishes at the end of December 2019; this refers to adults attending over 2018 and 2019, so the relevant time period therefore ends before the start of the impact of COVID-19. The dip in 2007/08 data (again covering attendances over the previous 24 months) is real, and follows the sharp loss in provision of NHS dentistry that was associated with the 2006 dental contract. The number of adults reporting having attended an NHS dentist has been relatively static over recent years, but the overall population has

increased. The percentage of the adult population in England reporting having attended an NHS dentist over the preceding 24 months, has decreased by three percentage points since 2014/15, to slightly fewer than 50% of adults. This is a lower percentage of the population accessing dental care than before the 2006 change to the dental contract.

Data for children reporting having attended a dentist over the previous 12 months are presented from June 2016 (before 2016 visits over the previous 24 months were reported, so the longer time series is not consistent). Since 2016, there has been a general upward trend in the number and percentage of children reporting having visited a dentist over the previous 12 months.

Figure 4.1. Number and percentage of adults reporting having visited a dentist in the previous 24 months (rolling total)

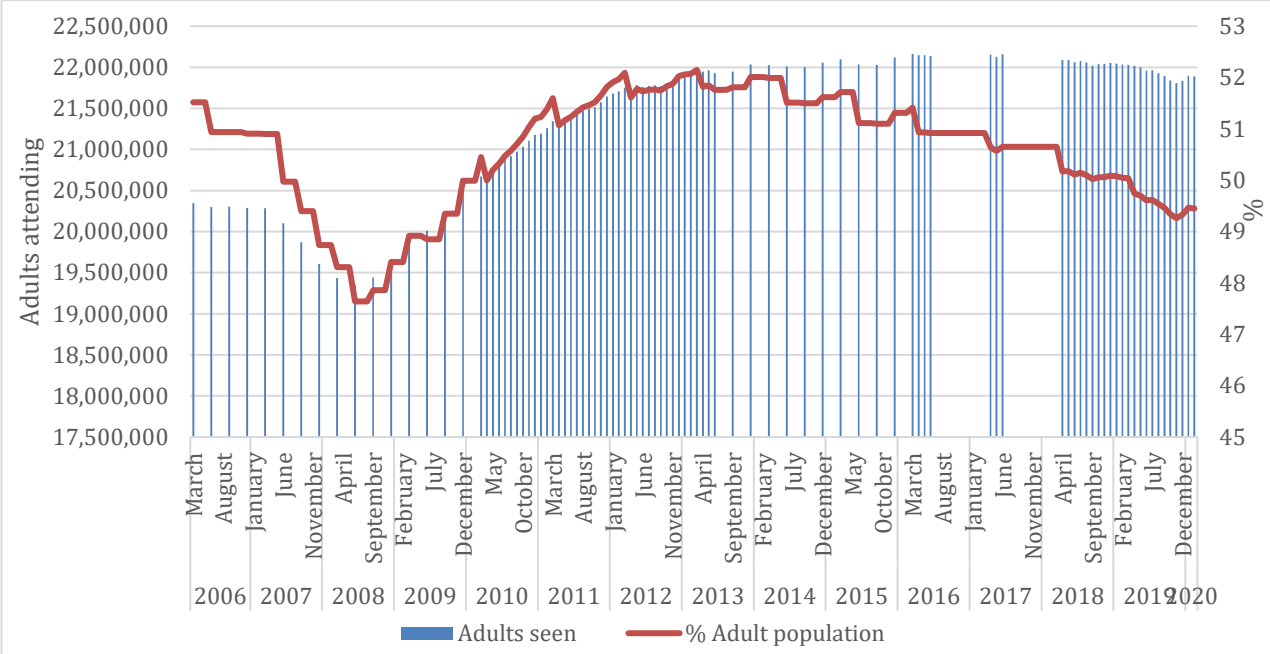
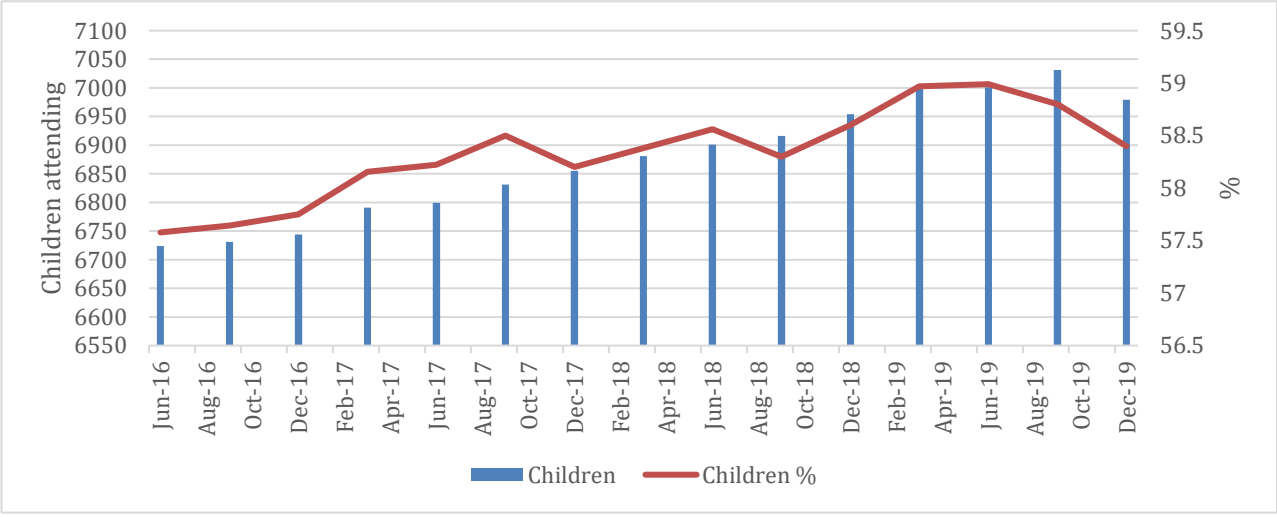


Figure 4.2. Number and percentage of children visiting a dentist in previous 24 months (rolling total)



4.1.1.2 Courses of treatment

The number of Band 1 courses of treatment (COTs) per 100,000 population per year has increased over time; band 2 COTs have decreased over time and band 3 treatments and urgent attendances are relatively stable (table 4.2 and figure 4.3). Table 4.3 shows that the proportion of COTs that are exempt from charges has decreased across all bands; this is likely to reflect general reductions in the number of adults who are claiming income-related benefits.[21]

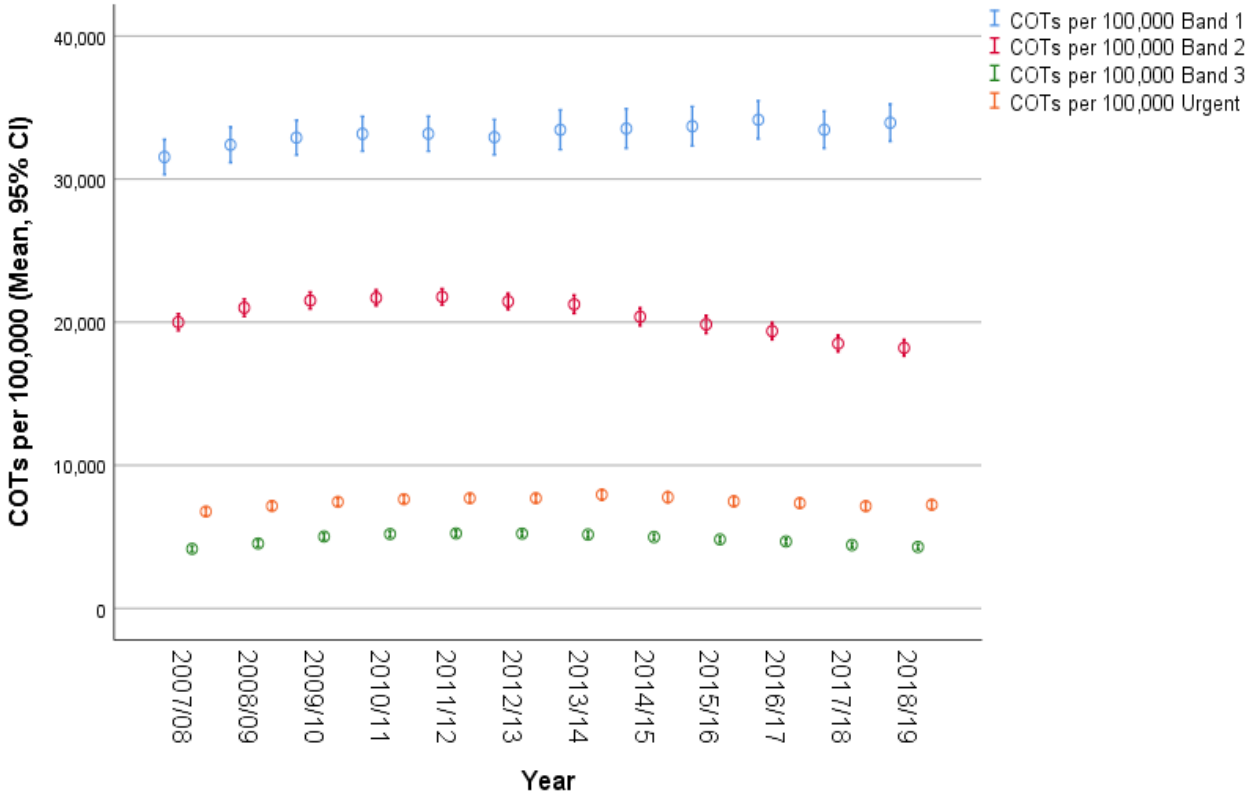
Table 4.2: Courses of treatment per 100,000 population

	Band 1		Band 2		Band 3		Urgent	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2007/08	31,545	8,591	19,997	4,159	4,162	1,474	6,767	2,076
2008/09	32,395	8,744	21,011	4,322	4,533	1,561	7,158	2,101
2009/10	32,896	8,569	21,516	4,129	5,021	1,598	7,448	1,994
2010/11	33,162	8,498	21,705	3,912	5,199	1,539	7,627	2,023
2011/12	33,169	8,564	21,773	3,960	5,239	1,525	7,698	2,040
2012/13	32,931	8,668	21,454	3,985	5,226	1,436	7,701	2,000
2013/14	33,446	9,697	21,251	4,478	5,159	1,475	7,948	2,623
2014/15	33,530	9,707	20,380	4,372	4,988	1,401	7,766	2,587
2015/16	33,694	9,632	19,851	4,372	4,820	1,364	7,478	2,428
2016/17	34,143	9,310	19,378	4,164	4,679	1,327	7,356	2,326
2017/18	33,452	9,080	18,509	4,056	4,430	1,287	7,148	2,179
2018/19	33,939	9,089	18,208	4,034	4,295	1,259	7,242	2,284

Table 4.3. Percentage of each band eligible for free treatment

	Band 1		Band 2		Band 3		Urgent	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2007/08	22.8	7.1	34.4	10.2	48.2	12.3	37.6	10.4
2008/09	22.9	6.8	34.5	9.7	49.4	11.8	38.9	10.3
2009/10	24.1	6.8	36.0	9.5	51.7	11.1	41.0	9.7
2010/11	24.3	6.7	36.0	9.4	52.1	10.9	40.8	9.3
2011/12	24.2	6.7	36.2	9.4	53.1	10.7	41.2	9.4
2012/13	23.6	6.6	35.7	9.3	52.9	10.6	40.4	9.5
2013/14	23.0	7.4	35.3	10.0	52.8	11.1	39.4	10.2
2014/15	21.6	7.1	34.2	10.1	51.2	11.5	37.7	10.0
2015/16	20.2	6.6	32.5	10.1	49.5	11.7	35.9	9.8
2016/17	19.1	6.5	31.3	10.0	48.8	11.8	34.0	9.7
2017/18	17.8	6.2	29.8	9.8	47.7	11.9	32.2	9.5
2018/19	16.9	6.2	29.2	9.8	47.7	12.0	31.2	9.3

Figure 4.3. Courses of Treatment (COTS) per 100,000 Population by Treatment Band (Mean and 95% Confidence Interval)



4.1.2 Supply side - number of NHS dentists

Data from NHS digital workforce statistics shows that the mean number of dentists per 100,000 in a CCG undertaking any NHS services has increased over time (from a low point following the 2006 contract). From these data we cannot tell whether the time these dentists commit to NHS work has changed.

4.1.3 Patient experiences - access to an NHS dentist

Data from the GP dental survey shows that the number of adults reporting that they were able to get an NHS dental appointment over the previous two years decreased from 2015 (2020 data was collected before the impact of COVID-19). There was also an increase in the number of patients not trying to get an appointment over the previous two years. In 2013, 39.6% did not try to get an appointment with an NHS dentist, this had risen to 42.1% by 2020. The reasons given for not trying to get an NHS appointment varied, the most common reason given was a preference for a private dentist - over time this increased from 19.9% to 25.9%. The number reporting not having needed to go to a dentist remained constant at around 21%. The number on an NHS waiting list increased from 0.6% to 0.9% and the percentage who thought an NHS dentist was too expensive increased from 4.1% in 2012/13 to 5% in 2019/20. These questions, however, might not be mutually exclusive, for example those who 'prefer to go to a private dentist' might make that judgement if they think the NHS and private sector prices are similar, but of perceived different quality, so they might view NHS care as too expensive as well.[22]

Figure 4.4: Number of dentists per 100,000 undertaking any NHS services (Mean and 95% Confidence Interval)

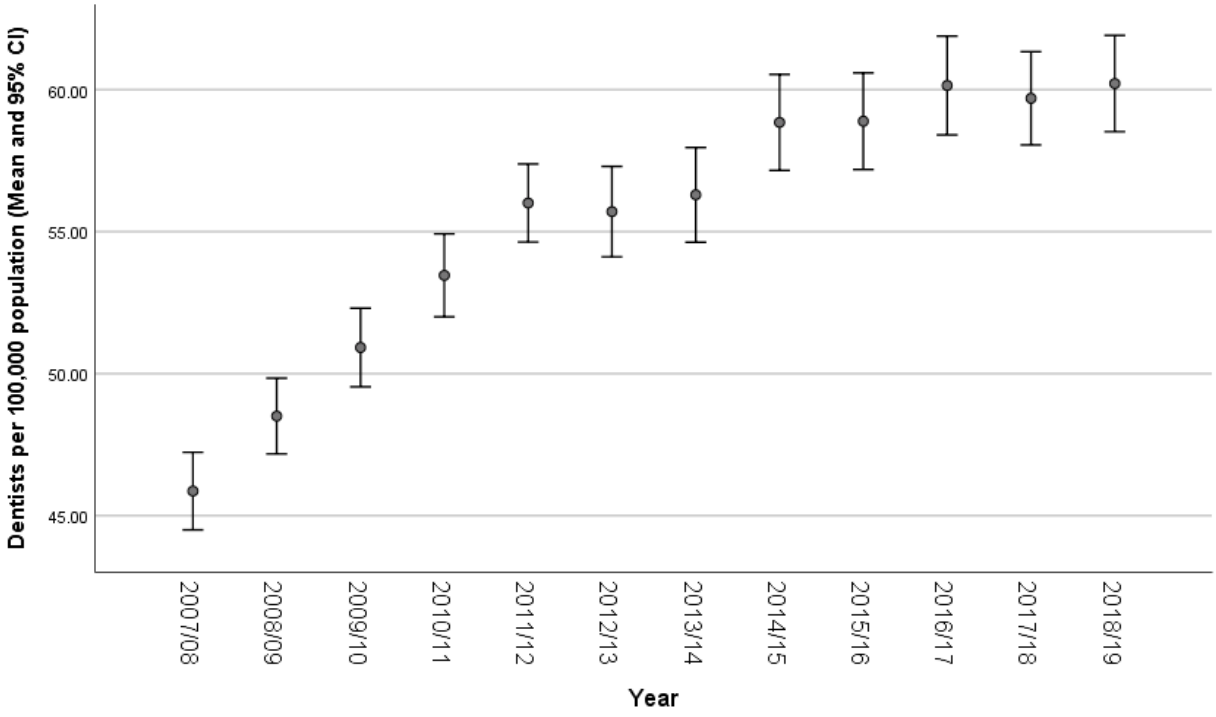


Table 4.4: Visits to an NHS dentist, reported in the GP dental survey

	More than 2 years ago	Have never tried to get an NHS dental appointment	Total who have not tried to get an NHS appointment in past 2 years
2012/2013	17.6%	22.0%	39.6%
2013/2014	18.0%	21.2%	39.1%
2014/2015	17.7%	21.6%	39.3%
2015/2016	17.3%	23.6%	41.0%
2016/2017	17.1%	24.1%	41.2%
2017/2018	16.1%	25.1%	41.2%
2018/2019	16.2%	25.5%	41.6%
2019/2020	16.1%	26.0%	42.1%

Table 4.5: Reasons for not attending an NHS dentist in the past 2 years, reported in the GP dental survey

	Not needed to visit a dentist	No longer have any natural teeth	Not had time to visit a dentist	Don't like going to the dentist	Didn't think they could get an NHS dentist	On a waiting list for an NHS dentist	Stayed with a dentist who changed from NHS to private	Prefer to go to a private dentist	Find NHS dental care is too expensive	Another reason
2012/2013	20.1%	7.7%	2.0%	6.4%	13.2%	0.6%	18.4%	19.9%	4.1%	7.6%
2013/2014	20.6%	7.4%	2.2%	6.5%	12.5%	0.5%	17.4%	20.7%	4.5%	7.7%
2014/2015	20.7%	6.8%	2.3%	6.5%	12.3%	0.5%	16.4%	22.2%	4.4%	8.0%
2015/2016	21.7%	6.4%	2.5%	6.9%	11.7%	0.5%	14.7%	23.3%	4.3%	7.9%
2016/2017	21.7%	6.0%	2.5%	6.8%	11.8%	0.5%	13.8%	24.2%	4.4%	8.2%
2017/2018	21.0%	5.4%	2.5%	6.2%	12.0%	0.7%	13.0%	25.6%	4.4%	9.1%
2018/2019	20.6%	4.9%	2.6%	6.2%	12.6%	0.8%	12.4%	25.9%	4.5%	9.5%
2019/2020	20.5%	4.4%	2.7%	6.2%	13.4%	0.9%	11.5%	25.9%	5.0%	9.6%

4.1.4 Patient outcomes - measures of dental health

Examining a number of available measures of population dental health demonstrates that outcomes have improved over time. The number of hospital episodes for dental caries has decreased, as has the number of fillings and extractions for adults. Data from the National Dental Epidemiology Programme for England's oral health survey of five-year-old children (2019) shows that children's dental health has also improved since 2008. The only category that has increased is the number of hospital admissions for dental caries for over 65s, which is likely to reflect changes in clinical practice and increases in the number of elderly people who are dentate, rather than any worsening of dental health.

Table 4.6: Hospital attendances (Finished Consultant Episodes) for dental caries (K02)

Year	All	Child	All Adult	(65+)
2011/12	108090	-	-	
2012/13	106312	44292	61832	6,919
2013/14	109951	46033	63736	7,227
2014/15	111892	47391	64289	7,683
2015/16	109336	45164	63919	7,870
2016/17	108632	44576	63743	8,312
2017/18	103547	43515	59085	8,150
2018/19	102973	42755	59821	8,649

Table 4.7: Estimated total number of Adult COTs that contain each treatment in each year

	Number of adult examinations	Number of adult fillings	Number of adult extractions
2009/10		7,485,440	2,041,660
2010/11	18,560,250	7,639,090	2,125,120
2011/12	21,512,138	7,714,558	2,190,245
2012/13	22,284,890	7,677,359	2,214,974
2013/14	23,191,087	7,671,312	2,226,054
2014/15	23,876,797	7,490,376	2,185,518
2015/16	24,213,524	7,305,323	2,156,023
2016/17	24,673,683	7,086,774	2,147,135
2017/18	24,427,440	6,769,352	2,082,546
2018/19	24,741,500	6,593,669	2,049,567

Table 4.8: Dental health of five-year olds

Year	Prevalence of experience of dental decay % (95% CI)	Mean number of teeth with experience of dental decay (95% CI)	Mean number of teeth with experience of dental decay in 5-year-olds with decay experience (95% CI)
2008	30.9 (30.66-31.13)	1.1 (1.1-1.12)	3.4 (3.42-3.47)
2012	27.9 (27.67-28.14)	0.9 (0.93-0.96)	3.4 (3.36-3.41)
2015	24.7 (24.48-24.98)	0.8 (0.83-0.85)	3.4 (3.37-3.43)
2017	23.3 (23.03-23.56)	0.8 (0.77-0.79)	3.4 (3.31-3.39)
2019	23.4 (23.08-23.67)	0.8 (0.78-0.81)	3.4 (3.36-3.44)

4.2 Modelling the relationship between costs and access to dentistry

Over time, national average weekly gross disposable household income (GDHI) in England has increased more than the increases in dental charges (after adjusting for inflation), in principle making dentistry more 'affordable' over time. Only in 2009/10 and 2016/17 were the increases in charges larger than the national average increase in GDHI. At area level, however, there is considerable variation in weekly GDHI (in 2018, ranging from £252 to £1217), and as the NHS charge applies across the country we are able to observe differences in both NHS costs as a percentage of GDHI, and explore whether this is potentially associated with access to NHS dentistry.

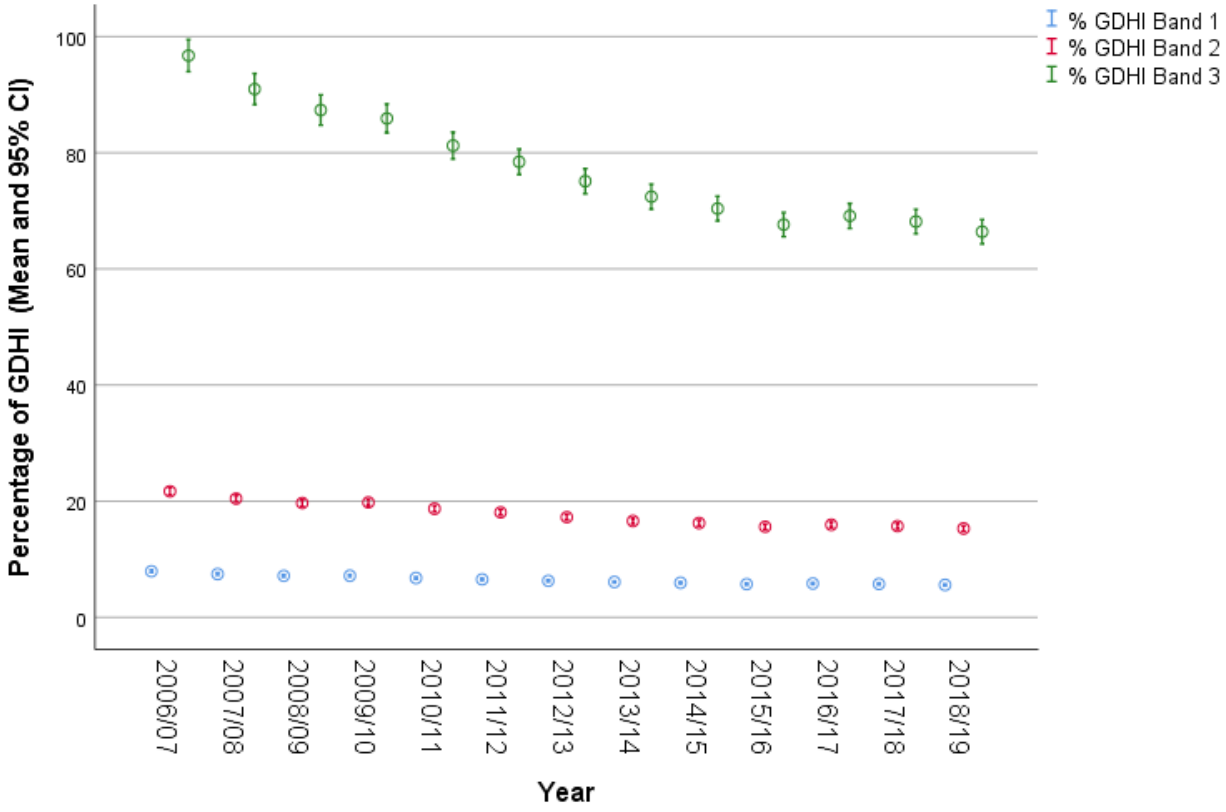
Table 4.9: Weekly Gross Disposable Income (GDHI) – average and variation across CCGs

	GDHI (weekly)			
	Mean	*SD*	*Median*	*Range*
2006/07	*299.47*	*78.62*	285.25	*195.48 - 747.83*
2007/08	*314.63*	*88.04*	294.65	*204.63 - 835.67*
2008/09	*322.50*	*94.43*	302.06	*205.85 – 891.27*
2009/10	*328.31*	*92.93*	310.33	*208.71 – 887.52*
2010/11	*331.15*	*90.10*	312.44	*208.85 – 862.79*
2011/12	*335.09*	*87.54*	319.29	*210.00 – 840.62*
2012/13	*348.71*	*95.91*	328.77	*215.38 – 915.48*
2013/14	*361.13*	*107.19*	335.38	*227.21 – 1022.42*
2014/15	*372.19*	*113.68*	344.33	*232.83 – 1095.12*
2015/16	*391.03*	*122.06*	366.48	*242.19 – 1142.06*
2016/17	*394.99*	*122.18*	368.87	*245.25 – 1122.87*
2017/18	*403.52*	*121.90*	379.27	*249.92 – 1131.10*
2018/19	*421.46*	*128.10*	393.48	*252.65 – 1217.04*

Table 4.10: Treatment costs as a proportion of GDHI – average and variation across CCGs

	% GDHI Band 1				% GDHI Band 2				% GDHI Band 3			
	Mean	SD	Median	Range	Mean	SD	Median	Range	Mean	SD	Median	Range
2006/07	7.93	1.60	7.92	3.02 - 11.56	21.70	4.37	21.67	8.27 - 31.62	96.73	19.48	96.59	36.84 - 140.95
2007/08	7.46	1.53	7.54	2.66 - 10.86	20.44	4.21	20.68	7.29 - 29.78	90.96	18.72	92.04	32.45 - 132.53
2008/09	7.15	1.50	7.21	2.44 - 10.58	19.68	4.13	19.85	6.73 - 29.13	87.35	18.32	88.12	29.86 - 129.31
2009/10	7.16	1.45	7.19	2.51 - 10.68	19.79	3.99	19.86	6.94 - 29.53	85.91	17.34	86.23	30.15 - 128.21
2010/11	6.77	1.35	6.82	2.47 - 10.21	18.71	3.73	18.85	6.83 - 28.21	81.23	16.18	81.87	29.65 - 122.48
2011/12	6.54	1.29	6.54	2.48 - 9.94	18.07	3.56	18.08	6.87 - 27.48	78.43	15.43	78.46	29.80 - 119.29
2012/13	6.29	1.27	6.33	2.27 - 9.67	17.25	3.50	17.37	6.24 - 26.51	75.09	15.22	75.63	27.16 - 115.45
2013/14	6.09	1.27	6.2	2.03 - 9.15	16.58	3.46	16.87	5.53 - 24.90	72.42	15.11	73.68	24.17 - 108.75
2014/15	5.95	1.25	6.06	1.91 - 8.96	16.23	3.41	16.54	5.20 - 24.47	70.38	14.79	71.74	22.56 - 106.10
2015/16	5.71	1.24	5.73	1.84 - 8.67	15.59	3.39	15.64	5.02 - 23.66	67.63	14.71	67.81	21.76 - 102.61
2016/17	5.83	1.27	5.86	1.93 - 8.82	15.94	3.49	16.04	5.27 - 24.13	69.12	15.12	69.56	22.85 - 104.62
2017/18	5.75	1.24	5.76	1.93 - 8.74	15.71	3.40	15.73	5.28 - 23.88	68.15	14.76	68.27	22.89 - 103.61
2018/19	5.59	1.23	5.63	1.82 - 8.77	15.30	3.37	15.41	4.98 - 23.99	66.39	14.64	66.86	21.62 - 104.13

Figure 4.5: Treatment cost bands as a percentage of GDHI (Mean and 95% Confidence Interval) for CCGs



4.2.1 Costs and percentage of adults attending

The regression models for each treatment band (tables 4.11-4.13) show that after accounting for area-level differences, availability of NHS dentistry and general time trends, the percentage of GDHI appears negatively associated with percentage of adults attending. As the relative cost to the patient rises, the percentage of adults attending decreases. In band 1, a 1% increase in relative cost is associated with a 1% decrease in the percentage of the population attending. For band 2 this was a 0.45% reduction and for band 3 the reduction was smaller at 0.08 percentage points. In each case, however, the findings were not statistically significant.

The number of dentists per 100,000 population was significant in predicting the proportion of adults attending; as the availability of dentists increased, the percentage attending also increased. Across all treatment bands, an increase of 1 dentist per 100,000 results in a 0.1 percentage point increase in adults attending.

The year variable was also significant in predicting the proportion of adults attending. Comparing 2018/19, the reference year to previous years, higher % attendance was predicted in the years prior. This was the same across all bands.

4.2.2 Costs and courses of treatment

The results of the regression models (tables 4.14-4.17) show that for bands 1, 2 and urgent cases, after accounting for area-level differences, availability of NHS dentistry and general time trends, there is again an apparent negative relationship: as the relative cost of treatment increases, the number of COTs decreases. For band 1, a 1% increase results in a reduction of 1562 COTs per 100,000. For band 2 this is 267 and urgent cases this is 486. For band 3, the reverse is observed: as the cost increases the number of COTs also increases; a 1% point increase results in 16 extra COTs per 100,000. None of these results, however, are statistically significant. The number of dentists per 100,000 was significant in predicting the number of COTs, in each case a higher number of dentists predicted a higher rate of COTS per 100,000 population. The percentage of COTs that were free of charge was also significant in predicting the number of COTs -a higher proportion of free COTs significantly predicted a higher number of COTs per 100,000 across all treatment bands.

Table 4.11: Regression model results – relationship between Band 1 treatment cost as a percentage of GDHI and the percentage of adults reporting having attended an NHS dentist over the previous 2 years

Dependent Variable: % adults attending over previous 24 months						
Parameter*	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	40.473	5.130	7.890	<0.001	30.408	50.538
Cost % of GDHI (Band 1)	-1.014	.962	-1.054	.292	-2.903	.874
Dentists per 100,000	.147	.017	8.691	<0.001	.113	.180
[Year=2012/13]	3.651	.725	5.035	<0.001	2.228	5.074
[Year=2013/14]	2.902	.554	5.241	<0.001	1.816	3.988
[Year=2014/15]	2.109	.432	4.879	<0.001	1.261	2.957
[Year=2015/16]	1.502	.290	5.177	<0.001	.933	2.072
[Year=2016/17]	1.101	.348	3.163	.002	.418	1.784
[Year=2017/18]	.790	.303	2.602	.009	.194	1.385
[Year=2018/19] (reference)	0	.	.	.	.	.

**Model also adjusted for CCG*

Table 4.12: Regression model results – relationship between Band 2 treatment cost as a percentage of GDHI and the percentage of adults attending an NHS dentist over the previous 2 years

Dependent Variable: % adults attending over previous 24 months						
Parameter*	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	40.764	5.126	7.953	<0.001	30.708	50.821
Cost % of GDHI (Band 2)	-.391	.351	-1.114	.266	-1.081	.298
Dentists per 100,000	.147	.017	8.692	<0.001	.114	.180
[Year=2012/13]	3.707	.738	5.020	<0.001	2.258	5.156
[Year=2013/14]	2.897	.528	5.491	<0.001	1.862	3.932
[Year=2014/15]	2.114	.422	5.015	<0.001	1.287	2.941
[Year=2015/16]	1.493	.284	5.249	<0.001	.935	2.051
[Year=2016/17]	1.114	.348	3.203	.001	.432	1.797
[Year=2017/18]	.791	.300	2.635	.009	.202	1.381
[Year=2018/19] (reference)	0	.	.	.	.	.

**Model also adjusted for CCG*

Table 4.13: Regression model results – relationship between Band 3 treatment cost as a percentage of GDHI and the percentage of adults attending an NHS dentist over the previous 2 years

Dependent Variable: % adults attending over previous 24 months						
Parameter*	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	40.627	5.095	7.974	<0.001	30.631	50.624
Cost % of GDHI (Band 3)	-.088	.080	-1.093	.275	-.246	.070
Dentists per 100,000	.147	.017	8.690	<0.001	.113	.180
[Year=2012/13]	3.709	.752	4.931	<0.001	2.233	5.185
[Year=2013/14]	2.924	.556	5.256	<0.001	1.833	4.016
[Year=2014/15]	2.100	.416	5.044	<0.001	1.283	2.917
[Year=2015/16]	1.486	.283	5.254	<0.001	.931	2.041
[Year=2016/17]	1.102	.343	3.209	.001	.428	1.776
[Year=2017/18]	.786	.299	2.626	.009	.199	1.374
[Year=2018/19] (reference)	0[a]	.	.	.	.	.

**Model also adjusted for CCG*

Table 4.14: Regression model results – relationship between Band 1 treatment cost as a percentage of GDHI and dental activity (courses of treatment) per 100,000 population

Dependent Variable COTs per 100,000 population						
Parameter*	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	36200.44	4442.84	8.148	<0.001	27483.35	44917.54
Cost as % of GDHI (Band 1)	-1562.40	832.62	-1.876	.061	-3196.05	71.26
Dentists per 100,000	65.73	14.58	4.507	<0.001	37.11	94.34
% Band exempt of charge	82.92	38.39	2.160	.031	7.60	158.23
[Year=2012/13]	-181.97	670.88	-.271	.786	-1498.28	1134.33
[Year=2013/14]	33.95	528.13	.064	.949	-1002.27	1070.18
[Year=2014/15]	-156.96	411.03	-.382	.703	-963.42	649.50
[Year=2015/16]	-239.52	279.72	-.856	.392	-788.34	309.31
[Year=2016/17]	394.26	310.96	1.268	.205	-215.85	1004.38
[Year=2017/18]	-286.80	264.26	-1.085	.278	-805.29	231.70
[Year=2018/19] (reference)	0[a]	.	.	.	.	.

**Model also adjusted for CCG*

Table 4.15: Regression model results – relationship between Band 2 treatment cost as a percentage of GDHI and dental activity (courses of treatment) per 100,000 population

Dependent Variable COTs per 100,000 population						
Parameter*	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	14590.2	2350.9	6.2	<0.001	9977.50	19202.82
Cost as % of GDHI (Band 2)	-267.7	158.8	-1.7	0.092	-579.24	43.76
Dentists per 100,000	40.7	7.6	5.3	<0.001	25.74	55.64
% Band exempt of charge	87.9	21.0	4.2	<0.001	46.63	129.08
[Year=2012/13]	3387.4	361.5	9.4	<0.001	2678.13	4096.61
[Year=2013/14]	3011.6	271.9	11.1	<0.001	2477.98	3545.14
[Year=2014/15]	2042.1	218.0	9.4	<0.001	1614.37	2469.84
[Year=2015/16]	1488.3	146.1	10.2	<0.001	1201.67	1774.98
[Year=2016/17]	1166.5	163.3	7.1	<0.001	846.12	1486.93
[Year=2017/18]	381.4	136.3	2.8	0.005	113.97	648.843
[Year=2018/19] (reference)	0[a]	.	.	.	.	.

**Model also adjusted for CCG*

Table 4.16: Regression model results – relationship between Band 3 treatment cost as a percentage of GDHI and dental activity (courses of treatment) per 100,000 population

Dependent Variable COTs per 100,000 population						
Parameter*	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	-379.86	665.77	-0.57	0.568	-1686.12	926.41
Cost as % of GDHI (Band 3)	16.33	10.13	1.61	0.107	-3.55	36.21
Dentists per 100,000	8.40	2.12	3.96	<0.001	4.24	12.57
% Band exempt of charge	49.10	4.64	10.59	<0.001	40.00	58.20
[Year=2012/13]	566.59	99.22	5.71	<0.001	371.91	761.27
[Year=2013/14]	545.80	75.26	7.25	<0.001	398.14	693.45
[Year=2014/15]	464.19	55.68	8.34	<0.001	354.94	573.44
[Year=2015/16]	422.62	36.84	11.47	<0.001	350.35	494.89
[Year=2016/17]	283.19	43.73	6.48	<0.001	197.39	368.98
[Year=2017/18]	106.93	37.68	2.84	0.005	33.00	180.87
[Year=2018/19] (reference)	0[a]	.	.	.	.	.

**Model also adjusted for CCG*

Table 4.17: Regression model results – relationship between urgent treatment cost as a percentage of GDHI and dental activity (courses of treatment) per 100,000 population

Dependent Variable COTs per 100,000 population						
Parameter*	B	Std. Error	t	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
Intercept	7415.20	1772.63	4.18	<0.001	3937.21	10893.19
Cost as % of GDHI	-486.97	327.13	-1.49	0.137	-1128.82	154.87
Dentists per 100,000	25.65	5.74	4.47	<0.001	14.39	36.90
% Band exempt of charge	14.52	12.22	1.19	0.235	-9.46	38.50
[Year=2012/13]	780.24	271.80	2.87	0.004	246.97	1313.52
[Year=2013/14]	931.67	213.84	4.36	<0.001	512.11	1351.22
[Year=2014/15]	637.24	167.50	3.80	<0.001	308.60	965.88
[Year=2015/16]	261.97	114.31	2.29	0.022	37.69	486.25
[Year=2016/17]	190.23	123.47	1.54	0.124	-52.04	432.49
[Year=2017/18]	-19.20	103.87	-0.19	0.853	-222.99	184.60
[Year=2018/19] (reference)	0[a]	.	.	.	.	.

**Model also adjusted for CCG*

4.3 Comparing costs and attendances in England with other UK countries

It is potentially useful to compare NHS dental costs and attendances in England with other UK countries, see figure 4.6

In Scotland, where there is no charge for an initial dental examination, the percentage of adults attending an NHS dentist in the last two years has increased over time; by 2019 two-year attendances were 13 percentage points higher in Scotland compared with England.

In Wales, the banding and charging systems are identical to those in England, but charges have been increased at a much lower rate, particularly since 2014/15. In Wales the percentage of adults attending an NHS dentist has remained relatively static over time, and in England, attendances as a percentage of population have decreased slightly. Observing data reported from 2012 onwards, which avoids the apparent shock of the 2006 contract change, Wales and England had very similar rates of attendance between 2012 and 2015, but since the 5% uplifts implemented from 2014/2015 onwards, there is a very slight divergence in trends.

Figure 4.6: Percentage of adults attending an NHS dentist in England, Scotland and Wales in previous 24 months, alongside costs of Band 1/initial investigations

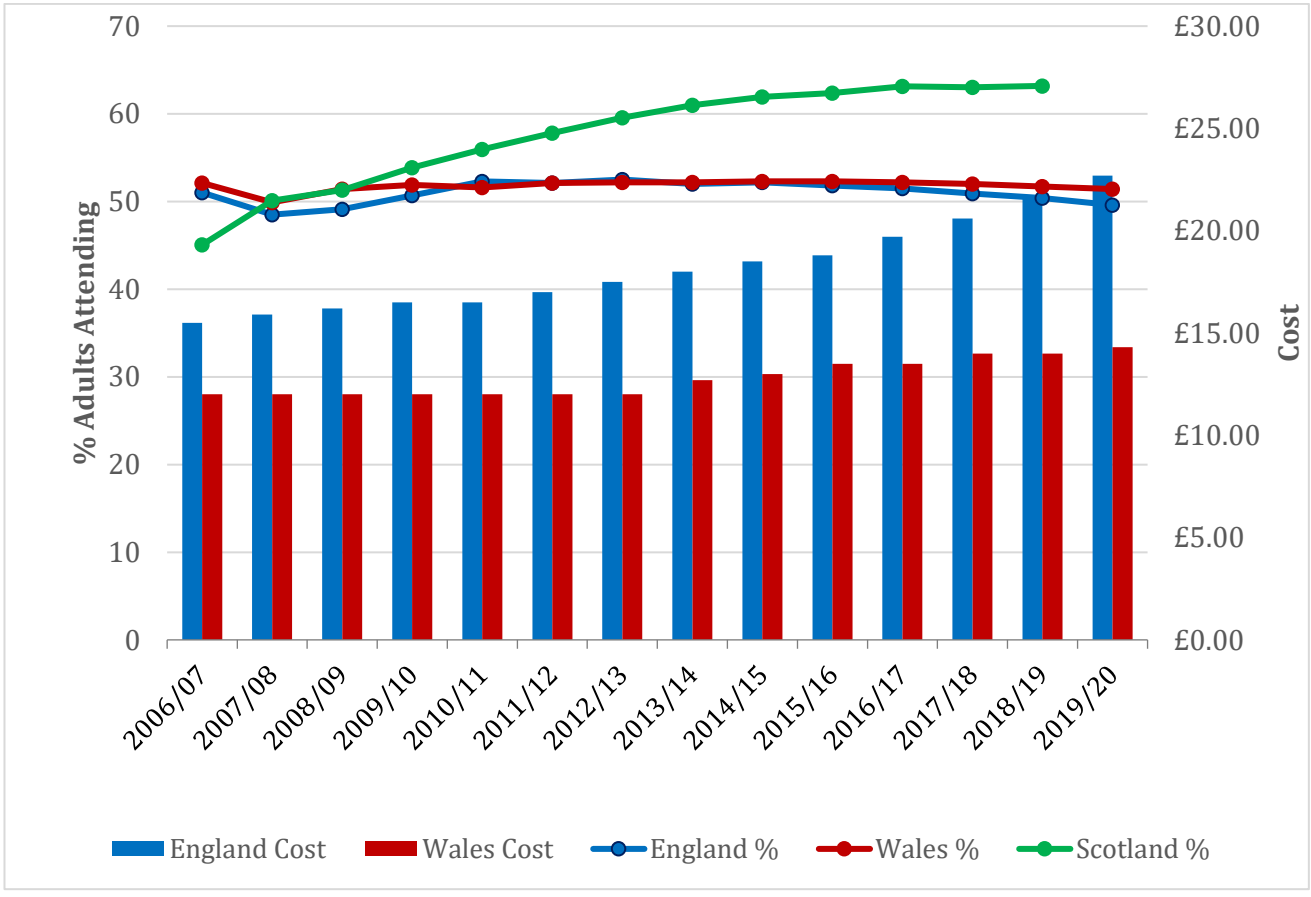


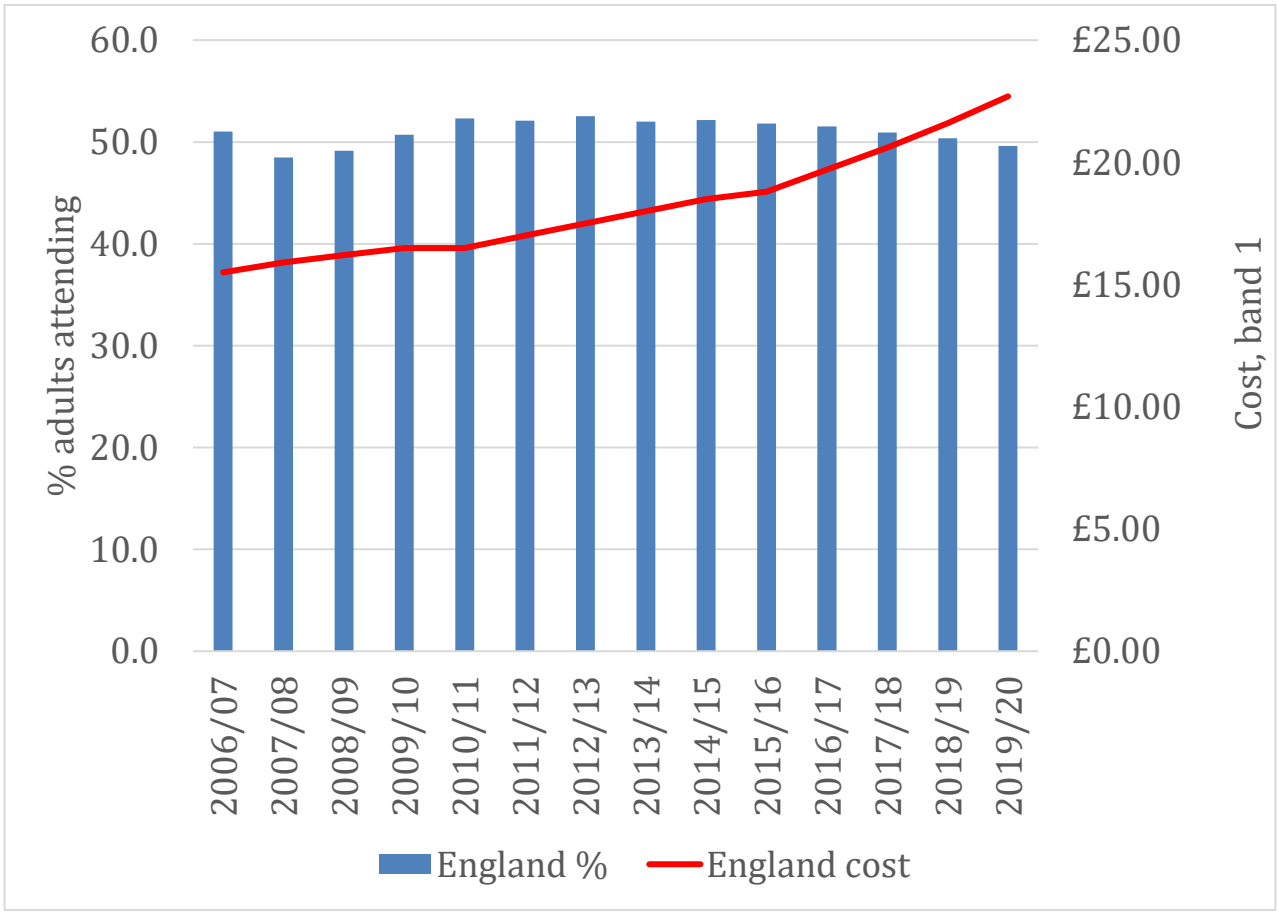
Table 4.18: Band 1 / initial examination charges and percentage attending in the previous 24 months by nation

	England			Wales			Scotland		
Year end	Band 1 Charge	Adults attending (000s)	%	Band 1 Charge	Adults attending (000s)	%	Examination Charge	Adults attending (000s)	%
31-Mar-07	£15.50	20,285	51	£12.00	-	52.1	0	1,838	45.1
31-Mar-08	£15.90	19,435	48.5	£12.00	-	49.9	0	2,062	50.1
31-Mar-09	£16.20	19,869	49.1	£12.00	-	51.4	0	2,130	51.3
31-Mar-10	£16.50	20,668	50.7	£12.00	1,246	51.9	0	2,251	53.9
31-Mar-11	£16.50	21,342	52.3	£12.00	1,247	51.6	0	2,358	55.9
31-Mar-12	£17.00	21,755	52.1	£12.00	1,266	52.1	0	2,461	57.8
31-Mar-13	£17.50	21,938	52.5	£12.00	1,276	52.2	0	2,547	59.6
31-Mar-14	£18.00	22,024	52	£12.70	1,280	52.2	0	2,618	61.0
31-Mar-15	£18.50	22,096	52.2	£13.00	1,287	52.3	0	2,672	61.9
31-Mar-16	£18.80	22,163	51.8	£13.50	1,292	52.3	0	2,709	62.4
31-Mar-17	£19.70	22,216	51.5	£13.50	1,297	52.2	0	2,761	63.1
31-Mar-18	£20.60	22,145	50.9	£14.00	1,299	52.0	0	2,769	63.0
31-Mar-19	£21.60	22,030	50.4	£14.00	1,301	51.7	0	2,786	63.2
31-Mar-20	£22.70	21,840	49.6	£14.30	1,297	51.4	0	-	-

4.3.1 England

The cost has increased from £15.50 in 2007 to £22.70 in 2020, the percentage attending has decreased since 2015.

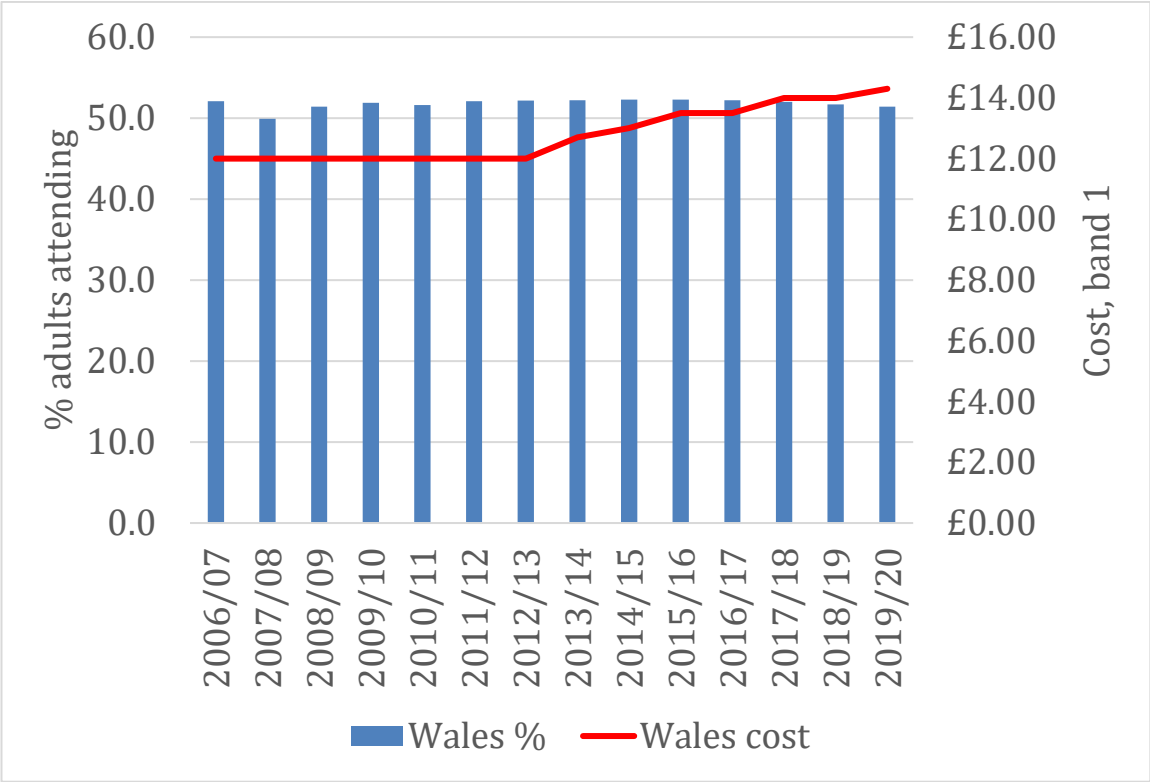
Figure 4.7 Percentage of adult population attending in previous 2 years and band 1 cost – England



4.3.2 Wales

The cost of band 1 has increased from £12 in 2007 to £14.30 in 2020. The percentage of the population attending has remained fairly constant around 52%.

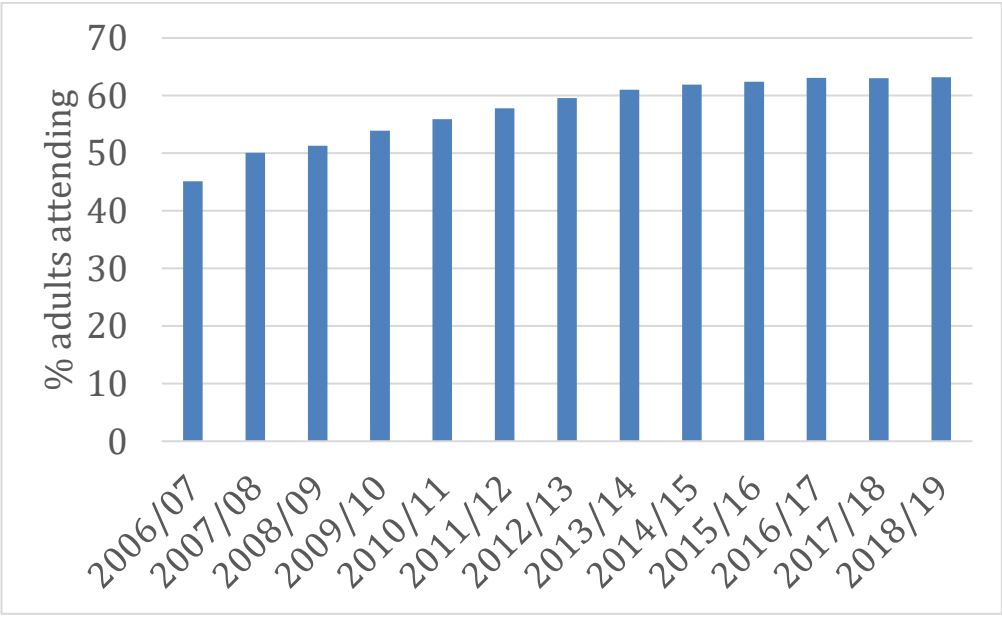
Figure 4.8: Percentage of adult population attending in previous 2 years and Band 1 cost – Wales



4.3.3 Scotland

In Scotland there were no charges for examinations from 2006; the percentage of adults attending has increased over time and exceeds that in England and Wales by around ten percentage points.

Figure 4.9: Percentage of adult population attending in previous 2 years – Scotland



4.4 Exploring inequalities in dental access and deprivation

To determine whether dental charges affect certain communities and/or populations particularly, we explore inequalities by level of deprivation, using the income domain of the Index of Deprivation.

Patients in the most income-deprived areas of England are more likely to access NHS dental care (figure 4.10). Although this pattern is unusual compared with access to many other NHS services,[23] it is explained by the ability of richer populations to access private dentistry, and differences in the public-private mix of the supply of dental services.

Poorer communities are also more likely to have more intensive treatments, with a larger proportion of all treatment being in the higher bands. This is consistent with reports of socio-economic differences in dental health.[24] Across all areas, the percentage of the adult population attending has decreased since 2013/14.

Data from the GP Dental survey showed that nationally the percentage of adults not reporting having seen an NHS dentist in the previous two years increased from 39.6% to 42.1% in 2019/20. We used data from 2015/16 onwards to examine the differences between CCGs in different deprivation quintiles. Attendance was higher in more deprived areas, and in the least deprived areas higher proportions attend a private dentist.

We examined cost as a reason for not attending for those that said they has not visited a dentist in the past two years. In the most deprived areas, 5.7% thought NHS dental treatment was too expensive in 2015/16, and 5.8% in 2019/20; for the least deprived it rose from 3.0% to 3.4%.

Access to a dentist affects attendance so we examined the number of NHS dentists per 100,000 population. There was little difference between the quintiles, with a general increase in dentists per 100,000 population over time.

Figure 4.10: Percentage of adults attending an NHS dentist over previous 24 months by IMD Income Quintile

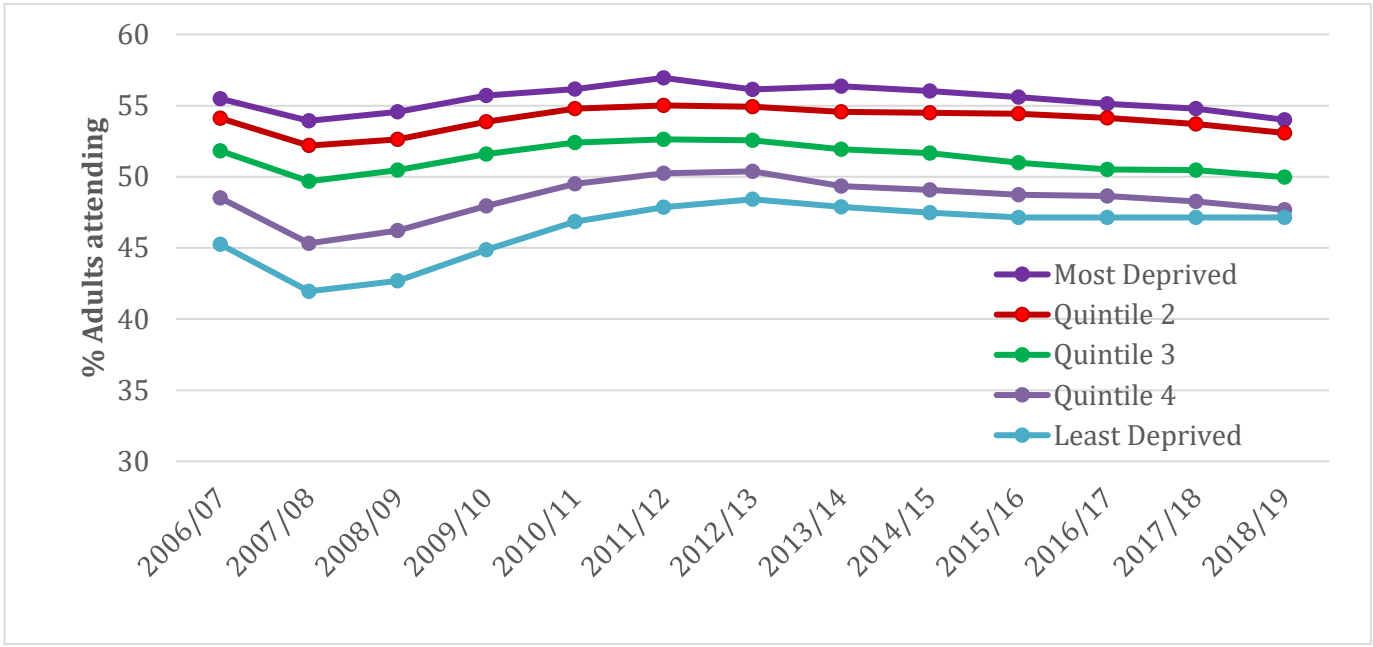


Figure 4.11: Courses of treatment per 100,000 population by treatment Band 1 and IMD Income Quintile

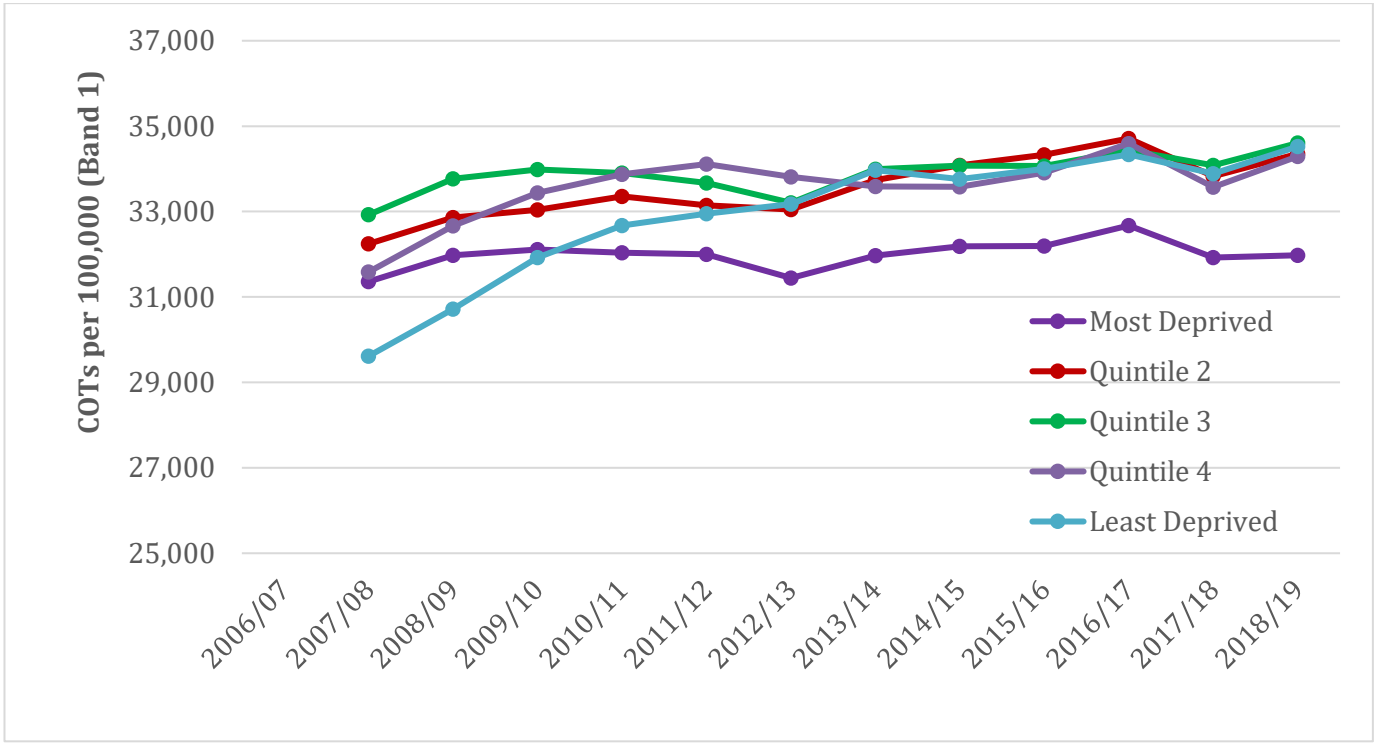


Figure 4.12: Courses of treatment per 100,000 population by treatment Band 2 and IMD Quintile

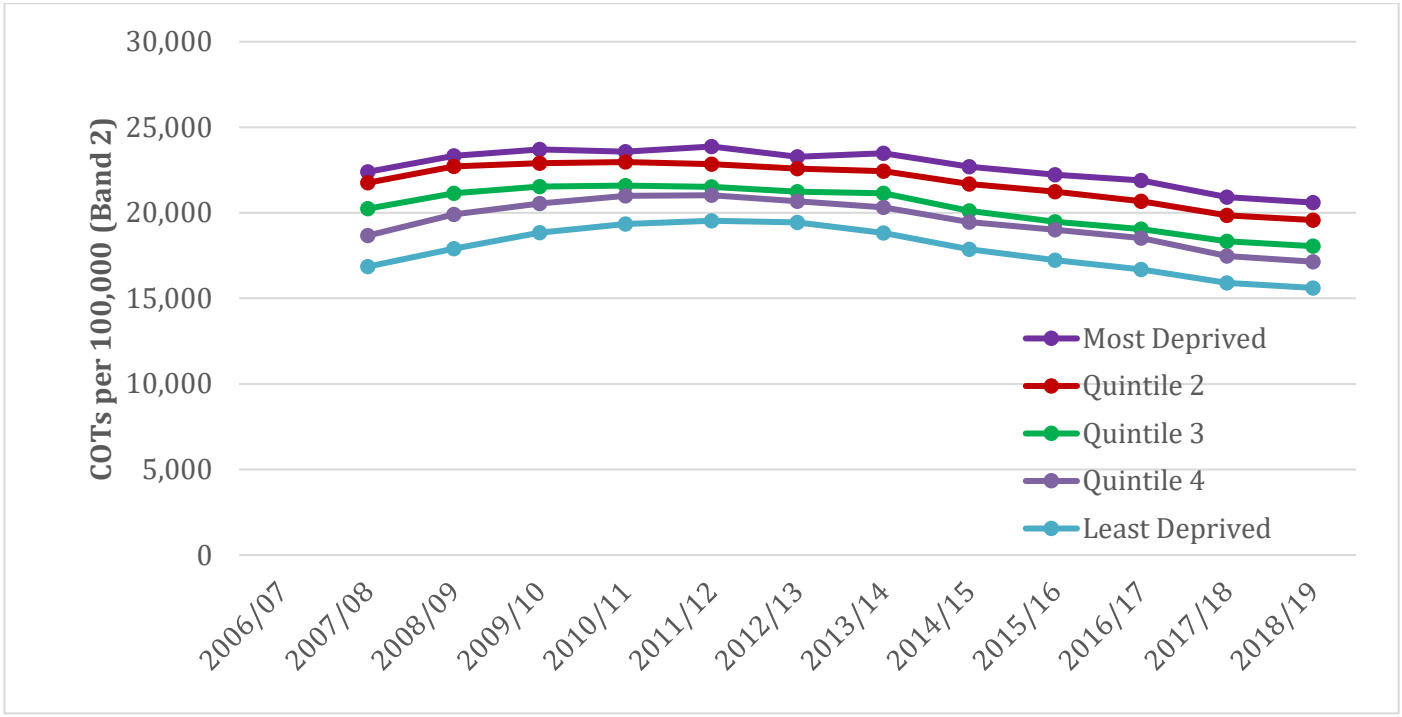


Figure 4.13: Courses of treatment per 100,000 population by treatment Band 3 and IMD Income Quintile

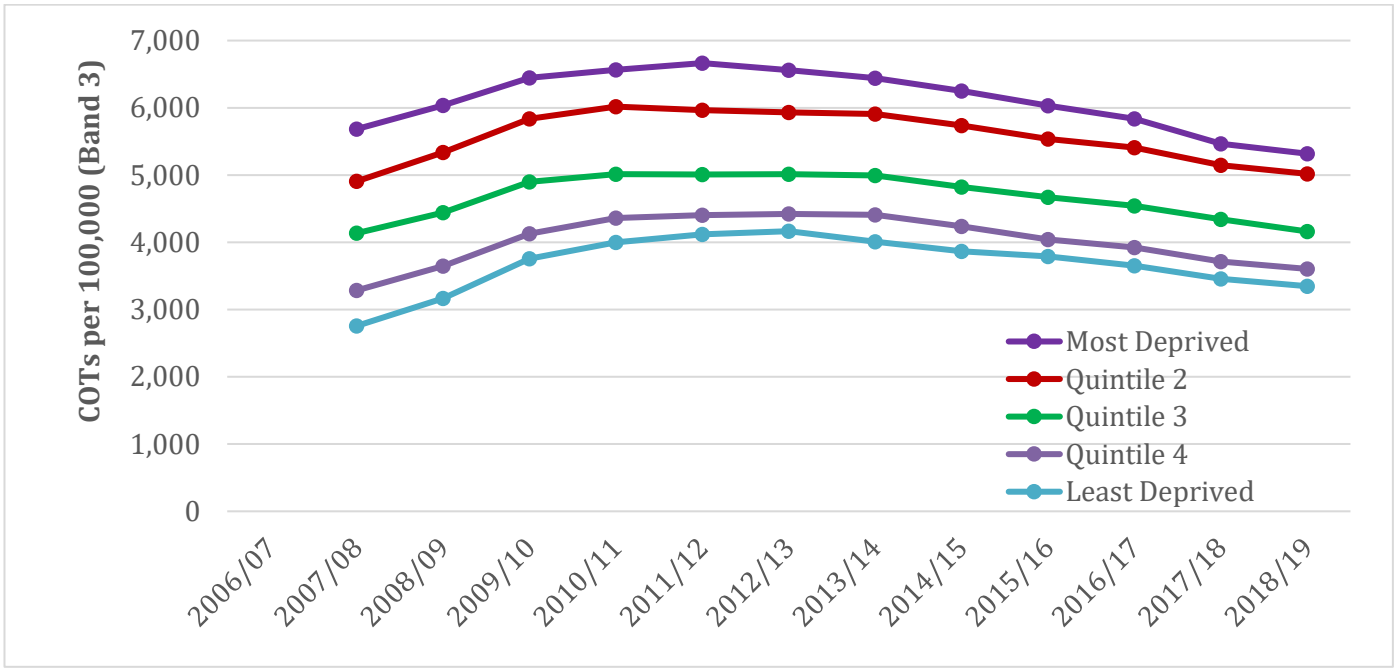


Figure 4.14: Courses of treatment per 100,000 population by treatment band Urgent and IMD Income Quintile

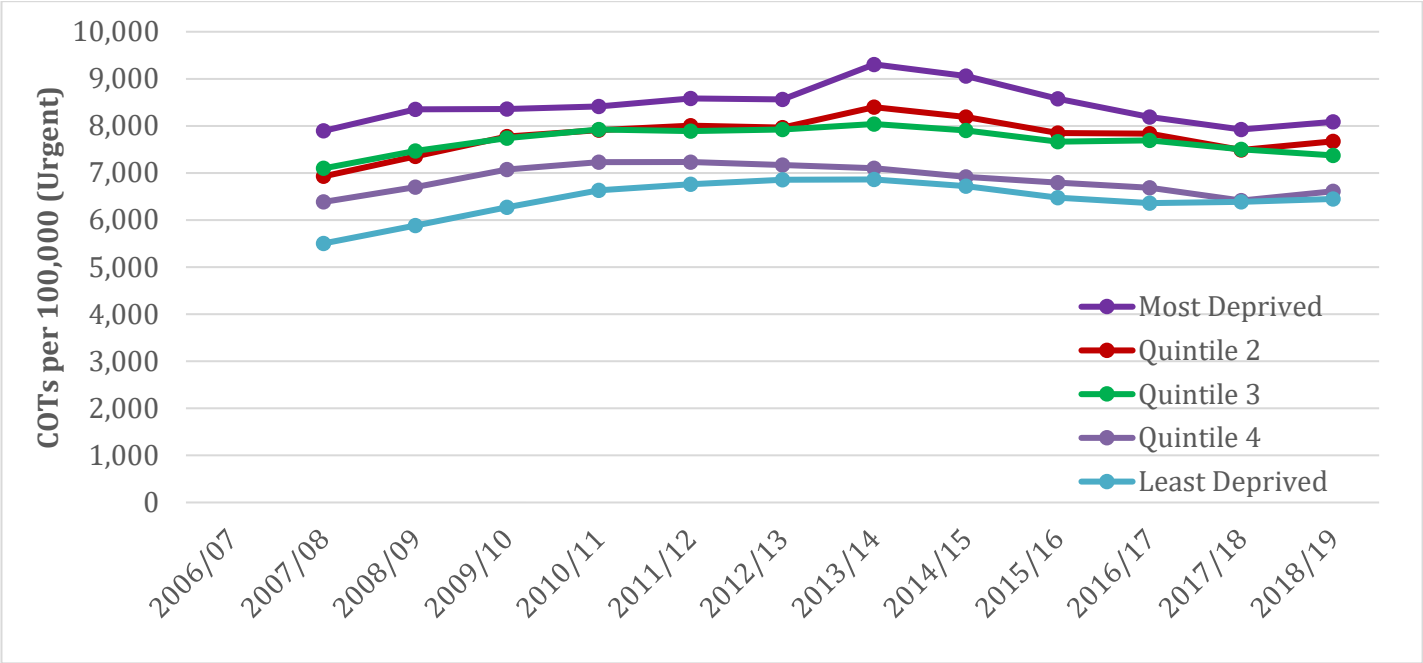


Table 4.19: All courses of treatment, and the percentage that are Band 1

	Most Deprived				Quintile 2				Quintile 3				Quintile 4				Least Deprived			
	COTs per 100,000		% COTs Band 1		COTs per 100,000		% COTs Band 1		COTs per 100,000		% COTs Band 1		COTs per 100,000		% COTs Band 1		COTs per 100,000		% COTs Band 1	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2007/08	69,916	14,147	45.5	6.7	68,196	14,044	47.9	7	66,486	11,867	50.4	6.6	61,796	13,033	52.5	3.7	56,323	13,591	53.8	3.4
2008/09	72,375	14,556	44.8	6.6	70,639	14,222	47.1	7.4	68,962	12,488	49.9	6.6	64,785	13,090	51.9	3.7	59,309	13,724	53.2	3.3
2009/10	73,288	14,451	44.4	6.5	71,951	13,767	46.5	7.7	70,333	12,161	49.3	6.4	67,120	12,613	51.3	3.7	62,458	12,573	52.7	3.5
2010/11	73,139	14,522	44.3	6.4	72,555	12,876	46.6	7.8	70,514	12,199	49.2	6.2	68,345	12,386	51	3.6	64,276	11,797	52.4	3.5
2011/12	73,622	15,513	44	6.3	72,288	13,674	46.4	7.6	70,114	12,686	49.1	6.2	68,628	11,742	51.1	3.5	65,001	11,398	52.2	3.5
2012/13	71,467	14,896	44.5	6.3	71,078	13,830	47.1	7.4	68,712	14,138	49.5	6.2	67,301	11,308	51.7	3.4	64,724	11,452	52.8	3.7
2013/14	71,748	16,160	45.1	6.4	70,970	14,231	48.1	7.5	68,641	17,839	50.4	6.2	65,846	12,543	52.5	4.6	63,998	13,070	54.7	4.3
2014/15	70,721	16,366	46.1	6.4	70,147	14,408	49.2	7.4	67,344	17,716	51.6	6.2	64,589	12,105	53.6	4.7	62,537	12,807	55.7	4
2015/16	69,532	16,193	46.9	6.4	69,388	14,548	50.2	7	66,295	17,734	52.5	6	64,132	11,867	54.5	4.7	61,790	12,465	56.9	3.8
2016/17	69,062	15,698	48	6.2	69,033	14,139	51.1	6.8	66,081	15,747	53.2	5.9	64,081	11,825	55.6	4.4	61,291	11,825	57.9	3.7
2017/18	66,660	15,128	48.6	6.2	66,689	13,804	51.6	6.5	64,617	15,539	53.9	6	61,490	11,534	56.3	4.3	59,861	11,434	58.6	3.6
2018/19	66,387	15,396	49	6.2	66,980	13,976	52.2	6.5	64,506	15,544	54.7	5.9	61,938	10,960	57.1	4.2	60,142	11,222	59.3	3.5

Table 4.20. Dental survey responses - Not attending due to cost

	2015/16				2016/17				2017/18				2018/19			
	% Not seeing dentist in previous 2 years		% Finding NHS dental care is too expensive		% Not seeing dentist in previous 2 years		% Finding NHS dental care is too expensive		% Not seeing dentist in previous 2 years		% Finding NHS dental care is too expensive		% Not seeing dentist in previous 2 years		% Finding NHS dental care is too expensive	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Most Deprived	36.4	5.2	5.7	2.2	38.1	5.2	5.3	1.6	38.5	4.8	5.3	1.6	38.6	5.0	5.8	1.6
Quintile 2	37.5	6.9	5.1	2.0	39.7	6.3	5.0	1.5	39.3	6.5	5.0	1.5	39.6	6.2	5.0	1.6
Quintile 3	38.5	6.4	4.2	1.9	40.5	6.3	4.1	1.7	40.7	6.4	4.3	1.4	40.2	6.2	4.3	1.5
Quintile 4	39.8	5.3	4.0	1.9	41.7	5.1	3.9	1.9	41.9	4.6	3.9	1.4	42.0	4.9	3.9	1.7
Least Deprived	42.8	6.1	3.0	1.1	44.1	5.9	3.2	1.3	44.3	6.3	3.3	1.2	44.1	5.8	3.4	1.4

Table 4.21: 'Affordability' of treatment (NHS dental charges as a percentage of weekly gross disposable household income)

	% GDHI		2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
Most Deprived	Band 1	Mean	9.4	8.8	8.5	8.5	8.0	7.7	7.4	7.2	7.0	6.8	6.9	6.9	6.7
		SD	1.6	1.5	1.5	1.4	1.3	1.3	1.3	1.3	1.2	1.2	1.3	1.2	1.2
	Band 2	Mean	25.6	24.2	23.4	23.4	22.1	21.3	20.4	19.6	19.2	18.6	19.0	18.7	18.3
		SD	4.3	4.2	4.1	3.9	3.7	3.6	3.5	3.4	3.3	3.3	3.4	3.3	3.4
	Band 3	Mean	114.0	107.6	103.9	101.6	95.8	92.5	88.6	85.7	83.3	80.6	82.3	81.2	79.4
		SD	18.9	18.5	18.1	17.1	16.1	15.5	15.4	14.9	14.5	14.5	14.8	14.4	14.5
Quintile 2	Band 1	Mean	8.3	7.7	7.4	7.4	7.0	6.8	6.5	6.3	6.1	5.9	6.0	5.9	5.8
		SD	1.6	1.5	1.5	1.5	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
	Band 2	Mean	22.6	21.2	20.5	20.6	19.4	18.7	17.8	17.1	16.8	16.1	16.5	16.2	15.8
		SD	4.3	4.2	4.2	4.1	3.8	3.6	3.5	3.6	3.5	3.5	3.7	3.6	3.6
	Band 3	Mean	100.6	94.3	90.8	89.3	84.1	81.3	77.7	74.8	72.7	69.9	71.4	70.4	68.7
		SD	19.0	18.7	18.6	17.6	16.5	15.5	15.4	15.5	15.3	15.3	15.9	15.4	15.4
Quintile 3	Band 1	Mean	7.9	7.4	7.0	7.0	6.6	6.4	6.2	6.0	5.9	5.6	5.7	5.6	5.5
		SD	1.5	1.4	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1
	Band 2	Mean	21.5	20.2	19.3	19.4	18.3	17.7	17.0	16.3	16.0	15.3	15.6	15.4	15.0
		SD	4.0	3.8	3.7	3.7	3.4	3.2	3.2	3.3	3.2	3.2	3.3	3.2	3.1
	Band 3	Mean	95.8	89.9	85.8	84.1	79.6	76.9	73.9	71.3	69.3	66.5	67.8	66.8	65.1
		SD	17.7	17.0	16.6	15.9	14.9	14.1	14.1	14.2	14.0	13.8	14.2	13.9	13.5
Quintile 4	Band 1	Mean	7.4	7.0	6.7	6.7	6.4	6.1	5.9	5.7	5.6	5.4	5.5	5.4	5.2
		SD	1.0	1.0	0.9	0.9	0.8	0.7	0.8	0.8	0.8	0.7	0.8	0.7	0.7
	Band 2	Mean	20.3	19.1	18.3	18.5	17.6	17.0	16.2	15.6	15.2	14.6	14.9	14.7	14.3
		SD	2.7	2.6	2.5	2.4	2.2	2.1	2.1	2.1	2.1	2.0	2.1	2.0	2.0
	Band 3	Mean	90.3	85.1	81.3	80.5	76.3	73.7	70.5	68.0	66.1	63.3	64.8	63.8	61.9
		SD	12.1	11.6	10.9	10.2	9.5	8.9	9.0	9.1	8.9	8.7	9.2	8.8	8.6
Least Deprived	Band 1	Mean	6.8	6.4	6.1	6.1	5.8	5.6	5.4	5.2	5.1	4.9	5.0	4.9	4.8
		SD	1.1	1.0	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	Band 2	Mean	18.5	17.4	16.8	17.0	16.1	15.5	14.8	14.2	13.9	13.3	13.6	13.4	13.0
		SD	3.0	2.8	2.6	2.5	2.3	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.1
	Band 3	Mean	82.5	77.6	74.4	73.6	70.0	67.5	64.4	61.9	60.2	57.6	59.0	58.1	56.5
		SD	13.3	12.4	11.5	10.8	10.1	9.7	9.6	9.6	9.4	9.4	9.7	9.3	9.2

Table 4.22: Dentists per 100,000 population

	Most Deprived		Quintile 2		Quintile 3		Quintile 4		Least Deprived	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
2007/08	45.22	8.98	46.15	9.62	48.13	13.83	44.07	7.34	45.82	5.72
2008/09	48.45	8.75	49.11	10.38	50.25	12.53	46.53	7.59	48.18	5.69
2009/10	52.00	9.60	51.38	10.39	52.38	12.06	48.96	8.49	49.79	6.67
2010/11	54.76	9.79	53.42	10.57	54.71	13.38	51.44	8.60	52.90	7.55
2011/12	57.10	9.54	56.43	10.12	56.91	12.67	53.24	7.00	56.31	7.68
2012/13	55.01	12.48	56.03	8.58	56.48	12.09	52.92	11.05	58.10	11.00
2013/14	56.24	12.63	56.61	8.66	55.83	13.50	53.71	11.41	59.08	11.59
2014/15	58.80	12.71	59.21	9.20	58.80	13.74	55.86	11.78	61.55	11.20
2015/16	58.85	14.14	59.40	9.81	59.00	13.58	56.00	10.94	61.19	10.38
2016/17	61.15	14.82	59.41	8.42	59.68	14.06	57.97	11.88	62.47	10.64
2017/18	59.73	13.78	59.50	10.25	59.90	11.88	58.51	11.07	60.83	10.61
2018/19	60.16	13.19	60.40	11.32	60.51	10.95	58.14	13.38	61.85	10.52

5 Discussion

The underlying principle that the NHS should provide services free at the point of use remains strongly supported by the UK public today. In the 2019 British Social Attitudes Survey, when respondents were asked 'if the NHS needed more money, what would you be prepared to accept?', ending exemptions for patient charges was supported by only 3 per cent of those surveyed and introducing charges for GP or A&E visits by only 11 per cent. The most popular response was to raise taxes, supported by the majority of respondents (54 per cent).[25] While patient charges undoubtedly raise revenue for the NHS, generally this covers only around 1 per cent of the NHS budget.[26]

Charges for NHS dentures, introduced in 1951, were the first charges of any kind for NHS treatment, and some at the time viewed them as undermining the fundamental values of the NHS. Charges were introduced at a time of concern about over-consumption and spiralling costs. While concerns about levels of and increases in NHS expenditure remain, the situation faced by policy makers with regard to NHS dentistry was markedly different in the early years of the NHS compared with today. First, dental health was dire - in 1948, more than three quarters of the adult population had dentures. Second, generous fee-for-service payment of dentists encouraged not just artificial teeth but also fillings and extractions – there were substantial incentives for over-treatment. Seventy years later, dental health is much improved, and changes in reimbursement of dentists have reduced the possible incentives for over-treatment.

Data constraints and the structure of provision of dentistry in the UK make it difficult to demonstrate a clear relationship between the level of user charges and access to dental care. This may explain the dearth of published empirical studies on this question – in a scoping review, we found no evidence beyond the 1990s addressing this question directly.

Analytical challenges to observing a clear relationship between NHS dental charges and access to treatment include:

- Improvements in dental health over time, with notable cohort effects that complicate longitudinal analysis.
- Changes to the practice of NHS dentistry, dental technology and choices of treatment, which limit comparisons over time..
- Changes in those entitled to free NHS dental treatment over time, as a result of labour market changes (e.g. increases or reductions in unemployment) and changes in benefit systems (e.g. the rollout of Universal Credit). Data sources on access to dental care do not identify separately those who pay for care and those who are exempt from charges. Only activity by dentists (courses of treatment) separate free from charged episodes of care.

- Constrained supply of NHS dentists, supplemented by substantial private sector provision. People 'priced out' of NHS dentistry may therefore be replaced by others who were previously attending private dentists. This makes data on courses of NHS treatment particularly hard to interpret.

Despite these constraints, our analysis does reveal some cause for concern in relation to the effects of recent increases in NHS dental charges in England.

We found some suggestive evidence that NHS dental charges are likely to be deterring patients from accessing dental care, but this is less clear than the relationship established in other areas of user charges (e.g. prescription charges) because of data constraints and the public/private mix of dental care provision. Our statistical model of the relationship between the percentage of adults attending an NHS dentist and the 'affordability' of NHS dental care indicated that increased cost appears to reduce the proportion of adults who access dental care, but the results did not reach statistical significance. Similar relationships emerged using NHS courses of treatment (COTs) as a dependent variable. Higher levels of cost (as a proportion of household income) are associated with lower COTs, but again results did not reach statistical significance.

In relation to the impact of increasing charges (particularly the recent 5% annual uplifts) and their effect on patients' ability to access dental care, we observe that the percentage of the adult population in England attending an NHS dentist over the preceding 24 months has decreased by three percentage points since 2014/15, to slightly fewer than 50% of adults. The number of adults reporting that they were unable to obtain an NHS dental appointment increased from 2015 to 2020 (pre-COVID-19). In 2015 4% reported that the expense of NHS dental care was their main reason for not trying to get an appointment, this figure has also increased slightly to 5% in 2020

Different charging regimes in the constituent countries of the UK permit some additional useful comparisons. England's charges have increased more than those in Wales, and in Scotland, a dental examination is free of charge, but treatments are charged. In Scotland the percentage of adults attending an NHS dentist in the last two years has increased, and exceeds that in England by around ten percentage points. In Wales this is relatively static over time, and in England, this decreased slightly. Wales and England had very similar rates of attendance between 2012 and 2015, but since 2015 are showing a slight divergence in trends, with a lower percentage of the population accessing NHS dentistry in England. This divergence coincides with the 5% annual increase in charges in England.

Higher deprivation areas have a higher percentage of adults attending an NHS dentist, reflecting the fact that higher income individuals are more likely to attend a private dentist. Nevertheless, a socio-economic gradient in subjective oral health has been reported in the UK,[27] as have more objective

measures of oral health,[28] particularly in children,[29] and costs being viewed as a barrier to accessing dental care.[30]

Whilst the analysis in this report is constrained, particularly by data limitations, all of our findings suggest a likely relationship between increased NHS dental charges and reduced access to NHS dentistry; a relationship which is likely to affect disproportionately poorer individuals and those with worse oral health. This is consistent with underlying theory and a substantial evidence base on user charges in other areas of health care.

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Appendix A: Scoping review search strategy

Results: 410

Database: Ovid MEDLINE(R) ALL <1946 to September 03, 2020>
Search Strategy:
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1 Fees, Dental/ (2342)
2 ((fees or fee or charge or charges or surcharge* or price* or payment* or pay or paying or expenditure or cost or costs) adj6 (dentist* or dental or fillings or root canal or dentures or tooth extraction* or teeth extraction* or oral health or crowns)).ti,ab. (2823)
3 1 or 2 (4787)
4 (demand or access or priced out or afford or visit* or restric* or barrier* or attend* or treatments or supply or utilisation or ulitlization or price elasticity or price sensitivity).ti,ab. (2067311)
5 3 and 4 (1104)
6 ((fees or fee or charge or charges or surcharge* or price* or payment* or pay or paying or expenditure or cost or costs) adj3 (dentist* or dental or fillings or root canal or dentures or tooth extraction* or teeth extraction* or oral
health or crowns)).ti,ab. (1612)
7 1 or 6 (3656)
8 ((fees or fee or charge or charges or surcharge* or price* or payment* or pay or paying or expenditure or cost or costs) adj2 (dentist* or dental or fillings or root canal or dentures or tooth extraction* or teeth extraction* or oral
health or crowns)).ti,ab. (1051)
9 1 or 8 (3169)
10 exp Great Britain/ (366048)
11 (national health service* or nhs*).ti,ab,in. (200050)
12 (english not ((published or publication* or translat* or written or language* or speak* or literature or citation*) adj5 english)).ti,ab. (95429)
13 (gb or g b or britain* or uk or u k or united kingdom* or england* or northern ireland* or northern irish* or scotland* or scottish* or wales or welsh*).ti,ab,jw,in. (1809565)
14 10 or 11 or 12 or 13 (2105031)
15 7 and 14 (410)

Appendix B: Regression equations and sensitivity analysis

Data from 2011/12 to 2018/19 (n = 7 years) and 191 CCGs.

Equation 1: modelling percentage of people who attended in the previous two years

$$Y_{ij} = \alpha + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_{3i} x_{3i} + \beta_{4j} x_{4j} + \varepsilon_{ij}$$

Y_{ij} = percentage of people attending over the two years preceding year *i* and CCG *j*
α = *Intercept*
x_{1ij} = *Cost of treatment as a % of GDHI for year i and CCG j*
x_{2ij} = *Number of NHS dentists per 100,000 for year i and CCG j*
x_{3i} = *Year, where* x_{3i} *takes the value of 0 or 1.*
x_{4j} = *CCG, where* x_{4j} *takes the value of 0 or 1*
ε_{ij}= error term

Equation 2: Courses of Treatment (COTs)

$$Y_{ij} = \alpha + \beta_1 x_{1ij} + \beta_2 x_{2ij} + \beta_{3i} x_{3i} + \beta_{4j} x_{4j} + \beta_{5ij} x_{5ij} + \varepsilon_{ij}$$

Y_{ij} = courses of treatment in year *i* and CCG *j*
α = *Intercept*
x_{1ij} = *Cost of treatment as a % of GDHI for year i and CCG j*
x_{2ij} = *Number of NHS dentists per 100,000 for year i and CCG j*
x_{3i} = *Year, where* x_{3i} *takes the value of 0 or 1.*
x_{4j} = *CCG, where* x_{4j} *takes the value of 0 or 1*
x_{5ij} = *proportion of treatments exempt from charges for year i and CCG j*
ε_{ij}= error term

Sensitivity analyses

The percentage attending is over the preceding two year period, but the affordability variable X_1 (cost of treatment as a % of GDHI) different each year. It was not possible to calculate % attendance over a single year.

In the main analyses the single year for affordability corresponds to the second period for % attended. A sensitivity analysis was carried out to see if changing the time period of affordability to match the first period of attendance had an impact on the results. For example the % attended was from 2018/19 but this covers 2017/18 to 2018/19. For the primary analysis the affordability was measured from 2018/19 but in the sensitivity analysis the affordability was from the previous year, in this case 2017/18.

The sensitivity analysis, changing the affordability from the second period of attendance to the first period, did not have an impact on the results.

Appendix C: Supplementary information

Private and NHS dental charges, as reported by *Which?*[22]

Treatment	NHS price	Private price
New patient consultation or check-up	Band 1 - £23.80	£20-£120
Simple X-rays/radiograph	Band 1 - £23.80	£5-£40
Hygiene clean/scale and polish	Band 1 - £23.80 / Band 2 - £65.20 for deep scaling	£25-£85
Amalgam filling/metal filling	Band 2 - £65.20	£30-£175
Composite filling/white filling	Band 2 - £65.20	£40-£250
Root canal treatment	Band 2 - £65.20	£45-£970
Tooth extraction	Band 2 - £65.20	£50-£370
Crown	Band 3 - £282.80	£250-£1,180
Dentures/bridges	Band 3 - £282.80	£355-£2,520

Reasons for adults to be eligible for free dental treatment

Aged 18 and in full-time education
Expectant Mother
Nursing Mother (had a baby in the year before treatment starts)
In Prison or a Young Offender Institution
Adult in receipt of Income Support
Adult in receipt of Income-based Jobseeker's Allowance (JSA)
Adult in receipt of income-related Employment and Support Allowance (ESA)
Adult in receipt of Universal Credit
Pension Credit guarantee credit (PCgc)
Named on a HC2 certificate
Named on valid NHS Tax Credit Exemption certificate
Named on a HC3 certificate


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