An analysis of patient expenditure in the GDS in Scotland 1998-2007

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RESEARCH

IN BRIEF

- Reports on the size and variability of patient expenditure in the general dental services (GDS) in Scotland.
- Expenditure is small relative to non-NHS insurance arrangements and other components of personal expenditure.
- There is relatively little variability in patients' GDS expenditure.
- This suggests that the system of patient charges provides some insurance against the cost of oral healthcare.

Introduction The purpose of this paper is to examine the size and variability of patients' expenditure in the general dental service (GDS) in Scotland during the recent past. **Methods** Retrospective analysis of individual patient's expenditure drawn from a 5% random sample of patients treated in the GDS in Scotland between January 1998 and September 2007. Three measures of expenditure per patient were used to assess the size and variability of patients' expenditure in the GDS: patient expenditure per claim, patient expenditure during a 12-month period and patient expenditure during the sample period. **Results** The size of patients' expenditure on the GDS is small relative to non-NHS insurance arrangements and other components of personal expenditure. There is relatively little variability in patients' GDS expenditure. **Conclusions** The relatively small size and variability of patient expenditure in the GDS in Scotland suggests that the system of patient charges provides some insurance against the cost of oral healthcare. However, a complete assessment of the insurance properties of the system of patient charges would require several other factors to be accounted for.

INTRODUCTION

The purpose of this paper is to examine the size and variability of patients' expenditure in the general dental service in Scotland during the recent past. In 2007 total expenditure on NHS general dental services (GDS) fees in Scotland amounted to £193.6 million.* The majority of this total was financed out of general taxation but patients also made a contribution, approximately £47.5 million, through patient charges. The patient charge constitutes 80% of the cost of treatment, excluding examinations, up to a maximum limit currently set at £384 unless the patient is exempt.‡ If exempt, the patient pays nothing. Since April 2006, dental examinations have been free for patients in Scotland. The size of patients' contribution to the funding of public sector dental care means that structure of patient charges, and the impact that structure has on patients' expenditure, is a key issue for NHS dental services.

This paper identifies a random sample of patients from the GDS payments database during 1998-2007, extracts the claims for the treatment associated with these patients and calculates the treatment fees and patient charges associated with those claims. After some data cleaning, we use over 1.3 million claims to analyse the size and variability of patients' expenditure on the GDS in Scotland. The longitudinal nature of these data allows us to measure GDS expenditure per person for individual claims, during a 12-month period and during the 10-year sample period.

METHODS

Before April 2006, non-salaried GDS dentists were paid in very similar ways within the UK. While the payment system in England & Wales has since changed, the payment system for non-salaried GDS dentists in Scotland has remained the same: dentists are paid a registration fee for each patient that registers with them and item of service fees for the treatment they provide. Non-salaried GDS dentists provide the vast majority of GDS treatment in Scotland but patients may also receive treatment from the salaried GDS. These salaried GDS dentists are employed by NHS boards, which are responsible for health services in their area, and are usually recruited to areas where access to the GDS is limited.§

The NHS GDS in Scotland records all claims for treatment in the Management Information and Dental Accounting System (MIDAS), which is an administrative database primarily used for paying dentists. MIDAS covers all GDS courses of dental treatment delivered and paid for over the last 10 years. In 2006-07 approximately 4.2 million courses of GDS dental treatment were recorded. Each practice, dentist, patient, course of treatment and individual treatment is allocated a unique identifier and it is, therefore, possible to follow patients, dentists and types of treatment over time.

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*This includes notional fees for treatment provided by the salaried GDS.
†The Scottish Executive introduced free examinations for NHS GDS patients in April 2006.

§In 2007, the item of service fees associated with the activity of salaried GDS and non-salaried GDS were £3.8 million and £137.1 million, respectively.

Within MIDAS, each course of GDS treatment is termed a claim. Within each claim a patient may receive a number of specific claim treatments, eg an examination, a scale and polish, a radiograph, an extraction, etc. Each of these claim treatments has a specific code (and fee) associated with it. These fees are informed by the Doctors and Dentists Review Body and the menu of fees is set out in an annual publication called the Statement of Dental Remuneration (SDR). While the level of fees has increased over time, the relative fees for treatments have remained largely fixed.

For the purposes of our analysis we obtained a simple random sample from the MIDAS database for claims paid between January 1998 and September 2007 using the following procedure. Within MIDAS, each patient is allocated a unique patient identifier the first time they receive treatment in the GDS and that unique identifier should remain with the patient for every subsequent course of treatment. In order to obtain a representative sample of patients we extracted all the claims made by dentists for patients with patient identifiers ending in 00, 01, 02, 03 and 04. Thus, the sample should represent a 5% random sample of patients whose GDS treatment was paid for during the sample period. Of the claims that had associated fee and dentist information (1,659,972) we excluded patients who had a claim made by dentists with a commitment list number (9 observations)[‖] and claims for patients for whom the fee paid was recorded as £0.00 (4,006).[¶] We further restricted the sample to patients aged between 18 and 75, which resulted in a further 302,124 observations being dropped and also omitted observations for patients whose recorded sex changed over the sample period (a further 53,162 observations).[#] This yielded 1,263,740 claims made by non-salaried dentists and 36,925 claims made by salaried dentists on 145,396 patients.

Three measures of expenditure per patient are used in this paper to assess the size and variability of patients' expenditure in the GDS. These are patient expenditure per claim, patient expenditure during a 12-month period and patient expenditure during the sample period.

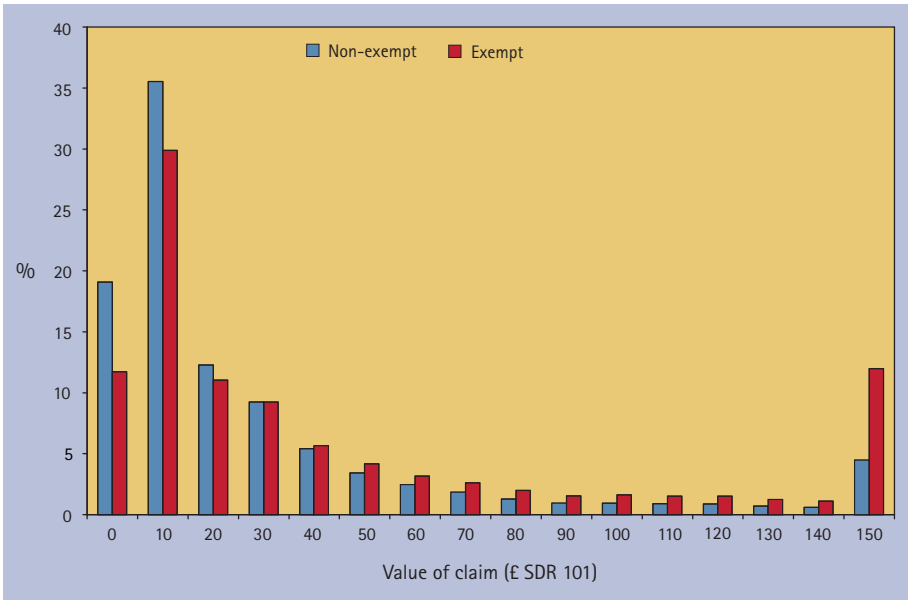

Fig. 1 The distribution of item of service fees per claim

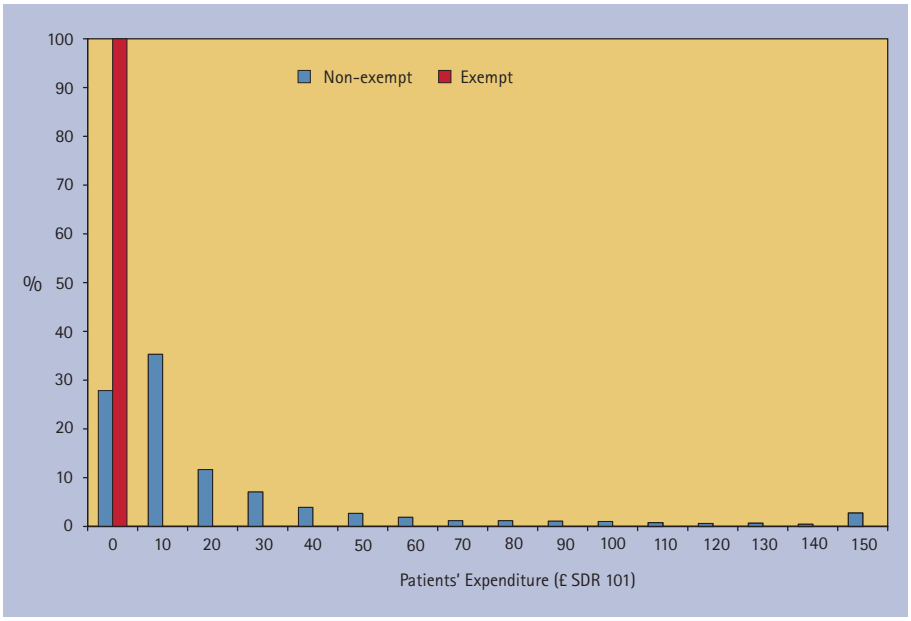

Fig. 2 The distribution of patient expenditure per claim

RESULTS

Patient expenditure per claim

Patients' expenditure in the GDS depends upon the total item of service fees paid to the dentist, the exemption status of the patients and the treatment items included in the claim. This paper calculates patients' expenditure as follows: expenditure on GDS by patients who were exempt was assumed to be £0;[**] expenditure by non-exempt patients was assumed to be 80% of the item of service fee up to a maximum of £384 (excluding examination fees paid after April 2006). Figure 1 and Figure 2 illustrate the distribution of item of service fees per claim and patient expenditure per claim, respectively, in the sample.

Comparing the distribution of fees with the distribution of patient expenditure illustrates the impact of the current system of patient charges in Scotland.[††] Compared with the distribution of item

[‖]Commitment list numbers are list numbers used to pay dentists' commitment payments rather than to pay for patient care.
[¶]These are claims for point of treatment checks for adult patients claiming exemption from or remission of patient charges and 'discretionary fees', for treatments that are not covered by the SDR but may be paid for by the NHS.
[#]This may arise if the sex of the patient differs between submitted claims or if a different sex is entered or recognised from the claim form.

[**]Patients who are liable to pay partial charges (about 0.4% of all claims) are assumed to be fully exempt.
[††]The right skew in both distributions is common in health data: most patients are relatively low cost while a few are very high cost.

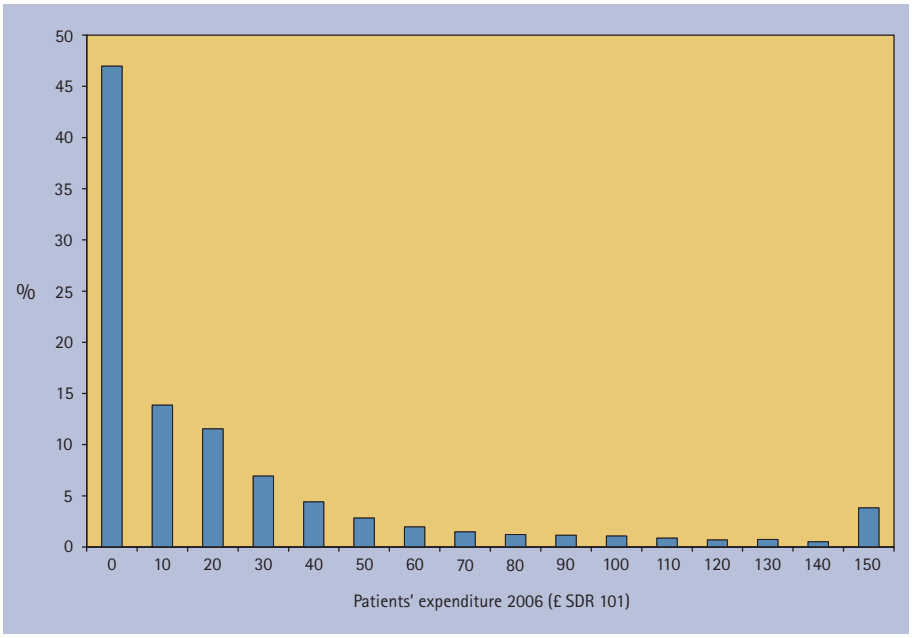

Fig. 3 The distribution of patient expenditure in the GDS in 2006

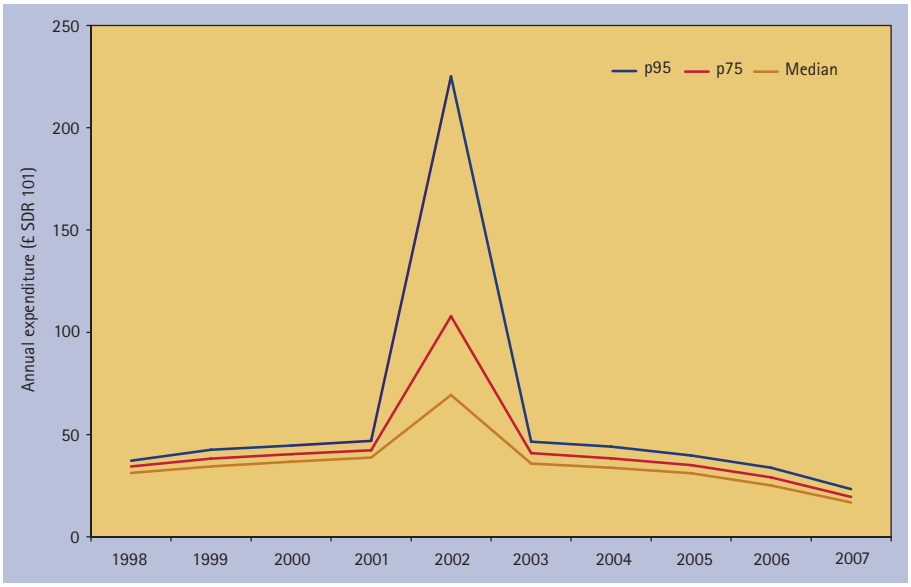

Fig. 4 Patient expenditure on GDS over time

of service fees, the distribution of patient expenditure for non-exempt patients has a lower mean (£29.86 compared with £39.00) and standard deviation (£42.02 compared with £62.36). The lower mean and standard deviation for the distribution of patient expenditure compared with the distribution of fees is a function of the maximum limit on patient expenditure (£384), because patients only pay 80% of the item of service fees and from the introduction of free dental exams. For exempt patients, the mean and variance of patient expenditure is £0. For all patients, therefore, the size and variability of patient expenditure per claim is relatively low.

Patient expenditure during a 12-month period

Patients may have more than one claim each year and the size and variability of annual expenditure may be much larger than the size and variability of expenditure per claim. These data allow patients' claims to be linked (anonymously) so it is possible to calculate each patient's expenditure on NHS dental services over time. Figure 3 illustrates the distribution of patient expenditure for claims paid in 2006 (the last full year in the sample) and shows that: only 5% of patients had GDS expenditure of more than £130 (£2.50 a week); only 10% of patients had expenditure of more than £80.52 (£1.54 a week); and 75% of patients had expenditure of less than £33.64 (£0.65 a week). Median patient expenditure on GDS in 2006 was just £12.48 (£0.24 a week).[§§]

To put this level of expenditure into context, expenditure on medical services is reported to be £4 per household per week in Scotland.[1] This expenditure includes medical products, appliances and equipment and hospital services but does not seem to include dental services. In contrast, the average household in Scotland spends £8.60 a week on personal care.[||||]

There are a variety of additional insurance schemes available for dental expenditure such as traditional insurance arrangements, including self-insurance, or healthcare cashplan schemes, which refund the cost of covered treatments up to a maximum limit. It is difficult to get a clear picture of the costs of these different types of insurance schemes in order to compare them with expenditure on NHS dental services, particularly since the coverage offered is different, but a search of the internet found that the monthly cost of dental insurance policies ranged from £6 a month (almost six times median expenditure on NHS dental services) to £20 a month (almost 20 times median expenditure on NHS dental services), depending upon the amount of cover and whether the treatment was provided in the public or private sector. Healthcare cashplan schemes, which cover dental and other expenditure, range from about £8 a month to around £45 a month depending upon the amount of cover required.

Patient expenditure during the sample period

The size and variability of patients' expenditure on the GDS may also be measured between years. Figure 4 illustrates the variation in patient expenditure during the entire sample period and shows the extent to which individuals who had high patient expenditure in one year had high patient expenditure in other years. For example the p(95) line in

[§§]These figures exclude information on patients who were in the sample and did not use the GDS in 2006. Moreover, free dental examinations were only introduced in April 2006.

[||||]Personal care includes: hairdressing, beauty treatment (£2.70); toilet paper (£0.70); toiletries and soap (£1.80); baby toiletries and accessories (disposable) (£0.40); hair products, cosmetics and electrical personal appliances (£3.10).

Figure 4 plots mean annual expenditure for patients who were in the 95th percentile of the patient expenditure distribution in 2002. If there was no variation in patient expenditure between years, annual expenditure in all other years would be roughly the same as in 2002. However, Figure 4 shows that patients in the 95th percentile of the expenditure distribution in 2002 had much lower expenditure in all other years. By contrast, patients with greater than median expenditure in 2002 had relatively similar levels of expenditure in all other years.

During the entire sample period, the mean annual expenditure of patients who were in the 95th (75th) percentile of the expenditure distribution in 2002 was only £58 (£43). Therefore, even for patients who face some variation in expenditure, the size of GDS expenditure over a 10-year period is relatively small.

CONCLUSION

This paper has used a random sample of data from an administrative database to estimate patient expenditure on the GDS in Scotland during 1998 and 2007. General Dental Service patients in Scotland are insured against the full cost of their treatment in several ways: patients may be exempt from charges; patients not exempt from charges are insured against losses greater than £384 for a single claim; since April 2006 patients have received free dental exams; and patients do not pay their own capitation fees. Partly as a result of this insurance, patient expenditure in the GDS is small relative to other forms of expenditure and non-NHS dental expenditure.

While the purpose of this paper is descriptive, it can be used to assess the effectiveness of this system of patient charges as an insurance mechanism. For example, an important component of insurance schemes is the extent to which they protect patients from large and unpredictable events. The results in this paper suggest that the size and variability of patients' expenditure on GDS is relatively small and thus the system of patient charges in Scotland does indeed provide some insurance against the cost of oral healthcare.

Moreover, this paper suggests that the merits of any new system of patient charges can be assessed in terms of its insurance properties by estimating the size and variability of patient expenditure. For example, this analysis could be conducted in England and Wales by comparing the old system of patient charges, which was similar to the current system in Scotland, with the new system based on the Band into which a patient's treatment is categorised.

However, there are several other factors that would need to be accounted for when assessing any system of patient charges in terms of its insurance properties. These other factors are beyond the scope of this paper but include patients' degree of risk aversion; the extent to which patient charges affect the use of dental services; and the oral health benefits of particular treatments.[2–5]

Another issue not discussed in this paper is the form of patient charges. Both in Scotland and England these are in the form of user charges, which depend upon the use of the GDS. There are many alternative forms of patient charges. One possible alternative is for non-exempt patients to pay an annual premium in return for NHS registration. Other things being equal, the data in this paper suggest that this premium would have to be set at about £30 per year (£2.50 a month) in order to generate the same level of patient charges for the GDS.

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